Appendix A
Data Usability Report

Data Usability Report
Crawford Creek and Nemadji River, St. Louis River and Bay Area of Concern
EPA GLAES Contract
Task Order No. 0015/Contract No. EP-R5-11-09

PREPARED FOR: U.S. Environmental Protection Agency

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Introduction

This report summarizes the quality evaluation of the data collected in June and July 2014 from the Crawford Creek/Nemadji River in the St. Louis River and Bay Area of Concern, Wisconsin. The project was conducted for the U.S. Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO).
The investigation was conducted to gather information regarding the nature and extent of contaminated sediments, to evaluate sediment thickness, to conduct a preliminary evaluation of contaminant bioaccumulation in fish, and to perform habitat and biological surveys. Sample collection methods, processing and analytical methods, general field observations, and the analytical data will be summarized in the site characterization report.

Field Data

Field investigation activities were conducted from June 18 through 27, 2014 (sediment thickness survey and sampling), and July 15 through 17, 2014 (habitat survey and fish sampling). The field data were assessed for completeness, compliance, and accuracy in accordance with the requirements stated in the field sampling plan (FSP) and quality assurance project plan (QAPP). The deviations from the sampling program and potential impacts on the usability of the data and decision making are presented in the following subsections.

Surveying

The precision and accuracy of surveyed locations is important in meeting the data quality objectives. Surveying activities were performed in accordance with the FSP (CH2M HILL 2014a) and QAPP (CH2M HILL 2014b).
A real-time kinematic (RTK) global positioning system (GPS) was used for navigation and collection of coordinates of core locations, sediment probe locations, shoreline topography survey locations, and collection of surface elevation data. Additionally, water depth and penetration depth during sediment coring and probing activities were measured at each sampling location and recorded on the sediment core logs or transect probe data forms.

The sampling vessel and RTK GPS instrumentation for the sediment investigation were provided by the team subcontractor, Affiliated Researchers. Horizontal coordinates were reported in latitude and longitude decimal degrees using the World Geodetic System of 1984. Elevation measurements were referenced to the North American Vertical Datum of 1988 and recorded in U.S. survey feet. A daily GPS system check of the northing, easting, and elevation readings was performed against the established project site benchmarks, and was performed both before and after sampling activities to verify horizontal and vertical accuracies.
Two benchmarks were established prior to sampling activities using NGS OPUS methodology. In addition, EPA

GLNPO Locational Data Checklist and Meta Forms were completed daily to record the GPS system checks against project benchmarks.

The FSP and QAPP specify the acceptance criteria for horizontal and vertical accuracies as ± 0.5 foot and ± 0.2 foot, respectively. During the investigations, the average variances for the horizontal and vertical readings at the established benchmarks were ± 0.02 foot and ± 0.01 foot, respectively, with a maximum vertical variance of + 0.15 foot and a maximum horizontal variance of + 0.08 foot, which are within the required tolerance criteria.

Sediment Probing

Sediment probing was conducted to obtain sediment thickness measurements within Crawford Creek and its respective floodplain, as well as the Nemadji River. Probing activities were performed in accordance with the FSP (CH2M HILL 2014a) and QAPP (CH2M HILL 2014b). A 0.5-inch outer-diameter steel rod was manually advanced until refusal, and the thickness measurement was recorded to the nearest 0.1 foot. The sediment thickness within Crawford Creek and the Nemadji River was calculated by subtracting the water depth from the total probe depth. Water depth was measured using a survey range pole outfitted with a 6-inch-diameter disc attached at the bottom and recorded to the nearest 0.1 foot. A water or ground surface elevation measurement was recorded at each probe location to convert depth measurements to a respective elevation.

Except for the probing locations in floodplain transect CF-07, locations in all other transects (9 out of 10 transects) were shifted slightly based field conditions coupled with light detection and ranging data received from the Wisconsin Department of Natural Resources (WDNR). The modified transect locations provided greater lateral floodplain coverage and improved the delineation of low-lying areas and visible drainage patterns within the floodplain.

Sediment probing in the Nemadji River was conducted at the five depositional areas proposed in the FSP. All but one area used transects with five evenly spaced probe locations spanning from each shoreline (approximately 15 to 20 feet apart). In the proposed Depositional Area No. 2, probing was conducted along the inside bend of the river where the thickest sediment deposit was observed. At this location, three probes were located along a transect starting at the shoreline of the inside bend and extending across half the width of the river. Additional probes were located approximately 75 feet upstream and 150 feet downstream of the initial three-point transect described above.

Sediment Sampling

Sediment cores were collected from the 55 locations proposed in the FSP and 6 additional locations, for a total of 61 locations within the investigation area. The additional 6 locations were selected to provide greater data density within drainage pattern features observed within the western half of the Crawford Creek floodplain. CH2M HILL, in collaboration with EPA and WDNR, agreed that the additional core locations were warranted to provide better sample coverage across the floodplain.

Sediment cores were collected using vibracore and manual coring techniques using 3-inch-diameter polycarbonate tubes. Manual core collection methods were used at locations within the Crawford Creek floodplain and at three locations (CC01-A1, CC01-A, and CC02-A) within Crawford Creek that could not be accessed by the vibracore sampling vessel. Samples were collected at depth intervals of 0 to 0.5 and 0.5 to 2.0 feet, and in continuous 1-foot intervals thereafter. Although the sediment sampling in Crawford Creek and the respective floodplain described in the FSP anticipated cores to extend to a maximum depth of 5 feet, the refusal at native clay was generally within the upper 2 or 3 feet, or there was minimal to no soft sediments encountered at the selected locations. Overall, the coring refusal and extensive presence of native clay in Crawford Creek and its floodplain reduced number of sample intervals (but not coring locations) collected at the site. The sampling approach is consistent with the FSP, which called for core collection to refusal depth. The Nemadji River locations contained greater depositional conditions (generally sand).

The sampling approach in the floodplain areas was modified to account for the vegetation and wooded area in wetlands and the native clay-like material encountered. Manual coring methods were used to collect samples in the floodplain area, where the vibracoring equipment was not able to be mobilized. The revised sampling approach due to existing site conditions was discussed and approved by EPA in the field.

The following are specific observations and deviations from the FSP and QAPP.

- Transect NR-04 located in the Nemadji River was relocated approximately 200 feet further downstream than proposed in the FSP. The change was made to include the portion of the river containing the thickest sediment deposit observed during the probing.
- The sample location representing background conditions of the Nemadji River located upstream of the confluence of Nemadji River and Crawford Creek (NR01-A1) was collected approximately 300 feet upstream from the proposed location in the FSP. The change was made based on the field observation of a prominent sediment depositional feature.
- One sample location (NR03-A10) was added between Nemadji River transects 2 and 3 to provide increased spatial coverage within the portion of the Nemadji River immediately downstream of the Crawford Creek confluence.

Defined Bank Survey

Survey data was collected at the water's edge and the top of the defined bank along each shore at the Crawford Creek transects and at locations spaced 100 feet along the shores of the 1-mile segment of the Nemadji River downstream of the Crawford Creek confluence. The top of bank was visually delineated as the first significant bank encountered above the water line by a CH2M HILL staff member. The defined bank survey was performed in accordance with the required survey tolerance criteria describe within the FSP (CH2M HILL 2014a) and QAPP (CH2M HILL 2014b); therefore, no adverse effects to data quality were observed.

Habitat Assessment Survey and Bio-uptake Sampling

The habitat assessment survey and bio-uptake sampling were conducted between July 14 and 17, 2014. The habitat assessment was performed at four reaches within Crawford Creek and included the collection of field data in support of calculating the indices of biotic integrity (IBI), invertebrate community indices (ICI), and qualitative habitat evaluation indices (QHEI). The study area includes a 0.5-mile segment of Crawford Creek from the Soo Line Railroad Bridge downstream to the confluence of Crawford Creek and the Nemadji River. The 0.5-mile segment of Crawford Creek was divided into four reaches of approximately equal length, starting at the upstream end with Reach 1 and proceeding downstream to Reach 4, which ends at the confluence with the Nemadji River. Fish collection for the bio-uptake sampling was performed in Crawford Creek and within a 1-mile segment of the Nemadji River, starting from the Crawford Creek confluence and moving downstream. The habitat assessment and bio-uptake activities were performed in accordance with the FSP (CH2M HILL 2014a) and QAPP (CH2M HILL 2014b).

The QHEI assessment was performed at one location within each of the four reaches. Macro invertebrate samples were collected using a D-frame net at multiple locations throughout the extent of each reach to calculate the ICI. One composite macroinvertebrate sample was collected from each of the four reaches within Crawford Creek. Fish from Crawford Creek were collected in support of calculating the IBI and for bioaccumulation testing, whereas fish from the Nemadji River were collected for bioaccumulation testing only.

For the first round of fish sampling, four gill nets, one in each reach, were set in Crawford Creek. The collected fish were logged, and a teleconference was held with EPA, WDNR, and CH2M HILL staff to determine how the fish would be processed and sampled for bioaccumulation testing. The sampling approach for the second round of fish sampling was determined in consultation with EPA and WDNR during the August 14 teleconference. Subsequently, three nets were set in the Nemadji River and one in Reach 1 of Crawford Creek.

Cast netting was performed as an alternative method to gill netting in all four reaches of Crawford Creek to support the IBI and bioaccumulation testing. Seine netting was performed in Reach 1 to target forage fish for bioaccumulation testing. Seine netting was not performed in the other three reaches of the creek because the steepness of the creek bank made it inaccessible. The targeted fish species identified in the FSP and QAPP were not captured within each reach; however, representative fish from each target category were obtained. In accordance with the FSP and QAPP, teleconferences were held with EPA and WDNR to evaluate the collected fish species. Fish tissue sample determinations were approved by EPA in consultation with WDNR.

Laboratory Data

The sediment sampling was conducted from June 22 through June 26, 2014. Analytical method information is presented in Table 1. Samples were collected and shipped to Pace Analytical for the following analyses:

- One-hundred and twenty-nine sediment samples and 13 field duplicate samples were analyzed for the following total metals: polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol (PCP), acid volatile sulfides/simultaneously extracted metals (AVS/SEM), total organic carbon (TOC), particle size, and dioxin and furans.

The fish tissue sampling was conducted between July 16 and 17, 2014, and samples were collected and shipped to Pace Analytical for the following analysis (Table 1):

- Fifteen fish tissue samples were collected and analyzed for PCP, dioxins and furans, and lipid content.

Quality assurance (QA)/quality control (QC) samples were collected at the frequencies indicated in the FSP and QAPP (CH2M HILL 2014a and 2014b). QA/QC samples collected included field duplicates and matrix spikes (MSs)/matrix spike duplicates [MSDs]). Field duplicate samples were collected at a frequency of at least 10 percent, and MS/MSD samples were collected at a frequency of at least 5 percent in sediment samples. In accordance with the FSP, MS/MSD samples were not collected for particle-size samples.

TABLE 1

Analytical Method Information

Crawford Creek and Nemadji River Site

Analyte Class	Matrix	Method Citations	Laboratory Assignment
Total Metals	Sediment	SW-846 6010C/7471B	Pace Analytical – Green Bay, WI
PAHs and PCP	Sediment	SW 846 8270C SIM	Pace Analytical – Green Bay, WI
AVS/SEM	Sediment	EPA 1629	Pace analytical – Green Bay, WI
TOC	Sediment	Lloyd Kahn	Pace Analytical – Green Bay, WI
Particle Size	Sediment	ASTM D422	Pace Analytical – Virginia, MN
Dioxin and Furan Congeners	Sediment	EPA 1613B	Pace Analytical- Minneapolis, MN
PCP	Tissue	SW-846 8270C SIM	Pace Analytical - Green Bay, WI
Dioxin and Furan Congeners	Tissue	EPA 1613B	Pace Analytical – Minneapolis, MN
Lipids	Tissue	Per Laboratory SOP	Pace Analytical – Green Bay, WI

Individual method requirements, guidelines in the QAPP (CH2M HILL 2014b), and elements described in the EPA National Functional Guidelines (NFG) were used in this assessment.

One-hundred percent of the data were reviewed, verified, and validated by Critigen following the Stage 2a validation level, and 20 percent at Stage 2b, according to the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009). Validation was performed manually in accordance

with the QAPP and patterned after the EPA NFGs flagging protocol. The QC requirements specified in the QAPP, individual analytical method requirements, and laboratory standard operating procedures were referenced during the review of the data set. Data were qualified according to the measurement quality objectives specified in the QAPP for each parameter. Four sample delivery groups, numbers 4098601, 4098668, 10271683, and 10271912 were selected for the Stage 2b validation.

Data qualifiers were applied to sample results when the QC statistics indicated a possible bias to specific compounds or analytes associated with a particular method and sample batch. Standard data qualifiers were used as a means of classifying the data with regard to their conformance to QC requirements. The applied data qualifiers are defined as follows:

Qualifier	Definition
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 an approximate concentration of the analyte in the sample.
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 action limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The data are unusable. (The compound may or may not be present.)

The data quality evaluation identifies which of the sample results were biased as a result of applicable QC statistics or other NFG requirements (see Attachment 1). The findings of the reviews are summarized in the following sections.

Findings

The following subsections summarize the data validation findings and usability of the final reportable results.

Total Metals (Including Mercury) Data

Total metals (including mercury) data were assessed for 129 sediment samples collected from 61 locations. The data validation summary indicates the following:

- J qualifiers were applied to sample results that were potentially affected by QC deficiencies.
- U qualifiers were applied to sample results that were reported below the reported sample quantitation limit.
- J qualifiers were applied to sample results that were reported between the method detection limit and the reporting limit.
- None of the reported total metals results was rejected.

One-hundred percent of the total metals data can be used to make project decisions.

PAH and PCP Data

PAH and PCP data were assessed for 129 sediment samples collected from 61 locations, and PCP data were assessed for 15 fish tissue samples. The data validation summary indicates the following:

- J, U, or UJ qualifiers were applied to sample results that were potentially affected by QC deficiencies.
- U qualifiers were applied to sample results that were below the reported sample quantitation limit.
- J qualifiers were applied to sample results that were reported between the method detection limit and the reporting limit.

- None of the reported PAH or PCP results was rejected.

One-hundred percent of the PAH and PCP data, as qualified, can be used to make project decisions.

AVS/SEM Data

AVS/SEM data were assessed for 129 sediment samples collected from 61 locations. The data validation summary indicates the following:

- J, U, or UJ qualifiers were applied to sample results that were potentially affected by QC deficiencies.
- J qualifiers were applied to sample results that were reported between the method detection limit and the reporting limit.
- U qualifiers were applied to sample results that were below the reported sample quantitation limit.
- Two of the reported AVS/SEM results for mercury were rejected due to matrix spike recoveries that were below 20 percent. The nondetected sample results for mercury in the parent samples were qualified “R” as unusable.

Overall, 99.9 percent of the AVS/SEM data, as qualified, can be used to make project decisions.

Total Organic Carbon Data

TOC data were assessed for 129 sediment samples collected from 61 locations. The data validation summary indicates the following:

- J qualifiers were applied to sample results that were potentially affected by QC deficiencies.
- None of the reported TOC results was rejected.

One-hundred percent of the TOC data, as qualified, can be used to make project decisions.

Dioxin and Furan Data

Dioxin and furan data were assessed for 129 sediment samples collected from 61 locations, and 15 fish tissue samples. The data validation summary indicates the following:

- J, U, or UJ qualifiers were applied to sample results that were potentially affected by QC deficiencies.
- U qualifiers were applied to sample results that were below the reported sample quantitation limit.
- J qualifiers were applied to sample results that were reported between the method detection limit and the reporting limit.
- None of the reported dioxin and furan results was rejected.

One-hundred percent of the dioxin and furan data, as qualified, can be used to make project decisions.

Lipid Data

Lipid data were assessed for 15 fish tissue samples. The data validation summary indicates the following:

- No qualifiers were applied to sample results for lipids.
- None of the reported lipid results was rejected.

One-hundred percent of the lipid data, as qualified, can be used to make project decisions.

Geotechnical Parameters

Geotechnical data results for particle size underwent a forms review by CH2M HILL to assess the laboratory notes and precision of the field duplicate samples. A total of 129 samples and 13 field duplicate samples was collected from 61 locations and analyzed for particle size. The field duplicate precision was generally acceptable. When a grain size accounted for three percent or more of the overall sample, the relative percent difference between the sample and field duplicate did not exceed 50 percent. The reported particle size data were determined to be in compliance with the laboratory methods.

All of the geotechnical data can be used in the decision making process.

Independent Validation

The sediment data set was submitted to EPA's Quality Assurance Technical Support contractor, CB&I Federal Services, Inc. (CB&I) for an independent review of completeness and to verify that the data validation had been conducted in accordance with the NFG and QAPP. The objective of the independent review was to assess the accuracy and precision of the method and the matrix using the appropriate criteria. CB&I completed a Tier 2 validation after initial validation by CH2M HILL's subcontractor, Critigen. The results of the CB&I validation review are summarized in the release of validated data report provided in Attachment 2.

CH2M HILL reviewed the CB&I validation report and the resulting changes to data qualifiers, specifically as it related to the data usability. The review found that the CB&I validation added or removed "U" or "UJ" qualifiers that effectively changed whether a result is considered detected or not detected. The changes, when applied to results for dioxin and furan congeners and PAHs, impacted the calculated dioxin and furan toxicity equivalents (TEQs) and total PAH result values, respectively, for a limited number of individual compound results (less than 10% of the total dioxin/furan results and less than 1% of total PAH results). The results of the third-party validation for dioxin and furan congeners and nine PAH compounds were subsequently used to revise the dioxin and furan TEQs and total PAHs presented in the site characterization report. The remaining CB&I qualifier changes did not affect how the data were used and were not incorporated into the data summaries of the site characterization report. However, the modified qualifiers have been incorporated in the final electronic data set provided to GLNPO for entry into the Great Lakes Sediment Database.

Conclusions

The goal of the data assessment is to determine if deviations from the FSP and QAPP affect the usability of the field data and the analytical results, and whether the field and laboratory data can be used to support the decision making process. The following summary highlights the data evaluation findings:

1. The reduced number of sample intervals collected within Crawford Creek and its floodplain, as a result of minimal or no soft sediment and refusal at native clay-like material, provides information regarding lithological conditions and sediment deposition at the site, and will not adversely affect the data usability.
2. Changes to the proposed sediment sampling locations in the floodplain areas, and the addition of six unanticipated core locations, provides a more representative distribution of sampling data where floodplain depositional sediment was present, and will not adversely affect the data usability.
3. The GPS benchmark average horizontal and vertical accuracies of ± 0.02 foot and ± 0.01 foot are within the specified tolerance for this investigation.
4. Collection of samples in the areas upstream of the confluence of Nemadji and Crawford Creek provides information of background conditions for the Nemadji River.
5. The fish collection procedures were modified based on consultation with and approval by EPA and WDNR, and will not adversely affect the data usability.
6. The completeness objective of 90 percent was met for all method/analyte combinations.
7. The precision and accuracy of the data, as measured by field and laboratory QC indicators, indicate that the data quality objectives were met.

References

CH2M HILL. 2014a. *Field Sampling Plan, Sediment Sampling – Crawford Creek/Nemadji River Sediment near Superior, Wisconsin, St. Louis River and Bay Area of Concern.* June.

CB&I Federal Services, Inc. 2014. *Release of Validated Data Report.* December 2, 2014.

CH2M HILL. 2014b. *Quality Assurance Project Plan Crawford Creek and Nemadji Rive, St. Louis and Bay Area of Concern Site Characterization.* June.

Critigen. 2014. *Technical memorandum, Data Quality Evaluation for GLNPO Crawford Creek, June-July 2014 Sampling Event.* September.

U.S. Environmental Protection Agency (EPA). 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (Office of Solid Waste and Emergency Response No. 920.1-85, EPA 540-R-08-005). January 13.

Attachment 1
Data Quality Evaluation

Data Quality Evaluation for GLNPO Crawford Creek, June - July 2014 Sampling Event

Introduction

This data quality evaluation (DQE) report assesses the quality of analytical results for sediment samples collected at Crawford Creek in the St. Louis River and Bay Area of Concern located in Douglas County, Wisconsin. CH2M HILL collected samples June 22 to July 17, 2014. Guidance for this DQE report came from *Final Quality Assurance and Assessment Plan, Site Characterization of Crawford Creek/Nemadji River Sediments (*CH2M HILL 2014) and individual method requirements. The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC) as described in the United States Environmental Protection Agency (USEPA) guidance documents.

This report is intended as a general data quality assessment designed to summarize data issues. This DQE assesses the quality of the analytical results for all samples submitted in batches along with the Crawford Creek investigation samples.

Analytical Data

This DQE report covers 150 normal investigative (N) and 14 field duplicate (FD) samples. The samples were reported in 17 sample delivery groups (SDGs). Samples and SDGs are listed in Table 2. Samples were collected and delivered to Pace Analytical in Green Bay, WI. Analyses were performed at Pace Analytical in Green Bay, WI, and Pace Analytical in Minneapolis, MN. The samples were analyzed by one or more methods listed in Table 1.

TABLE 1
Analytical Parameters
GLNPO Crawford Creek, June/July 2014

Parameter	Method	Laboratory
Semivolatile Organic Compounds / PAHs	SW8270SIM	Pace - GB
Dioxins and Furan Congeners	1613B	Pace - MN
AVS / SEM	SW1629	Pace - GB
Metals	SW6010	Pace - GB
Mercury	SW7471 / SW7470	Pace - GB
Total Organic Carbon (TOC)	Lloyd Kahn	Pace - GB
Moisture	D2974	Pace - GB

Data validation was performed at the Stage 2a level for 100% of the data, and data validation at the Stage 2b level was performed on up to 20% of the data (by SDG).

Stage 2a includes the following:

- Chain of Custody
- Case Narrative
- Field and Sample IDs
- Holding Time
- Preservation and Cooler Temperature
- Method Blank (Preparation Blank)
- Field Blanks
- Matrix Spike/Matrix Spike Duplicate
- Sample Duplicate (Metals)
- Field Duplicates
- Serial Dilution Sample (Metals)
- Laboratory Control Sample
- Surrogate (DMC) Recovery (Organics)
- Percent Solids (if applicable)

Stage 2b Consists of all of the items in Stage 2a validation, plus the following:

- Tune
- Initial Calibration
- Initial and Continuing Calibration Verification
- Initial and Continuing Calibration Blanks (Metals)
- Internal Standards
- Target Compound Identification (Organics)
- Interference Check Standards (Metals)

Following this guidance, SDGs 4098601, 4098688, 10271683, and 10271912 underwent Stage 2b validation. All other SDGs underwent Stage 2a validation.

Data flags were assigned according to the QAPP. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will only be one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample effects.

The data flags are those listed in the QAPP and are defined as follows:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample result was rejected because of serious deficiencies in the ability to analyze the sample and meet the QC criteria. The presence or absence of the analyte could not be verified.

U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

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.

Samples

The samples evaluated are listed in Table 2.

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CC-001-A	CC-001-A-0.0/0.8-062520141200	N	25-Jun-14	SED	4098688	Pace - GB
CC-001-A	CC-001-A-0.0/0.8-062520141200	N	25-Jun-14	SED	10272030	Pace - MN
CC-001-A1	CC-001-A1-0.0/0.5-062620141350	N	26-Jun-14	SED	4098783	Pace - GB
CC-001-A1	CC-001-A1-0.0/0.5-062620141350	N	26-Jun-14	SED	10272183	Pace - MN
CC-002-A	CC-002-A-0.0/0.5-062520141205	N	25-Jun-14	SED	4098688	Pace - GB
CC-002-A	CC-002-A-0.0/0.5-062520141205	N	25-Jun-14	SED	10272030	Pace - MN
CC-002-A	CC-002-A-0.5/1.4-062520141205	N	25-Jun-14	SED	4098688	Pace - GB
CC-002-A	CC-002-A-0.5/1.4-062520141205	N	25-Jun-14	SED	10272030	Pace - MN
CC-003-C	CC-003-C-0.0/0.5-062220141130	N	22-Jun-14	SED	4098523	Pace - GB
CC-003-C	CC-003-C-0.0/0.5-062220141130	N	22-Jun-14	SED	10271683	Pace - MN
CC-003-C	CC-003-C-0.5/1.3-062220141130	N	22-Jun-14	SED	4098523	Pace - GB
CC-003-C	CC-003-C-0.5/1.3-062220141130	N	22-Jun-14	SED	10271683	Pace - MN
CC-004-A	CC-004-A-0.0/0.5-062220141320	N	22-Jun-14	SED	4098523	Pace - GB
CC-004-A	CC-004-A-0.0/0.5-062220141320	N	22-Jun-14	SED	10271683	Pace - MN
CC-004-A	CC-004-A-0.5/1.8-062220141320	N	22-Jun-14	SED	4098523	Pace - GB
CC-004-A	CC-004-A-0.5/1.8-062220141320	N	22-Jun-14	SED	10271683	Pace - MN
CC-004-A	CC-004-A-0.5/1.8R-062220141320	FD	22-Jun-14	SED	4098523	Pace - GB
CC-004-A	CC-004-A-0.5/1.8R-062220141320	FD	22-Jun-14	SED	10271683	Pace - MN
CC-005-B	CC-005-B-0.0/0.5-062220141220	N	22-Jun-14	SED	4098523	Pace - GB
CC-005-B	CC-005-B-0.0/0.5-062220141220	N	22-Jun-14	SED	10271683	Pace - MN
CC-005-B	CC-005-B-0.5/1.3-062220141220	N	22-Jun-14	SED	4098523	Pace - GB
CC-005-B	CC-005-B-0.5/1.3-062220141220	N	22-Jun-14	SED	10271683	Pace - MN
CC-006-A	CC-006-A-0.0/0.5-062220141520	N	22-Jun-14	SED	4098523	Pace - GB
CC-006-A	CC-006-A-0.0/0.5-062220141520	N	22-Jun-14	SED	10271683	Pace - MN
CC-006-A	CC-006-A-0.5/1.3-062220141520	N	22-Jun-14	SED	4098523	Pace - GB
CC-006-A	CC-006-A-0.5/1.3-062220141520	N	22-Jun-14	SED	10271683	Pace - MN
CC-007-C	CC-007-C-0.0/0.5-062320141000	N	23-Jun-14	SED	4098523	Pace - GB
CC-007-C	CC-007-C-0.0/0.5-062320141000	N	23-Jun-14	SED	10271683	Pace - MN
CC-007-C	CC-007-C-0.5/1.6-062320141000	N	23-Jun-14	SED	4098523	Pace - GB
CC-007-C	CC-007-C-0.5/1.6-062320141000	N	23-Jun-14	SED	10271683	Pace - MN
CC-008-C	CC-008-C-0.0/0.5-062320141145	N	23-Jun-14	SED	4098523	Pace - GB
CC-008-C	CC-008-C-0.0/0.5-062320141145	N	23-Jun-14	SED	10271683	Pace - MN
CC-008-C	CC-008-C-0.5/2.3-062320141145	N	23-Jun-14	SED	4098523	Pace - GB
CC-008-C	CC-008-C-0.5/2.3-062320141145	N	23-Jun-14	SED	10271683	Pace - MN
CC-009-C	CC-009-C-0.0/0.5-062320141315	N	23-Jun-14	SED	4098523	Pace - GB
CC-009-C	CC-009-C-0.0/0.5-062320141315	N	23-Jun-14	SED	10271683	Pace - MN
CC-009-C	CC-009-C-0.5/1.3-062320141315	N	23-Jun-14	SED	4098523	Pace - GB
CC-009-C	CC-009-C-0.5/1.3-062320141315	N	23-Jun-14	SED	10271683	Pace - MN
CC-010-A	CC-010-A-0.0/0.8-062320141335	N	23-Jun-14	SED	4098523	Pace - GB

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CC-010-A	CC-010-A-0.0/0.8-062320141335	N	23-Jun-14	SED	10271683	Pace - MN
CC-010-A	CC-010-A-0.8/1.9-062320141335	N	23-Jun-14	SED	4098523	Pace - GB
CC-010-A	CC-010-A-0.8/1.9-062320141335	N	23-Jun-14	SED	10271683	Pace - MN
CC-010-A	CC-010-A-0.8/1.9R-062320141335	FD	23-Jun-14	SED	4098523	Pace - GB
CC-010-A	CC-010-A-0.8/1.9R-062320141335	FD	23-Jun-14	SED	10271683	Pace - MN
CC-011-A	CC-011-A-0.0/0.5-062320141515	N	23-Jun-14	SED	4098601	Pace - GB
CC-011-A	CC-011-A-0.0/0.5-062320141515	N	23-Jun-14	SED	10271912	Pace - MN
CC-011-A	CC-011-A-0.5/1.2-062320141515	N	23-Jun-14	SED	4098601	Pace - GB
CC-011-A	CC-011-A-0.5/1.2-062320141515	N	23-Jun-14	SED	10271912	Pace - MN
CC-012-C	CC-012-C-0.0/0.6-062320141435	N	23-Jun-14	SED	4098601	Pace - GB
CC-012-C	CC-012-C-0.0/0.6-062320141435	N	23-Jun-14	SED	10271912	Pace - MN
CC-013-C	CC-013-C-0.0/0.5-062320141540	N	23-Jun-14	SED	4098601	Pace - GB
CC-013-C	CC-013-C-0.0/0.5-062320141540	N	23-Jun-14	SED	10271912	Pace - MN
CC-013-C	CC-013-C-0.5/1.2-062320141540	N	23-Jun-14	SED	4098601	Pace - GB
CC-013-C	CC-013-C-0.5/1.2-062320141540	N	23-Jun-14	SED	10271912	Pace - MN
CC-014-B	CC-014-B-0.0/0.5-062320141600	N	23-Jun-14	SED	4098601	Pace - GB
CC-014-B	CC-014-B-0.0/0.5-062320141600	N	23-Jun-14	SED	10271912	Pace - MN
CC-014-B	CC-014-B-0.5/1.3-062320141600	N	23-Jun-14	SED	4098601	Pace - GB
CC-014-B	CC-014-B-0.5/1.3-062320141600	N	23-Jun-14	SED	10271912	Pace - MN
CC-015-A	CC-015-A-0.0/0.5-062320141625	N	23-Jun-14	SED	4098601	Pace - GB
CC-015-A	CC-015-A-0.0/0.5-062320141625	N	23-Jun-14	SED	10271912	Pace - MN
CC-015-A	CC-015-A-0.5/1.7-062320141625	N	23-Jun-14	SED	4098601	Pace - GB
CC-015-A	CC-015-A-0.5/1.7-062320141625	N	23-Jun-14	SED	10271912	Pace - MN
CC-015-A	CC-015-A-0.5/1.7R-062320141625	FD	23-Jun-14	SED	4098601	Pace - GB
CC-015-A	CC-015-A-0.5/1.7R-062320141625	FD	23-Jun-14	SED	10271912	Pace - MN
CC-016-C	CC-016-C-0.0/0.5-062420140850	N	24-Jun-14	SED	4098601	Pace - GB
CC-016-C	CC-016-C-0.0/0.5-062420140850	N	24-Jun-14	SED	10271912	Pace - MN
CC-016-C	CC-016-C-0.5/1.3-062420140850	N	24-Jun-14	SED	4098601	Pace - GB
CC-016-C	CC-016-C-0.5/1.3-062420140850	N	24-Jun-14	SED	10271912	Pace - MN
CC-017-A	CC-017-A-0.0/0.5-062420141020	N	24-Jun-14	SED	4098601	Pace - GB
CC-017-A	CC-017-A-0.0/0.5-062420141020	N	24-Jun-14	SED	10271912	Pace - MN
CC-017-A	CC-017-A-0.5/1.3-062420141020	N	24-Jun-14	SED	4098601	Pace - GB
CC-017-A	CC-017-A-0.5/1.3-062420141020	N	24-Jun-14	SED	10271912	Pace - MN
CC-018-C	CC-018-C-0.0/0.5-062420140925	N	24-Jun-14	SED	4098601	Pace - GB
CC-018-C	CC-018-C-0.0/0.5-062420140925	N	24-Jun-14	SED	10271912	Pace - MN
CC-018-C	CC-018-C-0.5/2.0-062420140925	N	24-Jun-14	SED	4098601	Pace - GB
CC-018-C	CC-018-C-0.5/2.0-062420140925	N	24-Jun-14	SED	10271912	Pace - MN
CC-019-C	CC-019-C-0.0/0.5-062420141030	N	24-Jun-14	SED	4098601	Pace - GB
CC-019-C	CC-019-C-0.0/0.5-062420141030	N	24-Jun-14	SED	10271912	Pace - MN
CC-019-C	CC-019-C-0.5/1.9-062420141030	N	24-Jun-14	SED	4098601	Pace - GB
CC-019-C	CC-019-C-0.5/1.9-062420141030	N	24-Jun-14	SED	10271912	Pace - MN
CC-019-C	CC-019-C-0.5/1.9R-062420141030	FD	24-Jun-14	SED	4098601	Pace - GB
CC-019-C	CC-019-C-0.5/1.9R-062420141030	FD	24-Jun-14	SED	10271912	Pace - MN

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CC-020-A	CC-020-A-0.0/0.5-062420141110	N	24-Jun-14	SED	4098601	Pace - GB
CC-020-A	CC-020-A-0.0/0.5-062420141110	N	24-Jun-14	SED	10271912	Pace - MN
CC-020-A	CC-020-A-0.5/1.8-062420141110	N	24-Jun-14	SED	4098601	Pace - GB
CC-020-A	CC-020-A-0.5/1.8-062420141110	N	24-Jun-14	SED	10271988	Pace - MN
CC-021-C	CC-021-C-0.0/0.5-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
CC-021-C	CC-021-C-0.5/2.0-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
CC-021-C	CC-021-C-0.5/2.0R-062520141510	FD	25-Jun-14	SED	4098783	Pace - GB
CC-021-C	CC-021-C-2.0/3.0-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
CC-021-C	CC-021-C-3.0/3.6-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
CC-021-C1	CC-021-C1-0.5/2.0	N	25-Jun-14	SED	10272183	Pace - MN
CC-021-C1	CC-021-C1-0.5/2.0R	FD	25-Jun-14	SED	10272183	Pace - MN
CC-021-C1	CC-021-C1-2.0/3.0	N	25-Jun-14	SED	10272183	Pace - MN
CC-021-C1	CC-021-C1-3.0/3.6	N	25-Jun-14	SED	10272183	Pace - MN
CC-022-A	CC-022-A-0.0/0.8-062520140900	N	25-Jun-14	SED	4098688	Pace - GB
CC-022-A	CC-022-A-0.0/0.8-062520140900	N	25-Jun-14	SED	10272030	Pace - MN
CC-023-A	CC-023-A-0.0/0.5-062520141120	N	25-Jun-14	SED	4098688	Pace - GB
CC-023-A	CC-023-A-0.0/0.5-062520141120	N	25-Jun-14	SED	10272030	Pace - MN
CC-023-A	CC-023-A-0.5/2.1-062520141120	N	25-Jun-14	SED	4098688	Pace - GB
CC-023-A	CC-023-A-0.5/2.1-062520141120	N	25-Jun-14	SED	10272030	Pace - MN
CC-023-A	CC-023-A-0.5/2.1R-062520141120	FD	25-Jun-14	SED	4098688	Pace - GB
CC-023-A	CC-023-A-0.5/2.1R-062520141120	FD	25-Jun-14	SED	10272030	Pace - MN
CC-024-A	CC-024-A-0.0/0.5-062520141610	N	25-Jun-14	SED	4098783	Pace - GB
CC-024-A	CC-024-A-0.0/0.5-062520141610	N	25-Jun-14	SED	10272183	Pace - MN
CC-024-A	CC-024-A-0.5/2.0-062520141610	N	25-Jun-14	SED	4098783	Pace - GB
CC-024-A	CC-024-A-0.5/2.0-062520141610	N	25-Jun-14	SED	10272183	Pace - MN
CC-024-A	CC-024-A-2.0/3.0-062520141610	N	25-Jun-14	SED	4098783	Pace - GB
CC-024-A	CC-024-A-2.0/3.0-062520141610	N	25-Jun-14	SED	10272183	Pace - MN
CC-024-A	CC-024-A-2.0/3.0R-062520141610	FD	25-Jun-14	SED	4098783	Pace - GB
CC-024-A	CC-024-A-2.0/3.0R-062520141610	FD	25-Jun-14	SED	10272183	Pace - MN
CC-024-A	CC-024-A-3.0/3.6-062520141610	N	25-Jun-14	SED	4098783	Pace - GB
CC-024-A	CC-024-A-3.0/3.6-062520141610	N	25-Jun-14	SED	10272183	Pace - MN
CC-025-C	CC-025-C-0.0/0.5-062620140830	N	26-Jun-14	SED	4098783	Pace - GB
CC-025-C	CC-025-C-0.0/0.5-062620140830	N	26-Jun-14	SED	10272183	Pace - MN
CC-025-C	CC-025-C-0.5/2.0-062620140830	N	26-Jun-14	SED	4098783	Pace - GB
CC-025-C	CC-025-C-0.5/2.0-062620140830	N	26-Jun-14	SED	10272183	Pace - MN
CC-025-C	CC-025-C-2.0/3.0-062620140830	N	26-Jun-14	SED	4098783	Pace - GB
CC-025-C	CC-025-C-2.0/3.0-062620140830	N	26-Jun-14	SED	10272183	Pace - MN
CC-025-C	CC-025-C-3.0/4.0-062620140830	N	26-Jun-14	SED	4098783	Pace - GB
CC-025-C	CC-025-C-3.0/4.0-062620140830	N	26-Jun-14	SED	10272183	Pace - MN
CC-026-C	CC-026-C-0.0/0.5-062420141140	N	24-Jun-14	SED	4098601	Pace - GB
CC-026-C	CC-026-C-0.0/0.5-062420141140	N	24-Jun-14	SED	10271988	Pace - MN
CC-026-C	CC-026-C-0.5/2.0-062420141140	N	24-Jun-14	SED	4098601	Pace - GB
CC-026-C	CC-026-C-0.5/2.0-062420141140	N	24-Jun-14	SED	10271988	Pace - MN

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CC-026-C	CC-026-C-0.5/2.0-062420141140	N	24-Jun-14	SED	10272183	Pace - MN
CC-026-C	CC-026-C-2.0/3.3-062420141140	N	24-Jun-14	SED	4098601	Pace - GB
CC-026-C	CC-026-C-2.0/3.3-062420141140	N	24-Jun-14	SED	10271988	Pace - MN
CC-027-A	CC-027-A-0.0/0.5-062520141410	N	25-Jun-14	SED	4098688	Pace - GB
CC-027-A	CC-027-A-0.0/0.5-062520141410	N	25-Jun-14	SED	10272030	Pace - MN
CC-027-A	CC-027-A-0.5/1.9-062520141410	N	25-Jun-14	SED	4098688	Pace - GB
CC-027-A	CC-027-A-0.5/1.9-062520141410	N	25-Jun-14	SED	10272030	Pace - MN
CC-028-B	CC-028-B-0.0/0.5-062520141400	N	25-Jun-14	SED	4098688	Pace - GB
CC-028-B	CC-028-B-0.0/0.5-062520141400	N	25-Jun-14	SED	10272030	Pace - MN
CC-028-B	CC-028-B-0.5/2.0-062520141400	N	25-Jun-14	SED	4098688	Pace - GB
CC-028-B	CC-028-B-0.5/2.0-062520141400	N	25-Jun-14	SED	10272030	Pace - MN
CC-028-B	CC-028-B-2.0/3.0-062520141400	N	25-Jun-14	SED	4098688	Pace - GB
CC-028-B	CC-028-B-2.0/3.0-062520141400	N	25-Jun-14	SED	10272030	Pace - MN
CC-028-B	CC-028-B-3.0/4.0-062520141400	N	25-Jun-14	SED	4098688	Pace - GB
CC-028-B	CC-028-B-3.0/4.0-062520141400	N	25-Jun-14	SED	10272030	Pace - MN
CC-028-B	CC-028-B-4.0/4.7-062520141400	N	25-Jun-14	SED	4098688	Pace - GB
CC-028-B	CC-028-B-4.0/4.7-062520141400	N	25-Jun-14	SED	10272030	Pace - MN
CC-06-A	CC-06-A-0.0/0.5	N	25-Jun-14	SED	10272030	Pace - MN
CC-06-A	CC-06-A-0.5/1.8	N	25-Jun-14	SED	10272030	Pace - MN
CC-FT-001-F	CC-FT-001-F-071620140955	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-001-F	CC-FT-001-F-071620140955	N	16-Jul-14	Tissue	10278447	Pace - MN
CC-FT-001-O	CC-FT-001-O-071620140955	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-001-O	CC-FT-001-O-071620140955	N	16-Jul-14	Tissue	10278447	Pace - MN
CC-FT-002-W	CC-FT-002-W-071620140920	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-003-W	CC-FT-003-W-071620140935	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-003-W	CC-FT-003-W-071620140935	N	16-Jul-14	Tissue	10278447	Pace - MN
CC-FT-004-W	CC-FT-004-W-071620140955	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-004-W	CC-FT-004-W-071620140955	N	16-Jul-14	Tissue	10280605	Pace - MN
CC-FT-005-F	CC-FT-005-F-071620140955	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-005-F	CC-FT-005-F-071620140955	N	16-Jul-14	Tissue	10278447	Pace - MN
CC-FT-005-O	CC-FT-005-O-071620140955	N	16-Jul-14	Tissue	4099994	Pace - GB
CC-FT-005-O	CC-FT-005-O-071620140955	N	16-Jul-14	Tissue	10278447	Pace - MN
CC-FT-006-W	CC-FT-006-W-071720140950	N	17-Jul-14	Tissue	4099996	Pace - GB
CC-FT-006-W	CC-FT-006-W-071720140950	N	17-Jul-14	Tissue	10278448	Pace - MN
CC-FT-007-W	CC-FT-007-W-071720140950	N	17-Jul-14	Tissue	4099996	Pace - GB
CC-FT-007-W	CC-FT-007-W-071720140950	N	17-Jul-14	Tissue	10278448	Pace - MN
CC-FT-010-W	CC-FT-010-W-071720141400	N	17-Jul-14	Tissue	4099996	Pace - GB
CC-FT-010-W	CC-FT-010-W-071720141400	N	17-Jul-14	Tissue	10278448	Pace - MN
CC-FT-011-W	CC-FT-011-W-071720141400	N	17-Jul-14	Tissue	4099996	Pace - GB
CC-FT-011-W	CC-FT-011-W-071720141400	N	17-Jul-14	Tissue	10278448	Pace - MN
CF-01-A	CF-01-A-0.0/0.5-062420141350	N	24-Jun-14	SED	4098601	Pace - GB
CF-01-A	CF-01-A-0.0/0.5-062420141350	N	24-Jun-14	SED	10271988	Pace - MN
CF-01-A	CF-01-A-0.5/1.0-062420141350	N	24-Jun-14	SED	4098601	Pace - GB

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CF-01-A	CF-01-A-0.5/1.0-062420141350	N	24-Jun-14	SED	10271988	Pace - MN
CF-01-B	CF-01-B-0.0/0.5-062620141030	N	26-Jun-14	SED	4098783	Pace - GB
CF-01-B	CF-01-B-0.0/0.5-062620141030	N	26-Jun-14	SED	10272183	Pace - MN
CF-01-B	CF-01-B-0.5/0.9-062620141030	N	26-Jun-14	SED	4098783	Pace - GB
CF-01-B	CF-01-B-0.5/0.9-062620141030	N	26-Jun-14	SED	10272183	Pace - MN
CF-01-C	CF-01-C-0.0/0.7-062620141420	N	26-Jun-14	SED	4098783	Pace - GB
CF-01-C	CF-01-C-0.0/0.7-062620141420	N	26-Jun-14	SED	10272183	Pace - MN
CF-01-D	CF-01-D-0.0/0.5-062520140900	N	25-Jun-14	SED	4098688	Pace - GB
CF-01-D	CF-01-D-0.0/0.5-062520140900	N	25-Jun-14	SED	10272030	Pace - MN
CF-01-D	CF-01-D-0.5/1.1-062520140900	N	25-Jun-14	SED	4098688	Pace - GB
CF-01-D	CF-01-D-0.5/1.1-062520140900	N	25-Jun-14	SED	10272030	Pace - MN
CF-02-B	CF-02-B-0.0/0.5-062420141650	N	24-Jun-14	SED	4098688	Pace - GB
CF-02-B	CF-02-B-0.0/0.5-062420141650	N	24-Jun-14	SED	10272030	Pace - MN
CF-02-B	CF-02-B-0.5/1.6-062420141650	N	24-Jun-14	SED	4098688	Pace - GB
CF-02-B	CF-02-B-0.5/1.6-062420141650	N	24-Jun-14	SED	10272030	Pace - MN
CF-02-C	CF-02-C-0.0/0.8-062520141020	N	25-Jun-14	SED	4098688	Pace - GB
CF-02-C	CF-02-C-0.0/0.8-062520141020	N	25-Jun-14	SED	10272031	Pace - MN
CF-03-A	CF-03-A-0.0/0.5-062420141415	N	24-Jun-14	SED	4098601	Pace - GB
CF-03-A	CF-03-A-0.0/0.5-062420141415	N	24-Jun-14	SED	10271988	Pace - MN
CF-03-A	CF-03-A-0.5/1.3-062420141415	N	24-Jun-14	SED	4098601	Pace - GB
CF-03-A	CF-03-A-0.5/1.3-062420141415	N	24-Jun-14	SED	10271988	Pace - MN
CF-03-A	CF-03-A-0.5/1.3R-062420141415	FD	24-Jun-14	SED	4098601	Pace - GB
CF-03-A	CF-03-A-0.5/1.3R-062420141415	FD	24-Jun-14	SED	10271988	Pace - MN
CF-03-C	CF-03-C-0.0/0.5-062420141200	N	24-Jun-14	SED	4098601	Pace - GB
CF-03-C	CF-03-C-0.0/0.5-062420141200	N	24-Jun-14	SED	10271988	Pace - MN
CF-03-C	CF-03-C-0.5/1.3-062420141200	N	24-Jun-14	SED	4098601	Pace - GB
CF-03-C	CF-03-C-0.5/1.3-062420141200	N	24-Jun-14	SED	10271988	Pace - MN
CF-03-E	CF-03-E-0.0/0.5-062620141200	N	26-Jun-14	SED	4098783	Pace - GB
CF-03-E	CF-03-E-0.0/0.5-062620141200	N	26-Jun-14	SED	10272183	Pace - MN
CF-03-E	CF-03-E-0.5/1.2-062620141200	N	26-Jun-14	SED	4098783	Pace - GB
CF-03-E	CF-03-E-0.5/1.2-062620141200	N	26-Jun-14	SED	10272183	Pace - MN
CF-04-B	CF-04-B-0.0/0.5-062420141240	N	24-Jun-14	SED	4098601	Pace - GB
CF-04-B	CF-04-B-0.0/0.5-062420141240	N	24-Jun-14	SED	10271988	Pace - MN
CF-04-B	CF-04-B-0.5/1.3-062420141240	N	24-Jun-14	SED	4098601	Pace - GB
CF-04-B	CF-04-B-0.5/1.3-062420141240	N	24-Jun-14	SED	10271988	Pace - MN
CF-05-B	CF-05-B-0.0/0.5-062420141245	N	24-Jun-14	SED	4098601	Pace - GB
CF-05-B	CF-05-B-0.0/0.5-062420141245	N	24-Jun-14	SED	10271988	Pace - MN
CF-05-B	CF-05-B-0.5/0.9-062420141245	N	24-Jun-14	SED	4098601	Pace - GB
CF-05-B	CF-05-B-0.5/0.9-062420141245	N	24-Jun-14	SED	10271988	Pace - MN
CF-05-C	CF-05-C-0.0/0.6-062620141425	N	26-Jun-14	SED	4098783	Pace - GB
CF-05-C	CF-05-C-0.0/0.6-062620141425	N	26-Jun-14	SED	10272184	Pace - MN
CF-05-D	CF-05-D-0.0/0.5-062520140935	N	25-Jun-14	SED	4098688	Pace - GB
CF-05-D	CF-05-D-0.0/0.5-062520140935	N	25-Jun-14	SED	10272031	Pace - MN

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
CF-05-D	CF-05-D-0.5/0.9-062520140935	N	25-Jun-14	SED	4098688	Pace - GB
CF-05-D	CF-05-D-0.5/0.9-062520140935	N	25-Jun-14	SED	10272031	Pace - MN
CF-06-A	CF-06-A-0.0/0.5-062520141100	N	25-Jun-14	SED	4098688	Pace - GB
CF-06-A	CF-06-A-0.5/1.8-062520141100	N	25-Jun-14	SED	4098688	Pace - GB
CF-06-B	CF-06-B-0.0/0.6-062620141430	N	26-Jun-14	SED	4098783	Pace - GB
CF-06-B	CF-06-B-0.0/0.6-062620141430	N	26-Jun-14	SED	10272184	Pace - MN
CF-06-B	CF-06-B-0.0/0.6R-062620141430	FD	26-Jun-14	SED	4098783	Pace - GB
CF-06-B	CF-06-B-0.0/0.6R-062620141430	FD	26-Jun-14	SED	10272184	Pace - MN
CF-06-D	CF-06-D-0.0/0.8-062520141015	N	25-Jun-14	SED	4098688	Pace - GB
CF-06-D	CF-06-D-0.0/0.8-062520141015	N	25-Jun-14	SED	10272031	Pace - MN
CF-07-A	CF-07-A-0.0/0.8-062620141400	N	26-Jun-14	SED	4098783	Pace - GB
CF-07-A	CF-07-A-0.0/0.8-062620141400	N	26-Jun-14	SED	10272184	Pace - MN
CF-07-B	CF-07-B-0.0/0.7-062320141415	N	23-Jun-14	SED	4098601	Pace - GB
CF-07-B	CF-07-B-0.0/0.7-062320141415	N	23-Jun-14	SED	10271988	Pace - MN
CF-08-D	CF-08-D-0.0/0.7-062620140955	N	26-Jun-14	SED	4098783	Pace - GB
CF-08-D	CF-08-D-0.0/0.7-062620140955	N	26-Jun-14	SED	10272184	Pace - MN
CF-09-A	CF-09-A-0.0/0.8-062520140940	N	25-Jun-14	SED	4098688	Pace - GB
CF-09-A	CF-09-A-0.0/0.8R-062520140940	FD	25-Jun-14	SED	4098688	Pace - GB
CF-09-A	CF-09-A-0.0/0.8R-062520140940	FD	25-Jun-14	SED	10272031	Pace - MN
CF-10-B	CF-10-B-0.0/0.5-062520141040	N	25-Jun-14	SED	4098688	Pace - GB
CF-10-B	CF-10-B-0.0/0.5-062520141040	N	25-Jun-14	SED	10272031	Pace - MN
CF-10-B	CF-10-B-0.5/1.3-062520141040	N	25-Jun-14	SED	4098688	Pace - GB
CF-10-B	CF-10-B-0.5/1.3-062520141040	N	25-Jun-14	SED	10272031	Pace - MN
FP-01	FP-01-0.0/0.5-062620141140	N	26-Jun-14	SED	4098783	Pace - GB
FP-01	FP-01-0.0/0.5-062620141140	N	26-Jun-14	SED	10272184	Pace - MN
FP-01	FP-01-0.5/1.2-062620141140	N	26-Jun-14	SED	4098783	Pace - GB
FP-01	FP-01-0.5/1.2-062620141140	N	26-Jun-14	SED	10272184	Pace - MN
FP-01	FP-01-0.5/1.2R-062620141140	FD	26-Jun-14	SED	4098783	Pace - GB
FP-01	FP-01-0.5/1.2R-062620141140	FD	26-Jun-14	SED	10272184	Pace - MN
NR-01-A1	NR-01-A1-0.0/0.5-062520141235	N	25-Jun-14	SED	4098688	Pace - GB
NR-01-A1	NR-01-A1-0.0/0.5-062520141235	N	25-Jun-14	SED	10272031	Pace - MN
NR-01-A1	NR-01-A1-0.5/2.0-062520141235	N	25-Jun-14	SED	4098688	Pace - GB
NR-01-A1	NR-01-A1-0.5/2.0-062520141235	N	25-Jun-14	SED	10272031	Pace - MN
NR-01-A1	NR-01-A1-0.5/2.0R-062520141235	FD	25-Jun-14	SED	4098688	Pace - GB
NR-01-A1	NR-01-A1-0.5/2.0R-062520141235	FD	25-Jun-14	SED	10272031	Pace - MN
NR-01-A1	NR-01-A1-2.0/2.5-062520141235	N	25-Jun-14	SED	4098688	Pace - GB
NR-01-A1	NR-01-A1-2.0/2.5-062520141235	N	25-Jun-14	SED	10272031	Pace - MN
NR-01-B	NR-01-B-0.0./0.5-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-B	NR-01-B-0.0./0.5-062520141510	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-B	NR-01-B-0.5/2.0-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-B	NR-01-B-0.5/2.0-062520141510	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-B	NR-01-B-2.0/3.0-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-B	NR-01-B-2.0/3.0-062520141510	N	25-Jun-14	SED	10272184	Pace - MN

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
NR-01-B	NR-01-B-3.0/3.5-062520141510	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-B	NR-01-B-3.0/3.5-062520141510	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-E	NR-01-E-0.0/0.5-062520141620	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-E	NR-01-E-0.0/0.5-062520141620	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-E	NR-01-E-0.5/2.0-062520141620	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-E	NR-01-E-0.5/2.0-062520141620	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-E	NR-01-E-2.0/3.0-062520141620	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-E	NR-01-E-2.0/3.0-062520141620	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-E	NR-01-E-3.0/4.0-062520141620	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-E	NR-01-E-3.0/4.0-062520141620	N	25-Jun-14	SED	10272184	Pace - MN
NR-01-E	NR-01-E-4.0/4.6-062520141620	N	25-Jun-14	SED	4098783	Pace - GB
NR-01-E	NR-01-E-4.0/4.6-062520141620	N	25-Jun-14	SED	10272184	Pace - MN
NR-02-B1	NR-02-B1-0.0/0.5-062620141045	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B1	NR-02-B1-0.0/0.5-062620141045	N	26-Jun-14	SED	10272184	Pace - MN
NR-02-B1	NR-02-B1-0.5/2.0-062620141045	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B1	NR-02-B1-0.5/2.0-062620141045	N	26-Jun-14	SED	10272184	Pace - MN
NR-02-B1	NR-02-B1-2.0/2.5-062620141045	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B1	NR-02-B1-2.0/2.5-062620141045	N	26-Jun-14	SED	10272184	Pace - MN
NR-02-B2	NR-02-B2-0.0/0.5-062620141000	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B2	NR-02-B2-0.0/0.5-062620141000	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-B2	NR-02-B2-0.5/2.0-062620141000	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B2	NR-02-B2-0.5/2.0-062620141000	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-B2	NR-02-B2-2.0/2.9-062620141000	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-B2	NR-02-B2-2.0/2.9-062620141000	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-C	NR-02-C-0.0/0.5-062620140920	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-C	NR-02-C-0.0/0.5-062620140920	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-C	NR-02-C-0.5/2.0-062620140920	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-C	NR-02-C-0.5/2.0-062620140920	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-C	NR-02-C-2.0/3.0-062620140920	N	26-Jun-14	SED	4098783	Pace - GB
NR-02-C	NR-02-C-2.0/3.0-062620140920	N	26-Jun-14	SED	10272185	Pace - MN
NR-02-C	NR-02-C-2.0/3.0R-062620140920	FD	26-Jun-14	SED	4098783	Pace - GB
NR-02-C	NR-02-C-2.0/3.0R-062620140920	FD	26-Jun-14	SED	10272185	Pace - MN
NR-03-A1	NR-03-A1-0.0/0.5-062520141240	N	25-Jun-14	SED	4098688	Pace - GB
NR-03-A1	NR-03-A1-0.0/0.5-062520141240	N	25-Jun-14	SED	10272031	Pace - MN
NR-03-A1	NR-03-A1-0.5/1.5-062520141240	N	25-Jun-14	SED	4098688	Pace - GB
NR-03-A1	NR-03-A1-0.5/1.5-062520141240	N	25-Jun-14	SED	10272031	Pace - MN
NR-03-B	NR-03-B-0.0/0.5-062420140855	N	24-Jun-14	SED	4098601	Pace - GB
NR-03-B	NR-03-B-0.0/0.5-062420140855	N	24-Jun-14	SED	10271988	Pace - MN
NR-03-B	NR-03-B-0.5/1.3-062420140855	N	24-Jun-14	SED	4098601	Pace - GB
NR-03-B	NR-03-B-0.5/1.3-062420140855	N	24-Jun-14	SED	10271988	Pace - MN
NR-04-B	NR-04-B-0.0/0.5-062520141130	N	25-Jun-14	SED	4098688	Pace - GB
NR-04-B	NR-04-B-0.0/0.5-062520141130	N	25-Jun-14	SED	10272031	Pace - MN
NR-04-B	NR-04-B-0.5/2.0-062520141130	N	25-Jun-14	SED	4098688	Pace - GB

TABLE 2
Samples
GLNPO Crawford Creek, June/July 2014

Location	Sample ID	Sample Type	Sample Date	Matrix	SDG	Lab
NR-04-B	NR-04-B-0.5/2.0-062520141130	N	25-Jun-14	SED	10272031	Pace - MN
NR-04-B	NR-04-B-2.0/2.6-062520141130	N	25-Jun-14	SED	4098688	Pace - GB
NR-04-B	NR-04-B-2.0/2.6-062520141130	N	25-Jun-14	SED	10272031	Pace - MN
NR-05-C	NR-05-C-0.0/0.5-062420141100	N	24-Jun-14	SED	4098601	Pace - GB
NR-05-C	NR-05-C-0.0/0.5-062420141100	N	24-Jun-14	SED	10271988	Pace - MN
NR-05-C	NR-05-C-0.5/1.6-062420141100	N	24-Jun-14	SED	4098601	Pace - GB
NR-05-C	NR-05-C-0.5/1.6-062420141100	N	24-Jun-14	SED	10271988	Pace - MN
NR-FT-008-F	NR-FT-008-F-071720140910	N	17-Jul-14	Tissue	4099996	Pace - GB
NR-FT-008-F	NR-FT-008-F-071720140910	N	17-Jul-14	Tissue	10278448	Pace - MN
NR-FT-008-O	NR-FT-008-O-071720140910	N	17-Jul-14	Tissue	4099996	Pace - GB
NR-FT-008-O	NR-FT-008-O-071720140910	N	17-Jul-14	Tissue	10278448	Pace - MN
NR-FT-009-F	NR-FT-009-F-071720140910	N	17-Jul-14	Tissue	4099996	Pace - GB
NR-FT-009-F	NR-FT-009-F-071720140910	N	17-Jul-14	Tissue	10278448	Pace - MN
NR-FT-009-O	NR-FT-009-O-071720140910	N	17-Jul-14	Tissue	4099996	Pace - GB
NR-FT-009-O	NR-FT-009-O-071720140910	N	17-Jul-14	Tissue	10278448	Pace - MN

Notes:
N = Normal Sample
FD = Field Duplicate Sample
SED = Sediment

Findings

The overall summaries of the data validation are contained in the following subsections and in Table 3.

Holding Time and Preservation

All samples were analyzed within the USEPA-recommended holding times.

Method Blanks

Method blanks were analyzed at the required frequency and were generally free of contamination. Anthracene, fluoranthene, silver, and 23 dioxin and furan compounds were detected in method blanks below the reporting limit. Acenaphthene, fluorene, phenanthrene, and zinc were detected in method blanks above the reporting limit. When the analyte detected in the blank was also detected in an associated sample, the data were evaluated according to the QAPP and analytical method. Table 3 includes results that were affected by blank contamination, qualified as non-detect, flagged "U", and identified as "LBL" or "LBH" in the "Reason Code" column. Of the total data reported, 2% of the data (212 of 10,375 total records) were qualified as non-detects due to blank contamination. These blank-related contamination results are within acceptable limits of the QAPP and are typical for this type and size of investigation.

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required and met acceptance criteria, except as follows:

- Pentachlorophenol was recovered below criteria in multiple LCS samples. All associated sample results were qualified as estimated, "J" or "UJ".
- OCDD; 1,2,3,6,7,8-HxCDD; and 1,2,3,7,8,9-HxCDD had high recoveries in one or more LCS samples. All associated sample detects were qualified as estimated, "J", due to a possible high bias. Non-detect samples were not qualified.

Overall, 0.6% of data (62 of 10,375 total records) were qualified as estimated due to LCS recoveries out of criteria. This is within acceptable limits and typical for this type and size of investigation.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) and matrix spike duplicate (MSD) samples were performed as required by the analytical method. The majority of recoveries were within laboratory established QC limits. When recoveries were low, the MS/MSD parent sample result was qualified as estimated, "J" or "UJ". When recoveries or RPD were high, MS/MSD parent sample detected results only were qualified as estimated, "J". Non-detects were not qualified. For this sampling event, two non-detected mercury results were rejected, "R", due to extremely low MS/MSD recoveries (less than 20% recovery). Overall, 33 results were qualified as estimated, and 2 results were rejected due to MS/MSD exceedances (less than 1% of total results). These results are typical for this type of matrix and size of investigation.

Surrogates

Surrogates were added as required and all acceptance criteria were met, with the following exceptions:

- Sample CC-025-C-2.0/3.0 had high surrogate recovery for PAH analysis. Associated detected results were qualified as estimated, "J", with a "Reason Code" of "SSH". Non-detected results were not qualified.
- Two samples, CC-001-A-0.0/0.8 and CC-FT-005-O, had low surrogate recovery for PAH analysis. Associated results were qualified as estimated, "J" or "UJ", with a "Reason Code" of "SSL".

Overall, 0.2% of results (19 out of 10,375 total results) were qualified as estimated due to surrogate recoveries out of criteria.

Field Duplicate Samples

Fourteen field duplicate samples were collected and analyzed. The following field duplicate sets were collected:

- CC-004-A-0.5/1.8 : CC-004-A-0.5/1.8R
- CC-010-A-0.8/1.9 : CC-010-A-0.8/1.9R
- CC-015-A-0.5/1.7 : CC-015-A-0.5/1.7R
- CC-019-C-0.5/1.9 : CC-019-C-0.5/1.9R

- CC-021-C-0.5/2.0 : CC-021-C-0.5/2.0R
- CC-021-C1-0.5/2.0 : CC-021-C1-0.5/2.0R
- CC-023-A-0.5/2.1 : CC-023-A-0.5/2.1R
- CC-024-A-2.0/3.0 : CC-024-A-2.0/3.0R
- CF-03-A-0.5/1.3 : CF-03-A-0.5/1.3R
- CF-06-B-0.0/0.6 : CF-06-B-0.0/0.6R
- CF-09-A-0.0/0.8 : CF-09-A-0.0/0.8R
- FP-01-0.5/1.2 : FP-01-0.5/1.2R
- NR-01-A1-0.5/2.0 : NR-01-A1-0.5/2.0R
- NR-02-C-2.0/3.0 : NR-02-C-2.0/3.0R

Ten of the 14 field duplicate pairs did not meet precision criteria for one or more compounds. These results were qualified as estimated, "J" or "UJ", and are presented in Table 3. Overall, 156 results out of 10,375 total results (1.5%) were qualified as estimated due to field duplicate precision exceedances. With the sediment and tissue sample matrices, these results were within expected precision results.

Calibration

Calibration data were reviewed and met method criteria.

Internal Standards

Internal standards data were reviewed and met method criteria routinely for the majority of samples. However, several samples did have internal standards recovered out of criteria. Two samples had high internal standard recovery for dioxin/furan compounds. The associated detected results were qualified as estimated, "J", due to possible high bias. One sample had low internal standard recovery for a dioxin/furan compound. The associated result was qualified as estimated, "J". The qualified results are presented in Table 3 with a Reason Code of "ISL" or "ISH". Of the total data reported, less than 1% of the data (12 of 10,375 total records) were qualified as estimated due to internal standard exceedances.

Estimated Maximum Possible Concentration (EMPC)

For dioxin and furan analysis, interfering substances can impact the determination of congeners. Any detected compounds that have incorrect isotope ratios or have polychlorinated diphenyl ethers present are reported and qualified by the laboratory as results at an estimated maximum possible concentration (EMPC). These results are qualified during validation as estimated, "J", with a reason code of "EMPC".

Chain of Custody

Required procedures were followed, and no exceptions were noted that caused qualification of data.

Overall Assessment

The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision making process. The following summary highlights the PARCC findings for the above-defined event:

- Precision of the data was verified through the review of the laboratory data quality indicators that include MS/MSD and FD relative percent differences (RPDs). Precision was acceptable for all analyses, with the exception of several field duplicate and MS/MSD results that were discussed above. All other precision criteria were met. Appropriate data qualifiers we applied.
- Accuracy of the data was verified through the review of the calibration, LCS, MS/MSD, and surrogate recoveries, as well as the evaluation of method/field blank data. Accuracy was acceptable for most analyses, with the exception of several LCS, surrogate, and MS/MSD results that were discussed above. All other precision criteria were met. Appropriate data qualifiers we applied.
- Representativeness of the data was verified through the samples' collection, storage, and preservation procedures and the verification of holding-time compliance. The laboratory did not note any problems with the samples' collection, holding-time, and storage and preservation procedures that affected the ability to use the data.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data are considered valid, with the exception of two mercury results discussed in the matrix spike section above that were rejected for project use. Overall, 10,373 of 10375 results (99.98%) are considered valid data, meeting project completeness goals.

TABLE 3

Qualified Data

GLNPO Crawford Creek, June/July 2014

Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	2-METHYLNAPHTHALENE	6.1	ug/Kg	UJ	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	ACENAPHTHENE	33.5	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	ACENAPHTHYLENE	5.1	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	ANTHRACENE	9.5	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	Benz[a]anthracene	6.2	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	BENZO(A)PYRENE	15.3	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	BENZO(B)FLUORANTHENE	16.1	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	BENZO(G,H,I)PERYLENE	13.1	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	BENZO(K)FLUORANTHENE	9.7	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	CHRYSENE	10.8	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	DIBENZ(A,H)ANTHRACENE	3.8	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	FLUORANTHENE	25.6	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	FLUORENE	15.8	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	INDENO(1,2,3-CD)PYRENE	11.9	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	NAPHTHALENE	52.5	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	PHENANTHRENE	18.1	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	8270SIM	PYRENE	10.6	ug/Kg	J	SSL
CC-001-A-0.0/0.8-062520141200	4098688	SW1629	Acid Volatile Sulfide	0.26	umoles/g	J	MSH, MSDH
CC-001-A-0.0/0.8-062520141200	4098688	SW6010	ARSENIC	0.007	umoles/g	J	MSDL
CC-001-A-0.0/0.8-062520141200	4098688	SW7470	MERCURY	0.0000065	umoles/g	R	MSDL
CC-001-A-0.0/0.8-062520141200	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.15	ng/kg	J	EMPC
CC-001-A-0.0/0.8-062520141200	10272030	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.39	ng/kg	J	EMPC
CC-001-A1-0.0/0.5-062620141350	4098783	8270SIM	CHRYSENE	32.9	ug/Kg	J	MSL, MSDL
CC-001-A1-0.0/0.5-062620141350	4098783	8270SIM	NAPHTHALENE	16.8	ug/Kg	J	MSDP
CC-001-A1-0.0/0.5-062620141350	4098783	8270SIM	PENTACHLOROPHENOL	56.5	ug/Kg	UJ	MSL, MSDL
CC-001-A1-0.0/0.5-062620141350	4098783	SW6010	ARSENIC	0.014	umoles/g	J	MSDL, MSDP
CC-001-A1-0.0/0.5-062620141350	4098783	SW7470	MERCURY	0.000016	umoles/g	J	MSL, MSDL, MSDP
CC-001-A1-0.0/0.5-062620141350	10272183	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.43	ng/kg	J	EMPC
CC-001-A1-0.0/0.5-062620141350	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.25	ng/kg	J	EMPC
CC-001-A1-0.0/0.5-062620141350	10272183	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.17	ng/kg	J	EMPC
CC-002-A-0.0/0.5-062520141205	4098688	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	11700	mg/Kg	J	MSH, MSDH
CC-002-A-0.0/0.5-062520141205	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	18	ng/kg	J	EMPC

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-002-A-0.5/1.4-062520141205	10272030	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.22	ng/kg	J	EMPC
CC-002-A-0.5/1.4-062520141205	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.15	ng/kg	J	EMPC
CC-002-A-0.5/1.4-062520141205	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.42	ng/kg	J	EMPC
CC-003-C-0.0/0.5-062220141130	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.5	ng/kg	J	EMPC
CC-003-C-0.0/0.5-062220141130	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.53	ng/kg	J	EMPC
CC-003-C-0.0/0.5-062220141130	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.64	ng/kg	J	EMPC
CC-003-C-0.0/0.5-062220141130	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.57	ng/kg	J	EMPC
CC-003-C-0.0/0.5-062220141130	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.25	ng/kg	J	EMPC
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.31	ng/kg	U	LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.076	ng/kg	UJ	EMPC, LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.57	ng/kg	U	LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.092	ng/kg	U	LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.15	ng/kg	J	EMPC
CC-003-C-0.5/1.3-062220141130	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.12	ng/kg	UJ	EMPC, LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.091	ng/kg	UJ	EMPC, LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	3.9	ng/kg	U	LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	1.1	ng/kg	U	LBL
CC-003-C-0.5/1.3-062220141130	10271683	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.48	ng/kg	U	LBL
CC-004-A-0.0/0.5-062220141320	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	6.9	ng/kg	J	EMPC
CC-004-A-0.5/1.8-062220141320	4098523	SW6010	SILVER	0.00089	umoles/g	U	LBL
CC-004-A-0.5/1.8-062220141320	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.47	ng/kg	J	EMPC
CC-004-A-0.5/1.8R-062220141320	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.2	ng/kg	J	EMPC
CC-004-A-0.5/1.8R-062220141320	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.54	ng/kg	J	EMPC
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	470	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1800	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	31	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	25	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.3	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	4.8	ng/kg	J	ISH
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	3.3	ng/kg	J	EMPC
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	48	ng/kg	J	EMPC
CC-005-B-0.0/0.5-062220141220	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.6	ng/kg	J	EMPC

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-005-B-0.0/0.5-062220141220	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	5.8	ng/kg	J	ISH
CC-005-B-0.5/1.3-062220141220	4098523	SW6010	SILVER	0.0026	umoles/g	U	LBL
CC-005-B-0.5/1.3-062220141220	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	3.2	ng/kg	J	EMPC
CC-005-B-0.5/1.3-062220141220	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.43	ng/kg	J	EMPC, ISH
CC-005-B-0.5/1.3-062220141220	10271683	1613B	OCTACHLORODIBENZOFURAN	3.8	ng/kg	U	LBL
CC-006-A-0.0/0.5-062220141520	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.86	ng/kg	J	EMPC
CC-006-A-0.0/0.5-062220141520	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.11	ng/kg	UJ	EMPC, LBL
CC-006-A-0.0/0.5-062220141520	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.29	ng/kg	U	LBL
CC-006-A-0.0/0.5-062220141520	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.17	ng/kg	U	LBL
CC-006-A-0.0/0.5-062220141520	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.083	ng/kg	J	EMPC
CC-006-A-0.5/1.3-062220141520	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-006-A-0.5/1.3-062220141520	10271683	1613B	OCTACHLORODIBENZOFURAN	0.88	ng/kg	UJ	EMPC, LBL
CC-006-A-0.5/1.3-062220141520	10271683	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.15	ng/kg	U	LBL
CC-006-A-0.5/1.3-062220141520	10271683	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.19	ng/kg	U	LBL
CC-007-C-0.0/0.5-062320141000	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.4	ng/kg	J	EMPC
CC-007-C-0.0/0.5-062320141000	10271683	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.32	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	9.5	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.28	ng/kg	UJ	EMPC, LBL
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.73	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.5	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.17	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.13	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.56	ng/kg	J	EMPC
CC-007-C-0.5/1.6-062320141000	10271683	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.1	ng/kg	J	EMPC
CC-008-C-0.0/0.5-062320141145	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.1	ng/kg	J	EMPC
CC-008-C-0.5/2.3-062320141145	4098523	SW1629	Acid Volatile Sulfide	0.41	umoles/g	J	MSH, MSDH, MSDP
CC-008-C-0.5/2.3-062320141145	4098523	SW7470	MERCURY	0.000007	umoles/g	UJ	MSL, MSDL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.47	ng/kg	UJ	EMPC, LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.81	ng/kg	U	LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.65	ng/kg	U	LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.91	ng/kg	U	LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.52	ng/kg	U	LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.24	ng/kg	U	LBL
CC-008-C-0.5/2.3-062320141145	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.89	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-008-C-0.5/2.3-062320141145	10271683	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.55	ng/kg	U	LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.52	ng/kg	U	LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.31	ng/kg	U	LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.1	ng/kg	U	LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.19	ng/kg	U	LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.26	ng/kg	UJ	EMPC, LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-009-C-0.0/0.5-062320141315	10271683	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.5	ng/kg	U	LBL
CC-009-C-0.5/1.3-062320141315	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.82	ng/kg	U	LBL
CC-009-C-0.5/1.3-062320141315	10271683	1613B	OCTACHLORODIBENZOFURAN	3	ng/kg	U	LBL
CC-009-C-0.5/1.3-062320141315	10271683	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.61	ng/kg	U	LBL
CC-009-C-0.5/1.3-062320141315	10271683	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	1.1	ng/kg	U	LBL
CC-009-C-0.5/1.3-062320141315	10271683	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.16	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	4098523	8270SIM	ACENAPHTHENE	131	ug/Kg	J	FD
CC-010-A-0.8/1.9-062320141335	4098523	SW1629	Acid Volatile Sulfide	1.4	umoles/g	J	FD
CC-010-A-0.8/1.9-062320141335	4098523	SW1629	SEM/AVS Ratio	0.72	no units	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	14	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	54	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.2	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.1	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.34	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.22	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.14	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.46	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.26	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	OCTACHLORODIBENZOFURAN	70	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	OCTACHLORODIBENZO-P-DIOXIN	730	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	68	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	110	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	19	ng/kg	J	FD
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	0.55	ng/kg	U	LBL
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	2	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-010-A-0.8/1.9-062320141335	10271683	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	1.6	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	4098523	8270SIM	ACENAPHTHENE	13.5	ug/Kg	J	FD
CC-010-A-0.8/1.9R-062320141335	4098523	8270SIM	PENTACHLOROPHENOL	55.2	ug/Kg	UJ	LCSL
CC-010-A-0.8/1.9R-062320141335	4098523	SW1629	Acid Volatile Sulfide	0.62	umoles/g	J	FD
CC-010-A-0.8/1.9R-062320141335	4098523	SW1629	SEM/AVS Ratio	1.5	no units	J	FD
CC-010-A-0.8/1.9R-062320141335	4098523	SW6010	ARSENIC	0.02	umoles/g	J	MSL, MSDL
CC-010-A-0.8/1.9R-062320141335	4098523	SW7470	MERCURY	0.0000064	umoles/g	R	MSL, MSDL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.88	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.9	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.2	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.23	ng/kg	J	EMPC
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.27	ng/kg	J	EMPC
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.37	ng/kg	J	EMPC
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.13	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.28	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.11	ng/kg	UJ	EMPC, LBL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	OCTACHLORODIBENZOFURAN	2.6	ng/kg	UJ	LBL, FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	OCTACHLORODIBENZO-P-DIOXIN	23	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	1.7	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	3.8	ng/kg	J	FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.62	ng/kg	UJ	LBL, FD
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.12	ng/kg	U	LBL
CC-010-A-0.8/1.9R-062320141335	10271683	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	6	ng/kg	J	FD
CC-011-A-0.0/0.5-062320141515	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1	ng/kg	U	LBL
CC-011-A-0.0/0.5-062320141515	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.51	ng/kg	UJ	EMPC, LBL
CC-011-A-0.0/0.5-062320141515	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.53	ng/kg	U	LBL
CC-011-A-0.0/0.5-062320141515	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.29	ng/kg	U	LBL
CC-011-A-0.0/0.5-062320141515	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.99	ng/kg	U	LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.41	ng/kg	UJ	EMPC, LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.15	ng/kg	UJ	EMPC, LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.13	ng/kg	U	LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.14	ng/kg	UJ	EMPC, LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.084	ng/kg	UJ	EMPC, LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	OCTACHLORODIBENZOFURAN	1.8	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-011-A-0.5/1.2-062320141515	10271912	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.5	ng/kg	U	LBL
CC-011-A-0.5/1.2-062320141515	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.69	ng/kg	U	LBL
CC-012-C-0.0/0.6-062320141435	4098601	SW6010	ARSENIC	0.0098	umoles/g	J	MSDL, MSDP
CC-012-C-0.0/0.6-062320141435	4098601	SW7470	MERCURY	0.0000096	umoles/g	J	MSL, MSDL, MSDP
CC-012-C-0.0/0.6-062320141435	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.23	ng/kg	J	EMPC
CC-012-C-0.0/0.6-062320141435	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.076	ng/kg	UJ	EMPC, LBL
CC-012-C-0.0/0.6-062320141435	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.096	ng/kg	J	EMPC
CC-013-C-0.0/0.5-062320141540	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	2	ng/kg	J	ISH
CC-013-C-0.0/0.5-062320141540	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	6.5	ng/kg	J	ISH
CC-013-C-0.0/0.5-062320141540	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	54	ng/kg	J	ISH
CC-013-C-0.0/0.5-062320141540	10271912	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	3.2	ng/kg	J	ISH
CC-013-C-0.5/1.2-062320141540	4098601	8270SIM	PENTACHLOROPHENOL	5490	ug/Kg	UJ	LCSL
CC-013-C-0.5/1.2-062320141540	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.39	ng/kg	J	EMPC
CC-013-C-0.5/1.2-062320141540	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.52	ng/kg	J	EMPC
CC-013-C-0.5/1.2-062320141540	10271912	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.58	ng/kg	J	EMPC
CC-014-B-0.0/0.5-062320141600	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	6.3	ng/kg	J	EMPC
CC-014-B-0.0/0.5-062320141600	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1.7	ng/kg	J	EMPC
CC-014-B-0.5/1.3-062320141600	10271912	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.75	ng/kg	J	EMPC
CC-014-B-0.5/1.3-062320141600	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.35	ng/kg	J	EMPC
CC-014-B-0.5/1.3-062320141600	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.26	ng/kg	J	EMPC
CC-015-A-0.0/0.5-062320141625	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.6	ng/kg	J	EMPC
CC-015-A-0.5/1.7-062320141625	10271912	1613B	OCTACHLORODIBENZOFURAN	0.26	ng/kg	J	EMPC
CC-015-A-0.5/1.7-062320141625	10271912	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.1	ng/kg	U	LBL
CC-015-A-0.5/1.7-062320141625	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.12	ng/kg	U	LBL
CC-015-A-0.5/1.7R-062320141625	10271912	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.18	ng/kg	J	EMPC
CC-016-C-0.0/0.5-062420140850	10271912	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.7	ng/kg	J	EMPC
CC-016-C-0.0/0.5-062420140850	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.09	ng/kg	J	EMPC
CC-016-C-0.0/0.5-062420140850	10271912	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.2	ng/kg	J	EMPC
CC-016-C-0.5/1.3-062420140850	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.1	ng/kg	U	LBL
CC-016-C-0.5/1.3-062420140850	10271912	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.4	ng/kg	U	LBL
CC-016-C-0.5/1.3-062420140850	10271912	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	0.3	ng/kg	U	LBL
CC-016-C-0.5/1.3-062420140850	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.34	ng/kg	U	LBL
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	4.4	ng/kg	J	EMPC
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.81	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1	ng/kg	U	LBL
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.3	ng/kg	U	LBL
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.55	ng/kg	U	LBL
CC-017-A-0.0/0.5-062420141020	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.29	ng/kg	UJ	EMPC, LBL
CC-017-A-0.0/0.5-062420141020	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.19	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.13	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.32	ng/kg	UJ	EMPC, LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.15	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	2.8	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.3	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	0.69	ng/kg	U	LBL
CC-017-A-0.5/1.3-062420141020	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.37	ng/kg	U	LBL
CC-018-C-0.0/0.5-062420140925	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.4	ng/kg	J	EMPC
CC-018-C-0.0/0.5-062420140925	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.1	ng/kg	J	EMPC
CC-018-C-0.5/2.0-062420140925	4098601	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	11000	mg/Kg	J	MSH
CC-018-C-0.5/2.0-062420140925	4098601	SW1629	Acid Volatile Sulfide	0.18	umoles/g	J	MSDP
CC-018-C-0.5/2.0-062420140925	4098601	SW7470	MERCURY	0.0000069	umoles/g	UJ	MSL, MSDL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.58	ng/kg	U	LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.74	ng/kg	U	LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.81	ng/kg	UJ	EMPC, LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.33	ng/kg	U	LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.18	ng/kg	U	LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.84	ng/kg	UJ	EMPC, LBL
CC-018-C-0.5/2.0-062420140925	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.54	ng/kg	U	LBL
CC-019-C-0.0/0.5-062420141030	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	82	ng/kg	J	EMPC
CC-019-C-0.0/0.5-062420141030	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	2.3	ng/kg	J	EMPC
CC-019-C-0.0/0.5-062420141030	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1.3	ng/kg	UJ	EMPC, LBL
CC-019-C-0.0/0.5-062420141030	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.39	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9-062420141030	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.43	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9-062420141030	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.49	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9-062420141030	10271912	1613B	OCTACHLORODIBENZO-P-DIOXIN	96	ng/kg	J	FD
CC-019-C-0.5/1.9-062420141030	10271912	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	2.9	ng/kg	U	LBL
CC-019-C-0.5/1.9-062420141030	10271912	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.3	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-019-C-0.5/1.9-062420141030	10271912	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	0.91	ng/kg	U	LBL
CC-019-C-0.5/1.9-062420141030	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.5	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.1	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.23	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.35	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.29	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.27	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.18	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.16	ng/kg	UJ	EMPC, LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	OCTACHLORODIBENZOFURAN	3.5	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	OCTACHLORODIBENZO-P-DIOXIN	48	ng/kg	J	FD
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	2	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.8	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	1.1	ng/kg	U	LBL
CC-019-C-0.5/1.9R-062420141030	10271912	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.85	ng/kg	U	LBL
CC-020-A-0.0/0.5-062420141110	10271912	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	4.1	ng/kg	J	EMPC
CC-020-A-0.0/0.5-062420141110	10271912	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	2	ng/kg	J	EMPC
CC-020-A-0.0/0.5-062420141110	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.93	ng/kg	UJ	EMPC, LBL
CC-020-A-0.0/0.5-062420141110	10271912	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.75	ng/kg	U	LBL
CC-020-A-0.0/0.5-062420141110	10271912	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	1.9	ng/kg	J	EMPC
CC-020-A-0.0/0.5-062420141110	10271912	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.2	ng/kg	UJ	EMPC, LBL
CC-020-A-0.5/1.8-062420141110	4098601	8270SIM	ACENAPHTHENE	181	ug/Kg	U	LBH
CC-020-A-0.5/1.8-062420141110	4098601	8270SIM	PENTACHLOROPHENOL	2740	ug/Kg	UJ	LCSL
CC-020-A-0.5/1.8-062420141110	4098601	8270SIM	PHENANTHRENE	525	ug/Kg	U	LBH
CC-020-A-0.5/1.8-062420141110	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.2	ng/kg	U	LBL
CC-020-A-0.5/1.8-062420141110	10271988	1613B	OCTACHLORODIBENZOFURAN	7.1	ng/kg	U	LBL
CC-020-A-0.5/1.8-062420141110	10271988	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.98	ng/kg	U	LBL
CC-020-A-0.5/1.8-062420141110	10271988	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.1	ng/kg	U	LBL
CC-021-C-0.5/2.0-062520141510	4098783	SW1629	Acid Volatile Sulfide	1.3	umoles/g	J	FD
CC-021-C-0.5/2.0-062520141510	4098783	SW1629	SEM/AVS Ratio	0.41	no units	J	FD
CC-021-C-0.5/2.0R-062520141510	4098783	SW1629	Acid Volatile Sulfide	0.19	umoles/g	J	FD
CC-021-C-0.5/2.0R-062520141510	4098783	SW1629	SEM/AVS Ratio	3.4	no units	J	FD
CC-021-C1-0.5/2.0	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.4	ng/kg	U	LBL
CC-021-C1-3.0/3.6	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.3	ng/kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-021-C1-3.0/3.6	10272183	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	0.44	ng/kg	U	LBL
CC-021-C-2.0/3.0-062520141510	4098783	8270SIM	PENTACHLOROPHENOL	24.6	ug/Kg	UJ	LCSL
CC-021-C-3.0/3.6-062520141510	4098783	8270SIM	PENTACHLOROPHENOL	24.5	ug/Kg	UJ	LCSL
CC-021-C-3.0/3.6-062520141510	4098783	SW1629	Acid Volatile Sulfide	0.38	umoles/g	J	MSH, MSDH
CC-021-C-3.0/3.6-062520141510	4098783	SW7470	MERCURY	0.0000059	umoles/g	UJ	MSL, MSDL
CC-022-A-0.0/0.8-062520140900	10272030	1613B	OCTACHLORODIBENZOFURAN	1.6	ng/kg	J	EMPC
CC-023-A-0.0/0.5-062520141120	10272030	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.9	ng/kg	J	EMPC
CC-023-A-0.0/0.5-062520141120	10272030	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.6	ng/kg	J	EMPC
CC-023-A-0.0/0.5-062520141120	10272030	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.37	ng/kg	J	EMPC
CC-023-A-0.0/0.5-062520141120	10272030	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.87	ng/kg	J	EMPC
CC-023-A-0.5/2.1-062520141120	4098688	8270SIM	PHENANTHRENE	378	ug/Kg	J	FD
CC-023-A-0.5/2.1-062520141120	4098688	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	6960	mg/Kg	J	FD
CC-023-A-0.5/2.1-062520141120	4098688	SW1629	Acid Volatile Sulfide	0.02	umoles/g	J	FD
CC-023-A-0.5/2.1-062520141120	4098688	SW1629	SEM/AVS Ratio	42.2	no units	J	FD
CC-023-A-0.5/2.1-062520141120	10272030	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	16	ng/kg	J	FD
CC-023-A-0.5/2.1-062520141120	10272030	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.35	ng/kg	J	EMPC
CC-023-A-0.5/2.1-062520141120	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.51	ng/kg	J	EMPC
CC-023-A-0.5/2.1-062520141120	10272030	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.27	ng/kg	J	EMPC
CC-023-A-0.5/2.1-062520141120	10272030	1613B	OCTACHLORODIBENZOFURAN	23	ng/kg	J	FD
CC-023-A-0.5/2.1-062520141120	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	190	ng/kg	J	FD
CC-023-A-0.5/2.1-062520141120	10272030	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	20	ng/kg	J	FD
CC-023-A-0.5/2.1-062520141120	10272030	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	31	ng/kg	J	FD
CC-023-A-0.5/2.1R-062520141120	4098688	8270SIM	PHENANTHRENE	920	ug/Kg	J	FD
CC-023-A-0.5/2.1R-062520141120	4098688	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	12800	mg/Kg	J	FD
CC-023-A-0.5/2.1R-062520141120	4098688	SW1629	Acid Volatile Sulfide	0.48	umoles/g	J	FD
CC-023-A-0.5/2.1R-062520141120	4098688	SW1629	SEM/AVS Ratio	1.9	no units	J	FD
CC-023-A-0.5/2.1R-062520141120	10272030	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.31	ng/kg	J	EMPC, FD
CC-023-A-0.5/2.1R-062520141120	10272030	1613B	OCTACHLORODIBENZOFURAN	0.52	ng/kg	J	EMPC, FD
CC-023-A-0.5/2.1R-062520141120	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.9	ng/kg	J	FD
CC-023-A-0.5/2.1R-062520141120	10272030	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	0.26	ng/kg	UJ	FD
CC-023-A-0.5/2.1R-062520141120	10272030	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	0.27	ng/kg	UJ	FD
CC-024-A-0.0/0.5-062520141610	4098783	8270SIM	PENTACHLOROPHENOL	603	ug/Kg	UJ	LCSL
CC-024-A-0.0/0.5-062520141610	10272183	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.4	ng/kg	J	EMPC
CC-024-A-0.0/0.5-062520141610	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.36	ng/kg	J	EMPC

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-024-A-0.0/0.5-062520141610	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.38	ng/kg	J	EMPC
CC-024-A-0.0/0.5-062520141610	10272183	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.22	ng/kg	J	EMPC
CC-024-A-0.5/2.0-062520141610	4098783	8270SIM	PENTACHLOROPHENOL	1430	ug/Kg	UJ	LCSL
CC-024-A-0.5/2.0-062520141610	10272183	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.3	ng/kg	J	EMPC
CC-024-A-0.5/2.0-062520141610	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.3	ng/kg	J	EMPC
CC-024-A-0.5/2.0-062520141610	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.65	ng/kg	J	EMPC
CC-024-A-0.5/2.0-062520141610	10272183	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.36	ng/kg	J	EMPC
CC-024-A-2.0/3.0-062520141610	4098783	8270SIM	PENTACHLOROPHENOL	27.8	ug/Kg	UJ	LCSL
CC-024-A-2.0/3.0-062520141610	10272183	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.73	ng/kg	U	LBL
CC-024-A-2.0/3.0-062520141610	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	5.3	ng/kg	UJ	EMPC, LBL
CC-024-A-2.0/3.0-062520141610	10272183	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	0.73	ng/kg	U	LBL
CC-024-A-2.0/3.0R-062520141610	4098783	8270SIM	PENTACHLOROPHENOL	28	ug/Kg	UJ	LCSL
CC-024-A-2.0/3.0R-062520141610	10272183	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.41	ng/kg	U	LBL
CC-024-A-2.0/3.0R-062520141610	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	3.2	ng/kg	UJ	EMPC, LBL
CC-024-A-2.0/3.0R-062520141610	10272183	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	0.41	ng/kg	U	LBL
CC-024-A-3.0/3.6-062520141610	4098783	8270SIM	PENTACHLOROPHENOL	28	ug/Kg	UJ	LCSL
CC-024-A-3.0/3.6-062520141610	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.6	ng/kg	U	LBL
CC-025-C-0.0/0.5-062620140830	4098783	8270SIM	PENTACHLOROPHENOL	67.4	ug/Kg	UJ	LCSL
CC-025-C-0.0/0.5-062620140830	10272183	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.85	ng/kg	J	EMPC
CC-025-C-0.0/0.5-062620140830	10272183	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.57	ng/kg	J	EMPC
CC-025-C-0.0/0.5-062620140830	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.28	ng/kg	U	LBL
CC-025-C-0.5/2.0-062620140830	4098783	8270SIM	PENTACHLOROPHENOL	54.9	ug/Kg	UJ	LCSL
CC-025-C-0.5/2.0-062620140830	10272183	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.8	ng/kg	J	EMPC
CC-025-C-2.0/3.0-062620140830	4098783	8270SIM	PENTACHLOROPHENOL	27.9	ug/Kg	UJ	LCSL
CC-025-C-2.0/3.0-062620140830	4098783	8270SIM	PHENANTHRENE	2.2	ug/Kg	J	SSH
CC-025-C-2.0/3.0-062620140830	10272183	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.1	ng/kg	UJ	EMPC, LBL
CC-025-C-3.0/4.0-062620140830	4098783	8270SIM	PENTACHLOROPHENOL	26.4	ug/Kg	UJ	LCSL
CC-026-C-0.0/0.5-062420141140	4098601	8270SIM	PENTACHLOROPHENOL	67.8	ug/Kg	UJ	LCSL
CC-026-C-0.0/0.5-062420141140	4098601	SW1629	Acid Volatile Sulfide	0.61	umoles/g	J	MSDL, MSDP
CC-026-C-0.0/0.5-062420141140	4098601	SW7470	MERCURY	0.0000093	umoles/g	J	MSL, MSDL, MSDP
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	11	ng/kg	J	EMPC
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.61	ng/kg	UJ	EMPC, LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.43	ng/kg	UJ	EMPC, LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.51	ng/kg	UJ	EMPC, LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.12	ng/kg	UJ	EMPC, LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.16	ng/kg	U	LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.23	ng/kg	U	LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.13	ng/kg	UJ	EMPC, LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	1.2	ng/kg	U	LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	0.16	ng/kg	U	LBL
CC-026-C-0.0/0.5-062420141140	10271988	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.47	ng/kg	U	LBL
CC-026-C-0.5/2.0-062420141140	4098601	8270SIM	ANTHRACENE	29.5	ug/Kg	U	LBL
CC-026-C-0.5/2.0-062420141140	4098601	8270SIM	FLUORANTHENE	67.8	ug/Kg	U	LBL
CC-026-C-0.5/2.0-062420141140	4098601	8270SIM	FLUORENE	137	ug/Kg	U	LBH
CC-026-C-0.5/2.0-062420141140	4098601	8270SIM	PENTACHLOROPHENOL	282	ug/Kg	UJ	LCSL
CC-026-C-0.5/2.0-062420141140	4098601	8270SIM	PHENANTHRENE	274	ug/Kg	U	LBH
CC-026-C-0.5/2.0-062420141140	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.89	ng/kg	J	EMPC
CC-026-C-0.5/2.0-062420141140	10272183	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.1	ng/kg	J	EMPC
CC-026-C-0.5/2.0-062420141140	10272183	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.81	ng/kg	J	EMPC
CC-026-C-0.5/2.0-062420141140	10272183	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.2	ng/kg	J	EMPC
CC-026-C-0.5/2.0-062420141140	10272183	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.23	ng/kg	J	EMPC
CC-026-C-2.0/3.3-062420141140	4098601	8270SIM	PENTACHLOROPHENOL	28.2	ug/Kg	UJ	LCSL
CC-027-A-0.0/0.5-062520141410	10272030	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	5.9	ng/kg	J	EMPC
CC-027-A-0.0/0.5-062520141410	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.18	ng/kg	J	EMPC
CC-027-A-0.5/1.9-062520141410	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.7	ng/kg	J	EMPC
CC-027-A-0.5/1.9-062520141410	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.34	ng/kg	J	EMPC
CC-027-A-0.5/1.9-062520141410	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.5	ng/kg	J	LCSH
CC-027-A-0.5/1.9-062520141410	10272030	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.87	ng/kg	J	LCSH
CC-028-B-0.0/0.5-062520141400	10272030	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.32	ng/kg	J	EMPC
CC-028-B-0.0/0.5-062520141400	10272030	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.39	ng/kg	J	EMPC
CC-028-B-0.0/0.5-062520141400	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.31	ng/kg	J	EMPC
CC-028-B-0.0/0.5-062520141400	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.19	ng/kg	J	EMPC
CC-028-B-0.0/0.5-062520141400	10272030	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.55	ng/kg	J	EMPC
CC-028-B-0.0/0.5-062520141400	10272030	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.39	ng/kg	U	LBL
CC-028-B-0.5/2.0-062520141400	4098688	SW1629	Acid Volatile Sulfide	0.24	umoles/g	J	MSL, MSDL, MSDP
CC-028-B-0.5/2.0-062520141400	4098688	SW7470	MERCURY	0.0000062	umoles/g	UJ	MSDL
CC-028-B-0.5/2.0-062520141400	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.5	ng/kg	J	EMPC
CC-028-B-2.0/3.0-062520141400	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.8	ng/kg	J	EMPC

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CC-028-B-2.0/3.0-062520141400	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	920	ng/kg	J	LCSH
CC-028-B-2.0/3.0-062520141400	10272030	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.25	ng/kg	U	LBL
CC-028-B-3.0/4.0-062520141400	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.55	ng/kg	J	EMPC
CC-028-B-3.0/4.0-062520141400	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	820	ng/kg	J	LCSH
CC-028-B-3.0/4.0-062520141400	10272030	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.77	ng/kg	U	LBL
CC-028-B-4.0/4.7-062520141400	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.2	ng/kg	J	EMPC
CC-028-B-4.0/4.7-062520141400	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	670	ng/kg	J	LCSH
CC-028-B-4.0/4.7-062520141400	10272030	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.48	ng/kg	U	LBL
CC-06-A-0.0/0.5	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.7	ng/kg	J	EMPC
CC-06-A-0.0/0.5	10272030	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.68	ng/kg	J	EMPC
CC-06-A-0.0/0.5	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	3100	ng/kg	J	LCSH
CC-06-A-0.5/1.8	10272030	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	4.5	ng/kg	J	EMPC
CC-06-A-0.5/1.8	10272030	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.9	ng/kg	J	EMPC
CC-06-A-0.5/1.8	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	4000	ng/kg	J	LCSH
CC-FT-001-F-071620140955	10278447	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.45	ng/Kg	J	EMPC
CC-FT-001-O-071620140955	10278447	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.45	ng/Kg	J	EMPC
CC-FT-001-O-071620140955	10278447	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.8	ng/Kg	J	EMPC
CC-FT-001-O-071620140955	10278447	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.56	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.1	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.7	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.24	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.47	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.53	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.1	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.89	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.16	ng/Kg	J	EMPC
CC-FT-003-W-071620140935	10278447	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.26	ng/Kg	J	EMPC
CC-FT-005-F-071620140955	10278447	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.12	ng/Kg	J	EMPC
CC-FT-004-W-071620140955	10280605	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.1	ng/Kg	J	EMPC
CC-FT-004-W-071620140955	10280605	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.11	ng/Kg	J	EMPC
CC-FT-005-O-071620140955	4099994	8270SIM	PENTACHLOROPHENOL	6.7	ug/Kg	J	SSL
CC-FT-005-O-071620140955	10278447	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.4	ng/Kg	J	EMPC
CC-FT-005-O-071620140955	10278447	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.69	ng/Kg	J	EMPC
CC-FT-005-O-071620140955	10278447	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.32	ng/Kg	J	EMPC

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CC-FT-005-O-071620140955	10278447	1613B	OCTACHLORODIBENZOFURAN	4.5	ng/Kg	J	EMPC
CC-FT-006-W-071720140950	10278448	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.47	ng/Kg	J	EMPC
CC-FT-006-W-071720140950	10278448	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.45	ng/Kg	J	EMPC
CC-FT-006-W-071720140950	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.5	ng/Kg	J	EMPC
CC-FT-006-W-071720140950	10278448	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.37	ng/Kg	J	EMPC
CC-FT-007-W-071720140950	10278448	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.41	ng/Kg	J	EMPC
CC-FT-007-W-071720140950	10278448	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.1	ng/Kg	J	EMPC
CC-FT-007-W-071720140950	10278448	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.24	ng/Kg	J	EMPC
CC-FT-007-W-071720140950	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.77	ng/Kg	J	EMPC
CC-FT-007-W-071720140950	10278448	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.21	ng/Kg	J	EMPC
CC-FT-010-W-071720141400	10278448	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1	ng/Kg	J	EMPC
CC-FT-010-W-071720141400	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.79	ng/Kg	J	EMPC
CC-FT-010-W-071720141400	10278448	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.18	ng/Kg	J	EMPC
CC-FT-010-W-071720141400	10278448	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.31	ng/Kg	J	EMPC
CC-FT-011-W-071720141400	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.5	ng/Kg	J	EMPC
CC-FT-011-W-071720141400	10278448	1613B	OCTACHLORODIBENZOFURAN	3.1	ng/Kg	J	EMPC
CF-01-A-0.0/0.5-062420141350	4098601	8270SIM	FLUORANTHENE	10.1	ug/Kg	U	LBL
CF-01-A-0.0/0.5-062420141350	4098601	8270SIM	PENTACHLOROPHENOL	64.3	ug/Kg	UJ	LCSL
CF-01-A-0.0/0.5-062420141350	4098601	8270SIM	PHENANTHRENE	8	ug/Kg	U	LBH
CF-01-A-0.0/0.5-062420141350	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.4	ng/kg	J	EMPC
CF-01-A-0.5/1.0-062420141350	4098601	8270SIM	FLUORANTHENE	56.5	ug/Kg	U	LBL
CF-01-A-0.5/1.0-062420141350	4098601	8270SIM	PENTACHLOROPHENOL	295	ug/Kg	UJ	LCSL
CF-01-A-0.5/1.0-062420141350	4098601	8270SIM	PHENANTHRENE	57.3	ug/Kg	U	LBH
CF-01-A-0.5/1.0-062420141350	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.45	ng/kg	J	EMPC
CF-01-A-0.5/1.0-062420141350	10271988	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.34	ng/kg	J	EMPC
CF-01-A-0.5/1.0-062420141350	10271988	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.3	ng/kg	J	EMPC
CF-01-B-0.0/0.5-062620141030	4098783	8270SIM	PENTACHLOROPHENOL	284	ug/Kg	UJ	LCSL
CF-01-B-0.0/0.5-062620141030	10272183	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.47	ng/kg	J	EMPC
CF-01-B-0.5/0.9-062620141030	4098783	8270SIM	PENTACHLOROPHENOL	57800	ug/Kg	UJ	LCSL
CF-01-B-0.5/0.9-062620141030	10272183	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	160	ng/kg	J	EMPC
CF-01-C-0.0/0.7-062620141420	4098783	8270SIM	PENTACHLOROPHENOL	5730	ug/Kg	UJ	LCSL
CF-01-C-0.0/0.7-062620141420	10272183	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	960	ng/kg	J	EMPC
CF-01-C-0.0/0.7-062620141420	10272183	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	35	ng/kg	J	EMPC
CF-01-D-0.0/0.5-062520140900	10272030	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.56	ng/kg	J	EMPC

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CF-01-D-0.0/0.5-062520140900	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	960	ng/kg	J	LCSH
CF-01-D-0.5/1.1-062520140900	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	400	ng/kg	J	EMPC
CF-01-D-0.5/1.1-062520140900	10272030	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.69	ng/kg	J	EMPC
CF-01-D-0.5/1.1-062520140900	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	74000	ng/kg	J	LCSH
CF-02-B-0.0/0.5-062420141650	10272030	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.35	ng/kg	J	EMPC
CF-02-B-0.0/0.5-062420141650	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	3500	ng/kg	J	LCSH
CF-02-B-0.5/1.6-062420141650	4098688	SW1629	Acid Volatile Sulfide	0.017	umoles/g	UJ	MSDL
CF-02-B-0.5/1.6-062420141650	4098688	SW6010	ARSENIC	0.023	umoles/g	J	MSL, MSDL
CF-02-B-0.5/1.6-062420141650	4098688	SW7470	MERCURY	0.000035	umoles/g	J	MSL
CF-02-B-0.5/1.6-062420141650	10272030	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	4.5	ng/kg	J	EMPC
CF-02-B-0.5/1.6-062420141650	10272030	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	5.5	ng/kg	J	EMPC
CF-02-B-0.5/1.6-062420141650	10272030	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	3.6	ng/kg	J	EMPC
CF-02-B-0.5/1.6-062420141650	10272030	1613B	OCTACHLORODIBENZO-P-DIOXIN	15000	ng/kg	J	LCSH
CF-02-C-0.0/0.8-062520141020	10272031	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.3	ng/kg	J	EMPC
CF-02-C-0.0/0.8-062520141020	10272031	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	1	ng/kg	J	EMPC
CF-02-C-0.0/0.8-062520141020	10272031	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.91	ng/kg	J	EMPC
CF-03-A-0.0/0.5-062420141415	4098601	8270SIM	PENTACHLOROPHENOL	33.5	ug/Kg	UJ	LCSL
CF-03-A-0.0/0.5-062420141415	4098601	8270SIM	PHENANTHRENE	4	ug/Kg	U	LBH
CF-03-A-0.0/0.5-062420141415	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.44	ng/kg	J	EMPC
CF-03-A-0.0/0.5-062420141415	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.55	ng/kg	J	EMPC
CF-03-A-0.5/1.3-062420141415	4098601	8270SIM	ANTHRACENE	9.8	ug/Kg	J	FD
CF-03-A-0.5/1.3-062420141415	4098601	8270SIM	BENZO(B)FLUORANTHENE	9.5	ug/Kg	J	FD
CF-03-A-0.5/1.3-062420141415	4098601	8270SIM	BENZO(G,H,I)PERYLENE	17.4	ug/Kg	J	FD
CF-03-A-0.5/1.3-062420141415	4098601	8270SIM	INDENO(1,2,3-CD)PYRENE	14.4	ug/Kg	J	FD
CF-03-A-0.5/1.3-062420141415	4098601	8270SIM	PENTACHLOROPHENOL	28.8	ug/Kg	UJ	LCSL
CF-03-A-0.5/1.3-062420141415	4098601	SW6010	LEAD	12	mg/Kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	280	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	900	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	26	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.3	ng/kg	J	EMPC
CF-03-A-0.5/1.3-062420141415	10271988	1613B	OCTACHLORODIBENZOFURAN	1300	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	OCTACHLORODIBENZO-P-DIOXIN	9300	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	1200	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	1700	ng/kg	J	FD

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CF-03-A-0.5/1.3-062420141415	10271988	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	290	ng/kg	J	FD
CF-03-A-0.5/1.3-062420141415	10271988	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	130	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	4098601	8270SIM	ANTHRACENE	164	ug/Kg	J	FD
CF-03-A-0.5/1.3R-062420141415	4098601	8270SIM	BENZO(B)FLUORANTHENE	122	ug/Kg	J	FD
CF-03-A-0.5/1.3R-062420141415	4098601	8270SIM	BENZO(G,H,I)PERYLENE	175	ug/Kg	J	FD
CF-03-A-0.5/1.3R-062420141415	4098601	8270SIM	INDENO(1,2,3-CD)PYRENE	158	ug/Kg	J	FD
CF-03-A-0.5/1.3R-062420141415	4098601	8270SIM	PENTACHLOROPHENOL	308	ug/Kg	UJ	LCSL
CF-03-A-0.5/1.3R-062420141415	4098601	SW6010	LEAD	20.3	mg/Kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	35	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	120	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.6	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.31	ng/kg	J	EMPC
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	OCTACHLORODIBENZOFURAN	160	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	OCTACHLORODIBENZO-P-DIOXIN	1300	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	150	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	230	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	41	ng/kg	J	FD
CF-03-A-0.5/1.3R-062420141415	10271988	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	19	ng/kg	J	FD
CF-03-C-0.0/0.5-062420141200	4098601	8270SIM	FLUORANTHENE	32.2	ug/Kg	U	LBL
CF-03-C-0.0/0.5-062420141200	4098601	8270SIM	PENTACHLOROPHENOL	320	ug/Kg	UJ	LCSL
CF-03-C-0.0/0.5-062420141200	4098601	8270SIM	PHENANTHRENE	24.9	ug/Kg	U	LBH
CF-03-C-0.0/0.5-062420141200	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.6	ng/kg	J	EMPC
CF-03-C-0.0/0.5-062420141200	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3.6	ng/kg	J	EMPC
CF-03-C-0.5/1.3-062420141200	4098601	8270SIM	ANTHRACENE	1450	ug/Kg	U	LBL
CF-03-C-0.5/1.3-062420141200	4098601	8270SIM	FLUORANTHENE	533	ug/Kg	U	LBL
CF-03-C-0.5/1.3-062420141200	4098601	8270SIM	PENTACHLOROPHENOL	5650	ug/Kg	UJ	LCSL
CF-03-C-0.5/1.3-062420141200	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	13	ng/kg	J	EMPC
CF-03-C-0.5/1.3-062420141200	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.55	ng/kg	J	EMPC
CF-03-E-0.0/0.5-062620141200	4098783	8270SIM	PENTACHLOROPHENOL	30.2	ug/Kg	UJ	LCSL
CF-03-E-0.0/0.5-062620141200	10272183	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.7	ng/kg	J	EMPC
CF-03-E-0.5/1.2-062620141200	10272183	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	4	ng/kg	J	EMPC
CF-03-E-0.5/1.2-062620141200	10272183	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.56	ng/kg	J	EMPC
CF-03-E-0.5/1.2-062620141200	10272183	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.17	ng/kg	J	EMPC
CF-04-B-0.0/0.5-062420141240	4098601	8270SIM	ANTHRACENE	38.8	ug/Kg	U	LBL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CF-04-B-0.0/0.5-062420141240	4098601	8270SIM	FLUORANTHENE	18.5	ug/Kg	U	LBL
CF-04-B-0.0/0.5-062420141240	4098601	8270SIM	PENTACHLOROPHENOL	153	ug/Kg	UJ	LCSL
CF-04-B-0.0/0.5-062420141240	4098601	8270SIM	PHENANTHRENE	12.2	ug/Kg	U	LBH
CF-04-B-0.0/0.5-062420141240	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.9	ng/kg	J	EMPC
CF-04-B-0.0/0.5-062420141240	10271988	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.42	ng/kg	J	EMPC
CF-04-B-0.5/1.3-062420141240	4098601	8270SIM	FLUORANTHENE	25	ug/Kg	U	LBL
CF-04-B-0.5/1.3-062420141240	4098601	8270SIM	FLUORENE	10	ug/Kg	U	LBH
CF-04-B-0.5/1.3-062420141240	4098601	8270SIM	PENTACHLOROPHENOL	140	ug/Kg	UJ	LCSL
CF-04-B-0.5/1.3-062420141240	4098601	8270SIM	PHENANTHRENE	20.8	ug/Kg	U	LBH
CF-04-B-0.5/1.3-062420141240	10271988	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.13	ng/kg	J	EMPC
CF-05-B-0.0/0.5-062420141245	4098601	8270SIM	FLUORENE	2.4	ug/Kg	U	LBH
CF-05-B-0.0/0.5-062420141245	4098601	8270SIM	PENTACHLOROPHENOL	33.5	ug/Kg	UJ	LCSL
CF-05-B-0.0/0.5-062420141245	4098601	8270SIM	PHENANTHRENE	6.1	ug/Kg	U	LBH
CF-05-B-0.0/0.5-062420141245	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.6	ng/kg	J	EMPC
CF-05-B-0.0/0.5-062420141245	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.8	ng/kg	J	EMPC
CF-05-B-0.0/0.5-062420141245	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.8	ng/kg	J	EMPC
CF-05-B-0.5/0.9-062420141245	4098601	8270SIM	FLUORANTHENE	669	ug/Kg	U	LBL
CF-05-B-0.5/0.9-062420141245	4098601	8270SIM	PENTACHLOROPHENOL	5640	ug/Kg	UJ	LCSL
CF-05-B-0.5/0.9-062420141245	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	44	ng/kg	J	LCSH
CF-05-B-0.5/0.9-062420141245	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	9.1	ng/kg	J	LCSH
CF-05-B-0.5/0.9-062420141245	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.6	ng/kg	J	EMPC
CF-05-C-0.0/0.6-062620141425	4098783	8270SIM	PENTACHLOROPHENOL	1070	ug/Kg	UJ	LCSL
CF-05-D-0.0/0.5-062520140935	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	15	ng/kg	J	EMPC
CF-05-D-0.5/0.9-062520140935	10272031	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	2.2	ng/kg	J	EMPC
CF-05-D-0.5/0.9-062520140935	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.9	ng/kg	J	EMPC
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	BENZO(A)PYRENE	2.9	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	BENZO(B)FLUORANTHENE	3.8	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	BENZO(G,H,I)PERYLENE	9.8	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	FLUORANTHENE	4.2	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	INDENO(1,2,3-CD)PYRENE	6.1	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	PENTACHLOROPHENOL	29	ug/Kg	UJ	LCSL
CF-06-B-0.0/0.6-062620141430	4098783	8270SIM	PYRENE	3.4	ug/Kg	J	FD
CF-06-B-0.0/0.6-062620141430	4098783	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	22200	mg/Kg	J	MSDH
CF-06-B-0.0/0.6-062620141430	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	230	ng/kg	J	FD

TABLE 3

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CF-06-B-0.0/0.6-062620141430	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	710	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	20	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	22	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.27	ng/kg	J	EMPC
CF-06-B-0.0/0.6-062620141430	10272184	1613B	OCTACHLORODIBENZOFURAN	840	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	9500	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	1000	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	1400	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	280	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	110	ng/kg	J	FD
CF-06-B-0.0/0.6-062620141430	10272184	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	29	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	BENZO(A)PYRENE	88.6	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	BENZO(B)FLUORANTHENE	74.6	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	BENZO(G,H,I)PERYLENE	189	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	FLUORANTHENE	57.9	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	INDENO(1,2,3-CD)PYRENE	135	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	PENTACHLOROPHENOL	139	ug/Kg	UJ	LCSL
CF-06-B-0.0/0.6R-062620141430	4098783	8270SIM	PYRENE	52.2	ug/Kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	50	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	170	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	3.2	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3.6	ng/kg	J	EMPC
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.76	ng/kg	J	EMPC
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	4.9	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.99	ng/kg	J	EMPC
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	OCTACHLORODIBENZOFURAN	240	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	2100	ng/kg	J	FD, ISL
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	250	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	350	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	44	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	30	ng/kg	J	FD
CF-06-B-0.0/0.6R-062620141430	10272184	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	4.4	ng/kg	J	FD
CF-06-D-0.0/0.8-062520141015	4098688	8270SIM	PENTACHLOROPHENOL	28.2	ug/Kg	UJ	LCSL, MSL, MSDL
CF-06-D-0.0/0.8-062520141015	4098688	SW1629	Acid Volatile Sulfide	0.015	umoles/g	UJ	MSL, MSDL

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
CF-06-D-0.0/0.8-062520141015	4098688	SW6010	ARSENIC	0.02	umoles/g	J	MSL, MSDL
CF-06-D-0.0/0.8-062520141015	4098688	SW6010	BARIUM	163	mg/Kg	J	MSH
CF-06-D-0.0/0.8-062520141015	4098688	SW7470	MERCURY	0.000026	umoles/g	J	MSL, MSDL
CF-06-D-0.0/0.8-062520141015	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	6.3	ng/kg	J	EMPC
CF-07-A-0.0/0.8-062620141400	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.9	ng/kg	J	EMPC
CF-07-B-0.0/0.7-062320141415	4098601	8270SIM	ANTHRACENE	2.3	ug/Kg	U	LBL
CF-07-B-0.0/0.7-062320141415	4098601	8270SIM	FLUORANTHENE	5.7	ug/Kg	U	LBL
CF-07-B-0.0/0.7-062320141415	4098601	8270SIM	PENTACHLOROPHENOL	28	ug/Kg	UJ	LCSL
CF-07-B-0.0/0.7-062320141415	4098601	8270SIM	PHENANTHRENE	3.6	ug/Kg	U	LBH
CF-07-B-0.0/0.7-062320141415	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	24	ng/kg	J	EMPC
CF-07-B-0.0/0.7-062320141415	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	17	ng/kg	J	LCSH
CF-07-B-0.0/0.7-062320141415	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1.8	ng/kg	J	EMPC
CF-07-B-0.0/0.7-062320141415	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3.3	ng/kg	J	LCSH
CF-07-B-0.0/0.7-062320141415	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.57	ng/kg	J	EMPC
CF-08-D-0.0/0.7-062620140955	10272184	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.3	ng/kg	J	EMPC
CF-08-D-0.0/0.7-062620140955	10272184	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.26	ng/kg	J	EMPC
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	12	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	24	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.6	ng/kg	J	EMPC
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.6	ng/kg	J	EMPC
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.68	ng/kg	J	EMPC
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.21	ng/kg	J	EMPC
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	140	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	280	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	16	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	28	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	25	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	44	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	3.2	ng/kg	J	FD
CF-09-A-0.0/0.8R-062520140940	10272031	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	8.6	ng/kg	J	FD
CF-10-B-0.0/0.5-062520141040	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3	ng/kg	J	EMPC
CF-10-B-0.5/1.3-062520141040	10272031	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.83	ng/kg	J	EMPC
CF-10-B-0.5/1.3-062520141040	10272031	1613B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.4	ng/kg	J	EMPC
FP-01-0.0/0.5-062620141140	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	2	ng/kg	J	EMPC

TABLE 3

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Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
FP-01-0.0/0.5-062620141140	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.1	ng/kg	J	EMPC
FP-01-0.0/0.5-062620141140	10272184	1613B	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.9	ng/kg	J	EMPC
FP-01-0.5/1.2-062620141140	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	660	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	2200	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	52	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	50	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	61	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.37	ng/kg	J	EMPC
FP-01-0.5/1.2-062620141140	10272184	1613B	OCTACHLORODIBENZOFURAN	2700	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	35000	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	3000	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	4200	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	920	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	310	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	62	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	6.7	ng/kg	J	FD
FP-01-0.5/1.2-062620141140	10272184	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	13	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	340	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1100	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	26	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	24	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	3	ng/kg	J	EMPC
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	32	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.63	ng/kg	J	EMPC
FP-01-0.5/1.2R-062620141140	10272184	1613B	OCTACHLORODIBENZOFURAN	1400	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	17000	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	360	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	2300	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	300	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	160	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	33	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	3.3	ng/kg	J	FD
FP-01-0.5/1.2R-062620141140	10272184	1613B	TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	6.4	ng/kg	J	FD
NR-01-A1-0.0/0.5-062520141235	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.46	ng/kg	J	EMPC

TABLE 3

Qualified Data

GLNPO Crawford Creek, June/July 2014

Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
NR-01-A1-0.0/0.5-062520141235	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.8	ng/kg	U	LBL
NR-01-A1-0.5/2.0-062520141235	4098688	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	3960	mg/Kg	J	FD
NR-01-A1-0.5/2.0-062520141235	10272031	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.16	ng/kg	UJ	EMPC, LBL
NR-01-A1-0.5/2.0-062520141235	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	2.6	ng/kg	U	LBL
NR-01-A1-0.5/2.0R-062520141235	4098688	LLOYDKHN	TOTAL ORGANIC CARBON (TOC)	2130	mg/Kg	J	FD
NR-01-A1-0.5/2.0R-062520141235	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.3	ng/kg	U	LBL
NR-01-B-0.0./0.5-062520141510	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	3	ng/kg	J	EMPC
NR-01-B-0.5/2.0-062520141510	4098783	8270SIM	PENTACHLOROPHENOL	24.1	ug/Kg	UJ	MSL, MSDL
NR-01-B-0.5/2.0-062520141510	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.18	ng/kg	J	EMPC
NR-01-B-0.5/2.0-062520141510	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	0.94	ng/kg	U	LBL
NR-01-B-2.0/3.0-062520141510	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	0.85	ng/kg	UJ	EMPC, LBL
NR-01-E-0.0/0.5-062520141620	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.19	ng/kg	J	EMPC
NR-01-E-0.0/0.5-062520141620	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	0.7	ng/kg	UJ	EMPC, LBL
NR-01-E-0.5/2.0-062520141620	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.11	ng/kg	J	EMPC
NR-01-E-0.5/2.0-062520141620	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.22	ng/kg	J	EMPC
NR-01-E-3.0/4.0-062520141620	10272184	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.28	ng/kg	J	EMPC
NR-01-E-3.0/4.0-062520141620	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	0.49	ng/kg	J	EMPC
NR-01-E-4.0/4.6-062520141620	4098783	SW6010	SILVER	0.002	umoles/g	U	LBL
NR-01-E-4.0/4.6-062520141620	10272184	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.21	ng/kg	J	EMPC
NR-01-E-4.0/4.6-062520141620	10272184	1613B	OCTACHLORODIBENZO-P-DIOXIN	0.58	ng/kg	J	EMPC
NR-02-B1-0.0/0.5-062620141045	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.14	ng/kg	J	EMPC
NR-02-B1-2.0/2.5-062620141045	10272184	1613B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.098	ng/kg	J	EMPC
NR-02-B1-2.0/2.5-062620141045	10272184	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.14	ng/kg	J	EMPC
NR-02-B2-0.5/2.0-062620141000	10272185	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.3	ng/kg	J	EMPC
NR-02-B2-2.0/2.9-062620141000	4098783	8270SIM	PENTACHLOROPHENOL	23.8	ug/Kg	UJ	LCSL, MSL, MSDL
NR-02-C-0.0/0.5-062620140920	10272185	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.17	ng/kg	J	EMPC
NR-02-C-0.0/0.5-062620140920	10272185	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.3	ng/kg	J	EMPC
NR-02-C-0.5/2.0-062620140920	4098783	8270SIM	PENTACHLOROPHENOL	48.6	ug/Kg	UJ	LCSL
NR-02-C-0.5/2.0-062620140920	10272185	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.097	ng/kg	J	EMPC
NR-02-C-0.5/2.0-062620140920	10272185	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.22	ng/kg	J	EMPC
NR-02-C-0.5/2.0-062620140920	10272185	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.6	ng/kg	J	EMPC
NR-02-C-2.0/3.0-062620140920	4098783	8270SIM	FLUORANTHENE	1460	ug/Kg	J	FD
NR-02-C-2.0/3.0-062620140920	4098783	8270SIM	PENTACHLOROPHENOL	1160	ug/Kg	UJ	LCSL
NR-02-C-2.0/3.0-062620140920	4098783	8270SIM	PHENANTHRENE	866	ug/Kg	J	FD

TABLE 3

Qualified Data

GLNPO Crawford Creek, June/July 2014

Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
NR-02-C-2.0/3.0-062620140920	4098783	8270SIM	PYRENE	1080	ug/Kg	J	FD
NR-02-C-2.0/3.0-062620140920	4098783	SW6010	SILVER	0.0018	umoles/g	U	LBL
NR-02-C-2.0/3.0-062620140920	10272185	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.31	ng/kg	J	EMPC
NR-02-C-2.0/3.0-062620140920	10272185	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.79	ng/kg	J	EMPC
NR-02-C-2.0/3.0-062620140920	10272185	1613B	OCTACHLORODIBENZO-P-DIOXIN	9.4	ng/kg	J	FD
NR-02-C-2.0/3.0R-062620140920	4098783	8270SIM	FLUORANTHENE	85.2	ug/Kg	J	FD
NR-02-C-2.0/3.0R-062620140920	4098783	8270SIM	PENTACHLOROPHENOL	119	ug/Kg	UJ	LCSL
NR-02-C-2.0/3.0R-062620140920	4098783	8270SIM	PHENANTHRENE	8.3	ug/Kg	J	FD
NR-02-C-2.0/3.0R-062620140920	4098783	8270SIM	PYRENE	67	ug/Kg	J	FD
NR-02-C-2.0/3.0R-062620140920	10272185	1613B	OCTACHLORODIBENZO-P-DIOXIN	32	ng/kg	J	FD
NR-03-A1-0.0/0.5-062520141240	10272031	1613B	OCTACHLORODIBENZOFURAN	0.42	ng/kg	U	LBL
NR-03-A1-0.0/0.5-062520141240	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	1.4	ng/kg	U	LBL
NR-03-A1-0.5/1.5-062520141240	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.41	ng/kg	U	LBL
NR-03-A1-0.5/1.5-062520141240	10272031	1613B	OCTACHLORODIBENZOFURAN	0.6	ng/kg	UJ	EMPC, LBL
NR-03-A1-0.5/1.5-062520141240	10272031	1613B	OCTACHLORODIBENZO-P-DIOXIN	3.3	ng/kg	U	LBL
NR-03-A1-0.5/1.5-062520141240	10272031	1613B	TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	0.41	ng/kg	U	LBL
NR-03-B-0.0/0.5-062420140855	4098601	8270SIM	ANTHRACENE	1.4	ug/Kg	U	LBL
NR-03-B-0.0/0.5-062420140855	4098601	8270SIM	FLUORANTHENE	3.8	ug/Kg	U	LBL
NR-03-B-0.0/0.5-062420140855	4098601	8270SIM	PENTACHLOROPHENOL	22.4	ug/Kg	UJ	LCSL
NR-03-B-0.0/0.5-062420140855	4098601	8270SIM	PHENANTHRENE	2.6	ug/Kg	U	LBH
NR-03-B-0.0/0.5-062420140855	4098601	SW6010	ZINC	0.045	umoles/g	U	LBH
NR-03-B-0.0/0.5-062420140855	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.34	ng/kg	J	EMPC
NR-03-B-0.0/0.5-062420140855	10271988	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.2	ng/kg	J	EMPC
NR-03-B-0.0/0.5-062420140855	10271988	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.59	ng/kg	U	LBL
NR-03-B-0.5/1.3-062420140855	4098601	8270SIM	PENTACHLOROPHENOL	2330	ug/Kg	UJ	LCSL
NR-03-B-0.5/1.3-062420140855	4098601	SW6010	ZINC	0.046	umoles/g	U	LBH
NR-03-B-0.5/1.3-062420140855	10271988	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.37	ng/kg	J	EMPC
NR-03-B-0.5/1.3-062420140855	10271988	1613B	TOTAL TETRACHLORODIBENZOFURANS (TCDF)	0.24	ng/kg	U	LBL
NR-04-B-0.0/0.5-062520141130	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	1.2	ng/kg	J	EMPC
NR-04-B-0.0/0.5-062520141130	10272031	1613B	OCTACHLORODIBENZOFURAN	2.9	ng/kg	U	LBL
NR-04-B-0.5/2.0-062520141130	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.27	ng/kg	U	LBL
NR-04-B-0.5/2.0-062520141130	10272031	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.76	ng/kg	J	EMPC
NR-04-B-0.5/2.0-062520141130	10272031	1613B	OCTACHLORODIBENZOFURAN	1.5	ng/kg	U	LBL
NR-04-B-0.5/2.0-062520141130	10272031	1613B	TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	0.27	ng/kg	U	LBL

TABLE 3

Qualified Data

GLNPO Crawford Creek, June/July 2014

Sample ID	SDG	Method	Compound	Result	Units	Final Qualifier	Reason Code
NR-04-B-0.5/2.0-062520141130	10272031	1613B	TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	0.22	ng/kg	U	LBL
NR-04-B-2.0/2.6-062520141130	10272031	1613B	OCTACHLORODIBENZOFURAN	1.5	ng/kg	UJ	EMPC, LBL
NR-05-C-0.0/0.5-062420141100	4098601	8270SIM	ANTHRACENE	3.5	ug/Kg	U	LBL
NR-05-C-0.0/0.5-062420141100	4098601	8270SIM	PENTACHLOROPHENOL	24.3	ug/Kg	UJ	LCSL
NR-05-C-0.0/0.5-062420141100	4098601	8270SIM	PHENANTHRENE	1.9	ug/Kg	U	LBH
NR-05-C-0.0/0.5-062420141100	4098601	SW6010	ZINC	0.064	umoles/g	U	LBH
NR-05-C-0.0/0.5-062420141100	10271988	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.25	ng/kg	J	EMPC
NR-05-C-0.0/0.5-062420141100	10271988	1613B	OCTACHLORODIBENZOFURAN	5.8	ng/kg	J	EMPC
NR-05-C-0.0/0.5-062420141100	10271988	1613B	TOTAL PENTACHLORODIBENZOFURANS (PECDF)	0.24	ng/kg	U	LBL
NR-05-C-0.5/1.6-062420141100	4098601	8270SIM	PENTACHLOROPHENOL	116	ug/Kg	UJ	LCSL
NR-05-C-0.5/1.6-062420141100	4098601	SW6010	ZINC	0.053	umoles/g	U	LBH
NR-05-C-0.5/1.6-062420141100	10271988	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.28	ng/kg	J	EMPC
NR-05-C-0.5/1.6-062420141100	10271988	1613B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	5.6	ng/kg	J	LCSH
NR-05-C-0.5/1.6-062420141100	10271988	1613B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.64	ng/kg	J	LCSH
NR-05-C-0.5/1.6-062420141100	10271988	1613B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.54	ng/kg	J	EMPC
NR-05-C-0.5/1.6-062420141100	10271988	1613B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.64	ng/kg	J	EMPC
NR-05-C-0.5/1.6-062420141100	10271988	1613B	2,3,7,8-TETRACHLORODIBENZOFURAN	0.35	ng/kg	J	EMPC
NR-FT-008-F-071720140910	10278448	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.34	ng/Kg	J	EMPC
NR-FT-008-F-071720140910	10278448	1613B	OCTACHLORODIBENZO-P-DIOXIN	6	ng/Kg	J	EMPC
NR-FT-008-O-071720140910	10278448	1613B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.57	ng/Kg	J	EMPC
NR-FT-009-F-071720140910	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.35	ng/Kg	J	EMPC
NR-FT-009-F-071720140910	10278448	1613B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.12	ng/Kg	J	EMPC
NR-FT-009-O-071720140910	10278448	1613B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	0.4	ng/Kg	J	EMPC
NR-FT-009-O-071720140910	10278448	1613B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.8	ng/Kg	J	EMPC

Notes:

EMPC = Estimated maximum possible concentration
FD = Field duplicate RPD exceeded precision criteria
ISH = Internal standard had high recovery
ISL = Internal standard had low recovery
LBH = Compound detected in associated laboratory method blank above the RL
LBL = Compound detected in associated laboratory method blank below the RL
LCSH = Compound had high %R in laboratory control sample
LCSL = Compound had low %R in laboratory control sample
MSDH = Compound had high %R in matrix spike duplicate sample
MSDP = Compound RPD exceeded MS/MSD precision criteria
MSH = Compound had high %R in matrix spike sample
MSL = Compound had low %R in matrix spike sample
SSH = Surrogate had high recovery
SSL = Surrogate had low recovery
MSDL = Compound had low %R in matrix spike duplicate sample

Attachment 2
CB&I Federal Services, Inc. Validation

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Las Vegas, NV 89120
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RELEASE OF VALIDATED DATA

DATE: December 2, 2014

SUBJECT: Review of Data for the Crawford Creek and Nemadji River, St. Louis River and Bay Area of Concern
Received for Review: October 06, 2014

LABORATORY: Pace Analytical, Green Bay, WI
Pace Analytical, Minneapolis, MN

FROM: Shellee McGrath, CB&I Federal Services LLC
Quality Assurance Technical Support (QATS) Program, Las Vegas, NV

TO: Mark Loomis, Great Lakes National Program Office (GLNPO)

LEVEL OF REVIEW: Tier 2 Validation Review

QATS has completed review of the validated data for the following project:

SITE Name: Crawford Creek and Nemadji River, St. Louis River and Bay AOC

Contractor: CH2M Hill, Milwaukee, WI

Primary Validators: Critigen, Denver, CO

SDG Numbers: 4098523, 4098601, 4098688, 4098783, 4099994, and 4099996

Analytical Methods: Semivolatile (SW-846 8270C SIM), Pentachlorophenol (PCP) (SW-846 8270-SIM), Metals (SW-846 6010C) and Mercury (SW-846 7471B), Total Organic Carbon (TOC) (Lloyd Khan), Acid Volatile Sulfide (AVS)/Simultaneously Extracted Metals (SEM) (EPA 1629), Dioxin and Furan Congeners (EPA 1613B), Lipids (Laboratory SOP), and Particle Size (ASTM D422)

Number and Type of Samples: 142 Sediment Samples and 15 Fish Tissue Sample

Case Number: NA
Site Name: Crawford Creek
SDG Number: 6 Various
Laboratory: Pace Analytical

VALIDATION SUMMARY

This report summarizes the data verification of previously validated analytical results from samples from the Crawford Creek and Nemadji River, St. Louis River and Bay Area of Concern (AOC) Site, in support of EPA's Great Lakes National Program Office (GLNPO). This evaluation was performed by CB&I's Quality Assurance Technical Support Program (QATS) under Technical Direction 09, Task Order 3025.

One hundred twenty-nine (129) sediment samples and thirteen (13) field duplicates in four SDGs (SDGs 4098523, 4098601, 4098688, 4098783) and fifteen (15) fish tissue samples in two SDGs (SDGs 4099994 and 4099996) were collected by CH2M Hill from Crawford Creek and Nemadji River, St. Louis River and Bay AOC Site locations between June 22, 2014 and July 17, 2014, and shipped to the Pace Analytical Laboratory in Green Bay, Wisconsin for analysis. The Pace Analytical Green Bay laboratory subsequently shipped the sediment samples designated for Dioxin and Furan to the Pace Analytical Laboratory in Minneapolis, Minnesota.

The initial data validation was performed by Critigen in Denver, Colorado. Tier 1 and 2 validation was performed on all samples, sample-related QC, and instrument-related QC as listed in the Crawford Creek and Nemadji River, St. Louis River and Bay AOC Quality Assurance Project Plan (QAPP). The National Functional Guidelines for Superfund Organic Methods Data Review, June 2008, and the National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2010 were the guidance documents used by Critigen in the original validation and by QATS in the subsequent validation/verification.

At the direction of EPA, CH2M Hill provided the validated data and an Electronic Data Deliverable (EDD) file to QATS via the CH2M Hill Extranet System on October 06, 2014 for the data validation/verification checks. QATS conducted a Tier 2 validation (without the full validation reports) on the six SDGs using the Tier 2 Validation Worksheets developed by QATS specifically for GLNPO validation. The resulting QATS qualifiers were compared to the Critigen-applied qualifiers and verified in the EDD files included with the data submission. The following issues were identified:

- For the dioxin/furan fraction, the original validators qualified 243 of the 303 reported EMPC values "J" and the remaining EMPC values "UJ". Most of these reported EMPC values were below the Reporting Detection Limits. The QATS validator determined that analyte results for those EMPC values qualified "J" did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.), these EMPC values were changed to "UJ" by the QATS validator. This resulted in changing 243 result qualifiers from "J" to "UJ".

- All samples from SDG 4098523 were received at the Pace Analytical Laboratory in Minneapolis, MN for dioxin/furan analysis in two sample coolers with temperatures recorded at 22.1ºC and 19.2ºC. All results, not previously qualified for other reasons, were qualified either "J" or "UJ" due to the high sample cooler temperatures. This resulted in 314 additional qualifiers.

- Also in the dioxin/furan fraction, the QATS validator observed discrepancies in the EDD file for one of the six SDGs. All of the results for the 18 samples in dioxin/furan SDG 10271683/4098523 were incorrectly reported by the laboratory in the EDD file in duplicate. The original validators qualified these identical duplicate sample results twice. The QATS validator qualified one set of the results and changed the REPORTABLE_RESULT column entries from "YES" to "NO" for the second set of identical results. Also, dilutions were performed for four

samples in this SDG because the results exceeded the calibration range of the instrument. The diluted results are reported in the hardcopy data package; however, the diluted results are not included in the EDD file. The following table lists the results that should have been reported in the EDD from the diluted samples, and the validation qualifiers that should be applied to these results due to sample cooler temperature issues:

Sample ID	Compound	Result (ng/Kg)	Dilution	Date Analyzed	Validation Qualifier
CC-005-B-0.0/0.5DL	OCDD	30	10	7/17/2014	J
CC-007-C-0.0/0.5DL	Total HpCDF	8800	30	7/17/2014	J
	1,2,3,4,6,7,8-HpCDD	9800	30	7/17/2014	J
	Total HpCDD	26000	30	7/17/2014	J
	OCDF	10000	30	7/17/2014	J
	OCDD	160000	30	7/17/2014	J
CC-008-C-0.0/0.5DL	1,2,3,4,6,7,8-HpCDD	4300	10	7/17/2014	J
	Total HpCDD	7300	10	7/17/2014	J
	OCDD	33000	10	7/17/2014	J
CC-010-A-0.0/0.8DL	Total HpCDF	4800	20	7/17/2014	J
	1,2,3,4,6,7,8-HpCDD	3800	20	7/17/2014	J
	Total HpCDD	7300	20	7/17/2014	J
	OCDF	6500	20	7/17/2014	J
	OCDD	67000	20	7/17/2014	J

In addition, one laboratory ID (4098783002) and the associated results appear in the EDD twice; however with different EPA Sample IDs. The first time it is reported as EPA Sample ID CC-021-C1-0.0/0.5 (which matches the hard copy report) and the second time the sample appears in the EDD file, it is reported as EPA Sample ID CC-026-C-0.5/2.0. Sample 40987873003 (EPA Sample ID CC-021-C1-0.5/2.0) is also missing from the EDD.

- Dioxin SDG 10272030/4098688 contained prefix discrepancies in the EPA Sample IDs for two samples, 4098688015 and 4098688016. The EPA Sample IDs, reported on the dioxin report forms, Table 2 on page 8, Table 3 on page 26 of the Draft Data Usability Report, and COC records, are CC-06-A-0.0/0.5 and CC-06-A-0.5/1.8. The EPA Sample IDs reported in the EDD file and for all fractions other than dioxin are CF-06-A-0.0/0.5 and CF-06-A-0.5/1.8. Also note that the EPA Sample IDs were hand-corrected to reflect the CF prefix for pages 154 and 155 of the data package for PAH, Metals, and General Chemistry produced by Pace Analytical in Green Bay, WI. It is not clear which sample ID is correct.

- For the PAH-SIM fraction, the original validators qualified detected sample results with a "U" qualifier when there was blank contamination in the associated blank. The levels reported in the samples were much greater than 5 times and in most cases much greater than 10 times the levels detected in the blanks. The "U" qualifiers were removed for nine detected PAH-SIM results.

- Also in the PAH-SIM fraction, the original validators qualified all compounds (except pentachlorophenol) for surrogate recovery exceeding criteria, when only one of three surrogate recoveries exceeded criteria. QATS validators removed the qualifiers from compounds associated with the passing surrogates. This resulted in the removal of nine qualifiers.

- The original validator qualified analyte results for field duplicates and original samples when the RPD exceeded of the acceptance limits (50%). As a general GLNPO rule, sample results are

not qualified due to field duplicate RPD unless the RPD exceeds 100%. The RPDs greater than 50% are listed in the Validation Narrative. As a result, 46 "J" qualifiers were removed.

Data validation and verification were performed on 11,912 sample results from 1,429 analyses of the 157 total project samples. Of the 11,912 analytical results, 11,086 originally-validated analytical results and qualifiers were verified to be correct. Revisions were required for 826 of the 11,912 result qualifiers (6.9%). The revisions performed by the QATS validators included changing, adding, or removing select qualifiers from the validated data.

A summary of the QATS-revised data qualifiers by SDG and fraction was prepared and is presented in tabular form in the next twenty-two pages of this report. Changes to the qualifiers were also applied to the EDD file. Changes to the EDD file that accompany this report are highlighted in blue.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
4098523 AVS	AVS SEM/AVS ratio	J	None	CC-010-A-0.8/1.9 CC-010-A-0.8/1.9R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098523 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	J	UJ	CC-010-A-0.8/1.9R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,7,8-PeCDD 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-003-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,7,8,9-HxCDD	J	UJ	CC-003-C-0.5/1.3	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	2,3,4,6,7,8-HxCDF	J	UJ	CC-004-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,6,7,8-HxCDD	J	UJ	CC-004-A-0.5/1.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF	J	UJ	CC-004-A-0.5/1.8R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD 1,2,3,7,8,9-HxCDF	J	UJ	CC-005-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,6,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	J	UJ	CC-005-B-0.5/1.3	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-006-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	2,3,7,8-TCDD 1,2,3,7,8-PeCDD	J	UJ	CC-007-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	J	UJ	CC-007-C-0.5/1.6	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,7,8,9-HxCDD				
4098523 Dioxin/Furan	1,2,3,7,8-PeCDD	J	UJ	CC-008-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098523 Dioxin/Furan	1,2,3,7,8,9-HxCDF Total HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD, OCDD	None	UJ	CC-010-A-0.8/1.9R	The sample results are less than 5x the level detected in the associated method blank. The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	2,3,4,7,8-PeCDF	None	UJ	CC-003-C-0.0/0.5	The sample result is less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total TCDF 1,2,3,4,6,7,8-HpCDF Total HxCDD	None	UJ	CC-003-C-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,4,7,8,9-HpCDF	U	J	CC-003-C-0.5/1.3	The original validators qualified the result "U" due to blank contamination. The 1,2,3,4,7,8,9-HpCDF result in the associated blank is an EMPC value. The "U" qualifier was removed and replaced with a "J" for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total PeCDD 1,2,3,6,7,8-HpCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	None	UJ	CC-004-A-0.0/0.5	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	OCDF	None	UJ	CC-004-A-0.5/1.8	The sample result for OCDF is less than 10x the level detected in the method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total PeCDF Total HxCDF Total HxCDD OCDF	None	UJ	CC-004-A-0.5/1.8R	The sample results are less than 5x the level detected in the associated method blank. The sample result for OCDF is less than 10x the level detected in the method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,4,7,8-HxCDD	None	UJ	CC-005-B-0.0/0.5	The sample result is less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total PeCDF Total HxCDF Total HxCDD Total HpCDD	None	UJ	CC-005-B-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,4,7,8-HxCDF	None	UJ	CC-006-A-0.0/0.5	The sample results are less than 5x the level detected in the associated

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
					method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	2,3,4,6,7,8-HxCDF	U	J	CC-006-A-0.0/0.5	The original validators qualified the result "U" due to blank contamination. The 2,3,4,6,7,8-HxCDF result in the associated blank is an EMPC value. The "U" qualifier was removed and replaced with a "J" for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD	None	UJ	CC-006-A-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total PeCDF Total PeCDD 1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD	None	UJ	CC-008-C-0.5/2.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total PeCDF Total PeCDD Total HxCDF 1,2,3,4,6,7,8-HpCDF	None	UJ	CC-009-C-0.0/0.5	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,4,7,8,9-HpCDF	U	J	CC-009-C-0.0/0.5	The original validators qualified the result "U" due to blank contamination. The 1,2,3,4,7,8,9-HpCDF result in the associated blank is an EMPC value. The "U" qualifier was removed and replaced with a "J" for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total TCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD	None	UJ	CC-009-C-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD	None	UJ	CC-010-A-0.0/0.8	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	Total HxCDD 1,2,3,6,7,8-HxCDD	None	UJ	CC-010-A-0.8/1.9	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U", and the "J" is added by the QATS validators for high sample cooler temperature exceedances.
4098523 Dioxin/Furan	1,2,3,4,7,8,9-HpCDF	U	J	CC-010-A-0.8/1.9	The original validators qualified the result "U" due to blank contamination. The 1,2,3,4,7,8,9-HpCDF result in the associated blank is an EMPC value. The "U" qualifier was removed and replaced with a "J" for temperature exceedances.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD 1,2,3,7,8-PeCDD Total PeCDD 1,2,3,4,7,8-HxCDD	None	J or UJ	CC-010-A-0.8/1.9R	All samples in SDG 4098523 were received at the laboratory at 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,4,7,8,9-HpCDF				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF Total PeCDF Total PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF Total HxCDF 1,2,3,6,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD	None	J or UJ	CC-003-C-0.0/0.5	All samples in SDG 4098523 were received at the laboratory at 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF Total PeCDF Total PeCDD 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF Total HxCDF 1,2,3,6,7,8-HxCDD Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD	None or U	J or UJ	CC-003-C-0.5/1.3	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF Total HxCDF 1,2,3,6,7,8-HxCDD	None	J or UJ	CC-004-A-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD Total PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	None	J or UJ	CC-004-A-0.5-1.8	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD Total PeCDD 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 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8,9-HpCDF	None	J or UJ	CC-004-A-0.5/1.8R	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 2,3,4,7,8-PeCDF Total PeCDF Total PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF Total HpCDF Total HpCDD OCDD	None	J or UJ	CC-005-B-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD Total PeCDD 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 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF OCDF, OCDD	None	J or UJ	CC-005-B-0.5/1.3	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD Total PeCDD	None	J or UJ	CC-006-A-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,7,8,9-HxCDF Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD Total PeCDD 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF, OCDD	None or U	J or UJ	CC-006-A-0.5/1.3	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF Total PeCDD 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 Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD	None	J	CC-007-C-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF				
4098523 Dioxin/Furan	Total TCDF 2,3,7,8-TCDD Total TCDD Total PeCDF Total PeCDD 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF Total HxCDF 1,2,3,6,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD	None	J or UJ	CC-007-C-0.5/1.6	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF Total PeCDD 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 Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF. OCDF	None	J or UJ	CC-008-C-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD	None or U	J or UJ	CC-008-C-0.5/2.3	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF Total HxCDF 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD, OCDF, OCDD				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF, OCDD	None or U	J or UJ	CC-009-C-0.0/0.5	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF 2,3,7,8-TCDD Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD Total PeCDD 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 Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF	None or U	J or UJ	CC-009-C-0.5/1.3	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,4,7,8,9-HpCDF OCDF, OCDD				
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD Total TCDD Total PeCDF Total PeCDD 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 Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	None or U	J or UJ	CC-010-A-0.0/0.8	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098523 Dioxin/Furan	2,3,7,8-TCDF Total TCDF 2,3,7,8-TCDD 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,7,8-PeCDD Total PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,7,8-HxCDD	None or U	J or UJ	CC-010-A-0.8/1.9	All samples in SDG 4098523 were received at the laboratory in sample coolers with temperatures of 22.1℃ and 19.2℃. All results, not previously qualified for other reasons, are qualified either "J" or "UJ" due to high sample cooler temperatures.
4098601 PAH SIM	Phenanthrene	U	None	CC-020-A-0.5/1.8	The original validators qualified a detected result with a "U" due to blank contamination above the CRQL. The blank result of 6.7 ug/kg is much lower than the sample result 525 ug/kg. The "U" was removed.
4098601 PAH SIM	Fluoranthene Fluorene Phenanthrene	U	None	CC-026-C-0.5/2.0	The original validators qualified detected results with a "U" due to blank contamination. The reported sample results are much greater than the levels detected in the blank. The "U" qualifiers were removed.
4098601 PAH SIM	Fluoranthene Phenanthrene	U	None	CF-01-A-0.5/1.0	The original validators qualified detected results with a "U" due to blank contamination. The reported sample results are much greater than the levels detected in the blank. The "U" qualifiers were removed.
4098601 PAH SIM	Anthracene	U	None	CF-03-C-0.5/1.3 CF-04-B-0.0/0.5	The original validators qualified detected results with a "U" due to blank contamination. The blank result of 1.6 ug/kg is much lower than the sample results of 1450 and 38.8 ug/kg. The "U" qualifiers were removed.
4098601 PAH SIM	Fluoranthene	U	None	CF-04-B-0.5/1.3	The original validators qualified detected results with a "U" due to blank

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
					contamination. The blank result of 1.4 ug/kg is much lower than the sample results of 25 ug/kg. The "U" qualifier was removed.
4098601 METALS	Lead	J	None	CF-03-A-0.5/1.3 CF-03-A-0.5/1.3R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate exceeded the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098601 SEM METALS	SEM Zinc	U	None	NR-03-B-0.0/0.5 NR-03-B-0.5/1.3 NR-05-C-0.0/0.5 NR-05-C-0.5/1.6	The original validators qualified detected SEM Zinc results with a "U" due to blank contamination. The four samples were analyzed on 7/16/2014 along with a method blank. The method blank result is a non-detect. Negative values for zinc between the MDL and RL were reported in two CCBs from that sequence; however, those results would not affect the four detected Zinc results. The "U" qualifiers were removed.
4098601 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD	J	UJ	CC-026-C-0.0/0.5 NR-03-B-0.0/0.5 CC-016-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,4,7,8-PeCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,7,8-HxCDD	J	UJ	CF-01-A-0.5/1.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,6,7,8-HxCDF	J	UJ	CF-01-A-0.0/0.5 CC-016-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,6,7,8-HpCDF	J	UJ	CC-026-C-0.5/2.0 NR-03-B-0.0/0.5 CC-015-A-0.5/1.7R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	J	UJ	CF-03-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,4,7,8-PeCDF	J	UJ	CF-03-A-0.5/1.3 CF-03-A-0.5/1.3R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD	J	UJ	CF-03-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDF	J	UJ	CF-03-C-0.5/1.3	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF	J	UJ	CF-04-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
4098601 Dioxin/Furan	2,3,7,8-TCDF	J	UJ	CF-04-B-0.5/1.3 NR-03-B-0.5/1.3 CC-016-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,7,8,9-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	J	UJ	CF-05-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,7,8-PeCDD	J	UJ	CF-05-B-0.5/0.9 CC-018-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDF	J	UJ	CF-07-B-0.0/0.7	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,7,8-TCDF OCDF	J	UJ	NR-05-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,7,8-TCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD	J	UJ	NR-05-C-0.5/1.6	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDD	J	UJ	CC-012-C-0.0/0.6	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	J	UJ	CC-013-C-0.5/1.2	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	J	UJ	CC-014-B-0.0/0.5 CC-014-B-0.5/1.3	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8-HxCDD	J	UJ	CC-015-A-0.0/0.5 CC-018-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	OCDF	J	UJ	CC-015-A-0.5/1.7	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8,9-HpCDF	J	UJ	CC-017-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CC-20-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	1,2,3,4,7,8-HxCDF	J	UJ	CF-019-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,7,8,9-HxCDF				did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098601 Dioxin/Furan	OCDD	J	None	CC-019-C-0.5/1.9 CC-019-C-0.5/1.9R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098601 Dioxin/Furan	Total TCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD	None	U	CC-020-A-0.5/1.8 CC-019-C-0.5/1.9R	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total HxCDF 1,2,3,4,6,7,8-HpCDF	None	U	CC-026-C-0.0/0.5	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF	None	U	CC-026-C-0.5/2.0 CF-01-A-0.5/1.0 CF-04-B-0.0/0.5 CF-07-B-0.0/0.7 NR-05-C-0.0/0.5 NR-05-C-0.5/1.6 CC-013-C-0.5/1.2 CC-014-B-0.0/0.5 CC-015-A-0.0/0.5 CC-015-A-0.5/1.7 CC-015-A-0.5/1.7R CC-016-C-0.0/0.5 CC-016-C-0.5/1.3	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	OCDD	None	U	NR-03-B-0.5/1.3 CC-015-A-0.5/1.7R	The sample result is less than 10x the level detected in the method blank for OCDD. The results are qualified "U".
4098601 Dioxin/Furan	Total PeCDD 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-HxCDD	None	U	CC-011-A-0.0/0.5	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF Total PeCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD, OCDD	None	U	CC-011-A-0.5/1.2	The sample results are less than 5x the level detected in the associated method blank. The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF Total PeCDF	None	U	CC-012-C-0.0/0.6	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF 2,3,4,7,8-PeCDF	None	U	CC-014-B-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
4098601 Dioxin/Furan	Total PeCDF Total PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF	None	U	CC-017-A-0.0/0.5	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF 1,2,3,4,6,7,8-HpCDF OCDF	None	U	CC-017-A-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The sample result for OCDF is less than 10x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	1,2,3,7,8-PeCDF Total PeCDD	None	U	CC-014-B-0.5/1.3	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF Total PeCDF Total PeCDD 1,2,3,4, 7,8-HxCDF 1,2,3,6,7,8-HxCDD	None	U	CC-018-C-0.5/2.0	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	2,3,4,7,8-PeCDF Total PeCDD 1,2,3,6,7,8-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD	None	U	CC-019-C-0.0/0.5	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total TCDF 1,2,3,4,6,7,8-HpCDF Total HpCDF, OCDF	None	U	CC-019-C-0.5/1.9	The sample results are less than 5x the level detected in the associated method blank. The sample result for OCDF is less than 10x the level detected in the method blank. The results are qualified "U".
4098601 Dioxin/Furan	Total PeCDF Total PeCDD 1,2,3,6,7,8-HxCDF	None	U	CC-020-A-0.0/0.5	The sample results are less than 5x the level detected in the associated method blank. The results are qualified "U".
4098601 Dioxin/Furan	1,2,3,7,8,9-HxCDD	None	J	CC-013-C-0.0/0.5	The associated LCS percent recovery exceeds the acceptance criteria.
4098601 Dioxin/Furan	1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	None	J	CC-013-C-0.5/1.2 CC-014-B-0.0/0.5 CC-015-A-0.0/0.5	The associated LCS percent recovery exceeds the acceptance criteria.
4098601 Dioxin/Furan	1,2,3,6,7,8-HxCDD	None	J	CC-014-B-0.5/1.3	The associated LCS percent recovery exceeds the acceptance criteria.
4098688 TOC	Total Organic Carbon	J	None	CC-023-A-0.5/2.1 CC-023-A-0.5/2.1R NR-01-A1-0.5/2.0 NR-01-A1-0.5/2.0R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098688 PAH SIM	Acenaphthene Acenaphthylene Antracene Fluoranthene	J	None	CC-001-A-0.0/0.8	The original validators qualified all compounds except pentachlorophenol for surrogate recovery exceeding criteria, when only one of three surrogate recoveries exceeded criteria. QATS validators removed the qualifiers from compounds associated with the passing surrogates. Note that the "J"

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	Fluorene 2-Methylnaphthalene Naphthalene Phenanthrene				qualifiers for Benzo(g,h,i)perylene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Pyrene were not removed due to a failing internal standard.
4098688 PAH SIM	Phenanthrene	J	None	CC-023-A-0.5/2.1 CC-023-A-0.5/2.1R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098688 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF	J	UJ	CC-001-A-0.0/0.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,7,8-HxCDF	J	UJ	CC-002-A-0.0/0.5 CC-028-B-2.0/3.0 CC-028-B-3.0/4.0 CC-028-B-4.0/4.7	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-002-A-0.5/1.4	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	OCDF	J	UJ	CC-022-A-0.0/0.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,7,8-PeCDD 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-023-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-023-A-0.5/2.1	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD OCDF	J	UJ	CC-023-A-0.5/2.1R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD	J	UJ	CC-027-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,7,8-HxCDF 1,2,3,4,7,8-HxCDD	J	UJ	CC-027-A-0.5/1.9	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF	J	UJ	CC-028-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers,

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SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD				etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,6,7,8-HxCDF	J	UJ	CC-028-B-0.5/2.0 CF-05-D-0.0/0.5 CF-06-D-0.0/0.8 CF-10-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDF	J	UJ	CF-06-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CF-06-A-0.5/1.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,7,8,9-HxCDD	J	UJ	CF-01-D-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,7,8-TCDD	J	UJ	CF-01-D-0.5/1.1	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,7,8-PeCDD	J	UJ	CF-02-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	J	UJ	CF-02-B-0.5/1.6	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,4,7,8-PeCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CF-02-C-0.0/0.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,4,7,8,9-HpCDF	J	UJ	CF-05-D-0.5/0.9	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8,9-HpCDF	J	UJ	CF-09-A-0.0/0.8R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF	J	UJ	CF-10-B-0.5/1.3	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098688 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD	J	UJ	NR-01-A1-0.0/0.5 NR-04-B-0.0/0.5 NR-04-B-0.5/2.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".

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SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
4098688 Dioxin/Furan	2,3,7,8-TCDF	None	U	CC-002-A-0.5/1.4 CC-023-A-0.0/0.5 CC-023-A-0.5/2.1 CC-027-A-0.0/0.5 CC-028-B-3.0/4.0	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	2,3,7,8-TCDF Total TCDF Total HxCDF	None	U	CC-022-A-0.0/0.8	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	2,3,7,8-TCDF Total TCDF	None	U	CC-023-A-0.5/2.1R CF-06-A-0.0/0.5 CF-01-D-0.0/0.5 CF-02-B-0.0/0.5	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	Total TCDF	None	U	CC-027-A-0.5/1.9 CC-028-B-0.0/0.5 CF-06-A-0.5/1.8 CF-02-B-0.5/1.6	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	OCDD	None	U	CC-028-B-0.0/0.5 NR-04-B-0.5/2.0	The sample result is less than 10x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	OCDD	U	None	NR-01-A1-0.5/2.0 NR-01-A1-0.5/2.0R	The original validators qualified the result "U" due to blank contamination. The OCDD result in the associated blank is an EMPC value. The "U" qualifier was removed.
4098688 Dioxin/Furan	Total HxCDF Total HpCDD, OCDD	None	U	NR-04-B-0.0/0.5	The sample result is less than 5x the level detected in the method blank. The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	1,2,3,4,6,7,8-HpCDF	U	None	NR-04-B-0.5/2.0	The original validators qualified the result "U" due to blank contamination. The 1,2,3,4,6,7,8-HpCDF result in the associated blank is an EMPC value. The "U" qualifier was removed.
4098688 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD Total HpCDD, OCDD	None	U	NR-04-B-2.0/2.6	The sample result is less than 5x the level detected in the method blank. The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U".
4098688 Dioxin/Furan	Total TCDD Total HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD	J	None	CF-09-A-0.0/0.8 CF-09-A-0.0/0.8R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
4098783 METALS	Cadmium	J	U	CC-025-C-3.0/4.0 CF-01-B-0.0/0.5 CF-01-B-0.5/0.9 CF-01-V-0.0/0.7 CF-03-R-0.0/0.5	Trace levels of cadmium between the MDL and CRQL were detected in the CCB. Associated sample results between the MDL and CRQL are qualified "U".

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SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
				CF-03-R-0.5/1.2	
4098783 SEM METALS	SEM Silver	J	U	FP-01-0.0/0.5 FP-01-0.5/1.2 NR-02-B1-2.0/2.5 NR-02-C-0.0/0.5	Trace levels of silver between the MDL and CRQL were detected in the ICB. Associated sample results between the MDL and CRQL are qualified "U".
4098783 MERCURY	Mercury	J	U	NR-02-B2-0.0/0.5 NR-02-B2-0.5/2.0 NR-02-B2-2.0/2.9 NR-02-V-0.0/0.5 NR-02-V-0.5/2.0 NR-02-C-2.0/3.0R	Trace levels of mercury between the MDL and CRQL were detected in the ICB and CCBs. Associated sample results between the MDL and CRQL are qualified "U".
4098783 PAH SIM	Phenanthrene	J	None	CC-025-C-2.0/3.0	The original validators qualified Phenanthrene "J" due to surrogate recovery exceeding the upper control limit. The surrogate associated with Phenanthrene is 2,4,6-Tribromophenol which was within control limits. Therefore, the "J" qualifier was removed.
4098783 Dioxin/Furan	OCDD	J	UJ	NR-02-B2-0.5/2.0 NR-01-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,7,8-TCDF OCDD	J	UJ	NR-02-C-0.0/0.5 NR-01-E-4.0/4.6	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD	J	UJ	NR-02-C-0.5/2.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD	J	UJ	NR-02-C-2.0/3.0 NR-01-E-0.5/2.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,7,8-TCDD	J	UJ	CF-06-B-0.0/0.6 FP-01-0.5/1.2	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,7,8-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD	J	UJ	CF-06-B-0.0/0.6R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,6,7,8-HxCDF	J	UJ	CF-07-A-0.0/0.8	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,7,8-TCDD 1,2,3,7,8-PeCDD	J	UJ	CF-08-D-0.0/0.7	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDF 1,2,3,6,7,8-HxCDF	J	UJ	FP-01-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers,

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SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,4,7,8-HxCDD				etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD	J	UJ	FP-01-0.5/1.2R	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD	J	UJ	NR-01-B-0.5/2.0 NR-01-E-0.0/0.5 CC-025-C-0.5/2.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,6,7,8-HpCDD OCDD	J	UJ	NR-01-E-3.0/4.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,6,7,8-HxCDD	J	UJ	NR-02-B1-0.0/0.5 CF-03-E-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDD	J	UJ	NR-02-B1-2.0/2.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CC-001-A1-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CC-021-C1-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,7,8,9-HxCDD	J	UJ	CC-024-A-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,7,8,9-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	J	UJ	CC-024-A-0.5/2.0	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,4,7,8,9-HpCDF	J	UJ	CC-025-C-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDD	J	UJ	CF-01-B-0.0/0.5	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDF	J	UJ	CF-01-B-0.5/0.9	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	1,2,3,7,8-PeCDF	J	UJ	CF-01-C-0.0/0.7	The original validators qualified EMPC values "J". Because analyte results

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SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
					did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	2,3,7,8-TCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8,9-HpCDF	J	UJ	CF-03-E-0.5/1.2	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4098783 Dioxin/Furan	Total TCDF Total TCDD Total PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD Total HpCDD, OCDF	J	None	FP-01-0.5/1.2 FP-01-0.5/1.2R	The original validators qualified the analytes listed because the %RPD between the original sample and the field duplicate was outside of the 50% criteria. As a general GLNPO rule, the sample results are not qualified due to field duplicate RPD unless the RPD exceeds 100%. All results qualified "J" by the original validators because the RPDs were greater than 50% were removed. The RPDs greater than 50% are listed in the Validation Narrative.
	OCDD			FP-01-0.5/1.2DL FP-01-0.5/1.2RDL	
4098783 Dioxin/Furan	OCDD	None	U	NR-01-E-0.5/2.0 NR-01-E-2.0/3.0 CC-021-C1-0.5/2.0* (*sample is missing from the EDD file)	The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U".
4098783 Dioxin/Furan	1,2,3,6,7,8-HxCDF	None	U	CC-021-C1-0.0/0.5 CC-024-A-0.0/0.5 CC-024-A-0.5/2.0	The sample result is less than 5x the level detected in the method blank. The results are qualified "U".
4098783 Dioxin/Furan	1,2,3,7,8,9-HxCDD	U	None	CC-025-C-0.0/0.5	The original validators qualified the result "U" due to blank contamination. The 1,2,3,7,8,9-HxCDD result in the associated blank is an EMPC value. The "U" qualifier was removed.
4098783 Dioxin/Furan	Total HpCDD OCDF, OCDD	None	U	CC-025-C-0.5/2.0	The sample results are less than 5x the level detected in the associated method blank. The sample results for OCDF and OCDD are less than 10x the level detected in the method blank. The results are qualified "U".
4099994 PAH SIM	Pentachlorophenol	None	J	CC-FT-001-O CC-FT-002-W CC-FT-003-W CC-FT-004-W CC-FT-005-F	The fish tissue samples were extracted outside of the 14-day extraction holding time requirement provided in Table 4 of the ***Crawford Creek and Nemadji River Site QAPP.*** The results are qualified "J" or "UJ".
			UJ	CC-FT-001-F	
4099994 Dioxin/Furan	2,3,7,8-TCDD 1,2,3,6,7,8-HxCDF	J	UJ	CC-FT-004-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099994 Dioxin/Furan	2,3,7,8-TCDF	None	U	CC-FT-004-W	The sample results are less than 5x the level detected in the associated

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	Total TCDF Total TCDD, OCDD				method blank. The sample result for OCDD is less than 10x the level detected in the method blank. The results are qualified "U".
4099994 Dioxin/Furan	2,3,7,8-TCDD 1,2,3,6,7,8-HxCDF 1,2,3,4,7,8-HxCDD	J	UJ	CC-FT-001-O	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099994 Dioxin/Furan	2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD	J	UJ	CC-FT-002-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099994 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	J	UJ	CC-FT-003-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099994 Dioxin/Furan	Total TCDF	None	U	CC-FT-005-F	The sample result is less than 5x the level detected in the associated method blank. The result is qualified "U".
4099994 Dioxin/Furan	2,3,7,8-TCDF	J	UJ	CC-FT-005-F CC-FT-001-F	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099994 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,6,7,8-HxCDD 1,2,3,4,6,7,8-HpCDF OCDF	J	UJ	CC-FT-005-O	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 PAH SIM	Pentachlorophenol	None	J	CC-FT-006-W CC-FT-007-W CC-FT-010-W CC-FT-011-W NR-FT-008-F NR-FT-008-O NR-FT-009-O	The fish tissue samples were extracted outside of the 14-day extraction holding time requirement provided in Table 4 of the ***Crawford Creek and Nemadji River Site QAPP.*** The results are qualified "J" or "UJ".
			UJ	NR-FT-009-F	
4099996 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF	J	UJ	CC-FT-006-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD	J	UJ	CC-FT-007-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	2,3,7,8-TCDF 1,2,3,4,7,8-PeCDF	J	UJ	CC-FT-010-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers,

DATA QUALIFICATION CHANGES SUMMARY TABLE

SDG/Fraction	Analyte/Compound	Original Qualifier	Revised Qualifier	EPA Sample ID	QATS Justification for EDD Revision
	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD				etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	Total TCDF	None	U	CC-FT-010-W	The sample result is less than 5x the level detected in the associated method blank. The result is qualified "U".
4099996 Dioxin/Furan	1,2,3,6,7,8-HxCDF OCDF	J	UJ	CC-FT-011-W	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	1,2,3,4,7,8-HxCDD OCDF	J	UJ	NR-FT-008-F	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	1,2,3,4,7,8-HxCDD	J	UJ	NR-FT-008-O	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	2,3,7,8-TCDD 1,2,3,6,7,8-HxCDF	J	UJ	NR-FT-009-F	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".
4099996 Dioxin/Furan	1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD	J	UJ	NR-FT-009-O	The original validators qualified EMPC values "J". Because analyte results did not meet identification criteria (ion ratios, interferences, phenyl ethers, etc.) all analytes identified with an EMPC value were qualified "UJ".

Appendix B
Summary of Sediment Probing, Sampling, and Surveying Activities

Summary of Sediment Probing, Sampling and Surveying Activities

DATA SUMMARY REPORT

Sediment Thickness Assessment, Sediment Sampling and Surveying Services
on Crawford Creek & Nemadji River
Crawford Creek Project – SOW#1 and SOW#2
Douglas County, Wisconsin

GLAES Contract No. EP-R5-09-11
Submitted 11 August 2014
Finalized 24 October 2014

This Data Summary Report (DSR) summarizes the methods and findings for technical services provided by AFFILIATED RESEARCHERS during June 2014, under sub-contract with CH2MHILL with respect to the above referenced USEPA GLNPO projects.

AFFILIATED RESEARCHERS provided technical services including sediment thickness assessment, topographic surveying, sediment sampling, and other technical support services to meet the requirements described in the Scope of Work (SOW#1 and SOW#2) for the USEPA GLNPO project at Crawford Creek and the Nemadji River (Site, Figure 1).

OBJECTIVES AND TASKS:

The primary objective identified in SOW#1 was site characterization to define the spatial (horizontal and vertical) extent of sediments at the Site. The specific objectives of SOW#1 include the following:

- obtain topographic data of Crawford creek, its floodplain area and a small portion of Nemadji River using static surveying methods or other appropriate methods to assist the sediment thickness assessment task; and,

- obtain sediment thickness data using manual probing methods to assess the sediment thickness in the Crawford creek, its associated floodplain area, and a small portion of the Nemadji River.

The primary objective identified in SOW#2 was to collect chemical and physical information for the Site to provide characterization and define the spatial (horizontal and vertical) nature and extent of sediment contamination for remediation or further investigation. The specific objectives of this SOW include:

- collect sediment samples (core and grab) for chemical analysis from approximately 50-60

sample locations within Crawford Creek, its associated floodplain and the Nemadji River (taken together – Site) to provide information to support characterization of the Site and its associated floodplain area.

The tasks performed to meet the objectives described in SOW#1 and #2 included the following:

- locating utilities;
- mobilization and demobilization;
- site setup;
- topographic survey;
- sediment thickness assessment;
- sediment samples collection; and,
- draft and final data summary report.

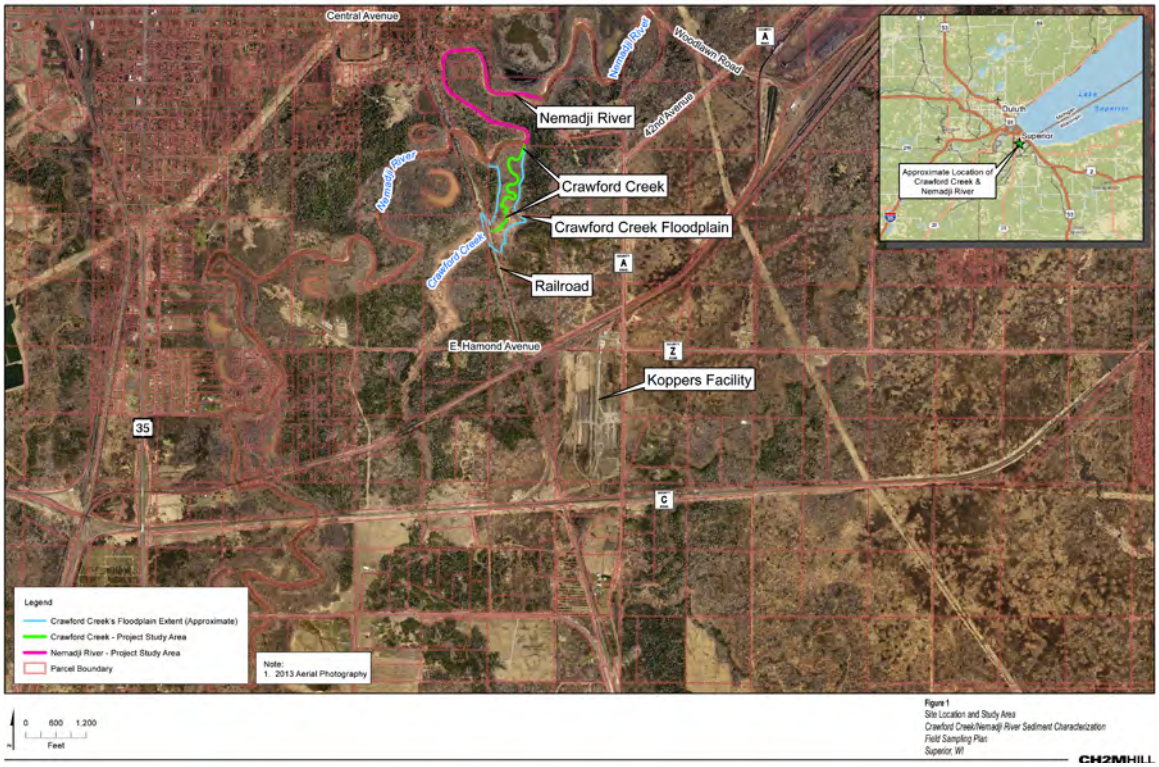

Figure 1. Site.

AFFILIATED RESEARCHERS utilized its most suited equipment, software, and most experienced personnel (to include: Project Scientist, Health and Safety Manager, Staff Engineer, and 2 Technicians) to perform the described tasks.

This data summary report describes the activities conducted under each task, the reliability and accuracy of the data, problems encountered during the survey, and interpretation and any post-processing of the data. Scaled drawings representing results from the project, and both raw and interpreted data in electronic formats have previously been provided to CH2MHILL.

LOCATING UTILITIES:

Prior to initiating intrusive subsurface activities, AFFILIATED RESEARCHERS contacted Wisconsin's *Locate 8-1-1*, and filed detailed descriptions of the proposed activities for the purpose of identifying and locating underground utilities within the project area. AFFILIATED RESEARCHERS ensured the locate "tickets" remained valid throughout the duration of the field work described within this SOW.

No problems were encountered with respect to the Locating Utilities aspect of the project.

MOBILIZATION/DEMOBILIZATION:

On 18 June 2014, AFFILIATED RESEARCHERS mobilized its crew, its currently registered vessels, and all supporting equipment, materials, and tools required to conduct the work described in the SOWs.

AFFILIATED RESEARCHERS mobilized one additional Technician in order to help expedite the successful completion of the project, and thereby secure additional time for other scheduled and pending GLNPO projects. The necessary staff, vessels, equipment, materials, and tools for the project were mobilized to the site prior to the first day of the field program, as scheduled by the CH2MHILL Field Team Leader. AFFILIATED RESEARCHERS conducted its services at the site from the 19th through the 25th of June, and demobilized its crew, vessels, and supporting equipment on 26 June 2014.

CH2MHILL had previously provided an electronic file of the sample location coordinates to AFFILIATED RESEARCHERS in advance of the start of the field effort. As part of the mobilization effort, AFFILIATED RESEARCHERS uploaded the project sample locations to its GPS equipment prior to beginning of sampling activities.

CH2MHILL provided its staff to work at a shore-based staging location to log, process, document, package, and ship all sediment samples for laboratory analysis. CH2MHILL also provided its staff to work with AFFILIATED RESEARCHERS for the sediment thickness probing, sediment sampling, and topographic surveying.

No problems were encountered with respect to the Mobilization/Demobilization aspect of the project.

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ESTABLISHMENT OF LOCAL CONTROL POINTS AND WATER LEVEL ELEVATIONS:

AFFILIATED RESEARCHERS provided its survey grade *Trimble R8* RTK-GNSS equipment operating in the real-time kinematic mode (RTK-GPS), and trained operators for same, to obtain highly accurate geodetic position and elevation data of the sediment sample locations.

Using NGS OPUS methods and RTK-GNSS survey equipment, AFFILIATED RESEARCHERS had previously (April 2014) established 2 semi-permanent benchmarks at the Site to serve as survey controls for positioning and surveying QAQC. One of the two OPUS benchmarks was established at the project boat launch facility in the town of Superior (*Loons Foot Landing*), while the other OPUS benchmark was established at the project staging area (*Rueille*, Figure 2, Attachment).

Figure 2.

Because of the distance between these two initially established benchmarks (approximately 3.5 miles) a third semi-permanent benchmark was established at the staging area using standard RTK procedures (*Rueille 2*), and *Loons Foot Landing* was not used during the project. All benchmarks were established to within accuracies described in the SOWs (Table 1).

Benchmark	Easting	Northing	Elevation
Rueille	1449382.92	549001.14	670.71
Rueille2	1449301.03	549092.23	670.93

Table 1. Established benchmarks
(NAD83 Wisconsin State Plane North, US Survey Feet, NAVD88[1] Geoid 2012a feet). feet).

To assure RTK-GNSS accuracy and reliability, AFFILIATED RESEARCHERS utilized the "*Rueille*" benchmark to establish a local RTK-GPS "base station". AFFILIATED RESEARCHERS' survey grade *Trimble SPS855* RTK-GNSS was be connected to a *Trimble TDL450H* data-radio transmitter to serve as a base station at the benchmark location. The base station transmitted continuous, highly accurate RTK-GNSS corrections to AFFILIATED RESEARCHERS' survey grade *Trimble R6/R8* RTK-GNSS "rovers" used to collect survey data.

[1] The NOAA website (http://www.ngs.noaa.gov/cgi-bin/IGLD85/IGLD85.prl) used to convert NAVD88 elevations to IGLD85 elevations, reported the project coordinates "Out of Bounds for Hydraulic Corrector model".

AFFILIATED RESEARCHERS confirmed the accuracy of the *Trimble R6/R8* RTK-GNSS survey equipment twice daily at the *Rueille2* benchmarks. The RTK-GPS equipment QAQC checks are provided below in Table 2. USEPA GPS metadata forms were completed and provided to CH2MHILL.

Date	Time	GPS	Pin	Easting	Easting Delta	Northing	Northing Delta	Elevation (NAVD88)	Elevation Delta
20Jun14	0917	*R8*	*Rueille2*	1449301.06	-0.03	549092.24	0.00	670.94	-0.01
20Jun14	0922	*R6*	*Rueille2*	1449301.01	0.02	549092.24	-0.01	671.06	-0.13
20Jun14	1728	*R8*	*Rueille2*	1449301.06	-0.02	549092.17	0.06	670.96	-0.03
20Jun14	1802	*R6*	*Rueille2*	1449301.03	0.00	549092.24	-0.01	670.92	0.01
21Jun14	0810	*R8*	*Rueille2*	1449301.16	-0.13	549092.15	0.08	670.78	0.15
21Jun14	0810	*R6*	*Rueille2*	1449301.16	-0.13	549092.28	-0.05	670.95	-0.02
21Jun14	1517	*R6*	*Rueille2*	1449301.04	-0.01	549092.25	-0.02	670.90	0.03
21Jun14	1805	*R8*	*Rueille2*	1449301.11	-0.08	549092.31	-0.08	670.90	0.03
22Jun14	0759	*R8*	*Rueille2*	1449301.06	-0.03	549092.30	-0.06	671.02	-0.09
22Jun14	0801	*R6*	*Rueille2*	1449301.10	-0.07	549092.27	-0.04	670.96	-0.03
22Jun14	1547	*R6*	*Rueille2*	1449300.96	0.07	549092.23	0.00	670.96	-0.03
22Jun14	1553	*R8*	*Rueille2*	1449301.06	-0.03	549092.29	-0.05	670.92	0.01
23Jun14	0750	*R8*	*Rueille2*	1449301.14	-0.11	549092.20	-0.03	670.88	0.04
23Jun14	1655	*R8*	*Rueille2*	1449301.09	-0.06	549092.24	-0.01	670.94	-0.01
24Jun14	0746	*R6*	*Rueille2*	1449301.05	-0.02	549092.28	-0.04	670.86	0.07
24Jun14	1637	*R8*	*Rueille2*	1449300.98	0.05	549092.16	0.07	670.86	0.06
24Jun14	1653	*R6*	*Rueille2*	1449301.04	-0.01	549092.21	0.02	670.95	-0.02
25Jun14	0750	*R8*	*Rueille2*	1449301.05	-0.02	549092.22	0.01	670.94	-0.01
25Jun14	0754	*R6*	*Rueille2*	1449301.12	-0.09	549092.31	-0.08	670.87	0.06
25Jun14	1310	*R6*	*Rueille2*	1449301.00	0.03	549092.29	-0.06	670.96	-0.03
25Jun14	1611	*R8*	*Rueille2*	1449301.05	-0.02	549092.25	-0.02	670.99	-0.06

Table 2. RTK-GPS equipment QAQC checks at *Rueille2*
(NAD83 Wisconsin State Plane North, US Survey Feet, NAVD88[1] Geoid 2012a feet).

AFFILIATED RESEARCHERS utilized its RTK-GNSS survey equipment to accurately measure and record terrain and/or water level elevations at each probing and sampling location.

No problems were encountered with respect to the establishment of local control points or water level elevations during the project, with the exception of there were no GPS QAQC checks on the first day of the project (19 June) due to the inability to transmit RTK corrections the distance to the *Loons Foot Landing* benchmark.

FIELD RECORDS:

AFFILIATED RESEARCHERS maintained daily written and electronic field records to be used in preparing the Data Summary Report. Written field records were maintained in a *Rite-in-the-Rain*

notebook with *Rite-in-the-Rain* ink. Electronic field records were collected with data collectors and field computers, and "backed-up" at the end of field day to an onsite external hard drive.

Field records documented the following:

- datum, horizontal coordinates, vertical measurements, and elevations for each survey monument and benchmark;
- procedures, equipment, and personnel;
- calibration methods and measurements;
- QAQC;
- field conditions;
- river stage and water level measurements;
- planned and unplanned events;
- weather conditions; and,
- other important information.

No problems were encountered with respect to the Field Records aspect of the project.

SEDIMENT THICKNESS PROBING AND SEDIMENT SAMPLING:

AFFILIATED RESEARCHERS utilized its 20' pontoon vibracore vessel and equipment to conduct sediment probing and sediment sampling in Crawford Creek and the Nemadji River. The nearest safe and suitable boat launch facility for accessing the project was the *Loon's Foot* public launch facility, near the mouth of the Nemadji River in the town of Superior, approximately 8 navigational miles to the mouth of Crawford Creek. The pontoon vessel was able to navigate the entire Nemadji River (Figure 3) and most of Crawford Creek (Figure 4).

Figure 3.

Figure 4.

AFFILIATED RESEARCHERS utilized its 4-wheel drive ATV to provide access for its crew and equipment to the Crawford Creek floodplain for sediment probing and sediment sampling.

SEDIMENT THICKNESS PROBING

Prior to the sediment sampling, a sediment thickness probing method was used to determine the vertical extent of the accumulated sediments in the Nemadji River, Crawford Creek and its floodplain.

To collect sediment thickness measurements, AFFILIATED RESEARCHERS followed CH2MHILL procedures and utilized an appropriate length of 0.5" diameter (OD) steel rod to conduct manual probing at pre-designated locations. The push-probe was manually pushed into the accumulated sediments by AFFILIATED RESEARCHERS' Technician, until native substrates (i.e. clay till) were reached and/or "refusal" was determined.

To accurately determine the depth of sediment penetration in the floodplain area, a clip was secured on the push-probe at the terrain level. The push-probe was pulled from the sediment, and AFFILIATED RESEARCHERS' Technician measured the depth of penetration (to a 0.1' accuracy using a 1/10' incremental tape-measure) from the tip of the push-probe to the secured clip to determine the depth of sediment penetration. AFFILIATED RESEARCHERS used its RTK-GNSS survey equipment to accurately obtain the elevation of the terrain (i.e. topography) at each sediment probing location. The RTK-GNSS elevation measurement was later subsequently included in the depth of sediment penetration calculations to establish sediment thickness in terms of elevations.

To accurately determine the depth of sediment penetration in the creek and river areas, AFFILIATED RESEARCHERS used a survey range-pole, with a 6" diameter plastic disc attached at the bottom, as a "sounding pole"[2] to obtain depth measurements from the water surface to the top of the accumulated sediments (i.e. water depth; bathymetry). A clip was again used and secured to the push-probe, but at the water level. The push-probe was pulled from the sediment/water, and AFFILIATED RESEARCHERS' Technician measured the depth of penetration (to a 0.1' accuracy using a 1/10' incremental tape-measure) from the tip of the push-probe to the secured clip. The water depth was subtracted from the calculation to determine the depth of sediment penetration. The RTK-GNSS water elevation measurement was subsequently included in the depth of sediment penetration calculations to establish sediment thickness in terms of elevations.

A total of 91 sediment thickness probings were collected in the Crawford Creek area; a total of 30 sediment thickness probing were collected in the Nemadji River area; and a total of 41 sediment thickness probing were collected in the floodplain area.

[2] *Engineering and Design Hydrographic Surveying*. USCOE Manual 1110-2-1003. 2002 (amended 2004). Chapter 8. US Army Corps of Engineers. Washington DC.

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Figure 5. Crawford Creek sediment thickness probing locations.

Data obtained from the sediment thickness probing method was used to estimate the amount of sediment sample that might be achievable at each sample location. Percent recovery was not derived from the sediment thickness probing but by a factor of core penetration.

CH2MHill provided personnel for QAQC purposes, as well as to complete data sheets and document the character of the sediments. AFFILIATED RESEARCHERS compiled the sediment probing data into *Excel* tabular format and accurate *AutoCAD* drawings (Figure 5), and submitted these deliverables to CH2MHILL.

No problems were encountered with respect to the Sediment Probing aspect of the project, with the following exceptions. During the first field day (19 June), real-time (RTK) corrections for the RTK-GNSS survey equipment was initially attempted by using an acceptable method through the National Geodetic Survey (NGS) Continuously Operating Reference Station (CORS) network (managed by the State of Minnesota). This method was determined to be slow and inadequate due to the lack of continuous cellular data connection in the low lying areas; resulting in a short delay to the field effort. As a solution, AFFILIATED RESEARCHERS quickly established a RTK-GPS base station using its extra RTK-GNSS survey equipment. As a result, a short delay (~2 hour) to the field effort occurred during the onset of the project.

SEDIMENT SAMPLING

AFFILIATED RESEARCHERS utilized its 20' pontoon vessel and vibracore equipment to collect discrete sediment samples, in 8' lengths of 3" diameter polycarbonate (i.e. *Lexan*) core-tubes, at designated locations at the site.

Vibracore sediment sampling methods were used exclusively in the Nemadji River designated sampling area, and all but the uppermost end of the Crawford Creek designated sampling area. Manual coring sediment sampling methods were used exclusively in the Crawford Creek floodplain area, which was accessed and accomplished using AFFILIATED RESEARCHERS' 4-wheel drive ATV. CH2MHILL provided personnel for QAQC purposes, complete data sheets, and document the character and amount of the sediments collected.

AFFILIATED RESEARCHERS utilized an industry proven *Rossfelder VT-1* underwater vibracore system for collecting vibracore sediment samples. The *Rossfelder VT-1* vibracore system includes a vibracore head which enables the vibrator to be fitted to 3" diameter polycarbonate core tubes. This vibracore system uses 115V and 12A, and operates at a power rating of 16kN. AFFILIATED RESEARCHERS followed its written *Standard Operating Procedures* for the collection of vibracore sediment samples.

Manual coring methods were planned as an alternative to vibracoring method in areas where the vibracore vessel could not be navigated, and used at 2 sample locations at the upstream end of Crawford Creek. Manual coring methods were also used throughout the Crawford Creek floodplain. AFFILIATED RESEARCHERS utilized the same 3" diameter cores tubes as used during the vibracore methods, and followed its written *Standard Operating Procedures* for the manual coring methods for collection sediment samples.

Designated sediment sample locations were navigated to (within the lateral distance specified in the SOW) using the RTK-GNSS survey equipment. The actual sample locations upon which the sediment samples were collected were surveyed and recorded using RTK-GNSS survey equipment.

Figure 6.

AFFILIATED RESEARCHERS recorded the identification number, GPS location and elevations, and water depth (when sampling the river and creek areas) at each sediment sample location. All sediment samples were labeled and logged by CH2MHILL personnel. AFFILIATED RESEARCHERS carefully and securely delivered the sediment samples to CH2MHILL personnel at the staging area for processing (Figure 6).

A total of 29 sediment samples were collected in the Crawford Creek area; a total of 10 sediment samples were collected in the Nemadji River area; and a total of 21 sediment samples were collected in the floodplain area. AFFILIATED RESEARCHERS compiled the sediment sampling data into *Excel* tabular format and accurate *AutoCAD* drawings (Figure 9), and submitted these deliverables to CH2MHILL.

No problems were encountered with respect to the Sediment Sampling aspect of the project, with the following exceptions. The manual core methods limited the depth of coring that could be accomplished in the clay substrates before compression ("plowing") of the sediment samples occurred. During the night, the indigenous black bears (Figure 7) accessed the pontoon boat where it had been anchored in Crawford Creek overnight, and stole away with a couple of the empty vibracore core tubes and caps. The transporting of the core tubes from the sampling areas to the staging areas resulted in a significant amount of ruts at a few limited areas on the access trails (Figure 8). AFFILIATED RESEARCHERS documented and showed all of the trail ruts to the land owner, and offered to restore the trails. The property owner stated that he saw nothing that he felt was a concern.

Figure 7.

Figure 8.

Figure 9. Crawford Creek sediment core sample locations.

TOPOGRAPHIC SURVEY:

CH2MHILL provided personnel to assist AFFILIATED RESEARCHERS' Technician in conducting topographic surveying along the shorelines of Crawford Creek and a portion of the shorelines of the Nemadji River.

AFFILIATED RESEARCHERS utilized its RTK-GNSS survey equipment to collect a total of 125 GPS positions and elevations at the water line and the "top of bank"[3] along approximately 0.5 river miles of Crawford Creek; and a total of 78 GPS positions and elevations at the water line and the "top of bank" along approximately 1 river mile of the Nemadji River.

AFFILIATED RESEARCHERS compiled the topographic data into *Excel* tabular format and accurate *AutoCAD* drawings (Figure 10) and submitted these deliverables to CH2MHILL.

No problems were encountered with respect to the Topographic Survey aspect of the project.

[3] CH2MHILL and AFFILIATED RESEARCHERS decided that "Top of bank" was to be visually determined as the first significant bank encountered beyond the water's edge.

Figure 10. Crawford Creek topographic surveying locations.

From: opus
To: mike@affiliatedresearchers.com
Subject: OPUS solution : 68640931.14o OP1396876602143
Date: Monday, April 07, 2014 9:17:49 AM

FILE: 68640931.14o OP1396876602143

NGS OPUS SOLUTION REPORT
==========

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: mike@affiliatedresearchers.com DATE: April 07, 2014
RINEX FILE: 6864093s.14o TIME: 13:17:15 UTC

SOFTWARE: page5 1209.04 master53.pl 022814 START: 2014/04/03 18:02:00
EPHEMERIS: igr17864.eph [rapid] STOP: 2014/04/03 20:08:00
NAV FILE: brdc0930.14n OBS USED: 2973 / 3879 : 77%
ANT NAME: TRMR8_GNSS3 NONE # FIXED AMB: 26 / 44 : 59%
ARP HEIGHT: 2.000 OVERALL RMS: 0.018(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.2542)

X:	-158218.061(m)	0.031(m)	-158218.913(m)	0.031(m)
Y:	-4383032.340(m)	0.041(m)	-4383031.040(m)	0.041(m)
Z:	4615550.356(m)	0.083(m)	4615550.322(m)	0.083(m)
LAT:	46 39 13.19732	0.049(m)	46 39 13.22644	0.049(m)
E LON:	267 55 57.51470	0.031(m)	267 55 57.47245	0.031(m)
W LON:	92 4 2.48530	0.031(m)	92 4 2.52755	0.031(m)
EL HGT:	176.265(m)	0.077(m)	175.369(m)	0.077(m)
ORTHO HGT:	204.433(m)	0.130(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES (UTM (Zone 15))	STATE PLANE COORDINATES (SPC (4801 WI N))
Northing (Y) [meters]	5167100.816	167335.882
Easting (X) [meters]	571361.410	441772.796
Convergence [degrees]	0.67826317	-1.49133097
Point Scale	0.99966259	0.99998130
Combined Factor	0.99963497	0.99995367

US NATIONAL GRID DESIGNATOR: 15TWM7136167100(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL5987	WISN SIREN CORS ARP	N454919.060	W0922206.634	95324.7
DJ7860	WIS6 WISCONSIN POINT 6 CORS ARP	N464218.365	W0920056.142	6955.6
DM3509	MNHN HINCKLEY CORS ARP	N455905.660	W0925653.931	100646.7

NEAREST NGS PUBLISHED CONTROL POINT

RN1088	A 152	N463857.	W0920400.	503.6

This position and the above vector components were computed without any
knowledge by the National Geodetic Survey regarding the equipment or

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GPS Unit Specifications

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Confirm required information has been provided.

Signature
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Date: June 20, 2014

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Benchmark ID: John's House Time: 0922

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Established Longitude: 92.067692 W Measured Longitude: 92.067693 W

Displacement (include UOM): 0.022'

Horizontal Control Point 2

Benchmark ID: John's House Time: 1802

Established Latitude: 46.65391 N Measured Latitude: 46.65391 N

Established Longitude: 92.067692 W Measured Longitude: 92.067692 W

Displacement (include UOM): 0.01'

Vertical Control Point 1

Benchmark ID: Johns House Time: 0922

Established Elevation: 670.93' Measured Elevation: 671.06'

Displacement (include UOM): -0.13'

Vertical Control Point 2

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Established Elevation: 670.93' Measured Elevation: 670.92'

Displacement (include UOM): 0.01'

Reference Point 1

Time: _____

Physical/Locational description: _____

Measured Latitude: _____ Measured Longitude: _____

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Time: _____

Physical/Locational description: _____

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Time: _____

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Project Title: Crawford Creek Project SOW#1 and SOW#2

Date: June 20, 2014

Horizontal Control Point 1

Benchmark ID: John's House Time: 0922

Established Latitude: 46.65391 N Measured Latitude: 46.65391 N

Established Longitude: 92.067692 W Measured Longitude: 92.067693 W

Displacement (include UOM): 0.022'

Horizontal Control Point 2

Benchmark ID: John's House Time: 1802

Established Latitude: 46.65391 N Measured Latitude: 46.65391 N

Established Longitude: 92.067692 W Measured Longitude: 92.067692 W

Displacement (include UOM): 0.01'

Vertical Control Point 1

Benchmark ID: Johns House Time: 0922

Established Elevation: 670.93' Measured Elevation: 671.06'

Displacement (include UOM): -0.13'

Vertical Control Point 2

Benchmark ID: Johns House Time: 1802

Established Elevation: 670.93' Measured Elevation: 670.92'

Displacement (include UOM): 0.01'

Reference Point 1

Time: _____

Physical/Locational description: _____

Measured Latitude: _____ Measured Longitude: _____

Reference Point 2

Time: _____

Physical/Locational description: _____

Measured Latitude: _____ Measured Longitude: _____

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Physical/Locational description: _____

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Phone Number: 989-305-6866
Affiliation: Hydrographer/GIS Manager
E-mail Address: mike@affiliatedresearchers.com

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2. Determined window of satellite availability. http://www.trimble.com/planningsoftware_ts.asp ✔
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4. Located 3 reference points. * ☐

Data Collection Activities (please confirm each activity in the boxes to the right)

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   d. A minimum signal-to-noise ratio (refer to GPS user manual for recommendation) ✔
2. Collected point data based on the nearest base station's logging interval. ✔
3. Collected point data for a period of at least 1 minute per location. ☐
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Quality Information

Describe any difficulties in collecting locational data: Over head tree coverage caused some delays collecting data.

List final post-processed accuracy of the data: <0.1'

Data Collector:

Confirm required information has been provided.

Signature
Date: Sept 22, 2014

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Signature
Date

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Vertical Control Point 2

Benchmark ID: Johns House Time: 1802

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Displacement (include UOM): 0.01'

Reference Point 1

Time: _____

Physical/Locational description: _____

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Time: _____

Physical/Locational description: _____

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Reference Point 1

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Physical/Locational description: _____

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Defined Bank Survey Data Points
Crawford Creek and Nemadji River Site Characterization

Study Area	GPS ID	Date	Elevation (ft)	Latitude (WGS 84)	Longitude (WGS 84)
Crawford Creek	water ele 1	20140625	603.24	46.654273	-92.076554
Crawford Creek	water ele 2	20140625	602.02	46.654226	-92.076543
Crawford Creek	water ele 3	20140625	602.99	46.654304	-92.07625
Crawford Creek	water ele 4	20140625	603.14	46.654324	-92.076268
Crawford Creek	water ele 5	20140625	603.08	46.654557	-92.076057
Crawford Creek	water ele 6	20140625	602.83	46.654523	-92.076039
Crawford Creek	water ele 7	20140625	602.92	46.654804	-92.075679
Crawford Creek	water ele 8	20140625	602.89	46.654807	-92.075749
Crawford Creek	water ele 9	20140625	603.76	46.655052	-92.075804
Crawford Creek	water ele 10	20140625	602.85	46.655046	-92.075741
Crawford Creek	water ele 11	20140625	602.67	46.655309	-92.075881
Crawford Creek	water ele 12	20140625	606.84	46.655275	-92.075812
Crawford Creek	water ele 13	20140625	602.97	46.655498	-92.075676
Crawford Creek	water ele 14	20140625	603.24	46.655461	-92.075735
Crawford Creek	water ele 15	20140625	603.10	46.655618	-92.076083
Crawford Creek	water ele 16	20140625	602.89	46.655618	-92.076167
Crawford Creek	water ele 17	20140625	602.32	46.655808	-92.075931
Crawford Creek	water ele 18	20140625	602.75	46.655842	-92.075995
Crawford Creek	water ele 19	20140625	602.92	46.656023	-92.075723
Crawford Creek	water ele 20	20140625	602.73	46.656063	-92.075792
Crawford Creek	water ele 21	20140625	603.07	46.655966	-92.075393
Crawford Creek	water ele 22	20140625	602.62	46.656015	-92.075366
Crawford Creek	water ele 23	20140625	602.46	46.65604	-92.075057
Crawford Creek	water ele 24	20140625	602.86	46.656035	-92.074979
Crawford Creek	water ele 25	20140625	602.48	46.656231	-92.075175
Crawford Creek	water ele 26	20140625	602.90	46.656266	-92.07511
Crawford Creek	water ele 27	20140625	602.80	46.656285	-92.075505
Crawford Creek	water ele 28	20140625	603.12	46.65634	-92.075455
Crawford Creek	water ele 29	20140625	588.93	46.656568	-92.075683
Crawford Creek	water ele 30	20140625	606.94	46.656583	-92.07575
Crawford Creek	water ele 31	20140625	603.04	46.656702	-92.075434
Crawford Creek	water ele 32	20140625	602.88	46.656757	-92.07546
Crawford Creek	water ele 33	20140625	603.76	46.656834	-92.075062
Crawford Creek	water ele 34	20140625	639.88	46.656936	-92.075101
Crawford Creek	water ele 35	20140625	602.52	46.656994	-92.074906
Crawford Creek	water ele 36	20140625	603.18	46.656978	-92.074929
Crawford Creek	water ele 37	20140625	603.35	46.656938	-92.074862
Crawford Creek	water ele 38	20140625	603.71	46.657203	-92.074927
Crawford Creek	water ele 39	20140625	632.97	46.657244	-92.074861
Crawford Creek	water ele 40	20140625	606.68	46.657421	-92.07515
Crawford Creek	water ele 41	20140625	603.53	46.657381	-92.075228

Crawford Creek	water ele 42	20140625	603.48	46.657871	-92.075512
Crawford Creek	water ele 43	20140625	603.37	46.657937	-92.075602
Crawford Creek	water ele 44	20140625	603.32	46.658128	-92.075521
Crawford Creek	water ele 45	20140625	603.54	46.658089	-92.07545
Crawford Creek	water ele 46	20140625	605.03	46.658176	-92.075079
Crawford Creek	water ele 47	20140625	603.54	46.65812	-92.075102
Crawford Creek	water ele 48	20140625	603.62	46.658111	-92.07474
Crawford Creek	water ele 49	20140625	607.88	46.658167	-92.074781
Crawford Creek	water ele 50	20140625	602.45	46.658164	-92.074797
Crawford Creek	water ele 51	20140625	602.74	46.658336	-92.074534
Crawford Creek	water ele 52	20140625	603.38	46.65837	-92.074619
Crawford Creek	water ele 53	20140625	603.71	46.658575	-92.074367
Crawford Creek	water ele 54	20140625	603.95	46.658601	-92.074447
Crawford Creek	water ele 55	20140625	603.36	46.658847	-92.074176
Crawford Creek	water ele 56	20140625	603.33	46.658851	-92.074289
Crawford Creek	CC001 bb w	20140620	603.56	46.654308	-92.076375
Crawford Creek	CC001 bb/wl E	20140620	603.41	46.654251	-92.076365
Crawford Creek	CC001 tb E	20140620	605.53	46.654243	-92.076362
Crawford Creek	CC001 tb w	20140620	604.51	46.654311	-92.076376
Crawford Creek	CC002 bb w	20140620	603.40	46.654348	-92.0762
Crawford Creek	CC002 bb/wl E	20140620	603.51	46.654331	-92.076163
Crawford Creek	CC002 tb E	20140620	605.23	46.654327	-92.076159
Crawford Creek	CC002 tb w	20140620	604.41	46.654351	-92.076205
Crawford Creek	CC003 bb wl	20140620	603.65	46.654598	-92.075941
Crawford Creek	CC003 bb/wl E	20140620	603.41	46.654561	-92.075914
Crawford Creek	CC003 tb E	20140620	603.97	46.654557	-92.07591
Crawford Creek	CC003 tb w	20140620	604.35	46.654598	-92.075948
Crawford Creek	CC003 tb wel	20140620	603.47	46.654595	-92.075937
Crawford Creek	CC004 bb/wl E	20140620	603.56	46.654832	-92.075676
Crawford Creek	CC004 tb E	20140620	604.78	46.654831	-92.07567
Crawford Creek	CC004 tb w	20140620	604.45	46.6548	-92.075756
Crawford Creek	CC005 tb E	20140620	604.96	46.655047	-92.075728
Crawford Creek	CC005 tb w	20140620	604.41	46.655054	-92.07581
Crawford Creek	CC006 tb E	20140620	605.34	46.655264	-92.075806
Crawford Creek	CC006 tb w	20140621	595.70	46.655306	-92.075919
Crawford Creek	CC007 tb E	20140620	605.94	46.655504	-92.075671
Crawford Creek	CC007 tb w	20140621	604.38	46.655489	-92.075806
Crawford Creek	CC008 tb E	20140620	605.48	46.655587	-92.076063
Crawford Creek	CC008 tb w	20140621	605.59	46.655648	-92.07617
Crawford Creek	CC009 tb E	20140620	605.19	46.65575	-92.075973
Crawford Creek	CC009 tb w	20140620	606.65	46.655824	-92.076025
Crawford Creek	CC009 tc E	20140620	605.19	46.655749	-92.075973
Crawford Creek	CC010 tb E	20140620	606.33	46.656017	-92.075711
Crawford Creek	CC010 tb w	20140620	607.26	46.65606	-92.075826
Crawford Creek	CC011 tb E	20140620	606.77	46.655963	-92.075419
Crawford Creek	CC011 tb w	20140620	606.82	46.656027	-92.075355
Crawford Creek	CC012 tb E	20140620	607.60	46.65598	-92.074988

Crawford Creek	CC012 tb w	20140620	605.65	46.656023	-92.075081
Crawford Creek	CC012 tc E	20140620	607.65	46.655979	-92.074988
Crawford Creek	CC013 tb 2 E	20140620	606.88	46.656295	-92.075152
Crawford Creek	CC013 tb E	20140620	606.67	46.656295	-92.075152
Crawford Creek	CC013 tb w	20140620	607.56	46.656212	-92.075223
Crawford Creek	CC014 tb E	20140620	606.81	46.656348	-92.075449
Crawford Creek	CC014 tb w	20140620	607.71	46.656266	-92.075525
Crawford Creek	CC015 tb E	20140621	607.44	46.656605	-92.075619
Crawford Creek	CC015 tb W	20140620	607.97	46.656578	-92.075771
Crawford Creek	CC016 tb E	20140620	607.73	46.656685	-92.075412
Crawford Creek	CC016 tb W	20140620	608.14	46.656766	-92.075488
Crawford Creek	CC017 tb E	20140621	608.71	46.656814	-92.075028
Crawford Creek	CC017 tb W	20140620	607.30	46.65691	-92.075061
Crawford Creek	CC018 tb E	20140620	608.74	46.656925	-92.074839
Crawford Creek	CC018 tb w	20140620	606.97	46.656972	-92.074966
Crawford Creek	CC019 tb E	20140620	609.73	46.657248	-92.074812
Crawford Creek	CC019 tb w	20140620	607.77	46.657174	-92.074927
Crawford Creek	CC020 tb E	20140620	608.54	46.657404	-92.075088
Crawford Creek	CC020 tb w	20140620	609.27	46.657372	-92.075274
Crawford Creek	CC021 tb E	20140620	608.00	46.657639	-92.075372
Crawford Creek	CC021 tb w	20140620	610.70	46.657607	-92.075529
Crawford Creek	CC022 tb E	20140620	608.68	46.657879	-92.075485
Crawford Creek	CC022 tb w	20140620	610.31	46.657885	-92.075645
Crawford Creek	CC023 tb E	20140620	609.07	46.658098	-92.075399
Crawford Creek	CC023tb w	20140620	610.25	46.658126	-92.075555
Crawford Creek	CC024 tb E	20140620	610.25	46.658082	-92.075111
Crawford Creek	CC024 tb w	20140620	609.59	46.658203	-92.075085
Crawford Creek	CC025 tb E	20140620	609.99	46.658108	-92.074687
Crawford Creek	CC025 tb w	20140620	608.80	46.658201	-92.074807
Crawford Creek	CC026 tb E	20140620	610.27	46.65833	-92.074501
Crawford Creek	CC026tb w	20140620	609.94	46.658377	-92.074666
Crawford Creek	CC027 tb E	20140620	610.86	46.658582	-92.074312
Crawford Creek	CC027 tb w	20140620	611.67	46.658615	-92.074476
Crawford Creek	CC028 tb E	20140620	609.10	46.658824	-92.074158
Crawford Creek	CC028 tb nr E	20140620	609.91	46.658863	-92.074092
Crawford Creek	CC028 tb w1	20140620	608.43	46.658828	-92.074319
Crawford Creek	CC028 tb w2	20140620	607.36	46.658847	-92.074324
Nemadji River	NR01-A	20140621	603.61	46.658965	-92.074996
Nemadji River	NR01-A1	20140622	603.61	46.658139	-92.077127
Nemadji River	NR01-B	20140621	603.61	46.659001	-92.074997
Nemadji River	NR01-C	20140621	603.61	46.659075	-92.075006
Nemadji River	NR01-D	20140621	603.61	46.659148	-92.074972
Nemadji River	NR01-E	20140621	603.61	46.659185	-92.074956
Nemadji River	NR02-A	20140621	603.51	46.659831	-92.074588
Nemadji River	NR02-A1	20140621	603.51	46.659841	-92.07494
Nemadji River	NR02-A2	20140621	603.51	46.659317	-92.074101
Nemadji River	NR02-B	20140621	603.51	46.659786	-92.074608

Nemadji River	NR02-B1	20140621	603.51	46.659799	-92.074919
Nemadji River	NR02-B2	20140621	603.51	46.659333	-92.074141
Nemadji River	NR02-C	20140621	603.51	46.659751	-92.074586
Nemadji River	NR03-A	20140621	603.55	46.661139	-92.078565
Nemadji River	NR03-A1	20140622	603.55	46.660096	-92.07665
Nemadji River	NR03-B	20140621	603.55	46.66112	-92.07861
Nemadji River	NR03-C	20140621	603.55	46.661078	-92.078618
Nemadji River	NR03-D	20140621	603.55	46.661043	-92.078665
Nemadji River	NR03-E	20140621	603.55	46.660998	-92.078689
Nemadji River	NR04-A	20140621	603.56	46.662454	-92.077441
Nemadji River	NR04-B	20140621	603.56	46.662447	-92.077355
Nemadji River	NR04-C	20140621	603.56	46.662449	-92.077265
Nemadji River	NR04-D	20140621	603.56	46.662474	-92.077167
Nemadji River	NR04-E	20140621	603.56	46.662462	-92.077074
Nemadji River	NR05-A	20140621	603.47	46.661596	-92.073121
Nemadji River	NR05-B	20140621	603.47	46.661546	-92.073104
Nemadji River	NR05-C	20140621	603.47	46.661473	-92.073128
Nemadji River	NR05-D	20140621	603.47	46.661394	-92.07316
Nemadji River	NR05-E	20140621	603.47	46.661323	-92.073203
Nemadji River	NR05-F	20140621	603.47	46.661285	-92.073242
Nemadji River	NR TE 01	20140624	603.64	46.658872	-92.074582
Nemadji River	NR TE 02	20140621	603.85	46.659849	-92.074264
Nemadji River	NR TE 03	20140621	604.03	46.660075	-92.075497
Nemadji River	NR TE 04	20140621	607.69	46.66026	-92.076619
Nemadji River	NR TE 05	20140621	604.89	46.660692	-92.077544
Nemadji River	NR TE 06	20140621	604.69	46.661148	-92.078522
Nemadji River	NR TE 07	20140621	609.37	46.661597	-92.079543
Nemadji River	NR TE 08	20140621	606.51	46.662108	-92.08032
Nemadji River	NR TE 09	20140621	605.60	46.662814	-92.080503
Nemadji River	NR TE 10	20140621	608.72	46.663536	-92.080495
Nemadji River	NR TE 11	20140621	607.89	46.663921	-92.079511
Nemadji River	NR TE 12	20140621	606.37	46.66393	-92.078421
Nemadji River	NR TE 13	20140621	609.98	46.663425	-92.077701
Nemadji River	NR TE 14	20140621	607.27	46.662758	-92.077546
Nemadji River	NR TE 15	20140621	608.81	46.661857	-92.077289
Nemadji River	NR TE 16	20140621	610.80	46.661489	-92.076041
Nemadji River	NR TE 17	20140621	610.57	46.661502	-92.07488
Nemadji River	NR TE 18	20140621	605.19	46.66136	-92.073725
Nemadji River	NR TE 19	20140621	604.55	46.661247	-92.072887
Nemadji River	NR TE 20	20140621	605.96	46.659257	-92.073797
Nemadji River	NR TW 01	20140624	605.54	46.659208	-92.074585
Nemadji River	NR TW 02	20140624	610.99	46.659629	-92.074434
Nemadji River	NR TW 03	20140624	612.97	46.65981	-92.075487
Nemadji River	NR TW 04	20140624	604.76	46.660043	-92.076716
Nemadji River	NR TW 05	20140624	606.12	46.660539	-92.077793
Nemadji River	NR TW 06	20140624	604.45	46.660973	-92.078708
Nemadji River	NR TW 07	20140624	605.46	46.661398	-92.07976

Nemadji River	NR TW 08	20140624	608.02	46.662005	-92.080621
Nemadji River	NR TW 09	20140624	606.50	46.662858	-92.08086
Nemadji River	NR TW 10	20140624	604.05	46.663745	-92.080761
Nemadji River	NR TW 11	20140624	606.74	46.664185	-92.079604
Nemadji River	NR TW 12	20140624	607.19	46.664224	-92.078348
Nemadji River	NR TW 13	20140624	603.73	46.663535	-92.077378
Nemadji River	NR TW 14	20140624	609.12	46.662725	-92.077048
Nemadji River	NR TW 15	20140624	612.11	46.661997	-92.076894
Nemadji River	NR TW 16	20140624	607.50	46.661801	-92.076023
Nemadji River	NR TW 17	20140624	609.05	46.66183	-92.074827
Nemadji River	NR TW 18	20140624	613.01	46.661738	-92.073639
Nemadji River	NR TW 19	20140624	611.42	46.661654	-92.073012
Nemadji River	NR TW 20	20140624	604.30	46.659324	-92.074188
Nemadji River	Water Elev 1	20140624	603.19	46.658878	-92.074585
Nemadji River	Water Elev 2	20140624	603.19	46.659152	-92.07449
Nemadji River	Water Elev 3	20140624	603.25	46.659296	-92.073827
Nemadji River	Water Elev 4	20140624	603.25	46.659317	-92.07417
Nemadji River	Water Elev 5	20140624	603.10	46.659658	-92.074422
Nemadji River	Water Elev 6	20140624	603.10	46.659848	-92.07427
Nemadji River	Water Elev 7	20140624	602.94	46.659837	-92.07557
Nemadji River	Water Elev 8	20140624	602.94	46.660063	-92.07547
Nemadji River	Water Elev 9	20140624	603.16	46.660045	-92.076695
Nemadji River	Water Elev 10	20140624	603.16	46.660243	-92.076602
Nemadji River	Water Elev 11	20140624	602.86	46.660508	-92.077738
Nemadji River	Water Elev 12	20140624	602.86	46.660685	-92.077533
Nemadji River	Water Elev 13	20140624	602.91	46.661393	-92.079737
Nemadji River	Water Elev 14	20140624	602.91	46.661588	-92.07956
Nemadji River	Water Elev 16	20140624	602.54	46.662127	-92.080346
Nemadji River	Water Elev 17	20140624	602.54	46.662133	-92.080704
Nemadji River	Water Elev 18	20140624	603.16	46.662854	-92.080853
Nemadji River	Water Elev 19	20140624	603.16	46.662869	-92.080522
Nemadji River	Water Elev 20	20140624	603.18	46.663731	-92.080776
Nemadji River	Water Elev 21	20140624	603.18	46.663701	-92.08037
Nemadji River	Water Elev 22	20140624	603.10	46.66418	-92.079629
Nemadji River	Water Elev 23	20140624	603.10	46.663942	-92.079614
Nemadji River	Water Elev 24	20140624	603.22	46.664213	-92.07837
Nemadji River	Water Elev 25	20140624	603.22	46.663938	-92.078412
Nemadji River	Water Elev 26	20140624	603.01	46.663515	-92.077365
Nemadji River	Water Elev 27	20140624	603.01	46.663335	-92.077637
Nemadji River	Water Elev 28	20140624	602.98	46.662728	-92.077077
Nemadji River	Water Elev 29	20140624	602.98	46.662647	-92.077523
Nemadji River	Water Elev 30	20140624	603.38	46.661789	-92.077153
Nemadji River	Water Elev 31	20140624	603.38	46.661948	-92.076852
Nemadji River	Water Elev 32	20140624	603.44	46.661512	-92.076039
Nemadji River	Water Elev 33	20140624	603.44	46.66179	-92.076019
Nemadji River	Water Elev 34	20140624	603.16	46.661813	-92.074821
Nemadji River	Water Elev 35	20140624	603.16	46.661531	-92.07501

Nemadji River	Water Elev 36	20140624	603.05	46.661711	-92.073632
Nemadji River	Water Elev 37	20140624	603.05	46.661371	-92.073749
Nemadji River	Water Elev 38	20140624	603.05	46.661639	-92.072998
Nemadji River	Water Elev 39	20140624	603.05	46.66125	-92.072905

Summary of Habitat Assessment Survey and Bio-Uptake Sampling Field Activities

DATA SUMMARY REPORT

Habitat Assessment Survey and Bio-uptake Study
at Crawford Creek and the Nemadji River
Crawford Creek Project – SOW3
Douglas County, Wisconsin

GLAES Contract No. EP-R5-09-11
9 September 2014
Amended 11 September 2014
Final 3 December 2014

AFFILIATED RESEARCHERS has performed a habitat assessment survey and bio-uptake study for the CH2M HILL Crawford Creek project, located in Douglas County, Wisconsin.

The purpose of this study is to provide habitat assessment survey, bio-uptake study services, and other technical support services for the USEPA GLNPO site characterization project of the Crawford Creek and Nemadji River (Site).

For this investigation effort, CH2M HILL, on behalf of USEPA, used team subcontractor AFFILIATED RESEARCHERS to perform the work as outlined in this report.

OBJECTIVES AND TASKS:

The overall objective of this proposed work is to collect chemical and physical information for the Site. The primary objectives of the Site Characterization include:

- investigate contaminant bioaccumulation in the food chain via fish sampling;
- assess the physical characteristics of Crawford Creek as they relate to the biological communities; and
- assess biological integrity of Crawford Creek through collection and identification of benthic macroinvertebrate samples.

The tasks performed to meet the described objective include the following (shown in order of scheduled accomplishment):

- mobilization and demobilization;
- habitat assessment/survey;
- benthic macro-invertebrate collection and identification;
- fish sampling; and,
- draft and final report submittals.

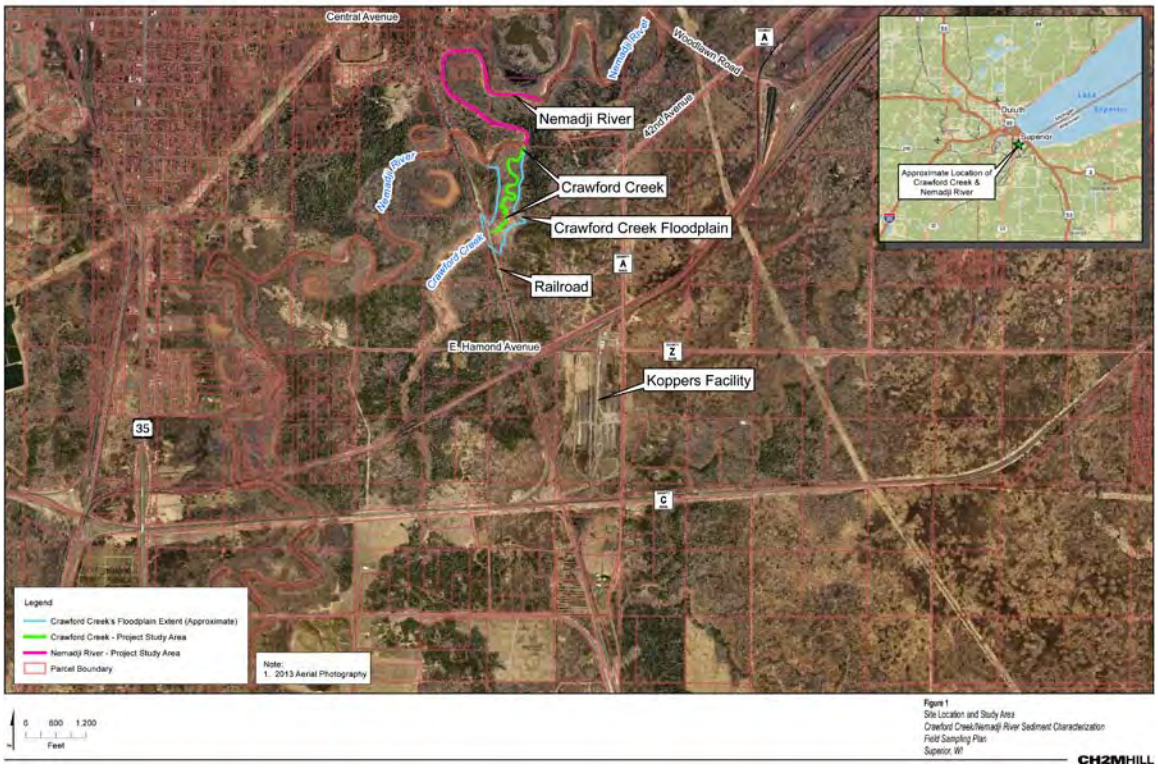

Figure 1. Project Site.

AFFILIATED RESEARCHERS utilized its most suited equipment, software, and most experienced personnel (to include: Project Scientist, Health and Safety Manager, and 2 Technicians) to perform the described tasks.

This data summary report describes the activities conducted under each task, the reliability and accuracy of the data, problems encountered during the survey, and interpretation and any post-processing of the data.

MOBILIZATION/DEMOBILIZATION

On 14 July 2014, AFFILIATED RESEARCHERS mobilized its crew, it's currently registered vessel, and all supporting equipment, materials, and tools required to conduct the work described in the project objectives and tasks.

AFFILIATED RESEARCHERS conducted its services at the site from the 15th through the 17th of July, and demobilized its crew, vessels, and supporting equipment on 18 July 2014.

CH2MHILL provided its staff to work at a shore-based staging location to log, process, document, package, and ship all fish samples for laboratory analysis.

No problems were encountered with respect to the Mobilization/Demobilization aspect of the project.

ESTABLISHMENT OF LOCAL CONTROL POINTS

AFFILIATED RESEARCHERS provided its *Trimble ProXT* GPS equipment and trained operators for same, to obtain sub-meter accurate position data of the habitat assessment and biological sample locations.

Using NGS OPUS methods and RTK-GNSS survey equipment, AFFILIATED RESEARCHERS had previously (April 2014) established a semi-permanent benchmark at the project boat launch facility in the town of Superior (*Loons Foot Landing*[1]) to serve as a survey control for positioning and surveying QAQC (Figure 2). The QAQC checks of the GPS equipment were performed twice daily; at the beginning and ending of each field day when the equipment was used (Table 1).

Figure 2.

No problems were encountered with respect to the establishment of local control points during the project.

Date	ID	Time	Latitude	Longitude	Delta
15-Jul-14	*Loons Foot Landing*	0852	46º 41’ 59.88496”	92º 02’ 07.31264”	Δ 2.43’
15-Jul-14	*Loons Foot Landing*	1736	46º 41’ 59.90121”	92º 02’ 07.34789”	Δ 0.84’
17-Jul-14	*Loons Foot Landing*	0833	46º 41’ 59.90881”	92º 02’ 07.34605”	Δ 1.59’
17-Jul-14	*Loons Foot Landing*	1621	46º 41’ 59.91227”	92º 02’ 07.34178”	Δ 1.96’

Table 1. GPS equipment QAQC checks.

[1] *Loons Foot Landing* coordinates, resolved by OPUS solution (Attachment 1), are N46º 41’ 59.89310” W092º 02’ 07.34559”.

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FIELD RECORDS

AFFILIATED RESEARCHERS maintained daily written and electronic field records to be used in preparing the Data Summary Report. Written field records were maintained in a *Rite-in-the-Rain* notebook with *Rite-in-the-Rain* ink. Electronic field records were collected with data collectors and field computers, and "backed-up" at the end of field day to an onsite external hard drive.

Field records documented the following:

- procedures, equipment, and personnel;
- calibration methods and measurements;
- QAQC;
- field conditions;
- river stage and water level measurements;
- planned and unplanned events;
- weather conditions; and
- other important information.

No problems were encountered with respect to the field records during the project.

PHYSICAL HABITAT SURVEY

Following methods outlined in the USEPA *Rapid Bioassessment Protocol*[2] (RBP), AFFILIATED RESEARCHERS utilized its 16' *Alumaweld* jet-drive survey boat and aquatic Scientist (Attachment 2) to conduct qualitative characterization of the physical habitats of the 400 meter study area of Crawford Creek.

For purposes of this physical habitat survey, the Crawford Creek study area was divided into four, 100 meter sampling reaches to account for the slight variations of the study area (Figure 3). Two RBP habitat quality field data sheets were completed in the field at each of the 4 reaches by AFFILIATED RESEARCHERS' aquatic Scientist (Attachment 3).

1. The *Physical Characterization and Water Quality Field Data Sheet* consisted of a basic description of the sampling reach including observations and measurements of stream physical dimensions, substrate composition, water quality observations, vegetation, and others.

2. The *Habitat Assessment Field Data Sheet for Low Gradient Streams* consisted of a rating 10 metrics of the physical habitat, including available cover, pool characteristics, sediment deposition, channel morphology, bank stability, and riparian zone characteristics.

[2] Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish*. Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Figure 3. Four sampling reaches of the Crawford Creek, WI.

Data for completing the data sheets were obtained on site at approximately the center of each of the sampling reaches (Figure 4). Sub-meter GPS positions were obtained for each of the respective data locations, and are provided in Table 2.

ID	Latitude	Longitude
Reach 1	46º 39’ 16.68718”	92º 04’ 33.01138”
Reach 2	46º 39’ 21.36553”	92º 04’ 33.16325”
Reach 3	46º 39’ 25.21438”	92º 04’ 29.67048”
Reach 4	46º 39’ 29.15645”	92º 04’ 29.26528”

Table 2. GPS locations of data collection.

Although the data are qualitative, the data sheets can be used to compare between streams or between different reaches of the same stream. Although not considered part of the data sheets, water temperatures and dissolved oxygen levels were also measured at each sampling reach using a *YSI ProODO* dissolved oxygen meter; and substrates samples were collected at each reach using a mini-Ponar grab.

No problems were encountered with respect to the physical habitat aspect of the project.

RESULTS FROM PHYSICAL HABITAT SURVEY

The data show the physical habitat in the study area of Crawford Creek is of relatively low quality for supporting aquatic life.

The creek had little or no current during the time of the investigation. Water levels and velocities in the creek are significantly affected by lake levels and seiches of Lake Superior. The limited amount of water velocity likely contributes to the relatively low quantities of dissolved oxygen (DO) in the creek, which ranged from 6.0 to 6.4 mg/L (ppm) during the time of the investigation.

Figure 4. Habitat characterization.

The area of study of Crawford Creek is more characteristic of a linear-shaped pool, versus "typical" stream habitat which has flow and habitat diversity respective of interspersed pools and riffles

In the study area of Crawford Creek aquatic plant life was very limited and the bottom substrate consisted of a soft mixture of silt and clay, with occasional organic debris (i.e. leaves and twigs). A creosote-like odor was notable in the sediments of Reach 1; somewhat notable in Reach 2; but not notable in Reaches 3 or 4. During the site investigation, the stream was very turbid with suspended clay; restricting water visibility to approximately 6".

The four Reaches investigated at Crawford Creek were found to be fairly homogenous with respect to habitat type and quality (Figures 5 – 7)[3]. The *Habitat Assessment Field Data Sheet for Low Gradient Streams* yielded a score[4] of 153 for Reach 1; and 161 for Reaches 2 through 4 (Table 3).

[3] Photograph not available for Reach 4.

[4] Maximum possible total score is 200.

Aquatic habitat was relatively low, with pools providing some cover in the form of depth. Only limited amounts of erosion were noted, and vegetation was found growing down to the water line. A relatively wide, native riparian zone was noted throughout much of the study area. Non-native invasive species were not noted in the stream or the adjacent floodplain. Bank stability was excellent and the channel was moderately sinuous. Lack of in-stream cover and diversity in the substrates were noted.

STREAM CHARACTERISTIC	REACH 1	REACH 2	REACH 3	REACH 4
Epifaunal substrate/available cover	6	6	6	6
Pool Substrate Characterization	6	6	6	6
Pool Variability	13	13	13	13
Sediment Deposition	20	20	20	20
Channel Flow Status	20	20	20	20
Channel Alteration	20	20	20	20
Channel Sinuosity	16	16	16	16
Bank Stability L/R	L:8, R:8	L:10, R:10	L:10, R:10	L:10, R:10
Vegetation Protection L/R	L:10, R:10	L:10, R:10	L:10, R:10	L:10, R:10
Riparian Vegetation Zone Width	L:8, R:8	L:10, R:10	L:10, R:10	L:10, R:10
TOTAL SCORE	**153**	**161**	**161**	**161**

Table 3. Scored metrics for RBP Habitat Assessment for area of study of Crawford Creek (each individual metric has a maximum possible score of 20).

Figure 5. Reach 1 looking upstream, Crawford Creek.

Figure 6. Reach 2 looking downstream, Crawford Creek.

Figure 7. Reach 3 looking upstream, Crawford Creek.

BENTHIC MACRO-INVERTEBRATE COLLECTION AND IDENTIFICATION

AFFILIATED RESEARCHERS utilized its 16' *Alumaweld* jet-drive survey boat and aquatic Scientist to collect benthic macro-invertebrates from the Crawford Creek study area. The collected benthic macro-invertebrates provide an assessment of the biological integrity by means of an Invertebrate Community Index (ICI) of the environment.

The benthic macro-invertebrate community was sampled using a long-handled, 500-micron mesh, aquatic D-net in accordance with methods outlined in the RBP. A total of 20 benthic macro-invertebrate samples were collected per each of the four Reaches. RBP macro-invertebrate field data sheets were completed by AFFILIATED RESEARCHERS' aquatic Scientist at each of the 4 reaches (Attachment 4).

Benthic invertebrate samples were collected proportionally from the various habitat types found within the sampling reach[5]. Collected samples from each reach were combined and placed in 70% ethanol for preservation, to be later identified by AFFILIATED RESEARCHERS' aquatic Scientist, at AFFILIATED RESEARCHERS' laboratory.

The sample collected from Reach 1 of Crawford Creek was the first sample processed at the laboratory, and was done so in its entirety (i.e. all collected benthic macro-invertebrates were identified to Family level). However, after a significantly high number of midge larvae (Diptera: Chronomidae) were found in this first sample, it was decided by AFFILIATED RESEARCHERS and CH2MHill that the remaining samples collected (from Reaches 2, 3 and 4) would be sub-sampled at 25%.

The sub-sampling was conducted subdividing the sample into four equal portions; with one of the four randomly selected from an online random number generator.

The samples were sorted by AFFILIATED RESEARCHERS' Technician using a 10x power magnifying lens, under the direct supervision of AFFILIATED RESEARCHERS' Entomologist, to remove all debris (Figure 5).

Figure 5. Sorting of sample.

The benthic macro-invertebrates in the samples were identified to Family level by AFFILIATED RESEARCHERS' aquatic Scientist, using a *Meiji Techno* 7-45x power stereomicroscope and recognized taxonomic authority[6]. Identified benthic macro-invertebrates were separated according to sampling Reach, and according to taxon into 2 ounce, clear glass jars with computer-printed labeling inside and outside. RBP laboratory "bench sheets" for each sampling reach were completed by AFFILIATED RESEARCHERS' aquatic Scientist (Figure 6, Attachment 5).

[5] For example, if 15% of sampling reach was determined to be occupied with woody debris and 85% the reach was determined to be open bottom, then approximately 15% of the 20 samples were taken from woody debris areas, while 85% of the sampling was conducted in areas of open bottom.

[6] Merritt, R.W. and K. W. Cummins. 1996. An Introduction to the Aquatic Insects of North America, 3rd ed. Kendall/Hunt Publishing Co., Dubuque, Iowa. 862 pp. + xiii.

A total of 47, 2-ounce sample jars containing the benthic macro-invertebrates were produced, and were hand delivered along with the respective data sheets to the Wisconsin Department of Natural Resources, Green Bay office for QAQC confirmation of the taxonomic identification.

The scientific literature contains a recognized "tolerance value" table for many of invertebrate Class, Order, and/or Family. This table of values is used in the RBP. These tolerance values are on a scale from 0-10, of which the value of 0 represents organisms which are extremely intolerant (i.e. sensitive) to "increasing perturbation" (i.e. human activities) and therefore might be found in isolated, un-impacted natural water body. The tolerance value of 10 represents extremely tolerant organisms (i.e. capable of existing in extremely disturbed or polluted water body) [7].

Figure 6. Sample specimen jar and data sheet.

A tolerance value was assigned to each of the collected macro-invertebrate Families, and a weighted-average tolerance value was assigned to each sampling reach. The weighted-average tolerance value was calculated by multiplying the tolerance value assigned each taxon; by the number of collected specimen of that taxon; totaling the totals for all taxa collected per sampling reach; and dividing this total by the total number of organisms collected in that reach. This is known as the Hilsenhoff Family Biotic Index[8,9] and is a recognized method for evaluating impacts to an environment[10].

No problems were encountered with respect to the benthic macro-invertebrate collection and identification aspect of the project.

[7] The RBP tolerance values are not derived from within or near the study area, but are interpolated from different areas of the country including Idaho, Ohio, and the mid-Atlantic coastal states.

[8] Hilsenhoff, W. L. 1988. *Seasonal correction factors for the biotic index*. Great Lakes Entomologist, Journal of the North American Benthological Society, 21:9–13.

[9] Hilsenhoff, W. L. 1988. *Rapid field assessment of organic pollution with a family level biotic index.* Journal of the North American Benthological Society, 7(1):65–68.

[10] Zimmerman, M. C. 1993. *The use of the biotic index as an indication of water quality.* Pages 85-98, *in* Tested studies for laboratory teaching, Volume 5 (C.A. Goldman, P.L.Hauta, M.A. O'Donnell, S.E. Andrews, and R. van der Heiden, Editors). Proceedings of the 5th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 115 pages.

RESULTS FROM BENTHIC MACRO-INVERTEBRATE COLLECTION AND IDENTIFICATION

The benthic macro-invertebrate community sampled in Crawford Creek was identified to Family level and found to be of relatively low diversity. The majority of organisms collected were midge larvae and pupae of the family Chironomidae (Diptera), with the second most common group of organisms being segmented worms (Annelida: Oligochaeta)[11]. Third most common were snails (Gastropoda) in the Families Lymnaeidae, Physidae, and Planorbidae. A few specimens in the following groups were also collected:

- Leeches (Hirudinea) in the Families Glossiphoniidae and Erpobdellidae;
- Amphipods (Amphipoda) in the Family Hyalellidae;
- Crayfish (Decapoda) in the Family Cambaridae (three small juveniles <1" long);
- Mayflies (Ephemeroptera) in the Families Baetidae, Caenidae, and Heptageniidae);
- Caddisflies (Trichoptera) in the Families Hydroptilidae, Limnephilidae, and Psychomyiidae);
- Beetles (Coleoptera) in the Family Haliplidae;
- True flies (Diptera) in the Families Ceratopogonidae and Tabanidae;
- Dragonflies and damselflies (Odonata) in the Families Coenagrionidae, Corduliidae, and Libelullidae; and
- Fingernail clams (Pelecypoda) in the Family Sphaeriidae.

Benthic macro-invertebrates collected in each Reach, along with the respective RBP tolerance values, are tabulated in Table 4. A total of only 22 taxa were collected in all four reaches of Crawford Creek combined. The results from the complete sampling of the Reach 1 sample, when compared with the results of the 25% sub-sampling of Reaches 2, 3, and 4, indicates only a minimal number of taxa, and a minor portion of the benthic community may have been missed in the sub-sampling process.

The RBP discusses a number of different benthic metrics for analyzing the macro-invertebrate community. The Hilsenhoff Family Biotic Index (FBI) is a recognized method for analyzing impacts and comparing stream environments, and requires identification only to the Family level. Analysis of the four study reaches of Crawford Creek yielded tolerance value with averages ranging from 5.9 to 6.3 per reach; with an overall average for the entire study area of 6.0 (Table 4). These data show the stream is populated with mid-tolerant organisms, which would indicate this area of Crawford Creek is moderately-impacted. The interpretations of the Hilsenhoff FBI are provided in Table 5.

However, habitat could also be responsible for the low benthic diversity. The substrate of the study area was primarily composed of silt and clay, with almost no gravels. Gravels and cobbles are important habitat for a number of stream-dwelling aquatic organisms, especially mayflies, stoneflies (Plecoptera), and caddisflies. The absence of coarser substrates, providing productive

[11] The segmented worms collected in Crawford Creek were not identified below class level.

interstitial habitat, would preclude the occurrence of these insects at the study area of Crawford Creek. The relatively high amount of silt and clay particles in the stream would also smother the gills of many mayfly, stonefly, and caddisfly species.

Order/Class	Family	Tolerance Value per Taxon	Reach 1	Reach 2*	Reach 3*	Reach 4*
Oligochaeta	not identified	5 (ID)	141	32	14	1
Hirudinea	Glossiphoniidae	8 (ID)	3	3	0	0
	Erpobdellidae	8 (ID)	5	3	0	0
Amphipoda	Hyalellidae	8 (ID)	14	0	8	4
Decapoda	Cambaridae	6 (MACS)	3	0	0	0
Ephemeroptera	Baetidae	4 (ID, MACS)	6	0	0	0
	Caenidae	7 (ID)	7	0	0	0
	Heptageniidae	4 (ID)	1	0	0	1
Trichoptera	Hydroptilidae	4 (ID)	0	0	1	0
	Limnephilidae	4 (ID, MACS)	1	0	0	0
	Psychomyiidae	INA	1	0	0	0
Coleoptera	Haliplidae	7 (ID)	2	0	0	0
Diptera	Ceratopogonidae	5.7-6 (OH, MACS)	4	2	1	0
	Chironomidae	6 (ID)	333	44	59	58
	Tabanidae	8 (ID)	1	0	0	0
Gastropoda	Lymnaeidae	6-6.9 (OH, ID, MACS)	5	0	1	0
	Physidae	8 (ID)	31	2	8	2
	Planorbidae	7 (ID)	13	1	2	0
Pelecypoda	Sphaeriidae	8 (ID, MACS)	0	0	9	2
Odonata	Corduliidae	2-5 (ID, MACS)	5	0	0	0
	Libelullidae	9 ID, MACS)	1	0	0	0
	Coenagrionidae	6.1-9 (OH, ID, MACS)	0	0	0	1

Table 4. Benthic macro-invertebrates collected in Crawford Creek with RBP tolerance values (* references a 25% sub-sample). Abbreviations for tolerance value sources are ID = Idaho, MACS = Mid-Atlantic Coastal States, and OH = Ohio. INA = information not available.

Biotic Index	Water quality	Degree of organic pollution
0.00–3.50	Excellent	No apparent organic pollution
3.51–4.50	Very good	Possible slight organic pollution
4.51–5.50	Good	Some organic pollution
5.51–6.50	Fair	Fairly significant organic pollution
6.51–7.50	Fairly poor	Significant organic pollution
7.51–8.50	Poor	Very significant organic pollution
8.51–10.0	Very poor	Severe organic pollution

Table 5. Taken from Hilsenhoff Family Biotic Index[10].

Another method which can be utilized from the RBP benthic macro-invertebrate data, to evaluate the aquatic environment is the measure the percent of the dominant taxa in the samples. Increased perturbation to an aquatic environment often results in a reduction of less tolerant taxa and the population becoming dominated by only a few tolerant taxa. The data from all four of the reaches indicates this to be the case.

Reach 1 samples contained a total of 577 organisms. Of this total, 333 (57.7%) of the sample were midge larvae and pupae, and 141 of the sample (24.4%) were segmented worms; totaling 81.1% of the sample. Reaches 2 through 4 (which were sub-sampled) had similar percentages.

- Reach 2 samples contained 48.4% midge larvae and pupae, and 35.1% segmented worms, (totaling 83.5% of the samples).

- Reach 3 samples contained 45.4% midge larvae and pupae, and 13.6% segmented worms (totaling 59% of the samples).

- Reach 4 samples contained 72.5% midge larvae and pupae, and 15% segmented worms (totaling of 87.5% samples).

Midge larvae and pupae and segmented worms were the dominant taxa. Given their respective dominance and tolerance ratings of 6 and 5, the data indicates some type of perturbation or impairment exists in the study area of Crawford Creek.

FISH COLLECTION

AFFILIATED RESEARCHERS collected fish for laboratory analysis of bio-accumulation, and also for use in determining the Index of Biological Integrity (IBI). Based upon the environmental conditions of Crawford Creek, fish collection was conducted utilizing gill nets, a cast net, and a beach seine net.

On 15 July 2014, four gill nets, each measuring 24' x 4' and each containing four panels of different mesh sizes (1", 2", 4", and 8" stretch length), were set, one per reach in the Crawford Creek study area. The four gill nets were checked the next morning and pulled. On 16 July 2014, one gill net was placed in Crawford Creek in Reach 1, and three gill nets were placed in the Nemadji River below the confluence with Crawford Creek. The four gill nets were again checked the next morning and pulled.

In addition, fish capture was conducted in Crawford Creek on 17 July 2014 using a 6-foot diameter, clear monofilament cast net with 3/8" mesh (Figure 7). Finally, a 20-foot beach seine was used in Reach 1 for the collection of forage fish (i.e. minnows, fry, young-of-the-year) in areas of the creek which were accessible for seine usage.

RBP fish sampling field data sheets were completed by AFFILIATED RESEARCHERS' aquatic Scientist at each of the 4 reaches (Attachment 6). Captured fish specimens were delivered to CH2MHill personnel for cataloging and processing.

Figure 7. Cast netting in Crawford Creek.

No problems were encountered with the fish collection aspect of the project. Although the number of fish specimens captured was below expectations, all parties involved agreed the number of fish specimens captured would be sufficient to allow for the proposed bio-accumulation analysis.

RESULTS FROM FISH COLLECTION

A small but adequate number of fish specimens were collected utilizing the multiple methods described. The 4 gill nets placed in Crawford Creek during the afternoon of 15 July 2014 yielded the following results.

- Reach 1: two northern pike (31.5" total length shown in Figure 8; and 12" total length), and one black bullhead (*Ameiurus melas*; 7" total length).
- Reach 2: no fish were captured.
- Reach 3: one northern pike (12" total length); and one trout-perch (*Percopsis omiscomaycus*; 4.5" total length).
- Reach 4: one northern pike (*Esox lucius*; 14" total length).

Due to the relatively small numbers of fish captured, and the lack of forage fish, it was decided by CH2MHill, USEPA, and AFFILIATED RESEARCHERS to place three gill nets in the Nemadji River (below the confluence with Crawford Creek), and one gill net in Crawford Creek at Reach 1. As previously described, these nets were placed on the afternoon of 16 August and pulled the following morning. This net set produced the following results:

- Nets #1 and #3 in the Nemadji River did not capture any fish;

- Net #2 in the Nemadji River captured one channel catfish (*Ictalurus punctatus*, 17.25" total length), and one black redhorse sucker (*Moxostoma duquesni*, 17" total length, Figure 9); and,
- Net #4 at Reach 1 of Crawford Creek captured tow northern pike (13.5" and 12" total length).

As previously discussed, methods also included cast netting and seining. The cast net was thrown 3 times into each Reach of Crawford Creek. No fish were captured at Reaches 2 or 3; one northern pike (10.75" total length) was captured at Reach 1; and one minnow (Family Cyprinidae, 3") was caught at Reach 4.

Seine netting was only used at Reach 1 of Crawford Creek, due to the difficulty of seining other sections of the creek attributed to water depth, steep banks, or slick clay substrates. The seine netting captured approximately numerous minnows (species unknown, but some thought to be *Notemigonus crysoleucas*), and several brook sticklebacks (*Culaea inconstans*).

Fish collected during the investigation are summarized in Table 6.

Figure 8. Northern pike, 31.5" in total length from Reach 1 of Crawford Creek.

Despite the low number of individual fish collected, these data can be used for some analysis of the water quality conditions in Crawford Creek. The Index of Biological Integrity, as described in the RBP, is a series of metrics which can be chosen for particular stream conditions to assess the biological health of the stream.

Figure 9. Channel catfish and black redhorse sucker netting from the Nemadji River.

Collection Date	Location	Species	Common Name	Length (inches)
16 July 2014	Crawford Creek	*Esox Lucius*	northern pike	11.5
		Esox Lucius	northern pike	12.0
		Esox Lucius	northern pike	14.0
		Esox Lucius	northern pike	31.5
		Ameiurus melas	black bullhead	7.0
		Percopsis omiscomaycus	trout-perch	4.5
17 July 2014	Nemadji River	*Ictalurus punctatus*	channel catfish	17.25
		Moxostoma duquesni	black redhorse	17.0
17 July 2014	Crawford Creek	*Esox Lucius*	northern pike	12.0
		Esox Lucius	northern pike	13.5
		Esox Lucius	northern pike	9.0
		Culaea inconstans†	brook stickleback†	~2
		Notemigonus crysoleucas† *	golden shiner† *	~2
		unknown†	minnows†	~1
†Numerous individuals collected				
*Identification uncertain				

Table 6. Fish collected in Crawford Creek and the Nemadji River.

The RBP lists 12 metrics which are considered to be suitable for warm water streams in Wisconsin:

- native fish species collected;
- darter, darters, sculpins, and madtoms species collected;
- sunfish species collected;
- sucker species collected;
- intolerant species collected;
- tolerant species collected;
- percent of omnivores collected;
- percent of insectivores collected;
- percent of top carnivores collected;
- number of specimen, excluding tolerant species, collected;
- percent of simple lithophils (i.e., rock-loving species) collected; and,
- percent of diseased individuals (deformities, eroded fins, lesions, and tumors) collected.

The total number of native fish species collected was 6 in Crawford Creek and 2 in the Nemadji River. The RBP states: "*The number of species is strongly affected by stream size*…." The RBP also states that the number of native fish species generally declines with increasing degradation of a stream environment.

No darters, sculpins, or madtoms were collected in either Crawford Creek or the Nemadji River. However, this may be due to the lack of suitable habitat[12] for these species (gravel or vegetative substrates) throughout the study area.

No sunfish species were collected in either Crawford Creek or the Nemadji River, although suitable habitat seemed[12] to be present for at least some sunfish species (i.e. *Lepomis cyanellus*), and other members of the Family Centrarchidae (i.e. *Micropterus salmoides*). The RBP states that these pool-dwelling species decrease in abundance with pool and instream cover degradation. However, pool habitat degradation was not observed within the study area.

Only one sucker was captured during this study, a black redhorse captured in the Nemadji River. Redhorse suckers (*Moxostoma* spp.) are generally considered to be "intolerant" of environmental perturbations[13], as are many other species of suckers. All of the other species collected (87.5%) are considered "tolerant".

Two of the species collected (25%) are listed as omnivores[12], the golden shiner and the black bullhead. The small minnows (≤ 1") collected were not identified to species.

[12] Hubbs, C.L. and K.F. Lagler. 2004. Fishes of the Great Lakes Region, Revised Edition. University of Michigan Press. Ann Arbor, MI. 276pp.

[13] Michigan Department of Environmental Quality Document Number WB-SWAS-051, revised 2008. *Qualitative Biological and Habitat Survey Protocols for Wadeable Streams and Rivers*. Lansing, MI. 53 pp.

Approximately 37.5% of the species collected are considered to be insectivores including black redhorse, brook stickleback, and trout-perch. Many minnow species are also considered of insectivorous species, and would increase the respective percentage of the catch significantly. The RBP states that as the invertebrate community is impacted and becomes less abundant and diverse, the percentage of insectivores will decrease as the percentage of omnivores increases. Due to the lack of species-level identification of the unknown minnows, the interpretation of this metric is limited.

The only top carnivore species collected during this study was northern pike, but seven individuals were collected in Crawford Creek, including a large adult of 31.5" in total length. Other individuals ranged from 9" to 14" in total length (i.e. juveniles). The size and biomass of this species is significant. According to the RBP, the presence of northern pike can be an indicator of moderate quality.

If all tolerant species are excluded, the number of individuals collected metric yields a value of only 1, the black redhorse, and this fish was collected from the Nemadji River, not Crawford Creek itself. This metric indicates substantial impairment of the stream environment.

Finally, no diseased or malformed individuals were collected. All collected individuals appeared to be relatively healthy, with fully formed fins and no signs of any external lesions, tumors, or other noted anatomical/physiological problems.

Attachment 1

OPUS Solution for *Loons Foot Landing*

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From: opus
To: mike@affiliatedresearchers.com
Subject: OPUS solution : 68640930.14o OP1396876545763
Date: Monday, April 07, 2014 9:17:05 AM

FILE: 68640930.14o OP1396876545763

NGS OPUS SOLUTION REPORT
==========

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: mike@affiliatedresearchers.com DATE: April 07, 2014
RINEX FILE: 6864093o.14o TIME: 13:16:18 UTC

SOFTWARE: page5 1209.04 master92.pl 022814 START: 2014/04/03 14:07:00
EPHEMERIS: igr17864.eph [rapid] STOP: 2014/04/03 16:13:00
NAV FILE: brdc0930.14n OBS USED: 4858 / 5516 : 88%
ANT NAME: TRMR8_GNSS3 NONE # FIXED AMB: 56 / 58 : 97%
ARP HEIGHT: 2.000 OVERALL RMS: 0.015(m)

REF FRAME:	NAD_83(2011)(EPOCH:2010.0000)		IGS08 (EPOCH:2014.2538)	
X:	-155637.030(m)	0.003(m)	-155637.882(m)	0.003(m)
Y:	-4379365.156(m)	0.019(m)	-4379363.856(m)	0.019(m)
Z:	4619067.676(m)	0.010(m)	4619067.642(m)	0.010(m)
LAT:	46 41 59.86395	0.012(m)	46 41 59.89310	0.012(m)
E LON:	267 57 52.69666	0.003(m)	267 57 52.65441	0.003(m)
W LON:	92 2 7.30334	0.003(m)	92 2 7.34559	0.003(m)
EL HGT:	157.219(m)	0.016(m)	156.324(m)	0.016(m)
ORTHO HGT:	185.496(m)	0.027(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (4801 WI N)
Northing (Y) [meters]	5172274.700	172417.375
Easting (X) [meters]	573746.486	444352.890
Convergence [degrees]	0.70206829	-1.46825072
Point Scale	0.99966685	0.99998848
Combined Factor	0.99964221	0.99996384

US NATIONAL GRID DESIGNATOR: 15TWM7374672274(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DJ7860	WIS6 WISCONSIN POINT 6 CORS ARP	N464218.365	W0920056.142	1616.1
DK6521	MNVI VIRGINIA CORS ARP	N473123.771	W0923341.433	99864.7
DO7035	WIBL BELL CORS ARP	N465158.803	W0910508.725	74837.4

NEAREST NGS PUBLISHED CONTROL POINT

DO6073	9B32	N464135.	W0920147.	881.2

This position and the above vector components were computed without any
knowledge by the National Geodetic Survey regarding the equipment or

Attachment 2

Resume of Aquatic Scientist, Jonathon DeNike

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JONATHON M. DENIKE

BOTANIST; ENTOMOLOGIST; AQUATIC BIOLOGIST
AFFILIATED RESEARCHERS

SUMMARY OF EXPERIENCE:

- Mr. DeNike began career in biology in 1992, and is Affiliated Researchers' botanist, wetland scientist, aquatic biologist, and entomologist
- Mr. DeNike was the Senior Project Scientist on recent GLNPO project at the Maumee River AOC, provided expertise as an aquatic entomologist.
- As a professional Botanist, Mr. DeNike has been involved in more than 30 projects involving threatened, endangered, and invasive species.
- As a professional wetland scientist, he has been involved in more than 100 wetland determinations.
- Mr. DeNike has been involved in more than 20 environmental projects as a professional entomologist.
- As an Aquatic Biologist, Mr. DeNike has been involved in numerous NEPA water quality investigations.
- Mr. DeNike has extensive experience in coordinating with local, state, and federal regulatory agencies in projects involving ESA, NEPA, CWA and Michigan PA 451.

PROFESSIONAL STRENGTHS:

- Plant taxonomy and ecology
- Benthic macroinvertebrate taxonomy and ecology
- ESA threatened and endangered species inventories
- NEPA biological investigations
- Environmental indicator species identification
- Aquatic ecosystems, herpetology, and freshwater fisheries
- Section 404 CWA wetland delineations
- Invasive species inventories
- Water quality and environmental restoration monitoring
- Environmental data analysis and reporting

HIGHER EDUCATION:

Bachelor of Science in Botany, 1986, University of Michigan
Master of Science in Entomology, 1991, Michigan State University
PhD Program in Entomology/Aquatic Ecology, 1996, University of Missouri

EMPLOYMENT HISTORY:

Senior Project Scientist. *Affiliated Researchers*, 2008 to present
Natural Resource Specialist. *JJR*, 2005 to 2008
Biologist. *Blanton and Associates*, 2004 to 2005
Biologist; Environmental Scientist. *Hill Country Environmental*, 2003 to 2004
Senior Ecologist; NEPA Specialist. *Kisinger Campo and Associates*, 2002 to 2003
Biologist. *Affiliated Researchers*, 1999 to 2001

(989) 739-5471 • 864 Aulerich Road, East Tawas, Michigan 48730 • jonathon@affiliatedresearchers.com

Attachment 3

RBP Habitat Quality Field Data Sheets

(989) 739-5471 • 864 Aulerich Road, East Tawas, Michigan 48730 • www.affiliatedresearchers.com
Verified Service-disabled Veteran-owned Small Business • *Certified HUBZone Business Consideration*

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 1 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Nemadji	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 9:40 (AM) PM	REASON FOR SURVEY EPA contamination study

WEATHER CONDITIONS

Mostly sunny, light breeze

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	■
30 % ■	%cloud cover	☐ ___ %
☐	clear/sunny	☐

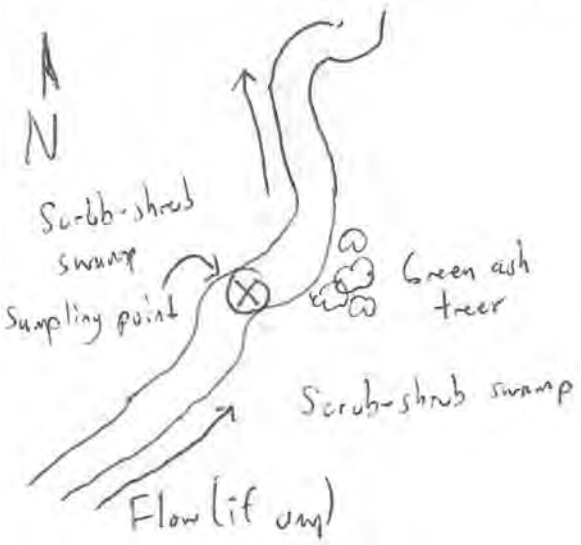
Has there been a heavy rain in the last 7 days? ■ Yes ☐ No

Air Temperature 15.7 °C

Other _____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
■ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ■ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
■ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☐ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ■ Other Scrub, shrub swamp
☐ Residential

Local Watershed NPS Pollution
■ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ■ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
■ Trees ■ Shrubs ■ Grasses ☐ Herbaceous
dominant species present willow, green ash, grasses, sedges

INSTREAM FEATURES

Estimated Reach Length 100 m
Estimated Stream Width 3 m
Sampling Reach Area 20 m²
Area in km² (m²x1000) _____ km²
Estimated Stream Depth 0.5 m
Surface Velocity (at thalweg) 0 m/sec

Canopy Cover
■ Partly open ☐ Partly shaded ☐ Shaded
High Water Mark 2 m
Proportion of Reach Represented by Stream Morphology Types
☐ Riffle ____ % ☐ Run ____ %
■ Pool 100 %
Channelized ☐ Yes ■ No
Dam Present ☐ Yes ■ No

LARGE WOODY DEBRIS

LWD 0 m²
Density of LWD 0 m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ■ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae
dominant species present Polygonum sp.
Portion of the reach with aquatic vegetation 1 %

WATER QUALITY

Temperature 16.5 °C
Specific Conductance –
Dissolved Oxygen 6.5 mg/L
pH –
Turbidity –
WQ Instrument Used YSI Pro 6DO

Water Odors
■ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other _____

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
■ None ☐ Other _____

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ■ Turbid
☐ Opaque ☐ Stained ☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
■ Other creosote (slight)

Oils
■ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other _____

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No N/A

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	45			
Clay	< 0.004 mm (slick)	950			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 1 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Neuse	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 16:10 (AM) PM	REASON FOR SURVEY EPA contamination study

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0

Total Score 153

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 2 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Nemadji	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 10:30 (AM) PM	REASON FOR SURVEY EPA contamination study

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	■
80% ■	%cloud cover	☐ ___%
☐	clear/sunny	☐

Has there been a heavy rain in the last 7 days? ■ Yes ☐ No

Air Temperature 19.1 °C

Other _____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION

Stream Subsystem
■ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ■ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
■ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other_____

Catchment Area_____km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
■ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
■ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
■ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
■ Trees ❑ Shrubs ■ Grasses ■ Herbaceous
dominant species present Green ash, grasses

INSTREAM FEATURES

Estimated Reach Length 100 m
Estimated Stream Width 4-5 m
Sampling Reach Area 20 m^2
Area in km^2 (m^2x1000) _____ km^2
Estimated Stream Depth 0.7 m
Surface Velocity (at thalweg) 0 m/sec

Canopy Cover
❑ Partly open ■ Partly shaded ❑ Shaded
High Water Mark 3 m
Proportion of Reach Represented by Stream Morphology Types
❑ Riffle _____ % ❑ Run _____ %
■ Pool 100 %
Channelized ❑ Yes ■ No
Dam Present ❑ Yes ■ No

LARGE WOODY DEBRIS

LWD 1 m^2
Density of LWD _____ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ❑ Attached Algae
dominant species present None
Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature 17.1 °C
Specific Conductance –
Dissolved Oxygen 6.4 mg/L
pH –
Turbidity –
WQ Instrument Used YSI Pro ODO

Water Odors
■ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other _____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
■ None ❑ Other _____

Turbidity (if not measured)
❑ Clear ❑ Slightly turbid ■ Turbid
❑ Opaque ❑ Stained ❑ Other _____

SEDIMENT/ SUBSTRATE

Odors
❑ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
■ Other creosote/mayapul (Exint)

Oils
■ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other None

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ❑ No N/A

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	45			
Clay	< 0.004 mm (slick)	50			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Crawford Creek	LOCATION
STATION # 2 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
INVESTIGATORS Jonathon M. DeNike	
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 10:45 (AM) PM
REASON FOR SURVEY EPA contaminant study	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 161

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 3 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Nemadji	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 10:55 (AM) PM	REASON FOR SURVEY EPA contamination study

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	■
80 % ■	%cloud cover	☐ ___ %
☐	clear/sunny	☐

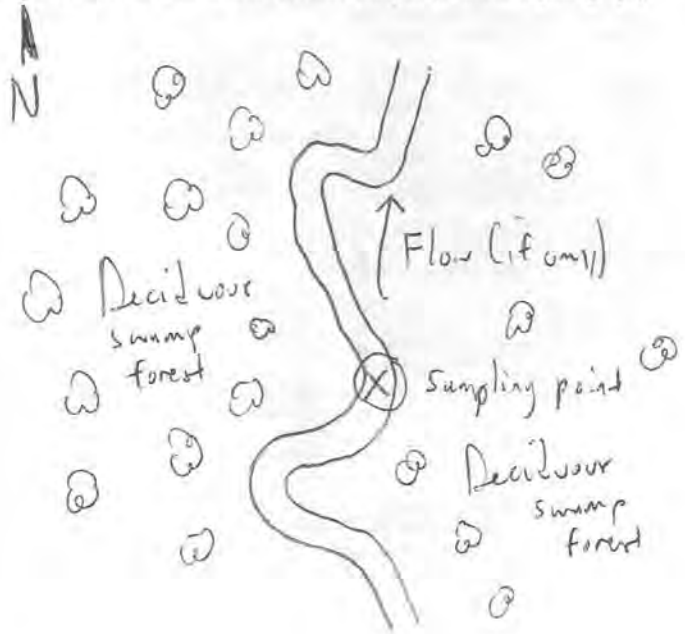
Has there been a heavy rain in the last 7 days? ■ Yes ☐ No

Air Temperature 18.2 °C

Other _____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
■ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ■ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
■ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
■ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
■ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
■ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
■ Trees ❑ Shrubs ■ Grasses ■ Herbaceous

dominant species present green ash, ostrich fern, grasses

INSTREAM FEATURES

Estimated Reach Length 100 m
Estimated Stream Width 4-5 m
Sampling Reach Area 20 m^2
Area in km^2 (m^2x1000) _____ km^2
Estimated Stream Depth 1.3 m
Surface Velocity (at thalweg) 0 m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ■ Shaded

High Water Mark 3 m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle _____ % ❑ Run _____ %
■ Pool 100 %

Channelized ❑ Yes ■ No

Dam Present ❑ Yes ■ No

LARGE WOODY DEBRIS

LWD 1 m^2
Density of LWD _____ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ❑ Attached Algae

dominant species present None

Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature 17.3 °C
Specific Conductance —
Dissolved Oxygen 6.0 mg/L
pH —
Turbidity —
WQ Instrument Used YSI Pro ODO

Water Odors
■ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other _____

Water Surface Oils
■ Slick ❑ Sheen ❑ Globs ❑ Flecks
❑ None ❑ Other _____

Turbidity (if not measured)
❑ Clear ❑ Slightly turbid ■ Turbid
❑ Opaque ❑ Stained ❑ Other _____

SEDIMENT/ SUBSTRATE

Odors
■ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other _____

Oils
■ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other None

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ❑ No N/A

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	45			
Clay	< 0.004 mm (slick)	45			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Crawford Creek	LOCATION
STATION # 3 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
INVESTIGATORS Jonathan M. DeNike	
FORM COMPLETED BY Jonathan M. DeNike	DATE 7/15/14 TIME 11:15 (AM) PM
REASON FOR SURVEY EPA contamination study	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 16 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 161

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 4 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Kenosha	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 11:25 (AM) PM	REASON FOR SURVEY EPA contamination survey

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
80 % ☑	%cloud cover	☐ ___ %
☐	clear/sunny	☐

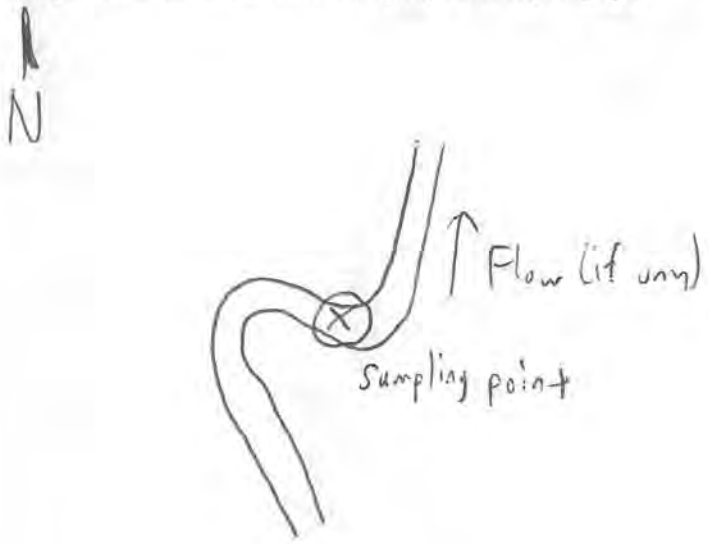
Has there been a heavy rain in the last 7 days? ☑ Yes ☐ No

Air Temperature 18.0 °C

Other _____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☑ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☑ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☑ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
■ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
■ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
■ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
■ Trees ❑ Shrubs ■ Grasses ■ Herbaceous
dominant species present Green ash, silver maple, ostrich fern

INSTREAM FEATURES

Estimated Reach Length 100 m
Estimated Stream Width 4-5 m
Sampling Reach Area 20 m^2
Area in km^2 (m^2x1000) _____ km^2
Estimated Stream Depth 1.3 m
Surface Velocity (at thalweg) 0 m/sec

Canopy Cover
❑ Partly open ■ Partly shaded ❑ Shaded

High Water Mark _____ m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle _____ % ❑ Run _____ %
■ Pool 100 %

Channelized ❑ Yes ■ No

Dam Present ❑ Yes ■ No

LARGE WOODY DEBRIS

LWD 2 m^2
Density of LWD _____ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ❑ Attached Algae
dominant species present None
Portion of the reach with aquatic vegetation 0 %

WATER QUALITY

Temperature 17.7 °C
Specific Conductance –
Dissolved Oxygen 6.0 mg/L
pH –
Turbidity _____
WQ Instrument Used YSI Pro ODO

Water Odors
■ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other _____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
❑ None ❑ Other None

Turbidity (if not measured)
❑ Clear ❑ Slightly turbid ■ Turbid
❑ Opaque ❑ Stained ❑ Other _____

SEDIMENT/ SUBSTRATE

Odors
■ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other _____

Oils
■ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other None

Looking at stones which are not deeply embedded, are the undersides black in color? N/A
❑ Yes ❑ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	40			
Clay	< 0.004 mm (slick)	50			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Crawford Creek	LOCATION	
STATION # 4 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Neshaminy	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 11:40 (AM) PM	REASON FOR SURVEY EPA contaminant study

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 16 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 161

Attachment 4

RBP Macro-invertebrate Field Data Sheets

(989) 739-5471 • 864 Aulerich Road, East Tawas, Michigan 48730 • www.affiliatedresearchers.com
Verified Service-disabled Veteran-owned Small Business • *Certified HUBZone Business Consideration*

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Crawford Creek	LOCATION	
STATION # 1 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Neuse	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		LOT NUMBER
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/15/14 TIME 12:25 AM (PM)	REASON FOR SURVEY EPA contaminant study

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐ Cobble ____ % ■ Snags 10 % ☐ Vegetated Banks 10 % ☐ Sand ____ % ☐ Submerged Macrophytes ____ % ■ Other (bottom) 80 %
SAMPLE COLLECTION	**Gear used** ■ D-frame ☐ kick-net ☐ Other ____ **How were the samples collected?** ☐ wading ~~■ from bank~~ ■ from boat (~~both~~) **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble ____ ■ Snags 2 ■ Vegetated Banks 2 ☐ Sand ____ ☐ Submerged Macrophytes ____ ■ Other (bottom) 16
GENERAL COMMENTS	Pool habitat w/ no visible current, very little woody debris, banks vegetated & just below water surface, no aquatic plants

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	(0)	1	2	3	4	Fish	(0)	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	(0)	1	2	3	4	Anisoptera	0	(1)	2	3	4	Chironomidae	(0)	1	2	3	4
Hydrozoa	(0)	1	2	3	4	Zygoptera	0	1	(2)	3	4	Ephemeroptera	(0)	1	2	3	4
Platyhelminthes	(0)	1	2	3	4	Hemiptera	(0)	1	2	3	4	Trichoptera	(0)	1	2	3	4
Turbellaria	(0)	1	2	3	4	Coleoptera	(0)	1	2	3	4	Other	(0)	1	2	3	4
Hirudinea	(0)	1	2	3	4	Lepidoptera	(0)	1	2	3	4						
Oligochaeta	(0)	1	2	3	4	Sialidae	(0)	1	2	3	4						
Isopoda	(0)	1	2	3	4	Corydalidae	(0)	1	2	3	4						
Amphipoda	(0)	1	2	3	4	Tipulidae	(0)	1	2	3	4						
Decapoda	(0)	1	2	3	4	Empididae	(0)	1	2	3	4						
Gastropoda	0	(1)	2	3	4	Simuliidae	(0)	1	2	3	4						
Bivalvia	(0)	1	2	3	4	Tabinidae	(0)	1	2	3	4						
						Culcidae	(0)	1	2	3	4						

Note: samples turbid visibility difficult

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Crawford Creek	LOCATION	
STATION # 2 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Nemadji	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeVike		LOT NUMBER
FORM COMPLETED BY Jonathon M. DeVike	DATE 7/15/14 TIME 1:05 AM (PM)	REASON FOR SURVEY EPA contamination survey

HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Cobble ____ % ❑ Snags 10 % ❑ Vegetated Banks 5 % ❑ Sand ____ % ❑ Submerged Macrophytes ____ % ❑ Other (bottom) 85 %
SAMPLE COLLECTION	**Gear used** ■ D-frame ❑ kick-net ❑ Other _____ **How were the samples collected?** ❑ wading ❑ from bank ■ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ❑ Cobble ____ ■ Snags 2 ■ Vegetated Banks 1 ❑ Sand ____ ❑ Submerged Macrophytes ____ ■ Other (bottom) 97
GENERAL COMMENTS	Pool habitat w/ no visible current, very little wood debris banks vegetated to water surface, no aquatic plants

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	(0)	1	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	(0)	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	(0)	1	2	3	4	Anisoptera	(0)	1	2	3	4
Hydrozoa	(0)	1	2	3	4	Zygoptera	(0)	1	2	3	4
Platyhelminthes	(0)	1	2	3	4	Hemiptera	(0)	1	2	3	4
Turbellaria	(0)	1	2	3	4	Coleoptera	(0)	1	2	3	4
Hirudinea	(0)	1	2	3	4	Lepidoptera	(0)	1	2	3	4
Oligochaeta	(0)	1	2	3	4	Sialidae	(0)	1	2	3	4
Isopoda	(0)	1	2	3	4	Corydalidae	(0)	1	2	3	4
Amphipoda	(0)	1	2	3	4	Tipulidae	(0)	1	2	3	4
Decapoda	(0)	1	2	3	4	Empididae	(0)	1	2	3	4
Gastropoda	(0)	1	2	3	4	Simuliidae	(0)	1	2	3	4
Bivalvia	(0)	1	2	3	4	Tabinidae	(0)	1	2	3	4
						Culcidae	(0)	1	2	3	4

Chironomidae	(0)	1	2	3	4
Ephemeroptera	(0)	1	2	3	4
Trichoptera	(0)	1	2	3	4
Other	(0)	1	2	3	4

No organisms observed in sample in field

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Crawford Creek	LOCATION	
STATION # 3 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN Neuse	
STORET #	AGENCY	
INVESTIGATORS Jonathon M. DeNike		LOT NUMBER
FORM COMPLETED BY Jonathon M. DeNike	DATE 7/16/14 TIME 10:40 (AM) PM	REASON FOR SURVEY EPA contaminant study

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐ Cobble ____% ■ Snags 10 % ☐ Vegetated Banks ____% ☐ Sand ____% ☐ Submerged Macrophytes ____% ■ Other (bottom) 80 %
SAMPLE COLLECTION	**Gear used** ■ D-frame ☐ kick-net ☐ Other ____ **How were the samples collected?** ☐ wading ☐ from bank ■ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble ____ ■ Snags 2 ☐ Vegetated Banks ____ ☐ Sand ____ ☐ Submerged Macrophytes ____ ■ Other (bottom) 18
GENERAL COMMENTS	Steep banks, clay bottom, no aquatic vegetation

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	(0)	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	(0)	1	2	3	4	Anisoptera	(0)	1	2	3	4	Chironomidae	(0)	1	2	3	4
Hydrozoa	(0)	1	2	3	4	Zygoptera	(0)	1	2	3	4	Ephemeroptera	(0)	1	2	3	4
Platyhelminthes	(0)	1	2	3	4	Hemiptera	(0)	1	2	3	4	Trichoptera	(0)	1	2	3	4
Turbellaria	(0)	1	2	3	4	Coleoptera	(0)	1	2	3	4	Other	(0)	1	2	3	4
Hirudinea	(0)	1	2	3	4	Lepidoptera	(0)	1	2	3	4						
Oligochaeta	(0)	1	2	3	4	Sialidae	(0)	1	2	3	4						
Isopoda	(0)	1	2	3	4	Corydalidae	(0)	1	2	3	4						
Amphipoda	(0)	1	2	3	4	Tipulidae	(0)	1	2	3	4						
Decapoda	(0)	1	2	3	4	Empididae	(0)	1	2	3	4						
Gastropoda	(0)	1	2	3	4	Simuliidae	(0)	1	2	3	4						
Bivalvia	0	(1)	2	3	4	Tabinidae	(0)	1	2	3	4						
						Culcidae	(0)	1	2	3	4						

Sampler full of silt, difficult to examine in field

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Crawford Creek	LOCATION
STATION # 4 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Neuse
STORET #	AGENCY
INVESTIGATORS Jonathan M. DeNivo	LOT NUMBER
FORM COMPLETED BY Jonathan M. DeNivo	DATE 7/16/14 TIME 1:35 AM (PM)
	REASON FOR SURVEY EPA contaminant survey

HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Cobble ____% ■ Snags 15 % ❑ Vegetated Banks ____% ❑ Sand ____% ❑ Submerged Macrophytes ____% ■ Other (bottom) 85 %
SAMPLE COLLECTION	**Gear used** ■ D-frame ❑ kick-net ❑ Other ____ **How were the samples collected?** ❑ wading ❑ from bank ■ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ❑ Cobble ____ ■ Snags 10 ❑ Vegetated Banks ____ ❑ Sand ____ ❑ Submerged Macrophytes ____ ■ Other (bottom) 17
GENERAL COMMENTS	Steep banks, clay bottom, no aquatic vegetation

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	(0)	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	(0)	1	2	3	4	Anisoptera	(0)	1	2	3	4	Chironomidae	(0)	1	2	3	4
Hydrozoa	(0)	1	2	3	4	Zygoptera	0	(1)	2	3	4	Ephemeroptera	(0)	1	2	3	4
Platyhelminthes	(0)	1	2	3	4	Hemiptera	(0)	1	2	3	4	Trichoptera	(0)	1	2	3	4
Turbellaria	(0)	1	2	3	4	Coleoptera	(0)	1	2	3	4	Other	(0)	1	2	3	4
Hirudinea	(0)	1	2	3	4	Lepidoptera	(0)	1	2	3	4						
Oligochaeta	0	(1)	2	3	4	Sialidae	(0)	1	2	3	4						
Isopoda	(0)	1	2	3	4	Corydalidae	(0)	1	2	3	4						
Amphipoda	(0)	1	2	3	4	Tipulidae	(0)	1	2	3	4						
Decapoda	(0)	1	2	3	4	Empididae	(0)	1	2	3	4						
Gastropoda	0	(1)	2	3	4	Simuliidae	(0)	1	2	3	4						
Bivalvia	0	(1)	2	3	4	Tabinidae	(0)	1	2	3	4						
						Culcidae	(0)	1	2	3	4						

Difficult to see sample in field due to debris

Attachment 5

RBP Macro-invertebrate Laboratory Bench Sheets

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BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION Reach 1
STATION # 1 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
COLLECTED BY Jonathan DeNike DATE 7/15/14	LOT #
TAXONOMIST Jonathan DeNike DATE 8/5/14	SUBSAMPLE TARGET ❑ 100 ❑ 200 ❑ 300 ❑ Other ___

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta	—	141	?	JMD	1	Megaloptera					
Hirudinea	Glossiphoniidae	3	A/I	JMD	1	Coleoptera	Haliplidae	2	A	JMD	1
	Erpobdellidae	5	I?	JMD	1						
Isopoda											
Amphipoda	Hyalellidae	14	A/I	JMD	1	Diptera	Tabanidae	1	I	JMD	1
							Ceratopogonidae	4	I	JMD	1
Decapoda	Cambaridae	3	I	JMD	1		Chironomidae	383	I	JMD	1
Ephemeroptera	Heptageniidae	1	I	JMD	2						
	Caenidae	7	I	JMD	1	Gastropoda	Lymnaeidae	5	I	JMD	1
	Baetidae	6	I	JMD	2		Planorbidae	13	A/I	JMD	1
							Physidae	31	A/I	JMD	1
						Pelecypoda					
Plecoptera											
						Other	Corduliidae	5	I	JMD	2
						Odonata	Libellulidae	1	I	JMD	2
Trichoptera	Psychomyiidae	1	I	JMD	2						
	Limnephilidae	1	I	JMD	1						
Hemiptera											

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 577 **Total No. Taxa** 19

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION Reach 2
STATION # 2 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
COLLECTED BY Jonathon DeNike DATE 7/15/14	LOT #
TAXONOMIST Jonathon DeNike DATE 8/5/14	SUBSAMPLE TARGET ☐ 100 ☐ 200 ☐ 300 ■ Other 25%

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR
Oligochaeta	—	32	?	JMD	1
Hirudinea	Glossiphoniidae	3	I	JMD	1
	Erpobdellidae	3	A?	JMD	1
Isopoda					
Amphipoda					
Decapoda					
Ephemeroptera	Caenidae	2	I	JMD	1
	Baetidae	1	I	JMD	2
Plecoptera					
Trichoptera					
Hemiptera					

Organisms		No.	LS	TI	TCR
Megaloptera					
Coleoptera					
Diptera	Ceratopogonidae	2	I	JMD	1
	Chironomidae	44	I	JMD	1
Gastropoda	Physidae	2	A/I	JMD	1
	Planorbidae	1	I	JMD	1
Pelecypoda					
Other					

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 91 **Total No. Taxa** 9

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION Reach 3
STATION # 3 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
COLLECTED BY Jonathan DeNike DATE 7/16/14	LOT #
TAXONOMIST Jonathan DeNike DATE 8/7/14	SUBSAMPLE TARGET ☐ 100 ☐ 200 ☐ 300 ■ Other 25%

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta	—	14	?	JMD	1	Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda	Hyalellidae	8	A/I	JMD	1	Diptera	Chironomidae	59	I	JMD	1
							Ceratopogonidae	1	I	JMD	1
Decapoda											
Ephemeroptera						Gastropoda	Physidae	8	A/I	JMD	1
							Planorbidae	2	A/I	JMD	1
							Lymnaeidae	1	A?	JMD	1
						Pelecypoda	Sphaeriidae	9	A/I	JMD	1
Plecoptera											
						Other					
Trichoptera	Hydroptilidae	1	I	JMD	2						
Hemiptera											

Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 103 **Total No. Taxa** 9

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

STREAM NAME Crawford Creek	LOCATION Reach 4
STATION # 4 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN Nemadji
STORET #	AGENCY
COLLECTED BY Jonathan DeNike DATE 7/16/14	LOT #
TAXONOMIST Jonathon DeNike DATE 8/7/14	SUBSAMPLE TARGET ☐ 100 ☐ 200 ☐ 300 ● Other 25%

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta	—	12	?	JMD	1	Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda	Hyalellidae	4	A/I	JMD	1	Diptera	Chironomidae	58	I	JMD	1
Decapoda											
Ephemeroptera	Heptageniidae	1	I	JMD	1						
						Gastropoda	Physidae	2	A	JMD	1
						Pelecypoda	Sphaeriidae	2	A?	JMD	1
Plecoptera											
						Other Odonata	Coenagrionidae	1	I	JMD	1
Trichoptera											
Hemiptera											

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 80 **Total No. Taxa** 7

Attachment 6

RBP Fish Sampling Field Data Sheets

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FISH SAMPLING FIELD DATA SHEET (FRONT)

page ____ of ____

STREAM NAME Crawford Ck	LOCATION	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
GEAR	INVESTIGATORS	
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

SAMPLE COLLECTION	**How were the fish captured?** ❑ back pack ❑ tote barge ❑ other _____ **Block nets used?** ❑ YES ❑ NO **Sampling Duration** Start time _____ End time _____ Duration _____ **Stream width (in meters)** Max_____ Mean_____
HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Riffles____% ❑ Pools____% ❑ Runs____% ❑ Snags____% ❑ Submerged Macrophytes____% ❑ Other ( )____%
GENERAL COMMENTS	Reach 1

SPECIES	TOTAL (COUNT)	OPTIONAL: LENGTH (mm)/WEIGHT (g) (25 SPECIMEN MAX SUBSAMPLE)					ANOMALIES*							
							D	E	F	L	M	S	T	Z
Northern Pike	2	31½"	12"											
2nd largest														
Black Bullhead		7"												
2nd Smallest														

FISH SAMPLING FIELD DATA SHEET (FRONT)

page ____ of ____

STREAM NAME Crawford Ck	LOCATION Reach 2	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
GEAR	INVESTIGATORS	
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

SAMPLE COLLECTION	**How were the fish captured?** ❑ back pack ❑ tote barge ❑ other _____ **Block nets used?** ❑ YES ❑ NO **Sampling Duration** Start time 1500 End time 0945 Duration _____ **Stream width (in meters)** Max _____ Mean _____
HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Riffles____% ❑ Pools____% ❑ Runs____% ❑ Snags____% ❑ Submerged Macrophytes____% ❑ Other ( )____%
GENERAL COMMENTS	Reach 2

SPECIES	TOTAL (COUNT)	OPTIONAL: LENGTH (mm)/WEIGHT (g) (25 SPECIMEN MAX SUBSAMPLE)					ANOMALIES*							
							D	E	F	L	M	S	T	Z
N/A														

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

FISH SAMPLING FIELD DATA SHEET (FRONT)

page ____ of ____

STREAM NAME Crawford	LOCATION Reach 3	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
GEAR	INVESTIGATORS	
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

SAMPLE COLLECTION	**How were the fish captured?** ❑ back pack ❑ tote barge ☑ other Gill **Block nets used?** ❑ YES ❑ NO **Sampling Duration** Start time 1530 End time 0930 Duration _____ **Stream width (in meters)** Max _____ Mean _____
HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Riffles ____% ❑ Pools ____% ❑ Runs ____% ❑ Snags ____% ❑ Submerged Macrophytes ____% ❑ Other ( ) ____%
GENERAL COMMENTS	Reach 3

SPECIES	TOTAL (COUNT)	OPTIONAL: LENGTH (mm)/WEIGHT (g) (25 SPECIMEN MAX SUBSAMPLE)					ANOMALIES*							
							D	E	F	L	M	S	T	Z
Trout Perch		43/8												
Smallest mesh														
Northern Pike		12 1/4												
2nd Smallest														

FISH SAMPLING FIELD DATA SHEET (FRONT)

page ____ of ____

STREAM NAME Crow Sand CK	LOCATION Reach 4	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
GEAR	INVESTIGATORS	
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

SAMPLE COLLECTION	**How were the fish captured?** ❑ back pack ❑ tote barge ☒ other _____ **Block nets used?** ❑ YES ❑ NO **Sampling Duration** Start time 1600 End time 0930 Duration _____ **Stream width (in meters)** Max 5 Mean 4
HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Riffles____% ❑ Pools____% ❑ Runs____% ❑ Snags____% ❑ Submerged Macrophytes____% ❑ Other ( )____%
GENERAL COMMENTS	Reach 4

SPECIES	TOTAL (COUNT)	OPTIONAL: LENGTH (mm)/WEIGHT (g) (25 SPECIMEN MAX SUBSAMPLE)					ANOMALIES*							
							D	E	F	L	M	S	T	Z
Northern Pike	1	14"												
Second Log Mesh														

Appendix C
Sediment Core Logs

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-01-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring (HP)
LOGGER: HJR
DATE: 10/25/14 START: 12:00 END: 12:05

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.4
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
2.4	0.8	NC-1	0.0-0.8 Red/brown (5YR 4/4) clay, very plastic, stiff	0.0/0.8 PID: 0.0

NOTES: No visual or odor of product
- Probing @ location indicated product & sheen

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET | OF

STATION ID: CC-0141

PROJECT: Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Manual core
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 1350 END: 1355

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.6'
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	0.9' (a)	0.7'	MC Manual Hand core	0-0.7 - Red clay [5yr 4/4] soft & lumpy @ top 2". Stiff & firm/consistent @ 2"-9" high-med plactic, some wood fibers throughout the core. No odors; trace sheen found @ top 1".	0.0-0.7 MS/MSD 0.0 ppm

NOTES: NO Odors / Trace sheen on top

WATER ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-02-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual coring (SE)
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 12:05 END: 1210

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.4'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.5'	1.4'	Manual coring	0.0-0.3 – loose soft clay lumps with sand; loose/ less dense / moist-wet / less plastic. [Redclay 5yr4/4] NAPL / sheen present. Strong Creosote odor. 0.3-1.4 – lean clay [5YR 4/4] high plasticity; wood fibers (SE) ~~intermittent~~ throughout the core. decayed canary grass/ vegetation sporadic. NO odor / NO sheen	0.0-0.5 0.5-1.4' 0.0 ppm PID reading

NOTES: Sheen / NAPL @ top 2".

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-003-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: A. Korpela
DATE: 6/22/2014 START: 1100 END: 1105

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.7'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
1.8'	1.3	VC-1	0.0-1.3 5YR 2.5/2, clay, firm, plastic trace med sum sand 0-0.2 w/ sheen wood debris @ 0.6 sheen + NAPL on fibers 0.6-1.3 Mild odor also angular gravel, few pieces at surface, black.	0.0/0.5 11:30 0.5/1.3 11:30

NOTES: Mild odor / NAPL observed.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: CC-004-A

PROJECT : Crawford Creek/Nemadji River
PROJECT NUMBER : 478321.FI.02
CONTRACTOR : Affiliated Researchers
EQUIPMENT : Vibracore Device
LOGGER : A. Kempka
DATE : 6/22/2014 START : 13:20 END : 1325

TOP OF ICE/BARGE TO SED SURF (FT) : —
TOP OF BARGE TO WATER (FT) : —
WATER DEPTH (FT) : 3.1'
TOP OF BARGE/ICE TO REFUSAL (FT) : —
SED THICKNESS TO REFUSAL (FT) : —
SURFACE ELEVATION (Water, Ice, Soil) : —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.3'	1.8	VC-1	0.0-0.5 Beads of clay - size of med sand, w/ trace fine sand, vegetation; and slag material @ 0.1, very soft, 5YR 3/3	0.0/0.5
				0.5-1.8 clay (fat), 5YR 3/3, soft, high plastic NAPL & fibers throughout: trace, to some with depth; strong odor	0.5/1.8 0.5/1.8R Field Duplicate 0.0 ppm

NOTES : Sheen / Napl / odors throughout the core

WATER/ICE ELEVATION : _____
X - COORDINATE : _____
Y - COORDINATE : _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-005-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: A. Korpela
DATE: 6/22/2014 START: 12:20 END: 1225

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.4'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
2.0'	1.3	VC-1	0.0-0.3 clay w/ trace fine sand, clay is in small balls, size of med sand, 5YR 2.5/2, soft, sheen, wood debris 0.3-0.5 clay, 5YR 2.5/2, soft, plastic 0.5-1.3 clay, 5YR 2.5/2, firm, plastic NAPL & fibers: some to trace w/depth mild odor	0.0/0.5 0.5/1.3 0.0 ppm

NOTES: NAPL/sheen/odors observed.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC06-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/22/14 START: 0940 END: 0945

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.3'
TOP OF BARGE/ICE TO REFUSAL (FT): core penetration 1.6'
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.6'	~~1.4~~ 1.3	VC	0.0-1.3 clay, 5YR 4/2, soft to 0.3 then firm to 1.3, sheen at surface; trace wood debris throughout w black staining, few wood debris: black + oily @ 1.3.	0.0/0.5 0.5/1.3 0.0 ppm

NOTES: Sheen (oily): strong odor; ~~Hard~~ stiff clay @ bottom

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

Core penetration – 1.6'

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: C007-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/22/14 START: 10:00 END: 1005

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.9'
~~TOP OF BARGE/ICE TO~~ Penetration REFUSAL (FT): 1.9 DSS
SED THICKNESS TO REFUSAL (FT)*: —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
					10:00 6/23/14
	1.9'	1.7'		0.0-1.1 Clay, trace w/ fine sand 5YR 3/2, soft, slight odor, PID=0	0.0/0.5
		1.6	VC		0.5/1.6
				1.1-1.6 clay, fat, 5YR 3/2, firm w/ trace fibrous vegetation, plastic	

NOTES: Sed Clay - strong odors, sheen, lots of brick/cinder.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

Core Penetration - 4.8' from TOW
2.9' WD
Sed penetration - 1.9'

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC008-C1

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 9/22/14 START: 1200 END: 1205

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.8'
TOP OF BARGE/ICE TO REFUSAL (FT): (5.3' - 2.8') = 2.5'
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
					1145 6/23/14
	2.5	2.3	VC 1	0.0-1.0 clay w/ trace fine sand, 5YR 3/3, soft beads of clay	0.0/0.5
				1.0-2.3 clay, silt, 5YR 3/3, soft, plastic, w/ trace silt wood fibers, becoming firm at 2.0-2.3	0.5/2.3 (MS/MSD)
				PID=0	PID: 0.0 ppm

NOTES: Moderate/strong odors @ bottom

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

Core penetration - 2.5'

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-009C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 8/22/14 START: 13:15 END: 13:35

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.9'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.4'	1.3'	VC 1	0.0 - 0.3 Red brown clay w/ fine sand 5YR 3/3. Visual product present. No PID reading 0.3 - 1.3 Red brown clay (5 YR 3/3). Highly plastic & firm. EOB	0.0-0.5 0.5-1.3 PID: 0.0 through core

NOTES: V. mild odors; No sheen/NAPL

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-10A

PROJECT:	Crawford Creek/Nemadji River	TOP OF ICE/BARGE TO SED SURF (FT):	—
PROJECT NUMBER:	478321.FI.02	TOP OF BARGE TO WATER (FT):	—
CONTRACTOR:	Affiliated Researchers	WATER DEPTH (FT):	2.7'
EQUIPMENT:	Vibracore Device	TOP OF BARGE/ICE TO REFUSAL (FT):	—
LOGGER:	HJR	SED THICKNESS TO REFUSAL (FT):	—
DATE:	6/22/14 START: 13:35 END: 1340	SURFACE ELEVATION (Water, Ice, Soil):	—

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	2.2'	1.9 ~~2.0~~' HJR	VC-1	0.0 - 0.8 Reddish brown clay w/ fine sand. Coal tar beads present. Plastic & somewhat loose 0.8 - 2.0 Reddish brown clay (5YR 4/4) Highly plastic & very dense	0.0 - 0.8 (HJR) 0.8 - ~~2.0~~ 1.9 0.8 - ~~2.0~~ 1.9 DUP No PID readings 0.0 ppm
				EOB •	

NOTES: odor / sheen / Observed. Black cinder chunks.

WATER/ICE ELEVATION: _____

X - COORDINATE: _____

Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-11A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 15:00 END: 1505

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.2'	1.2	VC1	0.0–0.4 Red/brown clay w/ fine sand. Coal tar staining present. Plastic & loose 0.4–1.2 (HJR) Red/brown clay, very stiff, somewhat plastic	0.0/0.5 0.5/1.2 0.0 ppm

NOTES: COAL TAR PRESENT @ 0.4
ODORS/SHEEN/NAPL PRESENT

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-12-C

PROJECT : Crawford Creek/Nemadji River
PROJECT NUMBER : 478321.FI.02
CONTRACTOR : Affiliated Researchers
EQUIPMENT : Vibracore Device
LOGGER : HJF
DATE : 6/22/14 START : 14:35 END : 1440

TOP OF ICE/BARGE TO SED SURF (FT) : —
TOP OF BARGE TO WATER (FT) : —
WATER DEPTH (FT) : 3.5'
TOP OF BARGE/ICE TO REFUSAL (FT) : —
SED THICKNESS TO REFUSAL (FT) : —
SURFACE ELEVATION (Water, Ice, Soil) : —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
0.7'	0.6	VC1	0.0–0.6 Red/brown clay (5YR 4/4) plastic, stiff	0.0–0.6 PID: 0.0

NOTES : No sheen/~~odor~~ or odor.

WATER/ICE ELEVATION : _____
X - COORDINATE : _____
Y - COORDINATE : _____

CH2MHILL — SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-013-C

PROJECT: Crawford Creek/Nemadji River	TOP OF ICE/BARGE TO SED SURF (FT): —
PROJECT NUMBER: 478321.FI.02	TOP OF BARGE TO WATER (FT): —
CONTRACTOR: Affiliated Researchers	WATER DEPTH (FT): 3.0'
EQUIPMENT: Vibracore Device	TOP OF BARGE/ICE TO REFUSAL (FT):
LOGGER: HJR	SED THICKNESS TO REFUSAL (FT): —
DATE: 6/22/14 START: 15:40 END: 1545	SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	1.4'	1.2	VC-1	0.0 - ~~0.5~~ 0.7 Red/brown clay w/ fine sand, somewhat plastic, loose, visual coal tar beads 0.7 - 1.2 Red/brown clay, stiff/v. stiff plastic	0.0-0.5 0.5-1.2 0.0ppm

NOTES: Coal tar present to 0.7

WATER/ICE ELEVATION: _____

X-COORDINATE: _____

Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-014-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 1600 END: 1605

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 4.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.3'	1.3	VC-1	0.0-0.5 Red/brown (5YR 4/4) clay w/ fine sand. coal tar beads, odor & sheen present	0.0/0.5
				0.5-1.3 Red/brown (5YR 4/4) clay, somewhat plastic, very stiff	0.5/1.3
				EOB	0.0 ppm

NOTES: odor / NAPL / sheen observed.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-15-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 15:25 END: 1620

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.3'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
2.5'	1.7	VC1	0.0-0.4 Red/brown clay (5 YR 4/4) w/ ~~fine~~ (HJR) fine sand Coal tar beads present. Plastic, loose/soft 0.4-1.7 Red/brown clay (5 YR 4/1) plastic, somewhat stiff	0.0-0.5 0.5-1.7 0.5-1.7 DUP 0.0 ppm

NOTES: No NAPL or sheen observed.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-16-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 1640 END: 1645

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
1.6'	1.3	VC-1	Red/Brown (5 YR 4/4) clay, very plastic, stiff White chunks observed @ bottom of core. (lime/calcium)	0.0 - 0.5 0.5 - 1.3 No PID readings
			EOB	

NOTES: No visual impacts

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: CC-017A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/24/14 START: 10:20 END: 1025

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.2'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.6'	1.3'	VC	0.0-0.4 - [red clay (5YR 4/4) soft / less dense / lumps of clay mixed with leaves & vegetation, (decayed); sheens found in top 2" mixed with leaves. less plastic / moist to low wet. mild odor - (decayed H_2S odor @ some parts)	0.0-0.5 0.5-1.3 0.0 ppm
				0.4-1.3 - red clay (5YR 4/4) Stiff / hard clay; highly plastic, less moist (almost dry) firm / high density; Organics / wood debris / fibers found @ bottom 3" (trace) of the core. NO odors in this section of core.	

NOTES: 0.0-0.4 - mild Hydrocarbon odor & some parts of core contained decayed H_2S odor.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-018-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/29/14 START: 09:30 END: 0935

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.1'	2.0'	VC	0.0-0.5 - Red brown (5YR 4/4) Clay; soft lean clay; low plasticity, Mod-firm; lumps of clay; low to none silt; ~~No Odor mild~~ strong ~~moderate~~ (SR) * odor of creosote; mod-dense; * 0.5-0.7 - decayed leaves; vegetation mixed with clay; mod-strong Hydrocarbons ~~gas~~ odor, creosote (SR) loosely packed (less dense) 0.7-2.0 → Red brown (5YR/4.4) Stiff clay; Hard clay; high plasticity; firm (very-mod) Chunks of wooden sticks embedded in clay; densely packed. Mild-moderate Hydrocarbon odor	0.0-0.5 0.5-2.0 MS/MSD 0.0 ppm ~~MS/MSD~~ (SR)

* - 0.0-0.5 - NAPL sheens on vegetation / strong odor / ↓ NAPL on clay sticking to it.

NOTES: strong odor observed @ 0.0-0.5'
NAPL sheens observed @ 0.0-0.5'

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-019-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 10:30 END: 1035

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.4'	1.9	VC-1	0.0 - 0.6 Red/brown clay w/sand (5YR 4/4) w/ organic matter Loose. Coal tar present 0.6 - 1.9 Red/brown (5YR 4/4) clay, highly plastic, somewhat firm.	0.0 - 0.6 0.6 - 1.9 No PID Readings

NOTES: ODOR & SHEEN PRESENT

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-20-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/22/14 START: 11:10 END: 1115

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.3'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	2.2'	1.8	VC-1	0.0 - 0.6 Red/brown (5YR4/1) clay w/ fine sand, trace o-matter, very plastic, loose/ unconsolidated 0.6 - 1.8 Red/brown clay, w/ trace organic matter firm/ stiff, somewhat plastic	0.0 - 0.6 0.6 - 1.8 0.0 ppm

NOTES: No indication of coal tar/NAPL

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-21-C1

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HDR
DATE: 6/24/14 START: 15:10 END: 15:15

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.8
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
~~8.0~~ 4.2' 6"	3.6	VC-1	0.0–0.2 clayey silt, (5YR 4/4) liquified, ~~loose~~ very loose 0.2–3.6 fine sandy clay trace organics to 2.6'	0.0/0.5 0.5/2.0 2.0/3.0 3.0/3.6

NOTES: No visual or odor of product observed.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-22-A1

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 09:00 END: 0905

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.8'
TOP OF BARGE/ICE TO REFUSAL (FT):
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.1'	0.8' (SED) (SV)	VC	0.0 - 0.8 → Red clay [5YR 4/4] Stiff; firm; high density; high plastic; dry-moist. Top 1" - Soft fluffy sediment (clay) No odor; No sheen.	0.0 - 0.8' (SV) 0.0 ppm

NOTES: No Creosote odor / Sheen

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: GC-023A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 17:20 END: 1125

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	2.4'	2.1'	VC	0.0-0.4' → Red clay [5YR 4/4] soft / lumpy clay; med-high plastic, less firm; wet/moist odor (mod) - creosote like odor; NO sheens; ~~black~~ chunks of (5) ~~coal tar~~ black wood (decayed) chunks of creosote ~~odor~~ black (4) coal tar cinders with ~~NAPL~~ sheen. 0.4-2.1 - Red clay [5YR 4/4] stiff hard clay; high plastic, (5) ~~no~~ mild odor / sheen / stiff / dry - less moist. roots / fibers ~~throughout~~ found throughout the core. - lense of NAPL @ 0.8 embedded in clay.	0.0-0.5' 0.5-2.1' 0.0 ppm PID

NOTES: sheens / coal tar chunks in top 6"

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-024-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S. Ramamurthy
DATE: 6/25/14 START: 1600 END: 1605

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.5'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	3.6'	3.6'	VC	0.0-0.4 - Soft brown clay/w/silt (5Y) 7.5YR (3/2); less plastic/less firm/vegetation - decomposed leaves @ top 2". moist. top 2" = decomposed leaves, odor	0.0-0.5 0.5-2.0 2.0-3.0 3.0-3.6'
				0.4-3.6 - (5Y) brown clay firmer with depth, moist; C1.2-1.3' = wood debris/decomposed vegetation) lenses of vegetation (decomp) throughout the core length. med-high plastic; firm; high dense, compacted. No odors/sheen of creosote like NAPL.	

NOTES: No NAPL/No sheen observed

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET \ OF

STATION ID: CC-025C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: SRamamurthy
DATE: 6/26/14 START: 0830 END: 0835

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 4.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	4.4'	4.0'	VC	0.0-1.0 - Soft brown clay Red clay [5YR 4/4]; med plastic; moist; chunks of black wood @ 0.5' less firm; less dense. No odor; No sheen. 1.0-4.0 - Med-stiff Red clay 5YR(4/4). High plasticity, moist; dense; Med-soft. No odor / No sheen	0.0-0.5 0.5-2.0 2.0-3.0 3.0-4.0

NOTES: No odor or sheen.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: CC-026G

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/24/14 START: 11:40 END: 1145

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	3.9'	3.3'	VC	0.0-0.5' - soft/slushy/ red clay (5YR 4/4); lots of leaves/decayed vegetation. soft/less dense/ ~~wet~~ H_2S odor, wet. (4) 0.5-3.3' - med firm - firmer with depth, high dense; ~~streaks~~ of lenses of decomposed vegetation; less moist, compacted; no odor. lenses of decomposed vegetation 1" thick - 0.6'; 2.0'; 2.3'; 2.7'; 3.1' 3.2'.	0.0-0.5' 0.5-2.0' 2.0-3.3' ~~Not~~ (32) 0.0 PPM

NOTES: No odor or sheen

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CC-027-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/25/14 START: 14:10 END: 1415

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.21
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.9'	1.9	VC-1	0.0 – 0.5 Red/brown (5YR 4/4) clay, very soft, very plastic	0.0/0.5
				0.5 – 1.9 Red brown clay w/ fine sand, firm, plastic	0.5/1.9

NOTES: _____

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: CC-028.5

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 14:00 END: 1405

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 3.2'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	5.2'	4.7'	VC	0.0-2.1'- ~~60ft red clay~~ SR Red Sand 5yr (3/3) SR ~~loose~~ loose, fine sand; well sorted, No plasticity med. some silt; loosely packed; NAPL @ 0.4'. NAPL found @ 1.4-1.6' interval strong odor; sheen/~~of~~NAPL 2.1-3.0'- Soft clay (Red 5y 3/3) with silt & sand; ~~mostly~~ fine SR sand] ow-med plastic; low firm/low dense; moist. lenses of ~~decayed~~ SR vegetation. decomposed 3.0-4.7'- Same as 0.0-2.1 with vegetation/twigs & lenses. More decomposed leaves @ core catcher. 1.2-1.3- Saturated with NAPL V. strong creosote odor; sand/silt/clay mix. 3.3-3.5' 3.0-~~4.0~~ - NAPL ontop (pooling up.] Freeproduct.	0.0-0.5 0.5-2.0 2.0-3.0 3.0-4.0 4.0-4.7'

NOTES: 1.2-1.6' ⇒ NAPL/Free product; Strong creosote/~~gasoline~~ Hydrocarbon like odor.
Sheen/NAPL/Odor observed @ 0.5-2.0 interval.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-01-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual coring
LOGGER: HJR
DATE: 6/22/14 START: 13:50 END: 1365

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	4'	1.0	~~VC~~ MC-1	0.0 - 1.0 Red/brown (5YR 4/4) clay w/ trace organic matter, very plastic, med. stiffness	0.0 - 0.5 0.5 - 1.0

NOTES: No sheen or odor

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF 1

STATION ID: CF-01-B

PROJECT: Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracoring~~ manual wire (SR)
LOGGER: SRamamurthy
DATE: 6/26/14 START: 10:30 END: 1035

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	2.1'	0.9'	Manual coring	0.0-0.7 - Red clay [5yr 4/4] soft/lumpy - high plastic, compacted, firm; moist; clay w/silt. Odor/sheen observed on 6/25/14 roots/vegetation @ top 4".	0.0-0.5 0.5-0.9 0.0 ppm
				0.7-0.9 - Black organic silt/clay [Gley 2 - 2.5/5PB] (SR) Brittle/ low plastic; moist; mild decomposed odor; wood debris; stratification of wood debris	

NOTES: ~~No~~ trace of NAPL (SR)

WATER ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF

STATION ID: CF-01C

PROJECT: Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Manual coring
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 14:30 END: 1425

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	2.15'	0.7'	Manual core	0.0-0.7' ⇒ Red brown [5yr 3/3] Clay; ~~moist~~ moist; highly plastic, No odor, No sheen. Root fibers in the top 4". Firm/dense high. Thin lense of black/decomposed vegetation / clay.	0-0.7

NOTES: No sheen or odor.

WATER ELEVATION: —
X - COORDINATE: —
Y - COORDINATE: —

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-01-D

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 06/24/14 START: 0900 END: 0905

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	1.5	1.1	VC-1 MC (HR)	0.0 – 1.1 Red/brown (5YR 4/4) clay, very plastic, firm & dense	0.0-0.5 0.5 – 1.1

NOTES: ~~No visual or Odor of NAPL~~
No odor or visual of product

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-02-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 6/22/14 START: 16:50 END: 16:55

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	3.5'	1.6	~~VC~~ Manual coring	@ 0.0 - 1.6 Red clay [5YR 4/4] top 4" (M) ~~loose~~ soft clay, (M) mod ~~less~~ plastic, firm - less firm, moist, hard/stiff top 2" - lots of vegetation, decayed wood. Rotten/decay odor. Chunks of wood/vegetation throughout the core length.	0.0 - 0.5 0.5 - 1.6' 0.0 ppm

NOTES: NO odor / NO sheen / NO NAPL

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF

STATION ID: CF-02-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 10:20 END: 1025

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): —
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.0'	0.8'	manual core	0.0-0.8 - Red clay [5YR 4/4] top few inches - soft lumps of clay; high plastic; firm ~~to~~ with depth; high dense with depth; drier with depth. Vegetation; roots, leaves @ top 6".	0.0-0.8' 0.0 ppm

NOTES: No odor / No Sheen / No NAPL

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF03-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 6/23/14 START: 14:15 END: 1420

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	4.5'	1.3	(VC) VCT MC	0.0 - 1.3 Red/brown (5YR 4/4) clay, very plastic, med. stiffness	0.0-0.5 0.5-1.3 PID: 0.0

NOTES: NO COAL TAR ODOR OR VISUAL IMPACT

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-03-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 6/22/14 START: 12:00 END: 1205

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	5.0'	1.3	MC-1	0.0-0.3 Red/brown clay (5YR 4/4) Very stiff, somewhat plastic. Trace silt lense from 0.7-0.9	0.0-0.5 0.5-1.3

NOTES: No Coal Tar Present

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF 1

STATION ID: CF-03-E

PROJECT Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER 478321
CONTRACTOR Affiliated Researchers
EQUIPMENT manual coring
LOGGER S Ramamurthy
DATE 6/26/14 START 12:00 END 1205

SAMPLING SURFACE TO SED SURF (FT) —
TOP OF BARGE TO WATER (FT) —
WATER DEPTH (FT) 0.0
SAMPLING SURFACE TO REFUSAL (FT) —
SED THICKNESS TO REFUSAL (FT) —
SAMPLING SURFACE ELEVATION —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
0	2.25'	1.2'	(SS) SS Manual coring	0.0-1.2' - Red Clay (5yr 4/4). Stiff - hard pan; Very high plasticity; firm/dense. No odor or sheen; moist. Some roots + decaying vegetation @ top 2".	0.0-0.5 0.5-1.2 0.0 ppm

NOTES No sheen or odor.

WATER ELEVATION
X - COORDINATE
Y - COORDINATE

CH2MHILL

SEDIMENT CORE LOG

SHEET [ ] OF [ ]

STATION ID: CF04-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual boring
LOGGER: S Ramamurthy
DATE: 6/24/14 START: 12:40 END: 1245

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	5.5'	1.3'	MC (SP) Manual	0-0.2 → Soft, lumps of clay; red clay (5YR 4/4); SP low density; less low plasticity; roots; moist; no odor 0.2-1.3 red clay 5YR 4/4) stiff clay; hard/dense) high plasticity, moist, no odor roots/vegetation. @0.6 - lense of sand [coarse/med sand] - 2" thick.	0.0-0.5 0.5-1.3' PID = 0.0 ppm

NOTES: NO odor; NO sheen.

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-05-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibrocore Device~~ Manual coring
LOGGER: HJR
DATE: 6/23/14 START: 12:45 END: 1250

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	5.5'	0.9	MC-1	0.0 - 0.9 Red/Brown (5YR 4/4) Clay, stiff, somewhat plastic	0.0 - 0.5 0.5 - 0.9 PID = 0.0

NOTES: No odor/visual of coal tar

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF 1

STATION ID: CF-05C

PROJECT: Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: manual coring
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 14:25 END: 1430

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.01
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	1.5'	0.6	Manual coring	0.0-0.6'- Red/brown [5yr 3/3] Clay; stiff; dense; High plasticity; root fibers throughout the core. Firm/moist. No odor/ No sheen.	0.0-0.6 0.0ppm

NOTES: No odor or sheen.

WATER ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-05-D

PROJECT: Crawford Creek/Nemadji River

PROJECT NUMBER: 478321.FI.02

CONTRACTOR: Affiliated Researchers

EQUIPMENT: ~~Vibracore Device~~ Manual auger

LOGGER: S. Ramamurthy (SR)

DATE: 6/22/11 START: ~~1030~~ 1030 (SR) END: ~~1035~~ 1035 (SR)

TOP OF ICE/BARGE TO SED SURF (FT): —

TOP OF BARGE TO WATER (FT): —

WATER DEPTH (FT): 0.0

TOP OF BARGE/ICE TO REFUSAL (FT): —

SED THICKNESS TO REFUSAL (FT): —

SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	~~1.2~~ 2.0'	0.9	~~VC~~ 1 MC (SR)	0.0 - 0.9 Red/brown (5YR 4/4) clay, w/ 0-matter @ surface, very plastic, somewhat stiff	0.0/0.5 0.5/0.9

NOTES: No odor or visual of product

WATER/ICE ELEVATION: _____

X - COORDINATE: _____

Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-06-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual corer
LOGGER: HJR
DATE: 6/22/14 START: 11:00 END: 1105

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	5.0	1.8	(Fine) VC-1 MC	0.0 – 1.8 Red/brown (5YR 4/4) clay, very plastic, stiff to very stiff to depth.	0.0/0.5 0.5/1.8 PID: 0.0

NOTES: NO ODOR OR SHEEN OF PRODUCT

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET | OF |

STATION ID: CF 06-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual coring
LOGGER: S Ramamurthi
DATE: 6/26/14 START: 14:30 END: 1435

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.25	0.6'	Manual Hand coring	0.0-0.6' — Red brown [5yr 3/3] clay; stiff; dense; high plasticity; root fibers @ top 2". Firm / dense / moist. NO sheen or odor.	0.0-0.6 MS/MSD 0.0 ppm

NOTES: No Sheens or odor

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-06-D

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 6/24/14 START: 10:15 END: 1020

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
1.2	0.8	1 MC	Red/brown (5YR 4/4) clay stiff/very stiff, highly plastic	0.0-0.8

NOTES: No visual or odor of product

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET | OF |

STATION ID: CF-07-4

PROJECT	Crawford Creek / Nemadji River Sediment RI	SAMPLING SURFACE TO SED SURF (FT)	—
PROJECT NUMBER	478321	TOP OF BARGE TO WATER (FT)	—
CONTRACTOR	Affiliated Researchers	WATER DEPTH (FT)	0.0
EQUIPMENT	Manual corer	SAMPLING SURFACE TO REFUSAL (FT)	—
LOGGER	S Ramamurthy	SED THICKNESS TO REFUSAL (FT)	—
DATE	6/20/11 START 14:00 END 1405	SAMPLING SURFACE ELEVATION	—

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2'	0.8'	Manual coring	0.0-0.8' - red/brown clay [5yr 3/3]; stiff, ~~hard~~ firm, highly plastic; moist, no odors / No sheens. some wood debris @ 0.2'.	0.0-0.8' 0.0 ppm

NOTES: No odor or sheens.

WATER ELEVATION _____

X - COORDINATE _____

Y - COORDINATE _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-07-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual Core
LOGGER: HJR
DATE: 6/22/14 START: 14:15 END: 1420

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	~~0.0~~ 0.7	~~0.0~~ 0.7	1/VC Manual core	0.0-0.9 Reddish brown clay highly plastic, firm No visual coal tar	0.0-0.7 PID: 0.0

NOTES: NO odors or sheen

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CR-08-D

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual corer
LOGGER: S Ramanujam
DATE: 6/26/14 START: 0955 END: 0900

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SED) — SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS — SAMPLE ID, QA/QC, ETC
	2.0'	0.7	Manual coring	0.0 - 0.7 - Red-Brown clay (5YR 3/3) firm; dense; high plasticity, compacted; dry - loose moist; roots & fiber @ top 4" (SM) No odor; NO sheen.	0.0 - 0.7 0.0 ppm

NOTES: No odor or sheen

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-09-A

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ Manual coring
LOGGER: S Ramamurthy
DATE: 6/25/14 START: 09:30 END: 0925

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	see logbook 3.0'	0.8'	Manual core	0.0-0.2 → Red clay [5YR 4/4] soft / lumpy clay; less plastic, wet; vegetation; decayed leaves, No odor; loose / less firm 0.2-0.8 → Red clay [5YR 4/4] Hard / stiff / firm / highly Plastic & high dense. No odor; ~~No~~ Some vegetation, roots @ bottom of the core.	0.0-0.8 0.0 ppm = PID readings.

NOTES: No oda / No sheen.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: CF-10-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: ~~Vibracore Device~~ manual coring
LOGGER: HJR
DATE: 6/22/14 START: 10:40 END: 1045

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0'
TOP OF BARGE/ICE TO REFUSAL (FT):
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	2.6	1.3	VC-1	0.0-0.3 clay & organics: leaves, roots 5YR 4/4, beads of clay, soft	0.0/0.5
				0.3-1.3 ft clay w/ organics to 0.7, 5YR 4/4, firm, high plastic	0.5/1.3

NOTES: _____

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF

STATION ID: FP-1

PROJECT: Crawford Creek / Nemadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: manual coring
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 11:40 END: 1145

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 0.0
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION (SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE)	COMMENTS (SAMPLE ID, QA/QC, ETC)
	2.5'	1.2'	Manual coring	0.0-0.4- Soft red clay [5yr 4/4]; low plastic, some silt; lots of roots/fibers stiff. less firm. 0.4-1.2- Red hard/stiff clay [5yr/4/4]; highly plastic, firm; dense; compact; No odors / No sheen	0.0-0.5 0.5-1.2' 0.0 ppm 0.5-1.2' (dup)

NOTES: No Odors or sheen.

WATER ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-02-B2

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 09:55 END: 1000

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
4.2'	2.9'	VC	0.0-2.0 - Red fine sand (5YR 3/3); well sorted, fine grained, uniform; No plasticity; moist; firm, compacted No odor / No sheen / No NAPL. 2.0-2.7 - Same as above but with trace silt; moist; compacted. No odor / No sheen / No NAPL.	0.0-0.5 0.5-2.0 2.0-2.9' 0.0 ppm

NOTES: No odor or sheen.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT SAMPLING LOG

SHEET 1 OF 1

STATION ID: NR-02B1

PROJECT: Crawford Creek / Nenadji River Sediment RI
PROJECT NUMBER: 478321
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 10:40 END: 1045

SAMPLING SURFACE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT):
WATER DEPTH (FT): 2.8'
SAMPLING SURFACE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SAMPLING SURFACE ELEVATION: —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	3.5'	2.6' N2.5'	VC	0.0-1.8- Fine sand; well sorted Red sand [5YR 3/3] (4) No plasicity; firm; NO odor/sheen	0.0-0.5 0.5-2.0 2.0-2.5'
				1.8-2.6- lotz of wood debris; decomposed vegetation; (6) fine sand w/silt; No- Plasticity; Brown sand (5Y 3/3) No odor or sheen.	0.0 ppm NR-02-B1

NOTES: No odor or sheen

WATER ELEVATION
X - COORDINATE
Y - COORDINATE

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-02-C

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy
DATE: 6/26/14 START: 09:00 END: 0905

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.8'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): =
SURFACE ELEVATION (Water, Ice, Soil):

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	k'b	3.0	NC	0.0 - 3.0 [Red sand 5yr (3/3) fine sand + med sand; well sorted; No plasticity; Moist; Firm / compacted No odor / No sheen.	0.0-0.5 0.5-2.0 2.0-3.0 0.0 ppm NR-02-C ER

NOTES: No odor or Sheen.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL — SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-41-A1

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/27/14 START: 12:35 END: 1240

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): (4) 4.2'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT) — PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION — SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS — SAMPLE ID, QA/QC, ETC
(4) 4.8'	2.6	VC-1	0.0-0.1 Silty fine sand, w/ trace O-matter 0.1-1.1 - med sand w/ fine sand (5YR 4/4) well sorted (4) ~~1.1-2.6~~ 1.1-1.3 Layer ~~of~~ of organic matter (leaf litter) 1.3-2.6 med sand, well sorted (5YR 4/4)	0.0-0.5 0.5/2.0 2.0/2.6

NOTES: _____

WATER/ICE ELEVATION: _____
X COORDINATE: _____
Y COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-01-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: S Ramamurthy.
DATE: 6/25/14 START: 1510 END: 1515

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 2.3'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	3.6'	3.5'	VC	0.0-2.2 — Red sand (5YR 3/3] well sorted; fine grained w/some silt. @ No plasticity; firm; compacted; No odor; No sheen; NO NAPL. 2.2 - (1") lense of wood debris 2.2 - 3.5 - Brown sand [5YR 3/2] well sorted; med-fine grained sand w/some silt; firm; moist-wet; No plasticity; compacted NO NAPL/ Nosheen/ NO Odor. Wood debris/ ~~fragmental vegetation~~ SN @ bottom of core.	0.0-0.5' 0.5-2.0' 2.0-3.0' 3.0-3.5' 0.0 ppm PID readings.

NOTES: NO NAPL or sheen or odors

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-01-E

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/24/14 START: 1620 END: 1625

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): 8.9
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	4.6	4.6	VC-1	0.0 - 1.0 clayey fine sand Red/brown (5YR 4/4), soft 1.0 - 4.6 fine sandy clay w/ med sand (5YR 4/4) well sorted, med dense 0.1 lense of o-matter @ 4.3'	0.0/0.5 0.5/2.0 2.0/3.0 3.0/4.0 4.0/4.6

NOTES: No visual or odor of product present

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-03-A1

PROJECT: Crawford Creek/Nemadji River	TOP OF ICE/BARGE TO SED SURF (FT): —
PROJECT NUMBER: 478321.FI.02	TOP OF BARGE TO WATER (FT): —
CONTRACTOR: Affiliated Researchers	WATER DEPTH (FT): 6.5'
EQUIPMENT: Vibracore Device	TOP OF BARGE/ICE TO REFUSAL (FT): —
LOGGER: S Ramamurthy	SED THICKNESS TO REFUSAL (FT): —
DATE: 6/25/14 START: 12:40 END: 1245	SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	2.5'	1.5'	VC	0.0-0.5- Red sand [5YR 3/3] well sorted / ~~poorly graded~~ (SP) fine-med grained sand; firm sand; ~~low~~ No (P) plasticity; moist; No silt observed. No odor / No sheen.	0.0-0.5 0.5-1.5 0.0 ppm

NOTES: No sheen / No odor / No NAPL

WATER/ICE ELEVATION: _____

X-COORDINATE: _____

Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-03-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: SRamamurthy
DATE: 6/24/14 START: 1110 END: 1115

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): See logbook (52) 7.7'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
	2.8'	1.5'	VC	0.0/1.5- Red sand [5YR 3/3], loose, well sorted (less graded) sand; medium/fine grained; loose sand @ top; compacted sand @ bottom (probably due to vibracoring. Uniform throughout the core. No (visual) impacts - No odors, firm @ bottom half core. Wood chips @ top of core.	0.0-0.5 0.5-1.5' No PID reading, 0.0 ppm

NOTES: No (visual) impacts - No odor; No sheen.

WATER/ICE ELEVATION: _____
X-COORDINATE: _____
Y-COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-04-B

PROJECT: Crawford Creek/Nemadji River
PROJECT NUMBER: 478321.FI.02
CONTRACTOR: Affiliated Researchers
EQUIPMENT: Vibracore Device
LOGGER: HJR
DATE: 6/23/14 START: 11:30 END: 1135

TOP OF ICE/BARGE TO SED SURF (FT): —
TOP OF BARGE TO WATER (FT): —
WATER DEPTH (FT): ~~2.5'~~ 3.7'
TOP OF BARGE/ICE TO REFUSAL (FT): —
SED THICKNESS TO REFUSAL (FT): —
SURFACE ELEVATION (Water, Ice, Soil): —

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION: SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS: SAMPLE ID, QA/QC, ETC
				0.0 - 2.6	0.0/0.5
				Red/brown (5YR 4/4) med sand, well sorted / less graded	0.5/2.0
	~~4~~ 3.2'	2.6	VC-1		2.0/2.6

NOTES: No odor or visual indication of product

WATER/ICE ELEVATION: _____
X - COORDINATE: _____
Y - COORDINATE: _____

CH2MHILL

SEDIMENT CORE LOG

SHEET 1 OF 1

STATION ID: NR-05-C

PROJECT: Crawford Creek/Nemadji River		TOP OF ICE/BARGE TO SED SURF (FT):	—
PROJECT NUMBER: 478321.FI.02		TOP OF BARGE TO WATER (FT):	—
CONTRACTOR: Affiliated Researchers		WATER DEPTH (FT):	4.3'
EQUIPMENT: Vibracore Device		TOP OF BARGE/ICE TO REFUSAL (FT):	—
LOGGER: S Ramamurthy		SED THICKNESS TO REFUSAL (FT):	—
DATE: 6/24/14 START: 11:00	END: 1105	SURFACE ELEVATION (Water, Ice, Soil):	—

DEPTH BELOW SURFACE (FT)	PENETRATION (FT)	RECOVERY (FT)	#/TYPE	SEDIMENT DESCRIPTION SEDIMENT TEXTURE, COLOR, RELATIVE DENSITY OR CONSISTENCY, & STRUCTURE	COMMENTS SAMPLE ID, QA/QC, ETC
	2.0'	1.6'	VC	0.0 - 1.6'; Red sand [5YR 3/3] loose sand; well sorted / less graded; less moist; med-fine grained sand; fluff @ top 0.1 mm.	0.0 - 0.5' 0.5 - 1.6' PID = 0.0 PPM

NOTES: No odor / No sheen.

WATER/ICE ELEVATION: _____

X - COORDINATE: _____

Y - COORDINATE: _____

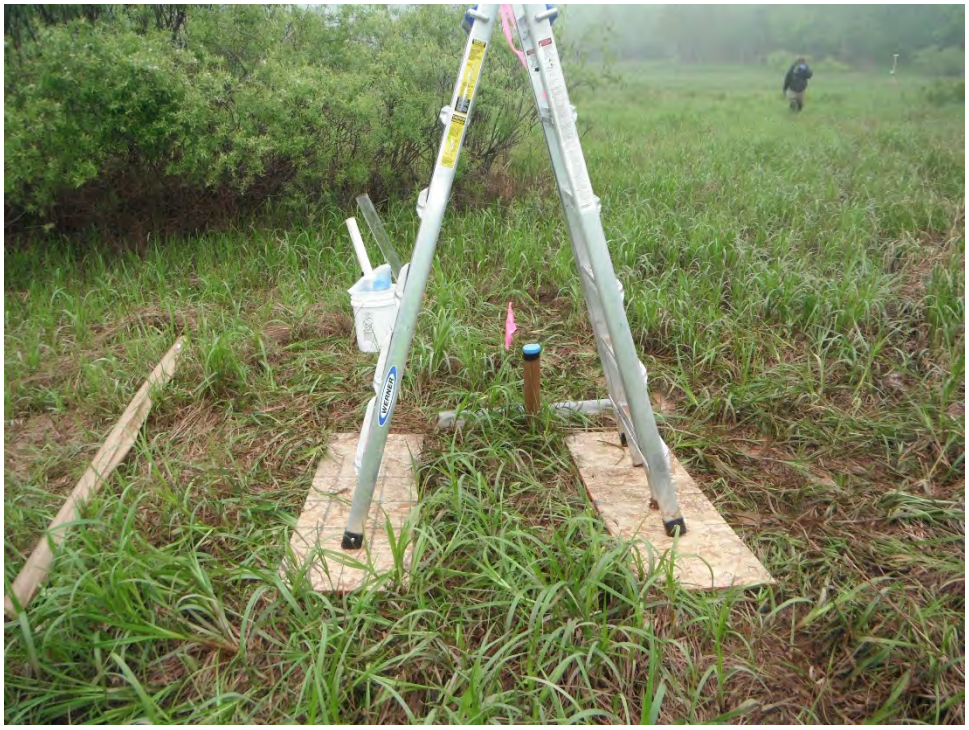
Appendix D
Photograph Logs

Crawford Creek and its Floodplain Area

Crawford Creek

Nemadji River

Typical Vibracore Setup – Core Sampling in Crawford Creek



Typical Manual Coring Setup - Core Sampling at Floodplain Locations

Typical Manual Coring setup from vessel

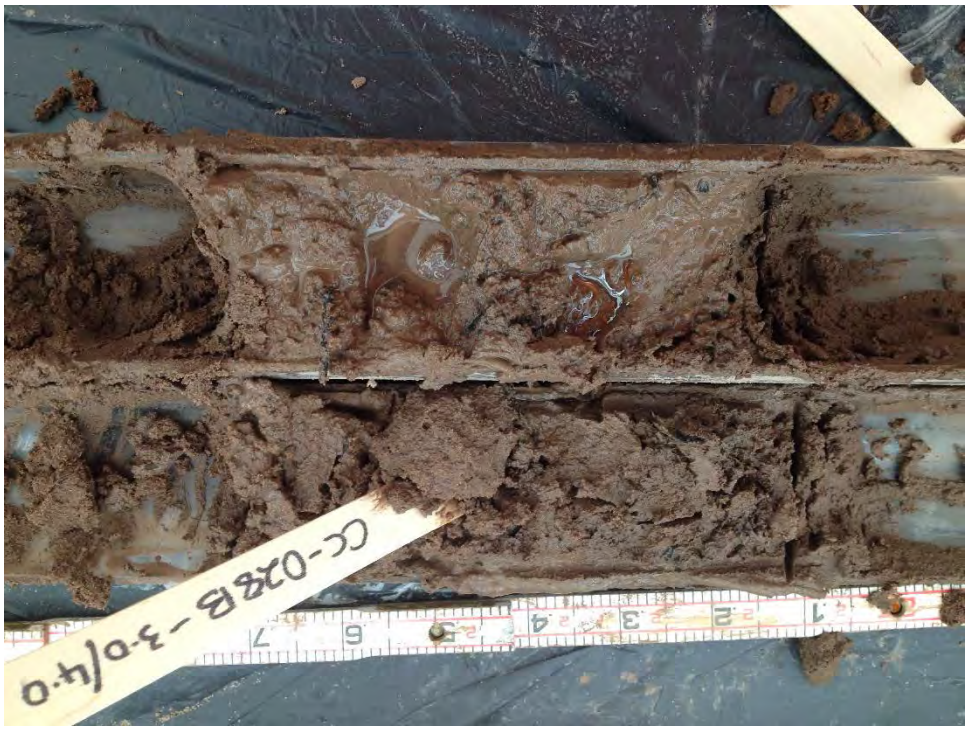
Vibracore Sample collected at Nemadji River

Core Sample collected in Crawford Creek with Creosote Impacts, Staining, Odors and Sheen

Sheen / NAPL blobs appearing on the water surface at a Crawford Creek sample location

Sample Core with NAPL-Free product and Staining (Crawford Creek)

Sample (CC-023-A)- with Chunks of coal tar like material, NAPL, Stains and Sheens



Sample (CC-028-B) with NAPL pooling/oozing out at the surface

Crawford Creek sample with NAPL, staining and sheens.

NAPL Sheens, NAPL observed in a small stream in the Floodplain area next to CF-01-B

Crayfish captured in a core sample at a Crawford Creek Location

Sampling team collecting benthic/macro-invertebrate samples from Crawford Creek's Reach 1

Sampling team collecting fish samples (minnows) from Crawford Creek Reach 1

Setting up Gill nets in Crawford Creek to collect Fish Samples

Northern Pike caught in Reach 1 of the Crawford Creek

Team setting up the nets for collecting fish samples

Northern Pike caught in Reach 1 of the Crawford Creek

Filleting of Northern Pike

Fish Samples collected from the Crawford Creek Reaches

Silver Redhorse Species collected from Nemadji River using Gill Net

Additional Photos, including Photos of Core Samples, Photos taken during Sediment Sampling Event and Habitat Assessment Survey are included in the CD (attached to Hard Copy)

Appendix E
Dioxins and Furans—Laboratory Data

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-001-A-0.0/0.8 6/25/2014	CC-001-A1-0.0/0.5 6/26/2014	CC-002-A-0.0/0.5 6/25/2014	CC-002-A-0.5/1.4 6/25/2014	CC-003-C-0.0/0.5 6/22/2014	CC-003-C-0.5/1.3 6/22/2014	CC-004-A-0.0/0.5 6/22/2014	CC-004-A-0.5/1.8 6/22/2014	CC-005-B-0.0/0.5 6/22/2014	CC-005-B-0.5/1.3 6/22/2014	CC-006-A-0.0/0.5 6/22/2014	CC-006-A-0.5/1.3 6/22/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	1.2 J	5.8	230	4.3	16 J	4.8 UJ	650 J	2.7 J	470 J	1.3 J	13 J	0.54 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	4	17	760	13	46 J	22 J	2,300 J	9.1 J	1,800 J	3.2 UJ	47 J	1.8 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0.42 U	0.47 J	12	0.22 UJ	1.5 UJ	0.31 J	29 J	0.69 J	31 J	1.1 UJ	0.86 UJ	0.25 UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0.15 UJ	0.63 J	18 UJ	0.15 UJ	2.5 J	0.12 UJ	12 J	0.44 UJ	25 J	0.38 UJ	0.3 UJ	0.12 UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.23 U	0.15 U	2.8 U	0.14 U	0.53 UJ	0.076 UJ	4.7 UJ	0.45 UJ	2.3 UJ	0.34 UJ	0.19 UJ	0.16 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.17 U	0.43 UJ	2.6 J	0.28 J	0.58 J	0.12 UJ	5.2 UJ	0.4 UJ	4.8 J	0.42 UJ	0.11 UJ	0.08 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0.31 U	0.81 J	22	0.42 UJ	1.5 J	0.57 UJ	58 J	0.47 UJ	50 J	0.43 UJ	1.2 J	0.16 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0.24 U	0.18 J	1.6 U	0.14 U	0.64 UJ	0.092 UJ	1.6 UJ	0.61 UJ	3.3 UJ	0.62 UJ	0.13 UJ	0.077 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.3 U	0.25 UJ	4.1	0.17 U	0.57 UJ	0.15 UJ	8.8 J	0.49 UJ	4.6 J	0.33 UJ	0.29 UJ	0.15 UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.32 U	0.26 U	1.7 U	0.23 U	0.23 J	0.077 UJ	0.97 UJ	0.27 UJ	48 UJ	0.23 UJ	0.07 UJ	0.079 UJ
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.28 U	0.18 U	1.5 U	0.14 U	0.25 UJ	0.12 UJ	0.8 UJ	0.23 UJ	1.6 UJ	0.37 UJ	0.056 UJ	0.1 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0.16 U	0.22 J	2.2 U	0.13 U	0.93 J	0.069 UJ	6.9 UJ	0.37 UJ	5.8 J	0.34 UJ	0.17 J	0.077 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.22 U	0.17 UJ	1.7 U	0.17 U	0.44 U	0.091 UJ	0.99 UJ	0.35 UJ	3.9 J	0.32 UJ	0.083 UJ	0.067 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.39 UJ	0.35 J	1.4 U	0.27 U	0.17 UJ	0.078 UJ	0.91 UJ	0.42 UJ	2.6 UJ	0.43 UJ	0.071 UJ	0.11 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.28 U	0.12 U	1.7 U	0.18 U	0.3 UJ	0.13 UJ	1.2 UJ	0.49 UJ	1.5 UJ	0.69 UJ	0.087 UJ	0.094 UJ
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	4.3 J	21	1,300	23	66 J	29 J	3,700 J	15 UJ	2,300 J	3.8 UJ	56 J	0.88 UJ
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	57	300	9,400	160	820 J	270 J	36,000 J	120 J	30,000	40 J	720 J	19 J
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	4.5 J	22	1,100	19	67 J	24 J	3,200 J	3.4 J	2,400 J	3.8 J	51 J	1.6 J
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	7.9	40	1,500	25	93 J	44 J	4,400 J	17 J	3,400 J	3.4 UJ	91 J	3.9 UJ
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	0.56 J	8	45	4 J	26 J	3.9 UJ	600 J	0.45 UJ	470 J	1.6 UJ	13 J	0.15 UJ
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	0.59 J	4.8 J	86	0.72 J	4.3 J	4.1 UJ	210 J	0.45 UJ	230 J	3.6 UJ	4 J	3.3 UJ
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	0.28 U	3.1 J	1.5 U	0.14 U	1.2 J	1.1 UJ	3 UJ	0.23 UJ	4.2 J	2.6 J	1.3 J	4.5 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	0.27 U	0.67 J	1.7 U	0.2 U	2.5 J	0.48 UJ	31 J	0.31 UJ	27 J	0.46 UJ	1.7 J	0.19 UJ
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	0.32 U	1.5 J	1.4 U	0.82 J	0.17 UJ	1.5 UJ	5.9 J	2.1 J	2.6 UJ	0.43 UJ	0.58 J	1.2 J
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	0.48 J	4.9	1.7 U	0.18 U	1.4 J	1.3 J	1.2 UJ	0.49 UJ	1.9 J	1.8 J	2.3 J	7.9 J
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	1.2 J	5.8	230	4.3	16 J	0 UJ	650 J	2.7 J	470 J	1.3 J	13 J	0.54 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	4	17	760	13	46 J	22 J	2300 J	9.1 J	1800 J	0 UJ	47 J	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0 U	0.47 J	12	0 UJ	0 UJ	0.31 J	29 J	0.69 J	31 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 UJ	0.63 J	0 UJ	0 UJ	2.5 J	0 UJ	12 J	0 UJ	25 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 UJ	2.6 J	0.28 J	0.58 J	0 UJ	0 UJ	0 UJ	4.8 J	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0 U	0.81 J	22	0 UJ	1.5 J	0 UJ	58 J	0 UJ	50 J	0 UJ	1.2 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0.18 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 U	0 UJ	4.1	0 U	0 UJ	0 UJ	8.8 J	0 UJ	4.6 J	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 U	0 U	0 U	0 U	0.23 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.1 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 U	0.22 J	0 U	0 U	0.93 J	0 UJ	0 UJ	0 UJ	5.8 J	0 UJ	0.17 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	3.9 J	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 UJ	0.35 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	4.3 J	21	1300	23	66 J	29 J	3700 J	0 UJ	2300 J	0 UJ	56 J	0 UJ
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	57	300	9400	160	820 J	270 J	36000 J	120 J	30000	40 J	720 J	19 J

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-001-A-0.0/0.8 6/25/2014	CC-001-A1-0.0/0.5 6/26/2014	CC-002-A-0.0/0.5 6/25/2014	CC-002-A-0.5/1.4 6/25/2014	CC-003-C-0.0/0.5 6/22/2014	CC-003-C-0.5/1.3 6/22/2014	CC-004-A-0.0/0.5 6/22/2014	CC-004-A-0.5/1.8 6/22/2014	CC-005-B-0.0/0.5 6/22/2014	CC-005-B-0.5/1.3 6/22/2014	CC-006-A-0.0/0.5 6/22/2014	CC-006-A-0.5/1.3 6/22/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.012 J	0.058	2.3	0.043	0.16 J	0 UJ	6.5 J	0.027 J	4.7 J	0.013 J	0.13 J	0.0054 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0.04	0.17	7.6	0.13	0.46 J	0.22 J	23 J	0.091 J	18 J	0 UJ	0.47 J	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0.0047 J	0.12	0 UJ	0 UJ	0.0031 J	0.29 J	0.0069 J	0.31 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0.063 J	0 UJ	0 UJ	0.25 J	0 UJ	1.2 J	0 UJ	2.5 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0.26 J	0.028 J	0.058 J	0 UJ	0 UJ	0 UJ	0.48 J	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0 U	0.081 J	2.2	0 UJ	0.15 J	0 UJ	5.8 J	0 UJ	5 J	0 UJ	0.12 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0.018 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 UJ	0.41	0 U	0 UJ	0 UJ	0.88 J	0 UJ	0.46 J	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0 U	0 U	0 U	0.0069 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.1 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0.093 J	0 UJ	0 UJ	0 UJ	0.58 J	0 UJ	0.017 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	1.17 J	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 UJ	0.035 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.00129 J	0.0063	0.39	0.0069	0.0198 J	0.0087 J	1.11 J	0 UJ	0.69 J	0 UJ	0.0168 J	0 UJ
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0.0171	0.09	2.82	0.048	0.246 J	0.081 J	10.8 J	0.036 J	9	0.012 J	0.216 J	0.0057 J
Mammals - Sum of TEQs (individuals)			0.07039	0.548	16.1	0.2559	1.4437	0.3128	49.58	0.1609	42.89	0.025	0.9698	0.1111
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.012 J	0.058	2.3	0.043	0.16 J	0 UJ	6.5 J	0.027 J	4.7 J	0.013 J	0.13 J	0.0054 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.004	0.017	0.76	0.013	0.046 J	0.022 J	2.3 J	0.0091 J	1.8 J	0 UJ	0.047 J	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0.0047 J	0.12	0 UJ	0 UJ	0.0031 J	0.29 J	0.0069 J	0.31 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0.063 J	0 UJ	0 UJ	0.25 J	0 UJ	1.2 J	0 UJ	2.5 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0.26 J	0.028 J	0.058 J	0 UJ	0 UJ	0 UJ	0.48 J	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0.0081 J	0.22	0 UJ	0.015 J	0 UJ	0.58 J	0 UJ	0.5 J	0 UJ	0.012 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0.018 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 UJ	0.41	0 U	0 UJ	0 UJ	0.88 J	0 UJ	0.46 J	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 U	0 U	0 U	0 U	0.023 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.1 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0.093 J	0 UJ	0 UJ	0 UJ	0.58 J	0 UJ	0.017 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	3.9 J	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 UJ	0.35 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.00043 J	0.0021	0.13	0.0023	0.0066 J	0.0029 J	0.37 J	0 UJ	0.23 J	0 UJ	0.0056 J	0 UJ
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.0057	0.03	0.94	0.016	0.082 J	0.027 J	3.6 J	0.012 J	3	0.004 J	0.072 J	0.0019 J
Birds - Sum of TEQs (individuals)			0.02213	0.5729	5.14	0.1023	0.7336	0.055	15.72	0.055	18.46	0.017	0.2836	0.1073

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-001-A-0.0/0.8 6/25/2014	CC-001-A1-0.0/0.5 6/26/2014	CC-002-A-0.0/0.5 6/25/2014	CC-002-A-0.5/1.4 6/25/2014	CC-003-C-0.0/0.5 6/22/2014	CC-003-C-0.5/1.3 6/22/2014	CC-004-A-0.0/0.5 6/22/2014	CC-004-A-0.5/1.8 6/22/2014	CC-005-B-0.0/0.5 6/22/2014	CC-005-B-0.5/1.3 6/22/2014	CC-006-A-0.0/0.5 6/22/2014	CC-006-A-0.5/1.3 6/22/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.012 J	0.058	2.3	0.043	0.16 J	0 UJ	6.5 J	0.027 J	4.7 J	0.013 J	0.13 J	0.0054 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.004	0.017	0.76	0.013	0.046 J	0.022 J	2.3 J	0.0091 J	1.8 J	0 UJ	0.047 J	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0.0047 J	0.12	0 UJ	0 UJ	0.0031 J	0.29 J	0.0069 J	0.31 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0.063 J	0 UJ	0 UJ	0.25 J	0 UJ	1.2 J	0 UJ	2.5 J	0 UJ	0 UJ	0 UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0.26 J	0.028 J	0.058 J	0 UJ	0 UJ	0 UJ	0.48 J	0 UJ	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0.0081 J	0.22	0 UJ	0.015 J	0 UJ	0.58 J	0 UJ	0.5 J	0 UJ	0.012 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0.018 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 U	0 UJ	0.041	0 U	0 UJ	0 UJ	0.088 J	0 UJ	0.046 J	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 U	0 U	0 U	0 U	0.0115 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.1 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0.093 J	0 UJ	0 UJ	0 UJ	0.58 J	0 UJ	0.017 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	1.95 J	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 UJ	0.0175 J	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.00043 J	0.0021	0.13	0.0023	0.0066 J	0.0029 J	0.37 J	0 UJ	0.23 J	0 UJ	0.0056 J	0 UJ
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.0057	0.03	0.94	0.016	0.082 J	0.027 J	3.6 J	0.012 J	3	0.004 J	0.072 J	0.0019 J
Fish - Sum of TEQs (individuals)			0.02213	0.2404	4.771	0.1023	0.7221	0.055	14.928	0.055	16.096	0.017	0.2836	0.1073

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-007-C-0.0/0.5 6/23/2014	CC-007-C-0.5/1.6 6/23/2014	CC-008-C-0.0/0.5 6/23/2014	CC-008-C-0.5/2.3 6/23/2014	CC-009-C-0.0/0.5 6/23/2014	CC-009-C-0.5/1.3 6/23/2014	CC-010-A-0.0/0.8 6/23/2014	CC-010-A-0.8/1.9 6/23/2014	CC-011-A-0.0/0.5 6/23/2014	CC-011-A-0.5/1.2 6/23/2014	CC-012-C-0.0/0.6 6/23/2014	CC-013-C-0.0/0.5 6/23/2014	CC-013-C-0.5/1.2 6/23/201
Dioxin and Furan Congeners	**CAS No.**	**Unit**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	1,900 J	47 J	200 J	63 J	6.6 UJ	0.82 UJ	1,100 J	14 J	150	0.41 UJ	1.5 J	480	80
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	9,800	140 J	4,300	210 J	25 J	2.4 UJ	3,800	54 J	540	1.4 U	4.3	1,700	290
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	130 J	5.2 J	15 J	5.1 J	0.55 J	0.42 UJ	62 J	1.2 J	9.4	0.34 U	0.26 U	34	4.3
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	160 J	9.5 UJ	38 J	4.2 UJ	0.52 UJ	0.21 UJ	49 J	1.1 UJ	3.7 U	0.14 U	0.17 U	25	3.4
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	24 J	0.28 UJ	5.5 J	0.47 UJ	0.23 UJ	0.19 UJ	8.1 J	0.22 UJ	1 U	0.16 U	0.25 U	2 J	0.39
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	28 J	1.1 J	2.6 J	0.81 UJ	0.31 UJ	0.16 UJ	10 J	0.34 UJ	1.5 U	0.15 UJ	0.15 J	6.5 J	1.5
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	180 J	3.6 J	42 J	6.1 UJ	1.1 UJ	0.17 UJ	100 J	1.5 UJ	14	0.22 U	0.23 UJ	54 J	7.5
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	19 J	0.73 UJ	1.3 UJ	0.65 UJ	0.21 UJ	0.21 UJ	6.8 J	0.17 UJ	0.51 UJ	0.17 U	0.14 U	5.1 J	0.52
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	40 J	0.5 UJ	15 J	0.91 UJ	0.2 UJ	0.2 UJ	17 J	0.22 UJ	2.4 U	0.14 U	0.23 U	3.5 J	0.76
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	5.6 J	0.17 UJ	1 J	0.52 UJ	0.12 UJ	0.095 UJ	2.2 UJ	0.14 UJ	0.53 U	0.13 U	0.076 UJ	0.84 J	0.32
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	2.4 UJ	0.13 UJ	1.1 UJ	0.24 UJ	0.19 UJ	0.12 UJ	1.9 UJ	0.13 UJ	0.29 U	0.14 UJ	0.14 U	1.3 J	0.41
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	44 J	1.7 J	3.5 J	1.8 UJ	0.26 UJ	0.17 UJ	17 J	0.46 UJ	2.5 U	0.15 U	0.12 U	3.2 J	0.58
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	9.2 J	0.56 UJ	1.5 J	0.89 UJ	0.12 UJ	0.083 UJ	5.6 UJ	0.26 UJ	0.99 U	0.084 UJ	0.096 UJ	4.1 J	0.95
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.72 J	0.1 UJ	0.36 UJ	0.12 UJ	0.091 UJ	0.12 UJ	0.32 UJ	0.17 UJ	0.14 U	0.069 U	0.14 U	0.72 U	1
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.32 UJ	0.11 UJ	0.52 UJ	0.19 UJ	0.17 UJ	0.12 UJ	0.57 J	0.2 UJ	0.21 U	0.067 U	0.17 U	0.97 U	1.1
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	10,000	160 J	960 J	290 J	32 J	3 UJ	6,500	70 J	800	1.8 U	5.1 J	2,300	440
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	160,000	2,500 J	33,000	3,300 J	350 J	36 J	67,000	730 J	7,900	18 U	70	23,000	4,100
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	8,800	180 J	950 J	290 J	32 J	3.4 UJ	4,800	68 J	750	0.3 U	5.1	2,300	380
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	26,000	310 J	7,300	410 J	50 J	4.9 UJ	7,300	110 J	1,000	2.7 U	8.3	3,400	590
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	2,200 J	61 J	250 J	84 J	11 UJ	0.61 UJ	390 J	19 J	160	0.5 U	1.6 J	520	95
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	1,100 J	18 J	370 J	24 J	1.5 UJ	0.19 UJ	460 J	4.5 UJ	58	0.17 U	0.87 J	170	30
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	23 J	2.6 J	4.4 J	1.2 UJ	3.1 UJ	1.1 UJ	10 J	0.55 UJ	1.9 U	1.2 U	0.14 U	1.3 J	2.1
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	110 J	6.1 J	20 J	9.7 UJ	11 UJ	0.16 UJ	15 J	2 UJ	7.6	0.69 U	0.27 U	29	4
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	8.1 J	0.88 J	1.6 J	2.1 J	14 J	0.6 UJ	3.2 J	2.3 J	7.2	0.92 U	1.2 U	3.7	1.1
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	9.9 J	4.8 J	0.52 UJ	1 J	2 J	1.2 J	9.2 J	1.6 J	2.1	1.4 J	0.34 J	0.97 U	1.1
ADJUSTMENTS (ND VALUES=0)															
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	1900 J	47 J	200 J	63 J	0 UJ	0 UJ	1100 J	14 J	150	0 UJ	1.5 J	480	80
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	9800	140 J	4300	210 J	25 J	0 UJ	3800	54 J	540	0 U	4.3	1700	290
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	130 J	5.2 J	15 J	5.1 J	0.55 J	0 UJ	62 J	1.2 J	9.4	0 U	0 U	34	4.3
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	160 J	0 UJ	38 J	0 UJ	0 UJ	0 UJ	49 J	0 UJ	0 U	0 U	0 U	25	3.4
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	24 J	0 UJ	5.5 J	0 UJ	0 UJ	0 UJ	8.1 J	0 UJ	0 U	0 U	0 U	2 J	0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	28 J	1.1 J	2.6 J	0 UJ	0 UJ	0 UJ	10 J	0 UJ	0 U	0 UJ	0.15 J	6.5 J	1.5
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	180 J	3.6 J	42 J	0 UJ	0 UJ	0 UJ	100 J	0 UJ	14	0 U	0 UJ	54 J	7.5
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	19 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	6.8 J	0 UJ	0 UJ	0 U	0 U	5.1 J	0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	40 J	0 UJ	15 J	0 UJ	0 UJ	0 UJ	17 J	0 UJ	0 U	0 U	0 U	3.5 J	0.76
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	5.6 J	0 UJ	1 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0.84 J	0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 U	1.3 J	0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	44 J	1.7 J	3.5 J	0 UJ	0 UJ	0 UJ	17 J	0 UJ	0 U	0 U	0 U	3.2 J	0
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	9.2 J	0 UJ	1.5 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 UJ	4.1 J	0.95
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.72 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 U	0 U	0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.57 J	0 UJ	0 U	0 U	0 U	0 U	0
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	10000	160 J	960 J	290 J	32 J	0 UJ	6500	70 J	800	0 U	5.1 J	2300	440
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	160000	2500 J	33000	3300 J	350 J	36 J	67000	730 J	7900	0 U	70	23000	4100

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-007-C-0.0/0.5 6/23/2014	CC-007-C-0.5/1.6 6/23/2014	CC-008-C-0.0/0.5 6/23/2014	CC-008-C-0.5/2.3 6/23/2014	CC-009-C-0.0/0.5 6/23/2014	CC-009-C-0.5/1.3 6/23/2014	CC-010-A-0.0/0.8 6/23/2014	CC-010-A-0.8/1.9 6/23/2014	CC-011-A-0.0/0.5 6/23/2014	CC-011-A-0.5/1.2 6/23/2014	CC-012-C-0.0/0.6 6/23/2014	CC-013-C-0.0/0.5 6/23/2014	CC-013-C-0.5/1.2 6/23/201
MAMMALIAN TEQs		**Mammal TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	19 J	0.47 J	2 J	0.63 J	0 UJ	0 UJ	11 J	0.14 J	1.5	0 UJ	0.015 J	4.8	0.8
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	98	1.4 J	43	2.1 J	0.25 J	0 UJ	38	0.54 J	5.4	0 U	0.043	17	2.9
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	1.3 J	0.052 J	0.15 J	0.051 J	0.0055 J	0 UJ	0.62 J	0.012 J	0.094	0 U	0 U	0.34	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	16 J	0 UJ	3.8 J	0 UJ	0 UJ	0 UJ	4.9 J	0 UJ	0 U	0 U	0 U	2.5	0.34
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	2.4 J	0 UJ	0.55 J	0 UJ	0 UJ	0 UJ	0.81 J	0 UJ	0 U	0 U	0 U	0.2 J	0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	2.8 J	0.11 J	0.26 J	0 UJ	0 UJ	0 UJ	1 J	0 UJ	0 U	0 UJ	0.015 J	0.65 J	0.15
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	18 J	0.36 J	4.2 J	0 UJ	0 UJ	0 UJ	10 J	0 UJ	1.4	0 U	0 UJ	5.4 J	0.75
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	1.9 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.68 J	0 UJ	0 UJ	0 U	0 U	0.51 J	0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	4 J	0 UJ	1.5 J	0 UJ	0 UJ	0 UJ	1.7 J	0 UJ	0 U	0 U	0 U	0.35 J	0.076
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0.168 J	0 UJ	0.03 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0.0252 J	0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 U	1.3 J	0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	4.4 J	0.17 J	0.35 J	0 UJ	0 UJ	0 UJ	1.7 J	0 UJ	0 U	0 U	0 U	0.32 J	0
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	2.76 J	0 UJ	0.45 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 UJ	1.23 J	0.285
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0.072 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 U	0 U	0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.57 J	0 UJ	0 U	0 U	0 U	0 U	0
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	3	0.048 J	0.288 J	0.087 J	0.0096 J	0 UJ	1.95	0.021 J	0.24	0 U	0.00153 J	0.69	0.132
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	48	0.75 J	9.9	0.99 J	0.105 J	0.0108 J	20.1	0.219 J	2.37	0 U	0.021	6.9	1.23
Mammals - Sum of TEQs (individuals)			221.8	3.36	66.478	3.858	0.3701	0.0108	93.03	0.932	11.004	0	0.09553	42.2152	6.706
AVIAN TEQs		**Bird TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	19 J	0.47 J	2 J	0.63 J	0 UJ	0 UJ	11 J	0.14 J	1.5	0 UJ	0.015 J	4.8	0.8
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	9.8	0.14 J	4.3	0.21 J	0.025 J	0 UJ	3.8	0.054 J	0.54	0 U	0.0043	1.7	0.29
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	1.3 J	0.052 J	0.15 J	0.051 J	0.0055 J	0 UJ	0.62 J	0.012 J	0.094	0 U	0 U	0.34	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	16 J	0 UJ	3.8 J	0 UJ	0 UJ	0 UJ	4.9 J	0 UJ	0 U	0 U	0 U	2.5	0.34
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	1.2 J	0 UJ	0.275 J	0 UJ	0 UJ	0 UJ	0.405 J	0 UJ	0 U	0 U	0 U	0.1 J	0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	2.8 J	0.11 J	0.26 J	0 UJ	0 UJ	0 UJ	1 J	0 UJ	0 U	0 UJ	0.015 J	0.65 J	0.15
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	1.8 J	0.036 J	0.42 J	0 UJ	0 UJ	0 UJ	1 J	0 UJ	0.14	0 U	0 UJ	0.54 J	0.075
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	1.9 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.68 J	0 UJ	0 UJ	0 U	0 U	0.51 J	0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	4 J	0 UJ	1.5 J	0 UJ	0 UJ	0 UJ	1.7 J	0 UJ	0 U	0 U	0 U	0.35 J	0.076
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0.56 J	0 UJ	0.1 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0.084 J	0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 U	1.3 J	0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	4.4 J	0.17 J	0.35 J	0 UJ	0 UJ	0 UJ	1.7 J	0 UJ	0 U	0 U	0 U	0.32 J	0
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	9.2 J	0 UJ	1.5 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 UJ	4.1 J	0.95
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0.72 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 U	0 U	0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.57 J	0 UJ	0 U	0 U	0 U	0 U	0
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	1	0.016 J	0.096 J	0.029 J	0.0032 J	0 UJ	0.65	0.007 J	0.08	0 U	0.00051 J	0.23	0.044
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	16	0.25 J	3.3	0.33 J	0.035 J	0.0036 J	6.7	0.073 J	0.79	0 U	0.007	2.3	0.41
Birds - Sum of TEQs (individuals)			89.68	1.244	18.051	1.25	0.0687	0.0036	34.725	0.286	3.144	0	0.04181	19.824	3.178

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-007-C-0.0/0.5 6/23/2014	CC-007-C-0.5/1.6 6/23/2014	CC-008-C-0.0/0.5 6/23/2014	CC-008-C-0.5/2.3 6/23/2014	CC-009-C-0.0/0.5 6/23/2014	CC-009-C-0.5/1.3 6/23/2014	CC-010-A-0.0/0.8 6/23/2014	CC-010-A-0.8/1.9 6/23/2014	CC-011-A-0.0/0.5 6/23/2014	CC-011-A-0.5/1.2 6/23/2014	CC-012-C-0.0/0.6 6/23/2014	CC-013-C-0.0/0.5 6/23/2014	CC-013-C-0.5/1.2 6/23/201
FISH TEQs		**Fish TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	19 J	0.47 J	2 J	0.63 J	0 UJ	0 UJ	11 J	0.14 J	1.5	0 UJ	0.015 J	4.8	0.8
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	9.8	0.14 J	4.3	0.21 J	0.025 J	0 UJ	3.8	0.054 J	0.54	0 U	0.0043	1.7	0.29
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	1.3 J	0.052 J	0.15 J	0.051 J	0.0055 J	0 UJ	0.62 J	0.012 J	0.094	0 U	0 U	0.34	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	16 J	0 UJ	3.8 J	0 UJ	0 UJ	0 UJ	4.9 J	0 UJ	0 U	0 U	0 U	2.5	0.34
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	12 J	0 UJ	2.75 J	0 UJ	0 UJ	0 UJ	4.05 J	0 UJ	0 U	0 U	0 U	1 J	0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	2.8 J	0.11 J	0.26 J	0 UJ	0 UJ	0 UJ	1 J	0 UJ	0 U	0 UJ	0.015 J	0.65 J	0.15
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	1.8 J	0.036 J	0.42 J	0 UJ	0 UJ	0 UJ	1 J	0 UJ	0.14	0 U	0 UJ	0.54 J	0.075
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	1.9 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.68 J	0 UJ	0 UJ	0 U	0 U	0.51 J	0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0.4 J	0 UJ	0.15 J	0 UJ	0 UJ	0 UJ	0.17 J	0 UJ	0 U	0 U	0 U	0.035 J	0.0076
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0.28 J	0 UJ	0.05 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0.042 J	0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 U	1.3 J	0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	4.4 J	0.17 J	0.35 J	0 UJ	0 UJ	0 UJ	1.7 J	0 UJ	0 U	0 U	0 U	0.32 J	0
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	4.6 J	0 UJ	0.75 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 UJ	0 UJ	2.05 J	0.475
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0.036 J	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 U	0 U	0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.57 J	0 UJ	0 U	0 U	0 U	0 U	0
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	1	0.016 J	0.096 J	0.029 J	0.0032 J	0 UJ	0.65	0.007 J	0.08	0 U	0.00051 J	0.23	0.044
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	16	0.25 J	3.3	0.33 J	0.035 J	0.0036 J	6.7	0.073 J	0.79	0 U	0.007	2.3	0.41
Fish - Sum of TEQs (individuals)			91.316	1.244	18.376	1.25	0.0687	0.0036	36.84	0.286	3.144	0	0.04181	18.317	2.6346

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-014-B-0.0/0.5 6/23/2014	CC-014-B-0.5/1.3 6/23/2014	CC-015-A-0.0/0.5 6/23/2014	CC-015-A-0.5/1.7 6/23/2014	CC-016-C-0.0/0.5 6/24/2014	CC-016-C-0.5/1.3 6/24/2014	CC-017-A-0.0/0.5 6/24/2014	CC-017-A-0.5/1.3 6/24/2014	CC-018-C-0.0/0.5 6/24/2014	CC-018-C-0.5/2.0 6/24/2014	CC-019-C-0.0/0.5 6/24/2014	CC-019-C-0.5/1.9 6/24/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	140	8.7	190	0.14 J	0.33 J	0.16 U	83	2.6 U	840	53	510	2.2 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	490	29	540	0.33 J	0.7 UJ	0.24 U	300	9.1	2,700	190	1,400	7.7
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	8.2	0.75 UJ	14	0.14 U	0.34 U	0.22 U	4.4 UJ	0.28 U	70	3.9	35	0.98 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	9.7	0.88 J	17	0.086 U	0.09 U	0.17 U	3.1 U	0.19 U	64	2.5 U	82 UJ	0.4 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg UJ	1.4 J	0.48 U	1.6 UJ	0.1 U	0.12 U	0.18 U	0.81 U	0.2 U	3.4 UJ	0.58 U	2 U	0.45 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg J	6.3 UJ	0.35 UJ	5.8 J	0.065 U	0.09 UJ	0.15 U	1.4 U	0.13 U	25 J	0.74 U	5.3 U	0.43 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg J	15 J	0.98 J	20 J	0.11 U	0.13 U	0.2 U	8	0.32 UJ	73	5.5 U	34	0.49 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg UJ	1.7 UJ	0.26 UJ	2.6 J	0.07 U	0.15 U	0.22 U	1 U	0.14 U	11 J	0.26 U	2.3 UJ	0.43 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg J	2.2 J	0.54 U	3.7 J	0.11 U	0.14 U	0.19 U	1.3 U	0.21 U	9.9 J	0.81 UJ	4.5 U	0.41 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg U	0.73 J	0.32 U	1 J	0.15 U	0.21 U	0.1 U	0.55 U	0.1 U	4.3 U	0.33 U	1.3 UJ	0.3 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg U	0.82 U	0.35 U	0.45 J	0.19 U	0.19 U	0.1 U	0.29 UJ	0.15 U	2.1 UJ	0.18 U	0.39 UJ	0.31 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg UJ	1.3 J	0.35 J	5.5 J	0.064 U	0.09 U	0.16 U	1.7 U	0.11 U	22 J	0.84 UJ	7.5	0.37 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg J	1.7 J	0.28 U	2.8 J	0.089 U	0.13 U	0.079 U	1 U	0.092 U	11 J	0.54 U	1.9 U	0.28 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg U	1.6 U	0.41 J	0.77 J	0.25 J	0.2 UJ	0.096 U	0.15 J	0.083 U	1.3 U	0.2 U	0.13 U	0.27 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg U	1.7 U	0.25 U	0.76 U	0.081 U	0.16 U	0.11 U	0.2 U	0.12 U	1.9 U	0.25 U	0.19 U	0.3 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	710	40	770	0.26 UJ	1.2 J	0.31 U	440	12 U	4,100	270	2,800	9 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	7,000	440	7,000	2.1 U	10	1.4 U	4,500	130	47,000	3,000	22,000	96 =
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	650	36	640	0.14 J	0.33 J	0.19 U	400	12	3,900	260	2,500	2.2 U
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	1,000	60	1,100	0.68 J	0.24 U	0.24 U	590	17	5,900	380	2,900	18
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	190	12	220	0.077 J	0.14 J	0.17 U	96	2.8 U	1,100	60	440	2.9 U
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	59	6.5 J	84	1.8 J	0.21 J	0.19 U	36	1.3 U	320	22	160	1.3 U
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg J	0.82 U	3.1 J	11	3 J	0.19 U	0.3 U	1.4 U	0.69 U	2 U	2.7 U	3 U	0.91 U
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg J	8.4 J	1.7 J	14	0.12 U	0.17 U	0.34 U	9.9 U	0.37 U	69 J	4.3 U	17	0.5 U
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg U	2.1 U	2.5 U	3 U	1.9 U	1.8 U	0.63 U	4.7	0.58 U	4.6 J	1.5 U	3.2	0.84 U
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg U	1.7 U	3.9	11	4.7	0.84 J	0.11 U	1.3 J	0.61 J	2.2 J	2.6	3.7	0.49 J
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	140	8.7	190	0.14 J	0.33 J	0 U	83	0 U	840	53	510	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	490	29	540	0.33 J	0 UJ	0 U	300	9.1	2700	190	1400	7.7
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	8.2	0 UJ	14	0 U	0 U	0 U	0 UJ	0 U	70	3.9	35	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	9.7	0.88 J	17	0 U	0 U	0 U	0 U	0 U	64	0 U	0 UJ	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg UJ	1.4 J	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg J	0 UJ	0 UJ	5.8 J	0 U	0 UJ	0 U	0 U	0 U	25 J	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg J	15 J	0.98 J	20 J	0 U	0 U	0 U	8	0 UJ	73	0 U	34	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg UJ	0 UJ	0 UJ	2.6 J	0 U	0 U	0 U	0 U	0 U	11 J	0 U	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg J	2.2 J	0 U	3.7 J	0 U	0 U	0 U	0 U	0 U	9.9 J	0 UJ	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg U	0.73 J	0 U	1 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg U	0 U	0 U	0.45 J	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg UJ	1.3 J	0.35 J	5.5 J	0 U	0 U	0 U	0 U	0 U	22 J	0 UJ	7.5	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg J	1.7 J	0 U	2.8 J	0 U	0 U	0 U	0 U	0 U	11 J	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg U	0 U	0.41 J	0.77 J	0.25 J	0 UJ	0 U	0.15 J	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	710	40	770	0 UJ	1.2 J	0 U	440	0 U	4100	270	2800	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	7000	440	7000	0 U	10	0 U	4500	130	47000	3000	22000	96 =

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

				CC-014-B-0.0/0.5 6/23/2014	CC-014-B-0.5/1.3 6/23/2014	CC-015-A-0.0/0.5 6/23/2014	CC-015-A-0.5/1.7 6/23/2014	CC-016-C-0.0/0.5 6/24/2014	CC-016-C-0.5/1.3 6/24/2014	CC-017-A-0.0/0.5 6/24/2014	CC-017-A-0.5/1.3 6/24/2014	CC-018-C-0.0/0.5 6/24/2014	CC-018-C-0.5/2.0 6/24/2014	CC-019-C-0.0/0.5 6/24/2014	CC-019-C-0.5/1.9 6/24/2014
MAMMALIAN TEQs		**Mammal TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01		1.4	0.087	1.9	0.0014 J	0.0033 J	0 U	0.83	0 U	8.4	0.53	5.1	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01		4.9	0.29	5.4	0.0033 J	0 UJ	0 U	3	0.091	27	1.9	14	0.077
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01		0.082	0 UJ	0.14	0 U	0 U	0 U	0 UJ	0 U	0.7	0.039	0.35	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1		0.97	0.088 J	1.7	0 U	0 U	0 U	0 U	0 U	6.4	0 U	0 UJ	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	UJ	0.14 J	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	J	0 UJ	0 UJ	0.58 J	0 U	0 UJ	0 U	0 U	0 U	2.5 J	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	J	1.5 J	0.098 J	2 J	0 U	0 U	0 U	0.8	0 UJ	7.3	0 U	3.4	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	UJ	0 UJ	0 UJ	0.26 J	0 U	0 U	0 U	0 U	0 U	1.1 J	0 U	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	J	0.22 J	0 U	0.37 J	0 U	0 U	0 U	0 U	0 U	0.99 J	0 UJ	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	U	0.0219 J	0 U	0.03 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	U	0 U	0 U	0.45 J	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	UJ	0.13 J	0.035 J	0.55 J	0 U	0 U	0 U	0 U	0 U	2.2 J	0 UJ	0.75	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	J	0.51 J	0 U	0.84 J	0 U	0 U	0 U	0 U	0 U	3.3 J	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	U	0 U	0.041 J	0.077 J	0.025 J	0 UJ	0 U	0.015 J	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003		0.213	0.012	0.231	0 UJ	0.00036 J	0 U	0.132	0 U	1.23	0.081	0.84	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003		2.1	0.132	2.1	0 U	0.003	0 U	1.35	0.039	14.1	0.9	6.6	0.0288 =
Mammals - Sum of TEQs (individuals)				12.1869	0.783	16.628	0.0297	0.00666	0	6.127	0.13	75.22	3.45	31.04	0.1058
AVIAN TEQs		**Bird TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01		1.4	0.087	1.9	0.0014 J	0.0033 J	0 U	0.83	0 U	8.4	0.53	5.1	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001		0.49	0.029	0.54	0.00033 J	0 UJ	0 U	0.3	0.0091	2.7	0.19	1.4	0.0077
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01		0.082	0 UJ	0.14	0 U	0 U	0 U	0 UJ	0 U	0.7	0.039	0.35	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1		0.97	0.088 J	1.7	0 U	0 U	0 U	0 U	0 U	6.4	0 U	0 UJ	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	UJ	0.07 J	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	J	0 UJ	0 UJ	0.58 J	0 U	0 UJ	0 U	0 U	0 U	2.5 J	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	J	0.15 J	0.0098 J	0.2 J	0 U	0 U	0 U	0.08	0 UJ	0.73	0 U	0.34	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	UJ	0 UJ	0 UJ	0.26 J	0 U	0 U	0 U	0 U	0 U	1.1 J	0 U	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	J	0.22 J	0 U	0.37 J	0 U	0 U	0 U	0 U	0 U	0.99 J	0 UJ	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	U	0.073 J	0 U	0.1 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	U	0 U	0 U	0.45 J	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	UJ	0.13 J	0.035 J	0.55 J	0 U	0 U	0 U	0 U	0 U	2.2 J	0 UJ	0.75	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	J	1.7 J	0 U	2.8 J	0 U	0 U	0 U	0 U	0 U	11 J	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	U	0 U	0.41 J	0.77 J	0.25 J	0 UJ	0 U	0.15 J	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001		0.071	0.004	0.077	0 UJ	0.00012 J	0 U	0.044	0 U	0.41	0.027	0.28	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001		0.7	0.044	0.7	0 U	0.001	0 U	0.45	0.013	4.7	0.3	2.2	0.0096 =
Birds - Sum of TEQs (individuals)				6.056	0.7068	11.137	0.25173	0.00442	0	1.854	0.0221	41.83	1.086	10.42	0.0173

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

				CC-014-B-0.0/0.5 6/23/2014	CC-014-B-0.5/1.3 6/23/2014	CC-015-A-0.0/0.5 6/23/2014	CC-015-A-0.5/1.7 6/23/2014	CC-016-C-0.0/0.5 6/24/2014	CC-016-C-0.5/1.3 6/24/2014	CC-017-A-0.0/0.5 6/24/2014	CC-017-A-0.5/1.3 6/24/2014	CC-018-C-0.0/0.5 6/24/2014	CC-018-C-0.5/2.0 6/24/2014	CC-019-C-0.0/0.5 6/24/2014	CC-019-C-0.5/1.9 6/24/2014
FISH TEQs		**Fish TEF**													
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01		1.4	0.087	1.9	0.0014 J	0.0033 J	0 U	0.83	0 U	8.4	0.53	5.1	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001		0.49	0.029	0.54	0.00033 J	0 UJ	0 U	0.3	0.0091	2.7	0.19	1.4	0.0077
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01		0.082	0 UJ	0.14	0 U	0 U	0 U	0 UJ	0 U	0.7	0.039	0.35	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1		0.97	0.088 J	1.7	0 U	0 U	0 U	0 U	0 U	6.4	0 U	0 UJ	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	UJ	0.7 J	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	J	0 UJ	0 UJ	0.58 J	0 U	0 UJ	0 U	0 U	0 U	2.5 J	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	J	0.15 J	0.0098 J	0.2 J	0 U	0 U	0 U	0.08	0 UJ	0.73	0 U	0.34	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	UJ	0 UJ	0 UJ	0.26 J	0 U	0 U	0 U	0 U	0 U	1.1 J	0 U	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	J	0.022 J	0 U	0.037 J	0 U	0 U	0 U	0 U	0 U	0.099 J	0 UJ	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	U	0.0365 J	0 U	0.05 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	U	0 U	0 U	0.45 J	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	UJ	0.13 J	0.035 J	0.55 J	0 U	0 U	0 U	0 U	0 U	2.2 J	0 UJ	0.75	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	J	0.85 J	0 U	1.4 J	0 U	0 U	0 U	0 U	0 U	5.5 J	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	U	0 U	0.0205 J	0.0385 J	0.0125 J	0 UJ	0 U	0.0075 J	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001		0.071	0.004	0.077	0 UJ	0.00012 J	0 U	0.044	0 U	0.41	0.027	0.28	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001		0.7	0.044	0.7	0 U	0.001	0 U	0.45	0.013	4.7	0.3	2.2	0.0096 =
Fish - Sum of TEQs (individuals)				5.6015	0.3173	8.6225	0.01423	0.00442	0	1.7115	0.0221	35.439	1.086	10.42	0.0173

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-020-A-0.0/0.5 6/24/2014	CC-020-A-0.5/1.8 6/24/2014	CC-021-C-0.0/0.5 6/25/2014	CC-021-C-0.5/2.0 6/25/2014	CC-021-C-2.0/3.0 6/25/2014	CC-021-C-3.0/3.6 6/25/2014	CC-022-A-0.0/0.8 6/25/2014	CC-023-A-0.0/0.5 6/25/2014	CC-023-A-0.5/2.1 6/25/2014	CC-024-A-0.0/0.5 6/25/2014	CC-024-A-0.5/2.0 6/25/2014	CC-024-A-2.0/3.0 6/25/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	91	1.2 U	18	0.21 U	0.25 U	0.18 U	0.6 J	35	4.9	29	26	0.39 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	330	4.9 U	59	0.34 U	0.33 U	0.28 U	1.7 J	110	16 J	91	78	0.73 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	9 J	0.37 U	2 J	0.33 U	0.35 U	0.23 U	0.35 U	1.9 UJ	0.35 UJ	2 J	1.9 J	0.54 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	4.1 UJ	0.25 U	1.1 UJ	0.14 U	0.25 U	0.16 U	0.16 U	2.1 J	0.22 J	1.4 UJ	2.1 J	0.29 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	1.5 U	0.2 U	0.38 J	0.27 U	0.27 U	0.21 U	0.2 U	0.32 U	0.25 U	0.39 U	0.39 U	0.38 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	1.7 U	0.2 U	0.64 U	0.14 U	0.23 U	0.14 U	0.14 U	0.59 J	0.12 U	0.61 U	0.51 U	0.26 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	9.9 J	0.25 U	1.9 J	0.32 U	0.34 U	0.28 U	0.24 U	3.7	0.51 UJ	3.3	2.3 UJ	0.48 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	1.3 U	0.13 U	0.36 J	0.2 U	0.28 U	0.2 U	0.17 U	0.6 UJ	0.13 U	0.36 UJ	0.3 UJ	0.32 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	2 UJ	0.24 U	0.81 UJ	0.29 U	0.26 U	0.22 U	0.22 U	0.84 J	0.3 U	0.38 UJ	0.65 UJ	0.4 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.93 UJ	0.12 U	0.2 UJ	0.16 U	0.23 U	0.15 U	0.17 U	0.26 J	0.12 U	0.21 U	0.4 U	0.21 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.75 U	0.11 U	0.35 U	0.34 U	0.24 U	0.23 U	0.17 U	0.37 UJ	0.15 U	0.4 U	0.35 U	0.36 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	1.9 UJ	0.14 U	0.31 J	0.15 U	0.16 U	0.19 U	0.13 U	0.87 UJ	0.15 U	0.22 UJ	0.35 U	0.26 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	1.2 UJ	0.11 U	0.23 UJ	0.14 U	0.22 U	0.13 U	0.11 U	0.45 J	0.097 U	0.37 J	0.36 UJ	0.28 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.88 U	0.14 U	0.19 J	0.15 U	0.17 U	0.15 U	0.25 U	0.42 U	0.27 UJ	0.22 U	0.28 U	0.24 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.84 U	0.13 U	0.17 U	0.2 U	0.22 U	0.13 U	0.094 U	0.34 U	0.21 U	0.38 U	0.35 U	0.29 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	550	7.1 U	64	0.51 U	0.69 U	0.45 U	1.6 UJ	180	23 J	150	110	1 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	5,000	64	820	1.4 U	0.74 U	2.3 U	22	1,600	190 J	1,400	1,100	5.3 UJ
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	440	5.7 U	70	0.27 U	0.3 U	0.21 U	2.1 J	140	20 J	130	100	0.46 U
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	660	9.4	120	0.34 U	0.33 U	0.44 U	3.6 J	220	31 J	180	160	0.73 U
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	97	0.98 U	20	0.16 U	0.23 U	0.17 U	0.43 U	37	4.3	30	30	0.28 U
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	39 J	1.1 U	14	0.29 U	0.29 U	0.24 U	0.33 J	18	4 J	11	8.9	0.52 J
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	3.7 U	0.11 U	5.7	0.34 U	0.24 U	0.79 J	0.17 U	2.3 J	2.6 J	0.4 U	0.44 J	0.61 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	5.7 U	0.11 U	2.1 J	0.15 U	0.23 U	0.14 U	0.17 J	0.7 J	0.11 U	2.7 J	2.5 J	0.24 U
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	7.2 J	0.48 U	1.5	0.51 J	0.17 U	0.49 J	0.51 U	1.1 J	0.87 J	0.56 J	0.52 J	0.45 J
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	1.1 J	0.89 J	7.9	0.53 J	0.29 J	0.52 J	1.2 J	2.7	4	0.38 U	0.35 U	0.76 J
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	91	0 U	18	0 U	0 U	0 U	0.6 J	35	4.9	29	26	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	330	0 U	59	0 U	0 U	0 U	1.7 J	110	16 J	91	78	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	9 J	0 U	2 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	2 J	1.9 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	2.1 J	0.22 J	0 UJ	2.1 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0.38 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.59 J	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	9.9 J	0 U	1.9 J	0 U	0 U	0 U	0 U	3.7	0 UJ	3.3	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0 U	0.36 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.84 J	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.26 J	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 UJ	0 U	0.31 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.45 J	0 U	0.37 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 U	0 U	0.19 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	550	0 U	64	0 U	0 U	0 U	0 UJ	180	23 J	150	110	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	5000	64	820	0 U	0 U	0 U	22	1600	190 J	1400	1100	0 UJ

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-020-A-0.0/0.5 6/24/2014	CC-020-A-0.5/1.8 6/24/2014	CC-021-C-0.0/0.5 6/25/2014	CC-021-C-0.5/2.0 6/25/2014	CC-021-C-2.0/3.0 6/25/2014	CC-021-C-3.0/3.6 6/25/2014	CC-022-A-0.0/0.8 6/25/2014	CC-023-A-0.0/0.5 6/25/2014	CC-023-A-0.5/2.1 6/25/2014	CC-024-A-0.0/0.5 6/25/2014	CC-024-A-0.5/2.0 6/25/2014	CC-024-A-2.0/3.0 6/25/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.91	0 U	0.18	0 U	0 U	0 U	0.006 J	0.35	0.049	0.29	0.26	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	3.3	0 U	0.59	0 U	0 U	0 U	0.017 J	1.1	0.16 J	0.91	0.78	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.09 J	0 U	0.02 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0.02 J	0.019 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.21 J	0.022 J	0 UJ	0.21 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0.038 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0.99 J	0 U	0.19 J	0 U	0 U	0 U	0 U	0.37	0 UJ	0.33	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0.036 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.084 J	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.0078 J	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0 U	0.031 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.135 J	0 U	0.111 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 U	0 U	0.019 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.165	0 U	0.0192	0 U	0 U	0 U	0 UJ	0.054	0.0069 J	0.045	0.033	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	1.5	0.0192	0.246	0 U	0 U	0 U	0.0066	0.48	0.057 J	0.42	0.33	0 UJ
Mammals - Sum of TEQs (individuals)			6.955	0.0192	1.3692	0	0	0	0.0296	2.8498	0.2949	2.126	1.632	0
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.91	0 U	0.18	0 U	0 U	0 U	0.006 J	0.35	0.049	0.29	0.26	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.33	0 U	0.059	0 U	0 U	0 U	0.0017 J	0.11	0.016 J	0.091	0.078	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.09 J	0 U	0.02 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0.02 J	0.019 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.21 J	0.022 J	0 UJ	0.21 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0.019 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.099 J	0 U	0.019 J	0 U	0 U	0 U	0 U	0.037	0 UJ	0.033	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0.036 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.084 J	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.026 J	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0 U	0.031 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.45 J	0 U	0.37 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 U	0 U	0.19 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.055	0 U	0.0064	0 U	0 U	0 U	0 UJ	0.018	0.0023 J	0.015	0.011	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.5	0.0064	0.082	0 U	0 U	0 U	0.0022	0.16	0.019 J	0.14	0.11	0 UJ
Birds - Sum of TEQs (individuals)			1.984	0.0064	0.6424	0	0	0	0.0099	1.504	0.1083	0.959	0.688	0

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-020-A-0.0/0.5 6/24/2014	CC-020-A-0.5/1.8 6/24/2014	CC-021-C-0.0/0.5 6/25/2014	CC-021-C-0.5/2.0 6/25/2014	CC-021-C-2.0/3.0 6/25/2014	CC-021-C-3.0/3.6 6/25/2014	CC-022-A-0.0/0.8 6/25/2014	CC-023-A-0.0/0.5 6/25/2014	CC-023-A-0.5/2.1 6/25/2014	CC-024-A-0.0/0.5 6/25/2014	CC-024-A-0.5/2.0 6/25/2014	CC-024-A-2.0/3.0 6/25/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.91	0 U	0.18	0 U	0 U	0 U	0.006 J	0.35	0.049	0.29	0.26	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.33	0 U	0.059	0 U	0 U	0 U	0.0017 J	0.11	0.016 J	0.091	0.078	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.09 J	0 U	0.02 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0.02 J	0.019 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.21 J	0.022 J	0 UJ	0.21 J	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0.19 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.099 J	0 U	0.019 J	0 U	0 U	0 U	0 U	0.037	0 UJ	0.033	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0.036 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.0084 J	0 U	0 UJ	0 UJ	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.013 J	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0 U	0.031 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0.225 J	0 U	0.185 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 U	0 U	0.0095 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.055	0 U	0.0064	0 U	0 U	0 U	0 UJ	0.018	0.0023 J	0.015	0.011	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.5	0.0064	0.082	0 U	0 U	0 U	0.0022	0.16	0.019 J	0.14	0.11	0 UJ
Fish - Sum of TEQs (individuals)			1.984	0.0064	0.6329	0	0	0	0.0099	1.1904	0.1083	0.774	0.688	0

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-024-A-3.0/3.6 6/25/2014	CC-025-C-0.0/0.5 6/26/2014	CC-025-C-0.5/2.0 6/26/2014	CC-025-C-2.0/3.0 6/26/2014	CC-025-C-3.0/4.0 6/26/2014	CC-026-C-0.0/0.5 6/24/2014	CC-026-C-0.5/2.0 6/24/2014	CC-026-C-2.0/3.3 6/24/2014	CC-027-A-0.0/0.5 6/25/2014	CC-027-A-0.5/1.9 6/25/2014	CC-028-B-0.0/0.5 6/25/2014	CC-028-B-0.5/2.0 6/25/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0.41 U	8.8	1 U	0.19 U	0.37 U	3.6 U	0.89 UJ	0.34 U	2.1 J	37	0.32 UJ	200
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0.52 U	29	1.8 UJ	0.26 U	0.44 U	11 UJ	4.2	0.5 U	5.9 UJ	160	0.39 UJ	640
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0.51 U	0.85 UJ	1.7 U	0.27 U	0.7 U	0.61 UJ	0.66 U	0.54 U	0.3 U	3.1	0.27 U	13 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0.36 U	0.6 J	0.63 U	0.14 U	0.19 U	0.43 UJ	0.29 U	0.32 U	0.24 J	1.7 UJ	0.31 UJ	7.4 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.61 U	0.22 U	0.7 U	0.23 U	0.28 U	0.4 U	0.43 U	0.41 U	0.17 U	0.34 UJ	0.32 U	1.3 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.25 U	0.57 UJ	0.57 U	0.13 U	0.17 U	0.16 U	0.36 U	0.24 U	0.18 UJ	0.69 J	0.19 UJ	1.5 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0.55 U	0.9 J	0.76 U	0.25 U	0.36 U	0.51 UJ	0.45 U	0.42 U	0.38 J	3.5 J	0.29 U	20 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0.31 U	0.18 U	0.94 U	0.18 U	0.34 U	0.18 U	0.52 U	0.47 U	0.26 U	0.24 U	0.27 U	1.1 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.52 U	0.28 J	0.76 U	0.22 U	0.36 U	0.32 U	0.36 U	0.43 U	0.2 U	0.87 J	0.29 U	1.5 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.31 U	0.21 U	0.67 U	0.14 U	0.2 U	0.12 UJ	0.37 U	0.47 U	0.14 U	0.23 U	0.17 U	1.6 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.51 U	0.21 U	0.58 U	0.23 U	0.16 U	0.16 U	0.5 U	0.58 U	0.17 U	0.21 U	0.12 U	1.4 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0.25 U	0.22 J	0.54 U	0.12 U	0.16 U	0.23 U	0.31 U	0.31 U	0.17 U	0.59 J	0.21 U	1.1 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.3 U	0.17 U	0.43 U	0.13 U	0.14 U	0.13 UJ	0.23 U	0.38 U	0.1 U	0.23 U	0.21 U	1.1 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.22 U	0.18 J	0.43 U	0.14 U	0.14 U	0.093 U	0.24 U	0.41 U	0.33 U	0.37 J	0.55 UJ	2.4 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.24 U	0.24 U	0.48 U	0.12 U	0.16 U	0.17 U	0.46 U	0.54 U	0.12 U	0.2 U	0.27 U	1.4 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0.93 U	39	3.3 U	0.51 U	1.9 U	15	4.8 J	1.3 U	7.5	200	0.36 U	1,000
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	2.6 U	370	21 U	1.1 UJ	2.2 U	180	47	3 J	97	2,900	3.5 U	7,400
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	0.46 U	37	1.4 U	0.23 U	0.53 U	15	0.48 U	0.44 U	7.8	99	0.24 U	860
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	0.52 U	56	2.1 J	0.26 U	0.44 U	13	7.9	0.5 U	7.2	290	0.59 J	1,200
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	0.29 U	8.1	0.67 U	0.14 U	0.21 U	5.6 U	0.37 U	0.33 U	1.4 J	31	3.4 U	63
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	1.5 J	6.7	0.84 J	1.8 J	0.33 U	1.2 U	1.4 J	1.1 J	2.5 J	9.9	4.1	50
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	2.3 J	3.2 J	0.58 U	3.4 J	0.49 J	0.16 U	0.5 U	1.8 J	3 J	0.21 U	5	1.8 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	0.31 U	0.99 J	0.55 U	0.13 U	0.17 U	0.47 U	0.3 U	0.42 U	0.36 J	0.23 U	0.19 U	4.8 J
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	0.54 J	0.76 J	0.43 U	0.35 J	0.49 J	1.8 J	0.68 U	0.41 U	0.79 J	1.6 U	0.39 U	2.4 U
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	4.4	5.5	0.48 U	4.8	0.49 J	0.57 J	2.3	0.54 U	3.5	0.2 U	6.6	1.4 U
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0 U	8.8	0 U	0 U	0 U	0 U	0 UJ	0 U	2.1 J	37	0 UJ	200
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0 U	29	0 UJ	0 U	0 U	0 UJ	4.2	0 U	0 UJ	160	0 UJ	640
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	3.1	0 U	13 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 U	0.6 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.24 J	0 UJ	0 UJ	7.4 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0.69 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0 U	0.9 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.38 J	3.5 J	0 U	20 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 U	0.28 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.87 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 U	0.22 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.59 J	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 U	0.18 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.37 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0 U	39	0 U	0 U	0 U	15	4.8 J	0 U	7.5	200	0 U	1000
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	0 U	370	0 U	0 UJ	0 U	180	47	3 J	97	2900	0 U	7400

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-024-A-3.0/3.6 6/25/2014	CC-025-C-0.0/0.5 6/26/2014	CC-025-C-0.5/2.0 6/26/2014	CC-025-C-2.0/3.0 6/26/2014	CC-025-C-3.0/4.0 6/26/2014	CC-026-C-0.0/0.5 6/24/2014	CC-026-C-0.5/2.0 6/24/2014	CC-026-C-2.0/3.3 6/24/2014	CC-027-A-0.0/0.5 6/25/2014	CC-027-A-0.5/1.9 6/25/2014	CC-028-B-0.0/0.5 6/25/2014	CC-028-B-0.5/2.0 6/25/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0.088	0 U	0 U	0 U	0 U	0 UJ	0 U	0.021 J	0.37	0 UJ	2
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0 U	0.29	0 UJ	0 U	0 U	0 UJ	0.042	0 U	0 UJ	1.6	0 UJ	6.4
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0.031	0 U	0.13 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0.06 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.024 J	0 UJ	0 UJ	0.74 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0.069 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0 U	0.09 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.038 J	0.35 J	0 U	2 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0.028 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.087 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 U	0.018 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.037 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0 U	0.0117	0 U	0 U	0 U	0.0045	0.00144 J	0 U	0.00225	0.06	0 U	0.3
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0 U	0.111	0 U	0 UJ	0 U	0.054	0.0141	0.0009 J	0.0291	0.87	0 U	2.22
Mammals - Sum of TEQs (individuals)			0	0.7187	0	0	0	0.0585	0.05754	0.0009	0.11435	3.533	0	13.79
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0.088	0 U	0 U	0 U	0 U	0 UJ	0 U	0.021 J	0.37	0 UJ	2
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 U	0.029	0 UJ	0 U	0 U	0 UJ	0.0042	0 U	0 UJ	0.16	0 UJ	0.64
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0.031	0 U	0.13 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0.06 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.024 J	0 UJ	0 UJ	0.74 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0.069 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0.009 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.0038 J	0.035 J	0 U	0.2 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0.028 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.087 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 U	0.18 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.37 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 U	0.0039	0 U	0 U	0 U	0.0015	0.00048 J	0 U	0.00075	0.02	0 U	0.1
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 U	0.037	0 U	0 UJ	0 U	0.018	0.0047	0.0003 J	0.0097	0.29	0 U	0.74
Birds - Sum of TEQs (individuals)			0	0.4569	0	0	0	0.0195	0.00938	0.0003	0.05925	1.491	0	4.55

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-024-A-3.0/3.6 6/25/2014	CC-025-C-0.0/0.5 6/26/2014	CC-025-C-0.5/2.0 6/26/2014	CC-025-C-2.0/3.0 6/26/2014	CC-025-C-3.0/4.0 6/26/2014	CC-026-C-0.0/0.5 6/24/2014	CC-026-C-0.5/2.0 6/24/2014	CC-026-C-2.0/3.3 6/24/2014	CC-027-A-0.0/0.5 6/25/2014	CC-027-A-0.5/1.9 6/25/2014	CC-028-B-0.0/0.5 6/25/2014	CC-028-B-0.5/2.0 6/25/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0.088	0 U	0 U	0 U	0 U	0 UJ	0 U	0.021 J	0.37	0 UJ	2
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 U	0.029	0 UJ	0 U	0 U	0 UJ	0.0042	0 U	0 UJ	0.16	0 UJ	0.64
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0.031	0 U	0.13 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0.06 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.024 J	0 UJ	0 UJ	0.74 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0.069 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0.009 J	0 U	0 U	0 U	0 UJ	0 U	0 U	0.0038 J	0.035 J	0 U	0.2 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 U	0.0028 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.0087 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0.022 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.059 J	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 U	0.009 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.0185 J	0 UJ	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 U	0.0039	0 U	0 U	0 U	0.0015	0.00048 J	0 U	0.00075	0.02	0 U	0.1
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 U	0.037	0 U	0 UJ	0 U	0.018	0.0047	0.0003 J	0.0097	0.29	0 U	0.74
Fish - Sum of TEQs (individuals)			0	0.2607	0	0	0	0.0195	0.00938	0.0003	0.05925	1.0612	0	4.55

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-028-B-2.0/3.0 6/25/2014	CC-028-B-3.0/4.0 6/25/2014	CC-028-B-4.0/4.7 6/25/2014	CF-01-A-0.0/0.5 6/24/2014	CF-01-A-0.5/1.0 6/24/2014	CF-01-B-0.0/0.5 6/26/2014	CF-01-B-0.5/0.9 6/26/2014	CF-01-C-0.0/0.7 6/26/2014	CF-01-D-0.0/0.5 6/25/2014	CF-01-D-0.5/1.1 6/25/2014	CF-02-B-0.0/0.5 6/24/2014	CF-02-B-0.5/1.6 6/24/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	36	25	19	110	31	210	1,700	2,700	22	1,300	81	350
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	90	69	47	310	85	680	6,100	8,300	71	4,800	250	880
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	1.9 J	1.6 J	1.5 J	8.3	1.8 J	18	150	240	2.5 J	84	7.9	26
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0.8 UJ	0.55 UJ	2.2 UJ	7.6	1.6 J	14	140	960 J	1.8 J	75	5.3	52
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.29 U	0.23 U	0.24 U	1.5 J	0.45 UJ	2.1 J	19	27	0.45 J	12	1.1 J	3.2 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.22 U	0.095 U	0.21 U	3.4 UJ	0.28 J	2.7 J	30	50	0.49 J	400 J	1.4 J	4.5 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	2.7 J	2.3 J	1.5 J	11	3 J	23	170	230	2.2 J	120	8.4	29
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0.19 U	0.12 U	0.16 U	2.2 J	0.35 U	4.1	37	64	0.5 J	18	2 J	5.5 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.59 J	0.48 J	0.29 U	2.6 J	0.8 J	4.8	32	38	0.56 UJ	16	1.7 J	4.8
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.42 U	0.21 U	0.44 U	0.8 U	0.32 U	0.78 J	160 UJ	35 UJ	0.3 U	1.5 U	0.61 J	1.9 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.26 U	0.19 U	0.21 U	0.6 U	0.29 U	0.47 UJ	8.5	8.6	0.19 U	4	0.35 UJ	1.4 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0.23 U	0.14 U	0.18 U	3.1 J	0.34 UJ	2.7 J	17	29	0.79 J	9.2	2.7 J	5.3
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.23 U	0.17 U	0.15 U	1.3 J	0.3 UJ	2.8	8.3 U	36	0.39 J	9.6	1.2 J	3.6 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.24 U	0.35 U	0.25 U	0.37 U	0.17 U	0.53 J	4.4 U	2.4	0.34 U	0.48 U	0.71 U	1.1 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.41 U	0.3 U	0.34 U	0.53 U	0.2 U	0.21 U	5.1 U	1.9	0.19 U	0.69 UJ	0.26 U	1.2 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	170	140	100	420	130	800	7,400	11,000	80	6,800	320	1,400
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	920 J	820 J	670 J	3,300	890	11,000	87,000	160,000	960 J	74,000 J	3,500 J	15,000 J
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	140	110	84	450	130	860	4,800	3,300	86	5,000	310	1,300
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	160	130	93	570	160	1,400	12,000	16,000	140	9,700	500	1,800
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	8.1	5.1	15	140	35	290	960	2,600	30	1,300	110	220
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	14	10	8.9	43	14	110	820	1,100	11	590	42	130
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	3 J	0.19 U	0.21 U	0.6 U	0.81 J	1.4 J	29	43	0.44 J	20	0.68 J	1.4 U
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	1.2 J	0.84 J	0.77 J	14	2.5 J	26	210	270	3.7 J	75	12	35
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	0.25 U	0.77 U	0.48 U	1.8	0.4 U	1.9	4.4 U	7.7	1.8 U	7.1	3.2 U	1.4 U
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	2	0.3 U	0.34 U	0.53 U	0.76 J	1.7	5.1 U	11	0.25 J	5.9	0.62 J	1.2 U
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	36	25	19	110	31	210	1700	2700	22	1300	81	350
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	90	69	47	310	85	680	6100	8300	71	4800	250	880
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	1.9 J	1.6 J	1.5 J	8.3	1.8 J	18	150	240	2.5 J	84	7.9	26
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 UJ	0 UJ	0 UJ	7.6	1.6 J	14	140	960 J	1.8 J	75	5.3	52
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0 U	1.5 J	0 UJ	2.1 J	19	27	0.45 J	12	1.1 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 U	0 U	0 UJ	0.28 J	2.7 J	30	50	0.49 J	400 J	1.4 J	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	2.7 J	2.3 J	1.5 J	11	3 J	23	170	230	2.2 J	120	8.4	29
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0 U	0 U	2.2 J	0 U	4.1	37	64	0.5 J	18	2 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.59 J	0.48 J	0 U	2.6 J	0.8 J	4.8	32	38	0 UJ	16	1.7 J	4.8
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0.78 J	0 UJ	0 UJ	0 U	0 U	0.61 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 UJ	8.5	8.6	0 U	4	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 U	0 U	0 U	3.1 J	0 UJ	2.7 J	17	29	0.79 J	9.2	2.7 J	5.3
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 U	0 U	0 U	1.3 J	0 UJ	2.8	0 U	36	0.39 J	9.6	1.2 J	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0.53 J	0 U	2.4	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	1.9	0 U	0 UJ	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	170	140	100	420	130	800	7400	11000	80	6800	320	1400
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	920 J	820 J	670 J	3300	890	11000	87000	160000	960 J	74000 J	3500 J	15000 J

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-028-B-2.0/3.0 6/25/2014	CC-028-B-3.0/4.0 6/25/2014	CC-028-B-4.0/4.7 6/25/2014	CF-01-A-0.0/0.5 6/24/2014	CF-01-A-0.5/1.0 6/24/2014	CF-01-B-0.0/0.5 6/26/2014	CF-01-B-0.5/0.9 6/26/2014	CF-01-C-0.0/0.7 6/26/2014	CF-01-D-0.0/0.5 6/25/2014	CF-01-D-0.5/1.1 6/25/2014	CF-02-B-0.0/0.5 6/24/2014	CF-02-B-0.5/1.6 6/24/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.36	0.25	0.19	1.1	0.31	2.1	17	27	0.22	13	0.81	3.5
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0.9	0.69	0.47	3.1	0.85	6.8	61	83	0.71	48	2.5	8.8
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.019 J	0.016 J	0.015 J	0.083	0.018 J	0.18	1.5	2.4	0.025 J	0.84	0.079	0.26
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 UJ	0 UJ	0.76	0.16 J	1.4	14	96 J	0.18 J	7.5	0.53	5.2
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0 U	0.15 J	0 UJ	0.21 J	1.9	2.7	0.045 J	1.2	0.11 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 UJ	0.028 J	0.27 J	3	5	0.049 J	40 J	0.14 J	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0.27 J	0.23 J	0.15 J	1.1	0.3 J	2.3	17	23	0.22 J	12	0.84	2.9
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0.22 J	0 U	0.41	3.7	6.4	0.05 J	1.8	0.2 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.059 J	0.048 J	0 U	0.26 J	0.08 J	0.48	3.2	3.8	0 UJ	1.6	0.17 J	0.48
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0 U	0 U	0 U	0 U	0.0234 J	0 UJ	0 UJ	0 U	0 U	0.0183 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 UJ	8.5	8.6	0 U	4	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0.31 J	0 UJ	0.27 J	1.7	2.9	0.079 J	0.92	0.27 J	0.53
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0 U	0 U	0.39 J	0 UJ	0.84	0 U	10.8	0.117 J	2.88	0.36 J	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 U	0 U	0 U	0 U	0 U	0.053 J	0 U	0.24	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	1.9	0 U	0 UJ	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.051	0.042	0.03	0.126	0.039	0.24	2.22	3.3	0.024	2.04	0.096	0.42
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0.276 J	0.246 J	0.201 J	0.99	0.267	3.3	26.1	48	0.288 J	22.2 J	1.05 J	4.5 J
Mammals - Sum of TEQs (individuals)			1.935	1.522	1.056	8.589	2.052	18.8764	160.82	325.04	2.007	157.98	7.1733	26.59
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.36	0.25	0.19	1.1	0.31	2.1	17	27	0.22	13	0.81	3.5
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.09	0.069	0.047	0.31	0.085	0.68	6.1	8.3	0.071	4.8	0.25	0.88
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.019 J	0.016 J	0.015 J	0.083	0.018 J	0.18	1.5	2.4	0.025 J	0.84	0.079	0.26
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 UJ	0 UJ	0.76	0.16 J	1.4	14	96 J	0.18 J	7.5	0.53	5.2
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0 U	0.075 J	0 UJ	0.105 J	0.95	1.35	0.0225 J	0.6	0.055 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 UJ	0.028 J	0.27 J	3	5	0.049 J	40 J	0.14 J	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.027 J	0.023 J	0.015 J	0.11	0.03 J	0.23	1.7	2.3	0.022 J	1.2	0.084	0.29
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0.22 J	0 U	0.41	3.7	6.4	0.05 J	1.8	0.2 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.059 J	0.048 J	0 U	0.26 J	0.08 J	0.48	3.2	3.8	0 UJ	1.6	0.17 J	0.48
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 U	0 U	0 U	0 U	0 U	0.078 J	0 UJ	0 UJ	0 U	0 U	0.061 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 UJ	8.5	8.6	0 U	4	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0.31 J	0 UJ	0.27 J	1.7	2.9	0.079 J	0.92	0.27 J	0.53
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 U	0 U	0 U	1.3 J	0 UJ	2.8	0 U	36	0.39 J	9.6	1.2 J	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 U	0 U	0 U	0 U	0 U	0.53 J	0 U	2.4	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	1.9	0 U	0 UJ	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.017	0.014	0.01	0.042	0.013	0.08	0.74	1.1	0.008	0.68	0.032	0.14
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.092 J	0.082 J	0.067 J	0.33	0.089	1.1	8.7	16	0.096 J	7.4 J	0.35 J	1.5 J
Birds - Sum of TEQs (individuals)			0.664	0.502	0.344	4.9	0.813	10.713	70.79	221.45	1.2125	93.94	4.231	12.78

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CC-028-B-2.0/3.0 6/25/2014	CC-028-B-3.0/4.0 6/25/2014	CC-028-B-4.0/4.7 6/25/2014	CF-01-A-0.0/0.5 6/24/2014	CF-01-A-0.5/1.0 6/24/2014	CF-01-B-0.0/0.5 6/26/2014	CF-01-B-0.5/0.9 6/26/2014	CF-01-C-0.0/0.7 6/26/2014	CF-01-D-0.0/0.5 6/25/2014	CF-01-D-0.5/1.1 6/25/2014	CF-02-B-0.0/0.5 6/24/2014	CF-02-B-0.5/1.6 6/24/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.36	0.25	0.19	1.1	0.31	2.1	17	27	0.22	13	0.81	3.5
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.09	0.069	0.047	0.31	0.085	0.68	6.1	8.3	0.071	4.8	0.25	0.88
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.019 J	0.016 J	0.015 J	0.083	0.018 J	0.18	1.5	2.4	0.025 J	0.84	0.079	0.26
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 UJ	0 UJ	0 UJ	0.76	0.16 J	1.4	14	96 J	0.18 J	7.5	0.53	5.2
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0 U	0.75 J	0 UJ	1.05 J	9.5	13.5	0.225 J	6	0.55 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 UJ	0.028 J	0.27 J	3	5	0.049 J	40 J	0.14 J	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.027 J	0.023 J	0.015 J	0.11	0.03 J	0.23	1.7	2.3	0.022 J	1.2	0.084	0.29
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0.22 J	0 U	0.41	3.7	6.4	0.05 J	1.8	0.2 J	0 UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0.0059 J	0.0048 J	0 U	0.026 J	0.008 J	0.048	0.32	0.38	0 UJ	0.16	0.017 J	0.048
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 U	0 U	0 U	0 U	0 U	0.039 J	0 UJ	0 UJ	0 U	0 U	0.0305 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 UJ	8.5	8.6	0 U	4	0 UJ	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0.31 J	0 UJ	0.27 J	1.7	2.9	0.079 J	0.92	0.27 J	0.53
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 U	0 U	0 U	0.65 J	0 UJ	1.4	0 U	18	0.195 J	4.8	0.6 J	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 U	0 U	0 U	0 U	0 U	0.0265 J	0 U	0.12	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	1.9	0 U	0 UJ	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.017	0.014	0.01	0.042	0.013	0.08	0.74	1.1	0.008	0.68	0.032	0.14
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.092 J	0.082 J	0.067 J	0.33	0.089	1.1	8.7	16	0.096 J	7.4 J	0.35 J	1.5 J
Fish - Sum of TEQs (individuals)			0.6109	0.4588	0.344	4.691	0.741	9.2835	76.46	209.9	1.22	93.1	3.9425	12.348

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-02-C-0.0/0.8 6/25/2014	CF-03-A-0.0/0.5 6/24/2014	CF-03-A-0.5/1.3 6/24/2014	CF-03-C-0.0/0.5 6/24/2014	CF-03-C-0.5/1.3 6/24/2014	CF-03-E-0.0/0.5 6/26/2014	CF-03-E-0.5/1.2 6/26/2014	CF-04-B-0.0/0.5 6/24/2014	CF-04-B-0.5/1.3 6/24/2014	CF-05-B-0.0/0.5 6/24/2014	CF-05-B-0.5/0.9 6/24/2014	CF-05-C-0.0/0.6 6/26/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	66	22	280 J	160	110	6.9	53	27	97	34	570	360
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	220	73	900 J	540	350	22	170	91	320	130	1,600	1,200
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	5.2	2.1 J	16	11	9.7	1.1 U	4 UJ	2.2 J	10	3.6	33	31
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	6	1.9 J	11 J	10	13 UJ	0.66 J	4.3	1.9 UJ	11	3.4 J	24	19
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.93 J	0.44 UJ	4.4 J	1.6 UJ	1.2 J	0.41 U	0.56 J	0.41 J	1.5 J	0.86 J	5.5	3.5
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.9 J	0.47 J	2.3 J	2.3 J	2.6 J	0.47 U	1.6 J	0.37 J	3.1	1.2 J	4.6	5.9
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	7.7	2.4 J	26 J	16	11	0.7 UJ	4.8	2.7 J	7.8	3.6 UJ	44 J	33
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	1.3 J	0.55 UJ	1.9 J	2.4 J	2.7 J	0.5 U	1.1 J	0.62 J	2.3 J	0.8 UJ	5	5
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	1.3 UJ	0.77 J	7.8 J	3.6 UJ	3.1	0.46 U	1.2 J	0.68 J	2.5 J	1.8 UJ	9.1 J	6.7
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.58 J	0.24 U	1.1 U	1.1 U	0.55 UJ	0.24 U	0.4 J	0.24 U	0.63 J	0.66 U	0.97 J	0.85 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.41 U	0.26 U	1.2 J	0.9 U	0.51 J	0.25 U	0.25 U	0.19 U	0.32 U	0.62 U	1.6 UJ	0.9 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	1 UJ	0.48 J	2.5 J	2.3 J	1.8 J	0.48 U	0.8 J	0.42 UJ	3.8	1.3 J	9.3	2.9
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.91 UJ	0.49 J	1.3 UJ	1.8 J	1.8 J	0.21 U	0.56 UJ	0.4 J	1.5 J	0.65 J	2.6 J	2.8
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.29 J	0.19 J	0.55 U	0.48 U	0.29 J	0.4 J	0.17 UJ	0.12 U	0.13 UJ	0.43 U	0.71	0.26 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.28 U	0.18 U	0.78 U	0.56 U	0.4 U	0.2 U	0.33 U	0.2 U	0.2 U	0.53 U	0.57 U	0.24 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	300	74	1,300 J	700	360	26	220	110	310	130	2,600	1,500
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	3,600	810	9,300 J	7,400	5,200	300	2,500	1,400	4,700	1,700	21,000	18,000
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	290	87	1,200 J	740	420	30	220	110	390	140	2,400	1,700
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	440	140	1,700 J	1,100	730	45	340	190	690	270	3,000	2,300
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	89	30	290 J	190	63	9.1	76	33	140	48	400	440
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	30	12	130 J	72	63	1.5 J	29	15	45	25	190	160
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	0.41 U	0.26 U	1.2 J	3.1 J	2.4 J	0.25 U	9.6	1.3 J	4.7	8	2.2 J	9.9
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	8	3.8 J	21	17	18	0.23 U	5.1	3.4 J	14	6.4	30	35
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	2.2	0.8 J	4.6 J	1.7	4.1	0.64 J	0.7	0.25 U	0.95 J	1.5	2.8	2.9
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	0.28 U	0.63 J	6.6 J	1.7	13	0.25 J	13	2.7	6.1	9.5	0.74	10
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	66	22	280 J	160	110	6.9	53	27	97	34	570	360
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	220	73	900 J	540	350	22	170	91	320	130	1600	1200
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	5.2	2.1 J	16	11	9.7	0 U	0 UJ	2.2 J	10	3.6	33	31
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	6	1.9 J	11 J	10	0 UJ	0.66 J	4.3	0 UJ	11	3.4 J	24	19
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.93 J	0 UJ	4.4 J	0 UJ	1.2 J	0 U	0.56 J	0.41 J	1.5 J	0.86 J	5.5	3.5
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.9 J	0.47 J	2.3 J	2.3 J	2.6 J	0 U	1.6 J	0.37 J	3.1	1.2 J	4.6	5.9
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	7.7	2.4 J	26 J	16	11	0 UJ	4.8	2.7 J	7.8	0 UJ	44 J	33
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	1.3 J	0 UJ	1.9 J	2.4 J	2.7 J	0 U	1.1 J	0.62 J	2.3 J	0 UJ	5	5
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 UJ	0.77 J	7.8 J	0 UJ	3.1	0 U	1.2 J	0.68 J	2.5 J	0 UJ	9.1 J	6.7
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.58 J	0 U	0 U	0 U	0 UJ	0 U	0.4 J	0 U	0.63 J	0 U	0.97 J	0.85 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	1.2 J	0 U	0.51 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0.9 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 UJ	0.48 J	2.5 J	2.3 J	1.8 J	0 U	0.8 J	0 UJ	3.8	1.3 J	9.3	2.9
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 UJ	0.49 J	0 UJ	1.8 J	1.8 J	0 U	0 UJ	0.4 J	1.5 J	0.65 J	2.6 J	2.8
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.29 J	0.19 J	0 U	0 U	0.29 J	0.4 J	0 UJ	0 U	0 UJ	0 U	0.71	0.26 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	300	74	1300 J	700	360	26	220	110	310	130	2600	1500
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	3600	810	9300 J	7400	5200	300	2500	1400	4700	1700	21000	18000

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-02-C-0.0/0.8 6/25/2014	CF-03-A-0.0/0.5 6/24/2014	CF-03-A-0.5/1.3 6/24/2014	CF-03-C-0.0/0.5 6/24/2014	CF-03-C-0.5/1.3 6/24/2014	CF-03-E-0.0/0.5 6/26/2014	CF-03-E-0.5/1.2 6/26/2014	CF-04-B-0.0/0.5 6/24/2014	CF-04-B-0.5/1.3 6/24/2014	CF-05-B-0.0/0.5 6/24/2014	CF-05-B-0.5/0.9 6/24/2014	CF-05-C-0.0/0.6 6/26/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.66	0.22	2.8 J	1.6	1.1	0.069	0.53	0.27	0.97	0.34	5.7	3.6
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	2.2	0.73	9 J	5.4	3.5	0.22	1.7	0.91	3.2	1.3	16	12
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.052	0.021 J	0.16	0.11	0.097	0 U	0 UJ	0.022 J	0.1	0.036	0.33	0.31
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.6	0.19 J	1.1 J	1	0 UJ	0.066 J	0.43	0 UJ	1.1	0.34 J	2.4	1.9
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0.093 J	0 UJ	0.44 J	0 UJ	0.12 J	0 U	0.056 J	0.041 J	0.15 J	0.086 J	0.55	0.35
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0.09 J	0.047 J	0.23 J	0.23 J	0.26 J	0 U	0.16 J	0.037 J	0.31	0.12 J	0.46	0.59
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0.77	0.24 J	2.6 J	1.6	1.1	0 UJ	0.48	0.27 J	0.78	0 UJ	4.4 J	3.3
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.13 J	0 UJ	0.19 J	0.24 J	0.27 J	0 U	0.11 J	0.062 J	0.23 J	0 UJ	0.5	0.5
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 UJ	0.077 J	0.78 J	0 UJ	0.31	0 U	0.12 J	0.068 J	0.25 J	0 UJ	0.91 J	0.67
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0.0174 J	0 U	0 U	0 U	0 UJ	0 U	0.012 J	0 U	0.0189 J	0 U	0.0291 J	0.0255 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	1.2 J	0 U	0.51 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0.9 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0.048 J	0.25 J	0.23 J	0.18 J	0 U	0.08 J	0 UJ	0.38	0.13 J	0.93	0.29
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 UJ	0.147 J	0 UJ	0.54 J	0.54 J	0 U	0 UJ	0.12 J	0.45 J	0.195 J	0.78 J	0.84
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0.029 J	0.019 J	0 U	0 U	0.029 J	0.04 J	0 UJ	0 U	0 UJ	0 U	0.071	0.026 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.09	0.0222	0.39 J	0.21	0.108	0.0078	0.066	0.033	0.093	0.039	0.78	0.45
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	1.08	0.243	2.79 J	2.22	1.56	0.09	0.75	0.42	1.41	0.51	6.3	5.4
Mammals - Sum of TEQs (individuals)			5.8114	2.0042	21.93	13.38	9.684	0.4928	4.494	2.253	9.4419	3.096	40.1401	31.1515
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.66	0.22	2.8 J	1.6	1.1	0.069	0.53	0.27	0.97	0.34	5.7	3.6
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.22	0.073	0.9 J	0.54	0.35	0.022	0.17	0.091	0.32	0.13	1.6	1.2
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.052	0.021 J	0.16	0.11	0.097	0 U	0 UJ	0.022 J	0.1	0.036	0.33	0.31
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.6	0.19 J	1.1 J	1	0 UJ	0.066 J	0.43	0 UJ	1.1	0.34 J	2.4	1.9
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0.0465 J	0 UJ	0.22 J	0 UJ	0.06 J	0 U	0.028 J	0.0205 J	0.075 J	0.043 J	0.275	0.175
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0.09 J	0.047 J	0.23 J	0.23 J	0.26 J	0 U	0.16 J	0.037 J	0.31	0.12 J	0.46	0.59
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.077	0.024 J	0.26 J	0.16	0.11	0 UJ	0.048	0.027 J	0.078	0 UJ	0.44 J	0.33
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.13 J	0 UJ	0.19 J	0.24 J	0.27 J	0 U	0.11 J	0.062 J	0.23 J	0 UJ	0.5	0.5
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 UJ	0.077 J	0.78 J	0 UJ	0.31	0 U	0.12 J	0.068 J	0.25 J	0 UJ	0.91 J	0.67
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0.058 J	0 U	0 U	0 U	0 UJ	0 U	0.04 J	0 U	0.063 J	0 U	0.097 J	0.085 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	1.2 J	0 U	0.51 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0.9 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0.048 J	0.25 J	0.23 J	0.18 J	0 U	0.08 J	0 UJ	0.38	0.13 J	0.93	0.29
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 UJ	0.49 J	0 UJ	1.8 J	1.8 J	0 U	0 UJ	0.4 J	1.5 J	0.65 J	2.6 J	2.8
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0.29 J	0.19 J	0 U	0 U	0.29 J	0.4 J	0 UJ	0 U	0 UJ	0 U	0.71	0.26 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.03	0.0074	0.13 J	0.07	0.036	0.0026	0.022	0.011	0.031	0.013	0.26	0.15
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.36	0.081	0.93 J	0.74	0.52	0.03	0.25	0.14	0.47	0.17	2.1	1.8
Birds - Sum of TEQs (individuals)			2.6135	1.4684	9.15	6.72	5.893	0.5896	1.988	1.1485	5.877	1.972	19.312	15.56

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-02-C-0.0/0.8 6/25/2014	CF-03-A-0.0/0.5 6/24/2014	CF-03-A-0.5/1.3 6/24/2014	CF-03-C-0.0/0.5 6/24/2014	CF-03-C-0.5/1.3 6/24/2014	CF-03-E-0.0/0.5 6/26/2014	CF-03-E-0.5/1.2 6/26/2014	CF-04-B-0.0/0.5 6/24/2014	CF-04-B-0.5/1.3 6/24/2014	CF-05-B-0.0/0.5 6/24/2014	CF-05-B-0.5/0.9 6/24/2014	CF-05-C-0.0/0.6 6/26/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0.66	0.22	2.8 J	1.6	1.1	0.069	0.53	0.27	0.97	0.34	5.7	3.6
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.22	0.073	0.9 J	0.54	0.35	0.022	0.17	0.091	0.32	0.13	1.6	1.2
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.052	0.021 J	0.16	0.11	0.097	0 U	0 UJ	0.022 J	0.1	0.036	0.33	0.31
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.6	0.19 J	1.1 J	1	0 UJ	0.066 J	0.43	0 UJ	1.1	0.34 J	2.4	1.9
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0.465 J	0 UJ	2.2 J	0 UJ	0.6 J	0 U	0.28 J	0.205 J	0.75 J	0.43 J	2.75	1.75
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0.09 J	0.047 J	0.23 J	0.23 J	0.26 J	0 U	0.16 J	0.037 J	0.31	0.12 J	0.46	0.59
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.077	0.024 J	0.26 J	0.16	0.11	0 UJ	0.048	0.027 J	0.078	0 UJ	0.44 J	0.33
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.13 J	0 UJ	0.19 J	0.24 J	0.27 J	0 U	0.11 J	0.062 J	0.23 J	0 UJ	0.5	0.5
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 UJ	0.0077 J	0.078 J	0 UJ	0.031	0 U	0.012 J	0.0068 J	0.025 J	0 UJ	0.091 J	0.067
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0.029 J	0 U	0 U	0 U	0 UJ	0 U	0.02 J	0 U	0.0315 J	0 U	0.0485 J	0.0425 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	1.2 J	0 U	0.51 J	0 U	0 U	0 U	0 U	0 U	0 UJ	0.9 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 UJ	0.048 J	0.25 J	0.23 J	0.18 J	0 U	0.08 J	0 UJ	0.38	0.13 J	0.93	0.29
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 UJ	0.245 J	0 UJ	0.9 J	0.9 J	0 U	0 UJ	0.2 J	0.75 J	0.325 J	1.3 J	1.4
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0.0145 J	0.0095 J	0 U	0 U	0.0145 J	0.02 J	0 UJ	0 U	0 UJ	0 U	0.0355	0.013 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.03	0.0074	0.13 J	0.07	0.036	0.0026	0.022	0.011	0.031	0.013	0.26	0.15
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.36	0.081	0.93 J	0.74	0.52	0.03	0.25	0.14	0.47	0.17	2.1	1.8
Fish - Sum of TEQs (individuals)			2.7275	0.9736	10.428	5.82	4.9785	0.2096	2.112	1.0718	5.5455	2.034	18.945	14.8425

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-05-D-0.0/0.5 6/25/2014	CF-05-D-0.5/0.9 6/25/2014	CF-06-A-0.0/0.5 6/25/2014	CF-06-A-0.5/1.8 6/25/2014	CF-06-B-0.0/0.6 6/26/2014	CF-06-D-0.0/0.8 6/25/2014	CF-07-A-0.0/0.8 6/26/2014	CF-07-B-0.0/0.7 6/23/2014	CF-08-D-0.0/0.7 6/26/2014	CF-09-A-0.0/0.8 6/25/2014	CF-10-B-0.0/0.5 6/25/2014	CF-10-B-0.5/1.3 6/25/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	250	32	78	83	230 J	81	200	190	58	4.4	39	15
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	790	96	230	270	710 J	260	650	560	180	12 =	130	51
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	21	2.2 UJ	7.7	5	20 J	8.1	19	17	5.1	1.2 U	3.7	0.84 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	21	1.7 J	8	4.5 UJ	11	7.7	17	24 UJ	4.9	0.73 J	3.9	0.9 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	2.6 J	0.54 U	0.95 J	1 J	2.6	1.4 U	2.2 J	1.6 J	0.99 J	0.77 U	0.55 J	0.28 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	15 UJ	1.9 UJ	1.7 UJ	2.3 J	3.3	6.3 UJ	3.9 UJ	5	1.2 J	0.73 J	3 UJ	0.83 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	26	3.1	7.7	9	22 J	8.5	19	17 J	5.6	0.83 U	4.2	1.7 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	5.6	0.46 U	2.4 J	0.56 U	3.5	1.4 U	5	1.8 UJ	1.2 J	0.86 U	0.86 J	0.18 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	5.8	0.62 U	1.7 J	1.9 UJ	4.8	1.5 J	4.8	3.3 J	1.7 J	0.84 U	1.2 J	0.43 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	1.7 J	0.5 U	0.68 UJ	0.7 U	0.87 J	1 U	1.5 J	1.7 J	0.52 J	0.63 U	0.34 J	0.22 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.84 J	0.85 U	0.53 J	0.73 U	0.74 J	1.4 U	0.72 J	0.57 UJ	0.3 UJ	0.73 U	0.17 U	0.36 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	3.7	0.81 J	3 J	2 J	2.4 J	3.1	7	7.8	1.9 J	0.56 U	1.4 J	0.4 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	3.5	0.51 U	1.8 J	0.62 U	2.3 J	1.2 J	3 J	3.6	0.87 J	0.64 U	0.66 J	0.35 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.61	0.33 U	0.37 U	0.41 U	0.28 J	0.53 U	0.4 J	0.72	0.26 UJ	0.44 U	0.32 J	0.35 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.34 U	0.5 U	0.22 U	0.46 U	0.27 UJ	0.58 U	0.24 U	0.62 U	0.14 U	0.47 U	0.14 U	0.24 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	940	160	230	390	840 J	320	770	520	190	15	130	75
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	9,700	1,400	3,100 J	4,000 J	9,500 J	3,300	8,600	7,600	2,200	140 =	1,500	610
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	860	140	290	380	1,000 J	350	840	680	220	16 =	150	67
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	1,500	170	460	540	1,400 J	510	1,300	1,100	360	25 =	240	94
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	330	32	120	100	280 J	100	300	270	81	3.2 J	52	16
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	110	13	36	44	110 J	37	100	69	36	1.1 J	21	12
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	6.1	4.9	1.7 J	3.8	14	4.9	10	6.2	7.7	2.3 J	3.9 J	7.6
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	34	2.4 J	14	5.7	29 J	8.3	29	28	10	0.63 U	6.7	3.4 J
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	2.6	0.76	2.7 U	0.99 U	4.3	0.53 U	4.5	2.6 U	2.5	0.56	2.6	3.2
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	6.1	8.1	0.63 J	4.3	12	2.9	9.3	3.2	9.9	3.2 =	5.4	10
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	250	32	78	83	230 J	81	200	190	58	4.4	39	15
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	790	96	230	270	710 J	260	650	560	180	12 =	130	51
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	21	0 UJ	7.7	5	20 J	8.1	19	17	5.1	0 U	3.7	0.84 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	21	1.7 J	8	0 UJ	11	7.7	17	0 UJ	4.9	0.73 J	3.9	0.9 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	2.6 J	0 U	0.95 J	1 J	2.6	0 U	2.2 J	1.6 J	0.99 J	0 U	0.55 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 UJ	0 UJ	0 UJ	2.3 J	3.3	0 UJ	0 UJ	5	1.2 J	0.73 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	26	3.1	7.7	9	22 J	8.5	19	17 J	5.6	0 U	4.2	1.7 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	5.6	0 U	2.4 J	0 U	3.5	0 U	5	0 UJ	1.2 J	0 U	0.86 J	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	5.8	0 U	1.7 J	0 UJ	4.8	1.5 J	4.8	3.3 J	1.7 J	0 U	1.2 J	0.43 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	1.7 J	0 U	0 UJ	0 U	0.87 J	0 U	1.5 J	1.7 J	0.52 J	0 U	0.34 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.84 J	0 U	0.53 J	0 U	0.74 J	0 U	0.72 J	0 UJ	0 UJ	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	3.7	0.81 J	3 J	2 J	2.4 J	3.1	7	7.8	1.9 J	0 U	1.4 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	3.5	0 U	1.8 J	0 U	2.3 J	1.2 J	3 J	3.6	0.87 J	0 U	0.66 J	0.35 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.61	0 U	0 U	0 U	0.28 J	0 U	0.4 J	0.72	0 UJ	0 U	0.32 J	0.35 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	940	160	230	390	840 J	320	770	520	190	15	130	75
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	9700	1400	3100 J	4000 J	9500 J	3300	8600	7600	2200	140 =	1500	610

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-05-D-0.0/0.5 6/25/2014	CF-05-D-0.5/0.9 6/25/2014	CF-06-A-0.0/0.5 6/25/2014	CF-06-A-0.5/1.8 6/25/2014	CF-06-B-0.0/0.6 6/26/2014	CF-06-D-0.0/0.8 6/25/2014	CF-07-A-0.0/0.8 6/26/2014	CF-07-B-0.0/0.7 6/23/2014	CF-08-D-0.0/0.7 6/26/2014	CF-09-A-0.0/0.8 6/25/2014	CF-10-B-0.0/0.5 6/25/2014	CF-10-B-0.5/1.3 6/25/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	2.5	0.32	0.78	0.83	2.3 J	0.81	2	1.9	0.58	0.044	0.39	0.15
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	7.9	0.96	2.3	2.7	7.1 J	2.6	6.5	5.6	1.8	0.12 =	1.3	0.51
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.21	0 UJ	0.077	0.05	0.2 J	0.081	0.19	0.17	0.051	0 U	0.037	0.0084 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	2.1	0.17 J	0.8	0 UJ	1.1	0.77	1.7	0 UJ	0.49	0.073 J	0.39	0.09 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0.26 J	0 U	0.095 J	0.1 J	0.26	0 U	0.22 J	0.16 J	0.099 J	0 U	0.055 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	0 UJ	0 UJ	0.23 J	0.33	0 UJ	0 UJ	0.5	0.12 J	0.073 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	2.6	0.31	0.77	0.9	2.2 J	0.85	1.9	1.7 J	0.56	0 U	0.42	0.17 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.56	0 U	0.24 J	0 U	0.35	0 U	0.5	0 UJ	0.12 J	0 U	0.086 J	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.58	0 U	0.17 J	0 UJ	0.48	0.15 J	0.48	0.33 J	0.17 J	0 U	0.12 J	0.043 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0.051 J	0 U	0 UJ	0 U	0.0261 J	0 U	0.045 J	0.051 J	0.0156 J	0 U	0.0102 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.84 J	0 U	0.53 J	0 U	0.74 J	0 U	0.72 J	0 UJ	0 UJ	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.37	0.081 J	0.3 J	0.2 J	0.24 J	0.31	0.7	0.78	0.19 J	0 U	0.14 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	1.05	0 U	0.54 J	0 U	0.69 J	0.36 J	0.9 J	1.08	0.261 J	0 U	0.198 J	0.105 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0.061	0 U	0 U	0 U	0.028 J	0 U	0.04 J	0.072	0 UJ	0 U	0.032 J	0.035 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.282	0.048	0.069	0.117	0.252 J	0.096	0.231	0.156	0.057	0.0045	0.039	0.0225
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	2.91	0.42	0.93 J	1.2 J	2.85 J	0.99	2.58	2.28	0.66	0.042 =	0.45	0.183
Mammals - Sum of TEQs (individuals)			22.274	2.309	7.601	6.327	19.1461	7.017	18.706	14.779	5.1736	0.3565	3.6672	1.3169
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	2.5	0.32	0.78	0.83	2.3 J	0.81	2	1.9	0.58	0.044	0.39	0.15
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.79	0.096	0.23	0.27	0.71 J	0.26	0.65	0.56	0.18	0.012 =	0.13	0.051
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.21	0 UJ	0.077	0.05	0.2 J	0.081	0.19	0.17	0.051	0 U	0.037	0.0084 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	2.1	0.17 J	0.8	0 UJ	1.1	0.77	1.7	0 UJ	0.49	0.073 J	0.39	0.09 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0.13 J	0 U	0.0475 J	0.05 J	0.13	0 U	0.11 J	0.08 J	0.0495 J	0 U	0.0275 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	0 UJ	0 UJ	0.23 J	0.33	0 UJ	0 UJ	0.5	0.12 J	0.073 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.26	0.031	0.077	0.09	0.22 J	0.085	0.19	0.17 J	0.056	0 U	0.042	0.017 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.56	0 U	0.24 J	0 U	0.35	0 U	0.5	0 UJ	0.12 J	0 U	0.086 J	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.58	0 U	0.17 J	0 UJ	0.48	0.15 J	0.48	0.33 J	0.17 J	0 U	0.12 J	0.043 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0.17 J	0 U	0 UJ	0 U	0.087 J	0 U	0.15 J	0.17 J	0.052 J	0 U	0.034 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.84 J	0 U	0.53 J	0 U	0.74 J	0 U	0.72 J	0 UJ	0 UJ	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.37	0.081 J	0.3 J	0.2 J	0.24 J	0.31	0.7	0.78	0.19 J	0 U	0.14 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	3.5	0 U	1.8 J	0 U	2.3 J	1.2 J	3 J	3.6	0.87 J	0 U	0.66 J	0.35 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0.61	0 U	0 U	0 U	0.28 J	0 U	0.4 J	0.72	0 UJ	0 U	0.32 J	0.35 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.094	0.016	0.023	0.039	0.084 J	0.032	0.077	0.052	0.019	0.0015	0.013	0.0075
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.97	0.14	0.31 J	0.4 J	0.95 J	0.33	0.86	0.76	0.22	0.014 =	0.15	0.061
Birds - Sum of TEQs (individuals)			13.684	0.854	5.3845	2.159	10.501	4.028	11.727	9.792	3.1675	0.2175	2.5395	1.1279

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			CF-05-D-0.0/0.5 6/25/2014	CF-05-D-0.5/0.9 6/25/2014	CF-06-A-0.0/0.5 6/25/2014	CF-06-A-0.5/1.8 6/25/2014	CF-06-B-0.0/0.6 6/26/2014	CF-06-D-0.0/0.8 6/25/2014	CF-07-A-0.0/0.8 6/26/2014	CF-07-B-0.0/0.7 6/23/2014	CF-08-D-0.0/0.7 6/26/2014	CF-09-A-0.0/0.8 6/25/2014	CF-10-B-0.0/0.5 6/25/2014	CF-10-B-0.5/1.3 6/25/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	2.5	0.32	0.78	0.83	2.3 J	0.81	2	1.9	0.58	0.044	0.39	0.15
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.79	0.096	0.23	0.27	0.71 J	0.26	0.65	0.56	0.18	0.012 =	0.13	0.051
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.21	0 UJ	0.077	0.05	0.2 J	0.081	0.19	0.17	0.051	0 U	0.037	0.0084 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	2.1	0.17 J	0.8	0 UJ	1.1	0.77	1.7	0 UJ	0.49	0.073 J	0.39	0.09 J
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	1.3 J	0 U	0.475 J	0.5 J	1.3	0 U	1.1 J	0.8 J	0.495 J	0 U	0.275 J	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	0 UJ	0 UJ	0.23 J	0.33	0 UJ	0 UJ	0.5	0.12 J	0.073 J	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.26	0.031	0.077	0.09	0.22 J	0.085	0.19	0.17 J	0.056	0 U	0.042	0.017 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.56	0 U	0.24 J	0 U	0.35	0 U	0.5	0 UJ	0.12 J	0 U	0.086 J	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0.058	0 U	0.017 J	0 UJ	0.048	0.015 J	0.048	0.033 J	0.017 J	0 U	0.012 J	0.0043 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0.085 J	0 U	0 UJ	0 U	0.0435 J	0 U	0.075 J	0.085 J	0.026 J	0 U	0.017 J	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.84 J	0 U	0.53 J	0 U	0.74 J	0 U	0.72 J	0 UJ	0 UJ	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.37	0.081 J	0.3 J	0.2 J	0.24 J	0.31	0.7	0.78	0.19 J	0 U	0.14 J	0 UJ
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	1.75	0 U	0.9 J	0 U	1.15 J	0.6 J	1.5 J	1.8	0.435 J	0 U	0.33 J	0.175 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0.0305	0 U	0 U	0 U	0.014 J	0 U	0.02 J	0.036	0 UJ	0 U	0.016 J	0.0175 J
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.094	0.016	0.023	0.039	0.084 J	0.032	0.077	0.052	0.019	0.0015	0.013	0.0075
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.97	0.14	0.31 J	0.4 J	0.95 J	0.33	0.86	0.76	0.22	0.014 =	0.15	0.061
Fish - Sum of TEQs (individuals)			11.9175	0.854	4.759	2.609	9.7795	3.293	10.33	7.646	2.999	0.2175	2.028	0.5817

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			FP-01-0.0/0.5 6/26/2014	FP-01-0.5/1.2 6/26/2014	NR-01-A1-0.0/0.5 6/25/2014	NR-01-A1-0.5/2.0 6/25/2014	NR-01-A1-2.0/2.5 6/25/2014	NR-01-B-0.0./0.5 6/25/2014	NR-01-B-0.5/2.0 6/25/2014	NR-01-B-2.0/3.0 6/25/2014	NR-01-B-3.0/3.5 6/25/2014	NR-01-E-0.0/0.5 6/25/2014	NR-01-E-0.5/2.0 6/25/2014	NR-01-E-2.0/3.0 6/25/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	120	660 =	0.24 U	0.24 U	0.41 U	0.26 U	0.16 J	0.1 U	0.13 U	0.14 U	0.11 UJ	0.15 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	430	2,200 =	0.46 UJ	0.25 U	0.62 U	0.47 U	0.18 UJ	0.24 U	0.23 U	0.19 UJ	0.22 UJ	0.33 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	10	52 =	0.33 U	0.43 U	0.84 U	0.47 U	0.11 U	0.22 U	0.26 U	0.15 U	0.17 U	0.21 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	9.7	50 =	0.15 U	0.17 U	0.26 U	0.25 U	0.059 U	0.12 U	0.09 U	0.072 U	0.12 U	0.13 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	2 UJ	7.1	0.21 U	0.27 U	0.49 U	0.29 U	0.088 U	0.14 U	0.13 U	0.16 U	0.17 U	0.22 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	3.1 UJ	11	0.19 U	0.14 U	0.29 U	0.21 U	0.052 J	0.1 U	0.1 U	0.07 U	0.12 U	0.13 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	13	61 =	0.27 U	0.33 U	0.45 U	0.3 U	0.11 U	0.16 U	0.14 U	0.17 U	0.18 U	0.23 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	2.4 J	11	0.24 U	0.27 U	0.47 U	0.31 U	0.065 U	0.11 U	0.12 U	0.1 U	0.13 U	0.12 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	5.1 J	9.3	0.23 U	0.25 U	0.44 U	0.34 U	0.11 U	0.16 U	0.12 U	0.16 U	0.12 U	0.2 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.9 UJ	2 J	0.18 U	0.19 U	0.46 U	0.38 U	0.094 U	0.16 U	0.11 U	0.12 U	0.15 U	0.18 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.71 J	1.9 J	0.3 U	0.23 U	0.5 U	0.31 U	0.086 U	0.11 U	0.12 U	0.16 U	0.15 U	0.26 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	4.2 J	6.4	0.2 U	0.15 U	0.3 U	0.21 U	0.051 U	0.082 U	0.081 U	0.068 U	0.087 U	0.1 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	1.7 J	6.3	0.19 U	0.19 U	0.28 U	0.23 U	0.068 U	0.1 U	0.078 U	0.08 U	0.1 U	0.16 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.4 U	0.64 J	0.28 J	0.16 UJ	0.3 U	0.25 U	0.082 U	0.085 U	0.066 U	0.056 U	0.077 U	0.12 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.46 U	0.37 UJ	0.23 U	0.15 U	0.44 U	0.36 U	0.1 U	0.16 U	0.13 U	0.091 U	0.13 U	0.17 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	480	2,700 =	0.47 U	1.4 U	1.4 U	0.92 U	0.29 U	0.37 U	0.43 U	0.44 U	0.23 U	0.31 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	6,000	35,000 =	2.8 U	2.6 J	2.1 U	3 UJ	0.94 U	0.85 UJ	0.63 U	0.7 UJ	1.4 U	1.6 U
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	490	3,000 J	0.29 U	0.34 U	0.63 U	0.37 U	0.26 J	0.16 U	0.2 U	0.14 U	0.14 U	0.18 U
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	940	4,200 =	0.51 J	0.54 J	0.62 U	0.47 U	0.34 J	0.32 J	0.33 J	0.4 J	0.29 J	0.68 J
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	170	920 J	0.2 U	0.18 U	0.33 U	0.24 U	0.12 J	0.1 U	0.098 U	0.078 U	0.11 U	0.12 U
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	79	310 =	0.64 J	0.29 U	0.46 U	0.31 U	0.38 J	0.15 U	0.13 U	1.8 J	0.68 J	1.5 J
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	9.9 J	14	0.3 U	0.23 U	0.5 U	0.31 U	0.086 U	0.11 U	0.12 U	2.3 J	1.5 J	0.27 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	12	62 =	0.19 U	0.19 U	0.37 U	0.3 U	0.081 U	0.13 U	0.095 U	0.098 U	0.13 U	0.17 U
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	2	6.7 =	1.1	0.19 J	0.61	0.25 U	0.29 J	0.26 J	0.32 J	0.44 J	0.077 U	0.48 J
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	7.4	13 =	1.1	0.15 U	0.44 U	0.36 U	0.36 J	0.16 U	0.22 J	2.9	2.2	2.5
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	120	660 =	0 U	0 U	0 U	0 U	0.16 J	0 U	0 U	0 U	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	430	2200 =	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 UJ	0 UJ	0.33 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	10	52 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	9.7	50 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 UJ	7.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 UJ	11	0 U	0 U	0 U	0 U	0.052 J	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	13	61 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	2.4 J	11	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	5.1 J	9.3	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 UJ	2 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.71 J	1.9 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	4.2 J	6.4	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	1.7 J	6.3	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 U	0.64 J	0.28 J	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	480	2700 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	6000	35000 =	0 U	2.6 J	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U	0 U

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			FP-01-0.0/0.5 6/26/2014	FP-01-0.5/1.2 6/26/2014	NR-01-A1-0.0/0.5 6/25/2014	NR-01-A1-0.5/2.0 6/25/2014	NR-01-A1-2.0/2.5 6/25/2014	NR-01-B-0.0./0.5 6/25/2014	NR-01-B-0.5/2.0 6/25/2014	NR-01-B-2.0/3.0 6/25/2014	NR-01-B-3.0/3.5 6/25/2014	NR-01-E-0.0/0.5 6/25/2014	NR-01-E-0.5/2.0 6/25/2014	NR-01-E-2.0/3.0 6/25/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	1.2	6.6 =	0 U	0 U	0 U	0 U	0.0016 J	0 U	0 U	0 U	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	4.3	22 =	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 UJ	0 UJ	0.0033 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.1	0.52 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.97	5 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 UJ	0.71	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	1.1	0 U	0 U	0 U	0 U	0.0052 J	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	1.3	6.1 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.24 J	1.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.51 J	0.93	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 UJ	0.06 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.71 J	1.9 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.42 J	0.64	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0.51 J	1.89	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 U	0.064 J	0.028 J	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0.144	0.81 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	1.8	10.5 =	0 U	0.00078 J	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U	0 U
Mammals - Sum of TEQs (individuals)			12.204	59.924	0.028	0.00078	0	0	0.0068	0	0	0	0	0.0033
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	1.2	6.6 =	0 U	0 U	0 U	0 U	0.0016 J	0 U	0 U	0 U	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.43	2.2 =	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 UJ	0 UJ	0.00033 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.1	0.52 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.97	5 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 UJ	0.355	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	1.1	0 U	0 U	0 U	0 U	0.0052 J	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.13	0.61 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.24 J	1.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0.51 J	0.93	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 UJ	0.2 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.71 J	1.9 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.42 J	0.64	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	1.7 J	6.3	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 U	0.64 J	0.28 J	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.048	0.27 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.6	3.5 =	0 U	0.00026 J	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U	0 U
Birds - Sum of TEQs (individuals)			7.058	31.865	0.28	0.00026	0	0	0.0068	0	0	0	0	0.00033

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			FP-01-0.0/0.5 6/26/2014	FP-01-0.5/1.2 6/26/2014	NR-01-A1-0.0/0.5 6/25/2014	NR-01-A1-0.5/2.0 6/25/2014	NR-01-A1-2.0/2.5 6/25/2014	NR-01-B-0.0./0.5 6/25/2014	NR-01-B-0.5/2.0 6/25/2014	NR-01-B-2.0/3.0 6/25/2014	NR-01-B-3.0/3.5 6/25/2014	NR-01-E-0.0/0.5 6/25/2014	NR-01-E-0.5/2.0 6/25/2014	NR-01-E-2.0/3.0 6/25/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	1.2	6.6 =	0 U	0 U	0 U	0 U	0.0016 J	0 U	0 U	0 U	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0.43	2.2 =	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 UJ	0 UJ	0.00033 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0.1	0.52 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0.97	5 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 UJ	3.55	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 UJ	1.1	0 U	0 U	0 U	0 U	0.0052 J	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0.13	0.61 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0.24 J	1.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0.051 J	0.093	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 UJ	0.1 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0.71 J	1.9 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0.42 J	0.64	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0.85 J	3.15	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 U	0.032 J	0.014 J	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0.048	0.27 =	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0.6	3.5 =	0 U	0.00026 J	0 U	0 UJ	0 U	0 UJ	0 U	0 UJ	0 U	0 U
Fish - Sum of TEQs (individuals)			5.749	30.365	0.014	0.00026	0	0	0.0068	0	0	0	0	0.00033

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-01-E-3.0/4.0 6/25/2014	NR-01-E-4.0/4.6 6/25/2014	NR-02-B1-0.0/0.5 6/26/2014	NR-02-B1-0.5/2.0 6/26/2014	NR-02-B1-2.0/2.5 6/26/2014	NR-02-B2-0.0/0.5 6/26/2014	NR-02-B2-0.5/2.0 6/26/2014	NR-02-B2-2.0/2.9 6/26/2014	NR-02-C-0.0/0.5 6/26/2014	NR-02-C-0.5/2.0 6/26/2014	NR-02-C-2.0/3.0 6/26/2014	NR-03-A1-0.0/0.5 6/25/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0.14 U	0.16 U	0.48 J	0.48 J	0.82 J	0.095 U	0.1 U	0.21 U	0.14 U	0.097 UJ	0.31 UJ	0.12 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0.28 UJ	0.27 U	1.2 J	1.4 J	2.3 J	0.12 U	0.24 J	0.43 U	0.23 J	0.22 UJ	0.79 UJ	0.21 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0.23 U	0.26 U	0.19 U	0.49 U	0.11 U	0.15 U	0.17 U	0.43 U	0.25 U	0.16 U	0.37 U	0.18 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0.086 U	0.11 U	0.087 U	0.28 U	0.098 UJ	0.074 U	0.069 U	0.22 U	0.077 U	0.079 U	0.15 U	0.1 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.26 U	0.21 U	0.12 U	0.4 U	0.11 U	0.13 U	0.12 U	0.23 U	0.15 U	0.1 U	0.25 U	0.12 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.092 U	0.098 U	0.091 U	0.25 U	0.11 J	0.052 U	0.07 U	0.18 U	0.075 U	0.075 U	0.15 U	0.11 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0.23 U	0.22 U	0.14 UJ	0.43 U	0.14 UJ	0.12 U	0.15 U	0.21 U	0.16 U	0.12 U	0.27 U	0.16 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0.12 U	0.16 U	0.11 U	0.3 U	0.12 U	0.086 U	0.089 U	0.41 U	0.11 U	0.1 U	0.19 U	0.13 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.25 U	0.2 U	0.14 U	0.36 U	0.066 U	0.14 U	0.16 U	0.29 U	0.15 U	0.13 U	0.24 U	0.14 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.2 U	0.11 U	0.092 U	0.22 U	0.21 U	0.09 U	0.12 U	0.16 U	0.12 U	0.11 U	0.15 U	0.13 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.17 U	0.18 U	0.12 U	0.23 U	0.14 U	0.14 U	0.14 U	0.19 U	0.15 U	0.13 U	0.17 U	0.19 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0.093 U	0.099 U	0.082 U	0.2 U	0.085 U	0.055 U	0.064 U	0.25 U	0.074 U	0.068 U	0.16 U	0.11 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.13 U	0.079 U	0.07 U	0.13 U	0.12 U	0.068 U	0.068 U	0.13 U	0.075 U	0.065 U	0.11 U	0.14 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.21 J	0.21 UJ	0.26 J	0.24 J	0.25 J	0.18 J	0.37 J	0.18 J	0.17 UJ	0.19 J	0.19 J	0.085 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.18 U	0.11 U	0.081 U	0.22 U	0.13 U	0.074 U	0.091 U	0.13 U	0.12 U	0.093 U	0.12 U	0.16 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0.29 U	0.25 U	1.5 J	1.8 J	3.3 J	0.3 U	0.29 U	1.3 U	0.47 U	0.29 U	1.1 J	0.42 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	0.49 UJ	0.58 UJ	11	13	27	0.95 J	1.3 UJ	1.5 U	1.3 UJ	1.6 UJ	9.4 J	1.4 U
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	0.19 U	0.21 U	1.5 J	1.5 J	3.2 J	0.12 U	0.14 U	0.32 U	0.2 U	0.13 U	0.88 J	0.15 U
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	0.23 U	0.27 U	2.5 J	2.7 J	4.9 J	0.12 U	0.57 J	0.43 U	0.23 J	0.32 J	0.39 U	0.21 U
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	0.097 U	0.12 U	0.44 J	0.38 J	0.11 J	0.068 J	0.073 U	0.27 U	0.085 U	0.082 U	0.19 J	0.11 U
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	1 J	0.58 J	0.66 J	0.4 U	0.8 J	0.24 J	0.14 U	0.24 U	0.15 U	0.11 U	0.25 U	0.14 U
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	0.17 U	1.1 J	0.12 U	0.23 U	0.14 U	0.41 J	0.37 J	0.27 J	0.15 U	0.13 U	0.17 U	0.19 U
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	0.17 U	0.092 U	0.081 U	0.18 U	0.17 U	0.08 J	0.095 U	0.14 U	0.096 U	0.086 U	0.13 U	0.14 J
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	0.21 J	0.071 U	0.71 J	0.24 J	0.43 J	0.29 J	0.48 J	0.32 J	0.18 J	0.33 J	0.19 J	0.42 J
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	2.7	0.9	0.41 J	0.22 U	0.13 U	0.2 J	0.091 U	0.13 U	0.12 U	0.093 U	0.12 U	0.3 J
ADJUSTMENTS (ND VALUES=0)														
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0 U	0 U	0.48 J	0.48 J	0.82 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0 UJ	0 U	1.2 J	1.4 J	2.3 J	0 U	0.24 J	0 U	0.23 J	0 UJ	0 UJ	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 U	0 U	0 U	0.11 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.21 J	0 UJ	0.26 J	0.24 J	0.25 J	0.18 J	0.37 J	0.18 J	0 UJ	0.19 J	0.19 J	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0 U	0 U	1.5 J	1.8 J	3.3 J	0 U	0 U	0 U	0 U	0 U	1.1 J	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	0 UJ	0 UJ	11	13	27	0.95 J	0 UJ	0 U	0 UJ	0 UJ	9.4 J	0 U

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-01-E-3.0/4.0 6/25/2014	NR-01-E-4.0/4.6 6/25/2014	NR-02-B1-0.0/0.5 6/26/2014	NR-02-B1-0.5/2.0 6/26/2014	NR-02-B1-2.0/2.5 6/26/2014	NR-02-B2-0.0/0.5 6/26/2014	NR-02-B2-0.5/2.0 6/26/2014	NR-02-B2-2.0/2.9 6/26/2014	NR-02-C-0.0/0.5 6/26/2014	NR-02-C-0.5/2.0 6/26/2014	NR-02-C-2.0/3.0 6/26/2014	NR-03-A1-0.0/0.5 6/25/2014
MAMMALIAN TEQs		**Mammal TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 U	0.0048 J	0.0048 J	0.0082 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0 UJ	0 U	0.012 J	0.014 J	0.023 J	0 U	0.0024 J	0 U	0.0023 J	0 UJ	0 UJ	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0.011 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0.021 J	0 UJ	0.026 J	0.024 J	0.025 J	0.018 J	0.037 J	0.018 J	0 UJ	0.019 J	0.019 J	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0 U	0 U	0.00045 J	0.00054 J	0.00099 J	0 U	0 U	0 U	0 U	0 U	0.00033 J	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0 UJ	0 UJ	0.0033	0.0039	0.0081	0.000285 J	0 UJ	0 U	0 UJ	0 UJ	0.00282 J	0 U
Mammals - Sum of TEQs (individuals)			0.021	0	0.04655	0.04724	0.07629	0.018285	0.0394	0.018	0.0023	0.019	0.02215	0
AVIAN TEQs		**Bird TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 U	0.0048 J	0.0048 J	0.0082 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 UJ	0 U	0.0012 J	0.0014 J	0.0023 J	0 U	0.00024 J	0 U	0.00023 J	0 UJ	0 UJ	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0.011 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0.21 J	0 UJ	0.26 J	0.24 J	0.25 J	0.18 J	0.37 J	0.18 J	0 UJ	0.19 J	0.19 J	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 U	0 U	0.00015 J	0.00018 J	0.00033 J	0 U	0 U	0 U	0 U	0 U	0.00011 J	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 UJ	0 UJ	0.0011	0.0013	0.0027	0.000095 J	0 UJ	0 U	0 UJ	0 UJ	0.00094 J	0 U
Birds - Sum of TEQs (individuals)			0.21	0	0.26725	0.24768	0.27453	0.180095	0.37024	0.18	0.00023	0.19	0.19105	0

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-01-E-3.0/4.0 6/25/2014	NR-01-E-4.0/4.6 6/25/2014	NR-02-B1-0.0/0.5 6/26/2014	NR-02-B1-0.5/2.0 6/26/2014	NR-02-B1-2.0/2.5 6/26/2014	NR-02-B2-0.0/0.5 6/26/2014	NR-02-B2-0.5/2.0 6/26/2014	NR-02-B2-2.0/2.9 6/26/2014	NR-02-C-0.0/0.5 6/26/2014	NR-02-C-0.5/2.0 6/26/2014	NR-02-C-2.0/3.0 6/26/2014	NR-03-A1-0.0/0.5 6/25/2014
FISH TEQs		**Fish TEF**												
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 U	0.0048 J	0.0048 J	0.0082 J	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 UJ	0 U	0.0012 J	0.0014 J	0.0023 J	0 U	0.00024 J	0 U	0.00023 J	0 UJ	0 UJ	0 U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0.011 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0 U	0 UJ	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0.0105 J	0 UJ	0.013 J	0.012 J	0.0125 J	0.009 J	0.0185 J	0.009 J	0 UJ	0.0095 J	0.0095 J	0 U
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 U	0 U	0.00015 J	0.00018 J	0.00033 J	0 U	0 U	0 U	0 U	0 U	0.00011 J	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 UJ	0 UJ	0.0011	0.0013	0.0027	0.000095 J	0 UJ	0 U	0 UJ	0 UJ	0.00094 J	0 U
Fish - Sum of TEQs (individuals)			0.0105	0	0.02025	0.01968	0.03703	0.009095	0.01874	0.009	0.00023	0.0095	0.01055	0

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-03-A1-0.5/1.5 6/25/2014	NR-03-B-0.0/0.5 6/24/2014	NR-03-B-0.5/1.3 6/24/2014	NR-04-B-0.0/0.5 6/25/2014	NR-04-B-0.5/2.0 6/25/2014	NR-04-B-2.0/2.6 6/25/2014	NR-05-C-0.0/0.5 6/24/2014	NR-05-C-0.5/1.6 6/24/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**								
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0.17 U	0.34 UJ	0.34 U	2.5	0.27 J	0.39 U	1.8 J	53
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0.41 U	1.2 UJ	0.43 U	1.2 UJ	0.76 UJ	0.94 U	6.9	180
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0.24 U	0.27 U	0.56 U	0.5 U	0.27 U	0.67 U	0.48 U	4.3
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0.15 U	0.098 U	0.27 U	0.26 U	0.17 U	0.31 U	0.35 U	4.2
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0.16 U	0.16 U	0.34 U	0.3 U	0.17 U	0.45 U	0.35 U	0.28 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0.13 U	0.075 U	0.27 U	0.23 U	0.17 U	0.27 U	0.31 U	0.71 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0.19 U	0.16 U	0.36 U	0.35 U	0.19 U	0.47 U	0.34 U	5.6 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0.16 U	0.088 U	0.34 U	0.28 U	0.16 U	0.41 U	0.4 U	0.83 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0.17 U	0.11 U	0.31 U	0.31 U	0.21 U	0.43 U	0.31 U	0.64 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0.11 U	0.075 U	0.18 U	0.2 U	0.13 U	0.25 U	0.18 U	0.35 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0.16 U	0.1 U	0.2 U	0.29 U	0.17 U	0.33 U	0.18 U	0.54 UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0.14 U	0.09 U	0.27 U	0.23 U	0.12 U	0.22 U	0.32 U	0.5 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0.077 U	0.065 U	0.14 U	0.21 U	0.13 U	0.23 U	0.14 U	0.64 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0.073 U	0.23 J	0.37 UJ	0.15 U	0.11 U	0.25 U	0.25 UJ	0.35 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0.1 U	0.11 U	0.29 U	0.23 U	0.13 U	0.33 U	0.19 U	0.38 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0.6 UJ	0.89 J	0.42 U	2.9 U	1.5 U	1.5 UJ	5.8 UJ	250
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	3.3 U	12	2.8 U	19 U	10 U	12 U	100	3,200
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/kg	0.2 U	0.8 J	0.45 U	5.7	0.27 U	0.53 U	7.1	250
TOTAL HEPTACHLORODIBENZO-P-DIOXINS (HPCDD)	HPCDD	ng/kg	0.41 U	1.3 J	0.43 U	1.6 U	0.19 U	2 U	13	370
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/kg	0.14 U	0.088 U	0.29 U	0.43 U	0.22 U	0.3 U	0.59 J	72
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/kg	0.17 U	0.14 U	0.33 U	0.32 U	0.19 U	0.45 U	0.34 U	26
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/kg	0.16 U	0.1 U	0.2 U	0.29 U	0.17 U	0.33 U	0.18 U	0.57 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/kg	0.092 U	0.07 U	0.16 U	0.21 U	0.13 U	0.24 U	0.24 U	2.7 J
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/kg	0.4 J	0.59 U	0.24 U	0.4 J	0.4 J	0.39 J	1 U	1.8 U
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/kg	0.1 U	0.11 U	0.29 U	0.23 U	0.33 J	0.33 U	0.19 U	3.7
ADJUSTMENTS (ND VALUES=0)										
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/kg	0 U	0 UJ	0 U	2.5	0.27 J	0 U	1.8 J	53
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/kg	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U	6.9	180
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	4.3
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	4.2
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.71 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	5.6 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.83 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.64 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.5 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/kg	0 U	0.23 J	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	ng/kg	0 UJ	0.89 J	0 U	0 U	0 U	0 UJ	0 UJ	250
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/kg	0 U	12	0 U	0 U	0 U	0 U	100	3200

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-03-A1-0.5/1.5 6/25/2014	NR-03-B-0.0/0.5 6/24/2014	NR-03-B-0.5/1.3 6/24/2014	NR-04-B-0.0/0.5 6/25/2014	NR-04-B-0.5/2.0 6/25/2014	NR-04-B-2.0/2.6 6/25/2014	NR-05-C-0.0/0.5 6/24/2014	NR-05-C-0.5/1.6 6/24/2014
MAMMALIAN TEQs		**Mammal TEF**								
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 UJ	0 U	0.025	0.0027 J	0 U	0.018 J	0.53
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U	0.069	1.8
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.42
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.071 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.56 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.083 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.064 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.05 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 U	0.023 J	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0 UJ	0.000267 J	0 U	0 U	0 U	0 UJ	0 UJ	0.075
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0 U	0.0036	0 U	0 U	0 U	0 U	0.03	0.96
Mammals - Sum of TEQs (individuals)			0	0.026867	0	0.025	0.0027	0	0.117	4.656
AVIAN TEQs		**Bird TEF**								
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 UJ	0 U	0.025	0.0027 J	0 U	0.018 J	0.53
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U	0.0069	0.18
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.42
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.05	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.071 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.056 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.083 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.064 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.05 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	1	0 U	0.23 J	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 UJ	0.000089 J	0 U	0 U	0 U	0 UJ	0 UJ	0.025
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 U	0.0012	0 U	0 U	0 U	0 U	0.01	0.32
Birds - Sum of TEQs (individuals)			0	0.231289	0	0.025	0.0027	0	0.0349	1.842

Appendix E

Table 1

Dioxin and Furan Congener TEQ Calculations for Sediment Samples

			NR-03-A1-0.5/1.5 6/25/2014	NR-03-B-0.0/0.5 6/24/2014	NR-03-B-0.5/1.3 6/24/2014	NR-04-B-0.0/0.5 6/25/2014	NR-04-B-0.5/2.0 6/25/2014	NR-04-B-2.0/2.6 6/25/2014	NR-05-C-0.0/0.5 6/24/2014	NR-05-C-0.5/1.6 6/24/2014
FISH TEQs		**Fish TEF**								
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 UJ	0 U	0.025	0.0027 J	0 U	0.018 J	0.53
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.001	0 U	0 UJ	0 U	0 UJ	0 UJ	0 U	0.0069	0.18
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.043
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.42
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.5	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.071 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.056 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.083 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.0064 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.05	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.05 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.5	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.05	0 U	0.0115 J	0 UJ	0 U	0 U	0 U	0 UJ	0 UJ
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
OCTACHLORODIBENZOFURAN	39001-02-0	0.0001	0 UJ	0.000089 J	0 U	0 U	0 U	0 UJ	0 UJ	0.025
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0001	0 U	0.0012	0 U	0 U	0 U	0 U	0.01	0.32
Fish - Sum of TEQs (individuals)			0	0.012789	0	0.025	0.0027	0	0.0349	1.7844

Appendix E
Table 2
Dioxin and Furan Congener TEQ Calculations for Fish Tissue Samples

			CC-FT-001-F 7/16/2014	CC-FT-001-O 7/16/2014	CC-FT-002-W 7/16/2014	CC-FT-003-W 7/16/2014	CC-FT-004-W 7/16/2014	CC-FT-005-F 7/16/2014	CC-FT-005-O 7/16/2014	CC-FT-006-W 7/17/2014	CC-FT-007-W 7/17/2014	CC-FT-010-W 7/17/2014	CC-FT-011-W 7/17/2014	NR-FT-008-F 7/17/2014	NR-FT-008-O 7/17/2014	NR-FT-009-F 7/17/2014	NR-FT-009-O 7/17/2014
Dioxin and Furan Congeners	**CAS No.**	**Unit**															
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/Kg	0.37 U	0.26 U	0.33 U	0.6 J	0.58 J	0.32 U	1.4 UJ	0.47 UJ	0.41 UJ	0.43 J	0.84 J	6.2	8.6	0.31 U	0.47 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/Kg	0.35 U	1.8	1.1 UJ	1.7 UJ	1.3	0.58 J	8.8	1.4	1.1 UJ	1 UJ	4.6	6.7	8.3	0.21 U	0.4 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/Kg	0.5 U	0.67 U	0.54 U	0.82 U	0.42 U	0.37 U	1.5 U	0.38 U	0.74 U	0.51 U	0.71 U	0.56 U	0.41 U	0.64 U	0.42 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/Kg	0.22 U	0.24 U	0.24 UJ	0.47 UJ	0.39 J	0.2 U	0.46 U	0.45 UJ	0.24 UJ	0.27 U	0.36 U	0.57 J	0.64 J	0.13 U	0.26 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/Kg	0.23 U	0.45 UJ	0.29 U	0.25 U	0.13 J	0.23 U	0.51 U	0.28 U	0.23 U	0.24 U	0.28 U	0.34 UJ	0.57 UJ	0.22 U	0.3 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/Kg	0.22 U	3.8 UJ	0.53 UJ	1.1 UJ	3.1 UJ	0.24 U	0.44 U	1.5 UJ	0.77 UJ	0.79 UJ	1.5 UJ	1.5	1.9	0.35 UJ	1.8 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/Kg	0.28 U	1.6	0.54 J	0.89 UJ	0.54 J	0.34 U	0.69 UJ	0.66 J	0.64 J	0.53 J	0.54 J	2.7	3.6	0.27 U	0.69 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/Kg	0.2 U	0.33 U	0.31 U	0.36 U	0.12 U	0.32 U	0.51 U	0.21 U	0.22 U	0.35 U	0.44 U	0.3 U	0.34 U	0.28 U	0.22 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/Kg	0.35 U	0.22 U	0.32 U	0.32 U	0.13 U	0.3 U	0.49 U	0.25 U	0.27 U	0.27 U	0.37 U	0.72 J	1.1 J	0.26 U	0.24 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/Kg	0.22 U	0.48 J	0.17 U	0.24 J	0.2 J	0.18 U	0.42 U	0.23 U	0.21 U	0.16 U	0.19 U	0.19 U	0.12 U	0.14 U	0.71 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/Kg	0.26 U	0.66 J	0.32 U	0.25 U	0.16 J	0.21 U	0.58 U	0.38 U	0.34 U	0.22 U	0.52 U	0.85 J	1 J	0.15 U	0.48 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/Kg	0.25 U	0.2 U	0.23 U	0.24 U	0.17 J	0.25 U	0.5 U	0.15 U	0.14 U	0.13 U	0.38 U	0.52 J	0.46 J	0.11 U	0.27 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/Kg	0.19 U	0.6 J	0.16 UJ	0.25 J	0.2 J	0.15 U	0.27 U	0.21 U	0.28 U	0.18 UJ	0.36 U	0.81 J	1 J	0.12 U	0.6 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/Kg	0.45 UJ	1.8	0.32	0.26 UJ	0.25 U	0.12 UJ	0.32 UJ	0.37 UJ	0.21 UJ	0.31 UJ	0.19 J	0.68	0.52	0.5	1.8
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/Kg	0.16 J	0.56 UJ	0.095 U	0.15 U	0.11 UJ	0.1 U	0.31 U	0.13 U	0.13 U	0.16 U	0.26 U	0.71	0.81	0.12 UJ	0.51
OCTACHLORODIBENZOFURAN	39001-02-0	ng/Kg	1.2 U	1.1 U	1.3 U	1.6 U	0.54 U	1.5 U	4.5 UJ	1.5 U	2 U	1.8 U	3.1 UJ	1.3 U	1.2 U	0.75 U	0.77 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/Kg	1.4 U	4.9	8.7	15	4.9 U	2.9 J	130	7.3	5.1	4.1	29	6 UJ	11	1.2 U	1.3 U
TOTAL HEPTACHLORODIBENZOFURANS (HPCDF)	HPCDF	ng/Kg	0.44 U	0.47 U	0.44 U	1.6 J	0.58 J	0.34 U	6.3	0.31 U	0.49 U	0.43 J	2.9	6.2	8.6	0.47 U	0.47 J
TOTAL HEPTACHLORODIBENZO-P-DIOXINS	HPCDD	ng/Kg	0.35 U	1.8	0.29 U	0.86 J	1.3	0.58 J	20	1.4	0.26 U	0.29 U	8.5	7.3	8.8	0.21 U	0.24 U
TOTAL HEXACHLORODIBENZOFURANS (HXCDF)	HXCDF	ng/Kg	0.22 U	5.3	0.25 U	3.3	2.3 J	2.3 J	6.6 J	3.2	1.3	0.25 U	0.39 U	4.5	5.2	0.17 U	0.27 J
TOTAL HEXACHLORODIBENZO-P-DIOXINS (HXCDD)	HXCDD	ng/Kg	0.28 U	1.6	0.54 J	0.3 U	0.67 J	0.29 U	0.51 U	0.66 J	0.64 J	0.53 J	1.1 J	3.4	4.7	0.25 U	0.99 J
TOTAL PENTACHLORINATEDIBENZO-P-DIOXIN	PECDD	ng/Kg	0.26 U	0.66 J	0.32 U	0.25 U	0.16 J	0.21 U	0.58 U	0.38 U	0.34 U	1.1 J	0.52 U	0.85 J	1 J	0.15 U	0.48 J
TOTAL PENTACHLORODIBENZOFURANS (PECDF)	PECDF	ng/Kg	0.2 U	1.1 J	0.22 J	0.97 J	0.58 J	0.17 U	0.34 U	0.53 J	0.43 J	0.36 J	0.53 J	1 J	1.3 J	0.19 J	2.5 J
TOTAL TETRACHLORODIBENZOFURANS (TCDF)	TCDF	ng/Kg	0.072 U	3.2	0.7	0.42 J	0.41 U	0.24 U	0.34 J	0.5	0.29	0.14 U	0.78 J	0.68	2.7	0.96	1.8
TOTAL TETRACHLORODIBENZO-P-DIOXINS (TCDD)	TCDD	ng/Kg	0.16 J	0.17 U	0.095 U	0.15 U	0.086 U	0.1 U	0.33 J	0.13 U	0.13 U	0.16 U	0.26 U	0.71	0.81	0.094 U	0.51

Appendix E
Table 2
Dioxin and Furan Congener TEQ Calculations for Fish Tissue Samples

			CC-FT-001-F 7/16/2014	CC-FT-001-O 7/16/2014	CC-FT-002-W 7/16/2014	CC-FT-003-W 7/16/2014	CC-FT-004-W 7/16/2014	CC-FT-005-F 7/16/2014	CC-FT-005-O 7/16/2014	CC-FT-006-W 7/17/2014	CC-FT-007-W 7/17/2014	CC-FT-010-W 7/17/2014	CC-FT-011-W 7/17/2014	NR-FT-008-F 7/17/2014	NR-FT-008-O 7/17/2014	NR-FT-009-F 7/17/2014	NR-FT-009-O 7/17/2014
ADJUSTMENTS (ND VALUES=0)																	
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	ng/Kg	0 U	0 U	0 U	0.6 J	0.58 J	0 U	0 UJ	0 UJ	0 UJ	0.43 J	0.84 J	6.2	8.6	0 U	0.47 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	ng/Kg	0 U	1.8	0 UJ	0 UJ	1.3	0.58 J	8.8	1.4	0 UJ	0 UJ	4.6	6.7	8.3	0 U	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	ng/Kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	ng/Kg	0 U	0 U	0 UJ	0 UJ	0.39 J	0 U	0 U	0 UJ	0 UJ	0 U	0 U	0.57 J	0.64 J	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	ng/Kg	0 U	0 UJ	0 U	0 U	0.13 J	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U	0.3 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	ng/Kg	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	1.5	1.9	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	ng/Kg	0 U	1.6	0.54 J	0 UJ	0.54 J	0 U	0 UJ	0.66 J	0.64 J	0.53 J	0.54 J	2.7	3.6	0 U	0.69 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	ng/Kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	ng/Kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.72 J	1.1 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	ng/Kg	0 U	0.48 J	0 U	0.24 J	0.2 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.71 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	ng/Kg	0 U	0.66 J	0 U	0 U	0.16 J	0 U	0 U	0 U	0 U	0 U	0 U	0.85 J	1 J	0 U	0.48 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	ng/Kg	0 U	0 U	0 U	0 U	0.17 J	0 U	0 U	0 U	0 U	0 U	0 U	0.52 J	0.46 J	0 U	0.27 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	ng/Kg	0 U	0.6 J	0 UJ	0.25 J	0.2 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0.81 J	1 J	0 U	0.6 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	ng/Kg	0 UJ	1.8	0.32	0 UJ	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.19 J	0.68	0.52	0.5	1.8
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	ng/Kg	0.16 J	0 UJ	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0.71	0.81	0 UJ	0.51
OCTACHLORODIBENZOFURAN	39001-02-0	ng/Kg	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	ng/Kg	0 U	4.9	8.7	15	0 U	2.9 J	130	7.3	5.1	4.1	29	0 UJ	11	0 U	0 U
MAMMALIAN TEQs		**Mammal TEF**															
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	0.01	0 U	0 U	0 U	0.006 J	0.0058 J	0 U	0 UJ	0 UJ	0 UJ	0.0043 J	0.0084 J	0.062	0.086	0 U	0.0047 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	0.01	0 U	0.018	0 UJ	0 UJ	0.013	0.0058 J	0.088	0.014	0 UJ	0 UJ	0.046	0.067	0.083	0 U	0 UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	0.01	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	0.1	0 U	0 U	0 UJ	0 UJ	0.039 J	0 U	0 U	0 UJ	0 UJ	0 U	0 U	0.057 J	0.064 J	0 U	0 U
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	0.1	0 U	0 UJ	0 U	0 U	0.013 J	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 UJ	0 U	0.03 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	0.1	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 U	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0.15	0.19	0 UJ	0 UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	0.1	0 U	0.16	0.054 J	0 UJ	0.054 J	0 U	0 UJ	0.066 J	0.064 J	0.053 J	0.054 J	0.27	0.36	0 U	0.069 J
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	0.1	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.072 J	0.11 J	0 U	0 U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	0.03	0 U	0.0144 J	0 U	0.0072 J	0.006 J	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.0213 J
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	1	0 U	0.66 J	0 U	0 U	0.16 J	0 U	0 U	0 U	0 U	0 U	0 U	0.85 J	1 J	0 U	0.48 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	0.1	0 U	0 U	0 U	0 U	0.017 J	0 U	0 U	0 U	0 U	0 U	0 U	0.052 J	0.046 J	0 U	0.027 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4	0.3	0 U	0.18 J	0 UJ	0.075 J	0.06 J	0 U	0 U	0 U	0 U	0 UJ	0 U	0.243 J	0.3 J	0 U	0.18 J
2,3,7,8-TETRACHLORODIBENZOFURAN	51207-31-9	0.1	0 UJ	0.18	0.032	0 UJ	0 U	0 UJ	0 UJ	0 UJ	0 UJ	0 UJ	0.019 J	0.068	0.052	0.05	0.18
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1746-01-6	1	0.16 J	0 UJ	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U	0 U	0 U	0.71	0.81	0 UJ	0.51
OCTACHLORODIBENZOFURAN	39001-02-0	0.0003	0 U	0 U	0 U	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 U
OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	0.0003	0 U	0.00147	0.00261	0.0045	0 U	0.00087 J	0.039	0.00219	0.00153	0.00123	0.0087	0 UJ	0.0033	0 U	0 U
Mammals - Sum of TEQs (individuals)			0.16	1.21387	0.08861	0.0927	0.3678	0.00667	0.127	0.08219	0.06553	0.05853	0.1361	2.601	3.1043	0.05	1.502

Appendix E

Table 3

Dioxin and Furan Congener TEF Values for Mammals, Birds and Fish Tissue Samples

Dioxin/Furan Congeners	Mammal TEF[1]	Bird TEF[2]	Fish TEF[2]
2,3,7,8-TCDD (dioxin)	1	1	1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1	1	1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.1	0.05	0.5
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.1	0.01	0.01
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.1	0.1	0.01
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.01	0.001	0.001
Total octachlorodibenzo-p-dioxin	0.0003	0.0001	0.0001
2,3,7,8-Tetrachlorodibenzofuran	0.1	1	0.05
1,2,3,7,8-Pentachlorodibenzofuran	0.03	0.1	0.05
2,3,4,7,8-Pentachlorodibenzofuran	0.3	1	0.5
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1	0.1	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01	0.01	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01	0.01	0.01
Total octachlorodibenzofuran	0.0003	0.0001	0.0001

Source:

[4]Van den Berg, M; Birnbaum, LS; Denison, M, DeVito, M, Farland, W, Feeley, M; Fiedler, H; Hakansson, H; Hanberg, A; Haws, L; Rose, M; Safe, S; Schrenk, D; Tohyama, C; Tritscher, A; Tuomisto, J; Tysklind, M; Walker, N; Peterson, RE. (2006) The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicol Sci 93:223-241

[4]Van den Berg, M; Birnbaum, L; Bosveld, ATC; Brunstrom, B; Cook, P; Feeley, M; Giesy, JP; Hanberg, A; Hasegawa, R; Kennedy, SW; Kubiak, T; Larsen, JC; van Leeuwen, FX; Liem, AK; Nolt, C; Peterson, RE; Poellinger, L; Safe, S; Schrenk, D; Tillitt, D; Tysklind, M; Younes, M; Waern, F; Zacharewski, T. (1998) Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environ Health Perspect 106(12):775-792.