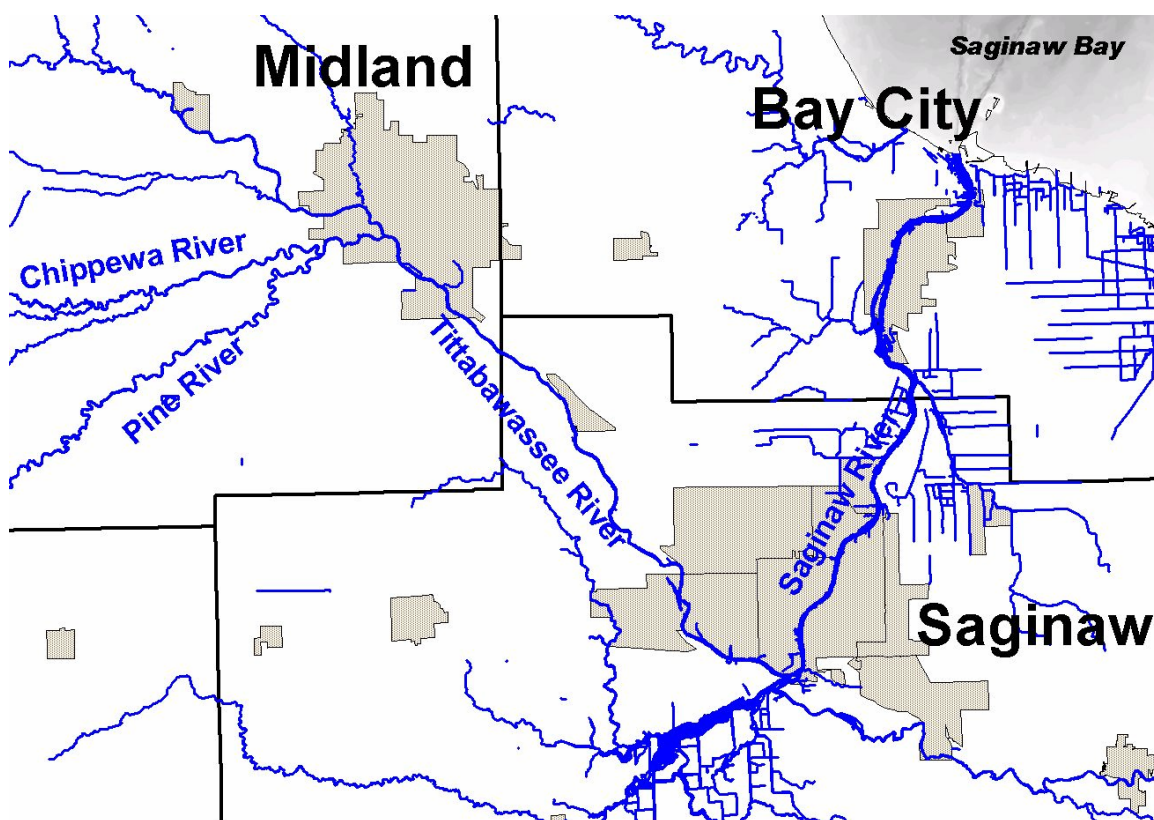


FINAL REPORT

Phase II Tittabawassee/Saginaw River Dioxin Flood Plain Sampling Study

JUNE 2003



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Revised August 2003

This is a complete version (appendices included) of the
Final Report
Phase II Tittabawassee/Saginaw River Dioxin Flood Plain Sampling Study

Note: An earlier, abbreviated version (no appendices) of this report was released in June 2003; since that time some changes have been made to the Table of Contents, and to pages 3, 5, 7, 8, 11, 12, and 19 of this report.

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Final Report

Phase II Tittabawassee/Saginaw River Dioxin Flood Plain Sampling Study

I. Executive Summary

Soil samples collected during the development of a wetland mitigation project identified elevated levels of dioxin and furan compounds (hereinafter collectively referred to as dioxin) in a farm field located near the confluence of the Tittabawassee and Saginaw Rivers. The samples, collected during April 2000, identified concentrations of dioxin as high as 2,200 parts per trillion (ppt) toxic equivalents (TEQ). The dioxin concentration was nearly 25 times the residential direct contact criterion (RDCC) of 90 ppt TEQ established under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201). The Part 201 RDCC of 90 ppt is the concentration of dioxin in soil determined to be safe for direct contact from residential exposure. Concern over the public and environmental health implications of these sample results prompted the Department of Environmental Quality (DEQ), Remediation and Redevelopment Division (RRD), to develop and implement a phased soil sampling and assessment program in the Tittabawassee River flood plain to determine the source and extent of the contamination.

Summary - Phase I

The Phase I portion of the soil sampling program was implemented during the period December 2000 through July 2001. The RRD collected 34 soil samples from five locations within a two-mile stretch of the Tittabawassee River flood plain between Center Road in Saginaw Township, Saginaw County, and the Saginaw River confluence. The Phase I sample locations are identified in Map 1. Soil samples were collected at depths ranging from the ground surface to 15 inches below ground level (bgl). Analytical results identified concentrations ranging from 35 to 7,300 ppt TEQ. Only 7 of the 34 samples contained dioxin TEQ concentrations less than the Part 201 RDCC (90 ppt TEQ). A summary of Phase I TEQ sample results is presented in Table 1. The Phase I individual dioxin congener results are presented in Appendix G.

Map 1: Phase I Sampling - - Tittabawassee/Saginaw River Flood Plain

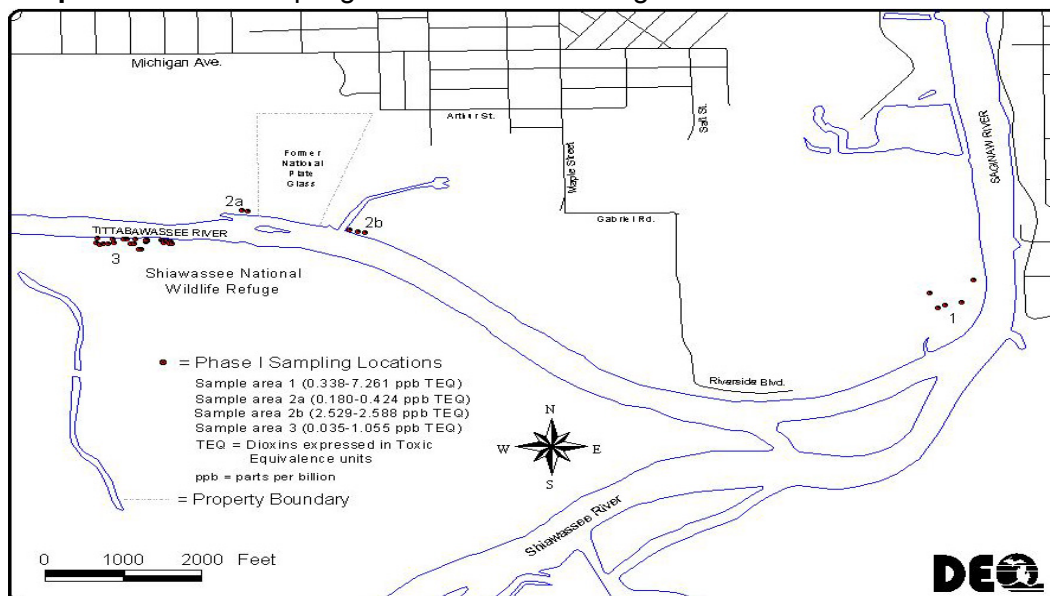


Table 1
Greenpoint-Tittabawassee River Dioxin/Furan Study Area
Phase I Sampling Study

Samples were analyzed by Triangle Laboratory, Durham, NC using US Environmental Protection Agency/USEPA Method 8290. All sample results are reported in pg/g (ppt) TEQ using USEPA Toxic Equivalency Factors (TEF) 1989

General Motors (GM) farm field (GM collected composite surface soil samples from the farm field) April 2000	
E3A	1,500
C1A	2,200

GM farm field (RRD collected discrete surface soil samples from farm field to verify April 2000 results) December 2000	
DX#1	390
DX#2	7,300
DX#3	6,300
DX#4	3,600
DX#5	340

LA Davidson (RRD collected discrete surface soil samples) May 2001	
From the farm field west of the LA Davidson site	
DX1 west	410
DX2 west	180
*From the golf course east of the LA Davidson site	
DX3 east	2,600
DX4 east	2,500

US Fish and Wildlife Service (USFWS) Shiawassee Wildlife Refuge (RRD collected discrete soil samples from wooded area) May 2001			
approximately < 6" bgl (below ground level)		approximately < 12" bgl	
GP1-6	39	GP1-12	58
GP2-6	130	GP2-12	360
GP3-6	59	GP3-12	57
GP4-6	35	GP4-12	160
GP5-6	130	GP5-12	1,100

USFWS Shiawassee Wildlife Refuge (RRD collected discrete soil samples from upland, open area) June 2001					
0 - 3" bgl		3 - 6" bgl		12 - 15" bgl	
SS1-3	390	SS1-6	590	SS1-12	58
SS2-3	770	SS2-6	420	SS2-12	280
SS5-3	390	SS5-6	540	SS5-12	250
SS6-3	590	SS6-6	550	SS6-12	110
SS7-3	490	SS7-6	660	SS7-12	68

DEQ residential direct contact criterion = 90 ppt (expressed as an equivalent concentration of 2,3,7,8-TCDD (TEQ))

The Phase I final report was completed during October 2001. The following determinations were presented in the final report:

- Elevated concentrations of dioxin were confirmed within the lower Tittabawassee River flood plain near the river's confluence with the Saginaw River.
- Dioxin concentrations were consistently found above the Part 201 RDCC (90 ppt TEQ), and were identified as high as 80 times the Part 201 RDCC.
- Human use of the flood plain increases upstream of the Phase I sample area. Residential properties are located within the flood plain, the majority located within the Shields area of Thomas Township and Saginaw Township. Public park lands and agricultural operations are also located within the flood plain.
- A Phase II sampling program was recommended to further evaluate the extent of contamination above the Part 201 RDCC occurring within the flood plain upstream of the Phase I sample area.

Summary – Sediment Study

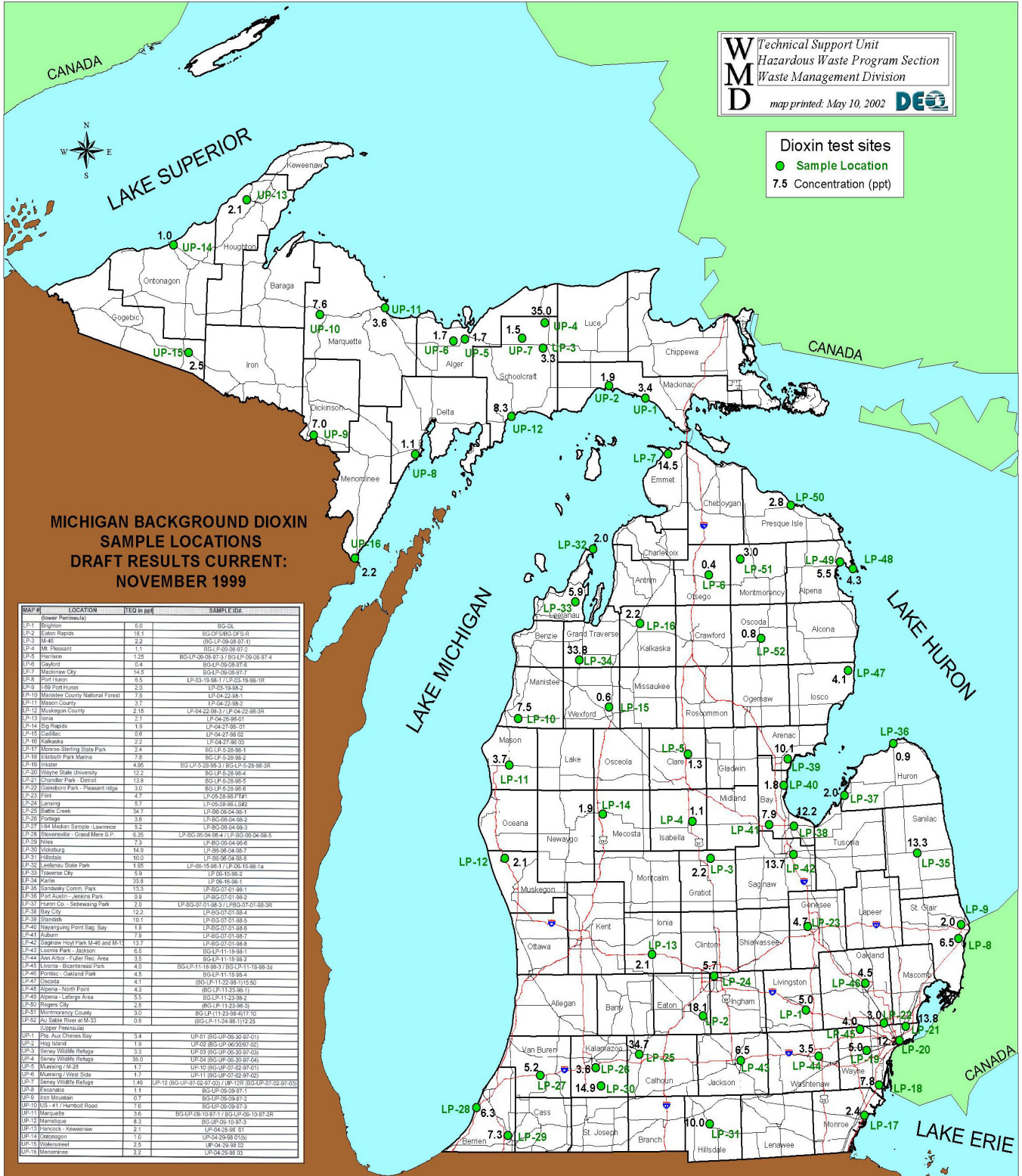
The DEQ collected and analyzed Tittabawassee River sediment samples during spring/summer 2001, as part of the Baseline Characterization of Saginaw Bay Watershed Sediment Study (DEQ Sediment Study). The objective of the DEQ Sediment Study was to provide baseline concentrations of contaminants in Tittabawassee River sediments both upstream and downstream of the city of Midland (Midland). Dioxins and furans were analyzed as part of this study. Surface sediment samples were collected from the Chippewa River, Pine River, and Tittabawassee River beginning immediately upstream of Midland and continuing downstream to the beginning of the Saginaw River. Sediment cores were collected and analyzed in select areas. Some flood plain soil samples were also collected for analysis. Sample locations and results are presented in Appendix H.

The DEQ Sediment Study final report was completed and distributed during the summer of 2002. The study results presented in the final report indicate the following:

- Dioxin concentrations from sediment and flood plain soil sample locations upstream of Midland are consistent with the average dioxin concentration in soil samples collected statewide from areas where there are no known dioxin release source(s) (hereinafter referred to as statewide background, see Figure 1).
- Dioxin is present at elevated concentrations in sediment and flood plain soil samples collected downstream of Midland. The extent of contamination is pervasive throughout the study area downstream of Midland. Sediment contamination ranged up to 2100 ppt TEQ and was present to the downstream limit of the study area, approximately 20 miles downstream of Midland. All flood plain soil samples collected downstream of Midland exceeded the Part 201 RDCC with concentrations ranging between 300 and 1500 ppt TEQ.
- The variability of dioxin concentrations in river sediment samples is believed to be a result of the variability of river water flow and site-specific sediment deposition characteristics.

Figure 1: Michigan Soil Background Dioxin Data

MICHIGAN SOIL BACKGROUND DIOXIN DATA

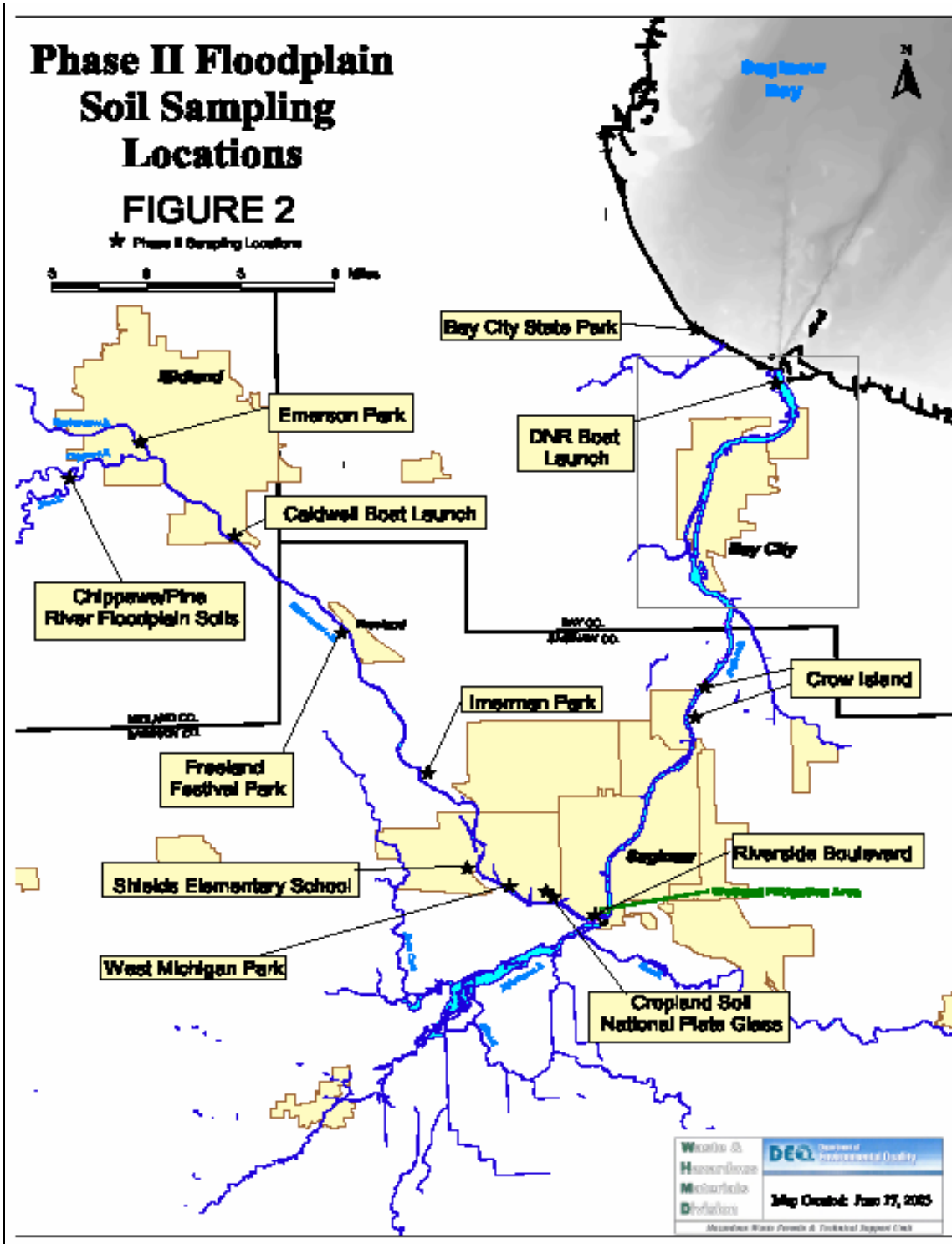


Summary – Phase II

A Phase II flood plain soil sampling program (Phase II) was developed based on the results of the Phase I Report and the DEQ Sediment Study. Flood plain soil samples were collected from the Chippewa, Pine, and Tittabawassee Rivers upstream of Midland, and at specific locations along the Tittabawassee River downstream of Midland to the beginning of the Saginaw River. Phase II soil samples were collected and analyzed during the period from May through December 2002 from the locations shown (see Figure 2). Initial observations of the Phase II sample results identified the following:

- The majority of flood plain soil sample dioxin concentrations downstream of Midland exceed the Part 201 RDCC, indicating that dioxin contamination of flood plain soil downstream of Midland is pervasive.
- Flood plain soil samples collected upstream of Midland contain dioxin concentrations consistent with statewide background concentrations.
- Dioxin concentrations from sample locations located downstream of Midland, but outside the estimated 100-year flood plain, are consistent with statewide background concentrations.
- The deepest initial Phase II soil sample (12-15 ") did not define the vertical extent of dioxin contamination. Soil samples were analyzed from three deep soil borings collected from Freeland Festival Park to improve understanding regarding the vertical extent of dioxin contamination. These additional samples indicate that dioxin contamination above statewide background concentrations exist at the park to a depth of four feet bgl. Additional deep soil sampling is necessary to determine if this vertical distribution of dioxin is consistent throughout the flood plain.
- The concentration of co-planar polychlorinated biphenyl (PCB) compounds represents an insignificant contribution to the total dioxin-like toxicity at all Phase II sample locations.
- Eggs from chickens that free range on flood plain soil exhibit elevated concentrations of dioxin. It is possible that food products from other animals raised on the flood plain could be affected.
- Dioxin concentrations in flood plain drinking water well samples were not determined to exceed applicable regulatory criteria.
- Saginaw River and Saginaw Bay navigation channel sediment samples collected in 1999 by the U.S. Army Corps of Engineers (USACE) indicate that dioxin contaminated sediment from the Tittabawassee River has migrated into the Saginaw River and the inner portions of the Saginaw Bay. Initial soil samples collected by the RRD from the Saginaw River and Saginaw Bay shoreline areas appear to confirm these results, though additional sampling of these areas is needed.

Figure 2: Phase II Soil Sampling Locations



The remainder of this report provides a detailed presentation of Phase II sampling objectives, methodology, sample results, congener profile characterization, conclusions, and recommendations.

II. Phase II Flood Plain Sampling Program Objectives

The following objectives were established for the Phase II flood plain sampling program:

- Investigate additional locations within the Tittabawassee River flood plain for the presence of dioxin.
- Assess dioxin distribution upstream and downstream of Midland.
- Assess dioxin distribution with respect to soil depth and elevation within the flood plain.
- Compare observed dioxin concentrations to applicable regulatory criteria.
- Assess if dioxin is present above applicable criteria in water supply wells located within potentially impacted flood plain areas.
- Evaluate the potential source(s) for the dioxin contamination.
- Assess whether soil dioxin concentrations in the public park areas in the flood plain pose an exposure hazard.
- Collect information on soil dioxin concentrations at two farms, one livestock and one crop operation, to provide preliminary information that will help determine the need for subsequent crop and animal data.
- Assess whether soil dioxin concentrations at residential properties along Riverside Boulevard pose an exposure hazard and provide preliminary information that will help determine the need for indoor dust and/or biological sampling data.

III. Sampling Methodology

Soil Samples

Soil samples were collected from locations upstream and downstream of Midland. Samples were also collected downstream beyond the Tittabawassee River into the Saginaw River and Saginaw Bay. Sampling locations are shown in Figure 2. The number of sample locations at each sample site varied based on the physical size of the sample site and the variety of unique physical features and human uses occurring at the sample site.

Sample Site	Distance from Midland	# Sample Locations
State of Michigan Property - Sanford	8 miles upstream; Tittabawassee River	2
Chippewa Nature Center	2 miles upstream; Chippewa River	2
Chippewa Nature Center	2 miles upstream; Pine River	2

Sample Site	Distance from Midland	# Sample Locations
Emerson Park	City of Midland	3
Caldwell Boat Launch	2 miles downstream	2
Freeland Festival Park	7 miles downstream	3 3 deep soil borings
Livestock Farm	9 miles downstream	6
Imerman Park	11½ miles downstream	14
Shields Elementary School	17 miles downstream	5
West Michigan Park	18 miles downstream	3
Crop Farm	20 miles downstream	5
National Plate Glass	20 miles downstream	1
19 Riverside Blvd.	22 miles downstream	5 soil, 4 egg
Saginaw River – Crow Island State Wildlife Refuge	31 miles downstream	3
Saginaw River – DNR Boat Launch	44 miles downstream	1 (surface only)
Saginaw Bay – DNR Bay City State Recreation Area	48 miles downstream	1 (surface only)

Samples were collected in accordance with the Phase II work plan, with these exceptions:

- Only one residential property was sampled along Riverside Boulevard due to property access issues.
- The number of sample locations was reduced at Emerson Park (6 to 3) and at the Crop Farm (8 to 5) based on an on-site field assessment of site characteristics.
- The following additional samples were collected and analyzed:
 - One soil sample location and two surface water samples from the former National Plate Glass site of environmental contamination.
 - Four eggs from chickens located at the Riverside Boulevard residence.
 - Three deep soil boring locations, with soil analysis conducted to a depth of five feet, at Freeland Festival Park.
 - Three soil sample locations from the Crow Island State Wildlife Refuge.
 - One surface soil sample location from the shoreline area at the Department of Natural Resources (DNR) Boat Launch Facility located near the mouth of the Saginaw River.
 - One soil sample location from the shoreline area at the DNR Bay City State Recreation Area.

Soil samples were collected from three soil layers at each sample location, these being 0-3", 3-6", and 12-15". At certain locations, based on property use, a surface soil sample was also collected from 0-1". Soil samples were manually collected using hand augers. Decisions regarding the exact location of a sample were made based on the physical characteristics of the sample site. Undisturbed and non-forested areas were preferred. Multiple auger holes were necessary at each location to provide a sufficient quantity of soil for sample analysis. Vegetative cover was removed prior to sample collection. For each soil layer, soil from the multiple auger holes was composited and homogenized in a disposable metal pan prior to transfer to the sample containers. Any soil remaining after all sample jars were filled was placed back into the auger holes at the end of sample collection activities. Auger holes were brought back to grade using available soil and supplemented as necessary with commercially purchased potting soil. The hand auger was decontaminated prior to sampling the next soil layer or soil sample location, and sample pans, spoons, and gloves were disposed. This procedure was repeated for each sample depth at all sample locations. The three deep soil borings located at Freeland Festival Park were collected using hydraulic soil-coring technology. Soil samples were collected from the cores at one foot intervals starting at the two foot depth.

Soil samples underwent analysis for dioxin and furan compounds (USEPA Method 1613), PCB (USEPA Method 1668), total organic carbon (MSA 29-3.5.2), percent solids (SW846-3550B), and soil grain size (ASTM-D422). Pesticide analysis was initially conducted, but was discontinued when pesticide concentrations were found to be an insignificant contribution to toxicity at sites located both upstream and downstream of Midland. The PCB analysis was conducted to assess whether any of the observed toxicity was related to the presence of PCB compounds. Information gathered from total organic carbon, percent solids, and soil grain size analysis was used to assess if there exists a correlation between these soil characteristics and observed dioxin concentrations.

Global positioning system coordinates were established for each sample location for mapping purposes and to re-locate sample sites, if necessary. Based on the information that has been collected to date, the position and elevation of a sample location within the estimated flood plain appear to be important factors to consider when determining the likelihood that a property, or portion of a property, is contaminated with dioxin.

Groundwater Samples

The majority of businesses and residences located within and adjacent to the Tittabawassee River flood plain are serviced by municipal drinking water supplies that use the Saginaw Bay of Lake Huron as the primary water source. However, some residences to the south and east of Midland along the east and west shorelines of the Tittabawassee River continue to acquire potable water from groundwater. Groundwater samples were collected from certain of these potable water wells that have the potential to be impacted by Tittabawassee River flood events. Initial sample collection activities were conducted by the Saginaw County Health Department. The DEQ collected additional water samples to augment and provide confirmation of the initial sample results. All water samples underwent analysis for dioxin (USEPA Method 1613) with the results reported in parts per quadrillion (ppq). Eventually 48 groundwater samples were collected and analyzed from 24 active potable water wells.

Analytical Laboratories

Four laboratories were used to complete soil and groundwater sample analysis.

Triangle Laboratory
2445 S. Alston Ave.
Durham, North Carolina

Soil dioxin analysis Phase I (Method 8290)
Soil dioxin analysis Phase II (Method 1613)
Co-planar PCB (Method 1668)
Water dioxin analysis (Method 1613)

Trimatrix Laboratories
5560 Corporate Exchange Ct. S.E.
Grand Rapids, MI

Percent solids (SW846-3550B)
Total Organic Carbon (MSA 29-3.5.2)

Midwest Laboratories
13611 "B" Street, Omaha, Nebraska

Grain size analysis (ASTM-D422)

Pace Analytical Laboratories
1700 Elm Street, Ste 200
Minneapolis, MN 55414

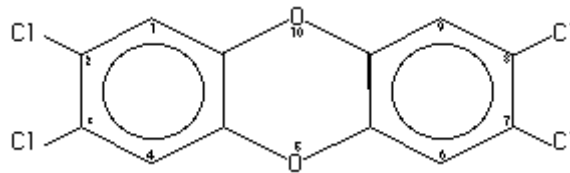
Water dioxin analysis (Method 1613)

IV. Dioxin Overview

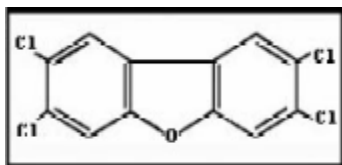
Dioxin is frequently used as a general term that refers to a group of chemical compounds, including furans, that are highly persistent in the environment and share similar chemical structures (see figures below). There are 210 different potential chemical configurations of these compounds that are individually referred to as congeners. Seventeen of these CDD and CDF congeners exhibit certain biological effects and are referred to in this report as "dioxin." Dioxin congeners exist as members of two closely related chemical families, these being the chlorinated dibenzo-*p*-dioxins (CDDs) and the chlorinated dibenzofurans (CDFs). Certain PCBs also possess toxicological properties similar to dioxin and are termed "dioxin-like."

The CDDs and CDFs are produced as a by-product of a variety of industrial production and other human activities, including but not limited to, waste incineration, pulp and paper bleaching, and chemical production. PCBs are manmade, but their production has been banned in the United States since the 1970s.

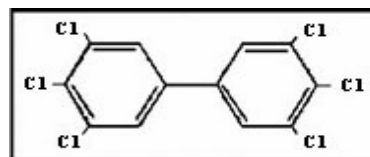
Chemical Structure of
2,3,7,8-tetrachlorodibenzo-*p*-dioxin
(CDD example)



Chemical Structure of
2,3,7,8-tetrachlorodibenzofuran
(CDF example)



Chemical Structure of
3,3',4,4',5,5'-hexachlorobiphenyl
(PCB example)



Individual congeners of CDDs, CDFs, and PCBs differ in form based on the number and location of the chlorine atoms within the chemical structures. If chlorine atoms exist in positions furthest from where the rings are linked together (refer to the figure of 2,3,7,8-tetrachlorodibenzo-para-dioxin - 2,3,7,8-TCDD) the shape is called “coplanar”. Of the hundreds of different dioxin congeners, there are only seven CDD congeners, 10 CDF congeners, and 12 PCB congeners that are coplanar. This coplanar shape is considered to be the most toxic form of dioxin because these congeners are most capable of disrupting the performance of biological systems. The 2,3,7,8-TCDD congener is considered the most toxic coplanar dioxin.

Long-term exposure to low levels of dioxin may cause a wide variety of effects on animals including cancer, liver damage, hormone disruption, immune system disorders, reproductive damage, miscarriages, and a variety of birth defects. People who have been exposed to high levels of dioxin have developed a condition known as chloracne, a disfiguring skin disease with severe acne-like pimples. Exposure to high levels of dioxin may also result in liver damage, long-term alterations in glucose metabolism, and changes in hormone levels. Fetuses, infants, and children are believed to be especially sensitive to dioxin exposure, but exact information on the effects of dioxin on children is limited. Based on currently available information, the USEPA has characterized dioxins as likely human carcinogens. The U.S. Department of Health and Human Services has identified 2,3,7,8-TCDD as “known to be a human carcinogen”.

Expressing Dioxin Toxicity – TEF and TEQ

Dioxin is found in the environment as a mixture of dioxin congeners. As a result, the additive toxic effects of all the congeners present in the environmental sample must be considered. The concept of toxic equivalency factors (TEFs) has been developed to provide a method to estimate the relative toxicity of different dioxin congeners present in an environmental sample, and to facilitate risk assessment and regulatory actions. The TEFs have been developed to compare the relative toxicity of other dioxins and dioxin-like compounds to that of 2,3,7,8-TCDD, the most toxic chemical in the dioxin group. The concentrations of other dioxin-like compounds are multiplied by a TEF to produce a 2,3,7,8-TCDD toxic equivalent (TEQ). The TEQ for each dioxin-like compound identified in a sample are then added together to determine the total TEQ for that sample. This method provides information on the combined toxicity of multiple dioxin congeners and provides a useful comparison of the relative congener concentrations at different sample locations.

World Health Organization (WHO) TEFs are used in the appendices to this report for calculating dioxin TEQ values. Since all the samples in both the Phase I and Phase II report did not have congener specific PCB data, and because PCB was found to represent a negligible contribution to the total dioxin TEQ, PCBs were not included in the TEQ values reported. The Phase II dioxin results for soil and egg samples are expressed as parts per trillion (ppt) of TEQ, whereas the Phase II dioxin results for water and groundwater are expressed as parts per quadrillion (ppq) of TEQ.

Establishing a TEQ – Non-Detectable Concentration Values

Modern laboratory analytical testing methods are capable of detecting very small concentrations of a wide variety of chemical compounds. This is true for dioxin test methods as well. However, for all laboratory test methods there is a lower limit below

which the test method is unable to detect the chemical compound. The lowest concentration value that can be accurately quantified by a test method is commonly referred to as the detection limit. However, just because a chemical compound is not identified in a sample above the detection limit does not mean that the chemical compound is not present in the sample. The chemical compound may be present in a sample but at concentrations below the detection limit of the test method.

It was a common occurrence at sample locations upstream of Midland and at locations downstream of Midland but outside of the flood plain, that certain dioxin and furan congeners were not identified in samples above the detection limit. The DEQ has calculated dioxin TEQs using three different methods to evaluate non-detectable concentration values, these being:

- The dioxin congener concentration is assumed to be the same as the detection limit (non-detection = detection limit).
- The dioxin congener concentration is assumed to be the same as $\frac{1}{2}$ of the detection limit (non-detection = $\frac{1}{2}$ detection limit).
- The dioxin congener is assumed not to be present in the sample (non-detection = zero).

All three dioxin TEQ calculations are included in the data tables presented in the appendices of this report. Based on these calculations it is the assessment of the DEQ that there was no meaningful difference among the three dioxin TEQ values. Dioxin TEQ data presented in the text of this report were calculated using $\frac{1}{2}$ of the detection limit for non-detectable concentration values.

Dioxin Congener Profile

Dioxins are stable chemicals and can persist for many years in the environment. Dioxins are generally found to be present in soil and water samples as a mixture of dioxin congeners. Determining the mixture of dioxin congeners that is present can assist efforts towards identifying the source for the dioxin release.

A graphical chart representation of the mixture of dioxin compounds present in an environmental sample has been created for this report. This chart is referred to in this report as a congener profile chart. The congener profile chart is constructed using the percent of total TEQ that a particular dioxin congener represents in a soil sample. Congener profile charts were created for all Phase II flood plain soil and egg samples, the DEQ Sediment Study, USACE sediment samples, Saginaw River/Bay shoreline soil samples, and Phase I soil samples. These charts are presented together in Appendix J to facilitate chart comparison. A preliminary assessment of the results of the dioxin congener profile analysis is provided later in this report.

Dioxin Soil Background Concentrations

Chemical manufacturing, industrial production, waste incineration, and chemical use activities over the past century have resulted in the widespread distribution of dioxin in soil, lake and river sediments, and water throughout the United States. During 1997 and 1998, the DEQ collected soil samples from 68 urban and rural locations in Michigan's

upper and lower peninsulas to gain an understanding of statewide dioxin background concentrations. The results of this assessment effort identified that dioxin soil background concentrations varied from less than 1.0 ppt TEQ to 35 ppt TEQ, with a statewide average soil background dioxin concentration calculated to be approximately 6.0 ppt TEQ. A similar nationwide effort conducted by the USEPA identified a calculated average United States soil background dioxin concentration of 10 ppt TEQ. These values are important to consider when evaluating dioxin TEQ concentrations. A map identifying state soil background sample locations and TEQ concentrations is included as Figure 1.

Dioxin Regulatory Criteria

Under the provisions of Part 201, the DEQ has established criteria for concentrations of hazardous substances in soil and groundwater that are believed to be safe for specific human exposure scenarios. For property designated for residential use, the concentration of dioxin in soil determined to be safe for direct contact, the RDCC, is 90 ppt TEQ. The RDCC is the criterion used by the DEQ to determine if a property or location requires some additional response activity, such as investigation, exposure barriers, use restrictions, or cleanup. The RDCC is a human health-based criterion and was developed using currently available risk-based exposure data and scenarios. The DEQ also uses a drinking water standard established by the USEPA of 30 ppq TEQ for the maximum concentration of dioxin in drinking water.

The U.S. Agency for Toxic Substance and Disease Registry (ATSDR) has established a screening value dioxin concentration of 50 ppt TEQ in soil. The ATSDR established this screening value based on currently available information concerning the human health effects of dioxin. Soil concentrations above this screening value is sufficient to warrant further study and evaluation to determine if a dioxin contamination problem exists at a property or location. The ATSDR has established a soil dioxin concentration of 1,000 ppt TEQ as an action level requiring that some form of response action be taken to address the identified contamination. This action level is based on ATSDR policy rather than the health effects of dioxin.

V. Polychlorinated Biphenyl Congeners (PCB)

During development of the Phase II sampling program, concerns were expressed to the DEQ regarding the contribution that PCBs may have to the total dioxin-like toxicity observed in a soil sample. It is known that certain PCB congeners can contribute to dioxin related toxicity. As a result, most soil samples underwent analysis for PCB. Data from this analysis confirmed that throughout the entirety of the Phase II study area, PCB represented a negligible contribution to the total dioxin TEQ. The maximum contribution for PCB identified during Phase II was 11 ppt TEQ at Imerman Park (IMP 1-15"), which was less than one percent of the total dioxin TEQ of 1,500 ppt identified at this location. From this data, it can be concluded that the dioxin TEQ observed at all Phase II soil samples is overwhelmingly the result of the presence of dioxin.

VI. Estimated 100-Year Flood Plain Contour

Initial evaluation of the Phase I and DEQ Sediment Study data indicated that dioxin congeners found in the Tittabawassee River sediments were similar in kind and relative abundance to those found in flood plain soil. To achieve Phase II study objectives it became important to develop a general understanding of the shape and extent of the Tittabawassee River flood plain downstream of Midland.

An estimate of the extent of the Tittabawassee River 100-year flood plain was developed using floodway data published by the U.S. Federal Emergency Management Agency. A 100-year flood plain can be described as that area of land located adjacent to a river that is expected to flood once every 100 years. It can also be described as that area of land located adjacent to a river that has a one percent chance of flooding during any given year. The shape and size of the estimated 100-year flood plain has been presented as a solid, color-enhanced (blue) contour line superimposed on maps and aerial photographs presented in this report. Any land or structure located between the Tittabawassee River shoreline and the contour line is considered to be within the estimated 100-year flood plain. Likewise, any land or structure located such that the contour line is located between it and the Tittabawassee River shoreline is considered to be outside the estimated 100-year flood plain.

VII. Phase II Sample Results - Soil

Soil Sample Labeling

More than 200 soil samples were collected and analyzed during the Phase II study. Samples were labeled to provide consistent information related to the location and depth of the soil sample. A unique identifier was established for the different Phase II sample sites. As an example, all samples collected at Imerman Park have an identifier of IMP. Following the identifier is a number that indicates the sample location within the sample site. The final number in the sample label identifies the soil layer depth from which the sample was collected. The larger number was used as the primary descriptor, so 3" means that the sample was collected from the 0-3" soil layer. Likewise, 15" means that the sample was collected from the 12-15" soil layer. As an example, the sample label IMP 7-6" indicates that the soil sample was collected from Imerman Park, at sample location #7, from the 3-6" soil layer. The DEQ has attempted to consistently use these sample labels in all data tables, maps, and reports.

Data Reporting

The data that is summarized in this report is reported to two significant figures. Please note that earlier results and Phase I data have been previously reported using more significant figures.

State of Michigan Property – Sanford

The property is located along the northern shoreline of the Tittabawassee River, south of the southern terminus of Cedar Street, near the City of Sanford. The property is located approximately eight miles upstream of Midland. Soil samples were collected from three soil layers (0-3", 3-6", 12-15") at two locations. Samples collected from this site were labeled SFD.

Photo 1: Sanford (SFD)



Dioxin concentrations ranged from 0.67 to 4.6 ppt TEQ. Soil dioxin concentrations were consistent with DEQ Sediment Study results and with concentrations identified by the statewide dioxin background study. Soil samples at this location underwent pesticide analysis and concentrations were found to be less than applicable Part 201 criteria. The PCB analysis was also completed for these soil sample locations and the contribution to total dioxin TEQ was found to be insignificant.

Tittabawassee River Flood Plain Soil, Sanford (SFD), Midland County Upstream	
Sample Identifier	Dioxin, ppt TEQ
SFD 1-3"	4.0
SFD 1-6"	3.3
SFD 1-15"	0.67
SFD 2-3"	3.3
SFD 2-6"	4.6
SFD 2-15"	1.2

Pine River – Chippewa Nature Center

The Pine River joins with the Chippewa River approximately two miles upstream of Midland. Soil samples were collected from three soil layers (0-3", 3-6", 12-15") at two locations along the north shore of the Pine River as it passes through the Chippewa Nature Center in Midland County, just upstream of the confluence of the Pine and Chippewa Rivers. Samples collected from this site were labeled PINE.

Photo 2: Pine River (PINE)



Dioxin concentrations ranged from 2.8 to 13 ppt TEQ. Soil dioxin concentrations were consistent with DEQ Sediment Study results, and with dioxin concentrations identified by the statewide dioxin background study. Soil samples at this location underwent pesticide analysis and concentrations were found to be insignificant. The PCB analysis was also completed for these soil sample locations and the contribution to total dioxin TEQ was found to be insignificant.

Pine River Flood Plain Soil (PINE), Chippewa Nature Center, Midland County	
Sample Identifier	Dioxin, ppt TEQ
PINE 1-3"	3.0
PINE 1-6"	2.8
PINE 1-15"	9.0
PINE 2-3"	8.9
PINE 2-6"	12
PINE 2-15"	13

Chippewa River – Chippewa Nature Center

The Chippewa River joins with the Pine River approximately two miles upstream of Midland. Soil samples were collected from three soil layers (0-3", 3-6", 12-15") at two locations along the south shore of the Chippewa River as it passes through the Chippewa Nature Center in Midland County, just upstream of the confluence of the Pine and Chippewa Rivers. Samples collected from this site were labeled CHW.

Photo 3: Chippewa River (CHW)



Dioxin concentrations ranged from 4.2 to 12 ppt TEQ. Soil dioxin concentrations were consistent with DEQ Sediment Study results and with dioxin concentrations identified by the statewide dioxin background study. Soil samples at this location underwent pesticide analysis and concentrations were found to be insignificant. The PCB analysis was also completed for these soil sample locations and the contribution to total dioxin TEQ was found to be insignificant.

Chippewa River Flood Plain Soil (CHW), Chippewa Nature Center, Midland County	
Sample Identifier	Dioxin, ppt TEQ
CHW 1-3"	4.7
CHW 1-6"	7.9
CHW 1-15"	12
CHW 2-3"	4.2
CHW 2-6"	7.0
CHW 2-15"	7.3

Emerson Park

Emerson Park is located within Midland along the Tittabawassee River just upstream of the confluence of the Tittabawassee and Chippewa Rivers. This is a multiple-use park with supported recreational activities including foot and bike paths, picnic areas, open areas, and softball/baseball facilities. Soil samples were collected from four soil layers (0-1", 0-3", 3-6", and 12-15") at three sample locations. Samples collected from this site are labeled EMP.

Photo 4: Emerson Park (EMP)



Dioxin concentrations at Emerson Park were elevated above concentrations observed at the three sample sites located upstream of Midland. Some of the observed concentrations exceed dioxin concentrations identified by the state-wide dioxin background study. Soil dioxin concentrations ranged from 5.2 to 100 ppt TEQ. Only one of the 12 samples, EMP 2-15", exceeded the Part 201 RDCC.

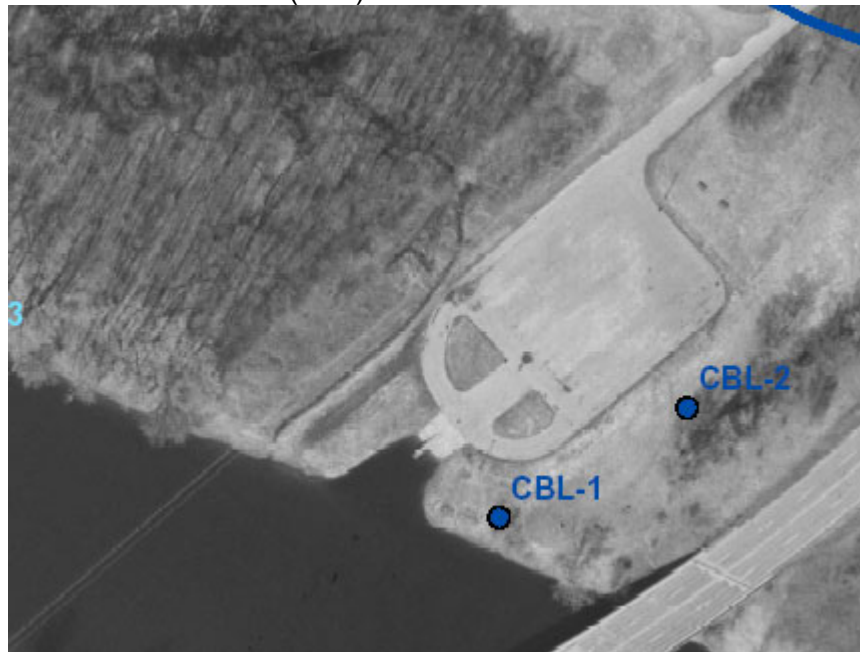
Emerson Park Soil (EMP), City of Midland Midland County	
Sample Identifier	Dioxin, ppt TEQ
EMP 1-1"	10
EMP 1-3"	7.5
EMP 1-6"	5.2
EMP 1-15"	22
EMP 2-1"	24
EMP 2-3"	29
EMP 2-6"	54
EMP 2-15"	100
EMP 3-1"	15
EMP 3-3"	21
EMP 3-6"	21
EMP 3-15"	5.6

An initial evaluation of the data appears to indicate that the distribution of dioxin congeners at Emerson Park is different from that found in soil samples collected within the flood plain downstream of Midland. As part of a separate soil investigation initiative, soil from properties located outside the flood plain, but within the city of Midland, was sampled to determine if dioxin concentrations have been elevated as a result of various chemical manufacturing and waste incineration processes that have occurred in the city since the early 1900s. This sampling effort confirmed that dioxin concentrations in Midland soil are elevated above statewide background concentrations, and in many instances above the Part 201 RDCC. Additional evaluation of the Phase II Emerson Park sample data may identify whether the data shares certain dioxin congener characteristics with the limited Midland soil data that is currently available. A more detailed discussion is provided in the section of this report entitled “Dioxin Congener Profile Data”.

Caldwell Boat Launch

The Caldwell Boat Launch facility is operated by the Midland Parks and Recreation Department and is located on the east shore of the Tittabawassee River approximately two miles downstream from Midland. Soil samples were collected from four soil layers (0-1”, 0-3”, 3-6”, and 12-15”) at two sample locations. Samples collected from this site are labeled CBL.

Photo 5: Caldwell Boat Launch (CBL)



Dioxin concentrations at Caldwell Boat Launch consistently exceed dioxin concentrations identified by the state-wide dioxin background study. Soil dioxin concentrations ranged from 35 to 270 ppt TEQ. Six of the eight soil samples exceeded the Part 201 RDCC. A soil sample was also collected during the DEQ Sediment Study from the wooded area adjacent to the boat launch. This sample exhibited a concentration of 690 ppt TEQ. Based on information currently available to the DEQ, it is believed that the Caldwell Boat Launch was constructed during the mid-1980s. It is

likely that earth moving activities associated with boat launch construction have affected the distribution of soil dioxin contamination on the property.

Caldwell Boat Launch Soil (CBL), Midland County	
Sample Identifier	Dioxin, ppt TEQ
CBL 1-1"	35
CBL 1-3"	140
CBL 1-6"	140
CBL 1-15"	270
CBL 2-1"	170
CBL 2-3"	180
CBL 2-6"	250
CBL 2-15"	210

Freeland Festival Park

The Freeland Festival Park is located approximately seven miles downstream of Midland. This is a multi-use park with fishing dock, picnic facilities, a walkway, and open areas. The park is managed by Tittabawassee Township. Soil samples were collected from four soil layers (0-1", 0-3", 3-6", and 12-15") at three sample locations. Samples collected from this site are labeled FFP. Please note that the labeling convention used for the Freeland Festival Park samples differs slightly from the labeling convention used at other sample sites. For these samples, the actual sample location is identified in parentheses, e.g., (LOC 1).

Photo 6: Freeland Festival Park (FFP)



Dioxin concentrations at Freeland Festival Park were the highest observed during the Phase II study. Soil dioxin concentrations ranged from 190 to 3,400 ppt TEQ. All soil samples exceeded the Part 201 RDCC. The greatest concentration of 3,400 ppt TEQ was found at FFP 1-15" (LOC 1), the deepest soil layer from the most inland sample location.

Freeland Festival Park Soil (FFP), Freeland, Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
(LOC 1) FFP 1-1"	1,500
(LOC 1) FFP 1-3"	1,400
(LOC 1) FFP 1-6"	2,600
(LOC 1) FFP 1-15"	3,400
(LOC 2) FFP 2-1"	1,200
(LOC 2) FFP 2-3"	1,500
(LOC 2) FFP 2-6"	1,600
(LOC 2) FFP 2-15"	2,400
(LOC 3) FFP 3-1"	360
(LOC 3) FFP 3-3"	360
(LOC 3) FFP 3-6"	190
(LOC 3) FFP 3-15"	750

Surface soil (0-1") dioxin concentrations ranged from 360 to 1,500 ppt TEQ, significantly exceeding the Part 201 RDCC. The greatest surface soil concentration of 1,500 ppt TEQ was at FFP 1-1" (LOC 1), the most inland sample location. These results suggest that all of the soil located within Freeland Festival Park is likely to be contaminated with dioxin above the Part 201 RDCC.

Three deep soil borings were collected from Freeland Festival Park during December 2002. The deep soil borings extended to a depth of five feet bgl and were collected using a DEQ hydraulic probe sampler. Deep soil borings were collected at Location 1 (LOC 1) and Location 2 (LOC 2). Deep soil samples from these locations were collected at one foot intervals starting at two feet bgl (i.e., 16-24", 25-36", 37-48", and 49-60"). A deep soil boring could not be collected at Location 3 due to obstructions. A new soil sample location was collected near the center of the park (LOC 4). Since LOC 4 was a new sample location, soil samples were also collected at 0-3", 3-6", and 12-15".

Deep Soil Borings Freeland Festival Park	
Sample Identifier	Dioxin, ppt TEQ
(LOC 1) FFP 2-24"	1,600
(LOC 1) FFP 2-36"	130
(LOC 1) FFP 2-48"	64
(LOC 1) FFP 2-60"	12
(LOC 2) FFP 3-24"	98
(LOC 2) FFP 3-36"	14
(LOC 2) FFP 3-48"	1.4
(LOC 4) FFP 1-3"	1,600
(LOC 4) FFP 1-6"	2,600
(LOC 4) FFP 1-15"	170
(LOC 4) FFP 1-24"	7.0
(LOC 4) FFP 1-36"	24
(LOC 4) FFP 1-48"	7.7
(LOC 4) FFP 1-60"	1.7

Soil dioxin concentrations in the deep soil borings ranged from 1.4 to 2,600 ppt TEQ. The deep soil borings were collected in an effort to gain understanding regarding the vertical extent of soil dioxin contamination. At Freeland Festival Park the deep soil samples indicate that concentrations of dioxin above the Part 201 RDCC could be encountered at depths extending between three and four feet bgl.

Livestock Farm

Phase II soil samples were collected from a livestock farm operation located approximately nine miles downstream of Midland. Samples collected from this site are labeled LIVE. Soil samples were collected from three soil layers (0-3", 3-6", and 12-15") at six sample locations. Sample locations were selected both within and outside of the estimated 100-year flood plain contour. A large portion of the livestock farm is located outside of the flood plain. Flooding conditions within the Tittabawassee River flood plain at the time of sample collection prevented access to the majority of the livestock farm property that is located within the estimated 100-year flood plain.

Photo 7: Livestock Farm (LIVE)



Sample locations LIVE 1 through LIVE 5 were located outside of the estimated flood plain. The dioxin concentration ranged from 0.36 to 5.3 ppt TEQ for all soil layers at these five sample locations. The observed concentrations are consistent with statewide background dioxin concentrations. In addition, the dioxin congener profiles were similar to those established at sample locations located upstream of Midland. In contrast, soil dioxin concentrations for all soil layers at LIVE 6 were elevated above the average statewide background dioxin concentration with soil concentrations ranging from 22 to 34 ppt TEQ. Also, the dioxin congener profile is consistent with flood plain soil and river sediment samples collected from locations downstream of Midland. A more detailed discussion is provided in the section of this report entitled "Dioxin Congener Profile Data".

Livestock Farm Soil (LIVE), River Road, Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
LIVE 1-3"	1.3
LIVE 1-6"	1.7
LIVE 1-15"	0.48
LIVE 2-3"	4.2
LIVE 2-6"	3.0
LIVE 2-15"	0.36
LIVE 3-3"	3.6
LIVE 3-6"	5.2
LIVE 3-15"	0.69
LIVE 4-3"	3.3
LIVE 4-6"	1.0
LIVE 4-15"	0.46
LIVE 5-3"	5.3
LIVE 5-6"	3.3
LIVE 5-15"	2.0
LIVE 6-3"	22
LIVE 6-6"	29
LIVE 6-15"	34

Imerman Park

Imerman Park is a large multi-use park operated by the Saginaw County Parks and Recreation Department, located approximately 11 miles downstream from Midland. The park provides a boat launch, canoe launch, pet exercise area, ball fields, open space, hiking trails, tennis courts, play sets, and picnic sites. The park is heavily used by local residents. The park property extends from the shoreline of the Tittabawassee River to M-47 (Midland Road). Although the vast majority of the park is located within the estimated 100-year flood plain a small portion along and adjacent to M-47 lies outside of the flood plain.

A total of 14 locations were sampled at Imerman Park. Samples collected from Imerman Park are labeled IMP. Soil samples were collected from three soil layers (0-3", 3-6", and 12-15") at 11 sample locations, these being IMP 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, and 14. Soil samples were collected from four soil layers (0-1", 0-3", 3-6", and 12-15") at two sample locations, IMP 7 and 8. At IMP 9, samples were only collected from the upper three soil layers (0-1", 0-3", and 3-6"). A 12-15" sample was not collected due to the presence of subsurface obstructions

Dioxin concentrations at IMP 1 through IMP 10 exceeded the Part 201 RDCC at all soil layers, with concentrations ranging from 230 to 2,400 ppt TEQ. IMP 1 was collected at the boat launch near the river shoreline with sample locations continuing inland to IMP 10. IMP 10 is located at the picnic pavilion on the riverside of the upper parking lot. The highest concentration of 2,400 ppt TEQ was found at IMP 1-6" and represents the second highest soil dioxin concentration identified during the Phase II study. Surface soil samples (0-1") were collected at IMP 7, 8, and 9. The highest surface soil concentration was 1,400 ppt TEQ, located near the ball field, at IMP 7-1".

Photo 8: Imerman Park (IMP)



The estimated 100-year flood plain contour lies between the upper parking lot and M-47. Land elevation rises relatively quickly over this short distance. Sample locations IMP 11 through IMP 14 are located in this portion of the park. Although elevated above the statewide average background concentration, no sample collected from any soil layer at IMP 11 through IMP 14 identified dioxin concentrations exceeding the Part 201 RDCC with dioxin concentrations ranging from 2.9 to 40 ppt TEQ.

Imerman Park Soil (IMP), Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
Lower Elevation Sampling Locations	
IMP 1-3"	1,300
IMP 1-6"	2,400
IMP 1-15"	1,500
IMP 2-3"	1,200
IMP 2-6"	1,000
IMP 2-15"	900
IMP 3-3"	960
IMP 3-6"	940
IMP 3-15"	1,000
IMP 4-3"	610
IMP 4-6"	980
IMP 4-15"	670
IMP 5-3"	790
IMP 5-6"	620
IMP 5-15"	640
IMP 6-3"	1,100
IMP 6-6"	1,200
IMP 6-15"	570
IMP 7-1"	1,400
IMP 7-3"	1,600
IMP 7-6"	1,800
IMP 7-15"	1,200
IMP 8-1"	370
IMP 8-3"	670
IMP 8-6"	1,000
IMP 8-15"	380
IMP 9-3"	230
IMP 9-6"	630
IMP 10-1"	550
IMP 10-3"	310
IMP 10-6"	460
IMP 10-15"	440
Upper Elevation Sampling Locations	
IMP 11-3"	38
IMP 11-6"	40
IMP 11-15"	17
IMP 12-3"	11
IMP 12-6"	12
IMP 12-15"	5.4
IMP 13-3"	5.2
IMP 13-6"	4.8
IMP 13-15"	2.9
IMP 14-3"	37
IMP 14-6"	23
IMP 14-15"	14

Shields Elementary School

Shields Elementary School was added to the Phase II sampling study when initial Phase II sample results suggested that the majority of the estimated 100-year flood plain downstream of Midland was contaminated with elevated concentrations of dioxin. The school is located adjacent to the southern shoreline of the Tittabawassee River near the intersection of River and Stroebel Roads in James Township, approximately 17 miles downstream from Midland. The property was initially believed to be within the flood plain based on flood plain elevation information available to the DEQ.

Photo 9: Shields Elementary School (SES)



Soil samples collected from Shields Elementary School were labeled SES. Soil samples were collected from four soil layers (0-1", 0-3", 3-6", and 12-15") at five locations. It became apparent to DEQ staff during the sampling event, and from discussions with school administrators, that the school does not flood on a frequent basis. Although the school is surrounded by the 100-year flood plain it is constructed on land that is elevated above the estimated 100-year flood plain. The dioxin results from this location were consistent with statewide background concentrations, ranging from 0.28 ppt to 5.5 ppt TEQ.

Shields Elementary School (SES), 6900 Stroebel Rd., Saginaw County			
Sample Identifier	Dioxin, ppt TEQ	Sampler Identifier	Dioxin, ppt TEQ
SES 1-1"	3.9	SES 3-6"	3.1
SES 1-3"	4.5	SES 3-15"	0.89
SES 1-6"	1.8	SES 4-1"	5.4
SES 1-15"	0.80	SES 4-3"	2.5
SES 2-1"	3.9	SES 4-6"	1.3
SES 2-3"	2.9	SES 4-15"	0.59
SES 2-6"	0.74	SES 5-1"	2.2
SES 2-15"	0.28	SES 5-3"	5.5
SES 3-1"	3.8	SES 5-6"	2.5
SES 3-3"	4.4	SES 5-15"	1.8

West Michigan Park

West Michigan Park is located in Saginaw Township between Michigan Avenue and the Tittabawassee River approximately 18 miles downstream from Midland. The park, operated by the Saginaw Township Parks and Recreation Department, contains a fishing dock platform, play equipment, soccer field, picnic areas, and open space.

Photo 10: West Michigan Park (WMP)



Samples collected from West Michigan Park were labeled WMP. Samples were collected from four soil layers (0-1", 0-3", 3-6", and 12-15") at three sample locations. All soil samples contained dioxin at concentrations exceeding the Part 201 RDCC. Dioxin concentrations ranged from 140 to 670 ppt TEQ.

West Michigan Park Soil (WMP), Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
WMP 1-1"	460
WMP 1-3"	270
WMP 1-6"	350
WMP 1-15"	450
WMP 2-1"	510
WMP 2-3"	420
WMP 2-6"	670
WMP 2-15"	340
WMP 3-1"	270
WMP 3-3"	540
WMP 3-6"	540
WMP 3-15"	140

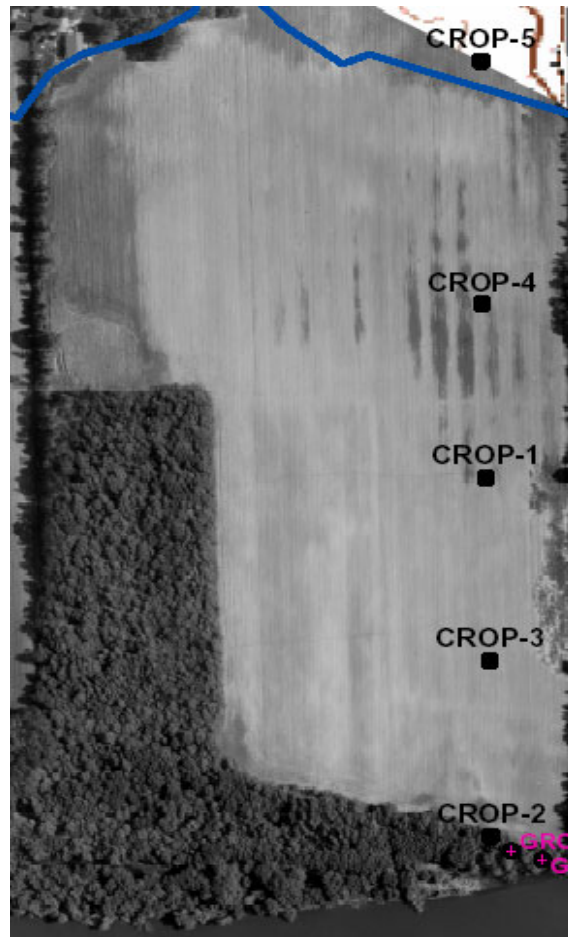
Crop Farm

The Phase II Crop Farm sample site is located approximately 20 miles downstream of Midland. The majority of the Crop Farm is located within the estimated 100-year flood plain. The former National Plate Glass (NPG) site of environmental contamination forms the eastern property boundary of the crop farm. A portion of the Crop Farm located adjacent to the Tittabawassee River is wooded. This wooded area was previously sampled as part of the Phase I.

Samples collected from this site are labeled CROP. Soil samples were collected from three soil layers (0-3", 3-6", and 12-15") at five sample locations. Dioxin concentrations at sample locations CROP 1 through CROP 3 ranged from 6.8 to 48 ppt TEQ. The dioxin concentrations observed at the crop farm were the lowest for any flood plain sample site downstream of Midland. All dioxin concentrations were less than the Part 201 RDCC and significantly less than Phase I soil sample results. Two Phase I soil samples collected from the wooded portion of the Crop Farm adjacent to the Tittabawassee River as part of the former NPG site assessment effort identified dioxin concentrations within the surface soil layer (0-1") of 180 and 410 ppt TEQ.

CROP 4 was located within the flood plain near the estimated 100-year flood plain contour, and CROP 5 was located just outside of the estimated flood plain contour. Dioxin concentrations at these sample locations were equivalent to statewide background with concentrations ranging from less than 0.15 to 1.9 ppt TEQ.

Photo 11: Crop Farm (CROP)



Given the pervasiveness of dioxin contamination within Tittabawassee River flood plain soil downstream of Midland, it is possible that there are local physical features that are impeding the deposition of dioxin onto Crop Farm soil. A forested area forms the southern and western boundaries of the Crop Farm. The forested area could be acting to slow the flow of the river during flood events resulting in the preferential deposition of river sediments within the forest area and reducing the amount available for deposition onto the Crop Farm. In addition, the NPG site is located directly to the east of the crop farm. As a result of glass production waste disposal practices that occurred during the period from 1900 through 1928, the elevation of the NPG property has been raised to a level approximately six to 10 feet higher than the adjacent Crop Farm property above the estimated 100-year flood plain elevation, and is acting as a barrier to river flow during flood events, forcing the flow of the Tittabawassee River to the south.

The Shiawassee Wildlife Refuge is located to the south, across the Tittabawassee River, from both the Crop Farm and NPG properties. Shiawassee Wildlife Refuge soil was sampled during Phase I (GP-1 through 5) with dioxin concentrations ranging from 35 to 1,100 ppt TEQ. In addition, soil from an island located in the river south of the former NPG was sampled (SS#2) during the DEQ Sediment Study and a dioxin concentration of 1,500 ppt TEQ was identified. Though not conclusive, these results appear to support a theory that physical features are affecting dioxin distribution at the Crop Farm area.

Crop Farm (CROP), West Michigan Avenue, Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
CROP 1-3"	19
CROP 1-6"	20
CROP 1-15"	19
CROP 2-3"	21
CROP 2-6"	21
CROP 2-15"	6.8
CROP 3-3"	48
CROP 3-6"	30
CROP 3-15"	22
CROP 4-3"	1.7
CROP 4-6"	1.3
CROP 4-15"	1.9
CROP 5-3"	0.52
CROP 5-6"	0.94
CROP 5-15"	0.15

National Plate Glass

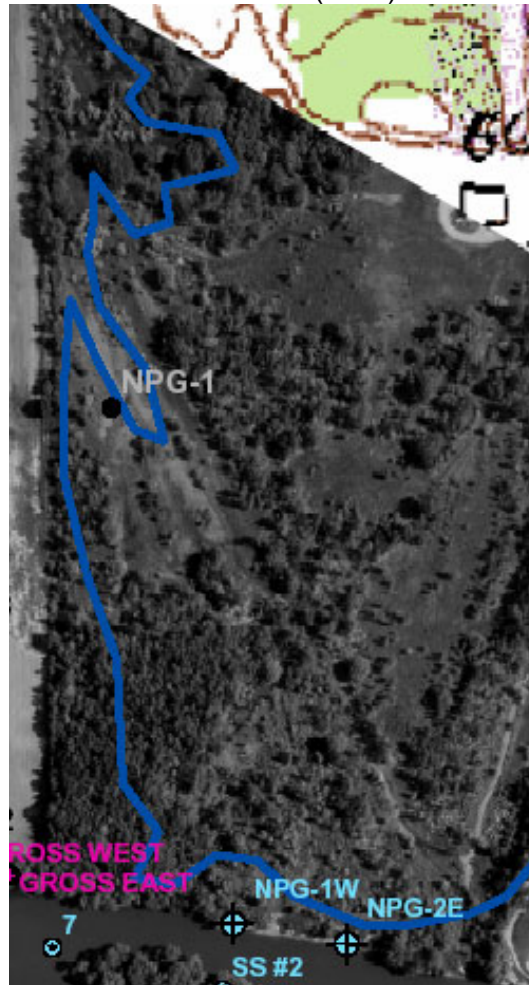
The former National Plate Glass site of environmental contamination (NPG) is located adjacent to the eastern boundary of the Crop Farm, approximately 20 miles downstream from Midland. As a result of glass production waste disposal practices that occurred during the period from 1900 through 1928 the elevation of the NPG property has been raised to a level approximately six to 10 feet higher than the adjacent Crop Farm property above the estimated 100-year flood plain elevation, and is acting as a barrier to river flow during flood events forcing the flow of the Tittabawassee River to the south. As a result, since the late 1920s it is probable that the former NPG property has not

been impacted by the vast majority of Tittabawassee River flood events that have occurred.

Soil samples collected from this site were labeled NPG. Soil samples were collected from three soil layers (0-3", 3-6", and 12-15") at one sample location. Dioxin concentrations were less than 1.0 ppt TEQ.

Former National Plate Glass Soil (NPG) Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
NPG 1-1"	0.97
NPG 1-3"	0.78
NPG 1-6"	0.57

Photo 12: National Plate Glass (NPG)



Groundwater that comes to be located within the elevated portion of the former NPG property eventually migrates overland to the Tittabawassee River. Water exiting the elevated area is commonly referred to as leachate. Two leachate water samples were collected. Dioxin concentrations in these water samples were 9.4 and 14 ppq TEQ.

Former National Plate Glass (NPG) Surface Water Run-off, Saginaw County	
Sample Identifier	Dioxin, ppq TEQ
NPG GW-1	9.4 ppq
NPG GW-2	14 ppq

Phase I soil samples collected from shoreline areas along the east and west boundaries identified the following dioxin TEQ concentrations:

National Plate Glass (NPG) May 2001 in ppt TEQ	
From the farm field west of NPG	
DX1 west	410
DX2 west	180
From the golf course east of the LA Davidson site	
DX3 east	2,600
DX4 east	2,500

It is probable that similar dioxin TEQ concentrations are present in shoreline soil located between the Phase I sample locations. The soil located along the southern boundary of the former NPG is sparsely vegetated and is susceptible to erosion. It is possible that leachate dioxin concentrations are the result of the suspension of dioxin contaminated soil particles in the water column as the leachate migrates across the shoreline soil.

Riverside Boulevard

Residences along Riverside Boulevard are located along the north shore of the Tittabawassee River near the confluence of the Tittabawassee and Shiawassee Rivers, approximately 22 miles downstream of Midland. Only one residential property was sampled on Riverside Boulevard because of property access issues. Samples collected from this site were labeled R 19. Soil samples were collected from three soil layers (0-3", 3-6", and 12-15") at R 19 1 and R 19 2, three soil layers (0-1", 0-3", and 3-6") at R 19 3, and one surface soil layer (0-1") at R 19 4 and R 19 5.

Photo 13: Riverside Boulevard (R)



All soil samples contained dioxin concentrations that exceeded statewide background concentrations. Nine of the 11 samples contain dioxin concentrations above the Part 201 RDCC. Dioxin concentrations ranged from 45 to 1,400 ppt TEQ with the highest concentration found at R 19 3-6”.

Riverside Boulevard (R 19) Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
R 19 1-3”	770
R 19 1-6”	530
R 19 1-15”	940
R 19 2-3”	240
R 19 2-6”	100
R 19 2-15”	140
R 19 3-1”	450
R 19 3-3”	1,100
R 19 3-6”	1,400
R 19 4-1”	45
R 19 5-1”	81

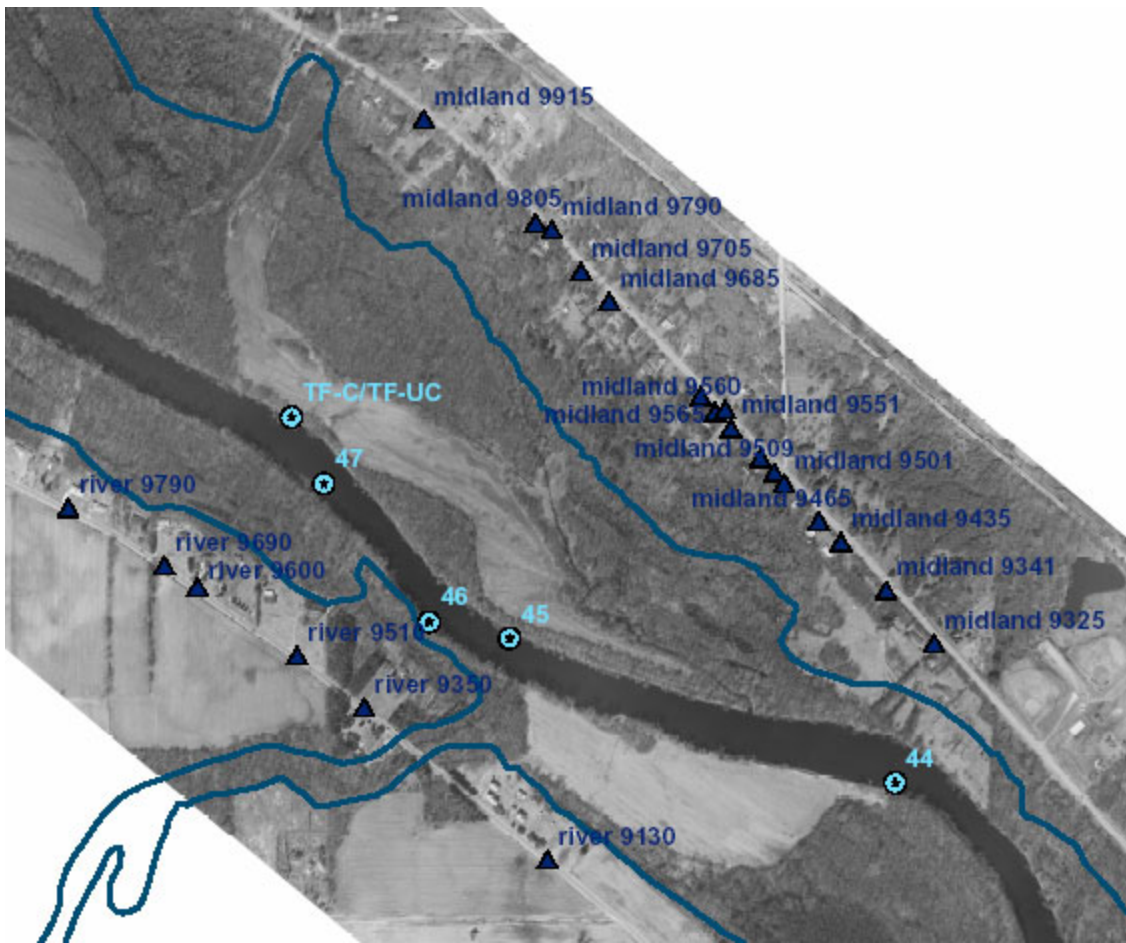
Chickens were being raised at this property for meat and eggs, which were subsequently consumed by the residents. The chickens were fed commercial feed, but they were also allowed to free range over the property. The property owners provided four eggs for dioxin analysis. Dioxin concentrations ranged from 16 to 49 ppt TEQ. Based on these results, the Department of Community Health (DCH) recommended that the property owners cease consumption of any food product from the chickens.

Eggs from Riverside Boulevard (R 19 Egg) Saginaw County	
Sample Identifier	Dioxin, ppt TEQ
R 19 egg 1	49
R 19 egg 2	42
R 19 egg 3	42
R 19 egg 4	16

VIII. Drinking Water Well Dioxin Data

The vast majority of businesses and residences located within and adjacent to the Tittabawassee River flood plain are serviced by municipal drinking water supplies. However, some residences to the south and east of Midland, along the east and west shorelines of the Tittabawassee River, continue to acquire potable water from groundwater. The Phase II included the collection of groundwater samples from selected residential drinking water wells.

Photo 14: Drinking Water Wells (private) with Street Addresses



The initial samples were collected by the Saginaw County Health Department based on a field assessment and recommendations by DEQ staff. Wells located in close proximity to the Tittabawassee River and most susceptible to inundation during flood events were selected for initial sampling. The DEQ collected additional water samples to augment and confirm the initial sample results. Twenty-two residential potable water wells were sampled along the portion of Midland Road between Buck and Sarle Roads and the portion of River Road between Smith's Crossing and Sarle Roads. The sample results did not confirm any dioxin concentration above the current drinking water criteria of 30 ppq of dioxin TEQ, established by the USEPA.

IX. Dioxin Congener Profile Data

As discussed previously in this report, dioxins and furans are a group of 210 chemicals commonly having similar structures and chemical properties. Each dioxin chemical has its own specific chemical structure, referred to as a congener. Dioxins are stable chemicals and can last for many years in the environment. In the environment dioxin is found as a mixture of the various dioxin congeners. Defining the type and amount of dioxin congeners present in an environmental sample can help to determine the source for the dioxin release. A quantitative assessment of the various congeners present in an environmental sample can be used to create a color bar chart commonly referred to as a congener profile chart. Each different color bar on the congener profile chart represents a different dioxin congener. The length of each of the color bar is proportional to the toxicity the congener contributes to the TEQ of the sample.

Dioxin and PCB congener profile charts were created for all Phase II soil and groundwater sample results. In addition, dioxin congener profile charts were created for the Phase I data, Midland Soil Study, and USACE Saginaw River/Saginaw Bay Dredge Sediment samples. These charts are presented in Appendix J. The congener profiles for the DEQ Sediment Study are presented in Appendix H.

Congener Profile Charts – Upstream of Midland

Congener profile charts illustrate the similarity of the type and relative abundance of dioxin congeners found at sample locations upstream of Midland. Upstream sample locations were located within the flood plains for the Tittabawassee, Chippewa, and Pine Rivers. Upstream sample locations include the following:

- Tittabawassee River – Sanford
- Chippewa River – Chippewa Nature Center
- Pine River – Chippewa Nature Center

Congener profile charts for upstream sample locations identify a mixture of dioxin congeners that is consistently different from the mixture of dioxin congeners present at all sample locations within the Tittabawassee River flood plain downstream of Midland. Downstream of Midland, within the flood plain, the mixture is dominated by certain furan congeners, whereas upstream the mixture is dominated by dioxin congeners.

Congener Profile Charts – Downstream of Midland Outside of the 100-Year Flood Plain

Congener profile charts illustrate the similarity of the type and relative abundance of dioxin congeners at sample locations downstream of Midland but outside of the estimated 100-year flood plain contour. Locations outside of the 100-year flood plain are not exposed to regular flooding by the Tittabawassee River. Downstream sample locations, outside of the 100-year flood plain, include the following:

- Livestock Farm (sample locations LIVE 1 through LIVE 4)
- Imerman Park (sample location IMP 14)
- Shields Elementary School
- Crop Farm (sample locations CROP 4 and CROP 5)
- National Plate Glass

Congener profile charts for these sample locations are similar to charts for upstream sample locations. Congener profile charts for these sample locations identify a mixture of dioxin congeners that is consistently different from the mixture of dioxin congeners present at all sample locations within the Tittabawassee River flood plain downstream of Midland, indicating a different source of dioxin contamination.

Congener Profile Charts – Downstream of Midland Within the Estimated Flood Plain

Congener profile charts illustrate the similarity of the type and relative abundance of dioxin congeners at sample locations downstream of Midland within the estimated 100-year flood plain contour. Soil dioxin contamination at these locations consists of a mixture of dioxin congeners that are dominated by furans. At locations upstream of Midland, and at downstream locations outside of the flood plain, the mixture is dominated by dioxin congeners. This is illustrated by the congener profile charts for the following Phase II sample locations:

- Caldwell Boat Launch
- Freeland Festival Park
- Livestock Farm (sample locations LIVE 5 and LIVE 6)
- Imerman Park (sample locations IMP 1 through IMP 13)
- West Michigan Park
- Crop Farm (sample locations CROP 1 through CROP 3)
- Riverside Boulevard

These locations are exposed to regular flooding by the Tittabawassee River. River flooding and sediment deposition appear to be the most probable mechanisms for distributing dioxin at these sample locations. The congener profile charts for these locations are similar amongst themselves and very different from sample locations located upstream of Midland, as well as sample locations downstream of Midland but outside of the flood plain. This similarity exists regardless of the quantity of dioxin found at the sample location. As an example, Crop Farm sample location CROP 2-15" has only 7.0 ppt TEQ dioxin, but the congener profile chart is similar to Freeland Festival Park sample location FFP 1-15" which had the highest Phase II dioxin concentration of 3,400 ppt TEQ.

Congener Profile Charts – Egg Samples

Chickens were being raised at the Riverside Boulevard sample location at the time of sample collection. The chickens were provided with commercial feed but were also allowed to free range over the property. Four eggs were collected and subsequent analysis identified dioxin concentrations ranging from 16 to 48 ppt TEQ. The congener profiles from the eggs are similar to the congener profiles that are present in flood plain soil downstream of Midland. Congener profile charts illustrate the similarity of the type and relative abundance of dioxin congeners in the egg samples with flood plain soil samples collected from flood plain soil at the Riverside Boulevard residence. This suggests that the source of the dioxin identified in the egg samples is the soil that the chickens are in contact with and ingesting as part of free range feeding practices.

Congener Profile Charts – Transitional Areas

Certain Phase II sample locations represent transition areas between locations upstream and downstream of Midland, and downstream locations within and outside of the estimated 100-year flood plain contour. These locations include:

- Emerson Park
- Livestock Farm (sample locations LIVE 4 through LIVE 6)
- Imerman Park (sample locations IMP 11 through IMP 14)
- Crop Farm (sample locations CROP 3 through CROP 5)

Emerson Park - Emerson Park is located in Midland along the Tittabawassee River just upstream of the confluence of the Chippewa and Tittabawassee Rivers. As discussed previously, concentrations of dioxin in Emerson Park soil are elevated above state-wide background concentrations, except for sample location EMP 2-15", below the Part 201 RDCC. Although concentrations at Emerson Park are elevated above concentrations observed at sample locations further upstream, the chart illustrates that the type and relative abundance of dioxin congeners is similar to upstream locations and Midland soil locations. It is possible that the increased concentrations observed at Emerson Park are related to the proximity of the park to the source of the dioxin release.

Livestock Farm (LIVE 4 – 6) - Soil samples were collected at the Livestock Farm from locations both outside and within the estimated 100-year flood plain. Sample location LIVE 6 is located within the flood plain, sample location LIVE 5 is located near but just outside of the estimated 100-year flood plain contour, and sample location LIVE 4 is located outside of the flood plain. The congener profile chart for the Livestock Farm reflects this, visually illustrating the transition from statewide background/upstream dioxin concentrations to the furan dominant congener distribution shared by all soil sample locations downstream of Midland within the Tittabawassee River flood plain.

Imerman Park (IMP 11 – 14) - The majority of Imerman Park is located within the estimated 100-year flood plain. Soil sample locations IMP 11 through IMP 14 were collected from that portion of the park located between the upper parking lot and Midland Road (M-47). Location IMP 14 was located between the tennis courts and M-47, just outside of the estimated 100-year flood plain. The congener profile chart visually illustrates the transition from statewide background/upstream dioxin concentrations to the furan dominant congener distribution shared by all soil sample locations downstream

of Midland within the Tittabawassee River flood plain, with the sole exception being IMP 14-15". However, debris indicative of fill material was encountered at this location which may be responsible for this result.

Crop Farm (CROP 3 – 5) - The majority of Crop Farm property is located within the estimated 100-year flood plain. Soil sample locations CROP 1 through CROP 4 are located within the flood plain with sample location CROP 5 located outside of the estimated flood plain. Congener profile charts for sample locations CROP 1 through CROP 3 are similar to the furan dominant congener distribution shared by all soil sample locations downstream of Midland within the Tittabawassee River flood plain. CROP 4, near the upper portion of the estimated 100-year flood plain, shows decreasing relative abundance of furan congeners, and at CROP 5 the congener profile chart identifies that the dioxin distribution outside of the flood plain is similar to upstream dioxin concentrations and congener distributions.

X. Grain Size Analysis

Grain size analysis of the soil samples was conducted for all samples collected during the Phase II study. Previous studies have shown that dioxin tends to preferentially adsorb to the surface of fine-grained colloidal soil particles. Establishing a correlation between the grain size distribution and dioxin contamination level in flood plain soils could provide a useful, relatively inexpensive tool to use in assessing the potential that any given property contains dioxin at sufficient concentrations to be of concern to human health and the environment. Qualitative evaluation of the relationship between grain size and dioxin concentration suggests that the higher levels of dioxin contamination are not necessarily associated with the finer grained soils. Further work is necessary to evaluate the relationship between grain size and dioxin concentration.

XI. Total Organic Carbon

All soil samples collected during the Phase II study underwent analysis to determine the total organic carbon content. Organic carbon is carbon-based material contained in soil that originated from biological processes. Total organic carbon analysis was conducted to determine if there exists a correlation between the amount of organic carbon present in a soil sample and the amount of dioxin contamination present in the sample.

Research has demonstrated that dioxin has a tendency to adsorb to the surface of fine-grain colloidal soil particles. Many of these colloidal particles found in soil originated as a result of biological processes. Establishing a correlation between the amount of total organic carbon present in a soil sample and the amount of dioxin present in the sample could provide a useful relatively inexpensive tool to use in assessing the potential that any given property contains dioxin at sufficient concentrations to be of concern to human health and the environment. Qualitative evaluation of the relationship between total organic carbon and dioxin concentration suggests that the higher levels of dioxin contamination are not necessarily associated with the presence of total organic carbon. Additional work is necessary to evaluate the correlation between total organic carbon and dioxin levels in flood plain soils.

XII. Other Data

U.S. Army Corps of Engineers (USACE) – Saginaw River/Bay Sediment Data

During February 2002 the RRD received a copy of excerpted data from a USACE funded assessment of dioxin concentrations in sediments that had come to be located in the commercial shipping channel located in the Saginaw River and Saginaw Bay (USACE Sediment Assessment). It is the understanding of the RRD that the USACE Sediment Assessment was conducted by the USACE as part of its ongoing efforts to dredge and properly dispose of dredged sediments as part of its shipping channel maintenance efforts. During 1998 and 1999, sediment samples were collected and analyzed from the Saginaw River and Saginaw Bay throughout the length of the shipping channel from the Sixth Street turning basin, located on the north side of the City of Saginaw, out to shipping channel locations in Saginaw Bay. The information provided to the RRD is summarized below.

U.S. Army Corps of Engineers Sediment Assessment Saginaw River and Saginaw Bay	
Sample Identifier	Dioxin, ppt TEQ
SR9901	84
SR9902	44
SR9903	330
SR9904	41
SR9905	340
SR9906	74
SR9907	11
SR9908	26
SR9909	93
SR9910	100
SR9911	550
SR9912	170
SR9913	3.0
SR9914	7.9
SR9915	3.1
SR9916	31
SR9917	210
SR9918	110
SR9919	130
SR9920	110
SR9921	140
SR9922	9.6
SR9923	110
SR9924	250
SR9925	130
SR9926	150
SB9901	190
SB9902	190
SB9903	130
SB9904	110
SB9905	180
SB9906	56
SB9907	29
SB9908	49
SB9909	42

Samples collected from Saginaw River sediments are labeled SR and samples collected from Saginaw Bay sediments are labeled SB. It is the understanding of the RRD that the samples were collected from commercial shipping channel sediments and as such may not reflect dioxin TEQ concentrations in areas of the Saginaw River and Saginaw Bay that are not subject to repeated dredging activity. Detailed sample results are presented in Appendix I.

The USACE Sediment Assessment data indicates that the dioxin contamination observed in the Saginaw River and Saginaw Bay is similar to the furan dominated mixture of dioxin congeners that has been identified in Tittabawassee River sediments and flood plain samples collected downstream of Midland. The congener profile charts illustrate correlation (Appendix J). The data suggests that dioxin contaminated sediment from the Tittabawassee River has migrated into the Saginaw River and out into the inner portions of the Saginaw Bay.

The USACE Sediment Assessment sampling locations are from the commercial shipping channel which is continuously dredged as part of USACE shipping channel maintenance efforts. It is likely that accumulated dioxin contamination is periodically removed from the shipping channel as it is dredged. It is possible that the level of dioxin contamination is different in those areas of the Saginaw River and Saginaw Bay that are not subject to maintenance dredging activity. The continuing presence of dioxin contamination in shipping channel sediments, given historical and ongoing maintenance dredging activities, indicates that dioxin contaminated sediments are continuing to migrate from the Tittabawassee River into the Saginaw River and Bay.

December 2002 DEQ Saginaw River and Bay Shoreline Dioxin Data

During December 2002, DEQ staff collected a limited number of soil samples from three shoreline areas along the Saginaw River and Saginaw Bay. Soil samples were collected from three locations within the shoreline areas of the Crow Island State Wildlife Refuge, one shoreline location at the Department of Natural Resources boat launch facility located near the mouth of the Saginaw River, and one shoreline location near the southern boundary of the Bay City State Recreation Area. The sample results are presented in ppt TEQ and are comparable to the results obtained by the USACE Sediment Assessment.

December 2002 DEQ Saginaw River/Bay Soil Samples	
Sample Identifier	Dioxin, ppt TEQ
CROW ISL 1 0-3"	5.4
CROW ISL 1 3-6"	12
CROW ISL 1 12-15"	0.85
CROW ISL 2 0-3"	130
CROW ISL 2 3-6"	37
CROW ISL 2 12-15"	190
CROW ISL 3 0-3"	140
CROW ISL 3 3-6"	0.94
DNR 1 0-2"	8.0
STATE PK 1 0-2"	220

Saginaw River, Saginaw Bay, and PCB

Industrial activities along the Saginaw River have released PCBs into the Saginaw River and Saginaw Bay ecosystems. The majority of these industrial facilities are currently engaged in site investigation and remediation activities in accordance with state and federal environmental laws. Significant remedial efforts have been completed that have contained or removed PCB contaminated soil from shoreline areas and removed PCB contaminated sediments from the Saginaw River. Even with these ongoing PCB remediation efforts, any future investigation into dioxin contamination of the Saginaw River sediments and flood plain, and Saginaw Bay sediments and shoreline, areas should also include an evaluation of any PCB contribution to dioxin-like toxicity. However, PCB data generated from the December 2002 soil samples are comparable to the Phase II PCB data and suggest that PCB represents a minor contribution to dioxin TEQ in the Saginaw River and Saginaw Bay shoreline soil.

XIII. Conclusions

Most of the soil samples that were collected from within the estimated 100-year flood plain downstream of Midland are contaminated with dioxin above the Part 201 RDCC. The highest Phase II dioxin concentration, 3,400 ppt TEQ, was encountered at Freeland Festival Park, seven miles downstream of Midland. A dioxin concentration of 1,400 ppt TEQ was identified approximately 22 miles downstream of Midland at a Riverside Boulevard property. The DEQ believes that the following conclusions can be drawn from the Phase I, Phase II, and DEQ Sediment Study and USACE Sediment Assessment data sets:

- Dioxin contamination within the estimated 100-year flood plain downstream of Midland is extensive. The Phase II study results suggest that much of the property located within the estimated 100-year flood plain downstream of Midland contains soil dioxin concentrations above the Part 201 RDCC.
- Soil samples collected upstream of Midland did not contain elevated levels of dioxins. Dioxin concentrations from these sample locations were consistent with statewide background concentrations.
- Samples collected downstream of Midland, but outside of the estimated 100-year flood plain, did not contain elevated dioxin concentrations. Dioxin concentrations in soils collected from these locations were consistent with statewide background concentrations. Existing information suggests that property located outside the estimated 100-year flood plain downstream of Midland may not be contaminated above state-wide background concentrations. However, property located outside the estimated 100-year flood plain that received soil or fill material from property located within the estimated 100-year flood plain has the potential to be contaminated with dioxin above statewide background concentrations. In addition, other pathways such as blowing dust have the potential to transport dioxins out of the flood plain at levels of concern.
- Properties located within the general boundaries of the estimated flood plain, but elevated above the flood plain due to the presence of local natural features or the introduction of clean fill material, may not contain elevated dioxin concentrations.

As an example, dioxin concentrations in the Shields Elementary School samples ranged between 0.28 and 5.5 ppt TEQ.

- Surface soil dioxin contamination within the 100-year flood plain is a significant concern. Surface soil dioxin concentrations significantly exceed the Part 201 RDCC at Imerman Park, Riverside Boulevard, Caldwell Boat Launch, West Michigan Park, and Freeland Festival Park.
- The Phase II study did not define the vertical extent of the dioxin contamination. At some sample sites the greatest dioxin contamination was identified at the deepest Phase II sample depth (12-15"). The highest concentration identified during the Phase II study, 3,400 ppt TEQ, was found at Freeland Festival Park, FFP 1-15. This indicated that dioxin contamination can extend beyond the lowest Phase II sample depth. In response to this observation, three deep soil borings were collected from Freeland Festival Park during December 2002. These deep soil samples indicate that concentrations of dioxin above The Part 201 RDCC could be encountered to depths of three to four feet below ground level (bgl).
- Dioxin contamination was encountered to depths of three to four feet bgl. The depth of contamination encountered during this investigation indicates that dioxin has been accumulating in the Tittabawassee River flood plain over an extended period of time.
- The presence of significant dioxin contamination in the floodplain is thought to be the result of the continuing redistribution of contaminated sediment throughout the flood plain during flood events.
- The type and relative distribution of dioxin congeners (i.e., congener profile) of impacted soil downstream of Midland are similar. A quantitative analysis of congener distributions should be pursued.
- Analysis of some samples included dioxin-like PCBs. The contribution of PCBs to the total dioxin TEQ for these samples was trivial relative to the contribution provided by dioxin and furan congeners. The dioxin TEQ values presented in this report do not incorporate PCB TEQ contributions, which are very small in comparison to the total dioxin TEQ.
- Dioxin concentrations were elevated in eggs that were sampled from chickens that free ranged on flood plain soil. It is possible that food products from other animals raised on the flood plain may also be affected. This has resulted in an advisory by the Departments of Community Health and Agriculture against consumption of any animal food product that has been raised on property located within the boundaries of the estimated 100-year flood plain. It is also possible that wildlife populations that reside within the flood plain may be similarly affected.
- Dioxin concentrations in flood plain soil do not appear to be related to total organic carbon or grain size soil characteristics. The Phase II data suggest that the amount of dioxin present in flood plain soil is related to the depositional

characteristics of a given property. Additional work is necessary to determine how total organic carbon and grain size correlate with the level of dioxin contamination in flood plain soils.

- Phase II drinking water well confirmation sample results were below applicable regulatory criteria.

The Phase II study identified that elevated dioxin concentrations were pervasive in Tittabawassee River 100-year flood plain soil downstream of Midland. The geographic distribution of the contamination, the similarity of the congener profiles, and the presence of dioxin contamination at depth in flood plain soils indicate that The Dow Chemical Company manufacturing facility (Dow) in Midland is the principal source of dioxin contamination in the Tittabawassee River sediments and the Tittabawassee River flood plain soils.

XIV. Recommendations

Investigation Activities

Over the past two years, samples were collected at a total of 17 sample sites along three rivers from an area extending eight miles upstream of Midland to approximately twenty-two miles downstream of Midland at the confluence of the Tittabawassee and Saginaw Rivers. The information generated from these investigation activities has provided a general understanding of the concentration and distribution of dioxin within flood plain soil and river sediments. Additional information is needed to better understand dioxin distribution within certain areas of the Tittabawassee River flood plain, establish the vertical extent of the dioxin contamination, and identify the downstream extent of the contamination. These investigation activities should be coordinated with off-site corrective action required by the Dow Part 111 hazardous waste and corrective action operating license. Recommended investigation activities include the following:

- Identify all residential properties within the 100-year flood plain that are at high risk to have significant dioxin soil contamination. Properties identified to be at high risk should undergo soil sampling and analysis to adequately assess dioxin contamination. Decisions on further interim response action would be made based on these results.
- Additional investigation is needed in Saginaw River sediments and the Saginaw River flood plain. The highest flood plain dioxin concentration, 7,300 ppt TEQ, was identified at the confluence of the Saginaw and Tittabawassee Rivers. The USACE data collected during 1999, show that sediments from the Saginaw River shipping channel contained elevated concentrations of dioxin. These data indicate that dioxin contamination extends to the inner portions of Saginaw Bay. There is no hydraulic barrier to prevent the continued migration of dioxin from the Tittabawassee River into the Saginaw River and Saginaw Bay. Therefore, it is reasonable to conclude dioxin contamination has migrated and is continuing to migrate from the Tittabawassee River into the Saginaw River. Additional investigation should be conducted to evaluate Saginaw River sediments located outside of the shipping channel, flood plain areas, and shoreline areas within inner portions of the Saginaw Bay.

- An ecological risk assessment should be conducted to determine the impact of dioxin contamination on resident aquatic and wildlife populations. Evaluating the ecological impact of dioxin contamination in the Tittabawassee and Saginaw Rivers is especially important given the presence of two wildlife refuges in the lower Tittabawassee and upper Saginaw River areas, and other wildlife areas located nearby along the Chippewa and Bad Rivers, and the shoreline of Saginaw Bay.
- Human consumption of game (e.g., deer and turkey) residing on the 100-year flood plain should be evaluated to determine if there is a human health concern.
- Sampling and analysis of residential water supply wells should be conducted immediately after a major flooding event, or when well casings have been flooded.
- Further identification and assessment of the exposure pathways and health risks to flood plain residents is necessary. This evaluation should be conducted by the DEQ in coordination with the DCH and the ATSDR and should include the consideration of indoor and outdoor exposure pathways.
- The Michigan Department of Agriculture investigations are necessary to quantify the impact of dioxin soil contamination on agricultural products grown and raised within the flood plain.
- An assessment of the pathways and risks associated with wind-borne transport of dioxin contaminated soil particles is necessary.
- Evaluation of the vertical distribution of dioxin contamination in flood plain soils at additional locations within the flood plain downstream of Midland is necessary.
- Additional investigation is needed at the Dow manufacturing complex in Midland to ensure that all potential pathways for dioxin release to the Tittabawassee River have been identified and eliminated.

Interim Response Activities

The Phase II study has confirmed that residential and public use properties located within the estimated 100-year flood plain downstream of Midland, and sampled as part of the study, contain significant concentrations of dioxin that exceed the Part 201 RDCC. The highest concentration identified at a public park area was over 40 times the Part 201 RDCC. The highest concentration identified at a residential property was nearly 20 times the RDCC. The pervasiveness of dioxin contamination found at locations sampled within the flood plain suggests that similar contamination conditions exist at other properties located within the flood plain. Interim response activities need to be implemented that immediately address the health risk presented by soil dioxin contamination on residential and public use of flood plain property. Recommended interim response activities include the following:

- Action should be initiated to eliminate unacceptable dioxin exposure to Riverside Boulevard residents and any other similarly contaminated residential properties that are located in frequently flooded areas within the 100-year flood plain downstream of Midland.
- Unacceptable exposures to dioxin contaminated soils in public areas (e.g., parks and boat launches) should be eliminated.
- Efforts should be initiated to reduce or eliminate activities occurring within contaminated portions of the flood plain that result in the movement and/or redistribution of contaminated soil in a manner that results in the exacerbation of existing contamination. Activities that result in increased human exposure to dioxin contamination or contamination of previously uncontaminated property need to be controlled.
- Remedial activities (e.g., sediment trap or other sediment collection and removal technologies) should be evaluated and tested to determine the effectiveness for use as an interim response or a final remedy.

Public Information

- Public information meetings should be regularly scheduled with affected residents and local government officials to ensure adequate discussion of information and to provide adequate access to Department staff.
- The DEQ should continue developing and distributing information bulletins to provide wider distribution of information and progress updates.

XV. For More Information

Information Contacts	Information Repositories
<p>Environmental sampling/analysis: Department of Environmental Quality (DEQ) Sue Kaelber-Matlock, Project Manager Saginaw-Bay District Office 503 N. Euclid Ave., Suite 9, Bay City, MI 989-686-8025/ext. 8303 matlocks@michigan.gov</p>	<p>Grace A. Dow Memorial Library 1710 W. St. Andrews Midland, Michigan 989-837-3457</p>
<p>ATSDR and public health: Department of Community Health (DCH) Dr. Linda Dykema, Toxicologist Environmental & Occupational Epidemiology 3423 N. Martin Luther King Jr Blvd, Lansing, MI 517-335-8566; DykemaL@michigan.gov</p>	<p>Zaue Memorial Library 3100 N. Center Saginaw, Michigan 989-799-2771</p>
<p>Residential/commercial agriculture/ gardening: Department of Agriculture (MDA) Brian Hughes, Toxicologist 525 W. Allegan, Lansing MI 517-337-5067; HughesB9@michigan.gov</p>	<p>DEQ Saginaw Bay District Office. 503 N. Euclid Avenue, Suite 9 Bay City, MI 48706-2965 989-686-8025</p>

XVI. Appendices

- Appendix A** - Phase II Soil and Egg Dioxin Results
- Appendix B** - Phase II Soil and Egg PCB Results
- Appendix C** - Dioxin Results from Surface Water at National Plate Glass
- Appendix D** - Residential Water Well Dioxin Results
- Appendix E** - Saginaw River and Bay Shoreline Soil Dioxin Results
- Appendix F** - Saginaw River and Bay Shoreline Soil PCB Results
- Appendix G** - Phase I Soil Dioxin Results
- Appendix H** - Selected DEQ Tittabawassee River Sediment Study Results and Maps (*also known as: Baseline Chemical Characterizations of Saginaw Bay Watershed Sediments*)
- Appendix I** - U.S. Army Corps of Engineer Dioxin Results of the Sediments in the Saginaw River and Saginaw Bay Shipping Channel (1998/1999)
- Appendix J** - Dioxin Congener Profile Charts

To view copies of the complete report (including appendices), please refer to the listing of Information Repository locations provided in Section XV of this Report, or go to the DEQ Home Page: www.michigan.gov/deg and select Land, then Dioxin Information (under Quick Links), then Tittabawassee River Flood Plain Contamination.

Appendix A

Phase II Soil and Egg Dioxin Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports. The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-3

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.1
12378-PeCDD	1					J	1.3
123478-HxCDD	0.1					J	0.85
123678-HxCDD	0.1					J	1.6
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						12.6
12346789-OCDD	0.0001						75.5
2378TCDF	0.1					ND	0.5
12378-PeCDF	0.05					J	1
23478-PeCDF	0.5					J	0.79
123478-HxCDF	0.1					J,B	1.2
123678-HxCDF	0.1					J	0.85
234678-HxCDF	0.1					J	0.87
123789-HxCDF	0.1					J	1.6
1234678-HpCDF	0.01					J	4.3
1234789-HpCDF	0.01					J	1.1
12346789-OCDF	0.0001					J	7.2
Total TEQ:		Non-Detects = Detection Limit	4.0	% Finer than #200 Sieve		29.7	
		Non-Detects = 1/2 d.l.	4.0	% Total Organic Carbon		2	
		Non-Detects = zero	4.0	% Solids		78	

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-6

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.2
12378-PeCDD	1					J	1
123478-HxCDD	0.1					J	0.7
123678-HxCDD	0.1					J	1.7
123789-HxCDD	0.1					J	1.7
1234678-HpCDD	0.01						14.4
12346789-OCDD	0.0001						95.3
2378TCDF	0.1					ND	0.7
12378-PeCDF	0.05					J	0.44
23478-PeCDF	0.5					ND	0.6
123478-HxCDF	0.1					J	1.1
123678-HxCDF	0.1					J	0.57
234678-HxCDF	0.1					J	0.81
123789-HxCDF	0.1					J	0.38
1234678-HpCDF	0.01						5.7
1234789-HpCDF	0.01					J	0.45
12346789-OCDF	0.0001					J	6.7
Total TEQ:		Non-Detects = Detection Limit	3.5	% Finer than #200 Sieve		29.9	
		Non-Detects = 1/2 d.l.	3.3	% Total Organic Carbon		1.7	
		Non-Detects = zero	3.1	% Solids		81	

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-15

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	0.52
123789-HxCDD	0.1					J	0.62
1234678-HpCDD	0.01					J	3.9
12346789-OCDD	0.0001						26.9
2378TCDF	0.1					ND	0.4
12378-PeCDF	0.05					ND	0.2
23478-PeCDF	0.5					J	0.15
123478-HxCDF	0.1					J,B	0.4
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					J	0.21
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	1.8
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					J	1.8

Total TEQ:	Non-Detects = Detection Limit	1.0	% Finer than #200 Sieve	25.9
	Non-Detects = 1/2 d.l.	0.67	% Total Organic Carbon	0.87
	Non-Detects = zero	0.31	% Solids	88

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-3

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.2
12378-PeCDD	1					J	1
123478-HxCDD	0.1					J	0.61
123678-HxCDD	0.1					J	1.7
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						13.4
12346789-OCDD	0.0001						89.2
2378TCDF	0.1					ND	0.5
12378-PeCDF	0.05					J	0.4
23478-PeCDF	0.5					J	0.43
123478-HxCDF	0.1					J	0.98
123678-HxCDF	0.1					J	0.53
234678-HxCDF	0.1					J	0.72
123789-HxCDF	0.1					J	0.12
1234678-HpCDF	0.01					J	4.7
1234789-HpCDF	0.01					J	0.31
12346789-OCDF	0.0001					J	6.3

Total TEQ:	Non-Detects = Detection Limit	3.3	% Finer than #200 Sieve	25.9
	Non-Detects = 1/2 d.l.	3.3	% Total Organic Carbon	4.7
	Non-Detects = zero	3.2	% Solids	73

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-6

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						2.1
12378-PeCDD	1					ND,J	1.7
123478-HxCDD	0.1					J	1.1
123678-HxCDD	0.1					J	2.4
123789-HxCDD	0.1					J	2.5
1234678-HpCDD	0.01						21
12346789-OCDD	0.0001						156
2378TCDF	0.1					ND	0.6
12378-PeCDF	0.05					ND,J	0.6
23478-PeCDF	0.5					J	0.66
123478-HxCDF	0.1					J,B	1.7
123678-HxCDF	0.1					J	0.81
234678-HxCDF	0.1					J	1
123789-HxCDF	0.1					J	0.15
1234678-HpCDF	0.01						8.8
1234789-HpCDF	0.01					J	0.72
12346789-OCDF	0.0001						14.8
Total TEQ:		Non-Detects = Detection Limit	5.5	% Finer than #200 Sieve		17.6	
		Non-Detects = 1/2 d.l.	4.6	% Total Organic Carbon		2.8	
		Non-Detects = zero	3.7	% Solids		72	

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-15

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.9
12378-PeCDD	1					ND	0.7
123478-HxCDD	0.1					ND	0.7
123678-HxCDD	0.1					ND	0.6
123789-HxCDD	0.1					ND	0.6
1234678-HpCDD	0.01						5.5
12346789-OCDD	0.0001						36.8
2378TCDF	0.1					ND	0.7
12378-PeCDF	0.05					ND	0.6
23478-PeCDF	0.5					ND	0.4
123478-HxCDF	0.1					ND	0.5
123678-HxCDF	0.1					ND	0.5
234678-HxCDF	0.1					ND	0.4
123789-HxCDF	0.1					ND	0.6
1234678-HpCDF	0.01					ND	2
1234789-HpCDF	0.01					ND	0.7
12346789-OCDF	0.0001					ND	3.8
Total TEQ:		Non-Detects = Detection Limit	2.4	% Finer than #200 Sieve		26.7	
		Non-Detects = 1/2 d.l.	1.2	% Total Organic Carbon		1.1	
		Non-Detects = zero	0.059	% Solids		89	

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-3

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.93
12378-PeCDD	1					J	0.79
123478-HxCDD	0.1					J	0.51
123678-HxCDD	0.1					J	1.4
123789-HxCDD	0.1					J	1.3
1234678-HpCDD	0.01						17.9
12346789-OCDD	0.0001						148
2378TCDF	0.1					ND	0.5
12378-PeCDF	0.05					J	0.82
23478-PeCDF	0.5					ND	0.7
123478-HxCDF	0.1					J	2.3
123678-HxCDF	0.1					J	1.1
234678-HxCDF	0.1					ND	0.9
123789-HxCDF	0.1					J	0.32
1234678-HpCDF	0.01						11.1
1234789-HpCDF	0.01					J	0.82
12346789-OCDF	0.0001						13.5
Total TEQ:		Non-Detects = Detection Limit	3.3	% Finer than #200 Sieve		67.3	
		Non-Detects = 1/2 d.l.	3.0	% Total Organic Carbon		3.6	
		Non-Detects = zero	2.8	% Solids		70	

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-6

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.89
12378-PeCDD	1					ND,J	0.7
123478-HxCDD	0.1					J	0.45
123678-HxCDD	0.1					J	1.4
123789-HxCDD	0.1					J	1.2
1234678-HpCDD	0.01						19
12346789-OCDD	0.0001						155
2378TCDF	0.1						1.3
12378-PeCDF	0.05					J	0.81
23478-PeCDF	0.5					J	0.58
123478-HxCDF	0.1					J	2.4
123678-HxCDF	0.1					J	0.98
234678-HxCDF	0.1					J	0.85
123789-HxCDF	0.1					J	0.43
1234678-HpCDF	0.01						11.6
1234789-HpCDF	0.01					ND,J	0.6
12346789-OCDF	0.0001						14.9
Total TEQ:		Non-Detects = Detection Limit	3.2	% Finer than #200 Sieve		61.3	
		Non-Detects = 1/2 d.l.	2.8	% Total Organic Carbon		2.5	
		Non-Detects = zero	2.4	% Solids		74	

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-15

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						3.3
12378-PeCDD	1					J	1.8
123478-HxCDD	0.1					J	1.1
123678-HxCDD	0.1					J	3.8
123789-HxCDD	0.1					ND	3.5
1234678-HpCDD	0.01						52.2
12346789-OCDD	0.0001						430
2378TCDF	0.1					ND	3.3
12378-PeCDF	0.05					J	1.7
23478-PeCDF	0.5					J	1.7
123478-HxCDF	0.1						6.5
123678-HxCDF	0.1					J	2.6
234678-HxCDF	0.1					J	2.3
123789-HxCDF	0.1					J	0.53
1234678-HpCDF	0.01						31.2
1234789-HpCDF	0.01					J	1.8
12346789-OCDF	0.0001						39.8
Total TEQ:		Non-Detects = Detection Limit	9.3	% Finer than #200 Sieve		64.9	
		Non-Detects = 1/2 d.l.	9.0	% Total Organic Carbon		2.2	
		Non-Detects = zero	8.6	% Solids		74	

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-3

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						3.4
12378-PeCDD	1					J	2.5
123478-HxCDD	0.1					ND	1.5
123678-HxCDD	0.1					J	3.9
123789-HxCDD	0.1					J	4
1234678-HpCDD	0.01						39.5
12346789-OCDD	0.0001						317
2378TCDF	0.1						1.5
12378-PeCDF	0.05					J	2.2
23478-PeCDF	0.5					ND	0.07
123478-HxCDF	0.1					J	4.9
123678-HxCDF	0.1					J	2.5
234678-HxCDF	0.1					J	2.6
123789-HxCDF	0.1					J	2
1234678-HpCDF	0.01						25.1
1234789-HpCDF	0.01					J	2.5
12346789-OCDF	0.0001						30.2
Total TEQ:		Non-Detects = Detection Limit	9.0	% Finer than #200 Sieve		68.1	
		Non-Detects = 1/2 d.l.	8.9	% Total Organic Carbon		3.3	
		Non-Detects = zero	8.9	% Solids		73	

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-6

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						5
12378-PeCDD	1					J	2.5
123478-HxCDD	0.1					J	1.3
123678-HxCDD	0.1					J	4.7
123789-HxCDD	0.1					J	3.4
1234678-HpCDD	0.01						54.7
12346789-OCDD	0.0001						452
2378TCDF	0.1						4.1
12378-PeCDF	0.05					J	1.6
23478-PeCDF	0.5					J	1.6
123478-HxCDF	0.1						6.2
123678-HxCDF	0.1					J	2.5
234678-HxCDF	0.1					J	2.7
123789-HxCDF	0.1					J	0.42
1234678-HpCDF	0.01						34.5
1234789-HpCDF	0.01					J	1.8
12346789-OCDF	0.0001						42.4
Total TEQ:		Non-Detects = Detection Limit	12	% Finer than #200 Sieve	66.1		
		Non-Detects = 1/2 d.l.	12	% Total Organic Carbon	2.7		
		Non-Detects = zero	12	% Solids	75		

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-15

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						5
12378-PeCDD	1					J	2.9
123478-HxCDD	0.1					J	1.8
123678-HxCDD	0.1						6.7
123789-HxCDD	0.1					J	4.8
1234678-HpCDD	0.01						69.3
12346789-OCDD	0.0001						555
2378TCDF	0.1						4.4
12378-PeCDF	0.05					J	1.3
23478-PeCDF	0.5					J	2
123478-HxCDF	0.1						6.1
123678-HxCDF	0.1					J	2.6
234678-HxCDF	0.1					J	3.6
123789-HxCDF	0.1					X,J	0.96
1234678-HpCDF	0.01						40.9
1234789-HpCDF	0.01					J	2.5
12346789-OCDF	0.0001						45.5
Total TEQ:		Non-Detects = Detection Limit	13	% Finer than #200 Sieve	63.9		
		Non-Detects = 1/2 d.l.	13	% Total Organic Carbon	1.8		
		Non-Detects = zero	13	% Solids	77		

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-3

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	1.5
12378-PeCDD	1					J	1.1
123478-HxCDD	0.1					ND	0.7
123678-HxCDD	0.1					ND	1.3
123789-HxCDD	0.1					ND	1.3
1234678-HpCDD	0.01						15.6
12346789-OCDD	0.0001						105
2378TCDF	0.1						5.2
12378-PeCDF	0.05					ND	3.2
23478-PeCDF	0.5					J	2.2
123478-HxCDF	0.1					J	3.3
123678-HxCDF	0.1					J	1.6
234678-HxCDF	0.1					J	1.5
123789-HxCDF	0.1					J	0.68
1234678-HpCDF	0.01						6.3
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001						18.2
Total TEQ:		Non-Detects = Detection Limit	5.7	% Finer than #200 Sieve		35.4	
		Non-Detects = 1/2 d.l.	4.7	% Total Organic Carbon		1.5	
		Non-Detects = zero	3.7	% Solids		81	

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-6

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						2.4
12378-PeCDD	1					J	1.4
123478-HxCDD	0.1					J	0.94
123678-HxCDD	0.1					J	2.2
123789-HxCDD	0.1					J	1.8
1234678-HpCDD	0.01						23.4
12346789-OCDD	0.0001						187
2378TCDF	0.1						8.2
12378-PeCDF	0.05					J	4.5
23478-PeCDF	0.5					J	3.2
123478-HxCDF	0.1					J	3.9
123678-HxCDF	0.1					ND	1.6
234678-HxCDF	0.1					J	1.6
123789-HxCDF	0.1					ND	0.6
1234678-HpCDF	0.01						9.3
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001						11.7
Total TEQ:		Non-Detects = Detection Limit	8.1	% Finer than #200 Sieve		39.4	
		Non-Detects = 1/2 d.l.	7.9	% Total Organic Carbon		1.5	
		Non-Detects = zero	7.8	% Solids		81	

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-15

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						3.5
12378-PeCDD	1					J	2.1
123478-HxCDD	0.1					J	1.3
123678-HxCDD	0.1					J	3.5
123789-HxCDD	0.1					J	2.9
1234678-HpCDD	0.01						26.6
12346789-OCDD	0.0001						177
2378TCDF	0.1						10.1
12378-PeCDF	0.05						6.9
23478-PeCDF	0.5					J	4.5
123478-HxCDF	0.1						6.3
123678-HxCDF	0.1					J	2.5
234678-HxCDF	0.1					J	2.5
123789-HxCDF	0.1					J	0.6
1234678-HpCDF	0.01						15.7
1234789-HpCDF	0.01					J	1.5
12346789-OCDF	0.0001						16.1
Total TEQ:		Non-Detects = Detection Limit	12	% Finer than #200 Sieve		38.5	
		Non-Detects = 1/2 d.l.	12	% Total Organic Carbon		1.1	
		Non-Detects = zero	12	% Solids		82	

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-3

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.2
12378-PeCDD	1					J	0.63
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					J	0.95
123789-HxCDD	0.1					J	1
1234678-HpCDD	0.01						10.2
12346789-OCDD	0.0001						81.6
2378TCDF	0.1						5.1
12378-PeCDF	0.05					J	2.9
23478-PeCDF	0.5					J	1.8
123478-HxCDF	0.1					J	2.3
123678-HxCDF	0.1					ND	0.9
234678-HxCDF	0.1					J	0.9
123789-HxCDF	0.1					J	0.28
1234678-HpCDF	0.01					J	4.3
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001					J	5.4
Total TEQ:		Non-Detects = Detection Limit	4.2	% Finer than #200 Sieve		43.6	
		Non-Detects = 1/2 d.l.	4.2	% Total Organic Carbon		2.3	
		Non-Detects = zero	4.1	% Solids		75	

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-6

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.7
12378-PeCDD	1					J	1.9
123478-HxCDD	0.1					J	1.4
123678-HxCDD	0.1					J	2.3
123789-HxCDD	0.1					J	2.9
1234678-HpCDD	0.01						14.7
12346789-OCDD	0.0001						102
2378TCDF	0.1						3.6
12378-PeCDF	0.05					J	3.5
23478-PeCDF	0.5					J	2.1
123478-HxCDF	0.1					J	3.1
123678-HxCDF	0.1					J	1.9
234678-HxCDF	0.1					J	1.6
123789-HxCDF	0.1					J	2.1
1234678-HpCDF	0.01						7
1234789-HpCDF	0.01					J	1.9
12346789-OCDF	0.0001					J	8.9

Total TEQ:	Non-Detects = Detection Limit	7.0	% Finer than #200 Sieve	45.1
	Non-Detects = 1/2 d.l.	7.0	% Total Organic Carbon	1.7
	Non-Detects = zero	7.0	% Solids	78

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-15

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						2
12378-PeCDD	1					ND	1.3
123478-HxCDD	0.1					J	0.86
123678-HxCDD	0.1					J	2.4
123789-HxCDD	0.1					J	2.2
1234678-HpCDD	0.01						20.5
12346789-OCDD	0.0001						132
2378TCDF	0.1						8.1
12378-PeCDF	0.05						5.2
23478-PeCDF	0.5					J	3.4
123478-HxCDF	0.1					J	4.9
123678-HxCDF	0.1					J	2
234678-HxCDF	0.1					J	1.6
123789-HxCDF	0.1					J	0.49
1234678-HpCDF	0.01						18.9
1234789-HpCDF	0.01					J	1.4
12346789-OCDF	0.0001						15.1

Total TEQ:	Non-Detects = Detection Limit	7.9	% Finer than #200 Sieve	46.5
	Non-Detects = 1/2 d.l.	7.3	% Total Organic Carbon	1.4
	Non-Detects = zero	6.6	% Solids	84

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-1

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						3.7
12378-PeCDD	1					J	2.2
123478-HxCDD	0.1					J	1.8
123678-HxCDD	0.1					J	4.4
123789-HxCDD	0.1					J	4.4
1234678-HpCDD	0.01						57.5
12346789-OCDD	0.0001						429
2378TCDF	0.1						2.5
12378-PeCDF	0.05					J	2.1
23478-PeCDF	0.5					J	2.1
123478-HxCDF	0.1						5.6
123678-HxCDF	0.1					J	2.2
234678-HxCDF	0.1					J	2.6
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						29.5
1234789-HpCDF	0.01					J	1.5
12346789-OCDF	0.0001						31.8
Total TEQ:		Non-Detects = Detection Limit	10	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	10	% Total Organic Carbon		NS	
		Non-Detects = zero	10	% Solids		NS	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-3

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	3
12378-PeCDD	1					J	1.8
123478-HxCDD	0.1					J	1.5
123678-HxCDD	0.1					J	4.1
123789-HxCDD	0.1					J	3.5
1234678-HpCDD	0.01						47.4
12346789-OCDD	0.0001						382
2378TCDF	0.1						2.2
12378-PeCDF	0.05					J	2.6
23478-PeCDF	0.5					J	2.1
123478-HxCDF	0.1						5.7
123678-HxCDF	0.1					J	2.4
234678-HxCDF	0.1					J	3
123789-HxCDF	0.1					J	0.23
1234678-HpCDF	0.01						27
1234789-HpCDF	0.01					J	1.3
12346789-OCDF	0.0001						29.5
Total TEQ:		Non-Detects = Detection Limit	9.0	% Finer than #200 Sieve		57.7	
		Non-Detects = 1/2 d.l.	7.5	% Total Organic Carbon		2.1	
		Non-Detects = zero	6.0	% Solids		72	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-6

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.6
12378-PeCDD	1					J	0.99
123478-HxCDD	0.1					J	0.76
123678-HxCDD	0.1					J	2.3
123789-HxCDD	0.1					J	1.9
1234678-HpCDD	0.01						43.3
12346789-OCDD	0.0001						401
2378TCDF	0.1						1.6
12378-PeCDF	0.05					J	1.5
23478-PeCDF	0.5					J	1.3
123478-HxCDF	0.1					J	3
123678-HxCDF	0.1					J	1.2
234678-HxCDF	0.1					J	1.6
123789-HxCDF	0.1					J	0.14
1234678-HpCDF	0.01						17.4
1234789-HpCDF	0.01					J	0.97
12346789-OCDF	0.0001						30.9
Total TEQ:		Non-Detects = Detection Limit	5.2	% Finer than #200 Sieve		55.4	
		Non-Detects = 1/2 d.l.	5.2	% Total Organic Carbon		1.6	
		Non-Detects = zero	5.2	% Solids		84	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-15

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						8.9
12378-PeCDD	1					J	4.6
123478-HxCDD	0.1					J	3.3
123678-HxCDD	0.1						8.6
123789-HxCDD	0.1					J	8.2
1234678-HpCDD	0.01						86.8
12346789-OCDD	0.0001						692
2378TCDF	0.1						8.2
12378-PeCDF	0.05					J	4.6
23478-PeCDF	0.5					J	3.8
123478-HxCDF	0.1						10.9
123678-HxCDF	0.1					J	4.2
234678-HxCDF	0.1						5.1
123789-HxCDF	0.1					J	1.1
1234678-HpCDF	0.01						58
1234789-HpCDF	0.01					J	3.5
12346789-OCDF	0.0001						56.7
Total TEQ:		Non-Detects = Detection Limit	22	% Finer than #200 Sieve		74.4	
		Non-Detects = 1/2 d.l.	22	% Total Organic Carbon		2.2	
		Non-Detects = zero	22	% Solids		79	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-1

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						6.3
12378-PeCDD	1					J	3.8
123478-HxCDD	0.1					J	2.9
123678-HxCDD	0.1						8.6
123789-HxCDD	0.1					J	7.4
1234678-HpCDD	0.01						120
12346789-OCDD	0.0001						958
2378TCDF	0.1						15.7
12378-PeCDF	0.05						12.2
23478-PeCDF	0.5						5.5
123478-HxCDF	0.1						35.7
123678-HxCDF	0.1					B	7
234678-HxCDF	0.1						6.2
123789-HxCDF	0.1					J	0.58
1234678-HpCDF	0.01						73.2
1234789-HpCDF	0.01						8.2
12346789-OCDF	0.0001						128
Total TEQ:		Non-Detects = Detection Limit	24	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	24	% Total Organic Carbon		NS	
		Non-Detects = zero	24	% Solids		NS	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-3

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						5.7
12378-PeCDD	1					J	2.9
123478-HxCDD	0.1					J	2.5
123678-HxCDD	0.1						6.5
123789-HxCDD	0.1					J	6.6
1234678-HpCDD	0.01						95.8
12346789-OCDD	0.0001						710
2378TCDF	0.1						27.6
12378-PeCDF	0.05						26.5
23478-PeCDF	0.5						10.9
123478-HxCDF	0.1						60.5
123678-HxCDF	0.1						10.4
234678-HxCDF	0.1						5.7
123789-HxCDF	0.1					ND,J	0.8
1234678-HpCDF	0.01						70
1234789-HpCDF	0.01						11.9
12346789-OCDF	0.0001						115
Total TEQ:		Non-Detects = Detection Limit	29	% Finer than #200 Sieve		27.1	
		Non-Detects = 1/2 d.l.	29	% Total Organic Carbon		1.2	
		Non-Detects = zero	29	% Solids		90	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-6

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						15.1
12378-PeCDD	1						5.2
123478-HxCDD	0.1					J	3.6
123678-HxCDD	0.1						10.8
123789-HxCDD	0.1					J	9.9
1234678-HpCDD	0.01						153
12346789-OCDD	0.0001						1230
2378TCDF	0.1						45.1
12378-PeCDF	0.05						41.3
23478-PeCDF	0.5						16
123478-HxCDF	0.1						110
123678-HxCDF	0.1						17.2
234678-HxCDF	0.1						9.8
123789-HxCDF	0.1					J	1.1
1234678-HpCDF	0.01						118
1234789-HpCDF	0.01						22.1
12346789-OCDF	0.0001						235
Total TEQ:		Non-Detects = Detection Limit	54	% Finer than #200 Sieve		35.3	
		Non-Detects = 1/2 d.l.	54	% Total Organic Carbon		1.4	
		Non-Detects = zero	54	% Solids		87	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-15

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						17.1
12378-PeCDD	1						9.3
123478-HxCDD	0.1						5.9
123678-HxCDD	0.1						18.2
123789-HxCDD	0.1						13.5
1234678-HpCDD	0.01						227
12346789-OCDD	0.0001						1840
2378TCDF	0.1						91.8
12378-PeCDF	0.05						92.2
23478-PeCDF	0.5						54.4
123478-HxCDF	0.1						217
123678-HxCDF	0.1						33.2
234678-HxCDF	0.1						24.2
123789-HxCDF	0.1					J	3.1
1234678-HpCDF	0.01						269
1234789-HpCDF	0.01						45.2
12346789-OCDF	0.0001						615
Total TEQ:		Non-Detects = Detection Limit	100	% Finer than #200 Sieve		36.7	
		Non-Detects = 1/2 d.l.	100	% Total Organic Carbon		1.0	
		Non-Detects = zero	100	% Solids		76	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-1

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						3.9
12378-PeCDD	1					J	3.2
123478-HxCDD	0.1					J	2.3
123678-HxCDD	0.1						7.3
123789-HxCDD	0.1					J	6.3
1234678-HpCDD	0.01						110
12346789-OCDD	0.0001						871
2378TCDF	0.1						5
12378-PeCDF	0.05					ND	5.2
23478-PeCDF	0.5					J	4.7
123478-HxCDF	0.1						8.4
123678-HxCDF	0.1					J	3.9
234678-HxCDF	0.1						6.1
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						44.2
1234789-HpCDF	0.01					ND	2.6
12346789-OCDF	0.0001						74.1
Total TEQ:		Non-Detects = Detection Limit	15	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	15	% Total Organic Carbon		NS	
		Non-Detects = zero	15	% Solids		NS	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-3

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						6.2
12378-PeCDD	1					J	4.5
123478-HxCDD	0.1					J	4.3
123678-HxCDD	0.1						10.6
123789-HxCDD	0.1						10.2
1234678-HpCDD	0.01						129
12346789-OCDD	0.0001						1070
2378TCDF	0.1						7.8
12378-PeCDF	0.05						6
23478-PeCDF	0.5					J	4.2
123478-HxCDF	0.1						10.9
123678-HxCDF	0.1						5.4
234678-HxCDF	0.1						6.2
123789-HxCDF	0.1					J	3.3
1234678-HpCDF	0.01						47
1234789-HpCDF	0.01						6.4
12346789-OCDF	0.0001						82.3
Total TEQ:		Non-Detects = Detection Limit	21	% Finer than #200 Sieve		28.4	
		Non-Detects = 1/2 d.l.	21	% Total Organic Carbon		1.5	
		Non-Detects = zero	21	% Solids		88	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-6

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						5.2
12378-PeCDD	1					J	4.2
123478-HxCDD	0.1					J	4.3
123678-HxCDD	0.1						18
123789-HxCDD	0.1						13.1
1234678-HpCDD	0.01						262
12346789-OCDD	0.0001						2410
2378TCDF	0.1						7.9
12378-PeCDF	0.05					J	3.9
23478-PeCDF	0.5					J	3.6
123478-HxCDF	0.1						10.1
123678-HxCDF	0.1					J	4.5
234678-HxCDF	0.1						5.8
123789-HxCDF	0.1					J	0.42
1234678-HpCDF	0.01						76.3
1234789-HpCDF	0.01					J	4.3
12346789-OCDF	0.0001						131
Total TEQ:		Non-Detects = Detection Limit	21	% Finer than #200 Sieve		33.5	
		Non-Detects = 1/2 d.l.	21	% Total Organic Carbon		0.9	
		Non-Detects = zero	21	% Solids		88	

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-15

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.4
12378-PeCDD	1					ND,J	1
123478-HxCDD	0.1					J	0.85
123678-HxCDD	0.1					J	3.1
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						38.9
12346789-OCDD	0.0001						341
2378TCDF	0.1						2.6
12378-PeCDF	0.05					J	2.6
23478-PeCDF	0.5					J	2
123478-HxCDF	0.1					J	4
123678-HxCDF	0.1					J	1.9
234678-HxCDF	0.1					J	2.5
123789-HxCDF	0.1					J	0.11
1234678-HpCDF	0.01						35.9
1234789-HpCDF	0.01					J	1.2
12346789-OCDF	0.0001						31.5
Total TEQ:		Non-Detects = Detection Limit	6.1	% Finer than #200 Sieve		25.7	
		Non-Detects = 1/2 d.l.	5.6	% Total Organic Carbon		0.4	
		Non-Detects = zero	5.1	% Solids		92	

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-1

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	J	0.91			J	0.91
12378-PeCDD	1	ND	1.1			ND	1.1
123478-HxCDD	0.1	J	0.66			J	0.66
123678-HxCDD	0.1	J	3.1			J	3.1
123789-HxCDD	0.1	J	1.9			J	1.9
1234678-HpCDD	0.01		65.3				65.3
12346789-OCDD	0.0001		598				598
2378TCDF	0.1		76.7				76.7
12378-PeCDF	0.05		42				42
23478-PeCDF	0.5		31.4				31.4
123478-HxCDF	0.1		45.6				45.6
123678-HxCDF	0.1		8.8				8.8
234678-HxCDF	0.1		5.8				5.8
123789-HxCDF	0.1	J	0.72			J	0.72
1234678-HpCDF	0.01		86.8				86.8
1234789-HpCDF	0.01		7.6				7.6
12346789-OCDF	0.0001		147				147
Total TEQ:		Non-Detects = Detection Limit	36	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	35	% Total Organic Carbon		NS	
		Non-Detects = zero	35	% Solids		NS	

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-3

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.8				2.8
12378-PeCDD	1	J	2.6			J	2.6
123478-HxCDD	0.1	J	2.2			J	2.2
123678-HxCDD	0.1		16.6				16.6
123789-HxCDD	0.1	J	7.2			J	7.2
1234678-HpCDD	0.01		281				281
12346789-OCDD	0.0001		3470				3470
2378TCDF	0.1		332				332
12378-PeCDF	0.05		234				234
23478-PeCDF	0.5		119				119
123478-HxCDF	0.1		169				169
123678-HxCDF	0.1		39.6				39.6
234678-HxCDF	0.1		20				20
123789-HxCDF	0.1		5.1				5.1
1234678-HpCDF	0.01		344				344
1234789-HpCDF	0.01		33.9				33.9
12346789-OCDF	0.0001		658				658
Total TEQ:		Non-Detects = Detection Limit	140	% Finer than #200 Sieve		37.1	
		Non-Detects = 1/2 d.l.	140	% Total Organic Carbon		1.6	
		Non-Detects = zero	140	% Solids		77	

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-6

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.3				3.3
12378-PeCDD	1		6.9				6.9
123478-HxCDD	0.1		6.1				6.1
123678-HxCDD	0.1		45.2				45.2
123789-HxCDD	0.1		19.8				19.8
1234678-HpCDD	0.01		539				539
12346789-OCDD	0.0001	E	6310		4130		4130
2378TCDF	0.1	E	342		215		215
12378-PeCDF	0.05		180				180
23478-PeCDF	0.5		127				127
123478-HxCDF	0.1		151				151
123678-HxCDF	0.1		36.4				36.4
234678-HxCDF	0.1		26.4				26.4
123789-HxCDF	0.1	J	4			J	4
1234678-HpCDF	0.01		479				479
1234789-HpCDF	0.01		56.7				56.7
12346789-OCDF	0.0001		1240				1240
Total TEQ:		Non-Detects = Detection Limit	140	% Finer than #200 Sieve		31	
		Non-Detects = 1/2 d.l.	140	% Total Organic Carbon		1.2	
		Non-Detects = zero	140	% Solids		80	

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-15

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3				3
12378-PeCDD	1	J	3.2			J	3.2
123478-HxCDD	0.1	J	1.8			J	1.8
123678-HxCDD	0.1		18.3				18.3
123789-HxCDD	0.1	J	7.4			J	7.4
1234678-HpCDD	0.01		327				327
12346789-OCDD	0.0001		3590				3590
2378TCDF	0.1	E	834		637		637
12378-PeCDF	0.05		390				390
23478-PeCDF	0.5		266				266
123478-HxCDF	0.1		257				257
123678-HxCDF	0.1		57.7				57.7
234678-HxCDF	0.1		37.7				37.7
123789-HxCDF	0.1		5.5				5.5
1234678-HpCDF	0.01		689				689
1234789-HpCDF	0.01		39.4				39.4
12346789-OCDF	0.0001		1050				1050
Total TEQ:		Non-Detects = Detection Limit	270	% Finer than #200 Sieve		40.3	
		Non-Detects = 1/2 d.l.	270	% Total Organic Carbon		0.91	
		Non-Detects = zero	270	% Solids		82	

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-1

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.6				4.6
12378-PeCDD	1		5.4				5.4
123478-HxCDD	0.1	J	3.4			J	3.4
123678-HxCDD	0.1		23.8				23.8
123789-HxCDD	0.1	J	9.5			J	9.5
1234678-HpCDD	0.01		393				393
12346789-OCDD	0.0001		3520				3520
2378TCDF	0.1		290				290
12378-PeCDF	0.05		202				202
23478-PeCDF	0.5		140				140
123478-HxCDF	0.1		238				238
123678-HxCDF	0.1		44.8				44.8
234678-HxCDF	0.1		27.2				27.2
123789-HxCDF	0.1	J	4.7			J	4.7
1234678-HpCDF	0.01		833				833
1234789-HpCDF	0.01		42.3				42.3
12346789-OCDF	0.0001		907				907

Total TEQ:	Non-Detects = Detection Limit	170	% Finer than #200 Sieve	NS
	Non-Detects = 1/2 d.l.	170	% Total Organic Carbon	NS
	Non-Detects = zero	170	% Solids	NS

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-3

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.2				6.2
12378-PeCDD	1		7.8				7.8
123478-HxCDD	0.1		5.9				5.9
123678-HxCDD	0.1		27.2				27.2
123789-HxCDD	0.1		15.6				15.6
1234678-HpCDD	0.01		536				536
12346789-OCDD	0.0001	E	5140		6270		6270
2378TCDF	0.1		325				325
12378-PeCDF	0.05		185				185
23478-PeCDF	0.5		141				141
123478-HxCDF	0.1		227				227
123678-HxCDF	0.1		45.2				45.2
234678-HxCDF	0.1		30				30
123789-HxCDF	0.1		5.1				5.1
1234678-HpCDF	0.01		934				934
1234789-HpCDF	0.01		50.9				50.9
12346789-OCDF	0.0001		1150				1150

Total TEQ:	Non-Detects = Detection Limit	180	% Finer than #200 Sieve	60.5
	Non-Detects = 1/2 d.l.	180	% Total Organic Carbon	2.5
	Non-Detects = zero	180	% Solids	81

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-6

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		10.1				10.1
12378-PeCDD	1		12.9				12.9
123478-HxCDD	0.1		9.1				9.1
123678-HxCDD	0.1		50.9				50.9
123789-HxCDD	0.1		27.8				27.8
1234678-HpCDD	0.01		910				910
12346789-OCDD	0.0001	E	9160		8740		8740
2378TCDF	0.1	E	513		357		357
12378-PeCDF	0.05		328				328
23478-PeCDF	0.5		196				196
123478-HxCDF	0.1		331				331
123678-HxCDF	0.1		74.3				74.3
234678-HxCDF	0.1		46.2				46.2
123789-HxCDF	0.1		7.4				7.4
1234678-HpCDF	0.01	E	2370		1340		1340
1234789-HpCDF	0.01		75.3				75.3
12346789-OCDF	0.0001		2810				2810

Total TEQ: Non-Detects = Detection Limit 250 % Finer than #200 Sieve 58.9
 Non-Detects = 1/2 d.l. 250 % Total Organic Carbon 1.4
 Non-Detects = zero 250 % Solids 82

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-15

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.6				6.6
12378-PeCDD	1		6.1				6.1
123478-HxCDD	0.1	J	3.2			J	3.2
123678-HxCDD	0.1		23.6				23.6
123789-HxCDD	0.1		11.7				11.7
1234678-HpCDD	0.01		494				494
12346789-OCDD	0.0001	E	5130		4480		4480
2378TCDF	0.1	E	570		350		350
12378-PeCDF	0.05		300				300
23478-PeCDF	0.5		189				189
123478-HxCDF	0.1		248				248
123678-HxCDF	0.1		55.4				55.4
234678-HxCDF	0.1		35				35
123789-HxCDF	0.1	ND	6			ND	6
1234678-HpCDF	0.01		833				833
1234789-HpCDF	0.01		49.2				49.2
12346789-OCDF	0.0001		1290				1290

Total TEQ: Non-Detects = Detection Limit 210 % Finer than #200 Sieve 44.9
 Non-Detects = 1/2 d.l. 210 % Total Organic Carbon 0.15
 Non-Detects = zero 210 % Solids 88

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-1 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.2				3.2
12378-PeCDD	1	J	3.2			J	3.2
123478-HxCDD	0.1	J	2.7			J	2.7
123678-HxCDD	0.1		10.3				10.3
123789-HxCDD	0.1	J	5.9			J	5.9
1234678-HpCDD	0.01		209				209
12346789-OCDD	0.0001		1980				1980
2378TCDF	0.1	E	2380		2870		2870
12378-PeCDF	0.05	E	2120		1730		1730
23478-PeCDF	0.5		1800				1800
123478-HxCDF	0.1		1210				1210
123678-HxCDF	0.1		235				235
234678-HxCDF	0.1		170				170
123789-HxCDF	0.1		19.8				19.8
1234678-HpCDF	0.01		460				460
1234789-HpCDF	0.01		71.5				71.5
12346789-OCDF	0.0001		586				586

Total TEQ: Non-Detects = Detection Limit 1500 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1500 % Total Organic Carbon
 Non-Detects = zero 1500 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-3 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.4				3.4
12378-PeCDD	1	J	3.3			J	3.3
123478-HxCDD	0.1	J	2.3			J	2.3
123678-HxCDD	0.1		8.3				8.3
123789-HxCDD	0.1	J	5.3			J	5.3
1234678-HpCDD	0.01		152				152
12346789-OCDD	0.0001		1450				1450
2378TCDF	0.1	E	1770		3080		3080
12378-PeCDF	0.05		1960				1960
23478-PeCDF	0.5		1670				1670
123478-HxCDF	0.1		1070				1070
123678-HxCDF	0.1		204				204
234678-HxCDF	0.1		145				145
123789-HxCDF	0.1		20.3				20.3
1234678-HpCDF	0.01		364				364
1234789-HpCDF	0.01		55.6				55.6
12346789-OCDF	0.0001		404				404

Total TEQ: Non-Detects = Detection Limit 1400 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1400 % Total Organic Carbon
 Non-Detects = zero 1400 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-6 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.9				5.9
12378-PeCDD	1		5.7				5.7
123478-HxCDD	0.1	J	4.6			J	4.6
123678-HxCDD	0.1		18.2				18.2
123789-HxCDD	0.1		10				10
1234678-HpCDD	0.01		351				351
12346789-OCDD	0.0001		3480		8920		8920
2378TCDF	0.1	E	3090		6380		6380
12378-PeCDF	0.05	ND,S,E	3790		3780		3780
23478-PeCDF	0.5	S,E	3360		2740		2740
123478-HxCDF	0.1	S,E	2640		2830		2830
123678-HxCDF	0.1		515				515
234678-HxCDF	0.1		341				341
123789-HxCDF	0.1		47				47
1234678-HpCDF	0.01		896		2710		2710
1234789-HpCDF	0.01		138				138
12346789-OCDF	0.0001		925				925

Total TEQ: Non-Detects = Detection Limit 2600 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 2600 % Total Organic Carbon
 Non-Detects = zero 2600 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-15 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.3				7.3
12378-PeCDD	1		8.2				8.2
123478-HxCDD	0.1		5.5				5.5
123678-HxCDD	0.1		28.9				28.9
123789-HxCDD	0.1		13.4				13.4
1234678-HpCDD	0.01		488				488
12346789-OCDD	0.0001	E	5000		4280		4280
2378TCDF	0.1	S,E	9530		9720		9720
12378-PeCDF	0.05	E	6420		4500		4500
23478-PeCDF	0.5	E	4090		3380		3380
123478-HxCDF	0.1	E	3440		2970		2970
123678-HxCDF	0.1		778				778
234678-HxCDF	0.1		470				470
123789-HxCDF	0.1		59.1				59.1
1234678-HpCDF	0.01		1300				1300
1234789-HpCDF	0.01		189				189
12346789-OCDF	0.0001		1380				1380

Total TEQ: Non-Detects = Detection Limit 3400 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 3400 % Total Organic Carbon
 Non-Detects = zero 3400 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-24 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		1.2				1.2
12378-PeCDD	1	ND	0.8			ND	0.8
123478-HxCDD	0.1	ND	0.3			ND	0.3
123678-HxCDD	0.1	ND	0.3			ND	0.3
123789-HxCDD	0.1	ND	0.2			ND	0.2
1234678-HpCDD	0.01	J	2.6			J	2.6
12346789-OCDD	0.0001		20.6				20.6
2378TCDF	0.1	E	5540		4300		4300
12378-PeCDF	0.05	E	2560		2050		2050
23478-PeCDF	0.5	E	2050		1700		1700
123478-HxCDF	0.1		1780				1780
123678-HxCDF	0.1		342				342
234678-HxCDF	0.1		203				203
123789-HxCDF	0.1		45.6				45.6
1234678-HpCDF	0.01		228				228
1234789-HpCDF	0.01		86.4				86.4
12346789-OCDF	0.0001		52.9				52.9

Total TEQ: Non-Detects = Detection Limit 1600 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1600 % Total Organic Carbon
 Non-Detects = zero 1600 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-36 (LOC 1)

Latitude 43.526594146N

Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	J	0.54			J	0.54
12378-PeCDD	1	ND	0.3			ND	0.3
123478-HxCDD	0.1	ND	0.3			ND	0.3
123678-HxCDD	0.1	ND	0.3			ND	0.3
123789-HxCDD	0.1	ND	0.2			ND	0.2
1234678-HpCDD	0.01	ND	1			ND	1
12346789-OCDD	0.0001	J	6.7			J	6.7
2378TCDF	0.1	E	691		467		467
12378-PeCDF	0.05		120				120
23478-PeCDF	0.5		140				140
123478-HxCDF	0.1		68				68
123678-HxCDF	0.1		12.8				12.8
234678-HxCDF	0.1		10				10
123789-HxCDF	0.1	J	2			J	2
1234678-HpCDF	0.01		18.2				18.2
1234789-HpCDF	0.01	J	2.8			J	2.8
12346789-OCDF	0.0001	J	7.4			J	7.4

Total TEQ: Non-Detects = Detection Limit 130 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 130 % Total Organic Carbon
 Non-Detects = zero 130 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-48 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.3
1234678-HpCDD	0.01					J	2.7
12346789-OCDD	0.0001						21.5
2378TCDF	0.1						209
12378-PeCDF	0.05						73.7
23478-PeCDF	0.5						65.5
123478-HxCDF	0.1						48.5
123678-HxCDF	0.1						9.9
234678-HxCDF	0.1						6.6
123789-HxCDF	0.1					ND	1
1234678-HpCDF	0.01						9.6
1234789-HpCDF	0.01					J	2.5
12346789-OCDF	0.0001					J	7.8

Total TEQ: Non-Detects = Detection Limit 65 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 64 % Total Organic Carbon
 Non-Detects = zero 64 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-60 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.1
123678-HxCDD	0.1					ND	0.1
123789-HxCDD	0.1					ND	0.1
1234678-HpCDD	0.01					J	0.87
12346789-OCDD	0.0001						10.6
2378TCDF	0.1						32.4
12378-PeCDF	0.05						14.6
23478-PeCDF	0.5						12.6
123478-HxCDF	0.1						11
123678-HxCDF	0.1					J	2.6
234678-HxCDF	0.1					J	1.8
123789-HxCDF	0.1					J	0.36
1234678-HpCDF	0.01					ND	2.4
1234789-HpCDF	0.01					J	0.85
12346789-OCDF	0.0001					J	1.7

Total TEQ: Non-Detects = Detection Limit 12 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 12 % Total Organic Carbon
 Non-Detects = zero 12 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-1 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		11.3				11.3
12378-PeCDD	1		10.6				10.6
123478-HxCDD	0.1		8.8				8.8
123678-HxCDD	0.1		56.2				56.2
123789-HxCDD	0.1		22.9				22.9
1234678-HpCDD	0.01		1310				1310
12346789-OCDD	0.0001	S,E	11300		12550		12550
2378TCDF	0.1	E	3300		2470		2470
12378-PeCDF	0.05		1590				1590
23478-PeCDF	0.5		1360				1360
123478-HxCDF	0.1		1030				1030
123678-HxCDF	0.1		200				200
234678-HxCDF	0.1		141				141
123789-HxCDF	0.1		18.8				18.8
1234678-HpCDF	0.01		1640				1640
1234789-HpCDF	0.01		136				136
12346789-OCDF	0.0001		3540				3540

Total TEQ: Non-Detects = Detection Limit 1200 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1200 % Total Organic Carbon
 Non-Detects = zero 1200 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-3 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		11.4				11.4
12378-PeCDD	1		11.5				11.5
123478-HxCDD	0.1		8.9				8.9
123678-HxCDD	0.1		63.3				63.3
123789-HxCDD	0.1		22.7				22.7
1234678-HpCDD	0.01		1570				1570
12346789-OCDD	0.0001	S,E	13180		14520		14520
2378TCDF	0.1	E	4210		3380		3380
12378-PeCDF	0.05		1940				1940
23478-PeCDF	0.5		1690				1690
123478-HxCDF	0.1		1210				1210
123678-HxCDF	0.1		237				237
234678-HxCDF	0.1		166				166
123789-HxCDF	0.1		26.8				26.8
1234678-HpCDF	0.01		1700				1700
1234789-HpCDF	0.01		142				142
12346789-OCDF	0.0001	E	4130		3390		3390

Total TEQ: Non-Detects = Detection Limit 1500 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1500 % Total Organic Carbon
 Non-Detects = zero 1500 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-6 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		16.8				16.8
12378-PeCDD	1		14.6				14.6
123478-HxCDD	0.1		13.3				13.3
123678-HxCDD	0.1		82.3				82.3
123789-HxCDD	0.1		34.3				34.3
1234678-HpCDD	0.01		1850				1850
12346789-OCDD	0.0001	S,E	18020		16600		16600
2378TCDF	0.1	E	4380		3780		3780
12378-PeCDF	0.05	E	2440		1540		1540
23478-PeCDF	0.5		1610				1610
123478-HxCDF	0.1		1560				1560
123678-HxCDF	0.1		381				381
234678-HxCDF	0.1		220				220
123789-HxCDF	0.1		32.9				32.9
1234678-HpCDF	0.01	E	2170		1250		1250
1234789-HpCDF	0.01		184				184
12346789-OCDF	0.0001	E	3990		4480		4480

Total TEQ: Non-Detects = Detection Limit 1600 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1600 % Total Organic Carbon
 Non-Detects = zero 1600 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-15 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		10.5				10.5
12378-PeCDD	1		9.6				9.6
123478-HxCDD	0.1	ND	10.2			ND	10.2
123678-HxCDD	0.1		155				155
123789-HxCDD	0.1		48.2				48.2
1234678-HpCDD	0.01	E	2290		2180		2180
12346789-OCDD	0.0001	E	15310		13250		13250
2378TCDF	0.1	S,E	6450		7130		7130
12378-PeCDF	0.05	E	3990		2780		2780
23478-PeCDF	0.5	E	2590		2410		2410
123478-HxCDF	0.1	E	2600		1440		1440
123678-HxCDF	0.1		615				615
234678-HxCDF	0.1		350				350
123789-HxCDF	0.1		62.5				62.5
1234678-HpCDF	0.01	E	2650		1350		1350
1234789-HpCDF	0.01		346				346
12346789-OCDF	0.0001	E	5450		4680		4680

Total TEQ: Non-Detects = Detection Limit 2400 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 2400 % Total Organic Carbon
 Non-Detects = zero 2400 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-24 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					J	0.51
123789-HxCDD	0.1					ND	0.5
1234678-HpCDD	0.01						7.7
12346789-OCDD	0.0001						63.5
2378TCDF	0.1						287
12378-PeCDF	0.05						138
23478-PeCDF	0.5						103
123478-HxCDF	0.1						71.6
123678-HxCDF	0.1						14.5
234678-HxCDF	0.1						10.8
123789-HxCDF	0.1					J	1.9
1234678-HpCDF	0.01						30.3
1234789-HpCDF	0.01					J	3.9
12346789-OCDF	0.0001						24.1

Total TEQ: Non-Detects = Detection Limit 98 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 98 % Total Organic Carbon
 Non-Detects = zero 97 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-36 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.6
123478-HxCDD	0.1					J	0.5
123678-HxCDD	0.1					J	0.73
123789-HxCDD	0.1					J	0.84
1234678-HpCDD	0.01						8.2
12346789-OCDD	0.0001						94.8
2378TCDF	0.1						31.6
12378-PeCDF	0.05						22.2
23478-PeCDF	0.5						14.4
123478-HxCDF	0.1						13.2
123678-HxCDF	0.1					J	3.2
234678-HxCDF	0.1					J	2.1
123789-HxCDF	0.1					J	0.94
1234678-HpCDF	0.01						18.8
1234789-HpCDF	0.01					J	2
12346789-OCDF	0.0001						28.2

Total TEQ: Non-Detects = Detection Limit 15 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 14 % Total Organic Carbon
 Non-Detects = zero 14 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-48 (LOC 2)

Latitude 43.526578828N

Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					ND	0.8
12346789-OCDD	0.0001					J	6.6
2378TCDF	0.1						2.6
12378-PeCDF	0.05					J	2.3
23478-PeCDF	0.5					J	1.2
123478-HxCDF	0.1					J	1.1
123678-HxCDF	0.1					J	0.27
234678-HxCDF	0.1					ND	0.1
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	1.2
1234789-HpCDF	0.01					ND	0.3
12346789-OCDF	0.0001					J	1.2

Total TEQ: Non-Detects = Detection Limit 1.6 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1.4 % Total Organic Carbon
 Non-Detects = zero 1.1 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-1 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.1				6.1
12378-PeCDD	1		5.3				5.3
123478-HxCDD	0.1	J	4.2			J	4.2
123678-HxCDD	0.1		30.5				30.5
123789-HxCDD	0.1		11.2				11.2
1234678-HpCDD	0.01		613				613
12346789-OCDD	0.0001	E	6080		5600		5600
2378TCDF	0.1	E	1080		763		763
12378-PeCDF	0.05		546				546
23478-PeCDF	0.5		340				340
123478-HxCDF	0.1		374				374
123678-HxCDF	0.1		88.9				88.9
234678-HxCDF	0.1		53.7				53.7
123789-HxCDF	0.1		7.8				7.8
1234678-HpCDF	0.01		667				667
1234789-HpCDF	0.01		52				52
12346789-OCDF	0.0001		1790				1790

Total TEQ: Non-Detects = Detection Limit 360 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 360 % Total Organic Carbon
 Non-Detects = zero 360 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-3 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.4				6.4
12378-PeCDD	1		5.4				5.4
123478-HxCDD	0.1	J	3.6			J	3.6
123678-HxCDD	0.1		32.9				32.9
123789-HxCDD	0.1		12.4				12.4
1234678-HpCDD	0.01		704				704
12346789-OCDD	0.0001	E	6590		6190		6190
2378TCDF	0.1	E	1110		790		790
12378-PeCDF	0.05		543				543
23478-PeCDF	0.5		343				343
123478-HxCDF	0.1		368				368
123678-HxCDF	0.1		84.2				84.2
234678-HxCDF	0.1		52.6				52.6
123789-HxCDF	0.1		9.1				9.1
1234678-HpCDF	0.01		645				645
1234789-HpCDF	0.01		63.5				63.5
12346789-OCDF	0.0001		1840				1840

Total TEQ: Non-Detects = Detection Limit 360 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 360 % Total Organic Carbon
 Non-Detects = zero 360 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-6 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.7				4.7
12378-PeCDD	1	ND	5.2			ND	5.2
123478-HxCDD	0.1	J	3.8			J	3.8
123678-HxCDD	0.1		29.4				29.4
123789-HxCDD	0.1		10.9				10.9
1234678-HpCDD	0.01		621				621
12346789-OCDD	0.0001	E	6630		5580		5580
2378TCDF	0.1	E	493		283		283
12378-PeCDF	0.05		267				267
23478-PeCDF	0.5		177				177
123478-HxCDF	0.1		223				223
123678-HxCDF	0.1		50.1				50.1
234678-HxCDF	0.1		30				30
123789-HxCDF	0.1		5.3				5.3
1234678-HpCDF	0.01		626				626
1234789-HpCDF	0.01		44.8				44.8
12346789-OCDF	0.0001		1750				1750

Total TEQ: Non-Detects = Detection Limit 190 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 190 % Total Organic Carbon
 Non-Detects = zero 180 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-15 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		46.2				46.2
12378-PeCDD	1		31.8				31.8
123478-HxCDD	0.1		23.4				23.4
123678-HxCDD	0.1		126				126
123789-HxCDD	0.1		58.8				58.8
1234678-HpCDD	0.01	E	2980		3120		3120
12346789-OCDD	0.0001	E	29120		29920		29920
2378TCDF	0.1	E	1850		1270		1270
12378-PeCDF	0.05		972				972
23478-PeCDF	0.5		593				593
123478-HxCDF	0.1		840				840
123678-HxCDF	0.1		195				195
234678-HxCDF	0.1		121				121
123789-HxCDF	0.1		14.9				14.9
1234678-HpCDF	0.01	E	3270		2110		2110
1234789-HpCDF	0.01		195				195
12346789-OCDF	0.0001	E	7730		7240		7240

Total TEQ: Non-Detects = Detection Limit 750 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 750 % Total Organic Carbon
 Non-Detects = zero 750 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-3 (LOC 4)

Latitude

Longitude

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	4.5			ND	4.5
12378-PeCDD	1		7.6				7.6
123478-HxCDD	0.1	J	4.9			J	4.9
123678-HxCDD	0.1		26.9				26.9
123789-HxCDD	0.1		12.4				12.4
1234678-HpCDD	0.01		531				531
12346789-OCDD	0.0001	E	5530		4490		4490
2378TCDF	0.1	E	4680		3890		3890
12378-PeCDF	0.05	E	2440		1640		1640
23478-PeCDF	0.5		1810				1810
123478-HxCDF	0.1		1520				1520
123678-HxCDF	0.1		311				311
234678-HxCDF	0.1		194				194
123789-HxCDF	0.1		40.1				40.1
1234678-HpCDF	0.01		1250				1250
1234789-HpCDF	0.01		112				112
12346789-OCDF	0.0001		1540				1540

Total TEQ: Non-Detects = Detection Limit 1600 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 1600 % Total Organic Carbon
 Non-Detects = zero 1600 % Solids

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-6 (LOC 4)		Latitude		Longitude			
Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.1				8.1
12378-PeCDD	1		13.6				13.6
123478-HxCDD	0.1		9.1				9.1
123678-HxCDD	0.1		48.4				48.4
123789-HxCDD	0.1		22.9				22.9
1234678-HpCDD	0.01		978				978
12346789-OCDD	0.0001	E	10320		8920		8920
2378TCDF	0.1	E	6950		6380		6380
12378-PeCDF	0.05	E	4120		3780		3780
23478-PeCDF	0.5	E	3020		2740		2740
123478-HxCDF	0.1	E	2800		2830		2830
123678-HxCDF	0.1		565				565
234678-HxCDF	0.1		353				353
123789-HxCDF	0.1		74.7				74.7
1234678-HpCDF	0.01	E	2670		2710		2710
1234789-HpCDF	0.01		211				211
12346789-OCDF	0.0001		2850				2850
Total TEQ:		Non-Detects = Detection Limit	2600		% Finer than #200 Sieve		
		Non-Detects = 1/2 d.l.	2600		% Total Organic Carbon		
		Non-Detects = zero	2600		% Solids		

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-15 (LOC 4)		Latitude		Longitude			
Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.6			ND	0.6
12378-PeCDD	1	ND	0.6			ND	0.6
123478-HxCDD	0.1	ND	0.6			ND	0.6
123678-HxCDD	0.1	ND	1.2			ND	1.2
123789-HxCDD	0.1	J	0.65			J	0.65
1234678-HpCDD	0.01		26.3				26.3
12346789-OCDD	0.0001		307				307
2378TCDF	0.1	E	517		289		289
12378-PeCDF	0.05		258				258
23478-PeCDF	0.5		199				199
123478-HxCDF	0.1		175				175
123678-HxCDF	0.1		36.4				36.4
234678-HxCDF	0.1		24.1				24.1
123789-HxCDF	0.1	J	3.9			J	3.9
1234678-HpCDF	0.01		80.5				80.5
1234789-HpCDF	0.01	ND	10.8			ND	10.8
12346789-OCDF	0.0001		83.1				83.1
Total TEQ:		Non-Detects = Detection Limit	170		% Finer than #200 Sieve		
		Non-Detects = 1/2 d.l.	170		% Total Organic Carbon		
		Non-Detects = zero	170		% Solids		

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-24 (LOC 4)

Analyte	TEF	Latitude		Longitude		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.1
1234678-HpCDD	0.01					J	1.6
12346789-OCDD	0.0001						15.4
2378TCDF	0.1						16.1
12378-PeCDF	0.05						9.5
23478-PeCDF	0.5						7.2
123478-HxCDF	0.1						8.1
123678-HxCDF	0.1					J	2
234678-HxCDF	0.1					J	1.4
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	3.7
1234789-HpCDF	0.01					J	0.61
12346789-OCDF	0.0001					J	3.6
Total TEQ:		Non-Detects = Detection Limit	7.2	% Finer than #200 Sieve			
		Non-Detects = 1/2 d.l.	7.0	% Total Organic Carbon			
		Non-Detects = zero	6.9	% Solids			

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-36 (LOC 4)

Analyte	TEF	Latitude		Longitude		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01						6.2
12346789-OCDD	0.0001						60.3
2378TCDF	0.1						62.3
12378-PeCDF	0.05						34.3
23478-PeCDF	0.5						24.9
123478-HxCDF	0.1						24.4
123678-HxCDF	0.1						5.1
234678-HxCDF	0.1					J	3.3
123789-HxCDF	0.1					J	0.53
1234678-HpCDF	0.01						11.6
1234789-HpCDF	0.01					J	1.8
12346789-OCDF	0.0001						15.5
Total TEQ:		Non-Detects = Detection Limit	25	% Finer than #200 Sieve			
		Non-Detects = 1/2 d.l.	24	% Total Organic Carbon			
		Non-Detects = zero	24	% Solids			

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-48 (LOC 4)

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
		Concentration pg/g (ppt)		Concentration pg/g (ppt)			
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					J	2.1
12346789-OCDD	0.0001						22.8
2378TCDF	0.1						18.4
12378-PeCDF	0.05						11.8
23478-PeCDF	0.5						7.6
123478-HxCDF	0.1						7.8
123678-HxCDF	0.1					J	1.6
234678-HxCDF	0.1					J	1.1
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01					J	3.9
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001					J	5.4
Total TEQ:							
Non-Detects = Detection Limit		8.0	% Finer than #200 Sieve				
Non-Detects = 1/2 d.l.		7.7	% Total Organic Carbon				
Non-Detects = zero		7.3	% Solids				

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-60 (LOC 4)

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
		Concentration pg/g (ppt)		Concentration pg/g (ppt)			
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					ND	0.6
12346789-OCDD	0.0001					J	3.8
2378TCDF	0.1						3.6
12378-PeCDF	0.05					J	1.7
23478-PeCDF	0.5					J	1.7
123478-HxCDF	0.1					J	1.2
123678-HxCDF	0.1					ND	0.1
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					ND	0.6
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					ND	0.6
Total TEQ:							
Non-Detects = Detection Limit		1.9	% Finer than #200 Sieve				
Non-Detects = 1/2 d.l.		1.7	% Total Organic Carbon				
Non-Detects = zero		1.4	% Solids				

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-3

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.5
12378-PeCDD	1					ND	0.5
123478-HxCDD	0.1					ND	0.6
123678-HxCDD	0.1					ND	0.6
123789-HxCDD	0.1					ND	0.6
1234678-HpCDD	0.01						9.7
12346789-OCDD	0.0001						69.2
2378TCDF	0.1					ND	1.8
12378-PeCDF	0.05					ND	0.8
23478-PeCDF	0.5					J	0.5
123478-HxCDF	0.1					J	0.96
123678-HxCDF	0.1					ND	0.5
234678-HxCDF	0.1					J	0.34
123789-HxCDF	0.1					ND	0.6
1234678-HpCDF	0.01						5
1234789-HpCDF	0.01					ND	0.7
12346789-OCDF	0.0001					ND	10.2
Total TEQ:		Non-Detects = Detection Limit	2.1	% Finer than #200 Sieve		65.70	
		Non-Detects = 1/2 d.l.	1.3	% Total Organic Carbon		5.40	
		Non-Detects = zero	0.53	% Solids		68.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-6

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.6
12378-PeCDD	1					ND	0.6
123478-HxCDD	0.1					ND	0.7
123678-HxCDD	0.1					J	1
123789-HxCDD	0.1					ND	0.7
1234678-HpCDD	0.01						12.8
12346789-OCDD	0.0001						89.4
2378TCDF	0.1						1.9
12378-PeCDF	0.05					J	1.1
23478-PeCDF	0.5					J	0.59
123478-HxCDF	0.1					ND	1.1
123678-HxCDF	0.1					ND	0.5
234678-HxCDF	0.1					ND	0.5
123789-HxCDF	0.1					ND	0.6
1234678-HpCDF	0.01						6.6
1234789-HpCDF	0.01					ND	0.9
12346789-OCDF	0.0001					J	8.5
Total TEQ:		Non-Detects = Detection Limit	2.5	% Finer than #200 Sieve		54.80	
		Non-Detects = 1/2 d.l.	1.7	% Total Organic Carbon		3.70	
		Non-Detects = zero	0.84	% Solids		76.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-15

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					J	1.7
12346789-OCDD	0.0001						12.2
2378TCDF	0.1					ND	0.8
12378-PeCDF	0.05					ND	0.5
23478-PeCDF	0.5					ND	0.2
123478-HxCDF	0.1					J	0.32
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	0.88
1234789-HpCDF	0.01					ND	0.3
12346789-OCDF	0.0001					J	1

Total TEQ:	Non-Detects = Detection Limit	0.9	% Finer than #200 Sieve	53.10
	Non-Detects = 1/2 d.l.	0.48	% Total Organic Carbon	2.80
	Non-Detects = zero	0.059	% Solids	74.00

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-3

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.5
12378-PeCDD	1					J	0.95
123478-HxCDD	0.1					J	0.85
123678-HxCDD	0.1					J	2
123789-HxCDD	0.1					J	1.9
1234678-HpCDD	0.01						30.3
12346789-OCDD	0.0001						225
2378TCDF	0.1					ND	2.2
12378-PeCDF	0.05					J	1.4
23478-PeCDF	0.5					ND	1
123478-HxCDF	0.1					J	1.7
123678-HxCDF	0.1					J	0.75
234678-HxCDF	0.1					J	0.95
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						11.9
1234789-HpCDF	0.01					ND	0.8
12346789-OCDF	0.0001						25.1

Total TEQ:	Non-Detects = Detection Limit	4.5	% Finer than #200 Sieve	30.60
	Non-Detects = 1/2 d.l.	4.2	% Total Organic Carbon	3.70
	Non-Detects = zero	3.8	% Solids	76.00

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-6

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.4
12378-PeCDD	1					ND	0.8
123478-HxCDD	0.1					J	0.71
123678-HxCDD	0.1					J	1.5
123789-HxCDD	0.1					J	1.3
1234678-HpCDD	0.01						16.7
12346789-OCDD	0.0001						109
2378TCDF	0.1						1.2
12378-PeCDF	0.05					J	0.82
23478-PeCDF	0.5					ND	0.7
123478-HxCDF	0.1					J	1.4
123678-HxCDF	0.1					ND	0.6
234678-HxCDF	0.1					J	0.76
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01						9.4
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001						14.4
Total TEQ:		Non-Detects = Detection Limit	3.6	% Finer than #200 Sieve		29.40	
		Non-Detects = 1/2 d.l.	3.0	% Total Organic Carbon		3.00	
		Non-Detects = zero	2.4	% Solids		81.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-15

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.1
123678-HxCDD	0.1					ND	0.1
123789-HxCDD	0.1					ND	0.1
1234678-HpCDD	0.01					J	1.2
12346789-OCDD	0.0001						9.6
2378TCDF	0.1					J	0.75
12378-PeCDF	0.05					ND	0.1
23478-PeCDF	0.5					J	0.22
123478-HxCDF	0.1					J	0.25
123678-HxCDF	0.1					ND	0.1
234678-HxCDF	0.1					ND	0.09
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	0.73
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	1.1
Total TEQ:		Non-Detects = Detection Limit	0.5	% Finer than #200 Sieve		26.90	
		Non-Detects = 1/2 d.l.	0.36	% Total Organic Carbon		0.75	
		Non-Detects = zero	0.23	% Solids		84.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-3

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.84
12378-PeCDD	1					J	0.59
123478-HxCDD	0.1					J	0.58
123678-HxCDD	0.1					J	1.3
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						18.1
12346789-OCDD	0.0001						131
2378TCDF	0.1						3.6
12378-PeCDF	0.05					J	2.2
23478-PeCDF	0.5					J	1.5
123478-HxCDF	0.1					J	1.9
123678-HxCDF	0.1					J	0.78
234678-HxCDF	0.1					J	0.79
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01						9.2
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001						10.9
Total TEQ:		Non-Detects = Detection Limit	3.6	% Finer than #200 Sieve		38.20	
		Non-Detects = 1/2 d.l.	3.6	% Total Organic Carbon		3.50	
		Non-Detects = zero	3.6	% Solids		75.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-6

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.9
12378-PeCDD	1					J	0.75
123478-HxCDD	0.1					J	0.71
123678-HxCDD	0.1					J	1.9
123789-HxCDD	0.1					J	1.6
1234678-HpCDD	0.01						21.3
12346789-OCDD	0.0001						144
2378TCDF	0.1						4.5
12378-PeCDF	0.05					J	2.9
23478-PeCDF	0.5					J	1.6
123478-HxCDF	0.1					J	2.4
123678-HxCDF	0.1					J	0.8
234678-HxCDF	0.1					ND	0.8
123789-HxCDF	0.1					J	0.19
1234678-HpCDF	0.01						11.5
1234789-HpCDF	0.01					ND,J	0.5
12346789-OCDF	0.0001						13.7
Total TEQ:		Non-Detects = Detection Limit	5.2	% Finer than #200 Sieve		38.90	
		Non-Detects = 1/2 d.l.	5.2	% Total Organic Carbon		2.50	
		Non-Detects = zero	5.1	% Solids		79.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-15

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					J	3.3
12346789-OCDD	0.0001						21.8
2378TCDF	0.1					ND	0.8
12378-PeCDF	0.05					ND	0.6
23478-PeCDF	0.5					J	0.37
123478-HxCDF	0.1					J	0.52
123678-HxCDF	0.1					J	0.24
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	3
1234789-HpCDF	0.01					ND	0.3
12346789-OCDF	0.0001					J	2.7
Total TEQ:		Non-Detects = Detection Limit	1.0	% Finer than #200 Sieve		39.60	
		Non-Detects = 1/2 d.l.	0.69	% Total Organic Carbon		1.70	
		Non-Detects = zero	0.33	% Solids		79.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-3

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.64
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.5
123678-HxCDD	0.1					J	1.1
123789-HxCDD	0.1					J	1.2
1234678-HpCDD	0.01						16.9
12346789-OCDD	0.0001						151
2378TCDF	0.1						5.2
12378-PeCDF	0.05					J	3
23478-PeCDF	0.5					J	1.7
123478-HxCDF	0.1					J	2.3
123678-HxCDF	0.1					J	0.72
234678-HxCDF	0.1					J	0.74
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						10.6
1234789-HpCDF	0.01					ND	0.8
12346789-OCDF	0.0001						15
Total TEQ:		Non-Detects = Detection Limit	3.5	% Finer than #200 Sieve		50.70	
		Non-Detects = 1/2 d.l.	3.3	% Total Organic Carbon		1.90	
		Non-Detects = zero	3.1	% Solids		81.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-6

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.1
123789-HxCDD	0.1					J	0.15
1234678-HpCDD	0.01					J	2
12346789-OCDD	0.0001						16.4
2378TCDF	0.1						2.5
12378-PeCDF	0.05					J	1.2
23478-PeCDF	0.5					J	0.9
123478-HxCDF	0.1					J	0.79
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					ND	0.09
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	1.4
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	2
Total TEQ:		Non-Detects = Detection Limit	1.2	% Finer than #200 Sieve		54.30	
		Non-Detects = 1/2 d.l.	1.0	% Total Organic Carbon		1.50	
		Non-Detects = zero	0.89	% Solids		76.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-15

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					ND,J	1.9
12346789-OCDD	0.0001						16
2378TCDF	0.1						0.96
12378-PeCDF	0.05					J	0.6
23478-PeCDF	0.5					ND	0.3
123478-HxCDF	0.1					J	0.42
123678-HxCDF	0.1					ND	0.1
234678-HxCDF	0.1					ND	0.1
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					ND	1.1
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	2.6
Total TEQ:		Non-Detects = Detection Limit	0.75	% Finer than #200 Sieve		64.40	
		Non-Detects = 1/2 d.l.	0.46	% Total Organic Carbon		0.83	
		Non-Detects = zero	0.17	% Solids		83.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-3

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.6
12378-PeCDD	1					J	0.42
123478-HxCDD	0.1					J	0.38
123678-HxCDD	0.1					J	1
123789-HxCDD	0.1					J	0.86
1234678-HpCDD	0.01						14.7
12346789-OCDD	0.0001						139
2378TCDF	0.1						11.4
12378-PeCDF	0.05					J	4.4
23478-PeCDF	0.5					J	3.8
123478-HxCDF	0.1					J	3.6
123678-HxCDF	0.1					ND	1.1
234678-HxCDF	0.1					J	0.82
123789-HxCDF	0.1					ND	0.09
1234678-HpCDF	0.01						16.6
1234789-HpCDF	0.01					J	0.71
12346789-OCDF	0.0001						20
Total TEQ:		Non-Detects = Detection Limit	5.4	% Finer than #200 Sieve		50.20	
		Non-Detects = 1/2 d.l.	5.3	% Total Organic Carbon		2.10	
		Non-Detects = zero	5.3	% Solids		79.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-6

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.34
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					J	0.26
123678-HxCDD	0.1					J	0.73
123789-HxCDD	0.1					J	0.58
1234678-HpCDD	0.01						10.4
12346789-OCDD	0.0001						92
2378TCDF	0.1						5.6
12378-PeCDF	0.05					J	3.8
23478-PeCDF	0.5					J	2.3
123478-HxCDF	0.1					J	3.1
123678-HxCDF	0.1					J	0.91
234678-HxCDF	0.1					J	0.63
123789-HxCDF	0.1					ND	0.09
1234678-HpCDF	0.01						14.4
1234789-HpCDF	0.01					J	0.57
12346789-OCDF	0.0001						18.7
Total TEQ:		Non-Detects = Detection Limit	3.4	% Finer than #200 Sieve		50.20	
		Non-Detects = 1/2 d.l.	3.3	% Total Organic Carbon		1.70	
		Non-Detects = zero	3.1	% Solids		76.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-15

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					J	0.18
1234678-HpCDD	0.01					J	2
12346789-OCDD	0.0001						17.8
2378TCDF	0.1						4.6
12378-PeCDF	0.05					J	3.1
23478-PeCDF	0.5					J	1.7
123478-HxCDF	0.1					J	2
123678-HxCDF	0.1					J	0.5
234678-HxCDF	0.1					J	0.29
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	2.9
1234789-HpCDF	0.01					J	0.2
12346789-OCDF	0.0001					J	3
Total TEQ:	Non-Detects = Detection Limit		2.2	% Finer than #200 Sieve		51.20	
	Non-Detects = 1/2 d.l.		2.0	% Total Organic Carbon		0.81	
	Non-Detects = zero		1.8	% Solids		83.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-3

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.4
12378-PeCDD	1					J	1.4
123478-HxCDD	0.1					J	1.2
123678-HxCDD	0.1					J	3.1
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						46.8
12346789-OCDD	0.0001						391
2378TCDF	0.1						44.1
12378-PeCDF	0.05						25.7
23478-PeCDF	0.5						17.6
123478-HxCDF	0.1						21.7
123678-HxCDF	0.1						6
234678-HxCDF	0.1					J	4
123789-HxCDF	0.1					J	0.35
1234678-HpCDF	0.01						65.1
1234789-HpCDF	0.01					J	3.3
12346789-OCDF	0.0001						83.7
Total TEQ:	Non-Detects = Detection Limit		22	% Finer than #200 Sieve		63.60	
	Non-Detects = 1/2 d.l.		22	% Total Organic Carbon		3	
	Non-Detects = zero		22	% Solids		77	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-6

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						2.3
12378-PeCDD	1					J	1.6
123478-HxCDD	0.1					J	1.1
123678-HxCDD	0.1					J	4.8
123789-HxCDD	0.1					J	2.6
1234678-HpCDD	0.01						98.8
12346789-OCDD	0.0001						983
2378TCDF	0.1						55.9
12378-PeCDF	0.05						33.5
23478-PeCDF	0.5						20.8
123478-HxCDF	0.1						26.2
123678-HxCDF	0.1						7.3
234678-HxCDF	0.1						5.2
123789-HxCDF	0.1					J	0.43
1234678-HpCDF	0.01						108
1234789-HpCDF	0.01					J	4.8
12346789-OCDF	0.0001						145
Total TEQ:		Non-Detects = Detection Limit	29	% Finer than #200 Sieve		61.20	
		Non-Detects = 1/2 d.l.	29	% Total Organic Carbon		3.80	
		Non-Detects = zero	29	% Solids		73.00	

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-15

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						4.8
12378-PeCDD	1					J	3.6
123478-HxCDD	0.1					J	2.5
123678-HxCDD	0.1						7.2
123789-HxCDD	0.1					J	5.4
1234678-HpCDD	0.01						94.7
12346789-OCDD	0.0001						746
2378TCDF	0.1						48.8
12378-PeCDF	0.05						32
23478-PeCDF	0.5						21.2
123478-HxCDF	0.1						27.8
123678-HxCDF	0.1						8.3
234678-HxCDF	0.1						7
123789-HxCDF	0.1					J	0.54
1234678-HpCDF	0.01						116
1234789-HpCDF	0.01						5
12346789-OCDF	0.0001						149
Total TEQ:		Non-Detects = Detection Limit	34	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	34	% Total Organic Carbon		NS	
		Non-Detects = zero	34	% Solids		NS	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-3

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		16				16
12378-PeCDD	1		17.6				17.6
123478-HxCDD	0.1		14				14
123678-HxCDD	0.1		88.7				88.7
123789-HxCDD	0.1		35				35
1234678-HpCDD	0.01		1950				1950
12346789-OCDD	0.0001	E	18250		14320		14320
2378TCDF	0.1	E	4480		2690		2690
12378-PeCDF	0.05	E	2290		1610		1610
23478-PeCDF	0.5		1370				1370
123478-HxCDF	0.1		1590				1590
123678-HxCDF	0.1		397				397
234678-HxCDF	0.1		218				218
123789-HxCDF	0.1		28.9				28.9
1234678-HpCDF	0.01	E	2950		1710		1710
1234789-HpCDF	0.01		200				200
12346789-OCDF	0.0001	E	5110		4060		4060
Total TEQ:		Non-Detects = Detection Limit	1300	% Finer than #200 Sieve		67.5	
		Non-Detects = 1/2 d.l.	1300	% Total Organic Carbon		2.8	
		Non-Detects = zero	1300	% Solids		77	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-6

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		18.7				18.7
12378-PeCDD	1		21.8				21.8
123478-HxCDD	0.1		15.4				15.4
123678-HxCDD	0.1		85.2				85.2
123789-HxCDD	0.1		39.9				39.9
1234678-HpCDD	0.01		1370				1370
12346789-OCDD	0.0001	E	13250		12200		12200
2378TCDF	0.1	E	8350		6140		6140
12378-PeCDF	0.05	E	4420		3540		3540
23478-PeCDF	0.5	E	2610		2310		2310
123478-HxCDF	0.1	E	2990		2300		2300
123678-HxCDF	0.1		755				755
234678-HxCDF	0.1		394				394
123789-HxCDF	0.1		67.6				67.6
1234678-HpCDF	0.01	E	2960		2160		2160
1234789-HpCDF	0.01		256				256
12346789-OCDF	0.0001		3990				3990
Total TEQ:		Non-Detects = Detection Limit	2400	% Finer than #200 Sieve		65.3	
		Non-Detects = 1/2 d.l.	2400	% Total Organic Carbon		2	
		Non-Detects = zero	2400	% Solids		81	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-15

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		28.1				28.1
12378-PeCDD	1		29.7				29.7
123478-HxCDD	0.1		60.2				60.2
123678-HxCDD	0.1		352				352
123789-HxCDD	0.1		157				157
1234678-HpCDD	0.01	E	4990		4110		4110
12346789-OCDD	0.0001	E	48330		47950		47950
2378TCDF	0.1	E	6400		4650		4650
12378-PeCDF	0.05	E	3120		2680		2680
23478-PeCDF	0.5		563				563
123478-HxCDF	0.1	E	2840		2080		2080
123678-HxCDF	0.1		678				678
234678-HxCDF	0.1		399				399
123789-HxCDF	0.1		53.5				53.5
1234678-HpCDF	0.01	E	11890		8540		8540
1234789-HpCDF	0.01		566				566
12346789-OCDF	0.0001	E	14930		14360		14360

Total TEQ: Non-Detects = Detection Limit 1500 % Finer than #200 Sieve 49.9
 Non-Detects = 1/2 d.l. 1500 % Total Organic Carbon 1.9
 Non-Detects = zero 1500 % Solids 82

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-3

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.5				5.5
12378-PeCDD	1	J	4.7			J	4.7
123478-HxCDD	0.1	J	3.7			J	3.7
123678-HxCDD	0.1		17.8				17.8
123789-HxCDD	0.1	J	8.6			J	8.6
1234678-HpCDD	0.01		302				302
12346789-OCDD	0.0001		2810				2810
2378TCDF	0.1	E	4600		2570		2570
12378-PeCDF	0.05	E	2360		1570		1570
23478-PeCDF	0.5		1440				1440
123478-HxCDF	0.1		1200				1200
123678-HxCDF	0.1		301				301
234678-HxCDF	0.1		175				175
123789-HxCDF	0.1		25.6				25.6
1234678-HpCDF	0.01		651				651
1234789-HpCDF	0.01		79.2				79.2
12346789-OCDF	0.0001		783				783

Total TEQ: Non-Detects = Detection Limit 1200 % Finer than #200 Sieve 50
 Non-Detects = 1/2 d.l. 1200 % Total Organic Carbon 2.3
 Non-Detects = zero 1200 % Solids 82

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-6

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.6				5.6
12378-PeCDD	1		5				5
123478-HxCDD	0.1	J	4.3			J	4.3
123678-HxCDD	0.1		22.1				22.1
123789-HxCDD	0.1		11				11
1234678-HpCDD	0.01		432				432
12346789-OCDD	0.0001	E	4060		3280		3280
2378TCDF	0.1	E	3600		1820		1820
12378-PeCDF	0.05		1750				1750
23478-PeCDF	0.5		1160				1160
123478-HxCDF	0.1		942				942
123678-HxCDF	0.1		247				247
234678-HxCDF	0.1		141				141
123789-HxCDF	0.1		22.8				22.8
1234678-HpCDF	0.01		849				849
1234789-HpCDF	0.01		75.4				75.4
12346789-OCDF	0.0001		1130				1130

Total TEQ: Non-Detects = Detection Limit 1000 % Finer than #200 Sieve 53.5
 Non-Detects = 1/2 d.l. 1000 % Total Organic Carbon 1.9
 Non-Detects = zero 1000 % Solids 84

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-15

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.8				3.8
12378-PeCDD	1	J	4.2			J	4.2
123478-HxCDD	0.1	J	3.3			J	3.3
123678-HxCDD	0.1		15				15
123789-HxCDD	0.1	J	8.1			J	8.1
1234678-HpCDD	0.01		254				254
12346789-OCDD	0.0001		2380				2380
2378TCDF	0.1	E	2730		2400		2400
12378-PeCDF	0.05		1500				1500
23478-PeCDF	0.5		897				897
123478-HxCDF	0.1		799				799
123678-HxCDF	0.1		198				198
234678-HxCDF	0.1		111				111
123789-HxCDF	0.1		19.6				19.6
1234678-HpCDF	0.01		601				601
1234789-HpCDF	0.01		58.2				58.2
12346789-OCDF	0.0001		655				655

Total TEQ: Non-Detects = Detection Limit 900 % Finer than #200 Sieve 51.9
 Non-Detects = 1/2 d.l. 900 % Total Organic Carbon 1.3
 Non-Detects = zero 900 % Solids 86

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-3

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.4				7.4
12378-PeCDD	1	J	4.9			J	4.9
123478-HxCDD	0.1		5.4				5.4
123678-HxCDD	0.1		23.1				23.1
123789-HxCDD	0.1		12.7				12.7
1234678-HpCDD	0.01		476				476
12346789-OCDD	0.0001	E	4450		3570		3570
2378TCDF	0.1	E	3390		1780		1780
12378-PeCDF	0.05		1770				1770
23478-PeCDF	0.5		1070				1070
123478-HxCDF	0.1		930				930
123678-HxCDF	0.1		229				229
234678-HxCDF	0.1		136				136
123789-HxCDF	0.1		22.4				22.4
1234678-HpCDF	0.01		795				795
1234789-HpCDF	0.01		74.6				74.6
12346789-OCDF	0.0001		1070				1070

Total TEQ:	Non-Detects = Detection Limit	960	% Finer than #200 Sieve	52.7
	Non-Detects = 1/2 d.l.	960	% Total Organic Carbon	2.2
	Non-Detects = zero	960	% Solids	83

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-6

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.6				7.6
12378-PeCDD	1	J	4.7			J	4.7
123478-HxCDD	0.1	J	4.6			J	4.6
123678-HxCDD	0.1		22.3				22.3
123789-HxCDD	0.1		11.4				11.4
1234678-HpCDD	0.01		454				454
12346789-OCDD	0.0001	E	4100		3310		3310
2378TCDF	0.1	E	3660		2030		2030
12378-PeCDF	0.05		1530				1530
23478-PeCDF	0.5		1040				1040
123478-HxCDF	0.1		799				799
123678-HxCDF	0.1		209				209
234678-HxCDF	0.1		122				122
123789-HxCDF	0.1		19				19
1234678-HpCDF	0.01		731				731
1234789-HpCDF	0.01		66.8				66.8
12346789-OCDF	0.0001		1030				1030

Total TEQ:	Non-Detects = Detection Limit	940	% Finer than #200 Sieve	53.3
	Non-Detects = 1/2 d.l.	940	% Total Organic Carbon	2
	Non-Detects = zero	940	% Solids	85

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-15

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3				3
12378-PeCDD	1	ND	2.5			ND	2.5
123478-HxCDD	0.1	J	2.1			J	2.1
123678-HxCDD	0.1		9.5				9.5
123789-HxCDD	0.1	J	4.8			J	4.8
1234678-HpCDD	0.01		199				199
12346789-OCDD	0.0001		2470				2470
2378TCDF	0.1	E	3580		2520		2520
12378-PeCDF	0.05		1800				1800
23478-PeCDF	0.5		1120				1120
123478-HxCDF	0.1		934				934
123678-HxCDF	0.1		229				229
234678-HxCDF	0.1		130				130
123789-HxCDF	0.1		23.8				23.8
1234678-HpCDF	0.01		485				485
1234789-HpCDF	0.01		60.9				60.9
12346789-OCDF	0.0001		605				605

Total TEQ: Non-Detects = Detection Limit 1000 % Finer than #200 Sieve 55.1
 Non-Detects = 1/2 d.l. 1000 % Total Organic Carbon 1.3
 Non-Detects = zero 1000 % Solids 86

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-3

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.7				5.7
12378-PeCDD	1		12.6				12.6
123478-HxCDD	0.1		8.9				8.9
123678-HxCDD	0.1		32.2				32.2
123789-HxCDD	0.1		22.1				22.1
1234678-HpCDD	0.01		487				487
12346789-OCDD	0.0001	E	4300		3210		3210
2378TCDF	0.1	E	2330		1250		1250
12378-PeCDF	0.05		1030				1030
23478-PeCDF	0.5		616				616
123478-HxCDF	0.1		628				628
123678-HxCDF	0.1		154				154
234678-HxCDF	0.1		89				89
123789-HxCDF	0.1		9.9				9.9
1234678-HpCDF	0.01		675				675
1234789-HpCDF	0.01		55.9				55.9
12346789-OCDF	0.0001		1140				1140

Total TEQ: Non-Detects = Detection Limit 610 % Finer than #200 Sieve 85.2
 Non-Detects = 1/2 d.l. 610 % Total Organic Carbon 4
 Non-Detects = zero 610 % Solids 74

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-6

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.3				8.3
12378-PeCDD	1		9.7				9.7
123478-HxCDD	0.1		7				7
123678-HxCDD	0.1		29.6				29.6
123789-HxCDD	0.1		17.4				17.4
1234678-HpCDD	0.01		535				535
12346789-OCDD	0.0001	E	5290	ND	2300	ND	2300
2378TCDF	0.1	E	4240		1050		1050
12378-PeCDF	0.05		1930				1930
23478-PeCDF	0.5		1150				1150
123478-HxCDF	0.1		1160				1160
123678-HxCDF	0.1		282				282
234678-HxCDF	0.1		163				163
123789-HxCDF	0.1		20.4				20.4
1234678-HpCDF	0.01		833				833
1234789-HpCDF	0.01		83.5				83.5
12346789-OCDF	0.0001		1290				1290

Total TEQ: Non-Detects = Detection Limit 980 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 980 % Total Organic Carbon
 Non-Detects = zero 980 % Solids

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-15

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.8				3.8
12378-PeCDD	1		8.3				8.3
123478-HxCDD	0.1		5.6				5.6
123678-HxCDD	0.1		25				25
123789-HxCDD	0.1		13.1				13.1
1234678-HpCDD	0.01		413				413
12346789-OCDD	0.0001	E	4660		3230		3230
2378TCDF	0.1	E	2350		1190		1190
12378-PeCDF	0.05		1170				1170
23478-PeCDF	0.5		711				711
123478-HxCDF	0.1		755				755
123678-HxCDF	0.1		196				196
234678-HxCDF	0.1		109				109
123789-HxCDF	0.1		13.6				13.6
1234678-HpCDF	0.01		808				808
1234789-HpCDF	0.01		66.4				66.4
12346789-OCDF	0.0001		1110				1110

Total TEQ: Non-Detects = Detection Limit 670 % Finer than #200 Sieve 89.3
 Non-Detects = 1/2 d.l. 670 % Total Organic Carbon 2.5
 Non-Detects = zero 670 % Solids 79

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-3

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.2				7.2
12378-PeCDD	1		7.9				7.9
123478-HxCDD	0.1		8.4				8.4
123678-HxCDD	0.1		47.6				47.6
123789-HxCDD	0.1		18.5				18.5
1234678-HpCDD	0.01		1380				1380
12346789-OCDD	0.0001	E	12640		10250		10250
2378TCDF	0.1	E	3400		1850		1850
12378-PeCDF	0.05		1220				1220
23478-PeCDF	0.5		778				778
123478-HxCDF	0.1		741				741
123678-HxCDF	0.1		180				180
234678-HxCDF	0.1		109				109
123789-HxCDF	0.1		13.5				13.5
1234678-HpCDF	0.01		1340				1340
1234789-HpCDF	0.01		93.5				93.5
12346789-OCDF	0.0001	E	5240		4190		4190
Total TEQ:		Non-Detects = Detection Limit	790	% Finer than #200 Sieve		68.9	
		Non-Detects = 1/2 d.l.	790	% Total Organic Carbon		3.4	
		Non-Detects = zero	790	% Solids		79	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-6

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.6				2.6
12378-PeCDD	1	J	4.5			J	4.5
123478-HxCDD	0.1	J	4.4			J	4.4
123678-HxCDD	0.1		18.3				18.3
123789-HxCDD	0.1	J	9.7			J	9.7
1234678-HpCDD	0.01		375				375
12346789-OCDD	0.0001		3480				3480
2378TCDF	0.1	E	2260		1300		1300
12378-PeCDF	0.05		1050				1050
23478-PeCDF	0.5		643				643
123478-HxCDF	0.1		685				685
123678-HxCDF	0.1		160				160
234678-HxCDF	0.1		90.1				90.1
123789-HxCDF	0.1		11.8				11.8
1234678-HpCDF	0.01		614				614
1234789-HpCDF	0.01		56.7				56.7
12346789-OCDF	0.0001		1010				1010
Total TEQ:		Non-Detects = Detection Limit	620	% Finer than #200 Sieve		70.6	
		Non-Detects = 1/2 d.l.	620	% Total Organic Carbon		2.6	
		Non-Detects = zero	620	% Solids		81	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-15

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.1				3.1
12378-PeCDD	1	J	4.6			J	4.6
123478-HxCDD	0.1	J	2.8			J	2.8
123678-HxCDD	0.1		22.2				22.2
123789-HxCDD	0.1	J	8.9			J	8.9
1234678-HpCDD	0.01		358				358
12346789-OCDD	0.0001		2810				2810
2378TCDF	0.1	E	2350		1510		1510
12378-PeCDF	0.05		1010				1010
23478-PeCDF	0.5		646				646
123478-HxCDF	0.1		668				668
123678-HxCDF	0.1		169				169
234678-HxCDF	0.1		92.2				92.2
123789-HxCDF	0.1		11				11
1234678-HpCDF	0.01		647				647
1234789-HpCDF	0.01		67.1				67.1
12346789-OCDF	0.0001		978				978
Total TEQ:		Non-Detects = Detection Limit	640	% Finer than #200 Sieve		73.6	
		Non-Detects = 1/2 d.l.	640	% Total Organic Carbon		2.3	
		Non-Detects = zero	640	% Solids		81	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-3

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.4				3.4
12378-PeCDD	1	J	3.7			J	3.7
123478-HxCDD	0.1	J	2.9			J	2.9
123678-HxCDD	0.1		16.9				16.9
123789-HxCDD	0.1	J	7.4			J	7.4
1234678-HpCDD	0.01		301				301
12346789-OCDD	0.0001		2890				2890
2378TCDF	0.1	E	4310		2460		2460
12378-PeCDF	0.05	E	2100		1450		1450
23478-PeCDF	0.5		1240				1240
123478-HxCDF	0.1		1270				1270
123678-HxCDF	0.1		321				321
234678-HxCDF	0.1		178				178
123789-HxCDF	0.1		26.9				26.9
1234678-HpCDF	0.01		719				719
1234789-HpCDF	0.01		85.5				85.5
12346789-OCDF	0.0001		860				860
Total TEQ:		Non-Detects = Detection Limit	1100	% Finer than #200 Sieve		70	
		Non-Detects = 1/2 d.l.	1100	% Total Organic Carbon		3.0	
		Non-Detects = zero	1100	% Solids		79	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-6

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	2.8			ND	2.8
12378-PeCDD	1	J	4.4			J	4.4
123478-HxCDD	0.1	J	3.3			J	3.3
123678-HxCDD	0.1		29.6				29.6
123789-HxCDD	0.1	J	7.7			J	7.7
1234678-HpCDD	0.01		623				623
12346789-OCDD	0.0001	E	5180		3290		3290
2378TCDF	0.1	E	5370		2180		2180
12378-PeCDF	0.05		2040				2040
23478-PeCDF	0.5		1400				1400
123478-HxCDF	0.1		1190				1190
123678-HxCDF	0.1		291				291
234678-HxCDF	0.1		167				167
123789-HxCDF	0.1		23.6				23.6
1234678-HpCDF	0.01		839				839
1234789-HpCDF	0.01		84				84
12346789-OCDF	0.0001		1580				1580
Total TEQ:		Non-Detects = Detection Limit	1200	% Finer than #200 Sieve		69.9	
		Non-Detects = 1/2 d.l.	1200	% Total Organic Carbon		2.5	
		Non-Detects = zero	1200	% Solids		80	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-15

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND,J	0.8			ND,J	0.8
12378-PeCDD	1	J	0.84			J	0.84
123478-HxCDD	0.1	J	0.49			J	0.49
123678-HxCDD	0.1	J	3.1			J	3.1
123789-HxCDD	0.1	ND,J	1.2			ND,J	1.2
1234678-HpCDD	0.01		47.6				47.6
12346789-OCDD	0.0001		473				473
2378TCDF	0.1	E	2310		1150		1150
12378-PeCDF	0.05		1040				1040
23478-PeCDF	0.5		629				629
123478-HxCDF	0.1		609				609
123678-HxCDF	0.1		143				143
234678-HxCDF	0.1		79.9				79.9
123789-HxCDF	0.1		11.6				11.6
1234678-HpCDF	0.01		160				160
1234789-HpCDF	0.01		31.7				31.7
12346789-OCDF	0.0001		141				141
Total TEQ:		Non-Detects = Detection Limit	570	% Finer than #200 Sieve		84.6	
		Non-Detects = 1/2 d.l.	570	% Total Organic Carbon		2.5	
		Non-Detects = zero	570	% Solids		78	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-1

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.7				9.7
12378-PeCDD	1		8.8				8.8
123478-HxCDD	0.1		6.8				6.8
123678-HxCDD	0.1		58.4				58.4
123789-HxCDD	0.1		19.5				19.5
1234678-HpCDD	0.01		1130				1130
12346789-OCDD	0.0001	E	8540		7640		7640
2378TCDF	0.1	E	4750		3560		3560
12378-PeCDF	0.05	E	2200		2060		2060
23478-PeCDF	0.5		1440				1440
123478-HxCDF	0.1		1410				1410
123678-HxCDF	0.1		343				343
234678-HxCDF	0.1		207				207
123789-HxCDF	0.1		32.3				32.3
1234678-HpCDF	0.01		1670				1670
1234789-HpCDF	0.01		124				124
12346789-OCDF	0.0001		2720				2720

Total TEQ:	Non-Detects = Detection Limit	1400	% Finer than #200 Sieve	NS
	Non-Detects = 1/2 d.l.	1400	% Total Organic Carbon	NS
	Non-Detects = zero	1400	% Solids	NS

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-3

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.2				6.2
12378-PeCDD	1		5.2				5.2
123478-HxCDD	0.1	J	3.7			J	3.7
123678-HxCDD	0.1		28.5				28.5
123789-HxCDD	0.1		10.8				10.8
1234678-HpCDD	0.01		530				530
12346789-OCDD	0.0001	E	4620		3170		3170
2378TCDF	0.1	E	6320		2910		2910
12378-PeCDF	0.05	E	31.6		1830		1830
23478-PeCDF	0.5		1870				1870
123478-HxCDF	0.1		1600				1600
123678-HxCDF	0.1		389				389
234678-HxCDF	0.1		217				217
123789-HxCDF	0.1		23.2				23.2
1234678-HpCDF	0.01		1060				1060
1234789-HpCDF	0.01		107				107
12346789-OCDF	0.0001		1350				1350

Total TEQ:	Non-Detects = Detection Limit	1600	% Finer than #200 Sieve	47.6
	Non-Detects = 1/2 d.l.	1600	% Total Organic Carbon	2.3
	Non-Detects = zero	1600	% Solids	81

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-6

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		11				11
12378-PeCDD	1		9.8				9.8
123478-HxCDD	0.1		7.7				7.7
123678-HxCDD	0.1		45.3				45.3
123789-HxCDD	0.1		20				20
1234678-HpCDD	0.01		948				948
12346789-OCDD	0.0001	E	8110		6970		6970
2378TCDF	0.1	E	6710		4110		4110
12378-PeCDF	0.05	E	3030		2110		2110
23478-PeCDF	0.5		1960				1960
123478-HxCDF	0.1		1670				1670
123678-HxCDF	0.1		418				418
234678-HxCDF	0.1		240				240
123789-HxCDF	0.1		32.6				32.6
1234678-HpCDF	0.01		1730				1730
1234789-HpCDF	0.01		141				141
12346789-OCDF	0.0001		2490				2490

Total TEQ: Non-Detects = Detection Limit 1800 % Finer than #200 Sieve 42.1
 Non-Detects = 1/2 d.l. 1800 % Total Organic Carbon 1.7
 Non-Detects = zero 1800 % Solids 84

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-15

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.6				9.6
12378-PeCDD	1		23.7				23.7
123478-HxCDD	0.1		15.3				15.3
123678-HxCDD	0.1		58.2				58.2
123789-HxCDD	0.1		33				33
1234678-HpCDD	0.01		831				831
12346789-OCDD	0.0001	E	7390		4840		4840
2378TCDF	0.1	E	7990		3130		3130
12378-PeCDF	0.05	E	3680		1760		1760
23478-PeCDF	0.5	E	2290		1180		1180
123478-HxCDF	0.1	E	2020		897		897
123678-HxCDF	0.1		551				551
234678-HxCDF	0.1		305				305
123789-HxCDF	0.1		35.7				35.7
1234678-HpCDF	0.01	E	2350		1220		1220
1234789-HpCDF	0.01		180				180
12346789-OCDF	0.0001		2550				2550

Total TEQ: Non-Detects = Detection Limit 1200 % Finer than #200 Sieve 43.8
 Non-Detects = 1/2 d.l. 1200 % Total Organic Carbon 1.2
 Non-Detects = zero 1200 % Solids 87

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-1

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	6.1			ND	6.1
12378-PeCDD	1		11.3				11.3
123478-HxCDD	0.1		8.9				8.9
123678-HxCDD	0.1		32.8				32.8
123789-HxCDD	0.1		18.8				18.8
1234678-HpCDD	0.01		447				447
12346789-OCDD	0.0001		3380				3380
2378TCDF	0.1	E	1240		1000		1000
12378-PeCDF	0.05		511				511
23478-PeCDF	0.5		329				329
123478-HxCDF	0.1		359				359
123678-HxCDF	0.1		87.9				87.9
234678-HxCDF	0.1		60.2				60.2
123789-HxCDF	0.1		16.7				16.7
1234678-HpCDF	0.01		632				632
1234789-HpCDF	0.01		58.1				58.1
12346789-OCDF	0.0001		1060				1060

Total TEQ:	Non-Detects = Detection Limit	380	% Finer than #200 Sieve	NS
	Non-Detects = 1/2 d.l.	370	% Total Organic Carbon	NS
	Non-Detects = zero	370	% Solids	NS

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-3

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.4				3.4
12378-PeCDD	1	J	1.8			J	1.8
123478-HxCDD	0.1	J	1.4			J	1.4
123678-HxCDD	0.1		13.7				13.7
123789-HxCDD	0.1	J	4.3			J	4.3
1234678-HpCDD	0.01		286				286
12346789-OCDD	0.0001		3290				3290
2378TCDF	0.1	E	3290		1580		1580
12378-PeCDF	0.05		1020				1020
23478-PeCDF	0.5		756				756
123478-HxCDF	0.1		489				489
123678-HxCDF	0.1		115				115
234678-HxCDF	0.1		72.8				72.8
123789-HxCDF	0.1		9.4				9.4
1234678-HpCDF	0.01		344				344
1234789-HpCDF	0.01		33.8				33.8
12346789-OCDF	0.0001		741				741

Total TEQ:	Non-Detects = Detection Limit	670	% Finer than #200 Sieve	21.8
	Non-Detects = 1/2 d.l.	670	% Total Organic Carbon	1.0
	Non-Detects = zero	670	% Solids	85

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-6

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.5				6.5
12378-PeCDD	1	J	4.4			J	4.4
123478-HxCDD	0.1	J	3.2			J	3.2
123678-HxCDD	0.1		25.1				25.1
123789-HxCDD	0.1	J	8.9			J	8.9
1234678-HpCDD	0.01		514				514
12346789-OCDD	0.0001	E	5960		4390		4390
2378TCDF	0.1	E	4570		1960		1960
12378-PeCDF	0.05	E	2100		1100		1100
23478-PeCDF	0.5		1240				1240
123478-HxCDF	0.1		953				953
123678-HxCDF	0.1		214				214
234678-HxCDF	0.1		130				130
123789-HxCDF	0.1		14.8				14.8
1234678-HpCDF	0.01		693				693
1234789-HpCDF	0.01		68.7				68.7
12346789-OCDF	0.0001		1260				1260

Total TEQ: Non-Detects = Detection Limit 1000 % Finer than #200 Sieve 26.4
 Non-Detects = 1/2 d.l. 1000 % Total Organic Carbon 0.6
 Non-Detects = zero 1000 % Solids 87

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-15

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.9				8.9
12378-PeCDD	1		7				7
123478-HxCDD	0.1	J	4.7			J	4.7
123678-HxCDD	0.1		50.7				50.7
123789-HxCDD	0.1		15				15
1234678-HpCDD	0.01		1150				1150
12346789-OCDD	0.0001	S,E	10620		9290		9290
2378TCDF	0.1	E	1170		620		620
12378-PeCDF	0.05		570				570
23478-PeCDF	0.5		373				373
123478-HxCDF	0.1		384				384
123678-HxCDF	0.1		88.8				88.8
234678-HxCDF	0.1		58				58
123789-HxCDF	0.1		7.8				7.8
1234678-HpCDF	0.01		1680				1680
1234789-HpCDF	0.01		78.7				78.7
12346789-OCDF	0.0001		3060				3060

Total TEQ: Non-Detects = Detection Limit 380 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 380 % Total Organic Carbon
 Non-Detects = zero 380 % Solids

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 9-3

Latitude 43.457223750N

Longitude 84.081948587W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6				6
12378-PeCDD	1		5.3				5.3
123478-HxCDD	0.1	J	3.5			J	3.5
123678-HxCDD	0.1		18				18
123789-HxCDD	0.1	J	7.9			J	7.9
1234678-HpCDD	0.01		341				341
12346789-OCDD	0.0001		3150				3150
2378TCDF	0.1	E	1030		387		387
12378-PeCDF	0.05		358				358
23478-PeCDF	0.5		250				250
123478-HxCDF	0.1		198				198
123678-HxCDF	0.1		52.7				52.7
234678-HxCDF	0.1		32.4				32.4
123789-HxCDF	0.1		6				6
1234678-HpCDF	0.01		499				499
1234789-HpCDF	0.01		47.5				47.5
12346789-OCDF	0.0001		870				870

Total TEQ:	Non-Detects = Detection Limit	230	% Finer than #200 Sieve	19.4
	Non-Detects = 1/2 d.l.	230	% Total Organic Carbon	0.7
	Non-Detects = zero	230	% Solids	86

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 9-6

Latitude 43.457223750N

Longitude 84.081948587W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.6				4.6
12378-PeCDD	1	J	3.3			J	3.3
123478-HxCDD	0.1	J	2.1			J	2.1
123678-HxCDD	0.1		16.3				16.3
123789-HxCDD	0.1	J	5.6			J	5.6
1234678-HpCDD	0.01		308				308
12346789-OCDD	0.0001		2660				2660
2378TCDF	0.1	E	2050		1640		1640
12378-PeCDF	0.05		1120				1120
23478-PeCDF	0.5		613				613
123478-HxCDF	0.1		575				575
123678-HxCDF	0.1		136				136
234678-HxCDF	0.1		73.9				73.9
123789-HxCDF	0.1		9.3				9.3
1234678-HpCDF	0.01		496				496
1234789-HpCDF	0.01		51.3				51.3
12346789-OCDF	0.0001		785				785

Total TEQ:	Non-Detects = Detection Limit	630	% Finer than #200 Sieve	15.1
	Non-Detects = 1/2 d.l.	630	% Total Organic Carbon	1.0
	Non-Detects = zero	630	% Solids	88

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-1

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.5				4.5
12378-PeCDD	1	J	4.4			J	4.4
123478-HxCDD	0.1	J	3.2			J	3.2
123678-HxCDD	0.1		14.7				14.7
123789-HxCDD	0.1	J	7.7			J	7.7
1234678-HpCDD	0.01		276				276
12346789-OCDD	0.0001		2770				2770
2378TCDF	0.1	E	1890		1520		1520
12378-PeCDF	0.05		790				790
23478-PeCDF	0.5		534				534
123478-HxCDF	0.1		509				509
123678-HxCDF	0.1		116				116
234678-HxCDF	0.1		77.1				77.1
123789-HxCDF	0.1		11				11
1234678-HpCDF	0.01		576				576
1234789-HpCDF	0.01		45.2				45.2
12346789-OCDF	0.0001		712				712
Total TEQ:		Non-Detects = Detection Limit	550	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	550	% Total Organic Carbon		NS	
		Non-Detects = zero	550	% Solids		NS	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-3

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.8				2.8
12378-PeCDD	1	J	2.9			J	2.9
123478-HxCDD	0.1	J	2.3			J	2.3
123678-HxCDD	0.1		10.2				10.2
123789-HxCDD	0.1	J	5.5			J	5.5
1234678-HpCDD	0.01		187				187
12346789-OCDD	0.0001		1860				1860
2378TCDF	0.1	E	1300		627		627
12378-PeCDF	0.05		539				539
23478-PeCDF	0.5		338				338
123478-HxCDF	0.1		286				286
123678-HxCDF	0.1		78.2				78.2
234678-HxCDF	0.1		43.8				43.8
123789-HxCDF	0.1		5.3				5.3
1234678-HpCDF	0.01		357				357
1234789-HpCDF	0.01		25.8				25.8
12346789-OCDF	0.0001		458				458
Total TEQ:		Non-Detects = Detection Limit	310	% Finer than #200 Sieve		62	
		Non-Detects = 1/2 d.l.	310	% Total Organic Carbon		3.3	
		Non-Detects = zero	310	% Solids		78	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-6

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.5				4.5
12378-PeCDD	1	J	5			J	5
123478-HxCDD	0.1	J	3.7			J	3.7
123678-HxCDD	0.1		18.8				18.8
123789-HxCDD	0.1	J	9.3			J	9.3
1234678-HpCDD	0.01		345				345
12346789-OCDD	0.0001		3820				3820
2378TCDF	0.1	E	1740		746		746
12378-PeCDF	0.05		780				780
23478-PeCDF	0.5		507				507
123478-HxCDF	0.1		465				465
123678-HxCDF	0.1		116				116
234678-HxCDF	0.1		67.6				67.6
123789-HxCDF	0.1		10				10
1234678-HpCDF	0.01		717				717
1234789-HpCDF	0.01		46.6				46.6
12346789-OCDF	0.0001		919				919

Total TEQ:	Non-Detects = Detection Limit	460	% Finer than #200 Sieve	62.7
	Non-Detects = 1/2 d.l.	460	% Total Organic Carbon	2.1
	Non-Detects = zero	460	% Solids	79

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-15

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.2				6.2
12378-PeCDD	1		10.3				10.3
123478-HxCDD	0.1		6.5				6.5
123678-HxCDD	0.1		30.2				30.2
123789-HxCDD	0.1		15.2				15.2
1234678-HpCDD	0.01		485				485
12346789-OCDD	0.0001	E	5050		3610		3610
2378TCDF	0.1	E	1400		635		635
12378-PeCDF	0.05		753				753
23478-PeCDF	0.5		468				468
123478-HxCDF	0.1		473				473
123678-HxCDF	0.1		124				124
234678-HxCDF	0.1		71.5				71.5
123789-HxCDF	0.1		11.5				11.5
1234678-HpCDF	0.01		1180				1180
1234789-HpCDF	0.01		56.4				56.4
12346789-OCDF	0.0001		1410				1410

Total TEQ:	Non-Detects = Detection Limit	440	% Finer than #200 Sieve	66.7
	Non-Detects = 1/2 d.l.	440	% Total Organic Carbon	2.2
	Non-Detects = zero	440	% Solids	66

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-3

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.57
12378-PeCDD	1					J	0.64
123478-HxCDD	0.1					J	0.58
123678-HxCDD	0.1					J	2
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						36.5
12346789-OCDD	0.0001						294
2378TCDF	0.1						110
12378-PeCDF	0.05						59.2
23478-PeCDF	0.5						34
123478-HxCDF	0.1						33.7
123678-HxCDF	0.1						8.3
234678-HxCDF	0.1						5.4
123789-HxCDF	0.1					J	0.68
1234678-HpCDF	0.01						60.7
1234789-HpCDF	0.01					J	3.4
12346789-OCDF	0.0001						67
Total TEQ:		Non-Detects = Detection Limit	38	% Finer than #200 Sieve	17.5		
		Non-Detects = 1/2 d.l.	38	% Total Organic Carbon	2.9		
		Non-Detects = zero	38	% Solids	72		

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-6

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.7
12378-PeCDD	1					J	1.2
123478-HxCDD	0.1					J	0.89
123678-HxCDD	0.1					J	3.4
123789-HxCDD	0.1					J	1.8
1234678-HpCDD	0.01						54.1
12346789-OCDD	0.0001						501
2378TCDF	0.1						118
12378-PeCDF	0.05						54
23478-PeCDF	0.5						31.7
123478-HxCDF	0.1						39
123678-HxCDF	0.1						11.1
234678-HxCDF	0.1						6.5
123789-HxCDF	0.1					J	0.64
1234678-HpCDF	0.01						96.8
1234789-HpCDF	0.01					J	5
12346789-OCDF	0.0001						123
Total TEQ:		Non-Detects = Detection Limit	40	% Finer than #200 Sieve	16.2		
		Non-Detects = 1/2 d.l.	40	% Total Organic Carbon	1.8		
		Non-Detects = zero	40	% Solids	80		

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-15

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					ND	0.5
123789-HxCDD	0.1					ND	0.5
1234678-HpCDD	0.01						11.5
12346789-OCDD	0.0001						107
2378TCDF	0.1						47.7
12378-PeCDF	0.05						24.9
23478-PeCDF	0.5						14.6
123478-HxCDF	0.1						18.3
123678-HxCDF	0.1					J	4.7
234678-HxCDF	0.1					ND,Q	2.8
123789-HxCDF	0.1					J	0.37
1234678-HpCDF	0.01						23.5
1234789-HpCDF	0.01					J	2
12346789-OCDF	0.0001						32.2
Total TEQ:		Non-Detects = Detection Limit	17	% Finer than #200 Sieve		12.7	
		Non-Detects = 1/2 d.l.	17	% Total Organic Carbon		0.62	
		Non-Detects = zero	16	% Solids		81	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-3

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.85
12378-PeCDD	1					ND	0.9
123478-HxCDD	0.1					J	0.99
123678-HxCDD	0.1					J	2.3
123789-HxCDD	0.1					ND	2.2
1234678-HpCDD	0.01						36.6
12346789-OCDD	0.0001						287
2378TCDF	0.1						25.9
12378-PeCDF	0.05						12.6
23478-PeCDF	0.5						8.1
123478-HxCDF	0.1						10.3
123678-HxCDF	0.1					J	3
234678-HxCDF	0.1					J	2.6
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						33.5
1234789-HpCDF	0.01					ND	1.6
12346789-OCDF	0.0001						39.2
Total TEQ:		Non-Detects = Detection Limit	12	% Finer than #200 Sieve		16.6	
		Non-Detects = 1/2 d.l.	11	% Total Organic Carbon		2.2	
		Non-Detects = zero	11	% Solids		82	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-6

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.9
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	1.4
123678-HxCDD	0.1					J	2.8
123789-HxCDD	0.1					J	1.9
1234678-HpCDD	0.01						39.2
12346789-OCDD	0.0001						297
2378TCDF	0.1						29.4
12378-PeCDF	0.05						15.1
23478-PeCDF	0.5						10
123478-HxCDF	0.1						12.1
123678-HxCDF	0.1					ND	3.3
234678-HxCDF	0.1					J	2.9
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						36.6
1234789-HpCDF	0.01					ND	1.7
12346789-OCDF	0.0001						48
Total TEQ:		Non-Detects = Detection Limit	13	% Finer than #200 Sieve		16.6	
		Non-Detects = 1/2 d.l.	12	% Total Organic Carbon		1.9	
		Non-Detects = zero	12	% Solids		84	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-15

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.6
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.64
123678-HxCDD	0.1					ND	1.5
123789-HxCDD	0.1					J	1.7
1234678-HpCDD	0.01						18.3
12346789-OCDD	0.0001						129
2378TCDF	0.1						15.1
12378-PeCDF	0.05						8.1
23478-PeCDF	0.5					ND	5.2
123478-HxCDF	0.1						7.1
123678-HxCDF	0.1					ND	2.1
234678-HxCDF	0.1					J	1.8
123789-HxCDF	0.1					ND	0.4
1234678-HpCDF	0.01						19.7
1234789-HpCDF	0.01					J	1.4
12346789-OCDF	0.0001						25.3
Total TEQ:		Non-Detects = Detection Limit	7.4	% Finer than #200 Sieve		15.5	
		Non-Detects = 1/2 d.l.	5.4	% Total Organic Carbon		0.83	
		Non-Detects = zero	3.4	% Solids		88	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 13-3

Latitude 43.458193350N

Longitude 84.077260317W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.8
12378-PeCDD	1					J	0.79
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					J	1.1
123789-HxCDD	0.1					J	1.5
1234678-HpCDD	0.01						16.5
12346789-OCDD	0.0001						129
2378TCDF	0.1						7.8
12378-PeCDF	0.05					J	3.9
23478-PeCDF	0.5					J,B	2.7
123478-HxCDF	0.1					J,B	3.6
123678-HxCDF	0.1					J	1.3
234678-HxCDF	0.1					J	1.2
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						14.1
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001						21.2
Total TEQ:		Non-Detects = Detection Limit	5.2	% Finer than #200 Sieve		27	
		Non-Detects = 1/2 d.l.	5.2	% Total Organic Carbon		1.8	
		Non-Detects = zero	5.1	% Solids		83	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 13-6

Latitude 43.458193350N

Longitude 84.077260317W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.79
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.52
123678-HxCDD	0.1					J	1.4
123789-HxCDD	0.1					J	1.5
1234678-HpCDD	0.01						16.1
12346789-OCDD	0.0001						116
2378TCDF	0.1						8.3
12378-PeCDF	0.05					J	4.1
23478-PeCDF	0.5					J	3.1
123478-HxCDF	0.1					J	3.9
123678-HxCDF	0.1					ND	1.1
234678-HxCDF	0.1					J	0.91
123789-HxCDF	0.1					ND	0.4
1234678-HpCDF	0.01						12.2
1234789-HpCDF	0.01					J	0.73
12346789-OCDF	0.0001						16.4
Total TEQ:		Non-Detects = Detection Limit	5.1	% Finer than #200 Sieve		25.9	
		Non-Detects = 1/2 d.l.	4.8	% Total Organic Carbon		1.5	
		Non-Detects = zero	4.5	% Solids		83	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 13-15

Latitude 43.458193350N

Longitude 84.077260317W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.5
12378-PeCDD	1					ND	0.6
123478-HxCDD	0.1					ND	0.7
123678-HxCDD	0.1					J	0.89
123789-HxCDD	0.1					ND	0.7
1234678-HpCDD	0.01						7.9
12346789-OCDD	0.0001						48.7
2378TCDF	0.1						5.1
12378-PeCDF	0.05					J	2.9
23478-PeCDF	0.5					J	1.8
123478-HxCDF	0.1					J	2.6
123678-HxCDF	0.1					J	0.79
234678-HxCDF	0.1					J	0.7
123789-HxCDF	0.1					ND	0.7
1234678-HpCDF	0.01						7.5
1234789-HpCDF	0.01					ND	1
12346789-OCDF	0.0001					J	6.9
Total TEQ:		Non-Detects = Detection Limit	3.5	% Finer than #200 Sieve		24.5	
		Non-Detects = 1/2 d.l.	2.9	% Total Organic Carbon		1.3	
		Non-Detects = zero	2.2	% Solids		86	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-3

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						13.6
12378-PeCDD	1					ND,J	1.4
123478-HxCDD	0.1					ND,J	1.5
123678-HxCDD	0.1					J	4.1
123789-HxCDD	0.1					J	3
1234678-HpCDD	0.01						56.7
12346789-OCDD	0.0001						404
2378TCDF	0.1						58.8
12378-PeCDF	0.05						28.6
23478-PeCDF	0.5						18.3
123478-HxCDF	0.1						22
123678-HxCDF	0.1						8.5
234678-HxCDF	0.1						8.1
123789-HxCDF	0.1					ND,J	0.6
1234678-HpCDF	0.01						47.6
1234789-HpCDF	0.01					J	3.5
12346789-OCDF	0.0001						79.2
Total TEQ:		Non-Detects = Detection Limit	37	% Finer than #200 Sieve		21	
		Non-Detects = 1/2 d.l.	37	% Total Organic Carbon		2.5	
		Non-Detects = zero	36	% Solids		70	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-6

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						11
12378-PeCDD	1					ND,J	1.4
123478-HxCDD	0.1					ND,J	0.9
123678-HxCDD	0.1					J	2.5
123789-HxCDD	0.1					J	2
1234678-HpCDD	0.01						24.7
12346789-OCDD	0.0001						196
2378TCDF	0.1						28.5
12378-PeCDF	0.05						14.2
23478-PeCDF	0.5						10
123478-HxCDF	0.1						11.6
123678-HxCDF	0.1					J	4.7
234678-HxCDF	0.1					J	4.6
123789-HxCDF	0.1					ND,J	0.4
1234678-HpCDF	0.01						22.8
1234789-HpCDF	0.01					J	1.6
12346789-OCDF	0.0001						33.3
Total TEQ:		Non-Detects = Detection Limit	24	% Finer than #200 Sieve		11.8	
		Non-Detects = 1/2 d.l.	23	% Total Organic Carbon		1.7	
		Non-Detects = zero	23	% Solids		78	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-15

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND,J	0.7
12378-PeCDD	1					J	0.61
123478-HxCDD	0.1					ND	0.8
123678-HxCDD	0.1					J	1.3
123789-HxCDD	0.1					J	1.1
1234678-HpCDD	0.01						12.2
12346789-OCDD	0.0001						75.1
2378TCDF	0.1						32.3
12378-PeCDF	0.05						17.4
23478-PeCDF	0.5						11.5
123478-HxCDF	0.1						12.6
123678-HxCDF	0.1					J	4.7
234678-HxCDF	0.1					J	4.5
123789-HxCDF	0.1					ND	0.8
1234678-HpCDF	0.01						13.5
1234789-HpCDF	0.01						1.8
12346789-OCDF	0.0001						13
Total TEQ:		Non-Detects = Detection Limit	14	% Finer than #200 Sieve		14.4	
		Non-Detects = 1/2 d.l.	14	% Total Organic Carbon		0.87	
		Non-Detects = zero	13	% Solids		82	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 1-1

Latitude 43 24 30.23712

Longitude 84 05 50.46183

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.64
12378-PeCDD	1					J	0.9
123478-HxCDD	0.1					ND	0.6
123678-HxCDD	0.1					J	1.5
123789-HxCDD	0.1					J	2
1234678-HpCDD	0.01						22
12346789-OCDD	0.0001						139
2378TCDF	0.1						2.5
12378-PeCDF	0.05					J	1.5
23478-PeCDF	0.5					J	1.5
123478-HxCDF	0.1					J	2.7
123678-HxCDF	0.1					ND	1.1
234678-HxCDF	0.1					J	1.4
123789-HxCDF	0.1					J	0.39
1234678-HpCDF	0.01						13.1
1234789-HpCDF	0.01					J	0.94
12346789-OCDF	0.0001						22.5
Total TEQ:		Non-Detects = Detection Limit	4.0	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	3.9	% Total Organic Carbon		NS	
		Non-Detects = zero	3.8	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 1-3

Latitude 43 24 30.23712

Longitude 84 05 50.46183

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.85
12378-PeCDD	1					J	1.2
123478-HxCDD	0.1					J	0.57
123678-HxCDD	0.1					J	1.9
123789-HxCDD	0.1					J	1.9
1234678-HpCDD	0.01						22.6
12346789-OCDD	0.0001						140
2378TCDF	0.1						2.2
12378-PeCDF	0.05					ND	0.2
23478-PeCDF	0.5					J	1.5
123478-HxCDF	0.1					J	2.7
123678-HxCDF	0.1					J	1.2
234678-HxCDF	0.1					J	1.9
123789-HxCDF	0.1					J	0.43
1234678-HpCDF	0.01						13.6
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001						17
Total TEQ:		Non-Detects = Detection Limit	4.5	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	4.5	% Total Organic Carbon		NS	
		Non-Detects = zero	4.5	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 1-6

Latitude 43 24 30.23712

Longitude 84 05 50.46183

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	0.54
123789-HxCDD	0.1					ND	0.5
1234678-HpCDD	0.01					J	4
12346789-OCDD	0.0001					B	26
2378TCDF	0.1						2.9
12378-PeCDF	0.05					ND	0.3
23478-PeCDF	0.5					J	1.3
123478-HxCDF	0.1					J	1.8
123678-HxCDF	0.1					J	0.49
234678-HxCDF	0.1					ND	0.6
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01					J	3.1
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					J	2.4
Total TEQ:		Non-Detects = Detection Limit	2.3	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	1.8	% Total Organic Carbon		NS	
		Non-Detects = zero	1.3	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 1-15

Latitude 43 24 30.23712

Longitude 84 05 50.46183

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.3
1234678-HpCDD	0.01					J	0.92
12346789-OCDD	0.0001					JB	5.8
2378TCDF	0.1					ND	1
12378-PeCDF	0.05					J	0.6
23478-PeCDF	0.5					J	0.49
123478-HxCDF	0.1					J	0.69
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	2.4
1234789-HpCDF	0.01					ND	0.3
12346789-OCDF	0.0001					ND	1.6
Total TEQ:		Non-Detects = Detection Limit	1.2	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	0.8	% Total Organic Carbon		NS	
		Non-Detects = zero	0.38	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 2-1

Latitude 43 24 30.09319

Longitude 84 05 52.13361

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.1
12378-PeCDD	1					ND	1
123478-HxCDD	0.1					J	1.1
123678-HxCDD	0.1					J	2
123789-HxCDD	0.1					J	2.9
1234678-HpCDD	0.01						40.6
12346789-OCDD	0.0001						311
2378TCDF	0.1						1.7
12378-PeCDF	0.05					ND	0.4
23478-PeCDF	0.5					J	1.1
123478-HxCDF	0.1					ND	2.4
123678-HxCDF	0.1					ND	1.1
234678-HxCDF	0.1					J	1.4
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						14.3
1234789-HpCDF	0.01					J	0.98
12346789-OCDF	0.0001						30.9
Total TEQ:		Non-Detects = Detection Limit	4.6	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	3.9	% Total Organic Carbon		NS	
		Non-Detects = zero	3.2	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 2-3

Latitude 43 24 30.09319

Longitude 84 05 52.13361

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	1.9
123478-HxCDD	0.1					J	0.91
123678-HxCDD	0.1					J	1.9
123789-HxCDD	0.1					ND	2.2
1234678-HpCDD	0.01						33
12346789-OCDD	0.0001						210
2378TCDF	0.1					J	0.99
12378-PeCDF	0.05					ND	0.3
23478-PeCDF	0.5					J	0.95
123478-HxCDF	0.1					J	1.9
123678-HxCDF	0.1					J	0.88
234678-HxCDF	0.1					ND	1.2
123789-HxCDF	0.1					ND	0.4
1234678-HpCDF	0.01						10.8
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001						12.5
Total TEQ:		Non-Detects = Detection Limit	4.3	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	2.9	% Total Organic Carbon		NS	
		Non-Detects = zero	1.6	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 2-6

Latitude 43 24 30.09319

Longitude 84 05 52.13361

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.5
123478-HxCDD	0.1					ND	0.4
123678-HxCDD	0.1					ND	0.4
123789-HxCDD	0.1					ND	0.4
1234678-HpCDD	0.01					J	3.4
12346789-OCDD	0.0001					B	21.2
2378TCDF	0.1					ND	0.3
12378-PeCDF	0.05					ND	0.3
23478-PeCDF	0.5					ND	0.3
123478-HxCDF	0.1					J	0.39
123678-HxCDF	0.1					ND	0.3
234678-HxCDF	0.1					ND	0.3
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01					ND	1.6
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001					J	1.3
Total TEQ:		Non-Detects = Detection Limit	1.4	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	0.74	% Total Organic Carbon		NS	
		Non-Detects = zero	0.075	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 2-15

Latitude 43 24 30.09319

Longitude 84 05 52.13361

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.1
123678-HxCDD	0.1					ND	0.1
123789-HxCDD	0.1					ND	0.1
1234678-HpCDD	0.01					J	0.7
12346789-OCDD	0.0001					J,B	5.6
2378TCDF	0.1					ND	0.1
12378-PeCDF	0.05					ND	0.1
23478-PeCDF	0.5					ND	0.1
123478-HxCDF	0.1					ND	0.1
123678-HxCDF	0.1					ND	0.1
234678-HxCDF	0.1					ND	0.09
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	0.39
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	0.37
Total TEQ:		Non-Detects = Detection Limit	0.55	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	0.28	% Total Organic Carbon		NS	
		Non-Detects = zero	0.011	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 3-1

Latitude 43 24 29.54323

Longitude 84 02 53.78963

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.2
12378-PeCDD	1					ND	1.2
123478-HxCDD	0.1					ND	1
123678-HxCDD	0.1					J	2.1
123789-HxCDD	0.1					J	2.2
1234678-HpCDD	0.01						26.1
12346789-OCDD	0.0001						190
2378TCDF	0.1						2.1
12378-PeCDF	0.05					ND	0.2
23478-PeCDF	0.5					ND	1.6
123478-HxCDF	0.1					J	2.9
123678-HxCDF	0.1					J	0.91
234678-HxCDF	0.1					ND	1.1
123789-HxCDF	0.1					J	0.36
1234678-HpCDF	0.01						12.4
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001						15.8
Total TEQ:		Non-Detects = Detection Limit	4.9	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	3.8	% Total Organic Carbon		NS	
		Non-Detects = zero	2.7	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 3-3

Latitude 43 24 29.54323

Longitude 84 02 53.78963

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	1
12378-PeCDD	1					J	1.3
123478-HxCDD	0.1					J	1
123678-HxCDD	0.1					J	2.1
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						27.8
12346789-OCDD	0.0001						177
2378TCDF	0.1						2.3
12378-PeCDF	0.05					ND	0.2
23478-PeCDF	0.5					J	1.5
123478-HxCDF	0.1					J	3.1
123678-HxCDF	0.1					J	1.1
234678-HxCDF	0.1					J	1.3
123789-HxCDF	0.1					J	0.69
1234678-HpCDF	0.01						13.5
1234789-HpCDF	0.01					J	0.86
12346789-OCDF	0.0001						15.4
Total TEQ:		Non-Detects = Detection Limit	4.9	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	4.4	% Total Organic Carbon		NS	
		Non-Detects = zero	3.9	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 3-6

Latitude 43 24 29.54323

Longitude 84 02 53.78963

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.9
12378-PeCDD	1					J	0.97
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					J	1.3
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						14.4
12346789-OCDD	0.0001						91.9
2378TCDF	0.1						2.1
12378-PeCDF	0.05					PR,ND	0.6
23478-PeCDF	0.5					J	1.1
123478-HxCDF	0.1					J	2.1
123678-HxCDF	0.1					J	0.76
234678-HxCDF	0.1					J	0.96
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01						8.4
1234789-HpCDF	0.01					J	0.61
12346789-OCDF	0.0001					J	7.5
Total TEQ:		Non-Detects = Detection Limit	3.6	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	3.1	% Total Organic Carbon		NS	
		Non-Detects = zero	2.6	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 3-15

Latitude 43 24 29.54323

Longitude 84 02 53.78963

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.5
12378-PeCDD	1					ND	0.6
123478-HxCDD	0.1					ND	0.5
123678-HxCDD	0.1					ND	0.5
123789-HxCDD	0.1					ND	0.5
1234678-HpCDD	0.01					J	3.3
12346789-OCDD	0.0001						30.5
2378TCDF	0.1					ND	0.4
12378-PeCDF	0.05					ND	0.4
23478-PeCDF	0.5					ND	0.4
123478-HxCDF	0.1					ND	0.5
123678-HxCDF	0.1					ND	0.3
234678-HxCDF	0.1					ND	0.3
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01					J	1.8
1234789-HpCDF	0.01					ND	0.6
12346789-OCDF	0.0001					ND	2.1
Total TEQ:		Non-Detects = Detection Limit	1.7	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	0.89	% Total Organic Carbon		NS	
		Non-Detects = zero	0.054	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 4-1

Latitude 43 24 28.39358

Longitude 84 02 56.44961

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					J	0.3
123678-HxCDD	0.1					ND	0.7
123789-HxCDD	0.1					J	0.71
1234678-HpCDD	0.01						9.2
12346789-OCDD	0.0001						56.5
2378TCDF	0.1						10.8
12378-PeCDF	0.05						7.2
23478-PeCDF	0.5						5.1
123478-HxCDF	0.1						5.7
123678-HxCDF	0.1					J	1.3
234678-HxCDF	0.1					J	0.95
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						11.1
1234789-HpCDF	0.01					J	0.63
12346789-OCDF	0.0001					J	8.2
Total TEQ:		Non-Detects = Detection Limit	5.8	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	5.4	% Total Organic Carbon		NS	
		Non-Detects = zero	5.1	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 4-3

Latitude 43 24 28.39358

Longitude 84 02 56.44961

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.4
123678-HxCDD	0.1					ND	0.4
123789-HxCDD	0.1					ND	0.4
1234678-HpCDD	0.01					J	4
12346789-OCDD	0.0001						29.9
2378TCDF	0.1						4
12378-PeCDF	0.05					PR,X	4.7
23478-PeCDF	0.5					J	1.9
123478-HxCDF	0.1					J	2
123678-HxCDF	0.1					ND	0.5
234678-HxCDF	0.1					J	0.36
123789-HxCDF	0.1					ND	0.4
1234678-HpCDF	0.01						8.9
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001					J	7.4
Total TEQ:		Non-Detects = Detection Limit	3.0	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	2.5	% Total Organic Carbon		NS	
		Non-Detects = zero	2.0	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 4-6

Latitude 43 24 28.39358

Longitude 84 02 56.44961

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					J	0.9
12346789-OCDD	0.0001					J	7.3
2378TCDF	0.1						2.3
12378-PeCDF	0.05					PR,J	1.8
23478-PeCDF	0.5					J	0.96
123478-HxCDF	0.1					J	1.1
123678-HxCDF	0.1					J	0.25
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	2.3
1234789-HpCDF	0.01					ND	0.3
12346789-OCDF	0.0001					J	1.9
Total TEQ:		Non-Detects = Detection Limit	1.7	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	1.3	% Total Organic Carbon		NS	
		Non-Detects = zero	0.97	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 4-15

Latitude 43 24 28.39358

Longitude 84 02 56.44961

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	0.3
123789-HxCDD	0.1					ND	0.3
1234678-HpCDD	0.01					ND	0.5
12346789-OCDD	0.0001					J	2
2378TCDF	0.1					ND	0.3
12378-PeCDF	0.05					ND	0.3
23478-PeCDF	0.5					ND	0.3
123478-HxCDF	0.1					ND	0.2
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01					ND	0.3
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					ND	0.5
Total TEQ:		Non-Detects = Detection Limit	1.2	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	0.59	% Total Organic Carbon		NS	
		Non-Detects = zero	0.0002	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 5-1

Latitude 43 24 30.09365

Longitude 84 03 00.82655

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.7
12378-PeCDD	1					ND	0.8
123478-HxCDD	0.1					ND	0.6
123678-HxCDD	0.1					J	1
123789-HxCDD	0.1					J	1.3
1234678-HpCDD	0.01						19.3
12346789-OCDD	0.0001						116
2378TCDF	0.1						1.6
12378-PeCDF	0.05					ND	1.5
23478-PeCDF	0.5					J	0.84
123478-HxCDF	0.1					J	1.7
123678-HxCDF	0.1					ND	0.4
234678-HxCDF	0.1					ND	0.4
123789-HxCDF	0.1					ND	0.6
1234678-HpCDF	0.01						7.7
1234789-HpCDF	0.01					ND	0.8
12346789-OCDF	0.0001					J	9.5
Total TEQ:		Non-Detects = Detection Limit	3.0	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	2.2	% Total Organic Carbon		NS	
		Non-Detects = zero	1.3	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 5-3

Latitude 43 24 30.09365

Longitude 84 03 00.82655

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.38
123678-HxCDD	0.1					J	1.1
123789-HxCDD	0.1					J	1.2
1234678-HpCDD	0.01						18.9
12346789-OCDD	0.0001						122
2378TCDF	0.1						8.9
12378-PeCDF	0.05					PR	7.2
23478-PeCDF	0.5					J	5
123478-HxCDF	0.1						5.9
123678-HxCDF	0.1					J	1.3
234678-HxCDF	0.1					J	1.1
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01						6.7
1234789-HpCDF	0.01					J	0.65
12346789-OCDF	0.0001					J	7.3
Total TEQ:		Non-Detects = Detection Limit	5.9	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	5.5	% Total Organic Carbon		NS	
		Non-Detects = zero	5.1	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 5-6

Latitude 43 24 30.09365

Longitude 84 03 00.82655

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.5
12378-PeCDD	1					J	0.58
123478-HxCDD	0.1					J	0.35
123678-HxCDD	0.1					ND	0.9
123789-HxCDD	0.1					J	1
1234678-HpCDD	0.01						14.4
12346789-OCDD	0.0001						81.1
2378TCDF	0.1						2.1
12378-PeCDF	0.05					PR,X	3.1
23478-PeCDF	0.5					J	1.1
123478-HxCDF	0.1					J	1.9
123678-HxCDF	0.1					J	0.53
234678-HxCDF	0.1					J	0.65
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01						7
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001						12.6
Total TEQ:		Non-Detects = Detection Limit	2.8	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	2.5	% Total Organic Carbon		NS	
		Non-Detects = zero	2.2	% Solids		NS	

PHASE II - SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY SOIL SAMPLES

SES 5-15

Latitude 43 24 30.09365

Longitude 84 03 00.82655

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.7
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.4
123678-HxCDD	0.1					J	0.8
123789-HxCDD	0.1					J	0.93
1234678-HpCDD	0.01						10.9
12346789-OCDD	0.0001						68.2
2378TCDF	0.1						1.4
12378-PeCDF	0.05					PR,X	2.3
23478-PeCDF	0.5					J	0.67
123478-HxCDF	0.1					J	1.6
123678-HxCDF	0.1					J	0.59
234678-HxCDF	0.1					J	0.7
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01						7
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					J	6.6
Total TEQ:		Non-Detects = Detection Limit	2.3	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	1.8	% Total Organic Carbon		NS	
		Non-Detects = zero	1.2	% Solids		NS	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-1

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.6				9.6
12378-PeCDD	1		7.3				7.3
123478-HxCDD	0.1	J	4.9			J	4.9
123678-HxCDD	0.1		23				23
123789-HxCDD	0.1		11.5				11.5
1234678-HpCDD	0.01		399				399
12346789-OCDD	0.0001		3650				3650
2378TCDF	0.1	E	1320		851		851
12378-PeCDF	0.05		923				923
23478-PeCDF	0.5		455				455
123478-HxCDF	0.1		492				492
123678-HxCDF	0.1		117				117
234678-HxCDF	0.1		65.3				65.3
123789-HxCDF	0.1		10.8				10.8
1234678-HpCDF	0.01		626				626
1234789-HpCDF	0.01		42.3				42.3
12346789-OCDF	0.0001		883				883
Total TEQ:		Non-Detects = Detection Limit	460	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	460	% Total Organic Carbon		NS	
		Non-Detects = zero	460	% Solids		NS	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-3

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.5				9.5
12378-PeCDD	1		8.3				8.3
123478-HxCDD	0.1	J	4.6			J	4.6
123678-HxCDD	0.1		23.2				23.2
123789-HxCDD	0.1		11.4				11.4
1234678-HpCDD	0.01		532				532
12346789-OCDD	0.0001	E	5020		4480		4480
2378TCDF	0.1	E	851		475		475
12378-PeCDF	0.05		427				427
23478-PeCDF	0.5		252				252
123478-HxCDF	0.1		272				272
123678-HxCDF	0.1		69.6				69.6
234678-HxCDF	0.1		40.2				40.2
123789-HxCDF	0.1		6.5				6.5
1234678-HpCDF	0.01		647				647
1234789-HpCDF	0.01		39.2				39.2
12346789-OCDF	0.0001		1200				1200
Total TEQ:		Non-Detects = Detection Limit	270	% Finer than #200 Sieve		60.8	
		Non-Detects = 1/2 d.l.	270	% Total Organic Carbon		2.6	
		Non-Detects = zero	270	% Solids		77	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-6

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		15				15
12378-PeCDD	1		12.6				12.6
123478-HxCDD	0.1		7.4				7.4
123678-HxCDD	0.1		45.2				45.2
123789-HxCDD	0.1		18.5				18.5
1234678-HpCDD	0.01		951				951
12346789-OCDD	0.0001	E	8430		6340		6340
2378TCDF	0.1	E	1010		610		610
12378-PeCDF	0.05		527				527
23478-PeCDF	0.5		313				313
123478-HxCDF	0.1		358				358
123678-HxCDF	0.1		91.3				91.3
234678-HxCDF	0.1		54.3				54.3
123789-HxCDF	0.1		10.5				10.5
1234678-HpCDF	0.01		1040				1040
1234789-HpCDF	0.01		58.3				58.3
12346789-OCDF	0.0001		2190				2190
Total TEQ:		Non-Detects = Detection Limit	350	% Finer than #200 Sieve		55.2	
		Non-Detects = 1/2 d.l.	350	% Total Organic Carbon		2.2	
		Non-Detects = zero	350	% Solids		62	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-15

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		32.8				32.8
12378-PeCDD	1		22.5				22.5
123478-HxCDD	0.1		9.2				9.2
123678-HxCDD	0.1		63				63
123789-HxCDD	0.1		27.3				27.3
1234678-HpCDD	0.01		1490				1490
12346789-OCDD	0.0001	E	12890		12940		12940
2378TCDF	0.1	E	1310		836		836
12378-PeCDF	0.05		557				557
23478-PeCDF	0.5		361				361
123478-HxCDF	0.1		375				375
123678-HxCDF	0.1		97.4				97.4
234678-HxCDF	0.1		64.7				64.7
123789-HxCDF	0.1		9.9				9.9
1234678-HpCDF	0.01		1790				1790
1234789-HpCDF	0.01		73.7				73.7
12346789-OCDF	0.0001		3400				3400
Total TEQ:		Non-Detects = Detection Limit	450	% Finer than #200 Sieve		62.7	
		Non-Detects = 1/2 d.l.	450	% Total Organic Carbon		1.3	
		Non-Detects = zero	450	% Solids		77	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-1

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.6				5.6
12378-PeCDD	1		7.4				7.4
123478-HxCDD	0.1		5.8				5.8
123678-HxCDD	0.1		24.2				24.2
123789-HxCDD	0.1		12.3				12.3
1234678-HpCDD	0.01		370				370
12346789-OCDD	0.0001		3650				3650
2378TCDF	0.1	E	1710		935		935
12378-PeCDF	0.05		848				848
23478-PeCDF	0.5		522				522
123478-HxCDF	0.1		552				552
123678-HxCDF	0.1		132				132
234678-HxCDF	0.1		75.3				75.3
123789-HxCDF	0.1		12.7				12.7
1234678-HpCDF	0.01		1080				1080
1234789-HpCDF	0.01		71.5				71.5
12346789-OCDF	0.0001		1450				1450
Total TEQ:		Non-Detects = Detection Limit	510	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	510	% Total Organic Carbon		NS	
		Non-Detects = zero	510	% Solids		NS	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-3

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.9				6.9
12378-PeCDD	1		7.1				7.1
123478-HxCDD	0.1	J	4.6			J	4.6
123678-HxCDD	0.1		24.5				24.5
123789-HxCDD	0.1		12.2				12.2
1234678-HpCDD	0.01		473				473
12346789-OCDD	0.0001	E	4470		3690		3690
2378TCDF	0.1	E	1400		878		878
12378-PeCDF	0.05		671				671
23478-PeCDF	0.5		408				408
123478-HxCDF	0.1		454				454
123678-HxCDF	0.1		116				116
234678-HxCDF	0.1		59.6				59.6
123789-HxCDF	0.1		11.3				11.3
1234678-HpCDF	0.01		811				811
1234789-HpCDF	0.01		54.5				54.5
12346789-OCDF	0.0001		1120				1120
Total TEQ:		Non-Detects = Detection Limit	420	% Finer than #200 Sieve		57.8	
		Non-Detects = 1/2 d.l.	420	% Total Organic Carbon		3.4	
		Non-Detects = zero	420	% Solids		71	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-6

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.7				7.7
12378-PeCDD	1		8.7				8.7
123478-HxCDD	0.1		6.7				6.7
123678-HxCDD	0.1		34.1				34.1
123789-HxCDD	0.1		15.5				15.5
1234678-HpCDD	0.01		679				679
12346789-OCDD	0.0001	E	6430		5470		5470
2378TCDF	0.1	E	2260		1390		1390
12378-PeCDF	0.05		1110				1110
23478-PeCDF	0.5		662				662
123478-HxCDF	0.1		701				701
123678-HxCDF	0.1		173				173
234678-HxCDF	0.1		97.5				97.5
123789-HxCDF	0.1		15.9				15.9
1234678-HpCDF	0.01		1640				1640
1234789-HpCDF	0.01		83.4				83.4
12346789-OCDF	0.0001		1930				1930
Total TEQ:		Non-Detects = Detection Limit	670	% Finer than #200 Sieve		62.3	
		Non-Detects = 1/2 d.l.	670	% Total Organic Carbon		2.1	
		Non-Detects = zero	670	% Solids		79	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-15

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.5				3.5
12378-PeCDD	1		5.1				5.1
123478-HxCDD	0.1	J	3.2			J	3.2
123678-HxCDD	0.1		16.1				16.1
123789-HxCDD	0.1	J	7.1			J	7.1
1234678-HpCDD	0.01		272				272
12346789-OCDD	0.0001		2830				2830
2378TCDF	0.1	E	1310		318		318
12378-PeCDF	0.05		643				643
23478-PeCDF	0.5		391				391
123478-HxCDF	0.1		400				400
123678-HxCDF	0.1		102				102
234678-HxCDF	0.1		54.9				54.9
123789-HxCDF	0.1		8.9				8.9
1234678-HpCDF	0.01		575				575
1234789-HpCDF	0.01		37				37
12346789-OCDF	0.0001		624				624
Total TEQ:		Non-Detects = Detection Limit	340	% Finer than #200 Sieve		61	
		Non-Detects = 1/2 d.l.	340	% Total Organic Carbon		1.7	
		Non-Detects = zero	340	% Solids		81	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-1

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.3				5.3
12378-PeCDD	1	J	4.8			J	4.8
123478-HxCDD	0.1	J	4.3			J	4.3
123678-HxCDD	0.1		19.5				19.5
123789-HxCDD	0.1		11.1				11.1
1234678-HpCDD	0.01		261				261
12346789-OCDD	0.0001		2190				2190
2378TCDF	0.1	E	798		453		453
12378-PeCDF	0.05		460				460
23478-PeCDF	0.5		278				278
123478-HxCDF	0.1		283				283
123678-HxCDF	0.1		70.4				70.4
234678-HxCDF	0.1		44.4				44.4
123789-HxCDF	0.1		7.7				7.7
1234678-HpCDF	0.01		480				480
1234789-HpCDF	0.01		38.5				38.5
12346789-OCDF	0.0001		563				563
Total TEQ:		Non-Detects = Detection Limit	270	% Finer than #200 Sieve		NS	
		Non-Detects = 1/2 d.l.	270	% Total Organic Carbon		NS	
		Non-Detects = zero	270	% Solids		NS	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-3

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.2				4.2
12378-PeCDD	1		5.4				5.4
123478-HxCDD	0.1	J	3.9			J	3.9
123678-HxCDD	0.1		19.5				19.5
123789-HxCDD	0.1	J	10			J	10
1234678-HpCDD	0.01		381				381
12346789-OCDD	0.0001		3590				3590
2378TCDF	0.1	E	2690		1160		1160
12378-PeCDF	0.05		798				798
23478-PeCDF	0.5		591				591
123478-HxCDF	0.1		428				428
123678-HxCDF	0.1		119				119
234678-HxCDF	0.1		70.7				70.7
123789-HxCDF	0.1		8.4				8.4
1234678-HpCDF	0.01		830				830
1234789-HpCDF	0.01		54.4				54.4
12346789-OCDF	0.0001		987				987
Total TEQ:		Non-Detects = Detection Limit	540	% Finer than #200 Sieve		64.4	
		Non-Detects = 1/2 d.l.	540	% Total Organic Carbon		2.8	
		Non-Detects = zero	540	% Solids		73	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-6

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.8				4.8
12378-PeCDD	1		6.6				6.6
123478-HxCDD	0.1	J	4.3			J	4.3
123678-HxCDD	0.1		22.1				22.1
123789-HxCDD	0.1		10.7				10.7
1234678-HpCDD	0.01		456				456
12346789-OCDD	0.0001	E	4550		3880		3880
2378TCDF	0.1	E	1860		1180		1180
12378-PeCDF	0.05		782				782
23478-PeCDF	0.5		562				562
123478-HxCDF	0.1		476				476
123678-HxCDF	0.1		124				124
234678-HxCDF	0.1		73.7				73.7
123789-HxCDF	0.1		11				11
1234678-HpCDF	0.01		981				981
1234789-HpCDF	0.01		52.6				52.6
12346789-OCDF	0.0001		1260				1260
Total TEQ:		Non-Detects = Detection Limit	540	% Finer than #200 Sieve		63.2	
		Non-Detects = 1/2 d.l.	540	% Total Organic Carbon		3.1	
		Non-Detects = zero	540	% Solids		78	

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-15

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		1.8				1.8
12378-PeCDD	1	J	2.2			J	2.2
123478-HxCDD	0.1	J	1.5			J	1.5
123678-HxCDD	0.1		7.9				7.9
123789-HxCDD	0.1	J	4.1			J	4.1
1234678-HpCDD	0.01		162				162
12346789-OCDD	0.0001		1530				1530
2378TCDF	0.1	E	489		282		282
12378-PeCDF	0.05		223				223
23478-PeCDF	0.5		141				141
123478-HxCDF	0.1		138				138
123678-HxCDF	0.1		38.1				38.1
234678-HxCDF	0.1		20.5				20.5
123789-HxCDF	0.1	J	3.1				3.1
1234678-HpCDF	0.01		272				272
1234789-HpCDF	0.01		17				17
12346789-OCDF	0.0001		321				321
Total TEQ:		Non-Detects = Detection Limit	140	% Finer than #200 Sieve		72.1	
		Non-Detects = 1/2 d.l.	140	% Total Organic Carbon		0.83	
		Non-Detects = zero	140	% Solids		83	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-3

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.6
12378-PeCDD	1					ND	0.6
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	1.2
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						13.6
12346789-OCDD	0.0001						126
2378TCDF	0.1						50.3
12378-PeCDF	0.05						28
23478-PeCDF	0.5						17
123478-HxCDF	0.1						20.6
123678-HxCDF	0.1						5.1
234678-HxCDF	0.1					J	3.2
123789-HxCDF	0.1					J	0.49
1234678-HpCDF	0.01						18.1
1234789-HpCDF	0.01					ND	2
12346789-OCDF	0.0001						21.5
Total TEQ:		Non-Detects = Detection Limit	20	% Finer than #200 Sieve		83.2	
		Non-Detects = 1/2 d.l.	19	% Total Organic Carbon		1.5	
		Non-Detects = zero	18	% Solids		82	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-6

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.52
12378-PeCDD	1					J	0.78
123478-HxCDD	0.1					ND	0.6
123678-HxCDD	0.1					ND	1.3
123789-HxCDD	0.1					J	1.3
1234678-HpCDD	0.01						15.1
12346789-OCDD	0.0001						118
2378TCDF	0.1						50
12378-PeCDF	0.05						31
23478-PeCDF	0.5						17.7
123478-HxCDF	0.1						22.4
123678-HxCDF	0.1						5.2
234678-HxCDF	0.1					J	3.5
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						20.2
1234789-HpCDF	0.01					J	2.2
12346789-OCDF	0.0001						24.6
Total TEQ:		Non-Detects = Detection Limit	21	% Finer than #200 Sieve		83.9	
		Non-Detects = 1/2 d.l.	20	% Total Organic Carbon		0.98	
		Non-Detects = zero	20	% Solids		76	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-15

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.6
12378-PeCDD	1					J	0.48
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					J	1
123789-HxCDD	0.1					ND	1
1234678-HpCDD	0.01						12
12346789-OCDD	0.0001						131
2378TCDF	0.1						46
12378-PeCDF	0.05						28.7
23478-PeCDF	0.5						17.8
123478-HxCDF	0.1						19
123678-HxCDF	0.1					J	4.9
234678-HxCDF	0.1					J	2.8
123789-HxCDF	0.1					J	0.42
1234678-HpCDF	0.01						20.7
1234789-HpCDF	0.01					ND	1.5
12346789-OCDF	0.0001						22
Total TEQ:	Non-Detects = Detection Limit		19	% Finer than #200 Sieve		84.7	
	Non-Detects = 1/2 d.l.		19	% Total Organic Carbon		1.4	
	Non-Detects = zero		19	% Solids		80	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-3

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.71
12378-PeCDD	1					ND	0.9
123478-HxCDD	0.1					J	0.78
123678-HxCDD	0.1					J	1.9
123789-HxCDD	0.1					J	1.9
1234678-HpCDD	0.01						33.1
12346789-OCDD	0.0001						317
2378TCDF	0.1						49
12378-PeCDF	0.05						29.8
23478-PeCDF	0.5						18.2
123478-HxCDF	0.1						21.2
123678-HxCDF	0.1						5.3
234678-HxCDF	0.1					J	3.3
123789-HxCDF	0.1					J	0.58
1234678-HpCDF	0.01						58.3
1234789-HpCDF	0.01					J	2.6
12346789-OCDF	0.0001						64.2
Total TEQ:	Non-Detects = Detection Limit		22	% Finer than #200 Sieve		81.8	
	Non-Detects = 1/2 d.l.		21	% Total Organic Carbon		1.5	
	Non-Detects = zero		21	% Solids		82	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-6

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.6
12378-PeCDD	1					ND	0.7
123478-HxCDD	0.1					J	0.66
123678-HxCDD	0.1					J	1.7
123789-HxCDD	0.1					J	1.5
1234678-HpCDD	0.01						31.2
12346789-OCDD	0.0001						278
2378TCDF	0.1						52.3
12378-PeCDF	0.05						30.4
23478-PeCDF	0.5						18.7
123478-HxCDF	0.1						21.7
123678-HxCDF	0.1						5
234678-HxCDF	0.1					J	3.3
123789-HxCDF	0.1					ND	0.3
1234678-HpCDF	0.01						55.1
1234789-HpCDF	0.01					J	2.6
12346789-OCDF	0.0001						65.1
Total TEQ:		Non-Detects = Detection Limit	22	% Finer than #200 Sieve		81	
		Non-Detects = 1/2 d.l.	21	% Total Organic Carbon		1.5	
		Non-Detects = zero	20	% Solids		71	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-15

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	0.38
123789-HxCDD	0.1					ND	0.3
1234678-HpCDD	0.01						6.6
12346789-OCDD	0.0001						58.7
2378TCDF	0.1						16.8
12378-PeCDF	0.05						9.8
23478-PeCDF	0.5						6.3
123478-HxCDF	0.1						7.2
123678-HxCDF	0.1					J	1.7
234678-HxCDF	0.1					J	1
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						17.4
1234789-HpCDF	0.01					J	0.65
12346789-OCDF	0.0001						17.8
Total TEQ:		Non-Detects = Detection Limit	7.1	% Finer than #200 Sieve		83.5	
		Non-Detects = 1/2 d.l.	6.8	% Total Organic Carbon		0.92	
		Non-Detects = zero	6.6	% Solids		75	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-3

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.74
12378-PeCDD	1					ND	1.1
123478-HxCDD	0.1					ND	0.6
123678-HxCDD	0.1					J	2
123789-HxCDD	0.1					J	1.6
1234678-HpCDD	0.01						29.3
12346789-OCDD	0.0001						259
2378TCDF	0.1						117
12378-PeCDF	0.05						76
23478-PeCDF	0.5						46
123478-HxCDF	0.1						49.6
123678-HxCDF	0.1						12.3
234678-HxCDF	0.1						7.3
123789-HxCDF	0.1					J	0.85
1234678-HpCDF	0.01						69.4
1234789-HpCDF	0.01					J	4.5
12346789-OCDF	0.0001						66.8
Total TEQ:		Non-Detects = Detection Limit	49	% Finer than #200 Sieve		86.1	
		Non-Detects = 1/2 d.l.	48	% Total Organic Carbon		1.8	
		Non-Detects = zero	48	% Solids		61	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-6

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.5
12378-PeCDD	1					J	0.6
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					ND	1.6
123789-HxCDD	0.1					J	1.1
1234678-HpCDD	0.01						21
12346789-OCDD	0.0001						217
2378TCDF	0.1						79.9
12378-PeCDF	0.05						45.9
23478-PeCDF	0.5						27.8
123478-HxCDF	0.1						29.8
123678-HxCDF	0.1						7.1
234678-HxCDF	0.1					J	4.6
123789-HxCDF	0.1					J	0.49
1234678-HpCDF	0.01						45.2
1234789-HpCDF	0.01					J	2.6
12346789-OCDF	0.0001						53.3
Total TEQ:		Non-Detects = Detection Limit	30	% Finer than #200 Sieve		86.2	
		Non-Detects = 1/2 d.l.	30	% Total Organic Carbon		1.7	
		Non-Detects = zero	30	% Solids		67	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-15

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.28
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.37
123678-HxCDD	0.1					J	0.92
123789-HxCDD	0.1					J	0.76
1234678-HpCDD	0.01						17
12346789-OCDD	0.0001						178
2378TCDF	0.1						62.2
12378-PeCDF	0.05						26.3
23478-PeCDF	0.5						19.7
123478-HxCDF	0.1						25.5
123678-HxCDF	0.1						5.3
234678-HxCDF	0.1					J	3.4
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						35.9
1234789-HpCDF	0.01					J	2.1
12346789-OCDF	0.0001						29.4
Total TEQ:		Non-Detects = Detection Limit	22	% Finer than #200 Sieve		87	
		Non-Detects = 1/2 d.l.	22	% Total Organic Carbon		1.2	
		Non-Detects = zero	22	% Solids		79	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-3

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.4
12378-PeCDD	1					ND	0.05
123478-HxCDD	0.1					J	0.2
123678-HxCDD	0.1					J	0.34
123789-HxCDD	0.1					J	0.39
1234678-HpCDD	0.01					J	4.8
12346789-OCDD	0.0001					B	27.6
2378TCDF	0.1						4.3
12378-PeCDF	0.05					J	1.3
23478-PeCDF	0.5					J	1.2
123478-HxCDF	0.1					J	1.4
123678-HxCDF	0.1					J	0.43
234678-HxCDF	0.1					ND	0.4
123789-HxCDF	0.1					ND	0.05
1234678-HpCDF	0.01					J	2.1
1234789-HpCDF	0.01					ND	0.1
12346789-OCDF	0.0001					J	3.5
Total TEQ:		Non-Detects = Detection Limit	1.9	% Finer than #200 Sieve		90.9	
		Non-Detects = 1/2 d.l.	1.7	% Total Organic Carbon		1.1	
		Non-Detects = zero	1.4	% Solids		73	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-6

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.3
12378-PeCDD	1					J	0.17
123478-HxCDD	0.1					ND	0.4
123678-HxCDD	0.1					J	0.22
123789-HxCDD	0.1					ND	0.5
1234678-HpCDD	0.01					J	4.5
12346789-OCDD	0.0001					B	25.9
2378TCDF	0.1						2.5
12378-PeCDF	0.05					J	1.1
23478-PeCDF	0.5					J	0.82
123478-HxCDF	0.1					J	1.3
123678-HxCDF	0.1					J	0.37
234678-HxCDF	0.1					ND	0.3
123789-HxCDF	0.1					ND	0.04
1234678-HpCDF	0.01					J	1.5
1234789-HpCDF	0.01					ND	0.09
12346789-OCDF	0.0001					J	2
Total TEQ:		Non-Detects = Detection Limit	1.6	% Finer than #200 Sieve		92.8	
		Non-Detects = 1/2 d.l.	1.3	% Total Organic Carbon		0.77	
		Non-Detects = zero	1.1	% Solids		83	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-15

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.42
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND,J	0.2
123678-HxCDD	0.1					J	0.47
123789-HxCDD	0.1					J	0.91
1234678-HpCDD	0.01						6.3
12346789-OCDD	0.0001					B	34.4
2378TCDF	0.1						3.1
12378-PeCDF	0.05					ND,J	1.3
23478-PeCDF	0.5					J	1.2
123478-HxCDF	0.1					J	1.8
123678-HxCDF	0.1					J	0.45
234678-HxCDF	0.1					ND,J	0.5
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01					J	2.5
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					J	4
Total TEQ:		Non-Detects = Detection Limit	2.0	% Finer than #200 Sieve		92.7	
		Non-Detects = 1/2 d.l.	1.9	% Total Organic Carbon		1.3	
		Non-Detects = zero	1.8	% Solids		76	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-3

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					J	0.14
123478-HxCDD	0.1					ND	0.4
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.4
1234678-HpCDD	0.01					J	4.3
12346789-OCDD	0.0001					B	31.9
2378TCDF	0.1					ND	0.8
12378-PeCDF	0.05					J	0.33
23478-PeCDF	0.5					ND	0.2
123478-HxCDF	0.1					ND	0.5
123678-HxCDF	0.1					ND	0.2
234678-HxCDF	0.1					J	0.25
123789-HxCDF	0.1					ND	0.07
1234678-HpCDF	0.01					J	1.6
1234789-HpCDF	0.01					ND	0.1
12346789-OCDF	0.0001					J	2.5
Total TEQ:		Non-Detects = Detection Limit	0.8	% Finer than #200 Sieve		24.5	
		Non-Detects = 1/2 d.l.	0.52	% Total Organic Carbon		0.95	
		Non-Detects = zero	0.24	% Solids		82	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-6

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					J	0.35
123678-HxCDD	0.1					ND	0.6
123789-HxCDD	0.1					ND	0.6
1234678-HpCDD	0.01						7
12346789-OCDD	0.0001					B	45.9
2378TCDF	0.1					ND	0.8
12378-PeCDF	0.05					ND	0.4
23478-PeCDF	0.5					J	0.51
123478-HxCDF	0.1					ND	1
123678-HxCDF	0.1					J	0.32
234678-HxCDF	0.1					J	0.43
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	3.4
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	4.5
Total TEQ:		Non-Detects = Detection Limit	1.4	% Finer than #200 Sieve		22	
		Non-Detects = 1/2 d.l.	0.94	% Total Organic Carbon		0.94	
		Non-Detects = zero	0.47	% Solids		80	

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-15

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.09
12378-PeCDD	1					ND	0.05
123478-HxCDD	0.1					ND	0.07
123678-HxCDD	0.1					ND	0.06
123789-HxCDD	0.1					ND	0.06
1234678-HpCDD	0.01					J	0.62
12346789-OCDD	0.0001					J,B	3.4
2378TCDF	0.1					ND	0.4
12378-PeCDF	0.05					ND	0.06
23478-PeCDF	0.5					ND	0.06
123478-HxCDF	0.1					J	0.16
123678-HxCDF	0.1					ND	0.04
234678-HxCDF	0.1					ND	0.04
123789-HxCDF	0.1					ND	0.06
1234678-HpCDF	0.01					J	0.19
1234789-HpCDF	0.01					ND	0.1
12346789-OCDF	0.0001					ND	0.4
Total TEQ:		Non-Detects = Detection Limit	0.27	% Finer than #200 Sieve		18.5	
		Non-Detects = 1/2 d.l.	0.15	% Total Organic Carbon		0.44	
		Non-Detects = zero	0.024	% Solids		77	

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-1

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.2
12378-PeCDD	1					ND	0.4
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	0.31
123789-HxCDD	0.1					J	0.6
1234678-HpCDD	0.01					J	2.9
12346789-OCDD	0.0001					B	13.4
2378TCDF	0.1					ND	1.2
12378-PeCDF	0.05					J	0.6
23478-PeCDF	0.5					J	0.57
123478-HxCDF	0.1					J	0.73
123678-HxCDF	0.1					J	0.38
234678-HxCDF	0.1					ND,J	0.4
123789-HxCDF	0.1					ND	0.4
1234678-HpCDF	0.01					J	0.93
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					ND	1.3
Total TEQ:		Non-Detects = Detection Limit	1.4	% Finer than #200 Sieve			
		Non-Detects = 1/2 d.l.	0.97	% Total Organic Carbon			
		Non-Detects = zero	0.56	% Solids			

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-3

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.15
12378-PeCDD	1					ND	0.04
123478-HxCDD	0.1					ND	0.07
123678-HxCDD	0.1					ND	0.07
123789-HxCDD	0.1					ND	0.07
1234678-HpCDD	0.01					J	3
12346789-OCDD	0.0001					ND	12.5
2378TCDF	0.1						1.6
12378-PeCDF	0.05					J	0.73
23478-PeCDF	0.5					J	0.41
123478-HxCDF	0.1					J	1.1
123678-HxCDF	0.1					J	0.33
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	0.97
1234789-HpCDF	0.01					ND	0.1
12346789-OCDF	0.0001					J	1.6

Total TEQ: Non-Detects = Detection Limit 0.83 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 0.78 % Total Organic Carbon
 Non-Detects = zero 0.73 % Solids

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-6

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.05
12378-PeCDD	1					ND	0.06
123478-HxCDD	0.1					ND	0.1
123678-HxCDD	0.1					ND	0.1
123789-HxCDD	0.1					ND	0.1
1234678-HpCDD	0.01					J	1.8
12346789-OCDD	0.0001					ND	9.1
2378TCDF	0.1						1.1
12378-PeCDF	0.05					J	0.53
23478-PeCDF	0.5					J	0.46
123478-HxCDF	0.1					J	0.89
123678-HxCDF	0.1					ND	0.3
234678-HxCDF	0.1					ND	0.07
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					ND	0.7
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	1.4

Total TEQ: Non-Detects = Detection Limit 0.67 % Finer than #200 Sieve
 Non-Detects = 1/2 d.l. 0.57 % Total Organic Carbon
 Non-Detects = zero 0.47 % Solids

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-3

Analyte	Latitude		Longitude		Undiluted		Diluted		Final	
	TEF	Flags	Concentration	Flags	Concentration	Flags	Concentration	Flags	Concentration	
			pg/g (ppt)		pg/g (ppt)		pg/g (ppt)		pg/g (ppt)	
2378-TCDD	1	ND	2					ND	2	
12378-PeCDD	1	J	4.5					J	4.5	
123478-HxCDD	0.1	J	2.8					J	2.8	
123678-HxCDD	0.1		13.6						13.6	
123789-HxCDD	0.1	J	6.6					J	6.6	
1234678-HpCDD	0.01		229						229	
12346789-OCDD	0.0001		2320						2320	
2378TCDF	0.1	E	2670		1810				1810	
12378-PeCDF	0.05		1330						1330	
23478-PeCDF	0.5		817						817	
123478-HxCDF	0.1		698						698	
123678-HxCDF	0.1		180						180	
234678-HxCDF	0.1		104						104	
123789-HxCDF	0.1		19.6						19.6	
1234678-HpCDF	0.01		751						751	
1234789-HpCDF	0.01		52.8						52.8	
12346789-OCDF	0.0001		597						597	
Total TEQ:		Non-Detects = Detection Limit	780		% Finer than #200 Sieve	67.9				
		Non-Detects = 1/2 d.l.	770		% Total Organic Carbon	2.0				
		Non-Detects = zero	770		% Solids	77				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-6

Analyte	Latitude		Longitude		Undiluted		Diluted		Final	
	TEF	Flags	Concentration	Flags	Concentration	Flags	Concentration	Flags	Concentration	
			pg/g (ppt)		pg/g (ppt)		pg/g (ppt)		pg/g (ppt)	
2378-TCDD	1		1.7						1.7	
12378-PeCDD	1	J	3.3					J	3.3	
123478-HxCDD	0.1	J	2					J	2	
123678-HxCDD	0.1		11.3						11.3	
123789-HxCDD	0.1	J	5.4					J	5.4	
1234678-HpCDD	0.01		178						178	
12346789-OCDD	0.0001		1560						1560	
2378TCDF	0.1	E	1740		1180				1180	
12378-PeCDF	0.05		935						935	
23478-PeCDF	0.5		562						562	
123478-HxCDF	0.1		487						487	
123678-HxCDF	0.1		127						127	
234678-HxCDF	0.1		72.4						72.4	
123789-HxCDF	0.1		14.4						14.4	
1234678-HpCDF	0.01		563						563	
1234789-HpCDF	0.01		45.3						45.3	
12346789-OCDF	0.0001		535						535	
Total TEQ:		Non-Detects = Detection Limit	530		% Finer than #200 Sieve	58				
		Non-Detects = 1/2 d.l.	530		% Total Organic Carbon	1.7				
		Non-Detects = zero	530		% Solids	81				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-15

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)		
2378-TCDD	1		2.9			2.9
12378-PeCDD	1		9.1			9.1
123478-HxCDD	0.1		5.8			5.8
123678-HxCDD	0.1		39.6			39.6
123789-HxCDD	0.1		14.1			14.1
1234678-HpCDD	0.01		1280			1280
12346789-OCDD	0.0001	E	12850		11800	11800
2378TCDF	0.1	E	3200		2160	2160
12378-PeCDF	0.05		1590			1590
23478-PeCDF	0.5		958			958
123478-HxCDF	0.1		779			779
123678-HxCDF	0.1		214			214
234678-HxCDF	0.1		127			127
123789-HxCDF	0.1		17.6			17.6
1234678-HpCDF	0.01		1490			1490
1234789-HpCDF	0.01		88.1			88.1
12346789-OCDF	0.0001		3650			3650
Total TEQ:	Non-Detects = Detection Limit		940	% Finer than #200 Sieve	54.7	
	Non-Detects = 1/2 d.l.		940	% Total Organic Carbon	2.1	
	Non-Detects = zero		940	% Solids	79	

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-3

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)		
2378-TCDD	1	J	0.78		J	0.78
12378-PeCDD	1	J	2.5		J	2.5
123478-HxCDD	0.1	J	2.1		J	2.1
123678-HxCDD	0.1		6.3			6.3
123789-HxCDD	0.1	J	4.9		J	4.9
1234678-HpCDD	0.01		110			110
12346789-OCDD	0.0001		928			928
2378TCDF	0.1	E	834		495	495
12378-PeCDF	0.05		422			422
23478-PeCDF	0.5		256			256
123478-HxCDF	0.1		215			215
123678-HxCDF	0.1		54.8			54.8
234678-HxCDF	0.1		33.4			33.4
123789-HxCDF	0.1		5.3			5.3
1234678-HpCDF	0.01		289			289
1234789-HpCDF	0.01		15.9			15.9
12346789-OCDF	0.0001		210			210
Total TEQ:	Non-Detects = Detection Limit		240	% Finer than #200 Sieve	52.3	
	Non-Detects = 1/2 d.l.		240	% Total Organic Carbon	1.9	
	Non-Detects = zero		240	% Solids	80	

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-6

Analyte	Latitude		Longitude		Undiluted		Diluted		Final	
	TEF	Flags	Concentration	Flags	Concentration	Flags	Concentration	Flags	Concentration	
			pg/g (ppt)		pg/g (ppt)		pg/g (ppt)		pg/g (ppt)	
2378-TCDD	1	ND	0.7				ND		0.7	
12378-PeCDD	1	J	1.7				J		1.7	
123478-HxCDD	0.1	J	1.7				J		1.7	
123678-HxCDD	0.1		5.4						5.4	
123789-HxCDD	0.1	J	4.7				J		4.7	
1234678-HpCDD	0.01		102						102	
12346789-OCDD	0.0001		952						952	
2378TCDF	0.1		287						287	
12378-PeCDF	0.05		151						151	
23478-PeCDF	0.5		92.6						92.6	
123478-HxCDF	0.1		79.4						79.4	
123678-HxCDF	0.1		22.2						22.2	
234678-HxCDF	0.1		13.6						13.6	
123789-HxCDF	0.1	J	1.8				J		1.8	
1234678-HpCDF	0.01		173						173	
1234789-HpCDF	0.01		7.7						7.7	
12346789-OCDF	0.0001		125						125	
Total TEQ:			Non-Detects = Detection Limit	100	% Finer than #200 Sieve	56.9				
			Non-Detects = 1/2 d.l.	100	% Total Organic Carbon	0.97				
			Non-Detects = zero	100	% Solids	85				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-15

Analyte	Latitude		Longitude		Undiluted		Diluted		Final	
	TEF	Flags	Concentration	Flags	Concentration	Flags	Concentration	Flags	Concentration	
			pg/g (ppt)		pg/g (ppt)		pg/g (ppt)		pg/g (ppt)	
2378-TCDD	1		1.2						1.2	
12378-PeCDD	1	J	3.1					J	3.1	
123478-HxCDD	0.1	J	2.9					J	2.9	
123678-HxCDD	0.1		9.4						9.4	
123789-HxCDD	0.1	J	8.5					J	8.5	
1234678-HpCDD	0.01		136						136	
12346789-OCDD	0.0001		933						933	
2378TCDF	0.1	E	440				306		306	
12378-PeCDF	0.05		237						237	
23478-PeCDF	0.5		139						139	
123478-HxCDF	0.1		126						126	
123678-HxCDF	0.1		33.2						33.2	
234678-HxCDF	0.1		20.7						20.7	
123789-HxCDF	0.1	J	3.2					J	3.2	
1234678-HpCDF	0.01		352						352	
1234789-HpCDF	0.01		12						12	
12346789-OCDF	0.0001		209						209	
Total TEQ:			Non-Detects = Detection Limit	140	% Finer than #200 Sieve	54.6				
			Non-Detects = 1/2 d.l.	140	% Total Organic Carbon	0.94				
			Non-Detects = zero	140	% Solids	78				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-1

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)		
2378-TCDD	1		1.3			1.3
12378-PeCDD	1	J	4		J	4
123478-HxCDD	0.1	J	2.4		J	2.4
123678-HxCDD	0.1		10.6			10.6
123789-HxCDD	0.1	J	5.9		J	5.9
1234678-HpCDD	0.01		163			163
12346789-OCDD	0.0001		1510			1510
2378TCDF	0.1	E	1530	1180		1180
12378-PeCDF	0.05		695			695
23478-PeCDF	0.5		454			454
123478-HxCDF	0.1		364			364
123678-HxCDF	0.1		93.1			93.1
234678-HxCDF	0.1		56.7			56.7
123789-HxCDF	0.1		8.8			8.8
1234678-HpCDF	0.01		793			793
1234789-HpCDF	0.01		33			33
12346789-OCDF	0.0001		521			521
Total TEQ:	Non-Detects = Detection Limit		450	% Finer than #200 Sieve	NS	
	Non-Detects = 1/2 d.l.		450	% Total Organic Carbon	NS	
	Non-Detects = zero		450	% Solids	NS	

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-3

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)		
2378-TCDD	1		3			3
12378-PeCDD	1		11.7			11.7
123478-HxCDD	0.1		6.9			6.9
123678-HxCDD	0.1		29.7			29.7
123789-HxCDD	0.1		15.4			15.4
1234678-HpCDD	0.01		487			487
12346789-OCDD	0.0001		4660			4660
2378TCDF	0.1	E	2780	1890		1890
12378-PeCDF	0.05		2020			2020
23478-PeCDF	0.5		1120			1120
123478-HxCDF	0.1		1150			1150
123678-HxCDF	0.1		286			286
234678-HxCDF	0.1		172			172
123789-HxCDF	0.1		26.5			26.5
1234678-HpCDF	0.01		2360			2360
1234789-HpCDF	0.01		95.6			95.6
12346789-OCDF	0.0001		1420			1420
Total TEQ:	Non-Detects = Detection Limit		1100	% Finer than #200 Sieve	41.4	
	Non-Detects = 1/2 d.l.		1100	% Total Organic Carbon	2.6	
	Non-Detects = zero		1100	% Solids	70	

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-6

Analyte	Latitude		Longitude		Final		
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)			
2378-TCDD	1		3.4				3.4
12378-PeCDD	1		10.1				10.1
123478-HxCDD	0.1		5.9				5.9
123678-HxCDD	0.1		25.1				25.1
123789-HxCDD	0.1		13.6				13.6
1234678-HpCDD	0.01		409				409
12346789-OCDD	0.0001	E	4160			3810	3810
2378TCDF	0.1	E	4770			3260	3260
12378-PeCDF	0.05	E	2240			1890	1890
23478-PeCDF	0.5		1480				1480
123478-HxCDF	0.1		1170				1170
123678-HxCDF	0.1		293				293
234678-HxCDF	0.1		177				177
123789-HxCDF	0.1		27.3				27.3
1234678-HpCDF	0.01		2000				2000
1234789-HpCDF	0.01		89.4				89.4
12346789-OCDF	0.0001		1270				1270
Total TEQ:			Non-Detects = Detection Limit	1400	% Finer than #200 Sieve		53.4
			Non-Detects = 1/2 d.l.	1400	% Total Organic Carbon		1.5
			Non-Detects = zero	1400	% Solids		81

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 4-1

Analyte	Latitude		Longitude		Final		
	TEF	Flags	Undiluted	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
			Concentration pg/g (ppt)	Concentration pg/g (ppt)			
2378-TCDD	1					ND	0.6
12378-PeCDD	1					ND	0.7
123478-HxCDD	0.1					ND	0.8
123678-HxCDD	0.1					ND	1
123789-HxCDD	0.1					ND	1.4
1234678-HpCDD	0.01						22.6
12346789-OCDD	0.0001						218
2378TCDF	0.1						140
12378-PeCDF	0.05						68.3
23478-PeCDF	0.5						40.4
123478-HxCDF	0.1						41.4
123678-HxCDF	0.1						10.1
234678-HxCDF	0.1						5.6
123789-HxCDF	0.1				J		0.8
1234678-HpCDF	0.01						44.6
1234789-HpCDF	0.01				ND		2.5
12346789-OCDF	0.0001						39
Total TEQ:			Non-Detects = Detection Limit	46	% Finer than #200 Sieve		NS
			Non-Detects = 1/2 d.l.	45	% Total Organic Carbon		NS
			Non-Detects = zero	44	% Solids		NS

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 5-1

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	
		Concentration pg/g (ppt)		Concentration pg/g (ppt)			
2378-TCDD	1				J	0.62	
12378-PeCDD	1				J	1	
123478-HxCDD	0.1				J	0.91	
123678-HxCDD	0.1				J	2.9	
123789-HxCDD	0.1				J	2.1	
1234678-HpCDD	0.01					47.8	
12346789-OCDD	0.0001					427	
2378TCDF	0.1					267	
12378-PeCDF	0.05					110	
23478-PeCDF	0.5					70.7	
123478-HxCDF	0.1					63.8	
123678-HxCDF	0.1					18.3	
234678-HxCDF	0.1					10.7	
123789-HxCDF	0.1				J	1.1	
1234678-HpCDF	0.01					111	
1234789-HpCDF	0.01					5.9	
12346789-OCDF	0.0001					112	
Total TEQ:	Non-Detects = Detection Limit	81	% Finer than #200 Sieve	NS			
	Non-Detects = 1/2 d.l.	81	% Total Organic Carbon	NS			
	Non-Detects = zero	81	% Solids	NS			

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 1

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	
		Concentration pg/g (ppt)		Concentration pg/g (ppt)			
2378-TCDD	1				ND	0.3	
12378-PeCDD	1				J	0.86	
123478-HxCDD	0.1				J	0.78	
123678-HxCDD	0.1					2.2	
123789-HxCDD	0.1				J	1.2	
1234678-HpCDD	0.01					4.8	
12346789-OCDD	0.0001					6.9	
2378TCDF	0.1					129	
12378-PeCDF	0.05					72.8	
23478-PeCDF	0.5					54	
123478-HxCDF	0.1					26.2	
123678-HxCDF	0.1					6.5	
234678-HxCDF	0.1					2.1	
123789-HxCDF	0.1				J	0.65	
1234678-HpCDF	0.01					4.6	
1234789-HpCDF	0.01				J	0.31	
12346789-OCDF	0.0001				ND	1.6	
Total TEQ:	Non-Detects = Detection Limit	49	% Finer than #200 Sieve				
	Non-Detects = 1/2 d.l.	49	% Total Organic Carbon				
	Non-Detects = zero	48	% Solids				

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 2

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
		Flags		Concentration pg/g (ppt)			
2378-TCDD	1					ND	0.3
12378-PeCDD	1					ND	0.8
123478-HxCDD	0.1					J	0.98
123678-HxCDD	0.1					J	2.4
123789-HxCDD	0.1					J	1.4
1234678-HpCDD	0.01						6.8
12346789-OCDD	0.0001						12.9
2378TCDF	0.1						114
12378-PeCDF	0.05						66
23478-PeCDF	0.5						45.7
123478-HxCDF	0.1						25.5
123678-HxCDF	0.1						6.3
234678-HxCDF	0.1					J	2.2
123789-HxCDF	0.1					J	0.77
1234678-HpCDF	0.01						4.9
1234789-HpCDF	0.01					ND	0.5
12346789-OCDF	0.0001					ND	1.9
Total TEQ:		Non-Detects = Detection Limit	43	% Finer than #200 Sieve			
		Non-Detects = 1/2 d.l.	42	% Total Organic Carbon			
		Non-Detects = zero	42	% Solids			

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 3

Analyte	Latitude		Longitude		Final		
	TEF	Undiluted	Flags	Diluted	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
		Flags		Concentration pg/g (ppt)			
2378-TCDD	1					J	0.33
12378-PeCDD	1					J	0.91
123478-HxCDD	0.1					J	0.73
123678-HxCDD	0.1					J	1.9
123789-HxCDD	0.1					J	1.1
1234678-HpCDD	0.01						4.6
12346789-OCDD	0.0001						7.3
2378TCDF	0.1						111
12378-PeCDF	0.05						62.7
23478-PeCDF	0.5						45.5
123478-HxCDF	0.1						23.7
123678-HxCDF	0.1						6
234678-HxCDF	0.1					J	2.1
123789-HxCDF	0.1					J	0.53
1234678-HpCDF	0.01						3.9
1234789-HpCDF	0.01					ND	0.4
12346789-OCDF	0.0001					ND	1
Total TEQ:		Non-Detects = Detection Limit	42	% Finer than #200 Sieve			
		Non-Detects = 1/2 d.l.	42	% Total Organic Carbon			
		Non-Detects = zero	42	% Solids			

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 4

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
2378-TCDD	1					0.09
12378-PeCDD	1					0.5
123478-HxCDD	0.1					0.5
123678-HxCDD	0.1					1
123789-HxCDD	0.1					0.7
1234678-HpCDD	0.01					2.9
12346789-OCDD	0.0001					5.4
2378TCDF	0.1					43.2
12378-PeCDF	0.05					23.2
23478-PeCDF	0.5					17.3
123478-HxCDF	0.1					7.9
123678-HxCDF	0.1				J	1.9
234678-HxCDF	0.1				J	0.72
123789-HxCDF	0.1				ND	0.3
1234678-HpCDF	0.01				J	1.9
1234789-HpCDF	0.01				ND	0.3
12346789-OCDF	0.0001				ND	0.5

Total TEQ:	Non-Detects = Detection Limit	16	% Finer than #200 Sieve
	Non-Detects = 1/2 d.l.	16	% Total Organic Carbon
	Non-Detects = zero	15	% Solids

Appendix B

Phase II Soil and Egg PCB Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports. The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-3

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					EMPC,J,B	3
23445 pentaCB #114	0.0005					ND	1.2
23445 pentaCB #118	0.0001					J	31.4
23445 pentaCB #123	0.0001					J	5
23344 pentaCB #105	0.0001					J	18.5
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					Q,J	5
233445 hexaCB #156	0.0005					Q,J	10.4
233445 hexaCB #157	0.0005					Q,J	2.7
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001					B	75.6
2233445 heptaCB #170	0.0001						43.5
2334455 heptaCB #189	0.0001					ND	1.2

Total TEQ: Non-Detects = Detection Limit 0.15
 Non-Detects = 1/2 d.l. 0.084
 Non-Detects = zero 0.017

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-6

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.3
3344 tetraCB #77	0.0001					ND	1.1
23445 pentaCB #114	0.0005					ND	2
23445 pentaCB #118	0.0001					J	26.6
23445 pentaCB #123	0.0001					ND	2
23344 pentaCB #105	0.0001					EMPC,J	17.3
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					EMPC,J	4.2
233445 hexaCB #156	0.0005					J	7.2
233445 hexaCB #157	0.0005					J	2.9
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001					B	72.1
2233445 heptaCB #170	0.0001						42.2
2334455 heptaCB #189	0.0001					ND	1.4

Total TEQ: Non-Detects = Detection Limit 0.24
 Non-Detects = 1/2 d.l. 0.13
 Non-Detects = zero 0.014

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 1-15

Latitude 43.668889140N

Longitude 84.384442347W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.1
3344 tetraCB #77	0.0001					ND	0.9
23445 pentaCB #114	0.0005					ND	1.4
23445 pentaCB #118	0.0001					J	6.9
23445 pentaCB #123	0.0001					ND	1.4
23344 pentaCB #105	0.0001					EMPC,J	5.3
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					EMPC,J	1
233445 hexaCB #156	0.0005					ND	1.1
233445 hexaCB #157	0.0005					ND	1.1
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001					JB	18.5
2233445 heptaCB #170	0.0001					EMPC,J	10
2334455 heptaCB #189	0.0001					ND	1.5

Total TEQ: Non-Detects = Detection Limit 0.16
 Non-Detects = 1/2 d.l. 0.08
 Non-Detects = zero 0.0024

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-3

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.6
3344 tetraCB #77	0.0001					JB	5.3
23445 pentaCB #114	0.0005					ND	1.6
23445 pentaCB #118	0.0001						67.8
23445 pentaCB #123	0.0001					J	14.4
23344 pentaCB #105	0.0001						59.9
33445 pentaCB #126	0.1					ND	1.7
234455 hexaCB #167	0.00001					QJ	9.9
233445 hexaCB #156	0.0005					QJ	17.6
233445 hexaCB #157	0.0005					QJ	4.9
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						112
2233445 heptaCB #170	0.0001						77
2334455 heptaCB #189	0.0001					J	4.5

Total TEQ: Non-Detects = Detection Limit 0.22
 Non-Detects = 1/2 d.l. 0.13
 Non-Detects = zero 0.035

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-6

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	2.9
3344 tetraCB #77	0.0001					JB	5.3
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001						75.2
23445 pentaCB #123	0.0001					J	16.3
23344 pentaCB #105	0.0001						64.1
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					EMPC,QJ	8.5
233445 hexaCB #156	0.0005					EMPC,QJ	15.7
233445 hexaCB #157	0.0005					QJ	4.4
334455 hexaCB #169	0.01					ND	2
2234455 heptaCB #180	0.00001					B	81.2
2233445 heptaCB #170	0.0001						49.8
2334455 heptaCB #189	0.0001					EMPC,J	6.1

Total TEQ: Non-Detects = Detection Limit 0.19
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.033

PHASE II - TITABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY SOIL SAMPLES

SFD 2-15

Latitude 43.668928461N

Longitude 84.384474954W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.9
3344 tetraCB #77	0.0001					ND	0.8
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001					J	10.7
23445 pentaCB #123	0.0001					ND	1
23344 pentaCB #105	0.0001					ND	1
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					ND	1.1
233445 hexaCB #156	0.0005					ND	1.3
233445 hexaCB #157	0.0005					ND	1.3
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001					JB	16.4
2233445 heptaCB #170	0.0001					J	10.3
2334455 heptaCB #189	0.0001					ND	1.6

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.071
 Non-Detects = zero 0.0023

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-3

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	3.9
3344 tetraCB #77	0.0001					EMPC,JB	15
23445 pentaCB #114	0.0005					J	12.2
23445 pentaCB #118	0.0001						373
23445 pentaCB #123	0.0001						68
23344 pentaCB #105	0.0001						197
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					Q	37.7
233445 hexaCB #156	0.0005					Q	89.7
233445 hexaCB #157	0.0005					QJ	26.2
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001						208
2233445 heptaCB #170	0.0001						156
2334455 heptaCB #189	0.0001					J	8.2

Total TEQ: Non-Detects = Detection Limit 0.28
 Non-Detects = 1/2 d.l. 0.22
 Non-Detects = zero 0.15

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-6

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	4.5
3344 tetraCB #77	0.0001					EMPC,J	15
23445 pentaCB #114	0.0005					J	14.6
23445 pentaCB #118	0.0001						458
23445 pentaCB #123	0.0001						75
23344 pentaCB #105	0.0001						250
33445 pentaCB #126	0.1					EMPC,J	4
234455 hexaCB #167	0.00001					Q	49.9
233445 hexaCB #156	0.0005					Q	124
233445 hexaCB #157	0.0005					QJ	32.6
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001						233
2233445 heptaCB #170	0.0001						186
2334455 heptaCB #189	0.0001					J	7.9

Total TEQ: Non-Detects = Detection Limit 0.6
 Non-Detects = 1/2 d.l. 0.59
 Non-Detects = zero 0.59

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 1-15

Latitude 43.600675946N

Longitude 84.298750643W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	11.6
3344 tetraCB #77	0.0001					B	38.1
23445 pentaCB #114	0.0005						38.5
23445 pentaCB #118	0.0001						964
23445 pentaCB #123	0.0001						163
23344 pentaCB #105	0.0001						587
33445 pentaCB #126	0.1					J	9
234455 hexaCB #167	0.00001						123
233445 hexaCB #156	0.0005						284
233445 hexaCB #157	0.0005						82.1
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001						693
2233445 heptaCB #170	0.0001						433
2334455 heptaCB #189	0.0001					J	25.1

Total TEQ: Non-Detects = Detection Limit 1.3
 Non-Detects = 1/2 d.l. 1.3
 Non-Detects = zero 1.3

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-3

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	6.1
3344 tetraCB #77	0.0001					JB	28.1
23445 pentaCB #114	0.0005					J	22.4
23445 pentaCB #118	0.0001						602
23445 pentaCB #123	0.0001						101
23344 pentaCB #105	0.0001						324
33445 pentaCB #126	0.1					J	2.8
234455 hexaCB #167	0.00001					Q	66.3
233445 hexaCB #156	0.0005					Q	163
233445 hexaCB #157	0.0005					Q	45.4
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						316
2233445 heptaCB #170	0.0001						242
2334455 heptaCB #189	0.0001					J	9.9

Total TEQ: Non-Detects = Detection Limit 0.54
 Non-Detects = 1/2 d.l. 0.53
 Non-Detects = zero 0.53

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-6

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	12.6
3344 tetraCB #77	0.0001					B	46.2
23445 pentaCB #114	0.0005						38.1
23445 pentaCB #118	0.0001						1060
23445 pentaCB #123	0.0001						175
23344 pentaCB #105	0.0001						638
33445 pentaCB #126	0.1					J	6.7
234455 hexaCB #167	0.00001					EMPC,Q	108
233445 hexaCB #156	0.0005					Q	252
233445 hexaCB #157	0.0005					Q	68.8
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						548
2233445 heptaCB #170	0.0001						414
2334455 heptaCB #189	0.0001					J	16.3

Total TEQ: Non-Detects = Detection Limit 1.1
 Non-Detects = 1/2 d.l. 1.1
 Non-Detects = zero 1.1

PHASE II - PINE RIVER, MIDLAND COUNTY SOIL SAMPLES

PNE 2-15

Latitude 43.600742314N

Longitude 84.298703125W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.5
3344 tetraCB #77	0.0001					J	19.6
23445 pentaCB #114	0.0005					J	15.4
23445 pentaCB #118	0.0001						389
23445 pentaCB #123	0.0001						72.9
23344 pentaCB #105	0.0001						229
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					Q	42.7
233445 hexaCB #156	0.0005					Q	98
233445 hexaCB #157	0.0005					QJ	24.5
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						301
2233445 heptaCB #170	0.0001						197
2334455 heptaCB #189	0.0001					J	12.4

Total TEQ: Non-Detects = Detection Limit 0.32
 Non-Detects = 1/2 d.l. 0.24
 Non-Detects = zero 0.16

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-3

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	2.2
3344 tetraCB #77	0.0001					EMPC,JB	4.2
23445 pentaCB #114	0.0005					ND	2
23445 pentaCB #118	0.0001						67.9
23445 pentaCB #123	0.0001					J	11.9
23344 pentaCB #105	0.0001						36.3
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					J	9
233445 hexaCB #156	0.0005					J	20.9
233445 hexaCB #157	0.0005					J	6.7
334455 hexaCB #169	0.01					ND	2.1
2234455 heptaCB #180	0.00001						107
2233445 heptaCB #170	0.0001						62.7
2334455 heptaCB #189	0.0001					ND	2.3

Total TEQ: Non-Detects = Detection Limit 0.27
 Non-Detects = 1/2 d.l. 0.15
 Non-Detects = zero 0.033

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-6

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.5
3344 tetraCB #77	0.0001					JB	4.3
23445 pentaCB #114	0.0005					ND	1.4
23445 pentaCB #118	0.0001						105
23445 pentaCB #123	0.0001					J	22.6
23344 pentaCB #105	0.0001						44.9
33445 pentaCB #126	0.1					ND	1.5
234455 hexaCB #167	0.00001					J	15.4
233445 hexaCB #156	0.0005						34.9
233445 hexaCB #157	0.0005					J	8.7
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						170
2233445 heptaCB #170	0.0001						96.8
2334455 heptaCB #189	0.0001					J	8.2

Total TEQ: Non-Detects = Detection Limit 0.22
 Non-Detects = 1/2 d.l. 0.13
 Non-Detects = zero 0.052

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 1-15

Latitude 43.603721797N

Longitude 84.302449656W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	1.6
3344 tetraCB #77	0.0001					EMPC,JB	3.2
23445 pentaCB #114	0.0005					EMPC,J	4.6
23445 pentaCB #118	0.0001						87
23445 pentaCB #123	0.0001					J	19.4
23344 pentaCB #105	0.0001						43.1
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					J	14.6
233445 hexaCB #156	0.0005					J	29.5
233445 hexaCB #157	0.0005					J	8.8
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						180
2233445 heptaCB #170	0.0001						105
2334455 heptaCB #189	0.0001					J	9.3

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.094
 Non-Detects = zero 0.05

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-3

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.1
3344 tetraCB #77	0.0001					JB	3.7
23445 pentaCB #114	0.0005					ND	0.9
23445 pentaCB #118	0.0001						84.8
23445 pentaCB #123	0.0001					EMPC,J	13.1
23344 pentaCB #105	0.0001						45.8
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					QJ	9.9
233445 hexaCB #156	0.0005					QJ	21.7
233445 hexaCB #157	0.0005					QJ	5.5
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					B	91.7
2233445 heptaCB #170	0.0001						56.1
2334455 heptaCB #189	0.0001					J	3.5

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.086
 Non-Detects = zero 0.035

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-6

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.8
3344 tetraCB #77	0.0001					JB	5.4
23445 pentaCB #114	0.0005					ND	1.6
23445 pentaCB #118	0.0001						120
23445 pentaCB #123	0.0001					J	19.6
23344 pentaCB #105	0.0001						75.4
33445 pentaCB #126	0.1					ND	1.7
234455 hexaCB #167	0.00001					J	14
233445 hexaCB #156	0.0005					J	30.5
233445 hexaCB #157	0.0005					J	7.6
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001						155
2233445 heptaCB #170	0.0001						94
2334455 heptaCB #189	0.0001					J	6.1

Total TEQ: Non-Detects = Detection Limit 0.24
 Non-Detects = 1/2 d.l. 0.15
 Non-Detects = zero 0.053

PHASE II - CHIPPEWA RIVER, MIDLAND COUNTY SOIL SAMPLES

CHW 2-15

Latitude 43.603723853N

Longitude 84.302293175W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	2.2
3344 tetraCB #77	0.0001					ND	1.8
23445 pentaCB #114	0.0005					ND	2
23445 pentaCB #118	0.0001						43.8
23445 pentaCB #123	0.0001					EMPC,J	6.6
23344 pentaCB #105	0.0001					J	27.7
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					J	6.3
233445 hexaCB #156	0.0005					EMPC,J	14.4
233445 hexaCB #157	0.0005					J	3.6
334455 hexaCB #169	0.01					ND	2.1
2234455 heptaCB #180	0.00001					B	92.7
2233445 heptaCB #170	0.0001						48.3
2334455 heptaCB #189	0.0001					EMPC,J	6.6

Total TEQ: Non-Detects = Detection Limit 0.26
 Non-Detects = 1/2 d.l. 0.14
 Non-Detects = zero 0.023

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-1

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	3.2
3344 tetraCB #77	0.0001					J	15.6
23445 pentaCB #114	0.0005					ND	4
23445 pentaCB #118	0.0001						180
23445 pentaCB #123	0.0001					EMPC,J	29.5
23344 pentaCB #105	0.0001						80.1
33445 pentaCB #126	0.1					ND	5
234455 hexaCB #167	0.00001					EMPC,J	10
233445 hexaCB #156	0.0005					EMPC,J	23.7
233445 hexaCB #157	0.0005					ND	5.3
334455 hexaCB #169	0.01					ND	7
2234455 heptaCB #180	0.00001						112
2233445 heptaCB #170	0.0001						60.9
2334455 heptaCB #189	0.0001					ND	7.7

Total TEQ: Non-Detects = Detection Limit 0.63
 Non-Detects = 1/2 d.l. 0.34
 Non-Detects = zero 0.05

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-3

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	2.8
3344 tetraCB #77	0.0001					J	14.3
23445 pentaCB #114	0.0005					ND	2.7
23445 pentaCB #118	0.0001						173
23445 pentaCB #123	0.0001					J	24.8
23344 pentaCB #105	0.0001						86.2
33445 pentaCB #126	0.1					ND	3.5
234455 hexaCB #167	0.00001					EMPC,J	13.8
233445 hexaCB #156	0.0005					J	29.3
233445 hexaCB #157	0.0005					ND	3.5
334455 hexaCB #169	0.01					ND	4.6
2234455 heptaCB #180	0.00001						474
2233445 heptaCB #170	0.0001						213
2334455 heptaCB #189	0.0001					ND	5

Total TEQ: Non-Detects = Detection Limit 0.47
 Non-Detects = 1/2 d.l. 0.27
 Non-Detects = zero 0.071

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-6

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	2.1
3344 tetraCB #77	0.0001					J	14
23445 pentaCB #114	0.0005					EMPC,J	6.8
23445 pentaCB #118	0.0001						190
23445 pentaCB #123	0.0001						30.7
23344 pentaCB #105	0.0001						97.7
33445 pentaCB #126	0.1					ND	2.6
234455 hexaCB #167	0.00001					J	11.1
233445 hexaCB #156	0.0005						32.5
233445 hexaCB #157	0.0005					EMPC,J	9.1
334455 hexaCB #169	0.01					ND	4.2
2234455 heptaCB #180	0.00001						159
2233445 heptaCB #170	0.0001						82.3
2334455 heptaCB #189	0.0001					ND	4.1

Total TEQ: Non-Detects = Detection Limit 0.37
 Non-Detects = 1/2 d.l. 0.22
 Non-Detects = zero 0.067

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 1-15

Latitude 43.618779223N

Longitude 84.254056424W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	7.6
3344 tetraCB #77	0.0001						41.1
23445 pentaCB #114	0.0005					J	26
23445 pentaCB #118	0.0001						436
23445 pentaCB #123	0.0001						111
23344 pentaCB #105	0.0001						256
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					J	17.4
233445 hexaCB #156	0.0005						43
233445 hexaCB #157	0.0005					EMPC,J	10.8
334455 hexaCB #169	0.01					ND	3.2
2234455 heptaCB #180	0.00001						244
2233445 heptaCB #170	0.0001						145
2334455 heptaCB #189	0.0001					J	7.6

Total TEQ: Non-Detects = Detection Limit 0.38
 Non-Detects = 1/2 d.l. 0.26
 Non-Detects = zero 0.14

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-1

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	9.3
3344 tetraCB #77	0.0001					J	12.5
23445 pentaCB #114	0.0005						43
23445 pentaCB #118	0.0001						103
23445 pentaCB #123	0.0001					J	17.8
23344 pentaCB #105	0.0001					EMPC	82.7
33445 pentaCB #126	0.1					ND	2.3
234455 hexaCB #167	0.00001						35.9
233445 hexaCB #156	0.0005					J	23
233445 hexaCB #157	0.0005					J	5.4
334455 hexaCB #169	0.01					ND	3.2
2234455 heptaCB #180	0.00001						65.2
2233445 heptaCB #170	0.0001					EMPC	70.9
2334455 heptaCB #189	0.0001					EMPC,J	24

Total TEQ: Non-Detects = Detection Limit 0.33
 Non-Detects = 1/2 d.l. 0.2
 Non-Detects = zero 0.069

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-3

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						34.6
3344 tetraCB #77	0.0001						38.3
23445 pentaCB #114	0.0005						176
23445 pentaCB #118	0.0001						277
23445 pentaCB #123	0.0001						54.3
23344 pentaCB #105	0.0001					EMPC	233
33445 pentaCB #126	0.1						28
234455 hexaCB #167	0.00001						55.3
233445 hexaCB #156	0.0005						62.5
233445 hexaCB #157	0.0005					J	9.3
334455 hexaCB #169	0.01					ND	3.8
2234455 heptaCB #180	0.00001						168
2233445 heptaCB #170	0.0001						139
2334455 heptaCB #189	0.0001						48.9

Total TEQ: Non-Detects = Detection Limit 3.0
 Non-Detects = 1/2 d.l. 3.0
 Non-Detects = zero 3.0

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-6

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	6.4
3344 tetraCB #77	0.0001						39.1
23445 pentaCB #114	0.0005					J	25
23445 pentaCB #118	0.0001						581
23445 pentaCB #123	0.0001						90.5
23344 pentaCB #105	0.0001						290
33445 pentaCB #126	0.1					EMPC,J	7.3
234455 hexaCB #167	0.00001						34.8
233445 hexaCB #156	0.0005						91.7
233445 hexaCB #157	0.0005					J	19.6
334455 hexaCB #169	0.01					ND	3.1
2234455 heptaCB #180	0.00001						656
2233445 heptaCB #170	0.0001						397
2334455 heptaCB #189	0.0001					J	21.8

Total TEQ: Non-Detects = Detection Limit 0.98
 Non-Detects = 1/2 d.l. 0.96
 Non-Detects = zero 0.95

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 2-15

Latitude 43.618126703N

Longitude 84.253732471W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.1
3344 tetraCB #77	0.0001					EMPC,J	25.6
23445 pentaCB #114	0.0005					EMPC,J	13
23445 pentaCB #118	0.0001						303
23445 pentaCB #123	0.0001						46.9
23344 pentaCB #105	0.0001						159
33445 pentaCB #126	0.1					ND	2.9
234455 hexaCB #167	0.00001					J	21.9
233445 hexaCB #156	0.0005						56.9
233445 hexaCB #157	0.0005					J	11.3
334455 hexaCB #169	0.01					ND	4.5
2234455 heptaCB #180	0.00001						538
2233445 heptaCB #170	0.0001						305
2334455 heptaCB #189	0.0001					EMPC,J	21.1

Total TEQ: Non-Detects = Detection Limit 0.47
 Non-Detects = 1/2 d.l. 0.3
 Non-Detects = zero 0.13

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-1

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	6.3
3344 tetraCB #77	0.0001					J	31.1
23445 pentaCB #114	0.0005					J	23.2
23445 pentaCB #118	0.0001						542
23445 pentaCB #123	0.0001						140
23344 pentaCB #105	0.0001						322
33445 pentaCB #126	0.1					EMPC,J	7
234455 hexaCB #167	0.00001					Q	59.1
233445 hexaCB #156	0.0005					Q	139
233445 hexaCB #157	0.0005					Q	34.7
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001						630
2233445 heptaCB #170	0.0001						297
2334455 heptaCB #189	0.0001					J	7.6

Total TEQ: Non-Detects = Detection Limit 0.95
 Non-Detects = 1/2 d.l. 0.94
 Non-Detects = zero 0.94

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-3

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.2
3344 tetraCB #77	0.0001					J	22.7
23445 pentaCB #114	0.0005					J	14.8
23445 pentaCB #118	0.0001						427
23445 pentaCB #123	0.0001						99
23344 pentaCB #105	0.0001						251
33445 pentaCB #126	0.1					J	4.7
234455 hexaCB #167	0.00001					Q	36
233445 hexaCB #156	0.0005					Q	88.5
233445 hexaCB #157	0.0005					Q,J	20.4
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001						368
2233445 heptaCB #170	0.0001						193
2334455 heptaCB #189	0.0001					EMPC,J	7.3

Total TEQ: Non-Detects = Detection Limit 0.64
 Non-Detects = 1/2 d.l. 0.64
 Non-Detects = zero 0.64

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-6

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	9.5
3344 tetraCB #77	0.0001						39.2
23445 pentaCB #114	0.0005						31
23445 pentaCB #118	0.0001						913
23445 pentaCB #123	0.0001						219
23344 pentaCB #105	0.0001						533
33445 pentaCB #126	0.1					J	7.3
234455 hexaCB #167	0.00001						80.6
233445 hexaCB #156	0.0005						215
233445 hexaCB #157	0.0005						46.4
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001						774
2233445 heptaCB #170	0.0001						404
2334455 heptaCB #189	0.0001					J	8.7

Total TEQ: Non-Detects = Detection Limit 1.1
 Non-Detects = 1/2 d.l. 1.1
 Non-Detects = zero 1.1

PHASE II - EMERSON PARK, MIDLAND COUNTY SOIL SAMPLES

EMP 3-15

Latitude 43.618046341N

Longitude 84.257070167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	9.3
3344 tetraCB #77	0.0001					J	15.2
23445 pentaCB #114	0.0005						64.6
23445 pentaCB #118	0.0001						185
23445 pentaCB #123	0.0001						39.9
23344 pentaCB #105	0.0001					EMPC	121
33445 pentaCB #126	0.1					J	10.5
234455 hexaCB #167	0.00001					Q	39.8
233445 hexaCB #156	0.0005					Q	50.4
233445 hexaCB #157	0.0005					Q,J	11.2
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001						99.1
2233445 heptaCB #170	0.0001						81.2
2334455 heptaCB #189	0.0001					J	15.9

Total TEQ: Non-Detects = Detection Limit 1.2
 Non-Detects = 1/2 d.l. 1.2
 Non-Detects = zero 1.2

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-1

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	4.9
3344 tetraCB #77	0.0001						44.6
23445 pentaCB #114	0.0005					J	12.8
23445 pentaCB #118	0.0001						239
23445 pentaCB #123	0.0001						57.4
23344 pentaCB #105	0.0001					EMPC	167
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					J	9.9
233445 hexaCB #156	0.0005					J	26.2
233445 hexaCB #157	0.0005					EMPC,J	5.9
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						85.9
2233445 heptaCB #170	0.0001						50.6
2334455 heptaCB #189	0.0001					EMPC,J	8.1

Total TEQ: Non-Detects = Detection Limit 0.16
 Non-Detects = 1/2 d.l. 0.12
 Non-Detects = zero 0.081

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-3

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19.1
3344 tetraCB #77	0.0001						121
23445 pentaCB #114	0.0005						44
23445 pentaCB #118	0.0001						523
23445 pentaCB #123	0.0001						148
23344 pentaCB #105	0.0001					EMPC	590
33445 pentaCB #126	0.1					J	9.9
234455 hexaCB #167	0.00001					J	25
233445 hexaCB #156	0.0005						55.8
233445 hexaCB #157	0.0005					J	11.7
334455 hexaCB #169	0.01					ND	0.6
2234455 heptaCB #180	0.00001						206
2233445 heptaCB #170	0.0001						128
2334455 heptaCB #189	0.0001					EMPC,J	14.8

Total TEQ: Non-Detects = Detection Limit 1.2
 Non-Detects = 1/2 d.l. 1.2
 Non-Detects = zero 1.2

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-6

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19.2
3344 tetraCB #77	0.0001						149
23445 pentaCB #114	0.0005						48.8
23445 pentaCB #118	0.0001						405
23445 pentaCB #123	0.0001						113
23344 pentaCB #105	0.0001					EMPC	257
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					J	15.4
233445 hexaCB #156	0.0005						38.4
233445 hexaCB #157	0.0005					EMPC,J	5.3
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						147
2233445 heptaCB #170	0.0001						109
2334455 heptaCB #189	0.0001					J	5.5

Total TEQ: Non-Detects = Detection Limit 0.23
 Non-Detects = 1/2 d.l. 0.19
 Non-Detects = zero 0.15

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 1-15

Latitude 43.570056197N

Longitude 84.194778133W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	23.4
3344 tetraCB #77	0.0001						142
23445 pentaCB #114	0.0005						80.3
23445 pentaCB #118	0.0001						491
23445 pentaCB #123	0.0001						141
23344 pentaCB #105	0.0001					EMPC	403
33445 pentaCB #126	0.1					J	12.5
234455 hexaCB #167	0.00001					J	28.9
233445 hexaCB #156	0.0005						51.4
233445 hexaCB #157	0.0005					J	11.7
334455 hexaCB #169	0.01					ND	0.6
2234455 heptaCB #180	0.00001						205
2233445 heptaCB #170	0.0001						142
2334455 heptaCB #189	0.0001						34.4

Total TEQ: Non-Detects = Detection Limit 1.5
 Non-Detects = 1/2 d.l. 1.5
 Non-Detects = zero 1.5

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-1

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	14.5
3344 tetraCB #77	0.0001						87.7
23445 pentaCB #114	0.0005					EMPC,J	23.4
23445 pentaCB #118	0.0001						539
23445 pentaCB #123	0.0001						128
23344 pentaCB #105	0.0001					EMPC	346
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					Q	40.6
233445 hexaCB #156	0.0005					Q	85.3
233445 hexaCB #157	0.0005					QJ	22.1
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001						254
2233445 heptaCB #170	0.0001						191
2334455 heptaCB #189	0.0001					J	19

Total TEQ: Non-Detects = Detection Limit 0.29
 Non-Detects = 1/2 d.l. 0.25
 Non-Detects = zero 0.2

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-3

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J,B	10.1
3344 tetraCB #77	0.0001						76.7
23445 pentaCB #114	0.0005						31.5
23445 pentaCB #118	0.0001						450
23445 pentaCB #123	0.0001						92.3
23344 pentaCB #105	0.0001					EMPC	305
33445 pentaCB #126	0.1					J	7.7
234455 hexaCB #167	0.00001					Q	38.5
233445 hexaCB #156	0.0005					Q	76.6
233445 hexaCB #157	0.0005					Q,J	21.2
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001						244
2233445 heptaCB #170	0.0001						166
2334455 heptaCB #189	0.0001					J	18.4

Total TEQ: Non-Detects = Detection Limit 0.96
 Non-Detects = 1/2 d.l. 0.95
 Non-Detects = zero 0.95

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-6

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	11.5
3344 tetraCB #77	0.0001						68.1
23445 pentaCB #114	0.0005						29.8
23445 pentaCB #118	0.0001						403
23445 pentaCB #123	0.0001						86.3
23344 pentaCB #105	0.0001					EMPC	308
33445 pentaCB #126	0.1					J	7.3
234455 hexaCB #167	0.00001						30.9
233445 hexaCB #156	0.0005						71
233445 hexaCB #157	0.0005					J	15.4
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						246
2233445 heptaCB #170	0.0001						168
2334455 heptaCB #189	0.0001					J	21.6

Total TEQ: Non-Detects = Detection Limit 0.91
 Non-Detects = 1/2 d.l. 0.9
 Non-Detects = zero 0.9

PHASE II - CALDWELL BOAT LAUNCH, MIDLAND COUNTY SOIL SAMPLES

CBL 2-15

Latitude 43.570318477N

Longitude 84.194127167W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	11
3344 tetraCB #77	0.0001						135
23445 pentaCB #114	0.0005					J	19.4
23445 pentaCB #118	0.0001						431
23445 pentaCB #123	0.0001						123
23344 pentaCB #105	0.0001					EMPC	300
33445 pentaCB #126	0.1					EMPC,J	7.8
234455 hexaCB #167	0.00001					J	23
233445 hexaCB #156	0.0005						44.9
233445 hexaCB #157	0.0005					J	11.8
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						221
2233445 heptaCB #170	0.0001						139
2334455 heptaCB #189	0.0001					J	15.2

Total TEQ: Non-Detects = Detection Limit 0.94
 Non-Detects = 1/2 d.l. 0.94
 Non-Detects = zero 0.94

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-1 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	8
3344 tetraCB #77	0.0001					J	12.6
23445 pentaCB #114	0.0005						52.9
23445 pentaCB #118	0.0001						180
23445 pentaCB #123	0.0001						36.6
23344 pentaCB #105	0.0001					EMPC	113
33445 pentaCB #126	0.1					EMPC,J	9.1
234455 hexaCB #167	0.00001					Q	33.7
233445 hexaCB #156	0.0005					Q	49.5
233445 hexaCB #157	0.0005					Q,J	11.4
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001						105
2233445 heptaCB #170	0.0001						89.8
2334455 heptaCB #189	0.0001					J	17.7

Total TEQ: Non-Detects = Detection Limit 1.0
 Non-Detects = 1/2 d.l. 1.0
 Non-Detects = zero 1.0

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-3 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	6.2
3344 tetraCB #77	0.0001					J	10.1
23445 pentaCB #114	0.0005						35.5
23445 pentaCB #118	0.0001						97.1
23445 pentaCB #123	0.0001					EMPC,J	20.9
23344 pentaCB #105	0.0001					EMPC	63.1
33445 pentaCB #126	0.1					EMPC,J	5.4
234455 hexaCB #167	0.00001					Q,J	15.7
233445 hexaCB #156	0.0005					Q,J	22.9
233445 hexaCB #157	0.0005					Q,J	5
334455 hexaCB #169	0.01					ND	0.5
2234455 heptaCB #180	0.00001						72.7
2233445 heptaCB #170	0.0001						61.1
2334455 heptaCB #189	0.0001					J	10.5

Total TEQ: Non-Detects = Detection Limit 0.6
 Non-Detects = 1/2 d.l. 0.6
 Non-Detects = zero 0.6

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-6 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	12.1
3344 tetraCB #77	0.0001					J	15.7
23445 pentaCB #114	0.0005						53.7
23445 pentaCB #118	0.0001						120
23445 pentaCB #123	0.0001						30.4
23344 pentaCB #105	0.0001					EMPC	87.5
33445 pentaCB #126	0.1					J	10.1
234455 hexaCB #167	0.00001					Q	50
233445 hexaCB #156	0.0005					Q	33.5
233445 hexaCB #157	0.0005					EMPC,J,Q	7.2
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001						93.5
2233445 heptaCB #170	0.0001						75.9
2334455 heptaCB #189	0.0001					EMPC	32.7

Total TEQ: Non-Detects = Detection Limit 1.1
 Non-Detects = 1/2 d.l. 1.1
 Non-Detects = zero 1.1

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 1-15 (LOC 1) Latitude 43.526594146N Longitude 84.128383491W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						31.2
3344 tetraCB #77	0.0001						36.5
23445 pentaCB #114	0.0005						223
23445 pentaCB #118	0.0001						339
23445 pentaCB #123	0.0001						68.6
23344 pentaCB #105	0.0001					EMPC	284
33445 pentaCB #126	0.1						34
234455 hexaCB #167	0.00001					Q	116
233445 hexaCB #156	0.0005					Q	101
233445 hexaCB #157	0.0005					Q,J	19.4
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001						207
2233445 heptaCB #170	0.0001						169
2334455 heptaCB #189	0.0001						68.2

Total TEQ: Non-Detects = Detection Limit 3.7
 Non-Detects = 1/2 d.l. 3.7
 Non-Detects = zero 3.7

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-1 (LOC 2) Latitude 43.526578828N Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	25.2
3344 tetraCB #77	0.0001						126
23445 pentaCB #114	0.0005						96.5
23445 pentaCB #118	0.0001						1050
23445 pentaCB #123	0.0001						189
23344 pentaCB #105	0.0001					EMPC	860
33445 pentaCB #126	0.1					J	27.8
234455 hexaCB #167	0.00001					Q	128
233445 hexaCB #156	0.0005					Q	196
233445 hexaCB #157	0.0005					Q	44
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						445
2233445 heptaCB #170	0.0001						364
2334455 heptaCB #189	0.0001					EMPC	48

Total TEQ: **Non-Detects = Detection Limit** 3.2
 Non-Detects = 1/2 d.l. 3.2
 Non-Detects = zero 3.2

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-3 (LOC 2) Latitude 43.526578828N Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	22.4
3344 tetraCB #77	0.0001						128
23445 pentaCB #114	0.0005						90
23445 pentaCB #118	0.0001						1020
23445 pentaCB #123	0.0001						182
23344 pentaCB #105	0.0001					EMPC	712
33445 pentaCB #126	0.1					J	21.9
234455 hexaCB #167	0.00001					Q	90.7
233445 hexaCB #156	0.0005					Q	158
233445 hexaCB #157	0.0005					Q	31.7
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001						476
2233445 heptaCB #170	0.0001						345
2334455 heptaCB #189	0.0001						49.2

Total TEQ: **Non-Detects = Detection Limit** 2.6
 Non-Detects = 1/2 d.l. 2.6
 Non-Detects = zero 2.6

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-6 (LOC 2) Latitude 43.526578828N Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						52.1
3344 tetraCB #77	0.0001						187
23445 pentaCB #114	0.0005						222
23445 pentaCB #118	0.0001						1220
23445 pentaCB #123	0.0001						269
23344 pentaCB #105	0.0001					EMPC	1040
33445 pentaCB #126	0.1						46.5
234455 hexaCB #167	0.00001						97.9
233445 hexaCB #156	0.0005						181
233445 hexaCB #157	0.0005						36.2
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						557
2233445 heptaCB #170	0.0001						447
2334455 heptaCB #189	0.0001						94.8

Total TEQ: Non-Detects = Detection Limit 5.2
 Non-Detects = 1/2 d.l. 5.2
 Non-Detects = zero 5.2

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 2-15 (LOC 2) Latitude 43.526578828N Longitude 84.127767438W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						36.9
3344 tetraCB #77	0.0001						121
23445 pentaCB #114	0.0005						274
23445 pentaCB #118	0.0001						825
23445 pentaCB #123	0.0001						191
23344 pentaCB #105	0.0001					EMPC	755
33445 pentaCB #126	0.1						56.7
234455 hexaCB #167	0.00001						88.2
233445 hexaCB #156	0.0005						130
233445 hexaCB #157	0.0005					J	25.1
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001						390
2233445 heptaCB #170	0.0001						319
2334455 heptaCB #189	0.0001					EMPC	121

Total TEQ: Non-Detects = Detection Limit 6.1
 Non-Detects = 1/2 d.l. 6.1
 Non-Detects = zero 6.1

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-1 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	14.6
3344 tetraCB #77	0.0001						82.9
23445 pentaCB #114	0.0005						46.9
23445 pentaCB #118	0.0001						490
23445 pentaCB #123	0.0001						107
23344 pentaCB #105	0.0001					EMPC	360
33445 pentaCB #126	0.1					ND	1
234455 hexaCB #167	0.00001					Q	35.8
233445 hexaCB #156	0.0005					Q	71.1
233445 hexaCB #157	0.0005					EMPC,QJ	16
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						240
2233445 heptaCB #170	0.0001						181
2334455 heptaCB #189	0.0001					EMPC,J	25.1

Total TEQ: Non-Detects = Detection Limit 0.31
 Non-Detects = 1/2 d.l. 0.25
 Non-Detects = zero 0.2

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-3 (LOC 3)

Latitude 43.526357937N

Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	21.2
3344 tetraCB #77	0.0001						95.2
23445 pentaCB #114	0.0005						50.3
23445 pentaCB #118	0.0001						636
23445 pentaCB #123	0.0001						147
23344 pentaCB #105	0.0001					EMPC	431
33445 pentaCB #126	0.1					EMPC,J	13.2
234455 hexaCB #167	0.00001						62.1
233445 hexaCB #156	0.0005						79.1
233445 hexaCB #157	0.0005					J	18.3
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001						301
2233445 heptaCB #170	0.0001						223
2334455 heptaCB #189	0.0001					EMPC	43.8

Total TEQ: Non-Detects = Detection Limit 1.6
 Non-Detects = 1/2 d.l. 1.6
 Non-Detects = zero 1.6

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-6 (LOC 3) Latitude 43.526357937N Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19.6
3344 tetraCB #77	0.0001						108
23445 pentaCB #114	0.0005						54.2
23445 pentaCB #118	0.0001						757
23445 pentaCB #123	0.0001						156
23344 pentaCB #105	0.0001					EMPC	470
33445 pentaCB #126	0.1					J	11.6
234455 hexaCB #167	0.00001						39.6
233445 hexaCB #156	0.0005						93
233445 hexaCB #157	0.0005					J	21.9
334455 hexaCB #169	0.01					ND	0.6
2234455 heptaCB #180	0.00001						395
2233445 heptaCB #170	0.0001						256
2334455 heptaCB #189	0.0001						32.2

Total TEQ: Non-Detects = Detection Limit 1.4
 Non-Detects = 1/2 d.l. 1.4
 Non-Detects = zero 1.4

PHASE II - FREELAND FESTIVAL PARK, SAGINAW COUNTY SOIL SAMPLES

FFP 3-15 (LOC 3) Latitude 43.526357937N Longitude 84.127395911W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						92.3
3344 tetraCB #77	0.0001						511
23445 pentaCB #114	0.0005						194
23445 pentaCB #118	0.0001						2770
23445 pentaCB #123	0.0001						723
23344 pentaCB #105	0.0001						2000
33445 pentaCB #126	0.1						44.7
234455 hexaCB #167	0.00001						181
233445 hexaCB #156	0.0005						348
233445 hexaCB #157	0.0005						82
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						1350
2233445 heptaCB #170	0.0001						965
2334455 heptaCB #189	0.0001						83.9

Total TEQ: Non-Detects = Detection Limit 5.5
 Non-Detects = 1/2 d.l. 5.5
 Non-Detects = zero 5.5

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-3

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					J	8.2
23445 pentaCB #114	0.0005					EMPC,J	3.8
23445 pentaCB #118	0.0001						100
23445 pentaCB #123	0.0001					J	26.7
23344 pentaCB #105	0.0001						62.5
33445 pentaCB #126	0.1					ND	1
234455 hexaCB #167	0.00001					Q,J	7.5
233445 hexaCB #156	0.0005					Q,J	19.8
233445 hexaCB #157	0.0005					Q,J	3.5
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						106
2233445 heptaCB #170	0.0001						59.9
2334455 heptaCB #189	0.0001					EMPC,J	3.2

Total TEQ: Non-Detects = Detection Limit 0.16
 Non-Detects = 1/2 d.l. 0.098
 Non-Detects = zero 0.041

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-6

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					J	3.7
23445 pentaCB #114	0.0005					J	2.8
23445 pentaCB #118	0.0001						62.6
23445 pentaCB #123	0.0001					J	16.8
23344 pentaCB #105	0.0001					J	33.1
33445 pentaCB #126	0.1					ND	1
234455 hexaCB #167	0.00001					EMPC,J	6.8
233445 hexaCB #156	0.0005					J	13.2
233445 hexaCB #157	0.0005					EMPC,J	4.2
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001						80.2
2233445 heptaCB #170	0.0001						46.5
2334455 heptaCB #189	0.0001					ND	1.2

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.084
 Non-Detects = zero 0.027

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 1-15

Latitude 43.510389526N

Longitude 84.124452792W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					J	1.6
23445 pentaCB #114	0.0005					ND	1.4
23445 pentaCB #118	0.0001					J,B	10.8
23445 pentaCB #123	0.0001					ND	1.4
23344 pentaCB #105	0.0001					J	6.4
33445 pentaCB #126	0.1					ND	1.8
234455 hexaCB #167	0.00001					EMPC,J	1.8
233445 hexaCB #156	0.0005					J	3.2
233445 hexaCB #157	0.0005					ND	0.9
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						53.1
2233445 heptaCB #170	0.0001					J	26.1
2334455 heptaCB #189	0.0001					ND	1.4

Total TEQ: Non-Detects = Detection Limit 0.2
 Non-Detects = 1/2 d.l. 0.1
 Non-Detects = zero 0.0066

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-3

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.4
3344 tetraCB #77	0.0001					J	3.5
23445 pentaCB #114	0.0005					ND	0.4
23445 pentaCB #118	0.0001						45.7
23445 pentaCB #123	0.0001					J	9.5
23344 pentaCB #105	0.0001					J	29.5
33445 pentaCB #126	0.1					ND	0.6
234455 hexaCB #167	0.00001					J	5.7
233445 hexaCB #156	0.0005					EMPC,J	11.9
233445 hexaCB #157	0.0005					J	3.4
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						65.1
2233445 heptaCB #170	0.0001						43.5
2334455 heptaCB #189	0.0001					ND	0.7

Total TEQ: Non-Detects = Detection Limit 0.09
 Non-Detects = 1/2 d.l. 0.056
 Non-Detects = zero 0.022

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-6

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.4
3344 tetraCB #77	0.0001					J	1.3
23445 pentaCB #114	0.0005					ND	0.5
23445 pentaCB #118	0.0001					J	29.7
23445 pentaCB #123	0.0001					J	7.3
23344 pentaCB #105	0.0001					J	14.9
33445 pentaCB #126	0.1					ND	0.6
234455 hexaCB #167	0.00001					J	3.9
233445 hexaCB #156	0.0005					EMPC,J	6
233445 hexaCB #157	0.0005					EMPC,J	2.4
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						76.5
2233445 heptaCB #170	0.0001						42.5
2334455 heptaCB #189	0.0001					ND	0.7

Total TEQ: Non-Detects = Detection Limit 0.083
 Non-Detects = 1/2 d.l. 0.049
 Non-Detects = zero 0.015

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 2-15

Latitude 43.510378040N

Longitude 84.124261689W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					J	1.5
23445 pentaCB #114	0.0005					ND	0.8
23445 pentaCB #118	0.0001					J,B	7.6
23445 pentaCB #123	0.0001					ND	0.7
23344 pentaCB #105	0.0001					J	4.2
33445 pentaCB #126	0.1					ND	1
234455 hexaCB #167	0.00001					ND	1
233445 hexaCB #156	0.0005					EMPC,J	2.9
233445 hexaCB #157	0.0005					ND	1.1
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001					J	21.1
2233445 heptaCB #170	0.0001					J	11.7
2334455 heptaCB #189	0.0001					ND	1.5

Total TEQ: Non-Detects = Detection Limit 0.12
 Non-Detects = 1/2 d.l. 0.061
 Non-Detects = zero 0.0042

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-3

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	2.6
3344 tetraCB #77	0.0001					J	3.4
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001						79.9
23445 pentaCB #123	0.0001					EMPC,J	19.3
23344 pentaCB #105	0.0001						40.4
33445 pentaCB #126	0.1					J	4.4
234455 hexaCB #167	0.00001					J	7.7
233445 hexaCB #156	0.0005					J	16
233445 hexaCB #157	0.0005					J	5.2
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						65.7
2233445 heptaCB #170	0.0001						42.6
2334455 heptaCB #189	0.0001					ND	1.7

Total TEQ: Non-Detects = Detection Limit 0.49
 Non-Detects = 1/2 d.l. 0.48
 Non-Detects = zero 0.47

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-6

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.5
3344 tetraCB #77	0.0001					J	2.3
23445 pentaCB #114	0.0005					ND	0.5
23445 pentaCB #118	0.0001					J	28.7
23445 pentaCB #123	0.0001					J	9.4
23344 pentaCB #105	0.0001					J	16.7
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					EMPC,J	5.8
233445 hexaCB #156	0.0005					J	10.7
233445 hexaCB #157	0.0005					J	3.6
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						84
2233445 heptaCB #170	0.0001						46.2
2334455 heptaCB #189	0.0001					EMPC,J	2.6

Total TEQ: Non-Detects = Detection Limit 0.097
 Non-Detects = 1/2 d.l. 0.058
 Non-Detects = zero 0.019

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 3-15

Latitude 43.510364024N

Longitude 84.123832212W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.5
3344 tetraCB #77	0.0001					ND	0.4
23445 pentaCB #114	0.0005					ND	0.5
23445 pentaCB #118	0.0001					J	5.7
23445 pentaCB #123	0.0001					J	1.9
23344 pentaCB #105	0.0001					EMPC,J	3.4
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					J	1.6
233445 hexaCB #156	0.0005					EMPC,J	2.3
233445 hexaCB #157	0.0005					ND	0.6
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001					J	15.6
2233445 heptaCB #170	0.0001					J	7.8
2334455 heptaCB #189	0.0001					ND	0.8

Total TEQ: Non-Detects = Detection Limit 0.081
 Non-Detects = 1/2 d.l. 0.042
 Non-Detects = zero 0.0032

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-3

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					EMPC,J	2
23445 pentaCB #114	0.0005					ND	0.6
23445 pentaCB #118	0.0001					J	20.8
23445 pentaCB #123	0.0001					J	7.8
23344 pentaCB #105	0.0001					J	10.2
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					J	4.4
233445 hexaCB #156	0.0005					EMPC,J	9.5
233445 hexaCB #157	0.0005					J	2.5
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001						53.5
2233445 heptaCB #170	0.0001						32.6
2334455 heptaCB #189	0.0001					ND	1.1

Total TEQ: Non-Detects = Detection Limit 0.12
 Non-Detects = 1/2 d.l. 0.065
 Non-Detects = zero 0.014

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-6

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.5
3344 tetraCB #77	0.0001					EMPC,J	1.3
23445 pentaCB #114	0.0005					ND	0.5
23445 pentaCB #118	0.0001					J	11.4
23445 pentaCB #123	0.0001					J	3.4
23344 pentaCB #105	0.0001					J	6
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					EMPC,J	2.3
233445 hexaCB #156	0.0005					J	4.9
233445 hexaCB #157	0.0005					J	1
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						45.7
2233445 heptaCB #170	0.0001					J	21.6
2334455 heptaCB #189	0.0001					ND	0.8

Total TEQ: Non-Detects = Detection Limit 0.086
 Non-Detects = 1/2 d.l. 0.047
 Non-Detects = zero 0.0078

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 4-15

Latitude 43.510356218N

Longitude 84.123324510W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					EMPC,J	1.2
23445 pentaCB #114	0.0005					ND	0.6
23445 pentaCB #118	0.0001					J	4.4
23445 pentaCB #123	0.0001					ND	0.6
23344 pentaCB #105	0.0001					J	1.4
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					ND	0.7
233445 hexaCB #156	0.0005					J	2.1
233445 hexaCB #157	0.0005					ND	0.8
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001					J	25.2
2233445 heptaCB #170	0.0001					EMPC,J	15
2334455 heptaCB #189	0.0001					ND	1

Total TEQ: Non-Detects = Detection Limit 0.1
 Non-Detects = 1/2 d.l. 0.054
 Non-Detects = zero 0.0035

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-3

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.5
3344 tetraCB #77	0.0001					EMPC,J	3.9
23445 pentaCB #114	0.0005					ND	0.6
23445 pentaCB #118	0.0001						47.9
23445 pentaCB #123	0.0001					EMPC,J	8.4
23344 pentaCB #105	0.0001					J	26.5
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					J	5.2
233445 hexaCB #156	0.0005					J	12.4
233445 hexaCB #157	0.0005					J	3.1
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001						72.3
2233445 heptaCB #170	0.0001						46.5
2334455 heptaCB #189	0.0001					ND	0.9

Total TEQ: Non-Detects = Detection Limit 0.11
 Non-Detects = 1/2 d.l. 0.067
 Non-Detects = zero 0.022

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-6

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.5
3344 tetraCB #77	0.0001					EMPC,J	1.6
23445 pentaCB #114	0.0005					ND	0.5
23445 pentaCB #118	0.0001					J,B	17.7
23445 pentaCB #123	0.0001					J	3.7
23344 pentaCB #105	0.0001					J,B	9.2
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					J,B	3.6
233445 hexaCB #156	0.0005					J,B	6.3
233445 hexaCB #157	0.0005					ND	0.6
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001						50.1
2233445 heptaCB #170	0.0001					J	27.9
2334455 heptaCB #189	0.0001					J	2.1

Total TEQ: Non-Detects = Detection Limit 0.089
 Non-Detects = 1/2 d.l. 0.049
 Non-Detects = zero 0.0099

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 5-15

Latitude 43.510299607N

Longitude 84.123204987W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					ND	0.5
23445 pentaCB #114	0.0005					ND	0.7
23445 pentaCB #118	0.0001					EMPC,J,B	4.5
23445 pentaCB #123	0.0001					ND	0.7
23344 pentaCB #105	0.0001					J	3.4
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					ND	0.8
233445 hexaCB #156	0.0005					J	2.2
233445 hexaCB #157	0.0005					ND	0.8
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					EMPC,J,B	15.7
2233445 heptaCB #170	0.0001					J	9.9
2334455 heptaCB #189	0.0001					ND	1.2

Total TEQ: Non-Detects = Detection Limit 0.11
 Non-Detects = 1/2 d.l. 0.054
 Non-Detects = zero 0.003

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-3

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	4.1
3344 tetraCB #77	0.0001					J	10.6
23445 pentaCB #114	0.0005					EMPC,J	9.8
23445 pentaCB #118	0.0001						153
23445 pentaCB #123	0.0001					J	30
23344 pentaCB #105	0.0001						101
33445 pentaCB #126	0.1					ND	0.6
234455 hexaCB #167	0.00001					EMPC,J	14.9
233445 hexaCB #156	0.0005					J	33.3
233445 hexaCB #157	0.0005					J	8.3
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001						134
2233445 heptaCB #170	0.0001						82.4
2334455 heptaCB #189	0.0001					EMPC,J	7.6

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.1
 Non-Detects = zero 0.066

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-6

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.9
3344 tetraCB #77	0.0001					EMPC,J	23.3
23445 pentaCB #114	0.0005					J	15
23445 pentaCB #118	0.0001						282
23445 pentaCB #123	0.0001						52
23344 pentaCB #105	0.0001						171
33445 pentaCB #126	0.1					EMPC,J	4.3
234455 hexaCB #167	0.00001					J	28.5
233445 hexaCB #156	0.0005						55.4
233445 hexaCB #157	0.0005					J	14.2
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						221
2233445 heptaCB #170	0.0001						130
2334455 heptaCB #189	0.0001					EMPC,J	15.7

Total TEQ: Non-Detects = Detection Limit 0.56
 Non-Detects = 1/2 d.l. 0.55
 Non-Detects = zero 0.54

PHASE II - LIVESTOCK FARM, SAGINAW COUNTY SOIL SAMPLES

LIVE 6-15

Latitude 43.510400572N

Longitude 84.122889416W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	6.2
3344 tetraCB #77	0.0001					EMPC,J	25.7
23445 pentaCB #114	0.0005					J	16.5
23445 pentaCB #118	0.0001						378
23445 pentaCB #123	0.0001						93.6
23344 pentaCB #105	0.0001						214
33445 pentaCB #126	0.1					ND	2
234455 hexaCB #167	0.00001					J	34.3
233445 hexaCB #156	0.0005						59.2
233445 hexaCB #157	0.0005					J	18.7
334455 hexaCB #169	0.01					ND	3.7
2234455 heptaCB #180	0.00001						288
2233445 heptaCB #170	0.0001						157
2334455 heptaCB #189	0.0001					EMPC,J	20

Total TEQ: Non-Detects = Detection Limit 0.38
 Non-Detects = 1/2 d.l. 0.26
 Non-Detects = zero 0.14

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-3

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						42.2
3344 tetraCB #77	0.0001						213
23445 pentaCB #114	0.0005						183
23445 pentaCB #118	0.0001						1520
23445 pentaCB #123	0.0001						289
23344 pentaCB #105	0.0001					EMPC	1110
33445 pentaCB #126	0.1						35.9
234455 hexaCB #167	0.00001					Q	117
233445 hexaCB #156	0.0005					Q	195
233445 hexaCB #157	0.0005					Q	43.7
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001						690
2233445 heptaCB #170	0.0001						509
2334455 heptaCB #189	0.0001						67.9

Total TEQ: Non-Detects = Detection Limit 4.2
 Non-Detects = 1/2 d.l. 4.2
 Non-Detects = zero 4.2

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-6

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						35.8
3344 tetraCB #77	0.0001						196
23445 pentaCB #114	0.0005						166
23445 pentaCB #118	0.0001						1320
23445 pentaCB #123	0.0001						255
23344 pentaCB #105	0.0001					EMPC	933
33445 pentaCB #126	0.1						35.5
234455 hexaCB #167	0.00001						179
233445 hexaCB #156	0.0005						169
233445 hexaCB #157	0.0005						37.8
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						583
2233445 heptaCB #170	0.0001						442
2334455 heptaCB #189	0.0001						94.7

Total TEQ: Non-Detects = Detection Limit 4.1
 Non-Detects = 1/2 d.l. 4.1
 Non-Detects = zero 4.1

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 1-15

Latitude 43.453430907N

Longitude 84.081867058W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						79.7
3344 tetraCB #77	0.0001						575
23445 pentaCB #114	0.0005						246
23445 pentaCB #118	0.0001						2580
23445 pentaCB #123	0.0001						585
23344 pentaCB #105	0.0001					EMPC	3580
33445 pentaCB #126	0.1						97.8
234455 hexaCB #167	0.00001					Q	284
233445 hexaCB #156	0.0005					Q	444
233445 hexaCB #157	0.0005					Q	107
334455 hexaCB #169	0.01					ND	1.9
2234455 heptaCB #180	0.00001						1670
2233445 heptaCB #170	0.0001						1320
2334455 heptaCB #189	0.0001					EMPC	227
Total TEQ:		Non-Detects = Detection Limit				11	
		Non-Detects = 1/2 d.l.				11	
		Non-Detects = zero				11	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-3

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	16.7
3344 tetraCB #77	0.0001						53
23445 pentaCB #114	0.0005						66.8
23445 pentaCB #118	0.0001						338
23445 pentaCB #123	0.0001						69.3
23344 pentaCB #105	0.0001					EMPC	220
33445 pentaCB #126	0.1					J	14
234455 hexaCB #167	0.00001					Q	44.4
233445 hexaCB #156	0.0005					Q	50.5
233445 hexaCB #157	0.0005					EMPC,J,Q	11.2
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						168
2233445 heptaCB #170	0.0001						125
2334455 heptaCB #189	0.0001					J	24.3
Total TEQ:		Non-Detects = Detection Limit				1.6	
		Non-Detects = 1/2 d.l.				1.6	
		Non-Detects = zero				1.6	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-6

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	16
3344 tetraCB #77	0.0001						37.7
23445 pentaCB #114	0.0005						76.4
23445 pentaCB #118	0.0001						330
23445 pentaCB #123	0.0001						73.6
23344 pentaCB #105	0.0001					EMPC	228
33445 pentaCB #126	0.1					J	14.2
234455 hexaCB #167	0.00001						54.1
233445 hexaCB #156	0.0005						55.7
233445 hexaCB #157	0.0005					EMPC,J	14.2
334455 hexaCB #169	0.01					ND	3.7
2234455 heptaCB #180	0.00001						166
2233445 heptaCB #170	0.0001					EMPC	122
2334455 heptaCB #189	0.0001						33.1

Total TEQ: Non-Detects = Detection Limit 1.6
 Non-Detects = 1/2 d.l. 1.6
 Non-Detects = zero 1.6

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 2-15

Latitude 43.453661372N

Longitude 84.081571621W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	9.6
3344 tetraCB #77	0.0001					J	21.9
23445 pentaCB #114	0.0005						56.8
23445 pentaCB #118	0.0001						220
23445 pentaCB #123	0.0001						46.5
23344 pentaCB #105	0.0001					EMPC	208
33445 pentaCB #126	0.1					ND	3.1
234455 hexaCB #167	0.00001					J	27.6
233445 hexaCB #156	0.0005						40.8
233445 hexaCB #157	0.0005					EMPC,J	8.1
334455 hexaCB #169	0.01					ND	4.7
2234455 heptaCB #180	0.00001						119
2233445 heptaCB #170	0.0001						85.3
2334455 heptaCB #189	0.0001					EMPC,J	20.1

Total TEQ: Non-Detects = Detection Limit 0.47
 Non-Detects = 1/2 d.l. 0.29
 Non-Detects = zero 0.12

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-3

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	14.9
3344 tetraCB #77	0.0001						46.5
23445 pentaCB #114	0.0005						69.1
23445 pentaCB #118	0.0001						376
23445 pentaCB #123	0.0001						80.5
23344 pentaCB #105	0.0001					EMPC	370
33445 pentaCB #126	0.1					ND	1.7
234455 hexaCB #167	0.00001						45.9
233445 hexaCB #156	0.0005						68.8
233445 hexaCB #157	0.0005					EMPC,J	16
334455 hexaCB #169	0.01					ND	2.6
2234455 heptaCB #180	0.00001						171
2233445 heptaCB #170	0.0001						149
2334455 heptaCB #189	0.0001					J	26.4
Total TEQ:		Non-Detects = Detection Limit		0.38			
		Non-Detects = 1/2 d.l.		0.28			
		Non-Detects = zero		0.19			

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-6

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19.6
3344 tetraCB #77	0.0001						56.8
23445 pentaCB #114	0.0005						92.3
23445 pentaCB #118	0.0001						471
23445 pentaCB #123	0.0001						109
23344 pentaCB #105	0.0001					EMPC	395
33445 pentaCB #126	0.1					EMPC,J	11
234455 hexaCB #167	0.00001						44.2
233445 hexaCB #156	0.0005						76.8
233445 hexaCB #157	0.0005					J	17.5
334455 hexaCB #169	0.01					ND	2.2
2234455 heptaCB #180	0.00001						196
2233445 heptaCB #170	0.0001						160
2334455 heptaCB #189	0.0001					EMPC	32.8
Total TEQ:		Non-Detects = Detection Limit		1.3			
		Non-Detects = 1/2 d.l.		1.3			
		Non-Detects = zero		1.3			

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 3-15

Latitude 43.454077768N

Longitude 84.081533408W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	15.1
3344 tetraCB #77	0.0001					J	17.2
23445 pentaCB #114	0.0005						61.7
23445 pentaCB #118	0.0001						142
23445 pentaCB #123	0.0001						32.8
23344 pentaCB #105	0.0001					EMPC	97.3
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001						33.8
233445 hexaCB #156	0.0005					J	26.6
233445 hexaCB #157	0.0005					EMPC,J	7.5
334455 hexaCB #169	0.01					ND	3.3
2234455 heptaCB #180	0.00001						72.4
2233445 heptaCB #170	0.0001						57.9
2334455 heptaCB #189	0.0001						53.4

Total TEQ: Non-Detects = Detection Limit 0.33
 Non-Detects = 1/2 d.l. 0.21
 Non-Detects = zero 0.091

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-3

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	10.4
3344 tetraCB #77	0.0001						37.6
23445 pentaCB #114	0.0005						42.7
23445 pentaCB #118	0.0001						327
23445 pentaCB #123	0.0001						58.8
23344 pentaCB #105	0.0001					EMPC	202
33445 pentaCB #126	0.1					EMPC,J	11.8
234455 hexaCB #167	0.00001						34.6
233445 hexaCB #156	0.0005						59.7
233445 hexaCB #157	0.0005					J	12.2
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001						496
2233445 heptaCB #170	0.0001						280
2334455 heptaCB #189	0.0001					J	17.7

Total TEQ: Non-Detects = Detection Limit 1.4
 Non-Detects = 1/2 d.l. 1.3
 Non-Detects = zero 1.3

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-6

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	11
3344 tetraCB #77	0.0001						34.5
23445 pentaCB #114	0.0005						45.7
23445 pentaCB #118	0.0001						318
23445 pentaCB #123	0.0001						57.7
23344 pentaCB #105	0.0001					EMPC	257
33445 pentaCB #126	0.1					EMPC,J	12.9
234455 hexaCB #167	0.00001						46
233445 hexaCB #156	0.0005						65.9
233445 hexaCB #157	0.0005					J	12.9
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						669
2233445 heptaCB #170	0.0001						334
2334455 heptaCB #189	0.0001					EMPC	112
Total TEQ:		Non-Detects = Detection Limit				1.5	
		Non-Detects = 1/2 d.l.				1.5	
		Non-Detects = zero				1.5	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 4-15

Latitude 43.454395021N

Longitude 84.080574386W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	8.4
3344 tetraCB #77	0.0001					J	18.7
23445 pentaCB #114	0.0005					J	31.6
23445 pentaCB #118	0.0001						156
23445 pentaCB #123	0.0001					J	28.6
23344 pentaCB #105	0.0001					EMPC	160
33445 pentaCB #126	0.1					J	6.9
234455 hexaCB #167	0.00001					J	19.1
233445 hexaCB #156	0.0005						32.5
233445 hexaCB #157	0.0005					J	6.6
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001						139
2233445 heptaCB #170	0.0001						90.9
2334455 heptaCB #189	0.0001					J	14.8
Total TEQ:		Non-Detects = Detection Limit				0.78	
		Non-Detects = 1/2 d.l.				0.78	
		Non-Detects = zero				0.77	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-3

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	14.9
3344 tetraCB #77	0.0001						48.1
23445 pentaCB #114	0.0005						74.3
23445 pentaCB #118	0.0001						483
23445 pentaCB #123	0.0001						79.5
23344 pentaCB #105	0.0001					EMPC	366
33445 pentaCB #126	0.1					J	15.4
234455 hexaCB #167	0.00001						64.6
233445 hexaCB #156	0.0005						82.4
233445 hexaCB #157	0.0005					J	21.7
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						280
2233445 heptaCB #170	0.0001						195
2334455 heptaCB #189	0.0001						43.2

Total TEQ: Non-Detects = Detection Limit 1.8
 Non-Detects = 1/2 d.l. 1.8
 Non-Detects = zero 1.8

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-6

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	11.5
3344 tetraCB #77	0.0001						36.5
23445 pentaCB #114	0.0005						53.7
23445 pentaCB #118	0.0001						384
23445 pentaCB #123	0.0001						64.2
23344 pentaCB #105	0.0001					EMPC	241
33445 pentaCB #126	0.1					EMPC,J	13.6
234455 hexaCB #167	0.00001						40.6
233445 hexaCB #156	0.0005						65.3
233445 hexaCB #157	0.0005					J	16.4
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001						220
2233445 heptaCB #170	0.0001						161
2334455 heptaCB #189	0.0001						31.7

Total TEQ: Non-Detects = Detection Limit 1.5
 Non-Detects = 1/2 d.l. 1.5
 Non-Detects = zero 1.5

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 5-15

Latitude 43.455252168N

Longitude 84.080653579W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	9.5
3344 tetraCB #77	0.0001					J	21.6
23445 pentaCB #114	0.0005						45.1
23445 pentaCB #118	0.0001						201
23445 pentaCB #123	0.0001						58.3
23344 pentaCB #105	0.0001					EMPC	149
33445 pentaCB #126	0.1					J	9.2
234455 hexaCB #167	0.00001					J	25.6
233445 hexaCB #156	0.0005						34.2
233445 hexaCB #157	0.0005					J	7.6
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001						114
2233445 heptaCB #170	0.0001						82.4
2334455 heptaCB #189	0.0001					J	20.4

Total TEQ: Non-Detects = Detection Limit 1.0
 Non-Detects = 1/2 d.l. 1.0
 Non-Detects = zero 1.0

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-3

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	15.5
3344 tetraCB #77	0.0001						36.4
23445 pentaCB #114	0.0005						79.8
23445 pentaCB #118	0.0001						279
23445 pentaCB #123	0.0001						53.1
23344 pentaCB #105	0.0001					EMPC	205
33445 pentaCB #126	0.1					J	13.9
234455 hexaCB #167	0.00001						49.4
233445 hexaCB #156	0.0005						47.8
233445 hexaCB #157	0.0005					EMPC,J	11
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						157
2233445 heptaCB #170	0.0001						113
2334455 heptaCB #189	0.0001						32.3

Total TEQ: Non-Detects = Detection Limit 1.5
 Non-Detects = 1/2 d.l. 1.5
 Non-Detects = zero 1.5

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-6

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	17
3344 tetraCB #77	0.0001					J	30.5
23445 pentaCB #114	0.0005						92
23445 pentaCB #118	0.0001						252
23445 pentaCB #123	0.0001						53.5
23344 pentaCB #105	0.0001					EMPC	153
33445 pentaCB #126	0.1					J	15.7
234455 hexaCB #167	0.00001					EMPC	44
233445 hexaCB #156	0.0005						46
233445 hexaCB #157	0.0005					J	10.6
334455 hexaCB #169	0.01					ND	1.5
2234455 heptaCB #180	0.00001						146
2233445 heptaCB #170	0.0001						108
2334455 heptaCB #189	0.0001						33.5

Total TEQ: Non-Detects = Detection Limit 1.7
 Non-Detects = 1/2 d.l. 1.7
 Non-Detects = zero 1.7

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 6-15

Latitude 43.455199102N

Longitude 84.081488090W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	6.3
3344 tetraCB #77	0.0001					J	8.8
23445 pentaCB #114	0.0005						36.6
23445 pentaCB #118	0.0001						47.9
23445 pentaCB #123	0.0001					J	12.7
23344 pentaCB #105	0.0001					EMPC,J	30.7
33445 pentaCB #126	0.1					J	5
234455 hexaCB #167	0.00001					J	19
233445 hexaCB #156	0.0005					J	9.2
233445 hexaCB #157	0.0005					ND	0.7
334455 hexaCB #169	0.01					ND	0.8
2234455 heptaCB #180	0.00001					J	20.7
2233445 heptaCB #170	0.0001					J	14.6
2334455 heptaCB #189	0.0001					J	9.1

Total TEQ: Non-Detects = Detection Limit 0.54
 Non-Detects = 1/2 d.l. 0.54
 Non-Detects = zero 0.54

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-1

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						38.2
3344 tetraCB #77	0.0001						87.6
23445 pentaCB #114	0.0005						317
23445 pentaCB #118	0.0001						620
23445 pentaCB #123	0.0001						165
23344 pentaCB #105	0.0001					EMPC	361
33445 pentaCB #126	0.1						35.9
234455 hexaCB #167	0.00001						61.5
233445 hexaCB #156	0.0005						99
233445 hexaCB #157	0.0005					EMPC,J	20.7
334455 hexaCB #169	0.01					ND	3.1
2234455 heptaCB #180	0.00001						281
2233445 heptaCB #170	0.0001						227
2334455 heptaCB #189	0.0001						58.8
Total TEQ:		Non-Detects = Detection Limit		4.0			
		Non-Detects = 1/2 d.l.		4.0			
		Non-Detects = zero		4.0			

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-3

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	26.9
3344 tetraCB #77	0.0001						95.7
23445 pentaCB #114	0.0005						93.4
23445 pentaCB #118	0.0001						707
23445 pentaCB #123	0.0001						153
23344 pentaCB #105	0.0001					EMPC	621
33445 pentaCB #126	0.1					J	25.4
234455 hexaCB #167	0.00001					Q	57.4
233445 hexaCB #156	0.0005					Q	114
233445 hexaCB #157	0.0005					Q,J	26.1
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001						444
2233445 heptaCB #170	0.0001						322
2334455 heptaCB #189	0.0001					EMPC	58.8
Total TEQ:		Non-Detects = Detection Limit		2.9			
		Non-Detects = 1/2 d.l.		2.9			
		Non-Detects = zero		2.9			

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-6

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	25.1
3344 tetraCB #77	0.0001						91.2
23445 pentaCB #114	0.0005						82.5
23445 pentaCB #118	0.0001						531
23445 pentaCB #123	0.0001						117
23344 pentaCB #105	0.0001					EMPC	594
33445 pentaCB #126	0.1					J	24.4
234455 hexaCB #167	0.00001					Q	70
233445 hexaCB #156	0.0005					Q	113
233445 hexaCB #157	0.0005					Q,J	26.1
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						366
2233445 heptaCB #170	0.0001						337
2334455 heptaCB #189	0.0001						68.6

Total TEQ: Non-Detects = Detection Limit 2.7
 Non-Detects = 1/2 d.l. 2.7
 Non-Detects = zero 2.7

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 7-15

Latitude 43.455706377N

Longitude 84.081910269W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						36.8
3344 tetraCB #77	0.0001						94.5
23445 pentaCB #114	0.0005						140
23445 pentaCB #118	0.0001						538
23445 pentaCB #123	0.0001						127
23344 pentaCB #105	0.0001					EMPC	530
33445 pentaCB #126	0.1					EMPC	39.9
234455 hexaCB #167	0.00001						54.9
233445 hexaCB #156	0.0005						103
233445 hexaCB #157	0.0005					J	22.8
334455 hexaCB #169	0.01					ND	2.8
2234455 heptaCB #180	0.00001						348
2233445 heptaCB #170	0.0001						309
2334455 heptaCB #189	0.0001						93.5

Total TEQ: Non-Detects = Detection Limit 4.3
 Non-Detects = 1/2 d.l. 4.3
 Non-Detects = zero 4.3

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-1

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	14
3344 tetraCB #77	0.0001						72.2
23445 pentaCB #114	0.0005						111
23445 pentaCB #118	0.0001						585
23445 pentaCB #123	0.0001						138
23344 pentaCB #105	0.0001					EMPC	374
33445 pentaCB #126	0.1					EMPC,J	13.5
234455 hexaCB #167	0.00001						33.5
233445 hexaCB #156	0.0005						79.9
233445 hexaCB #157	0.0005					J	19
334455 hexaCB #169	0.01					ND	2.6
2234455 heptaCB #180	0.00001						249
2233445 heptaCB #170	0.0001						165
2334455 heptaCB #189	0.0001					EMPC,J	17.5
Total TEQ:		Non-Detects = Detection Limit				1.6	
		Non-Detects = 1/2 d.l.				1.6	
		Non-Detects = zero				1.6	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-3

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	10.1
3344 tetraCB #77	0.0001						55
23445 pentaCB #114	0.0005					J	26.3
23445 pentaCB #118	0.0001						333
23445 pentaCB #123	0.0001						81.7
23344 pentaCB #105	0.0001					EMPC	219
33445 pentaCB #126	0.1					J	7.7
234455 hexaCB #167	0.00001					J	21.7
233445 hexaCB #156	0.0005						41.8
233445 hexaCB #157	0.0005					J	10.3
334455 hexaCB #169	0.01					ND	3.3
2234455 heptaCB #180	0.00001						147
2233445 heptaCB #170	0.0001						109
2334455 heptaCB #189	0.0001					J	15.9
Total TEQ:		Non-Detects = Detection Limit				0.93	
		Non-Detects = 1/2 d.l.				0.91	
		Non-Detects = zero				0.89	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-6

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	17.7
3344 tetraCB #77	0.0001						77.3
23445 pentaCB #114	0.0005					EMPC	36.7
23445 pentaCB #118	0.0001						431
23445 pentaCB #123	0.0001						104
23344 pentaCB #105	0.0001					EMPC	302
33445 pentaCB #126	0.1					J	12.3
234455 hexaCB #167	0.00001					J	23.8
233445 hexaCB #156	0.0005						52.7
233445 hexaCB #157	0.0005					EMPC,J	13.7
334455 hexaCB #169	0.01					ND	2.5
2234455 heptaCB #180	0.00001						225
2233445 heptaCB #170	0.0001						160
2334455 heptaCB #189	0.0001					J	22.2

Total TEQ: Non-Detects = Detection Limit 1.4
 Non-Detects = 1/2 d.l. 1.4
 Non-Detects = zero 1.4

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 8-15

Latitude 43.457513391N

Longitude 84.081717369W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	24.6
3344 tetraCB #77	0.0001						185
23445 pentaCB #114	0.0005						54.3
23445 pentaCB #118	0.0001						818
23445 pentaCB #123	0.0001						222
23344 pentaCB #105	0.0001					EMPC	656
33445 pentaCB #126	0.1					J	16.6
234455 hexaCB #167	0.00001						50.3
233445 hexaCB #156	0.0005						101
233445 hexaCB #157	0.0005					J	25
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001						392
2233445 heptaCB #170	0.0001						260
2334455 heptaCB #189	0.0001						32.9

Total TEQ: Non-Detects = Detection Limit 2.0
 Non-Detects = 1/2 d.l. 2.0
 Non-Detects = zero 2.0

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 9-3

Latitude 43.457223750N

Longitude 84.081948587W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	14.5
3344 tetraCB #77	0.0001						89.7
23445 pentaCB #114	0.0005						38.2
23445 pentaCB #118	0.0001						651
23445 pentaCB #123	0.0001						148
23344 pentaCB #105	0.0001					EMPC	408
33445 pentaCB #126	0.1					J	11.3
234455 hexaCB #167	0.00001						39.1
233445 hexaCB #156	0.0005						99.1
233445 hexaCB #157	0.0005					J	22.8
334455 hexaCB #169	0.01					ND	2.3
2234455 heptaCB #180	0.00001						286
2233445 heptaCB #170	0.0001						220
2334455 heptaCB #189	0.0001					J	19.4
Total TEQ:		Non-Detects = Detection Limit				1.4	
		Non-Detects = 1/2 d.l.				1.4	
		Non-Detects = zero				1.4	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 9-6

Latitude 43.457223750N

Longitude 84.081948587W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	10.7
3344 tetraCB #77	0.0001						60.3
23445 pentaCB #114	0.0005					J	27.2
23445 pentaCB #118	0.0001						441
23445 pentaCB #123	0.0001						115
23344 pentaCB #105	0.0001					EMPC	300
33445 pentaCB #126	0.1					J	7.5
234455 hexaCB #167	0.00001						31.8
233445 hexaCB #156	0.0005						62.3
233445 hexaCB #157	0.0005					J	17.4
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001						268
2233445 heptaCB #170	0.0001						177
2334455 heptaCB #189	0.0001					EMPC,J	16.1
Total TEQ:		Non-Detects = Detection Limit				0.94	
		Non-Detects = 1/2 d.l.				0.93	
		Non-Detects = zero				0.92	

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-1

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	7
3344 tetraCB #77	0.0001					J	18.6
23445 pentaCB #114	0.0005						52.6
23445 pentaCB #118	0.0001						199
23445 pentaCB #123	0.0001						41.6
23344 pentaCB #105	0.0001					EMPC	169
33445 pentaCB #126	0.1					ND	3
234455 hexaCB #167	0.00001					EMPC,J	25.9
233445 hexaCB #156	0.0005						38.9
233445 hexaCB #157	0.0005					J	10.2
334455 hexaCB #169	0.01					ND	4.5
2234455 heptaCB #180	0.00001						120
2233445 heptaCB #170	0.0001						89.5
2334455 heptaCB #189	0.0001					J	10.6

Total TEQ: Non-Detects = Detection Limit 0.45
 Non-Detects = 1/2 d.l. 0.28
 Non-Detects = zero 0.11

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-3

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	15.2
3344 tetraCB #77	0.0001						39.2
23445 pentaCB #114	0.0005						49.8
23445 pentaCB #118	0.0001						362
23445 pentaCB #123	0.0001						81
23344 pentaCB #105	0.0001					EMPC	288
33445 pentaCB #126	0.1					EMPC,J	13.3
234455 hexaCB #167	0.00001					Q	39.5
233445 hexaCB #156	0.0005					Q	75.8
233445 hexaCB #157	0.0005					Q,J	19.4
334455 hexaCB #169	0.01					ND	2.4
2234455 heptaCB #180	0.00001						274
2233445 heptaCB #170	0.0001						214
2334455 heptaCB #189	0.0001					EMPC	38.3

Total TEQ: Non-Detects = Detection Limit 1.5
 Non-Detects = 1/2 d.l. 1.5
 Non-Detects = zero 1.5

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-6

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	8.1
3344 tetraCB #77	0.0001					J	24.7
23445 pentaCB #114	0.0005					J	27
23445 pentaCB #118	0.0001						223
23445 pentaCB #123	0.0001						47.1
23344 pentaCB #105	0.0001					EMPC	192
33445 pentaCB #126	0.1					J	8.5
234455 hexaCB #167	0.00001					J	21.8
233445 hexaCB #156	0.0005						43.7
233445 hexaCB #157	0.0005					EMPC,J	11.1
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001						161
2233445 heptaCB #170	0.0001						118
2334455 heptaCB #189	0.0001					J	22.4

Total TEQ: Non-Detects = Detection Limit 0.97
 Non-Detects = 1/2 d.l. 0.97
 Non-Detects = zero 0.96

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 10-15

Latitude 43.457900425N

Longitude 84.078748671W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	16.2
3344 tetraCB #77	0.0001						52.9
23445 pentaCB #114	0.0005						59.8
23445 pentaCB #118	0.0001						535
23445 pentaCB #123	0.0001						100
23344 pentaCB #105	0.0001					EMPC	370
33445 pentaCB #126	0.1					EMPC,J	15.1
234455 hexaCB #167	0.00001					Q	45
233445 hexaCB #156	0.0005					Q	97.2
233445 hexaCB #157	0.0005					Q,J	21.4
334455 hexaCB #169	0.01					ND	2.1
2234455 heptaCB #180	0.00001						307
2233445 heptaCB #170	0.0001						208
2334455 heptaCB #189	0.0001					EMPC	37

Total TEQ: Non-Detects = Detection Limit 1.8
 Non-Detects = 1/2 d.l. 1.7
 Non-Detects = zero 1.7

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-3

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.3
3344 tetraCB #77	0.0001					J	4.9
23445 pentaCB #114	0.0005					ND	1.1
23445 pentaCB #118	0.0001					B	58.5
23445 pentaCB #123	0.0001					J	13.3
23344 pentaCB #105	0.0001					EMPC	36.4
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	6.3
233445 hexaCB #156	0.0005					EMPC,J	10.7
233445 hexaCB #157	0.0005					EMPC,J	3.4
334455 hexaCB #169	0.01					ND	1.8
2234455 heptaCB #180	0.00001					B	52.2
2233445 heptaCB #170	0.0001						39.7
2334455 heptaCB #189	0.0001					EMPC,J	6.2

Total TEQ: Non-Detects = Detection Limit 0.18
 Non-Detects = 1/2 d.l. 0.1
 Non-Detects = zero 0.024

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-6

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.1
3344 tetraCB #77	0.0001					ND	1
23445 pentaCB #114	0.0005					ND	1.2
23445 pentaCB #118	0.0001					B	49.7
23445 pentaCB #123	0.0001					J	8.6
23344 pentaCB #105	0.0001					EMPC,J	25.7
33445 pentaCB #126	0.1					ND	1.6
234455 hexaCB #167	0.00001					J	4.3
233445 hexaCB #156	0.0005					EMPC,J	10.9
233445 hexaCB #157	0.0005					EMPC,J	2.4
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001					B	50.1
2233445 heptaCB #170	0.0001						39.4
2334455 heptaCB #189	0.0001					ND	1.5

Total TEQ: Non-Detects = Detection Limit 0.2
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.02

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 11-15

Latitude 43.457987100N

Longitude 84.078062069W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	6
3344 tetraCB #77	0.0001					ND	5.2
23445 pentaCB #114	0.0005					ND	6.2
23445 pentaCB #118	0.0001					ND	5.7
23445 pentaCB #123	0.0001					ND	6.2
23344 pentaCB #105	0.0001					ND	6.6
33445 pentaCB #126	0.1					ND	7.8
234455 hexaCB #167	0.00001					ND	8.6
233445 hexaCB #156	0.0005					ND	9.6
233445 hexaCB #157	0.0005					ND	9.8
334455 hexaCB #169	0.01					ND	12
2234455 heptaCB #180	0.00001					ND	11.7
2233445 heptaCB #170	0.0001					ND	14.6
2334455 heptaCB #189	0.0001					ND	9.9

Total TEQ: Non-Detects = Detection Limit 0.92
 Non-Detects = 1/2 d.l. 0.46
 Non-Detects = zero 0

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-3

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	2.7
3344 tetraCB #77	0.0001					J	12
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001					B	85.7
23445 pentaCB #123	0.0001					J	23.3
23344 pentaCB #105	0.0001						81.2
33445 pentaCB #126	0.1					ND	1.3
234455 hexaCB #167	0.00001					J	7.7
233445 hexaCB #156	0.0005					J	14.9
233445 hexaCB #157	0.0005					J	4.8
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001					B	71
2233445 heptaCB #170	0.0001						46.7
2334455 heptaCB #189	0.0001					ND	1.5

Total TEQ: Non-Detects = Detection Limit 0.18
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.036

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-6

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	2.9
3344 tetraCB #77	0.0001					EMPC,J	8.6
23445 pentaCB #114	0.0005					J	2.8
23445 pentaCB #118	0.0001					B	81.4
23445 pentaCB #123	0.0001					J	20.7
23344 pentaCB #105	0.0001						66.5
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					J	6.7
233445 hexaCB #156	0.0005					J	16.2
233445 hexaCB #157	0.0005					J	4.6
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001					B	74.2
2233445 heptaCB #170	0.0001						52.8
2334455 heptaCB #189	0.0001					J	3

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.086
 Non-Detects = zero 0.036

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 12-15

Latitude 43.458216374N

Longitude 84.077716392W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	1.9
3344 tetraCB #77	0.0001					J	3.9
23445 pentaCB #114	0.0005					ND	0.8
23445 pentaCB #118	0.0001					B	46.4
23445 pentaCB #123	0.0001					J	9.6
23344 pentaCB #105	0.0001						31.2
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					J	4.2
233445 hexaCB #156	0.0005					J	9.2
233445 hexaCB #157	0.0005					J	2.5
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					B	59.1
2233445 heptaCB #170	0.0001						33.2
2334455 heptaCB #189	0.0001					ND	1.2

Total TEQ: Non-Detects = Detection Limit 0.12
 Non-Detects = 1/2 d.l. 0.07
 Non-Detects = zero 0.019

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 13-6

Latitude 43.458193350N

Longitude 84.077260317W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.2
3344 tetraCB #77	0.0001					J	2.4
23445 pentaCB #114	0.0005					ND	1.6
23445 pentaCB #118	0.0001					J	21
23445 pentaCB #123	0.0001					J	8.8
23344 pentaCB #105	0.0001					EMPC,J	18.6
33445 pentaCB #126	0.1					ND	1.9
234455 hexaCB #167	0.00001					J	5.1
233445 hexaCB #156	0.0005					EMPC,J	8.1
233445 hexaCB #157	0.0005					ND	2.5
334455 hexaCB #169	0.01					ND	3
2234455 heptaCB #180	0.00001						35.9
2233445 heptaCB #170	0.0001					J	21.9
2334455 heptaCB #189	0.0001					ND	2.8

Total TEQ: Non-Detects = Detection Limit 0.23
 Non-Detects = 1/2 d.l. 0.12
 Non-Detects = zero 0.012

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 13-15

Latitude 43.458193350N

Longitude 84.077260317W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					J	2.3
23445 pentaCB #114	0.0005					ND	1.3
23445 pentaCB #118	0.0001					J	28.4
23445 pentaCB #123	0.0001					EMPC,J	7.1
23344 pentaCB #105	0.0001					J	15.6
33445 pentaCB #126	0.1					ND	1.6
234455 hexaCB #167	0.00001					EMPC,J	4.2
233445 hexaCB #156	0.0005					J	7
233445 hexaCB #157	0.0005					ND	2.3
334455 hexaCB #169	0.01					ND	2.8
2234455 heptaCB #180	0.00001					EMPC	29.2
2233445 heptaCB #170	0.0001					J	17.2
2334455 heptaCB #189	0.0001					ND	2.6

Total TEQ: Non-Detects = Detection Limit 0.2
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.011

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-3

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.2
3344 tetraCB #77	0.0001					J	1.9
23445 pentaCB #114	0.0005					ND	1.5
23445 pentaCB #118	0.0001						129
23445 pentaCB #123	0.0001					J	25.1
23344 pentaCB #105	0.0001						72.8
33445 pentaCB #126	0.1					ND	1.8
234455 hexaCB #167	0.00001					J	16.5
233445 hexaCB #156	0.0005					J	30.9
233445 hexaCB #157	0.0005					EMPC,J	9.9
334455 hexaCB #169	0.01					ND	2.8
2234455 heptaCB #180	0.00001						156
2233445 heptaCB #170	0.0001						106
2334455 heptaCB #189	0.0001					EMPC,J	7.5

Total TEQ: Non-Detects = Detection Limit 0.27
 Non-Detects = 1/2 d.l. 0.16
 Non-Detects = zero 0.056

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-6

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.3
3344 tetraCB #77	0.0001					EMPC,J	6.6
23445 pentaCB #114	0.0005					J	7.1
23445 pentaCB #118	0.0001						172
23445 pentaCB #123	0.0001						33
23344 pentaCB #105	0.0001						88.4
33445 pentaCB #126	0.1					ND	2
234455 hexaCB #167	0.00001					J	14.8
233445 hexaCB #156	0.0005					J	32.7
233445 hexaCB #157	0.0005					EMPC,J	8.8
334455 hexaCB #169	0.01					ND	3
2234455 heptaCB #180	0.00001						122
2233445 heptaCB #170	0.0001						84.8
2334455 heptaCB #189	0.0001					ND	2.8

Total TEQ: Non-Detects = Detection Limit 0.29
 Non-Detects = 1/2 d.l. 0.18
 Non-Detects = zero 0.064

PHASE II - IMERMAN PARK, SAGINAW COUNTY SOIL SAMPLES

IMP 14-15

Latitude 43.458709374N

Longitude 84.077257419W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.4
3344 tetraCB #77	0.0001					ND	1.2
23445 pentaCB #114	0.0005					ND	1.7
23445 pentaCB #118	0.0001					J	20.3
23445 pentaCB #123	0.0001					ND	1.7
23344 pentaCB #105	0.0001					J	11.3
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					ND	2.6
233445 hexaCB #156	0.0005					EMPC,J	7.3
233445 hexaCB #157	0.0005					ND	2.9
334455 hexaCB #169	0.01					ND	3.5
2234455 heptaCB #180	0.00001						43.7
2233445 heptaCB #170	0.0001					J	21.4
2334455 heptaCB #189	0.0001					ND	3.2

Total TEQ: Non-Detects = Detection Limit 0.26
 Non-Detects = 1/2 d.l. 0.13
 Non-Detects = zero 0.0094

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-1

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	12.1
3344 tetraCB #77	0.0001						72.7
23445 pentaCB #114	0.0005						32.2
23445 pentaCB #118	0.0001						391
23445 pentaCB #123	0.0001						84.3
23344 pentaCB #105	0.0001					EMPC	283
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					QJ	30
233445 hexaCB #156	0.0005					Q	59.4
233445 hexaCB #157	0.0005					QJ	14.2
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						195
2233445 heptaCB #170	0.0001						130
2334455 heptaCB #189	0.0001					J	15.1

Total TEQ: Non-Detects = Detection Limit 0.26
 Non-Detects = 1/2 d.l. 0.2
 Non-Detects = zero 0.15

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-3

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	22.2
3344 tetraCB #77	0.0001						136
23445 pentaCB #114	0.0005						50.3
23445 pentaCB #118	0.0001						778
23445 pentaCB #123	0.0001					EMPC	177
23344 pentaCB #105	0.0001					EMPC	456
33445 pentaCB #126	0.1					ND	4
234455 hexaCB #167	0.00001						42.7
233445 hexaCB #156	0.0005						109
233445 hexaCB #157	0.0005					J	27.1
334455 hexaCB #169	0.01					ND	4.7
2234455 heptaCB #180	0.00001						365
2233445 heptaCB #170	0.0001						276
2334455 heptaCB #189	0.0001					J	28.4

Total TEQ: Non-Detects = Detection Limit 0.73
 Non-Detects = 1/2 d.l. 0.51
 Non-Detects = zero 0.28

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-6

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	29.1
3344 tetraCB #77	0.0001						151
23445 pentaCB #114	0.0005						66.9
23445 pentaCB #118	0.0001						1120
23445 pentaCB #123	0.0001						242
23344 pentaCB #105	0.0001						606
33445 pentaCB #126	0.1					ND	3.2
234455 hexaCB #167	0.00001						58.7
233445 hexaCB #156	0.0005						143
233445 hexaCB #157	0.0005						34.3
334455 hexaCB #169	0.01					ND	4.2
2234455 heptaCB #180	0.00001						493
2233445 heptaCB #170	0.0001						365
2334455 heptaCB #189	0.0001					J	30.7

Total TEQ: Non-Detects = Detection Limit 0.74
 Non-Detects = 1/2 d.l. 0.56
 Non-Detects = zero 0.38

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 1-15

Latitude 43.401558152N

Longitude 84.029730811W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						66.2
3344 tetraCB #77	0.0001						413
23445 pentaCB #114	0.0005						138
23445 pentaCB #118	0.0001						2350
23445 pentaCB #123	0.0001						526
23344 pentaCB #105	0.0001						1290
33445 pentaCB #126	0.1					J	26.8
234455 hexaCB #167	0.00001						108
233445 hexaCB #156	0.0005						275
233445 hexaCB #157	0.0005						61.1
334455 hexaCB #169	0.01					ND	4.1
2234455 heptaCB #180	0.00001						1020
2233445 heptaCB #170	0.0001						854
2334455 heptaCB #189	0.0001						72

Total TEQ: Non-Detects = Detection Limit 3.5
 Non-Detects = 1/2 d.l. 3.5
 Non-Detects = zero 3.5

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-1

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						196
3344 tetraCB #77	0.0001						169
23445 pentaCB #114	0.0005						518
23445 pentaCB #118	0.0001						4600
23445 pentaCB #123	0.0001						2170
23344 pentaCB #105	0.0001						5990
33445 pentaCB #126	0.1						43.4
234455 hexaCB #167	0.00001					Q	340
233445 hexaCB #156	0.0005					Q	767
233445 hexaCB #157	0.0005					Q	180
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001						2830
2233445 heptaCB #170	0.0001						1910
2334455 heptaCB #189	0.0001						95

Total TEQ: Non-Detects = Detection Limit 6.6
 Non-Detects = 1/2 d.l. 6.6
 Non-Detects = zero 6.6

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-3

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	16
3344 tetraCB #77	0.0001						73.7
23445 pentaCB #114	0.0005						47.5
23445 pentaCB #118	0.0001						546
23445 pentaCB #123	0.0001						122
23344 pentaCB #105	0.0001					EMPC	394
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	33.5
233445 hexaCB #156	0.0005						81.7
233445 hexaCB #157	0.0005					J	19.1
334455 hexaCB #169	0.01					ND	1.9
2234455 heptaCB #180	0.00001						284
2233445 heptaCB #170	0.0001						241
2334455 heptaCB #189	0.0001					EMPC	41.7

Total TEQ: Non-Detects = Detection Limit 0.38
 Non-Detects = 1/2 d.l. 0.3
 Non-Detects = zero 0.22

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-6

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	21.9
3344 tetraCB #77	0.0001						92
23445 pentaCB #114	0.0005						64.7
23445 pentaCB #118	0.0001						678
23445 pentaCB #123	0.0001						142
23344 pentaCB #105	0.0001					EMPC	446
33445 pentaCB #126	0.1					J	17.6
234455 hexaCB #167	0.00001						70.5
233445 hexaCB #156	0.0005						99.8
233445 hexaCB #157	0.0005					J	22.8
334455 hexaCB #169	0.01					ND	4.9
2234455 heptaCB #180	0.00001						384
2233445 heptaCB #170	0.0001						319
2334455 heptaCB #189	0.0001					EMPC	91.2

Total TEQ: Non-Detects = Detection Limit 2.1
 Non-Detects = 1/2 d.l. 2.1
 Non-Detects = zero 2.0

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 2-15

Latitude 43.402221209N

Longitude 84.029852619W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	17.5
3344 tetraCB #77	0.0001						45.8
23445 pentaCB #114	0.0005						65.6
23445 pentaCB #118	0.0001						395
23445 pentaCB #123	0.0001						88.5
23344 pentaCB #105	0.0001						229
33445 pentaCB #126	0.1					ND	1.6
234455 hexaCB #167	0.00001					J	25.5
233445 hexaCB #156	0.0005						61.2
233445 hexaCB #157	0.0005					EMPC,J	15.4
334455 hexaCB #169	0.01					ND	2.3
2234455 heptaCB #180	0.00001						205
2233445 heptaCB #170	0.0001					EMPC	136
2334455 heptaCB #189	0.0001						42.6

Total TEQ: Non-Detects = Detection Limit 0.35
 Non-Detects = 1/2 d.l. 0.26
 Non-Detects = zero 0.17

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-1

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					JB	4.2
3344 tetraCB #77	0.0001					JB	19.2
23445 pentaCB #114	0.0005					EMPC,J	15
23445 pentaCB #118	0.0001						153
23445 pentaCB #123	0.0001					J	33.3
23344 pentaCB #105	0.0001					EMPC	121
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					J	15.4
233445 hexaCB #156	0.0005					J	28.1
233445 hexaCB #157	0.0005					EMPC,J	6.8
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001						112
2233445 heptaCB #170	0.0001						79.3
2334455 heptaCB #189	0.0001					EMPC,J	10.9

Total TEQ: Non-Detects = Detection Limit 0.16
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.068

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-3

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19.3
3344 tetraCB #77	0.0001						66.9
23445 pentaCB #114	0.0005						49.1
23445 pentaCB #118	0.0001						456
23445 pentaCB #123	0.0001					EMPC	102
23344 pentaCB #105	0.0001					EMPC	247
33445 pentaCB #126	0.1					J	15.1
234455 hexaCB #167	0.00001					J	33
233445 hexaCB #156	0.0005						69.8
233445 hexaCB #157	0.0005					J	15.7
334455 hexaCB #169	0.01					ND	2.3
2234455 heptaCB #180	0.00001						343
2233445 heptaCB #170	0.0001						232
2334455 heptaCB #189	0.0001					EMPC	75.5

Total TEQ: Non-Detects = Detection Limit 1.7
 Non-Detects = 1/2 d.l. 1.7
 Non-Detects = zero 1.7

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-6

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	19
3344 tetraCB #77	0.0001						79.4
23445 pentaCB #114	0.0005						43.5
23445 pentaCB #118	0.0001						518
23445 pentaCB #123	0.0001					EMPC	112
23344 pentaCB #105	0.0001					EMPC	377
33445 pentaCB #126	0.1					J	14.9
234455 hexaCB #167	0.00001						39.2
233445 hexaCB #156	0.0005						90.1
233445 hexaCB #157	0.0005					J	21.7
334455 hexaCB #169	0.01					ND	3.2
2234455 heptaCB #180	0.00001						478
2233445 heptaCB #170	0.0001						305
2334455 heptaCB #189	0.0001					EMPC	127

Total TEQ: Non-Detects = Detection Limit 1.8
 Non-Detects = 1/2 d.l. 1.7
 Non-Detects = zero 1.7

PHASE II - WEST MICHIGAN PARK, SAGINAW COUNTY SOIL SAMPLES

WMP 3-15

Latitude 43.402659180N

Longitude 84.030660358W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.7
3344 tetraCB #77	0.0001					J	18
23445 pentaCB #114	0.0005					J	11.5
23445 pentaCB #118	0.0001						135
23445 pentaCB #123	0.0001						41.4
23344 pentaCB #105	0.0001					EMPC	78.4
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	11.8
233445 hexaCB #156	0.0005					J	21.9
233445 hexaCB #157	0.0005					EMPC,J	5
334455 hexaCB #169	0.01					ND	2.7
2234455 heptaCB #180	0.00001						101
2233445 heptaCB #170	0.0001						63.4
2334455 heptaCB #189	0.0001					J	12.6

Total TEQ: Non-Detects = Detection Limit 0.22
 Non-Detects = 1/2 d.l. 0.14
 Non-Detects = zero 0.055

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-3

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					J,B	3.2
23445 pentaCB #114	0.0005					EMPC,J	5.6
23445 pentaCB #118	0.0001						116
23445 pentaCB #123	0.0001					EMPC,J	22.7
23344 pentaCB #105	0.0001						57.3
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	8.7
233445 hexaCB #156	0.0005					J	18.4
233445 hexaCB #157	0.0005					EMPC,J	3.8
334455 hexaCB #169	0.01					ND	1.3
2234455 heptaCB #180	0.00001					B	59.5
2233445 heptaCB #170	0.0001					B	35.2
2334455 heptaCB #189	0.0001					J	3.9

Total TEQ: Non-Detects = Detection Limit 0.19
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.038

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-6

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.9
3344 tetraCB #77	0.0001					J,B	5.9
23445 pentaCB #114	0.0005					J	7.1
23445 pentaCB #118	0.0001						146
23445 pentaCB #123	0.0001					J	27.8
23344 pentaCB #105	0.0001						78.5
33445 pentaCB #126	0.1					ND	1.3
234455 hexaCB #167	0.00001					J	11.9
233445 hexaCB #156	0.0005					J	27.5
233445 hexaCB #157	0.0005					EMPC,J	6.8
334455 hexaCB #169	0.01					ND	1.6
2234455 heptaCB #180	0.00001					B	84.4
2233445 heptaCB #170	0.0001					B	45.7
2334455 heptaCB #189	0.0001					ND	1.2

Total TEQ: Non-Detects = Detection Limit 0.2
 Non-Detects = 1/2 d.l. 0.13
 Non-Detects = zero 0.052

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 1-15

Latitude 43.396559145N

Longitude 84.000811679W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					J,B	4.8
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001						111
23445 pentaCB #123	0.0001					J	22.4
23344 pentaCB #105	0.0001						64.5
33445 pentaCB #126	0.1					ND	1
234455 hexaCB #167	0.00001					EMPC,J	8.7
233445 hexaCB #156	0.0005					J	19.7
233445 hexaCB #157	0.0005					J	4.9
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001					B	87.5
2233445 heptaCB #170	0.0001					B	48.6
2334455 heptaCB #189	0.0001					J	3.7

Total TEQ: Non-Detects = Detection Limit 0.15
 Non-Detects = 1/2 d.l. 0.094
 Non-Detects = zero 0.039

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-3

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	1.1
3344 tetraCB #77	0.0001					J,B	6.6
23445 pentaCB #114	0.0005					J	5.4
23445 pentaCB #118	0.0001						129
23445 pentaCB #123	0.0001					J	24.1
23344 pentaCB #105	0.0001						71.5
33445 pentaCB #126	0.1					ND	0.7
234455 hexaCB #167	0.00001					Q,J	13.1
233445 hexaCB #156	0.0005					Q,J	30.2
233445 hexaCB #157	0.0005					Q,J	7.1
334455 hexaCB #169	0.01					ND	0.7
2234455 heptaCB #180	0.00001					B	126
2233445 heptaCB #170	0.0001					B	73.5
2334455 heptaCB #189	0.0001					J	3.5

Total TEQ: Non-Detects = Detection Limit 0.13
 Non-Detects = 1/2 d.l. 0.092
 Non-Detects = zero 0.054

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-6

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.3
3344 tetraCB #77	0.0001					J,B	7.2
23445 pentaCB #114	0.0005					J	6.7
23445 pentaCB #118	0.0001						152
23445 pentaCB #123	0.0001						30.8
23344 pentaCB #105	0.0001						81.8
33445 pentaCB #126	0.1					ND	1.9
234455 hexaCB #167	0.00001					J	14.2
233445 hexaCB #156	0.0005						32.7
233445 hexaCB #157	0.0005					J	8.2
334455 hexaCB #169	0.01					ND	2.3
2234455 heptaCB #180	0.00001					B	138
2233445 heptaCB #170	0.0001					B	77.8
2334455 heptaCB #189	0.0001					ND	1.7

Total TEQ: Non-Detects = Detection Limit 0.27
 Non-Detects = 1/2 d.l. 0.17
 Non-Detects = zero 0.06

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 2-15

Latitude 43.393861741N

Longitude 84.000855284W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					J,B	4.2
23445 pentaCB #114	0.0005					EMPC,J	3.5
23445 pentaCB #118	0.0001						71.1
23445 pentaCB #123	0.0001					J	13.2
23344 pentaCB #105	0.0001						42.6
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					J	5.4
233445 hexaCB #156	0.0005					J	15
233445 hexaCB #157	0.0005					J	3.8
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001					B	99.2
2233445 heptaCB #170	0.0001					B	55.7
2334455 heptaCB #189	0.0001					J	2.9

Total TEQ: Non-Detects = Detection Limit 0.12
 Non-Detects = 1/2 d.l. 0.076
 Non-Detects = zero 0.031

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-3

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					J,B	10.9
23445 pentaCB #114	0.0005					EMPC,J	12
23445 pentaCB #118	0.0001						211
23445 pentaCB #123	0.0001						39.5
23344 pentaCB #105	0.0001						111
33445 pentaCB #126	0.1					ND	0.8
234455 hexaCB #167	0.00001					J	15.5
233445 hexaCB #156	0.0005						38
233445 hexaCB #157	0.0005					EMPC,J	8.7
334455 hexaCB #169	0.01					ND	0.9
2234455 heptaCB #180	0.00001					B	141
2233445 heptaCB #170	0.0001					B	76.4
2334455 heptaCB #189	0.0001					EMPC,J	4

Total TEQ: Non-Detects = Detection Limit 0.17
 Non-Detects = 1/2 d.l. 0.12
 Non-Detects = zero 0.076

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-6

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					J,B	10.2
23445 pentaCB #114	0.0005					EMPC,J	8.6
23445 pentaCB #118	0.0001						218
23445 pentaCB #123	0.0001						41.6
23344 pentaCB #105	0.0001						111
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					J	14.9
233445 hexaCB #156	0.0005						37.1
233445 hexaCB #157	0.0005					J	9.2
334455 hexaCB #169	0.01					ND	1
2234455 heptaCB #180	0.00001					B	118
2233445 heptaCB #170	0.0001					B	69
2334455 heptaCB #189	0.0001					EMPC,J	3.8

Total TEQ: Non-Detects = Detection Limit 0.17
 Non-Detects = 1/2 d.l. 0.12
 Non-Detects = zero 0.074

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 3-15

Latitude 43.395185334N

Longitude 84.000823366W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					J,B	5.1
23445 pentaCB #114	0.0005					J	6.1
23445 pentaCB #118	0.0001						114
23445 pentaCB #123	0.0001					J	20.4
23344 pentaCB #105	0.0001						62.2
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	7.5
233445 hexaCB #156	0.0005					J	19.4
233445 hexaCB #157	0.0005					ND	1.3
334455 hexaCB #169	0.01					ND	1.7
2234455 heptaCB #180	0.00001					B	58.2
2233445 heptaCB #170	0.0001					B,J	31
2334455 heptaCB #189	0.0001					ND	1.3

Total TEQ: Non-Detects = Detection Limit 0.19
 Non-Detects = 1/2 d.l. 0.12
 Non-Detects = zero 0.037

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-3

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.9
3344 tetraCB #77	0.0001					EMPC,J,B	7.3
23445 pentaCB #114	0.0005					J	5.3
23445 pentaCB #118	0.0001						133
23445 pentaCB #123	0.0001					J	22.7
23344 pentaCB #105	0.0001						61.2
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					J	9.7
233445 hexaCB #156	0.0005					EMPC,J	22.3
233445 hexaCB #157	0.0005					EMPC,J	5.2
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001					B	68.3
2233445 heptaCB #170	0.0001					EMPC,B	38.7
2334455 heptaCB #189	0.0001					ND	1.1

Total TEQ: Non-Detects = Detection Limit 0.18
 Non-Detects = 1/2 d.l. 0.11
 Non-Detects = zero 0.043

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-6

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.6
3344 tetraCB #77	0.0001					J,B	5.5
23445 pentaCB #114	0.0005					EMPC,J	5
23445 pentaCB #118	0.0001						121
23445 pentaCB #123	0.0001					J	23.2
23344 pentaCB #105	0.0001						59.2
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					J	8.3
233445 hexaCB #156	0.0005					J	20.6
233445 hexaCB #157	0.0005					J	5.4
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					B	71.4
2233445 heptaCB #170	0.0001					B	43.8
2334455 heptaCB #189	0.0001					ND	1.1

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.092
 Non-Detects = zero 0.042

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 4-15

Latitude 43.397865410N

Longitude 84.000807309W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.2
3344 tetraCB #77	0.0001					ND	1.1
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001						104
23445 pentaCB #123	0.0001					EMPC,J	16
23344 pentaCB #105	0.0001						41.5
33445 pentaCB #126	0.1					ND	1.3
234455 hexaCB #167	0.00001					J	8
233445 hexaCB #156	0.0005					J	17.1
233445 hexaCB #157	0.0005					EMPC,J	3.4
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001					B	52.4
2233445 heptaCB #170	0.0001					EMPC,J,B	25.7
2334455 heptaCB #189	0.0001					ND	1

Total TEQ: Non-Detects = Detection Limit 0.17
 Non-Detects = 1/2 d.l. 0.1
 Non-Detects = zero 0.03

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-3

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					ND	0.9
23445 pentaCB #114	0.0005					ND	0.9
23445 pentaCB #118	0.0001						47.5
23445 pentaCB #123	0.0001					J	18.6
23344 pentaCB #105	0.0001					J	19.9
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					J	10.4
233445 hexaCB #156	0.0005					J	20.2
233445 hexaCB #157	0.0005					EMPC,J	6.1
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001					B	73.4
2233445 heptaCB #170	0.0001					B	39.9
2334455 heptaCB #189	0.0001					EMPC,J	4

Total TEQ: Non-Detects = Detection Limit 0.16
 Non-Detects = 1/2 d.l. 0.094
 Non-Detects = zero 0.027

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-6

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1
3344 tetraCB #77	0.0001					ND	0.9
23445 pentaCB #114	0.0005					ND	0.9
23445 pentaCB #118	0.0001						41.3
23445 pentaCB #123	0.0001					J	15.4
23344 pentaCB #105	0.0001					J	14.5
33445 pentaCB #126	0.1					ND	1.1
234455 hexaCB #167	0.00001					J	8.1
233445 hexaCB #156	0.0005					J	16.2
233445 hexaCB #157	0.0005					J	5.7
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					B	66.3
2233445 heptaCB #170	0.0001					B	39.4
2334455 heptaCB #189	0.0001					EMPC,J	2.1

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.084
 Non-Detects = zero 0.023

PHASE II - CROP LAND, SAGINAW COUNTY SOIL SAMPLES

CROP 5-15

Latitude 43.399696706N

Longitude 84.000756107W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.1
3344 tetraCB #77	0.0001					ND	0.9
23445 pentaCB #114	0.0005					ND	1
23445 pentaCB #118	0.0001					J	7.3
23445 pentaCB #123	0.0001					ND	0.9
23344 pentaCB #105	0.0001					ND	1
33445 pentaCB #126	0.1					ND	1.2
234455 hexaCB #167	0.00001					ND	0.9
233445 hexaCB #156	0.0005					ND	1
233445 hexaCB #157	0.0005					ND	1
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001					B	39.4
2233445 heptaCB #170	0.0001					EMPC,J,B	21.5
2334455 heptaCB #189	0.0001					ND	1.1

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.07
 Non-Detects = zero 0.0033

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-1

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.9
3344 tetraCB #77	0.0001					EMPC,J,B	5.5
23445 pentaCB #114	0.0005					ND	0.8
23445 pentaCB #118	0.0001						55
23445 pentaCB #123	0.0001					J	13
23344 pentaCB #105	0.0001					J	28.6
33445 pentaCB #126	0.1					ND	1.1
234455 hexaCB #167	0.00001					J	4.3
233445 hexaCB #156	0.0005					J	8.9
233445 hexaCB #157	0.0005					J	2.4
334455 hexaCB #169	0.01					ND	1.2
2234455 heptaCB #180	0.00001					B	39.3
2233445 heptaCB #170	0.0001					J,B	20.8
2334455 heptaCB #189	0.0001					ND	1

Total TEQ: Non-Detects = Detection Limit 0.14
 Non-Detects = 1/2 d.l. 0.08
 Non-Detects = zero 0.018

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-3

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.7
3344 tetraCB #77	0.0001					J,B	6.7
23445 pentaCB #114	0.0005					ND	0.7
23445 pentaCB #118	0.0001						68.9
23445 pentaCB #123	0.0001					J	18.1
23344 pentaCB #105	0.0001					J	37.1
33445 pentaCB #126	0.1					ND	0.9
234455 hexaCB #167	0.00001					EMPC,J	5.8
233445 hexaCB #156	0.0005					EMPC,J	12.3
233445 hexaCB #157	0.0005					EMPC,J	3.6
334455 hexaCB #169	0.01					ND	1.1
2234455 heptaCB #180	0.00001					B	42.9
2233445 heptaCB #170	0.0001					J,B	24.2
2334455 heptaCB #189	0.0001					ND	0.9

Total TEQ: Non-Detects = Detection Limit 0.13
 Non-Detects = 1/2 d.l. 0.075
 Non-Detects = zero 0.024

PHASE II - NATIONAL PLATE GLASS, SAGINAW COUNTY SOIL SAMPLES

NPG 1-6

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	3.5
3344 tetraCB #77	0.0001					ND	3
23445 pentaCB #114	0.0005					ND	3.8
23445 pentaCB #118	0.0001					ND	3.4
23445 pentaCB #123	0.0001					ND	3.7
23344 pentaCB #105	0.0001					ND	4.1
33445 pentaCB #126	0.1					ND	4.8
234455 hexaCB #167	0.00001					ND	5.1
233445 hexaCB #156	0.0005					ND	5.8
233445 hexaCB #157	0.0005					ND	5.7
334455 hexaCB #169	0.01					ND	7.2
2234455 heptaCB #180	0.00001					J,B	19.7
2233445 heptaCB #170	0.0001					ND	6.4
2334455 heptaCB #189	0.0001					ND	5.7

Total TEQ: Non-Detects = Detection Limit 0.56
 Non-Detects = 1/2 d.l. 0.28
 Non-Detects = zero 0.0002

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-3

Latitude

Longitude

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	21.5
3344 tetraCB #77	0.0001						75.5
23445 pentaCB #114	0.0005						91.4
23445 pentaCB #118	0.0001						598
23445 pentaCB #123	0.0001						133
23344 pentaCB #105	0.0001					EMPC	489
33445 pentaCB #126	0.1					J	17.2
234455 hexaCB #167	0.00001					Q	57
233445 hexaCB #156	0.0005					Q	128
233445 hexaCB #157	0.0005					QJ	29.8
334455 hexaCB #169	0.01					ND	2.2
2234455 heptaCB #180	0.00001						451
2233445 heptaCB #170	0.0001						319
2334455 heptaCB #189	0.0001					EMPC	37.9

Total TEQ: Non-Detects = Detection Limit 2.0
 Non-Detects = 1/2 d.l. 2.0
 Non-Detects = zero 2.0

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-6

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J 18.9
3344 tetraCB #77	0.0001					69
23445 pentaCB #114	0.0005					52.3
23445 pentaCB #118	0.0001					581
23445 pentaCB #123	0.0001					132
23344 pentaCB #105	0.0001					EMPC 441
33445 pentaCB #126	0.1					ND 3
234455 hexaCB #167	0.00001					55
233445 hexaCB #156	0.0005					113
233445 hexaCB #157	0.0005					32.7
334455 hexaCB #169	0.01					ND 4.4
2234455 heptaCB #180	0.00001					492
2233445 heptaCB #170	0.0001					296
2334455 heptaCB #189	0.0001					EMPC,J 25.4
Total TEQ:		Non-Detects = Detection Limit	0.6			
		Non-Detects = 1/2 d.l.	0.43			
		Non-Detects = zero	0.26			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 1-15

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J 26.7
3344 tetraCB #77	0.0001					101
23445 pentaCB #114	0.0005					86.2
23445 pentaCB #118	0.0001					828
23445 pentaCB #123	0.0001					170
23344 pentaCB #105	0.0001					EMPC 698
33445 pentaCB #126	0.1					J 21.1
234455 hexaCB #167	0.00001					71.6
233445 hexaCB #156	0.0005					157
233445 hexaCB #157	0.0005					EMPC 39.8
334455 hexaCB #169	0.01					ND 3.1
2234455 heptaCB #180	0.00001					551
2233445 heptaCB #170	0.0001					363
2334455 heptaCB #189	0.0001					EMPC 48.7
Total TEQ:		Non-Detects = Detection Limit	2.5			
		Non-Detects = 1/2 d.l.	2.5			
		Non-Detects = zero	2.5			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-3

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					22.3
3344 tetraCB #77	0.0001					115
23445 pentaCB #114	0.0005					49.9
23445 pentaCB #118	0.0001					705
23445 pentaCB #123	0.0001					223
23344 pentaCB #105	0.0001				EMPC	553
33445 pentaCB #126	0.1				ND	2
234455 hexaCB #167	0.00001				Q	42.6
233445 hexaCB #156	0.0005				Q	90.6
233445 hexaCB #157	0.0005				Q,J	26.5
334455 hexaCB #169	0.01				ND	3.4
2234455 heptaCB #180	0.00001					463
2233445 heptaCB #170	0.0001					266
2334455 heptaCB #189	0.0001				J	15.7
Total TEQ:		Non-Detects = Detection Limit	0.51			
		Non-Detects = 1/2 d.l.	0.4			
		Non-Detects = zero	0.28			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-6

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					4.5
3344 tetraCB #77	0.0001					17.5
23445 pentaCB #114	0.0005				EMPC,J	10.1
23445 pentaCB #118	0.0001					172
23445 pentaCB #123	0.0001					62.7
23344 pentaCB #105	0.0001					97.2
33445 pentaCB #126	0.1				ND	1.4
234455 hexaCB #167	0.00001				J	17.9
233445 hexaCB #156	0.0005					36.2
233445 hexaCB #157	0.0005				EMPC,J	11.5
334455 hexaCB #169	0.01				ND	2.4
2234455 heptaCB #180	0.00001					169
2233445 heptaCB #170	0.0001					98.2
2334455 heptaCB #189	0.0001				ND	1.8
Total TEQ:		Non-Detects = Detection Limit	0.24			
		Non-Detects = 1/2 d.l.	0.16			
		Non-Detects = zero	0.076			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 2-15

Analyte	Latitude		Longitude		Final		
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.8
3344 tetraCB #77	0.0001					J	27.5
23445 pentaCB #114	0.0005					J	14.4
23445 pentaCB #118	0.0001						227
23445 pentaCB #123	0.0001						81.3
23344 pentaCB #105	0.0001					EMPC	140
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					J	21.3
233445 hexaCB #156	0.0005						45.7
233445 hexaCB #157	0.0005					EMPC,J	14.8
334455 hexaCB #169	0.01					ND	3.1
2234455 heptaCB #180	0.00001						209
2233445 heptaCB #170	0.0001						123
2334455 heptaCB #189	0.0001					ND	2.8
Total TEQ:		Non-Detects = Detection Limit	0.34				
		Non-Detects = 1/2 d.l.	0.22				
		Non-Detects = zero	0.1				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-1

Analyte	Latitude		Longitude		Final		
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	13.3
3344 tetraCB #77	0.0001						50.7
23445 pentaCB #114	0.0005						43.9
23445 pentaCB #118	0.0001						441
23445 pentaCB #123	0.0001						101
23344 pentaCB #105	0.0001					EMPC	405
33445 pentaCB #126	0.1					J	9.4
234455 hexaCB #167	0.00001					Q	50.2
233445 hexaCB #156	0.0005					Q	102
233445 hexaCB #157	0.0005					Q,J	26.8
334455 hexaCB #169	0.01					ND	1.4
2234455 heptaCB #180	0.00001						308
2233445 heptaCB #170	0.0001						214
2334455 heptaCB #189	0.0001					J	21.7
Total TEQ:		Non-Detects = Detection Limit	1.2				
		Non-Detects = 1/2 d.l.	1.2				
		Non-Detects = zero	1.2				

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-3

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					27.5
3344 tetraCB #77	0.0001					127
23445 pentaCB #114	0.0005					76
23445 pentaCB #118	0.0001					936
23445 pentaCB #123	0.0001					202
23344 pentaCB #105	0.0001				EMPC	972
33445 pentaCB #126	0.1				J	23.7
234455 hexaCB #167	0.00001					90.7
233445 hexaCB #156	0.0005					193
233445 hexaCB #157	0.0005					48
334455 hexaCB #169	0.01				ND	3.6
2234455 heptaCB #180	0.00001					649
2233445 heptaCB #170	0.0001				EMPC	530
2334455 heptaCB #189	0.0001				EMPC	72.7
Total TEQ:		Non-Detects = Detection Limit	2.9			
		Non-Detects = 1/2 d.l.	2.8			
		Non-Detects = zero	2.8			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 3-6

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					28.5
3344 tetraCB #77	0.0001					96.2
23445 pentaCB #114	0.0005					111
23445 pentaCB #118	0.0001					855
23445 pentaCB #123	0.0001					182
23344 pentaCB #105	0.0001				EMPC	707
33445 pentaCB #126	0.1				J	14.3
234455 hexaCB #167	0.00001					88.7
233445 hexaCB #156	0.0005					164
233445 hexaCB #157	0.0005					37.3
334455 hexaCB #169	0.01				ND	1.6
2234455 heptaCB #180	0.00001					523
2233445 heptaCB #170	0.0001					351
2334455 heptaCB #189	0.0001					58.8
Total TEQ:		Non-Detects = Detection Limit	1.8			
		Non-Detects = 1/2 d.l.	1.8			
		Non-Detects = zero	1.8			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 4-1

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					1.3
3344 tetraCB #77	0.0001					12.6
23445 pentaCB #114	0.0005					7.5
23445 pentaCB #118	0.0001					83
23445 pentaCB #123	0.0001					18.1
23344 pentaCB #105	0.0001				EMPC	64.6
33445 pentaCB #126	0.1				ND	1.6
234455 hexaCB #167	0.00001				Q,J	9.6
233445 hexaCB #156	0.0005				Q,J	19.6
233445 hexaCB #157	0.0005				ND	2.2
334455 hexaCB #169	0.01				ND	2.8
2234455 heptaCB #180	0.00001					64.8
2233445 heptaCB #170	0.0001					38.9
2334455 heptaCB #189	0.0001				ND	2.2
Total TEQ:		Non-Detects = Detection Limit	0.23			
		Non-Detects = 1/2 d.l.	0.13			
		Non-Detects = zero	0.036			

PHASE II - 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 5-1

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					8.9
3344 tetraCB #77	0.0001					48.1
23445 pentaCB #114	0.0005					19.2
23445 pentaCB #118	0.0001					343
23445 pentaCB #123	0.0001					79.8
23344 pentaCB #105	0.0001				EMPC	229
33445 pentaCB #126	0.1				J	7.7
234455 hexaCB #167	0.00001				Q	38.7
233445 hexaCB #156	0.0005				Q	81.4
233445 hexaCB #157	0.0005				Q,J	21.5
334455 hexaCB #169	0.01				ND	2.4
2234455 heptaCB #180	0.00001					299
2233445 heptaCB #170	0.0001					182
2334455 heptaCB #189	0.0001				J	15.5
Total TEQ:		Non-Detects = Detection Limit	0.95			
		Non-Detects = 1/2 d.l.	0.94			
		Non-Detects = zero	0.93			

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 1

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					4.4
3344 tetraCB #77	0.0001					3.7
23445 pentaCB #114	0.0005					32.8
23445 pentaCB #118	0.0001					1220
23445 pentaCB #123	0.0001					70.9
23344 pentaCB #105	0.0001					532
33445 pentaCB #126	0.1				ND	5.2
234455 hexaCB #167	0.00001					68
233445 hexaCB #156	0.0005					191
233445 hexaCB #157	0.0005					40.4
334455 hexaCB #169	0.01				ND	9.2
2234455 heptaCB #180	0.00001					452
2233445 heptaCB #170	0.0001					227
2334455 heptaCB #189	0.0001				ND	6.9
Total TEQ:			Non-Detects = Detection Limit			0.96
			Non-Detects = 1/2 d.l.			0.65
			Non-Detects = zero			0.34

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 2

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					4.5
3344 tetraCB #77	0.0001					1.9
23445 pentaCB #114	0.0005					32.6
23445 pentaCB #118	0.0001					1340
23445 pentaCB #123	0.0001					88
23344 pentaCB #105	0.0001					527
33445 pentaCB #126	0.1				ND	3
234455 hexaCB #167	0.00001					62.4
233445 hexaCB #156	0.0005					174
233445 hexaCB #157	0.0005					42.4
334455 hexaCB #169	0.01				ND	4.6
2234455 heptaCB #180	0.00001					408
2233445 heptaCB #170	0.0001					188
2334455 heptaCB #189	0.0001				EMPC,J	14.8
Total TEQ:			Non-Detects = Detection Limit			0.69
			Non-Detects = 1/2 d.l.			0.52
			Non-Detects = zero			0.35

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 3

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					3.1
3344 tetraCB #77	0.0001					2.6
23445 pentaCB #114	0.0005					42.4
23445 pentaCB #118	0.0001					1240
23445 pentaCB #123	0.0001					78.9
23344 pentaCB #105	0.0001					495
33445 pentaCB #126	0.1				ND	4.2
234455 hexaCB #167	0.00001					50.8
233445 hexaCB #156	0.0005					160
233445 hexaCB #157	0.0005					26.7
334455 hexaCB #169	0.01				ND	6.3
2234455 heptaCB #180	0.00001					392
2233445 heptaCB #170	0.0001					184
2334455 heptaCB #189	0.0001				ND	4.9
Total TEQ:		Non-Detects = Detection Limit	0.8			
		Non-Detects = 1/2 d.l.	0.56			
		Non-Detects = zero	0.32			

PHASE II - EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY SOIL SAMPLES

R19 EGG 4

Analyte	Latitude		Longitude		Final	
	TEF	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					2.4
3344 tetraCB #77	0.0001					2
23445 pentaCB #114	0.0005				EMPC,J	11.7
23445 pentaCB #118	0.0001					236
23445 pentaCB #123	0.0001				EMPC,J	17.5
23344 pentaCB #105	0.0001					90.2
33445 pentaCB #126	0.1				ND	2.7
234455 hexaCB #167	0.00001				ND	3.7
233445 hexaCB #156	0.0005					36.9
233445 hexaCB #157	0.0005				ND	4
334455 hexaCB #169	0.01				ND	4.7
2234455 heptaCB #180	0.00001					206
2233445 heptaCB #170	0.0001					76.3
2334455 heptaCB #189	0.0001				ND	3.6
Total TEQ:		Non-Detects = Detection Limit	0.39			
		Non-Detects = 1/2 d.l.	0.23			
		Non-Detects = zero	0.068			

Appendix C

Dioxin Results from Surface Water at National Plate Glass

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports.

The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

PHASE II - Surface water run-off from the NPG site to the Tittabawassee River

II NPG GW1

Latitude 43.396557275N

Longitude 83.999427512W

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.9
12378-PeCDD	1	ND	4.2
123478-HxCDD	0.1	ND	4.6
123678-HxCDD	0.1	ND	4.7
123789-HxCDD	0.1	ND	4.5
1234678-HpCDD	0.01	ND	7.4
12346789-OCDD	0.0001	J	48.5
2378TCDF	0.1	ND	14.3
12378-PeCDF	0.05	J	10
23478-PeCDF	0.5	J	5.8
123478-HxCDF	0.1	J	8.1
123678-HxCDF	0.1	ND	3.2
234678-HxCDF	0.1	ND	3
123789-HxCDF	0.1	ND	4.7
1234678-HpCDF	0.01	J	15.1
1234789-HpCDF	0.01	ND	6.6
12346789-OCDF	0.0001	ND	11.5

Total TEQ:	Non-Detects = Detection Limit	17
	Non-Detects = 1/2 d.l.	10
	Non-Detects = zero	4.4

PHASE II - Surface water run-off from the NPG site to the Tittabawassee River

II NPG GW2

Latitude 43.393202225N

Longitude 83.997534649W

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.5
12378-PeCDD	1	ND	4.2
123478-HxCDD	0.1	ND	4.6
123678-HxCDD	0.1	ND	4.6
123789-HxCDD	0.1	ND	4.5
1234678-HpCDD	0.01	J	9.8
12346789-OCDD	0.0001	J	94.3
2378TCDF	0.1		32.8
12378-PeCDF	0.05	J	15
23478-PeCDF	0.5	J	10.7
123478-HxCDF	0.1	ND	10.4
123678-HxCDF	0.1	ND	3.3
234678-HxCDF	0.1	ND	3
123789-HxCDF	0.1	ND	4.5
1234678-HpCDF	0.01	J	15.6
1234789-HpCDF	0.01	ND	6.2
12346789-OCDF	0.0001	J	24.1

Total TEQ:	Non-Detects = Detection Limit	21
	Non-Detects = 1/2 d.l.	15
	Non-Detects = zero	9.6

Appendix D

Residential Water Well Dioxin Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports. The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

PHASE II RESIDENTIAL WATER WELLS**4909 RIVER****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.3
12378-PeCDD	1	ND	1.8
123478-HxCDD	0.1	ND	2.2
123678-HxCDD	0.1	ND	2.2
123789-HxCDD	0.1	ND	2.2
1234678-HpCDD	0.01	ND	5.5
12346789-OCDD	0.0001	ND	17.9
2378TCDF	0.1	ND	0.9
12378-PeCDF	0.05	ND	1.2
23478-PeCDF	0.5	ND	1.2
123478-HxCDF	0.1	ND	1.2
123678-HxCDF	0.1	ND	1.2
234678-HxCDF	0.1	ND	1.2
123789-HxCDF	0.1	ND	1.8
1234678-HpCDF	0.01	ND	2.2
1234789-HpCDF	0.01	ND	4.2
12346789-OCDF	0.0001	ND	13
Total TEQ:	Non-Detects = Detection Limit		5.2
	Non-Detects = 1/2 d.l.		2.6
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9130 N. RIVER****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.7
12378-PeCDD	1	ND	2.3
123478-HxCDD	0.1	ND	3.6
123678-HxCDD	0.1	ND	3.5
123789-HxCDD	0.1	ND	3.5
1234678-HpCDD	0.01	J	11.9
12346789-OCDD	0.0001	ND	304
2378TCDF	0.1	ND	2.1
12378-PeCDF	0.05	ND	1.8
23478-PeCDF	0.5	ND	1.7
123478-HxCDF	0.1	ND	2.2
123678-HxCDF	0.1	ND	2.2
234678-HxCDF	0.1	ND	2.3
123789-HxCDF	0.1	ND	3.3
1234678-HpCDF	0.01	ND	3.5
1234789-HpCDF	0.01	ND	5.4
12346789-OCDF	0.0001	ND	11.2
Total TEQ:	Non-Detects = Detection Limit		8.4
	Non-Detects = 1/2 d.l.		4.3
	Non-Detects = zero		0.12

PHASE II RESIDENTIAL WATER WELLS**9350 N. RIVER****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2
12378-PeCDD	1	ND	1.7
123478-HxCDD	0.1	ND	2.5
123678-HxCDD	0.1	ND	2.5
123789-HxCDD	0.1	ND	2.4
1234678-HpCDD	0.01	ND	9.4
12346789-OCDD	0.0001	B	218
2378TCDF	0.1	ND	1.5
12378-PeCDF	0.05	ND	1.4
23478-PeCDF	0.5	ND	1.2
123478-HxCDF	0.1	ND	1.7
123678-HxCDF	0.1	ND	1.5
234678-HxCDF	0.1	ND	1.6
123789-HxCDF	0.1	ND	2.1
1234678-HpCDF	0.01	ND	2.5
1234789-HpCDF	0.01	ND	3.8
12346789-OCDF	0.0001	ND	7.7
Total TEQ:		Non-Detects = Detection Limit	6.1
		Non-Detects = 1/2 d.l.	3.1
		Non-Detects = zero	0.022

PHASE II RESIDENTIAL WATER WELLS**9510 N. RIVER****TLI#57468**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.5
12378-PeCDD	1	ND	3.7
123478-HxCDD	0.1	ND	3.4
123678-HxCDD	0.1	ND	3.6
123789-HxCDD	0.1	ND	3.4
1234678-HpCDD	0.01	ND	5.7
12346789-OCDD	0.0001	J	6.2
2378TCDF	0.1	ND	2.8
12378-PeCDF	0.05	ND	3.1
23478-PeCDF	0.5	ND	2.3
123478-HxCDF	0.1	JB	4.3
123678-HxCDF	0.1	J	4.1
234678-HxCDF	0.1	JB	3.2
123789-HxCDF	0.1	ND, J	3.1
1234678-HpCDF	0.01	ND	4.2
1234789-HpCDF	0.01	ND	5
12346789-OCDF	0.0001	ND	7.4
Total TEQ:		Non-Detects = Detection Limit	11
		Non-Detects = 1/2 d.l.	6.3
		Non-Detects = zero	1.2

PHASE II RESIDENTIAL WATER WELLS**9510 N. RIVER****TLI#57468r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	6.7
12378-PeCDD	1	ND	7.6
123478-HxCDD	0.1	ND	7.7
123678-HxCDD	0.1	ND	7.1
123789-HxCDD	0.1	ND	7
1234678-HpCDD	0.01	ND	13.5
12346789-OCDD	0.0001	ND	21.4
2378TCDF	0.1	ND	5.8
12378-PeCDF	0.05	ND	5
23478-PeCDF	0.5	ND	4.9
123478-HxCDF	0.1	ND	5.1
123678-HxCDF	0.1	ND	4.9
234678-HxCDF	0.1	ND	5.3
123789-HxCDF	0.1	ND	7.3
1234678-HpCDF	0.01	ND	7.2
1234789-HpCDF	0.01	ND	11.1
12346789-OCDF	0.0001	ND	17.8
Total TEQ:	Non-Detects = Detection Limit		22
	Non-Detects = 1/2 d.l.		11
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9600 N. RIVER****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.2
12378-PeCDD	1	ND	2.7
123478-HxCDD	0.1	ND	4.2
123678-HxCDD	0.1	ND	4.2
123789-HxCDD	0.1	ND	4.2
1234678-HpCDD	0.01	J	13
12346789-OCDD	0.0001	B	237
2378TCDF	0.1	ND	2.6
12378-PeCDF	0.05	ND	2.2
23478-PeCDF	0.5	ND	2.2
123478-HxCDF	0.1	ND	2.7
123678-HxCDF	0.1	ND	2.4
234678-HxCDF	0.1	ND	2.7
123789-HxCDF	0.1	ND	3.6
1234678-HpCDF	0.01	ND	3.9
1234789-HpCDF	0.01	ND	6.8
12346789-OCDF	0.0001	ND	13.4
Total TEQ:	Non-Detects = Detection Limit		10
	Non-Detects = 1/2 d.l.		5.1
	Non-Detects = zero		0.15

PHASE II RESIDENTIAL WATER WELLS**9690 N. RIVER****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.9
12378-PeCDD	1	ND	1.6
123478-HxCDD	0.1	ND	2.4
123678-HxCDD	0.1	ND	2.3
123789-HxCDD	0.1	ND	2.3
1234678-HpCDD	0.01	ND	14.2
12346789-OCDD	0.0001	B	332
2378TCDF	0.1	ND	1.4
12378-PeCDF	0.05	ND	1.3
23478-PeCDF	0.5	ND	1.2
123478-HxCDF	0.1	ND	1.5
123678-HxCDF	0.1	ND	1.4
234678-HxCDF	0.1	ND	1.5
123789-HxCDF	0.1	ND	2
1234678-HpCDF	0.01	ND	2.2
1234789-HpCDF	0.01	ND	3.3
12346789-OCDF	0.0001	ND	6
Total TEQ: Non-Detects = Detection Limit			5.9
Non-Detects = 1/2 d.l.			3.0
Non-Detects = zero			0.033

PHASE II RESIDENTIAL WATER WELLS**9730 RIVER****TLI#58671**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.8
12378-PeCDD	1	ND	2.3
123478-HxCDD	0.1	ND	2.3
123678-HxCDD	0.1	ND	2.5
123789-HxCDD	0.1	ND	2.5
1234678-HpCDD	0.01	ND	4.6
12346789-OCDD	0.0001	ND	8.6
2378TCDF	0.1	ND	1.4
12378-PeCDF	0.05	ND	1.6
23478-PeCDF	0.5	ND	1.3
123478-HxCDF	0.1	ND	1.5
123678-HxCDF	0.1	ND	1.4
234678-HxCDF	0.1	ND	1.6
123789-HxCDF	0.1	ND	2.1
1234678-HpCDF	0.01	ND	2.2
1234789-HpCDF	0.01	ND	3.8
12346789-OCDF	0.0001	ND	6.4
Total TEQ: Non-Detects = Detection Limit			6.5
Non-Detects = 1/2 d.l.			3.2
Non-Detects = zero			0

PHASE II RESIDENTIAL WATER WELLS**9790 N. RIVER****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.6
12378-PeCDD	1	ND	3.2
123478-HxCDD	0.1	ND	5.5
123678-HxCDD	0.1	ND	5
123789-HxCDD	0.1	ND	5.1
1234678-HpCDD	0.01	ND	10.9
12346789-OCDD	0.0001	B	346
2378TCDF	0.1	ND	2.6
12378-PeCDF	0.05	ND	2.6
23478-PeCDF	0.5	ND	2.4
123478-HxCDF	0.1	ND	3.3
123678-HxCDF	0.1	ND	3.1
234678-HxCDF	0.1	ND	3
123789-HxCDF	0.1	ND	4.6
1234678-HpCDF	0.01	ND	5.1
1234789-HpCDF	0.01	ND	8.1
12346789-OCDF	0.0001	ND	16.9

Total TEQ: Non-Detects = Detection Limit 12
Non-Detects = 1/2 d.l. 5.8
Non-Detects = zero 0.035

PHASE II RESIDENTIAL WATER WELLS**9325 MIDLAND****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.8
12378-PeCDD	1	ND	3.7
123478-HxCDD	0.1	ND	3.5
123678-HxCDD	0.1	ND	3.6
123789-HxCDD	0.1	ND	3.4
1234678-HpCDD	0.01	ND	6
12346789-OCDD	0.0001	J	13.8
2378TCDF	0.1	ND	2.3
12378-PeCDF	0.05	ND	2.4
23478-PeCDF	0.5	ND	2.5
123478-HxCDF	0.1	J	2.5
123678-HxCDF	0.1	ND	2.2
234678-HxCDF	0.1	ND	2.4
123789-HxCDF	0.1	ND	3.5
1234678-HpCDF	0.01	J	5.2
1234789-HpCDF	0.01	ND	5.6
12346789-OCDF	0.0001	J	41.1

Total TEQ: Non-Detects = Detection Limit 10
Non-Detects = 1/2 d.l. 5.3
Non-Detects = zero 0.31

PHASE II RESIDENTIAL WATER WELLS**9341 MIDLAND****TLI#57468**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	4.8
12378-PeCDD	1	J	9.9
123478-HxCDD	0.1	ND	8.2
123678-HxCDD	0.1	JB	7.1
123789-HxCDD	0.1	JB	6.7
1234678-HpCDD	0.01	ND	5.2
12346789-OCDD	0.0001	J	8.3
2378TCDF	0.1	ND	6.4
12378-PeCDF	0.05	JB	11.2
23478-PeCDF	0.5	ND	6.7
123478-HxCDF	0.1	JB	7.5
123678-HxCDF	0.1	J	8.5
234678-HxCDF	0.1	ND	7.2
123789-HxCDF	0.1	J	8.4
1234678-HpCDF	0.01	J	4.5
1234789-HpCDF	0.01	J	4.1
12346789-OCDF	0.0001	ND	4.7
Total TEQ:			
	Non-Detects = Detection Limit		25
	Non-Detects = 1/2 d.l.		20
	Non-Detects = zero		14

PHASE II RESIDENTIAL WATER WELLS**9341 MIDLAND****TLI#57468r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.6
12378-PeCDD	1	ND	3.5
123478-HxCDD	0.1	ND	4.2
123678-HxCDD	0.1	ND	3.7
123789-HxCDD	0.1	ND	3.7
1234678-HpCDD	0.01	ND	6.7
12346789-OCDD	0.0001	ND	10.3
2378TCDF	0.1	ND	2.9
12378-PeCDF	0.05	ND	2.8
23478-PeCDF	0.5	ND	2.3
123478-HxCDF	0.1	ND	2.5
123678-HxCDF	0.1	ND	2.5
234678-HxCDF	0.1	ND	2.7
123789-HxCDF	0.1	ND	3.6
1234678-HpCDF	0.01	ND	3.8
1234789-HpCDF	0.01	ND	5.6
12346789-OCDF	0.0001	ND	8.6
Total TEQ:			
	Non-Detects = Detection Limit		11
	Non-Detects = 1/2 d.l.		5.6
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9341 MIDLAND****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.7
12378-PeCDD	1	ND	2.2
123478-HxCDD	0.1	ND	3.2
123678-HxCDD	0.1	ND	3.5
123789-HxCDD	0.1	ND	3.4
1234678-HpCDD	0.01	ND	7.5
12346789-OCDD	0.0001	ND	15.2
2378TCDF	0.1	ND	1.5
12378-PeCDF	0.05	ND	1.6
23478-PeCDF	0.5	ND	1.3
123478-HxCDF	0.1	ND	2.5
123678-HxCDF	0.1	ND	2.3
234678-HxCDF	0.1	ND	2.3
123789-HxCDF	0.1	ND	3.6
1234678-HpCDF	0.01	ND	4
1234789-HpCDF	0.01	ND	6.8
12346789-OCDF	0.0001	ND	11.3
Total TEQ:	Non-Detects = Detection Limit		7.0
	Non-Detects = 1/2 d.l.		3.5
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9435 MIDLAND****TLI#57514r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	9.9
12378-PeCDD	1	JB	25.5
123478-HxCDD	0.1	ND	30.5
123678-HxCDD	0.1	J	34
123789-HxCDD	0.1	JB	30.4
1234678-HpCDD	0.01	JB	33.3
12346789-OCDD	0.0001	J	70.2
2378TCDF	0.1	ND	13.4
12378-PeCDF	0.05	JB	36.1
23478-PeCDF	0.5	JB	20.4
123478-HxCDF	0.1	JB	19.6
123678-HxCDF	0.1	JB	22.8
234678-HxCDF	0.1	JB	24.7
123789-HxCDF	0.1	JB	28.5
1234678-HpCDF	0.01	JB	26.3
1234789-HpCDF	0.01	J	18.1
12346789-OCDF	0.0001	ND	50.6
Total TEQ:	Non-Detects = Detection Limit		69
	Non-Detects = 1/2 d.l.		61
	Non-Detects = zero		54

PHASE II RESIDENTIAL WATER WELLS**9435 MIDLAND****TLI#58354**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	4.3
12378-PeCDD	1	ND	5
123478-HxCDD	0.1	ND	5.6
123678-HxCDD	0.1	ND	5.5
123789-HxCDD	0.1	ND	5.2
1234678-HpCDD	0.01	ND	8.5
12346789-OCDD	0.0001	ND	11.2
2378TCDF	0.1	ND	3.5
12378-PeCDF	0.05	ND	3.4
23478-PeCDF	0.5	ND	3.2
123478-HxCDF	0.1	ND	3.6
123678-HxCDF	0.1	ND	3.5
234678-HxCDF	0.1	ND	3.9
123789-HxCDF	0.1	ND	4.9
1234678-HpCDF	0.01	ND	5.2
1234789-HpCDF	0.01	ND	7.5
12346789-OCDF	0.0001	ND	9.4
Total TEQ:	Non-Detects = Detection Limit		15
	Non-Detects = 1/2 d.l.		7.4
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9465 MIDLAND****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	6.2
12378-PeCDD	1	ND	5.7
123478-HxCDD	0.1	ND	9.4
123678-HxCDD	0.1	ND	9.8
123789-HxCDD	0.1	ND	9.4
1234678-HpCDD	0.01	ND	23.1
12346789-OCDD	0.0001	ND	45.8
2378TCDF	0.1	ND	5.1
12378-PeCDF	0.05	ND	4.8
23478-PeCDF	0.5	ND	4.1
123478-HxCDF	0.1	ND	6.2
123678-HxCDF	0.1	ND	5.9
234678-HxCDF	0.1	ND	6.4
123789-HxCDF	0.1	ND	8.8
1234678-HpCDF	0.01	ND	10.4
1234789-HpCDF	0.01	ND	17.1
12346789-OCDF	0.0001	ND	39.8
Total TEQ:	Non-Detects = Detection Limit		21
	Non-Detects = 1/2 d.l.		10
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9507 MIDLAND****TLI#57468**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2
12378-PeCDD	1	ND	2.1
123478-HxCDD	0.1	ND	2.2
123678-HxCDD	0.1	ND	2.2
123789-HxCDD	0.1	ND	2.2
1234678-HpCDD	0.01	ND	3.5
12346789-OCDD	0.0001	ND	6.1
2378TCDF	0.1	ND	1.5
12378-PeCDF	0.05	ND	1.8
23478-PeCDF	0.5	ND	1.3
123478-HxCDF	0.1	ND	1.5
123678-HxCDF	0.1	ND	1.6
234678-HxCDF	0.1	ND	1.4
123789-HxCDF	0.1	ND	2.1
1234678-HpCDF	0.01	ND	2.4
1234789-HpCDF	0.01	ND	3.1
12346789-OCDF	0.0001	ND	5
Total TEQ:	Non-Detects = Detection Limit		6.4
	Non-Detects = 1/2 d.l.		3.2
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9509 MIDLAND****TLI#57468**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	5.8
12378-PeCDD	1	ND	4.8
123478-HxCDD	0.1	ND	4.8
123678-HxCDD	0.1	ND	4.9
123789-HxCDD	0.1	ND	4.7
1234678-HpCDD	0.01	ND	8.4
12346789-OCDD	0.0001	ND	13.4
2378TCDF	0.1	ND	4.4
12378-PeCDF	0.05	ND	4.5
23478-PeCDF	0.5	ND	3.2
123478-HxCDF	0.1	ND	3.6
123678-HxCDF	0.1	ND	4
234678-HxCDF	0.1	ND	3.1
123789-HxCDF	0.1	ND	5
1234678-HpCDF	0.01	ND	5.5
1234789-HpCDF	0.01	ND	7.2
12346789-OCDF	0.0001	ND	11.1
Total TEQ:	Non-Detects = Detection Limit		16
	Non-Detects = 1/2 d.l.		8.0
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9515 MIDLAND****TLI#57514r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.1
12378-PeCDD	1	J,B	6.5
123478-HxCDD	0.1	J,B	6.3
123678-HxCDD	0.1	J	5.6
123789-HxCDD	0.1	ND	6.2
1234678-HpCDD	0.01	J,B	8.1
12346789-OCDD	0.0001	J	21.7
2378TCDF	0.1	ND	2.9
12378-PeCDF	0.05	J,B	5.4
23478-PeCDF	0.5	ND	4.6
123478-HxCDF	0.1	J,B	5.9
123678-HxCDF	0.1	ND	5.3
234678-HxCDF	0.1	ND	5.2
123789-HxCDF	0.1	J,B	6.7
1234678-HpCDF	0.01	ND	6.2
1234789-HpCDF	0.01	ND	5
12346789-OCDF	0.0001	ND	8.1
Total TEQ:		Non-Detects = Detection Limit	17
		Non-Detects = 1/2 d.l.	13
		Non-Detects = zero	9.3

PHASE II RESIDENTIAL WATER WELLS**9515 MIDLAND****TLI#58354r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	J	3.1
12378-PeCDD	1	J	8.2
123478-HxCDD	0.1	J	6.7
123678-HxCDD	0.1	J	5.8
123789-HxCDD	0.1	J	6.6
1234678-HpCDD	0.01	J	5.4
12346789-OCDD	0.0001	J	5.7
2378TCDF	0.1	J	2.9
12378-PeCDF	0.05	J	6.9
23478-PeCDF	0.5	ND	6.1
123478-HxCDF	0.1	ND	7.8
123678-HxCDF	0.1	JB	6.6
234678-HxCDF	0.1	J	5.8
123789-HxCDF	0.1	J	6.8
1234678-HpCDF	0.01	JB	5.3
1234789-HpCDF	0.01	J	5.2
12346789-OCDF	0.0001	J	6.2
Total TEQ:		Non-Detects = Detection Limit	20
		Non-Detects = 1/2 d.l.	18
		Non-Detects = zero	16

PHASE II RESIDENTIAL WATER WELLS**9551 MIDLAND****TLI#57468**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.2
12378-PeCDD	1	ND	2.3
123478-HxCDD	0.1	ND	2.5
123678-HxCDD	0.1	ND	2.5
123789-HxCDD	0.1	ND	2.4
1234678-HpCDD	0.01	ND	4.2
12346789-OCDD	0.0001	ND	6.5
2378TCDF	0.1	ND	1.7
12378-PeCDF	0.05	ND	2
23478-PeCDF	0.5	ND	1.5
123478-HxCDF	0.1	ND	1.8
123678-HxCDF	0.1	ND	1.9
234678-HxCDF	0.1	ND	1.6
123789-HxCDF	0.1	ND	2.3
1234678-HpCDF	0.01	ND	3
1234789-HpCDF	0.01	ND	3.6
12346789-OCDF	0.0001	ND	5.4
Total TEQ:	Non-Detects = Detection Limit		7.1
	Non-Detects = 1/2 d.l.		3.6
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9565 MIDLAND****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.6
12378-PeCDD	1	ND	2.4
123478-HxCDD	0.1	ND	3.8
123678-HxCDD	0.1	ND	3.6
123789-HxCDD	0.1	ND	3.6
1234678-HpCDD	0.01	ND	8.3
12346789-OCDD	0.0001	ND	30.5
2378TCDF	0.1	ND	3.7
12378-PeCDF	0.05	ND	2
23478-PeCDF	0.5	ND	1.6
123478-HxCDF	0.1	ND	2.3
123678-HxCDF	0.1	ND	2.3
234678-HxCDF	0.1	ND	2.4
123789-HxCDF	0.1	ND	3.3
1234678-HpCDF	0.01	ND	3.4
1234789-HpCDF	0.01	ND	6
12346789-OCDF	0.0001	ND	12.5
Total TEQ:	Non-Detects = Detection Limit		8.6
	Non-Detects = 1/2 d.l.		4.3
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9595 MIDLAND****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.1
12378-PeCDD	1	ND	1.9
123478-HxCDD	0.1	ND	2.8
123678-HxCDD	0.1	ND	2.8
123789-HxCDD	0.1	ND	2.8
1234678-HpCDD	0.01	J	15.1
12346789-OCDD	0.0001	B	282
2378TCDF	0.1	ND	1.7
12378-PeCDF	0.05	ND	1.5
23478-PeCDF	0.5	ND	1.3
123478-HxCDF	0.1	ND	1.8
123678-HxCDF	0.1	ND	1.7
234678-HxCDF	0.1	ND	1.6
123789-HxCDF	0.1	ND	2.6
1234678-HpCDF	0.01	ND	3
1234789-HpCDF	0.01	ND	4.8
12346789-OCDF	0.0001	ND	9.5
Total TEQ:	Non-Detects = Detection Limit		6.8
	Non-Detects = 1/2 d.l.		3.5
	Non-Detects = zero		0.18

PHASE II RESIDENTIAL WATER WELLS**9620 MIDLAND****TLI#58368**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.4
12378-PeCDD	1	ND	3.5
123478-HxCDD	0.1	ND	4.2
123678-HxCDD	0.1	ND	4.2
123789-HxCDD	0.1	ND	4
1234678-HpCDD	0.01	ND	8.4
12346789-OCDD	0.0001	ND	14.9
2378TCDF	0.1	ND	1.9
12378-PeCDF	0.05	ND	2.2
23478-PeCDF	0.5	ND	2.1
123478-HxCDF	0.1	ND	2.6
123678-HxCDF	0.1	ND	2.7
234678-HxCDF	0.1	ND	2.9
123789-HxCDF	0.1	ND	4.1
1234678-HpCDF	0.01	ND	4.6
1234789-HpCDF	0.01	ND	7.3
12346789-OCDF	0.0001	ND	12.4
Total TEQ:	Non-Detects = Detection Limit		9.9
	Non-Detects = 1/2 d.l.		5.0
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9670 MIDLAND****TLI#58368r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.4
12378-PeCDD	1	ND	1.6
123478-HxCDD	0.1	ND	1.7
123678-HxCDD	0.1	ND	1.7
123789-HxCDD	0.1	ND	1.7
1234678-HpCDD	0.01	ND	2.7
12346789-OCDD	0.0001	ND	3.6
2378TCDF	0.1	ND	1.1
12378-PeCDF	0.05	ND	1
23478-PeCDF	0.5	ND	1
123478-HxCDF	0.1	ND	1.1
123678-HxCDF	0.1	ND	1.1
234678-HxCDF	0.1	ND	1.1
123789-HxCDF	0.1	ND	1.4
1234678-HpCDF	0.01	ND	1.5
1234789-HpCDF	0.01	ND	2.1
12346789-OCDF	0.0001	ND	2.7
Total TEQ:	Non-Detects = Detection Limit		4.7
	Non-Detects = 1/2 d.l.		2.4
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9685 MIDLAND****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	4.4
12378-PeCDD	1	ND	3.6
123478-HxCDD	0.1	ND	5.3
123678-HxCDD	0.1	ND	5.8
123789-HxCDD	0.1	ND	5.4
1234678-HpCDD	0.01	ND	13.2
12346789-OCDD	0.0001	ND	23.9
2378TCDF	0.1	ND	3.2
12378-PeCDF	0.05	ND	2.9
23478-PeCDF	0.5	ND	2.6
123478-HxCDF	0.1	ND	4.3
123678-HxCDF	0.1	ND	3.8
234678-HxCDF	0.1	ND	3.8
123789-HxCDF	0.1	ND	5
1234678-HpCDF	0.01	ND	6.4
1234789-HpCDF	0.01	ND	8.6
12346789-OCDF	0.0001	ND	19.3
Total TEQ:	Non-Detects = Detection Limit		13
	Non-Detects = 1/2 d.l.		6.7
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9705 MIDLAND****TLI#57514r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1		13.1
12378-PeCDD	1	JB	23.8
123478-HxCDD	0.1	JB	26.9
123678-HxCDD	0.1	J	25.6
123789-HxCDD	0.1	JB	25.2
1234678-HpCDD	0.01	JB	20.5
12346789-OCDD	0.0001	J	37.1
2378TCDF	0.1	B	16.6
12378-PeCDF	0.05	JB	26.8
23478-PeCDF	0.5	JB	22.7
123478-HxCDF	0.1	JB	22.6
123678-HxCDF	0.1	JB	21.8
234678-HxCDF	0.1	JB	25.3
123789-HxCDF	0.1	JB	25
1234678-HpCDF	0.01	JB	20.9
1234789-HpCDF	0.01	J	21
12346789-OCDF	0.0001	JB	33
Total TEQ:	Non-Detects = Detection Limit		69
	Non-Detects = 1/2 d.l.		69
	Non-Detects = zero		69

PHASE II RESIDENTIAL WATER WELLS**9705 MIDLAND****TLI#58354**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3.8
12378-PeCDD	1	ND	4.4
123478-HxCDD	0.1	ND	4.8
123678-HxCDD	0.1	ND	4.8
123789-HxCDD	0.1	ND	4.6
1234678-HpCDD	0.01	ND	7.2
12346789-OCDD	0.0001	ND	10.2
2378TCDF	0.1	ND	3
12378-PeCDF	0.05	ND	3
23478-PeCDF	0.5	ND	3
123478-HxCDF	0.1	ND	3.1
123678-HxCDF	0.1	ND	3.2
234678-HxCDF	0.1	ND	3.4
123789-HxCDF	0.1	ND	4.3
1234678-HpCDF	0.01	ND	4.4
1234789-HpCDF	0.01	ND	6.2
12346789-OCDF	0.0001	ND	8.5
Total TEQ:	Non-Detects = Detection Limit		13
	Non-Detects = 1/2 d.l.		6.6
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9705 MIDLAND****TLI#58554r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	0.9
12378-PeCDD	1	ND	1
123478-HxCDD	0.1	ND	0.8
123678-HxCDD	0.1	ND	0.9
123789-HxCDD	0.1	ND	0.9
1234678-HpCDD	0.01	ND	1.5
12346789-OCDD	0.0001	JB	9.6
2378TCDF	0.1	ND	0.7
12378-PeCDF	0.05	ND	0.8
23478-PeCDF	0.5	ND	0.7
123478-HxCDF	0.1	JB	1.5
123678-HxCDF	0.1	ND	0.7
234678-HxCDF	0.1	ND	0.7
123789-HxCDF	0.1	ND	0.9
1234678-HpCDF	0.01	J	2
1234789-HpCDF	0.01	ND	1.3
12346789-OCDF	0.0001	J	41.4
Total TEQ:	Non-Detects = Detection Limit		3.1
	Non-Detects = 1/2 d.l.		1.6
	Non-Detects = zero		0.18

PHASE II RESIDENTIAL WATER WELLS**9805 MIDLAND****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.5
12378-PeCDD	1	ND	1.8
123478-HxCDD	0.1	ND	1.6
123678-HxCDD	0.1	ND	1.8
123789-HxCDD	0.1	ND	1.6
1234678-HpCDD	0.01	ND	2.6
12346789-OCDD	0.0001	J	15.4
2378TCDF	0.1	ND	1.2
12378-PeCDF	0.05	XJ	14.5
23478-PeCDF	0.5	ND	1.2
123478-HxCDF	0.1	ND	2.3
123678-HxCDF	0.1	ND	1.1
234678-HxCDF	0.1	ND	1.1
123789-HxCDF	0.1	ND	1.5
1234678-HpCDF	0.01	J	5.7
1234789-HpCDF	0.01	ND	2.4
12346789-OCDF	0.0001	J	41.8
Total TEQ:	Non-Detects = Detection Limit		6.0
	Non-Detects = 1/2 d.l.		3.4
	Non-Detects = zero		0.79

PHASE II RESIDENTIAL WATER WELLS**9915 MIDLAND****TLI#57503r1**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.4
12378-PeCDD	1	ND	2.2
123478-HxCDD	0.1	ND	3.6
123678-HxCDD	0.1	ND	3.3
123789-HxCDD	0.1	ND	3.4
1234678-HpCDD	0.01	ND	7.7
12346789-OCDD	0.0001	ND	13.4
2378TCDF	0.1	ND	2
12378-PeCDF	0.05	ND	1.9
23478-PeCDF	0.5	ND	1.6
123478-HxCDF	0.1	ND	2.7
123678-HxCDF	0.1	ND	2.4
234678-HxCDF	0.1	ND	2.2
123789-HxCDF	0.1	ND	3
1234678-HpCDF	0.01	ND	3.9
1234789-HpCDF	0.01	ND	5.5
12346789-OCDF	0.0001	ND	11.7
Total TEQ:	Non-Detects = Detection Limit		7.9
	Non-Detects = 1/2 d.l.		4.0
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**9930 MIDLAND****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.7
12378-PeCDD	1	ND	3
123478-HxCDD	0.1	ND	2.6
123678-HxCDD	0.1	ND	2.6
123789-HxCDD	0.1	ND	2.4
1234678-HpCDD	0.01	ND	3.9
12346789-OCDD	0.0001	J	10.1
2378TCDF	0.1	ND	2.1
12378-PeCDF	0.05	ND	2.2
23478-PeCDF	0.5	ND	2
123478-HxCDF	0.1	ND	1.7
123678-HxCDF	0.1	ND	1.7
234678-HxCDF	0.1	ND	1.7
123789-HxCDF	0.1	ND	2.4
1234678-HpCDF	0.01	J	2.8
1234789-HpCDF	0.01	ND	3.6
12346789-OCDF	0.0001	J	27.6
Total TEQ:	Non-Detects = Detection Limit		8.6
	Non-Detects = 1/2 d.l.		4.3
	Non-Detects = zero		0.032

PHASE II RESIDENTIAL WATER WELLS**9975 MIDLAND****TLI#58554**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	3
12378-PeCDD	1	ND	3.3
123478-HxCDD	0.1	ND	2.6
123678-HxCDD	0.1	ND	2.8
123789-HxCDD	0.1	ND	2.5
1234678-HpCDD	0.01	ND	4.2
12346789-OCDD	0.0001	ND	7.2
2378TCDF	0.1	ND	2.4
12378-PeCDF	0.05	ND	2.3
23478-PeCDF	0.5	ND	2
123478-HxCDF	0.1	ND	1.8
123678-HxCDF	0.1	ND	1.8
234678-HxCDF	0.1	ND	1.8
123789-HxCDF	0.1	ND	2.7
1234678-HpCDF	0.01	ND	2.5
1234789-HpCDF	0.01	ND	3.8
12346789-OCDF	0.0001	ND	6
Total TEQ:	Non-Detects = Detection Limit		9.4
	Non-Detects = 1/2 d.l.		4.7
	Non-Detects = zero		0

PHASE II RESIDENTIAL WATER WELLS**BAY 1-Bay City****TLI#58671**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.8
12378-PeCDD	1	ND	2.1
123478-HxCDD	0.1	ND	2.3
123678-HxCDD	0.1	ND	2.4
123789-HxCDD	0.1	ND	2.4
1234678-HpCDD	0.01	ND	5
12346789-OCDD	0.0001	ND	10.5
2378TCDF	0.1	ND	1.3
12378-PeCDF	0.05	ND	1.5
23478-PeCDF	0.5	ND	1.4
123478-HxCDF	0.1	JB	2.5
123678-HxCDF	0.1	ND	1.4
234678-HxCDF	0.1	ND	1.5
123789-HxCDF	0.1	ND	2.2
1234678-HpCDF	0.01	ND	2.2
1234789-HpCDF	0.01	ND	4
12346789-OCDF	0.0001	ND	7.8
Total TEQ:	Non-Detects = Detection Limit		6.4
	Non-Detects = 1/2 d.l.		3.3
	Non-Detects = zero		0.25

PHASE II RESIDENTIAL WATER WELLS**BAY 2-Saginaw****TLI#57622A**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.2
12378-PeCDD	1	ND	1
123478-HxCDD	0.1	ND	1.5
123678-HxCDD	0.1	ND	1.6
123789-HxCDD	0.1	ND	1.6
1234678-HpCDD	0.01	ND	2.5
12346789-OCDD	0.0001	JB	8.5
2378TCDF	0.1	ND	1
12378-PeCDF	0.05	ND	0.8
23478-PeCDF	0.5	ND	0.7
123478-HxCDF	0.1	ND	1.1
123678-HxCDF	0.1	ND	1
234678-HxCDF	0.1	ND	1
123789-HxCDF	0.1	ND	1.3
1234678-HpCDF	0.01	ND	1.7
1234789-HpCDF	0.01	ND	2
12346789-OCDF	0.0001	ND	2.5

Total TEQ: Non-Detects = Detection Limit 3.7
Non-Detects = 1/2 d.l. 1.8
Non-Detects = zero 0.00085

PHASE II RESIDENTIAL WATER WELLS**BAY 2-Saginaw Township****TLI#58671**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	1.5
12378-PeCDD	1	ND	2.4
123478-HxCDD	0.1	ND	2.2
123678-HxCDD	0.1	ND	2.2
123789-HxCDD	0.1	ND	2.2
1234678-HpCDD	0.01	J	7.9
12346789-OCDD	0.0001		147
2378TCDF	0.1	ND	1.2
12378-PeCDF	0.05	ND	1.6
23478-PeCDF	0.5	ND	1.3
123478-HxCDF	0.1	ND	1.3
123678-HxCDF	0.1	ND	1.3
234678-HxCDF	0.1	ND	1.3
123789-HxCDF	0.1	ND	1.9
1234678-HpCDF	0.01	ND	1.9
1234789-HpCDF	0.01	ND	3.1
12346789-OCDF	0.0001	ND	18.3

Total TEQ: Non-Detects = Detection Limit 6.1
Non-Detects = 1/2 d.l. 3.1
Non-Detects = zero 0.094

PHASE II RESIDENTIAL WATER WELLS**BAY 3-Midland/Auburn****TLI#58671**

Analyte	TEF	Flags	Concentration pg/l (ppq)
2378-TCDD	1	ND	2.1
12378-PeCDD	1	ND	3.6
123478-HxCDD	0.1	ND	2.2
123678-HxCDD	0.1	ND	2.3
123789-HxCDD	0.1	ND	2.3
1234678-HpCDD	0.01	ND	4.2
12346789-OCDD	0.0001	ND	9.5
2378TCDF	0.1	ND	1.4
12378-PeCDF	0.05	ND	1.8
23478-PeCDF	0.5	ND	2
123478-HxCDF	0.1	ND	1.5
123678-HxCDF	0.1	ND	1.4
234678-HxCDF	0.1	ND	1.4
123789-HxCDF	0.1	ND	2
1234678-HpCDF	0.01	ND	1.9
1234789-HpCDF	0.01	ND	3.1
12346789-OCDF	0.0001	ND	7
Total TEQ:	Non-Detects = Detection Limit		8.3
	Non-Detects = 1/2 d.l.		4.2
	Non-Detects = zero		0

Appendix E

Saginaw River and Bay Shoreline Soil Dioxin Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports. The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

SAGINAW RIVER SHORELINE SOILS

CROW ISL 1 0-3"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.37
12378-PeCDD	1					ND	0.5
123478-HxCDD	0.1					J	0.6
123678-HxCDD	0.1					J	0.86
123789-HxCDD	0.1					J	0.77
1234678-HpCDD	0.01						10.9
12346789-OCDD	0.0001						128
2378TCDF	0.1						10.6
12378-PeCDF	0.05					J	3.9
23478-PeCDF	0.5					J	4.2
123478-HxCDF	0.1					J	4.2
123678-HxCDF	0.1					J	2.7
234678-HxCDF	0.1					J	1.2
123789-HxCDF	0.1					J	0.45
1234678-HpCDF	0.01						19.3
1234789-HpCDF	0.01					J	1.1
12346789-OCDF	0.0001						24.2

Total TEQ: Non-Detects = Detection Limit 5.6
 Non-Detects = 1/2 d.l. 5.4
 Non-Detects = zero 5.1

SAGINAW RIVER SHORELINE SOILS

CROW ISL 1 3-6"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1
12378-PeCDD	1					ND	0.9
123478-HxCDD	0.1					J	0.86
123678-HxCDD	0.1					J	1.7
123789-HxCDD	0.1					J	1.5
1234678-HpCDD	0.01						28.2
12346789-OCDD	0.0001						278
2378TCDF	0.1						21.4
12378-PeCDF	0.05					ND	0.2
23478-PeCDF	0.5						10.3
123478-HxCDF	0.1						9.7
123678-HxCDF	0.1						5.7
234678-HxCDF	0.1					J	2.5
123789-HxCDF	0.1					ND	0.5
1234678-HpCDF	0.01						54.9
1234789-HpCDF	0.01					J	2.2
12346789-OCDF	0.0001						61.5

Total TEQ: Non-Detects = Detection Limit 12
 Non-Detects = 1/2 d.l. 12
 Non-Detects = zero 11

SAGINAW RIVER SHORELINE SOILS**CROW ISL 1 12-15"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.1
123478-HxCDD	0.1					ND	0.1
123678-HxCDD	0.1					J	0.67
123789-HxCDD	0.1					J	0.46
1234678-HpCDD	0.01						5.7
12346789-OCDD	0.0001						56.6
2378TCDF	0.1					J	0.77
12378-PeCDF	0.05					ND	0.09
23478-PeCDF	0.5					J	0.55
123478-HxCDF	0.1					J	0.74
123678-HxCDF	0.1					J	0.43
234678-HxCDF	0.1					J	0.27
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						6
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	6.4

Total TEQ: Non-Detects = Detection Limit 0.97
Non-Detects = 1/2 d.l. 0.85
Non-Detects = zero 0.73

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 0-3"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	J	0.63			J	0.63
12378-PeCDD	1	ND	0.3			ND	0.3
123478-HxCDD	0.1	ND	0.4			ND	0.4
123678-HxCDD	0.1	J	0.59			J	0.59
123789-HxCDD	0.1	ND	0.4			ND	0.4
1234678-HpCDD	0.01		7.4				7.4
12346789-OCDD	0.0001		42.6				42.6
2378TCDF	0.1	E	475		397		397
12378-PeCDF	0.05		153				153
23478-PeCDF	0.5		145				145
123478-HxCDF	0.1		73.3				73.3
123678-HxCDF	0.1		15				15
234678-HxCDF	0.1		10.6				10.6
123789-HxCDF	0.1	J	1.6			J	1.6
1234678-HpCDF	0.01		17.4				17.4
1234789-HpCDF	0.01	J	2.9			J	2.9
12346789-OCDF	0.0001		11.8				11.8

Total TEQ: Non-Detects = Detection Limit 130
Non-Detects = 1/2 d.l. 130
Non-Detects = zero 130

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 3-6"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.6
12378-PeCDD	1					J	0.63
123478-HxCDD	0.1					J	0.43
123678-HxCDD	0.1					J	1.3
123789-HxCDD	0.1					J	0.8
1234678-HpCDD	0.01						15.1
12346789-OCDD	0.0001						92.5
2378TCDF	0.1						127
12378-PeCDF	0.05					X	49.6
23478-PeCDF	0.5						35.9
123478-HxCDF	0.1						18.6
123678-HxCDF	0.1					J	4.5
234678-HxCDF	0.1					J	3.6
123789-HxCDF	0.1					J	0.65
1234678-HpCDF	0.01						31
1234789-HpCDF	0.01					J	2
12346789-OCDF	0.0001						23.6
Total TEQ:		Non-Detects = Detection Limit	38				
		Non-Detects = 1/2 d.l.	38				
		Non-Detects = zero	37				

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 12-15"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.49
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	0.87
123789-HxCDD	0.1					ND	0.3
1234678-HpCDD	0.01						5.9
12346789-OCDD	0.0001						38.1
2378TCDF	0.1						362
12378-PeCDF	0.05						342
23478-PeCDF	0.5						214
123478-HxCDF	0.1						244
123678-HxCDF	0.1						50.5
234678-HxCDF	0.1						24.9
123789-HxCDF	0.1					J	4.1
1234678-HpCDF	0.01						61.2
1234789-HpCDF	0.01						22.7
12346789-OCDF	0.0001						60.8
Total TEQ:		Non-Detects = Detection Limit	190				
		Non-Detects = 1/2 d.l.	190				
		Non-Detects = zero	190				

SAGINAW RIVER SHORELINE SOILS

CROW ISL 3 0-3"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J	0.56
12378-PeCDD	1					ND	0.3
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					J	1.1
123789-HxCDD	0.1					J	0.63
1234678-HpCDD	0.01						22.1
12346789-OCDD	0.0001						199
2378TCDF	0.1						382
12378-PeCDF	0.05						184
23478-PeCDF	0.5						171
123478-HxCDF	0.1						73.8
123678-HxCDF	0.1						14.7
234678-HxCDF	0.1						10.5
123789-HxCDF	0.1					J	1.6
1234678-HpCDF	0.01						27.2
1234789-HpCDF	0.01					J	3.4
12346789-OCDF	0.0001						51.2

Total TEQ: Non-Detects = Detection Limit 140
 Non-Detects = 1/2 d.l. 140
 Non-Detects = zero 140

SAGINAW RIVER SHORELINE SOILS

CROW ISL 3 3-6"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.1
12378-PeCDD	1					ND	0.2
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					ND	0.2
123789-HxCDD	0.1					ND	0.2
1234678-HpCDD	0.01					J	2.8
12346789-OCDD	0.0001						19.8
2378TCDF	0.1						1.7
12378-PeCDF	0.05					ND	0.1
23478-PeCDF	0.5					J	0.78
123478-HxCDF	0.1					J	0.85
123678-HxCDF	0.1					J	0.35
234678-HxCDF	0.1					ND	0.2
123789-HxCDF	0.1					ND	0.1
1234678-HpCDF	0.01					J	3.5
1234789-HpCDF	0.01					ND	0.2
12346789-OCDF	0.0001					J	3.6

Total TEQ: Non-Detects = Detection Limit 1.1
 Non-Detects = 1/2 d.l. 0.94
 Non-Detects = zero 0.75

SAGINAW RIVER SHORELINE SOILS

DNR 1 0-2"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					ND	0.9
12378-PeCDD	1					J	0.64
123478-HxCDD	0.1					ND	0.2
123678-HxCDD	0.1					J	1.7
123789-HxCDD	0.1					J	1.2
1234678-HpCDD	0.01						20.2
12346789-OCDD	0.0001						149
2378TCDF	0.1						19.1
12378-PeCDF	0.05						5
23478-PeCDF	0.5						6
123478-HxCDF	0.1						5.8
123678-HxCDF	0.1					J	2.4
234678-HxCDF	0.1					J	1.5
123789-HxCDF	0.1					ND	0.2
1234678-HpCDF	0.01						31
1234789-HpCDF	0.01					J	1.6
12346789-OCDF	0.0001						30.8
Total TEQ:		Non-Detects = Detection Limit	8.5				
		Non-Detects = 1/2 d.l.	8.1				
		Non-Detects = zero	7.6				

SAGINAW RIVER SHORELINE SOILS

STATE PK 1 0-2"

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1						1.7
12378-PeCDD	1					J	1.3
123478-HxCDD	0.1					J	0.69
123678-HxCDD	0.1					J	3
123789-HxCDD	0.1					ND	1.3
1234678-HpCDD	0.01						26.5
12346789-OCDD	0.0001						274
2378TCDF	0.1						606
12378-PeCDF	0.05						279
23478-PeCDF	0.5						241
123478-HxCDF	0.1						127
123678-HxCDF	0.1						28
234678-HxCDF	0.1						20.2
123789-HxCDF	0.1					J	3
1234678-HpCDF	0.01						67.9
1234789-HpCDF	0.01						6.8
12346789-OCDF	0.0001						50.1
Total TEQ:		Non-Detects = Detection Limit	220				
		Non-Detects = 1/2 d.l.	220				
		Non-Detects = zero	220				

Appendix F

Saginaw River and Bay Shoreline Soil PCB Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports.

The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

SAGINAW RIVER SHORELINE SOILS**CROW ISL 1 0-3"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	18.6
3344 tetraCB #77	0.0001					EMPC,J	31.5
23445 pentaCB #114	0.0005						45.7
23445 pentaCB #118	0.0001						1160
23445 pentaCB #123	0.0001						318
23344 pentaCB #105	0.0001						508
33445 pentaCB #126	0.1					ND	3.3
234455 hexaCB #167	0.00001					Q	70.9
233445 hexaCB #156	0.0005					Q	126
233445 hexaCB #157	0.0005					QJ	30
334455 hexaCB #169	0.01					ND	3.8
2334455 heptaCB #189	0.0001					EMPC,J	7.5
Total TEQ:		Non-Detects = Detection Limit	0.67				
		Non-Detects = 1/2 d.l.	0.49				
		Non-Detects = zero	0.31				

SAGINAW RIVER SHORELINE SOILS**CROW ISL 1 3-6"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						65.4
3344 tetraCB #77	0.0001						64.9
23445 pentaCB #114	0.0005						144
23445 pentaCB #118	0.0001						3780
23445 pentaCB #123	0.0001						1180
23344 pentaCB #105	0.0001						1590
33445 pentaCB #126	0.1					J	11.6
234455 hexaCB #167	0.00001						152
233445 hexaCB #156	0.0005						294
233445 hexaCB #157	0.0005						67.9
334455 hexaCB #169	0.01					ND	4
2334455 heptaCB #189	0.0001					J	18.2
Total TEQ:		Non-Detects = Detection Limit	2.1				
		Non-Detects = 1/2 d.l.	2.1				
		Non-Detects = zero	2.1				

SAGINAW RIVER SHORELINE SOILS**CROW ISL 1 12-15"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					EMPC,J	4
3344 tetraCB #77	0.0001					J	5.1
23445 pentaCB #114	0.0005					J	8.5
23445 pentaCB #118	0.0001						245
23445 pentaCB #123	0.0001						70
23344 pentaCB #105	0.0001						109
33445 pentaCB #126	0.1					ND	1.5
234455 hexaCB #167	0.00001					J	12.2
233445 hexaCB #156	0.0005					J	25.6
233445 hexaCB #157	0.0005					EMPC,J	5.9
334455 hexaCB #169	0.01					ND	1.8
2334455 heptaCB #189	0.0001					ND	1.3

Total TEQ: Non-Detects = Detection Limit 0.23
Non-Detects = 1/2 d.l. 0.15
Non-Detects = zero 0.063

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 0-3"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.5
3344 tetraCB #77	0.0001					JB	7.9
23445 pentaCB #114	0.0005					J	4.3
23445 pentaCB #118	0.0001					B	49.3
23445 pentaCB #123	0.0001					J	13.2
23344 pentaCB #105	0.0001						21.8
33445 pentaCB #126	0.1					ND	2.1
234455 hexaCB #167	0.00001					ND	1.8
233445 hexaCB #156	0.0005					J	6.4
233445 hexaCB #157	0.0005					ND	1.9
334455 hexaCB #169	0.01					ND	2.2
2334455 heptaCB #189	0.0001					ND	1.6

Total TEQ: Non-Detects = Detection Limit 0.25
Non-Detects = 1/2 d.l. 0.13
Non-Detects = zero 0.015

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 3-6"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.5
3344 tetraCB #77	0.0001						27.8
23445 pentaCB #114	0.0005					J	13.7
23445 pentaCB #118	0.0001						228
23445 pentaCB #123	0.0001					EMPC	65.6
23344 pentaCB #105	0.0001						116
33445 pentaCB #126	0.1					ND	2.4
234455 hexaCB #167	0.00001					EMPC,J	16
233445 hexaCB #156	0.0005					J	19.5
233445 hexaCB #157	0.0005					J	7.3
334455 hexaCB #169	0.01					ND	2.6
2334455 heptaCB #189	0.0001					ND	1.6
Total TEQ:		Non-Detects = Detection Limit	0.33				
		Non-Detects = 1/2 d.l.	0.2				
		Non-Detects = zero	0.064				

SAGINAW RIVER SHORELINE SOILS**CROW ISL 2 12-15"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	1.5
3344 tetraCB #77	0.0001					ND	1.3
23445 pentaCB #114	0.0005					ND	2.3
23445 pentaCB #118	0.0001					J	15.5
23445 pentaCB #123	0.0001					ND	2.9
23344 pentaCB #105	0.0001					ND	2.4
33445 pentaCB #126	0.1					ND	2.7
234455 hexaCB #167	0.00001					ND	2.6
233445 hexaCB #156	0.0005					ND	2.8
233445 hexaCB #157	0.0005					ND	2.8
334455 hexaCB #169	0.01					ND	3.3
2334455 heptaCB #189	0.0001					ND	2.4
Total TEQ:		Non-Detects = Detection Limit	0.31				
		Non-Detects = 1/2 d.l.	0.16				
		Non-Detects = zero	0.0016				

SAGINAW RIVER SHORELINE SOILS**CROW ISL 3 0-3"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	5.1
3344 tetraCB #77	0.0001						43.7
23445 pentaCB #114	0.0005					EMPC,J	11.9
23445 pentaCB #118	0.0001						243
23445 pentaCB #123	0.0001						75.6
23344 pentaCB #105	0.0001						103
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					EMPC,J	10.6
233445 hexaCB #156	0.0005					J	20.6
233445 hexaCB #157	0.0005					J	6.9
334455 hexaCB #169	0.01					ND	1.6
2334455 heptaCB #189	0.0001					ND	1

Total TEQ: Non-Detects = Detection Limit 0.22
Non-Detects = 1/2 d.l. 0.14
Non-Detects = zero 0.067

SAGINAW RIVER SHORELINE SOILS**CROW ISL 3 3-6"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					ND	0.8
3344 tetraCB #77	0.0001					J	22.9
23445 pentaCB #114	0.0005					J	6.9
23445 pentaCB #118	0.0001						150
23445 pentaCB #123	0.0001						58.9
23344 pentaCB #105	0.0001						64.6
33445 pentaCB #126	0.1					ND	1.4
234455 hexaCB #167	0.00001					J	5.8
233445 hexaCB #156	0.0005					J	12.5
233445 hexaCB #157	0.0005					J	3.2
334455 hexaCB #169	0.01					ND	1.7
2334455 heptaCB #189	0.0001					ND	1.3

Total TEQ: Non-Detects = Detection Limit 0.2
Non-Detects = 1/2 d.l. 0.12
Non-Detects = zero 0.041

SAGINAW RIVER SHORELINE SOILS**DNR 1 0-2"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001					J	30.9
3344 tetraCB #77	0.0001						450
23445 pentaCB #114	0.0005						72.5
23445 pentaCB #118	0.0001						1420
23445 pentaCB #123	0.0001						482
23344 pentaCB #105	0.0001						665
33445 pentaCB #126	0.1					J	10.9
234455 hexaCB #167	0.00001					J	33.2
233445 hexaCB #156	0.0005						79.1
233445 hexaCB #157	0.0005					J	22.1
334455 hexaCB #169	0.01					ND	2.7
2334455 heptaCB #189	0.0001					J	13.2
Total TEQ:		Non-Detects = Detection Limit					1.5
		Non-Detects = 1/2 d.l.					1.5
		Non-Detects = zero					1.5

SAGINAW RIVER SHORELINE SOILS**STATE PK 1 0-2"**

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
3445 tetraCB #81	0.0001						13.4
3344 tetraCB #77	0.0001						179
23445 pentaCB #114	0.0005						33.3
23445 pentaCB #118	0.0001						588
23445 pentaCB #123	0.0001						157
23344 pentaCB #105	0.0001						360
33445 pentaCB #126	0.1					ND	3.6
234455 hexaCB #167	0.00001						14.3
233445 hexaCB #156	0.0005						36.2
233445 hexaCB #157	0.0005						9.3
334455 hexaCB #169	0.01					ND	5.6
2334455 heptaCB #189	0.0001					ND	5.5
Total TEQ:		Non-Detects = Detection Limit					0.59
		Non-Detects = 1/2 d.l.					0.38
		Non-Detects = zero					0.17

Appendix G

Phase I Soil Dioxin Results

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports. The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks

- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

PHASE I - WETLAND CONFIRMATION SOILS

DX #1

Latitude 43 23 24.13021

Longitude 83 57 57.64732

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.9				6.9
12378-PeCDD	1		24				24
123478-HxCDD	0.1		24				24
123678-HxCDD	0.1		37.5				37.5
123789-HxCDD	0.1		33.4				33.4
1234678-HpCDD	0.01		323				323
12346789-OCDD	0.0001		2800				2800
2378TCDF	0.1	E	913		741		741
12378-PeCDF	0.05		515				515
23478-PeCDF	0.5		384				384
123478-HxCDF	0.1		404				404
123678-HxCDF	0.1		97.9				97.9
234678-HxCDF	0.1		73.5				73.5
123789-HxCDF	0.1		25.3				25.3
1234678-HpCDF	0.01		1060				1060
1234789-HpCDF	0.01		53.8				53.8
12346789-OCDF	0.0001		1020				1020

Total TEQ: Non-Detects = Detection Limit 410
 Non-Detects = 1/2 d.l. 410
 Non-Detects = zero 410

PHASE I - WETLAND CONFIRMATION SOILS

DX #2

Latitude 43 23 22.14732

Longitude 83 58 05.10501

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.1				5.1
12378-PeCDD	1		8.6				8.6
123478-HxCDD	0.1		6.2				6.2
123678-HxCDD	0.1		26.2				26.2
123789-HxCDD	0.1		14.2				14.2
1234678-HpCDD	0.01		457				457
12346789-OCDD	0.0001	E	4070		7610		7610
2378TCDF	0.1	EMPC,SE	7860		21950		21950
12378-PeCDF	0.05	E	5540		9920		9920
23478-PeCDF	0.5	E	3940		7510		7510
123478-HxCDF	0.1	E	3950		7790		7790
123678-HxCDF	0.1		707				707
234678-HxCDF	0.1		468				468
123789-HxCDF	0.1		73.3				73.3
1234678-HpCDF	0.01	E	2540		4600		4600
1234789-HpCDF	0.01		169				169
12346789-OCDF	0.0001		1780				1780

Total TEQ: Non-Detects = Detection Limit 7400
 Non-Detects = 1/2 d.l. 7400
 Non-Detects = zero 7400

PHASE I - WETLAND CONFIRMATION SOILS

DX #3

Latitude 43 23 19.79889

Longitude 83 58 03.87874

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.6				7.6
12378-PeCDD	1		19.7				19.7
123478-HxCDD	0.1		18.7				18.7
123678-HxCDD	0.1		37.5				37.5
123789-HxCDD	0.1		26.8				26.8
1234678-HpCDD	0.01		472				472
12346789-OCDD	0.0001	E	4080		6970		6970
2378TCDF	0.1	EMPC,S,E	5810		18730		18730
12378-PeCDF	0.05	E	5080		8550		8550
23478-PeCDF	0.5	E	3840		6500		6500
123478-HxCDF	0.1	E	3430		7010		7010
123678-HxCDF	0.1		641				641
234678-HxCDF	0.1		449				449
123789-HxCDF	0.1		85.9				85.9
1234678-HpCDF	0.01	E	2000		3480		3480
1234789-HpCDF	0.01		187				187
12346789-OCDF	0.0001		1710				1710

Total TEQ: Non-Detects = Detection Limit 6400
 Non-Detects = 1/2 d.l. 6400
 Non-Detects = zero 6400

PHASE I - WETLAND CONFIRMATION SOILS

DX #4

Latitude 43 23 20.24459

Longitude 83 58 02.48230

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.1				4.1
12378-PeCDD	1		9.2				9.2
123478-HxCDD	0.1		5.9				5.9
123678-HxCDD	0.1		27.2				27.2
123789-HxCDD	0.1		14.5				14.5
1234678-HpCDD	0.01		505				505
12346789-OCDD	0.0001	E	4550		7190		7190
2378TCDF	0.1	S,E	5220		10930		10930
12378-PeCDF	0.05	E	3430		5110		5110
23478-PeCDF	0.5	E	2240		3680		3680
123478-HxCDF	0.1	E	2260		3850		3850
123678-HxCDF	0.1		422				422
234678-HxCDF	0.1		267				267
123789-HxCDF	0.1		45.6				45.6
1234678-HpCDF	0.01	E	2040		2880		2880
1234789-HpCDF	0.01		132				132
12346789-OCDF	0.0001		1710				1710

Total TEQ: Non-Detects = Detection Limit 3700
 Non-Detects = 1/2 d.l. 3700
 Non-Detects = zero 3700

PHASE I - WETLAND CONFIRMATION SOILS

DX #5

Latitude 43 23 20.65511

Longitude 83 57 59.74854

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1			EMPC	2.1	EMPC	2.1
12378-PeCDD	1			J	3	J	3
123478-HxCDD	0.1			J	2.1	J	2.1
123678-HxCDD	0.1				7.7		7.7
123789-HxCDD	0.1				5		5
1234678-HpCDD	0.01				133		133
12346789-OCDD	0.0001				1220		1220
2378TCDF	0.1			E	933		933
12378-PeCDF	0.05				448		448
23478-PeCDF	0.5				361		361
123478-HxCDF	0.1				278		278
123678-HxCDF	0.1				55.6		55.6
234678-HxCDF	0.1				38.4		38.4
123789-HxCDF	0.1			J	5	J	5
1234678-HpCDF	0.01				454		454
1234789-HpCDF	0.01				22.1		22.1
12346789-OCDF	0.0001				387		387

Total TEQ: Non-Detects = Detection Limit 350
 Non-Detects = 1/2 d.l. 350
 Non-Detects = zero 350

PHASE I - LA DAVIDSON (NPG) east=Germania Golf Course, west=Gross farm field

LA DAV DX 1 WEST

Latitude 43 23 37.22912

Longitude 84 00 01.39642

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.4				9.4
12378-PeCDD	1		10.9				10.9
123478-HxCDD	0.1		7.7				7.7
123678-HxCDD	0.1		26.9				26.9
123789-HxCDD	0.1		20.5				20.5
1234678-HpCDD	0.01		681				681
12346789-OCDD	0.0001	E	6180		7280		7280
2378TCDF	0.1		944				944
12378-PeCDF	0.05	EMPC,X	637			EMPC,X	637
23478-PeCDF	0.5		346				346
123478-HxCDF	0.1		450				450
123678-HxCDF	0.1		85.3				85.3
234678-HxCDF	0.1		61.5				61.5
123789-HxCDF	0.1	EMPC,X	12.5			EMPC,X	12.5
1234678-HpCDF	0.01		1180				1180
1234789-HpCDF	0.01		53.7				53.7
12346789-OCDF	0.0001		1280				1280

Total TEQ: Non-Detects = Detection Limit 410
 Non-Detects = 1/2 d.l. 410
 Non-Detects = zero 410

PHASE I - LA DAVIDSON (NPG) east=Germania Golf Course, west=Gross farm field

LA DAV DX 2 WEST

Latitude 43 23 37.47302

Longitude 84 00 02.39832

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.4				8.4
12378-PeCDD	1		8.6				8.6
123478-HxCDD	0.1		6				6
123678-HxCDD	0.1		20.1				20.1
123789-HxCDD	0.1		16.1				16.1
1234678-HpCDD	0.01		511				511
12346789-OCDD	0.0001	E	4360		5660		5660
2378TCDF	0.1		352				352
12378-PeCDF	0.05	EMPC,X	259			EMPC,X	259
23478-PeCDF	0.5		135				135
123478-HxCDF	0.1		189				189
123678-HxCDF	0.1		38.4				38.4
234678-HxCDF	0.1		30.1				30.1
123789-HxCDF	0.1	EMPC,X	7.1			EMPC,X	7.1
1234678-HpCDF	0.01		705				705
1234789-HpCDF	0.01		30.5				30.5
12346789-OCDF	0.0001		851				851

Total TEQ: Non-Detects = Detection Limit 180
 Non-Detects = 1/2 d.l. 180
 Non-Detects = zero 180

PHASE I - LA DAVIDSON (NPG) east=Germania Golf Course, west=Gross farm field

LA DAV DX 3 EAST

Latitude 43 23 33.60160

Longitude 83 59 42.63212

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	EMPC	5.7			EMPC	5.7
12378-PeCDD	1		9.4				9.4
123478-HxCDD	0.1		5.3				5.3
123678-HxCDD	0.1		39.4				39.4
123789-HxCDD	0.1		15.1				15.1
1234678-HpCDD	0.01		870				870
12346789-OCDD	0.0001	E	7620		8300		8300
2378TCDF	0.1	E	6440		6650		6650
12378-PeCDF	0.05	EMPC,X,E	3170		4100		4100
23478-PeCDF	0.5	E	2260		2700		2700
123478-HxCDF	0.1	E	2370		2230		2230
123678-HxCDF	0.1		419				419
234678-HxCDF	0.1		293				293
123789-HxCDF	0.1	EMPC,X	48.1			EMPC,X	48.1
1234678-HpCDF	0.01	E	2150		2180		2180
1234789-HpCDF	0.01		177				177
12346789-OCDF	0.0001		2130				2130

Total TEQ: Non-Detects = Detection Limit 2600
 Non-Detects = 1/2 d.l. 2600
 Non-Detects = zero 2600

PHASE I - LA DAVIDSON (NPG) east=Germania Golf Course, west=Gross farm field

LA DAV DX 4 EAST

Latitude 43 23 34.00872

Longitude 83 59 44.10444

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		10.7				10.7
12378-PeCDD	1		17.2				17.2
123478-HxCDD	0.1		12.9				12.9
123678-HxCDD	0.1		58				58
123789-HxCDD	0.1		31.1				31.1
1234678-HpCDD	0.01		1130				1130
12346789-OCDD	0.0001	E	10500		9530		9530
2378TCDF	0.1	S,E	5920		6780		6780
12378-PeCDF	0.05	EMPC,S,X,E	3650		3660		3660
23478-PeCDF	0.5	E	2530		2550		2550
123478-HxCDF	0.1	E	2720		2110		2110
123678-HxCDF	0.1		485				485
234678-HxCDF	0.1		352				352
123789-HxCDF	0.1	EMPC,X	54				54
1234678-HpCDF	0.01	E	3870		3260		3260
1234789-HpCDF	0.01		217				217
12346789-OCDF	0.0001		3190				3190

Total TEQ: Non-Detects = Detection Limit 2500
 Non-Detects = 1/2 d.l. 2500
 Non-Detects = zero 2500

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 1-6

Latitude 43 23 32.47347

Longitude 84 00 21.76851

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					EMPC,B	1.3
12378-PeCDD	1					J	0.83
123478-HxCDD	0.1					J	0.78
123678-HxCDD	0.1					EMPC,J,B	3.8
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						84
12346789-OCDD	0.0001						735
2378TCDF	0.1						104
12378-PeCDF	0.05						47.8
23478-PeCDF	0.5						31
123478-HxCDF	0.1						40.1
123678-HxCDF	0.1						9
234678-HxCDF	0.1						6.4
123789-HxCDF	0.1					J	1.5
1234678-HpCDF	0.01						112
1234789-HpCDF	0.01					EMPC	5.2
12346789-OCDF	0.0001						170

Total TEQ: Non-Detects = Detection Limit 39
 Non-Detects = 1/2 d.l. 39
 Non-Detects = zero 39

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 1-12

Latitude 43 23 32.47347

Longitude 84 00 21.76851

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					B	0.76
12378-PeCDD	1					J	0.9
123478-HxCDD	0.1					J	0.97
123678-HxCDD	0.1					B	4
123789-HxCDD	0.1					J	2.1
1234678-HpCDD	0.01						71.5
12346789-OCDD	0.0001						677
2378TCDF	0.1						163
12378-PeCDF	0.05						65.4
23478-PeCDF	0.5						51
123478-HxCDF	0.1						59.3
123678-HxCDF	0.1						12.6
234678-HxCDF	0.1						8.5
123789-HxCDF	0.1					J	1.6
1234678-HpCDF	0.01						151
1234789-HpCDF	0.01						8
12346789-OCDF	0.0001						159

Total TEQ: Non-Detects = Detection Limit 58
 Non-Detects = 1/2 d.l. 58
 Non-Detects = zero 58

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 2-6

Latitude 43 23 33.20442

Longitude 84 00 22.23185

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	B	2.9			B	2.9
12378-PeCDD	1	J	1.8			J	1.8
123478-HxCDD	0.1	EMPC,J	1.4			EMPC,J	1.4
123678-HxCDD	0.1		11.1				11.1
123789-HxCDD	0.1	J	4.9			J	4.9
1234678-HpCDD	0.01		267				267
12346789-OCDD	0.0001		2430				2430
2378TCDF	0.1		397				397
12378-PeCDF	0.05		184				184
23478-PeCDF	0.5		121				121
123478-HxCDF	0.1		164				164
123678-HxCDF	0.1		31				31
234678-HxCDF	0.1		19.5				19.5
123789-HxCDF	0.1	J	3.2			J	3.2
1234678-HpCDF	0.01		348				348
1234789-HpCDF	0.01		19.1				19.1
12346789-OCDF	0.0001		684				684

Total TEQ: Non-Detects = Detection Limit 140
 Non-Detects = 1/2 d.l. 140
 Non-Detects = zero 140

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 2-12

Latitude 43 23 33.20442

Longitude 84 00 22.23185

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	B	4.3			B	4.3
12378-PeCDD	1		3.4				3.4
123478-HxCDD	0.1	J	2.7			J	2.7
123678-HxCDD	0.1		19.2				19.2
123789-HxCDD	0.1		8.3				8.3
1234678-HpCDD	0.01		328				328
12346789-OCDD	0.0001	E	2630		2800		2800
2378TCDF	0.1	E	1240		1130		1130
12378-PeCDF	0.05		346				346
23478-PeCDF	0.5		331				331
123478-HxCDF	0.1		274				274
123678-HxCDF	0.1		57.8				57.8
234678-HxCDF	0.1		44.1				44.1
123789-HxCDF	0.1		8.1				8.1
1234678-HpCDF	0.01		588				588
1234789-HpCDF	0.01		29.4				29.4
12346789-OCDF	0.0001		612				612

Total TEQ: Non-Detects = Detection Limit 350
 Non-Detects = 1/2 d.l. 350
 Non-Detects = zero 350

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 3-6

Latitude 43 23 32.55589

Longitude 84 00 26.30206

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					B	0.92
12378-PeCDD	1					EMPC,J	0.82
123478-HxCDD	0.1					ND	0.3
123678-HxCDD	0.1					EMPC,J,B	2.9
123789-HxCDD	0.1					J	1.7
1234678-HpCDD	0.01						77.1
12346789-OCDD	0.0001						707
2378TCDF	0.1						175
12378-PeCDF	0.05						70.2
23478-PeCDF	0.5						50.9
123478-HxCDF	0.1						59.7
123678-HxCDF	0.1						12.2
234678-HxCDF	0.1						8.6
123789-HxCDF	0.1					EMPC,J	1.4
1234678-HpCDF	0.01						122
1234789-HpCDF	0.01						7.7
12346789-OCDF	0.0001						138

Total TEQ: Non-Detects = Detection Limit 59
 Non-Detects = 1/2 d.l. 59
 Non-Detects = zero 59

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 3-12

Latitude 43 23 32.55589

Longitude 84 00 26.30206

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					B	1.4
12378-PeCDD	1					J	1.2
123478-HxCDD	0.1					J	0.88
123678-HxCDD	0.1					J,B	4.2
123789-HxCDD	0.1					J	2.3
1234678-HpCDD	0.01						79.3
12346789-OCDD	0.0001						741
2378TCDF	0.1						159
12378-PeCDF	0.05						67.8
23478-PeCDF	0.5						46.6
123478-HxCDF	0.1						58.7
123678-HxCDF	0.1						13.1
234678-HxCDF	0.1						7.9
123789-HxCDF	0.1					J	1.9
1234678-HpCDF	0.01						169
1234789-HpCDF	0.01						8.1
12346789-OCDF	0.0001						173

Total TEQ: Non-Detects = Detection Limit 57
 Non-Detects = 1/2 d.l. 57
 Non-Detects = zero 57

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 4-6

Latitude 43 23 32.68348

Longitude 84 00 27.62213

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1					J,B	0.47
12378-PeCDD	1					EMPC,J	0.51
123478-HxCDD	0.1					J	0.48
123678-HxCDD	0.1					J,B	2.1
123789-HxCDD	0.1					J	1.3
1234678-HpCDD	0.01					B	32.8
12346789-OCDD	0.0001					B	301
2378TCDF	0.1						95.8
12378-PeCDF	0.05						44.9
23478-PeCDF	0.5						30.1
123478-HxCDF	0.1						35.5
123678-HxCDF	0.1						9
234678-HxCDF	0.1						5.4
123789-HxCDF	0.1					J	1.2
1234678-HpCDF	0.01						65.8
1234789-HpCDF	0.01						3.9
12346789-OCDF	0.0001						69.7

Total TEQ: Non-Detects = Detection Limit 34
 Non-Detects = 1/2 d.l. 34
 Non-Detects = zero 34

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 4-12

Latitude 43 23 32.68348

Longitude 84 00 27.62213

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	B	1.3			B	1.3
12378-PeCDD	1	J	2.4			J	2.4
123478-HxCDD	0.1	J	2			J	2
123678-HxCDD	0.1	B	5.1			B	5.1
123789-HxCDD	0.1	J	3.4			J	3.4
1234678-HpCDD	0.01		54.9				54.9
12346789-OCDD	0.0001		532				532
2378TCDF	0.1		579				579
12378-PeCDF	0.05		174				174
23478-PeCDF	0.5		159				159
123478-HxCDF	0.1		143				143
123678-HxCDF	0.1		31				31
234678-HxCDF	0.1		18.8				18.8
123789-HxCDF	0.1		5.2				5.2
1234678-HpCDF	0.01		180				180
1234789-HpCDF	0.01		10.8				10.8
12346789-OCDF	0.0001		139				139

Total TEQ: Non-Detects = Detection Limit 170
 Non-Detects = 1/2 d.l. 170
 Non-Detects = zero 170

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 5-6

Latitude 43 23 32.61969

Longitude 84 00 24.55440

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	B	5.9			B	5.9
12378-PeCDD	1	J	1			J	1
123478-HxCDD	0.1	EMPC,J	1.1			EMPC,J	1.1
123678-HxCDD	0.1		13.6				13.6
123789-HxCDD	0.1		10				10
1234678-HpCDD	0.01		162				162
12346789-OCDD	0.0001		849				849
2378TCDF	0.1		380				380
12378-PeCDF	0.05		183				183
23478-PeCDF	0.5		121				121
123478-HxCDF	0.1		141				141
123678-HxCDF	0.1		28.6				28.6
234678-HxCDF	0.1		18.6				18.6
123789-HxCDF	0.1	J	3.5			J	3.5
1234678-HpCDF	0.01		167				167
1234789-HpCDF	0.01		17.9				17.9
12346789-OCDF	0.0001		257				257

Total TEQ: Non-Detects = Detection Limit 140
 Non-Detects = 1/2 d.l. 140
 Non-Detects = zero 140

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FIELD SOILS

GP 5-12

Latitude 43 23 32.61969

Longitude 84 00 24.55440

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	B	5.5			B	5.5
12378-PeCDD	1		3.3				3.3
123478-HxCDD	0.1	J	3			J	3
123678-HxCDD	0.1		21.4				21.4
123789-HxCDD	0.1		8.7				8.7
1234678-HpCDD	0.01		400				400
12346789-OCDD	0.0001	E	3010		3500		3500
2378TCDF	0.1	E	2810		2920		2920
12378-PeCDF	0.05	EMPC,S,E	1530		2060		2060
23478-PeCDF	0.5		941				941
123478-HxCDF	0.1		1240				1240
123678-HxCDF	0.1		246				246
234678-HxCDF	0.1		128				128
123789-HxCDF	0.1		21				21
1234678-HpCDF	0.01		598				598
1234789-HpCDF	0.01		65.7				65.7
12346789-OCDF	0.0001		800				800

Total TEQ: Non-Detects = Detection Limit 1100
 Non-Detects = 1/2 d.l. 1100
 Non-Detects = zero 1100

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 1-3

Latitude 43 23 32.93351

Longitude 84 00 16.40952

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.8				2.8
12378-PeCDD	1	J	4.7			J	4.7
123478-HxCDD	0.1	J	3			J	3
123678-HxCDD	0.1		12.1				12.1
123789-HxCDD	0.1		7.2				7.2
1234678-HpCDD	0.01		235				235
12346789-OCDD	0.0001		1830				1830
2378TCDF	0.1	E	1240		790		790
12378-PeCDF	0.05		524				524
23478-PeCDF	0.5		424				424
123478-HxCDF	0.1		377				377
123678-HxCDF	0.1		85.6				85.6
234678-HxCDF	0.1		52.1				52.1
123789-HxCDF	0.1		8.8				8.8
1234678-HpCDF	0.01		413				413
1234789-HpCDF	0.01		33.9				33.9
12346789-OCDF	0.0001		448				448

Total TEQ: Non-Detects = Detection Limit 390
 Non-Detects = 1/2 d.l. 390
 Non-Detects = zero 390

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 1-6

Latitude 43 23 32.93351

Longitude 84 00 16.40952

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	EMPC,J	0.76			EMPC,J	0.76
12378-PeCDD	1	J	1.2			J	1.2
123478-HxCDD	0.1	EMPC,J	0.71			EMPC,J	0.71
123678-HxCDD	0.1	J	2.2			J	2.2
123789-HxCDD	0.1	J	2.2			J	2.2
1234678-HpCDD	0.01		35.2				35.2
12346789-OCDD	0.0001		277				277
2378TCDF	0.1	E	2210		1540		1540
12378-PeCDF	0.05		762				762
23478-PeCDF	0.5		640				640
123478-HxCDF	0.1		533				533
123678-HxCDF	0.1		111				111
234678-HxCDF	0.1		74.3				74.3
123789-HxCDF	0.1		12.7				12.7
1234678-HpCDF	0.01		146				146
1234789-HpCDF	0.01		29.8				29.8
12346789-OCDF	0.0001		85.5				85.5

Total TEQ: Non-Detects = Detection Limit 590
 Non-Detects = 1/2 d.l. 590
 Non-Detects = zero 590

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 1-12

Latitude 43 23 32.93351

Longitude 84 00 16.40952

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	EMPC,J	0.23			EMPC,J	0.23
12378-PeCDD	1	ND	0.2			ND	0.2
123478-HxCDD	0.1	ND	0.2			ND	0.2
123678-HxCDD	0.1	ND	0.2			ND	0.2
123789-HxCDD	0.1	ND	0.2			ND	0.2
1234678-HpCDD	0.01		6.8				6.8
12346789-OCDD	0.0001		52.4				52.4
2378TCDF	0.1		177				177
12378-PeCDF	0.05		68.7				68.7
23478-PeCDF	0.5		57.1				57.1
123478-HxCDF	0.1		52.1				52.1
123678-HxCDF	0.1		13				13
234678-HxCDF	0.1		8.1				8.1
123789-HxCDF	0.1	J	1.2			J	1.2
1234678-HpCDF	0.01		19.8				19.8
1234789-HpCDF	0.01	J	4.2			J	4.2
12346789-OCDF	0.0001		18.4				18.4

Total TEQ: Non-Detects = Detection Limit 58
 Non-Detects = 1/2 d.l. 58
 Non-Detects = zero 58

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 2-3

Latitude 43 23 32.60616

Longitude 84 00 15.47423

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.9				5.9
12378-PeCDD	1		8				8
123478-HxCDD	0.1		4.9				4.9
123678-HxCDD	0.1		23.2				23.2
123789-HxCDD	0.1		12.2				12.2
1234678-HpCDD	0.01		504				504
12346789-OCDD	0.0001	E	4460		4400		4400
2378TCDF	0.1	E	2900		2370		2370
12378-PeCDF	0.05		835				835
23478-PeCDF	0.5		743				743
123478-HxCDF	0.1		562				562
123678-HxCDF	0.1		113				113
234678-HxCDF	0.1		89.9				89.9
123789-HxCDF	0.1		13.7				13.7
1234678-HpCDF	0.01		1130				1130
1234789-HpCDF	0.01		53.9				53.9
12346789-OCDF	0.0001		1090				1090

Total TEQ: Non-Detects = Detection Limit 760
 Non-Detects = 1/2 d.l. 760
 Non-Detects = zero 760

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 2-6

Latitude 43 23 32.60616

Longitude 84 00 15.47423

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.7				3.7
12378-PeCDD	1		7.4				7.4
123478-HxCDD	0.1	J	4.1			J	4.1
123678-HxCDD	0.1		19.8				19.8
123789-HxCDD	0.1		12.7				12.7
1234678-HpCDD	0.01		421				421
12346789-OCDD	0.0001		3680				3680
2378TCDF	0.1	E	1380		938		938
12378-PeCDF	0.05		566				566
23478-PeCDF	0.5		422				422
123478-HxCDF	0.1		429				429
123678-HxCDF	0.1		91.2				91.2
234678-HxCDF	0.1		67.7				67.7
123789-HxCDF	0.1		12.9				12.9
1234678-HpCDF	0.01		1080				1080
1234789-HpCDF	0.01		48.4				48.4
12346789-OCDF	0.0001		968				968

Total TEQ: Non-Detects = Detection Limit 420
 Non-Detects = 1/2 d.l. 420
 Non-Detects = zero 420

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 2-12

Latitude 43 23 32.60616

Longitude 84 00 15.47423

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	EMPC,J	0.43			EMPC,J	0.43
12378-PeCDD	1	J	0.76			J	0.76
123478-HxCDD	0.1	ND	0.3			ND	0.3
123678-HxCDD	0.1	J	1.4			J	1.4
123789-HxCDD	0.1	J	1.1			J	1.1
1234678-HpCDD	0.01		28.9				28.9
12346789-OCDD	0.0001		257				257
2378TCDF	0.1		983				983
12378-PeCDF	0.05		410				410
23478-PeCDF	0.5		308				308
123478-HxCDF	0.1		282				282
123678-HxCDF	0.1		54.2				54.2
234678-HxCDF	0.1		35.7				35.7
123789-HxCDF	0.1		6.2				6.2
1234678-HpCDF	0.01		106				106
1234789-HpCDF	0.01		17.5				17.5
12346789-OCDF	0.0001		76.1				76.1

Total TEQ: Non-Detects = Detection Limit 310
 Non-Detects = 1/2 d.l. 310
 Non-Detects = zero 310

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 5-3

Latitude 43 23 32.67094

Longitude 84 00 14.80497

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.3				7.3
12378-PeCDD	1		8.1				8.1
123478-HxCDD	0.1	J	4.8			J	4.8
123678-HxCDD	0.1		31.5				31.5
123789-HxCDD	0.1		13.4				13.4
1234678-HpCDD	0.01		815				815
12346789-OCDD	0.0001	E	6980		6240		6240
2378TCDF	0.1	E	1290		805		805
12378-PeCDF	0.05		514				514
23478-PeCDF	0.5		383				383
123478-HxCDF	0.1		363				363
123678-HxCDF	0.1		78.4				78.4
234678-HxCDF	0.1		59.9				59.9
123789-HxCDF	0.1		12.2				12.2
1234678-HpCDF	0.01		971				971
1234789-HpCDF	0.01		56.3				56.3
12346789-OCDF	0.0001		1540				1540

Total TEQ: Non-Detects = Detection Limit 390
 Non-Detects = 1/2 d.l. 390
 Non-Detects = zero 390

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 5-6

Latitude 43 23 32.67094

Longitude 84 00 14.80497

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.1				5.1
12378-PeCDD	1		9.1				9.1
123478-HxCDD	0.1		6.5				6.5
123678-HxCDD	0.1		26.1				26.1
123789-HxCDD	0.1		15.6				15.6
1234678-HpCDD	0.01		460				460
12346789-OCDD	0.0001	E	4010		3330		3330
2378TCDF	0.1	E	1620		1140		1140
12378-PeCDF	0.05		726				726
23478-PeCDF	0.5		549				549
123478-HxCDF	0.1		533				533
123678-HxCDF	0.1		119				119
234678-HxCDF	0.1		91.2				91.2
123789-HxCDF	0.1		14.3				14.3
1234678-HpCDF	0.01		1280				1280
1234789-HpCDF	0.01		64.8				64.8
12346789-OCDF	0.0001		1040				1040

Total TEQ: Non-Detects = Detection Limit 540
 Non-Detects = 1/2 d.l. 540
 Non-Detects = zero 540

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 5-12

Latitude 43 23 32.67094

Longitude 84 00 14.80497

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	EMPC,J	0.81			EMPC,J	0.81
12378-PeCDD	1	J	2.7			J	2.7
123478-HxCDD	0.1	J	1.7			J	1.7
123678-HxCDD	0.1		6.2				6.2
123789-HxCDD	0.1	J	4.2			J	4.2
1234678-HpCDD	0.01		92.4				92.4
12346789-OCDD	0.0001		845				845
2378TCDF	0.1		793				793
12378-PeCDF	0.05		352				352
23478-PeCDF	0.5		264				264
123478-HxCDF	0.1		234				234
123678-HxCDF	0.1		54				54
234678-HxCDF	0.1		44.1				44.1
123789-HxCDF	0.1		7.6				7.6
1234678-HpCDF	0.01		368				368
1234789-HpCDF	0.01		23.3				23.3
12346789-OCDF	0.0001		274				274

Total TEQ: Non-Detects = Detection Limit 270
 Non-Detects = 1/2 d.l. 270
 Non-Detects = zero 270

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 6-3

Latitude 43 23 32.38141

Longitude 84 00 15.05328

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.3				6.3
12378-PeCDD	1		7.4				7.4
123478-HxCDD	0.1	J	4.7			J	4.7
123678-HxCDD	0.1		18.5				18.5
123789-HxCDD	0.1		11.3				11.3
1234678-HpCDD	0.01		385				385
12346789-OCDD	0.0001	E	4130		3660		3660
2378TCDF	0.1	E	14860		1420		1420
12378-PeCDF	0.05	EMPC,S,E	2310		675		675
23478-PeCDF	0.5	EMPC,S,E	2250		478		478
123478-HxCDF	0.1	E	2410		413		413
123678-HxCDF	0.1		450				450
234678-HxCDF	0.1		405				405
123789-HxCDF	0.1		41.4				41.4
1234678-HpCDF	0.01		1250				1250
1234789-HpCDF	0.01		107				107
12346789-OCDF	0.0001		845				845

Total TEQ: Non-Detects = Detection Limit 580
 Non-Detects = 1/2 d.l. 580
 Non-Detects = zero 580

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 6-6

Latitude 43 23 32.38141

Longitude 84 00 15.05328

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.4				3.4
12378-PeCDD	1		6.8				6.8
123478-HxCDD	0.1	J	4.4			J	4.4
123678-HxCDD	0.1		17.4				17.4
123789-HxCDD	0.1		11.8				11.8
1234678-HpCDD	0.01		323				323
12346789-OCDD	0.0001		3130				3130
2378TCDF	0.1	E	1870		1410		1410
12378-PeCDF	0.05		702				702
23478-PeCDF	0.5		543				543
123478-HxCDF	0.1		549				549
123678-HxCDF	0.1		116				116
234678-HxCDF	0.1		85.1				85.1
123789-HxCDF	0.1	Q	13.5			Q	13.5
1234678-HpCDF	0.01		993				993
1234789-HpCDF	0.01		56.2				56.2
12346789-OCDF	0.0001		784				784

Total TEQ: Non-Detects = Detection Limit 550
 Non-Detects = 1/2 d.l. 550
 Non-Detects = zero 550

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 6-12

Latitude 43 23 32.38141

Longitude 84 00 15.05328

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.7			ND	0.7
12378-PeCDD	1	J	1			J	1
123478-HxCDD	0.1	ND	0.7			ND	0.7
123678-HxCDD	0.1	J	1.3			J	1.3
123789-HxCDD	0.1	J	0.92			J	0.92
1234678-HpCDD	0.01		25.5				25.5
12346789-OCDD	0.0001		234				234
2378TCDF	0.1		507				507
12378-PeCDF	0.05		106				106
23478-PeCDF	0.5		113				113
123478-HxCDF	0.1		74.9				74.9
123678-HxCDF	0.1		15.7				15.7
234678-HxCDF	0.1		10.9				10.9
123789-HxCDF	0.1	J	1.3			J	1.3
1234678-HpCDF	0.01		84.2				84.2
1234789-HpCDF	0.01		5.9				5.9
12346789-OCDF	0.0001		67.6				67.6

Total TEQ: Non-Detects = Detection Limit 130
 Non-Detects = 1/2 d.l. 130
 Non-Detects = zero 130

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 7-3

Latitude 43 23 32.85392

Longitude 84 00 15.68027

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.7				5.7
12378-PeCDD	1	EMPC	6.1			EMPC	6.1
123478-HxCDD	0.1		4.2				4.2
123678-HxCDD	0.1		19.8				19.8
123789-HxCDD	0.1		9.2				9.2
1234678-HpCDD	0.01		519				519
12346789-OCDD	0.0001	E	4110		2730		2730
2378TCDF	0.1	E	1290		915		915
12378-PeCDF	0.05		671				671
23478-PeCDF	0.5		458				458
123478-HxCDF	0.1		452				452
123678-HxCDF	0.1		97.7				97.7
234678-HxCDF	0.1		66.5				66.5
123789-HxCDF	0.1	EMPC,X	9.6			EMPC,X	9.6
1234678-HpCDF	0.01		827				827
1234789-HpCDF	0.01		43.2				43.2
12346789-OCDF	0.0001		1180				1180

Total TEQ: Non-Detects = Detection Limit 450
 Non-Detects = 1/2 d.l. 450
 Non-Detects = zero 450

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 7-6

Latitude 43 23 32.85392

Longitude 84 00 15.68027

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.5				4.5
12378-PeCDD	1		12.5				12.5
123478-HxCDD	0.1		8.6				8.6
123678-HxCDD	0.1		58.6				58.6
123789-HxCDD	0.1		23.7				23.7
1234678-HpCDD	0.01		732				732
12346789-OCDD	0.0001	E	4430		3280		3280
2378TCDF	0.1	E	1910		1400		1400
12378-PeCDF	0.05		992				992
23478-PeCDF	0.5		678				678
123478-HxCDF	0.1		657				657
123678-HxCDF	0.1		139				139
234678-HxCDF	0.1		96.9				96.9
123789-HxCDF	0.1	EMPC,X	20.8			EMPC,X	20.8
1234678-HpCDF	0.01		1080				1080
1234789-HpCDF	0.01		68.6				68.6
12346789-OCDF	0.0001		1500				1500

Total TEQ: Non-Detects = Detection Limit 670
 Non-Detects = 1/2 d.l. 670
 Non-Detects = zero 670

PHASE I - SHIAWASSEE WILDLIFE REFUGE - FOREST SOILS

I SS 7-12

Latitude 43 23 32.85392

Longitude 84 00 15.68027

Analyte	TEF	Undiluted		Diluted		Final	
		Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.3			ND	0.3
12378-PeCDD	1	EMPC,J	0.68			EMPC,J	0.68
123478-HxCDD	0.1	J	1			J	1
123678-HxCDD	0.1	ND	0.3			ND	0.3
123789-HxCDD	0.1	ND	0.2			ND	0.2
1234678-HpCDD	0.01		20.4				20.4
12346789-OCDD	0.0001		145				145
2378TCDF	0.1		189				189
12378-PeCDF	0.05		94.7				94.7
23478-PeCDF	0.5		67.2				67.2
123478-HxCDF	0.1		67.2				67.2
123678-HxCDF	0.1		13.8				13.8
234678-HxCDF	0.1		10.3				10.3
123789-HxCDF	0.1	ND	0.2			ND	0.2
1234678-HpCDF	0.01		39.3				39.3
1234789-HpCDF	0.01	J	4.9			J	4.9
12346789-OCDF	0.0001		42.9				42.9

Total TEQ: Non-Detects = Detection Limit 68
 Non-Detects = 1/2 d.l. 68
 Non-Detects = zero 68

Appendix H

Selected DEQ Tittabawassee River Sediment Study Results and Maps

-- Note --

This document is an abbreviated version of
the full 163-page report entitled:
Baseline Chemical Characterization of Saginaw Bay Watershed Sediments
The full report can be accessed from this DEQ web site:
<http://www.deq.state.mi.us/documents/deq-rrd-dioxin-FinalReport.pdf>

BASELINE CHEMICAL CHARACTERIZATION OF SAGINAW BAY WATERSHED SEDIMENTS

A Report to the Office of the Great Lakes
Michigan Department of Environmental Quality



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August 29, 2002

Baseline Chemical Characterization of Saginaw Bay Watershed Sediments

Introduction

General: Persistent bioaccumulative compounds have historically been released from industrial entities in the Saginaw Bay watershed. Dioxins and furans, polychlorinated and polybrominated biphenyl compounds (PCBs and PBBs), pesticides, herbicides, and other persistent bioaccumulative compounds have been identified as significant pollutants in the Saginaw River and the Saginaw Bay (U.S.EPA, 1995).

In September of 2000, the Waste Management Division of the Michigan Department of Environmental Quality (MDEQ) was awarded a grant of \$88,775.00 from the Michigan Great Lakes Protection Fund to conduct a study entitled: "Baseline Chemical Characterization of Saginaw Bay Watershed Sediments (Baseline Study)." The Baseline Study area is shown below as Figure 1. A copy of the approved grant proposal and budget is attached as Appendix 1 of this Report.

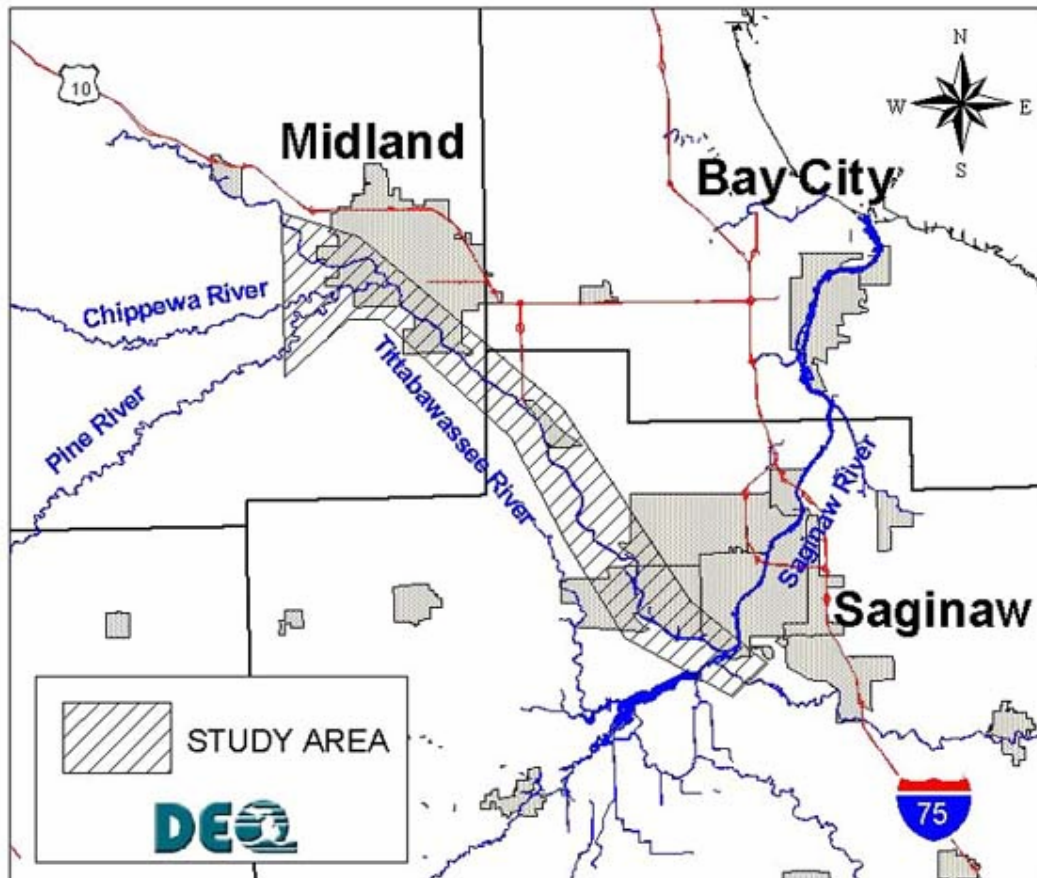


Figure 1

The focus of the Baseline Study is to characterize the sediments in the identified study area beginning upstream of Midland Michigan on the Pine, Chippewa, and Tittabawassee Rivers, and continuing downstream on the Tittabawassee to its confluence with the Saginaw River. The data and sampling locations from this study establish a year 2001 baseline level of contamination of watershed sediments that provides a benchmark against which future improvements in sediment and water quality can be measured. The analytical data from this project is also intended to serve as a screening level evaluation of sediment quality in the Tittabawassee River; to determine if contaminants are present at levels of environmental concern; and to determine if Tittabawassee River sediments are a potential source of ongoing releases to Lake Huron. Finally, analytical results from the study can be used to form the basis for a request for corrective action, if necessary, from regulated facilities within the watershed.

The Baseline Study was developed and conducted in a phased manner that consisted of a review of existing literature and data; the development of a sampling and analysis plan; the collection of samples; the analysis of the data; and the preparation of this Report. The Michigan State University Aquatic Toxicology Laboratory (MSU ATL), under the direction of Dr. John Giesy, assisted in the completion of this project by conducting a detailed literature review, assisting with the development of the study sampling and analysis plan (SAP), and conducting the dioxin and furan related analyses on the samples.

Literature and Data Review

The MSU-ATL conducted a literature search to identify appropriate literature to support the Baseline Study. This included all general literature on polychlorinated diaromatic hydrocarbons and specifically all of the literature, either in the open or gray literature and reports on the Saginaw River drainage system. The literature is compiled into an electronic data base (Reference Manager[®]). A hard copy of the literature search is attached as Appendix 2 of this study.

The literature review indicates that significant sediment investigation work has been downstream of the study area in the Saginaw River and in the Saginaw Bay. In particular, the United States Environmental Protection Agency (U.S. EPA) has identified the Saginaw River and Saginaw Bay as an Area of Concern (U.S. EPA, 1995) as part of the Assessment and Remediation of Contaminated Sediments Program (ARCS Program). The ARCS Program resulted in the development of detailed sediment quality information on the lower Saginaw River and Saginaw Bay. Grab and core sediment samples from the ARCS study were analyzed for polyaromatic hydrocarbons, PCBs, chlorinated pesticides, polychlorinated dibenzo-p-

dioxins, polychlorinated dibenzofurans, and metals. General conclusions regarding the presence and risk of PCBs and certain metals in the sediments of the Area of Concern are presented in this study. In addition, to the ARCS Program, the Army Corps of Engineers (1999) has also conducted fairly extensive sampling and analysis of sediments in the navigable channel of the Saginaw associated with dredging projects.

Much less data is available on sediment quality in the Tittabawassee, Pine, and Chippewa Rivers upstream of the confluence of the Tittabawassee and the Saginaw Rivers. The Michigan Department of Community Health has issued fish advisories based on elevated levels of dioxins and furans and PCBs found in fish tissues in the Tittabawassee and Saginaw Rivers downstream of Midland. Fish advisories for PBBs and DDT have been issued for all species of fish on the Pine River downstream of the St. Louis impoundment.

Amendola and Barna (1986) reported of dioxin concentrations at up to 16 parts per billion (OCDD) in Tittabawassee River sediments in 1984. Dioxins were not detected in sediments upstream of The Dow Chemical Company facility in Midland, Michigan. Two studies have analyzed Tittabawassee River sediments for PCBs (MDNR, 1971, 1988). The Michigan Department of Natural Resources summaries of this work indicate that the sediment data from these studies is relatively sparse.

The MDEQ Surface Water Quality Division conducted an extensive review of existing information on the Tittabawassee River in 1993 during the evaluation of a potential Natural Resources Damage Assessment claim against The Dow Chemical Company (RCG/Hagler, Bailly Inc., 1993). That review identified data gaps in water quality and sediment quality with respect to dioxins and furans and PCBs.

The MDEQ conducted limited sediment sampling of the Tittabawassee and Chippewa Rivers in 1996 for a broad range of organic compounds, including dioxins and furans, and metals (MDEQ, 1996). This sampling event was concentrated adjacent to The Dow Chemical Company facility and immediately upstream of the facility.

Based on a review of existing data, it was clear that no comprehensive sediment characterization program has been conducted on the Tittabawassee River and that there is no program which routinely analyzes sediments to track changes in environmental quality of this portion of the Saginaw Bay watershed. It was also apparent that dioxins and furans were a significant issue in this watershed.

Methodology

Sampling and Analysis Plan: A SAP was developed for the collection and analysis of the samples. A copy of the SAP is attached as Appendix 3 to this Report. Unless otherwise stated, analyses were conducted in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Third Edition, November 1986, and its updates I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), and IIIA (April 1998) (SW-846)

Study Design: The goals of this project were to (1) obtain a baseline chemical characterization of Tittabawassee River sediments and floodplain soils; and (2) to choose and document sampling locations so that the study might be replicated at a future date. These goals, in concert with financial and logistical realities, resulted in the sampling and analysis approach utilized in this project.

The parameters of interest in this study consisted of heavy metals, volatile and semivolatile organic compounds, pesticides, PCBs, dioxins, and furans. These parameters were chosen by the principal investigators as being the best indicators of the overall environmental health of the river system. A complete list of individual parameters is included in Table 1. In addition, analyses of physical parameters [Total Organic Carbon (TOC) and Total Organic Matter] were performed on all samples.

In addition to conventional dioxin and furan instrumental analysis (SW-846 Method 8290), each of the transect, composite, floodplain soils, and selected individual reach samples described below were analyzed using H4IIE-luc bioassay to determine relative dioxin-like activity. A subset of these samples were further analyzed in order to perform mass balance calculations to determine if other compounds are contributing significant dioxin like activity to Tittabawassee River sediments and soils.

The persistent bioaccumulative compounds of concern in this study are most frequently associated with fine particulate matter in the environment. Due to this association, an attempt was made to preferentially sample areas of fine particulate deposition. Preferred sampling locations included zones immediately downstream of large snags, bridge pilings, or other man-made structures, the inside bend of river meanders and other areas where fine particulates were observed to accumulate. Field personnel frequently tested possible sampling locations by poling with a boat oar to determine if there was suitable sediment accumulation. Figure 2 illustrates typical river sampling locations.

The location of each sample collected during this study was memorialized using hand-held Global Positioning System technology. Location coordinates in decimal degrees latitude and longitude for each sampling location in this study are identified in Table 2.



Figure 2. Typical River Sample Locations

Transect Sampling Locations: Sampling locations were chosen to provide geographic coverage of the study area and to preferentially sample depositional areas where the parameters of concern were most likely to be found. Nine locations (hereinafter referred to as transects) were chosen in order to provide coverage along the approximately 22 miles of river comprising the study area. Transect locations were tentatively identified by reviewing maps of the study area and locations finalized by the identification of depositional zones in the field. Transect locations are shown in Figure 3.

Two types of sampling were typically performed at each transect location. A sediment core sample was obtained by driving a four-inch diameter acetate or polyvinyl chloride (PVC) tube into the river bottom to a depth of one and a half to two feet (0.45 to 0.6 meter) at one discrete location per transect. Stones larger than 1/4 inch and leaves and twigs were removed from the sample before compositing in a stainless steel bowl. Aliquots of the composite sample were taken for analysis for each of the study parameters. Figure 4 illustrates a typical core sample.



Figure 4. Typical Core sample

A composite sample of the surficial sediments was obtained by using a petite Ponar dredge to collect a sample of the upper one to two inches of sediment at three to five locations per transect along a line between each bank of the river. The number of locations per transect was a field decision based on stream width, particle size of the sediment, and practical considerations in obtaining a sample. The individual dredge samples were composited by mixing with a stainless steel scoop in a

stainless steel bowl. Stones larger than 0 inch and leaves and twigs were removed from the sample before compositing in a stainless steel bowl. Figure 5 illustrates a typical upper composite sample. Aliquots of the composite sample were taken for analysis for each of the study parameters.



Figure 5. Typical Composite Sample

Discrete Sediment Samples: A series of discrete sediment samples were collected at locations between transects to characterize individual reaches of the river and obtain good geographic coverage of the study area. Between three and 20 reach samples were taken between each transect. Reach sample locations were identified in the field and were preferentially located in depositional zones. Reach samples consisted of the upper one to two inches of sediment collected with a petite Ponar dredge. Stones larger than 0 inch and leaves and twigs were removed from the sample before compositing in a stainless steel bowl. Reach sample locations are identified in Figure 3. Because of resource limitations and holding time limitations, reach samples were analyzed for dioxins, furans and physical parameters only.

Adjacent individual reach samples were carefully split and mixed in the lab to form a composite sample prior to analysis. A total of 19 reach composite samples were analyzed for dioxins and furans. The individual reach samples and the reach composites are shown on Figure 3 and listed in Table 3.

In addition to the composites, individual analyses were completed on each of the reach samples that make up Composites #4, #11, #15, and #17. These composites were selected for additional analysis based on the results of the H4IIE-luc bioassay as described in further detail below. An individual analysis was also performed on reach sample #23 which was distinguished from the other samples by a much higher TOC content.

Floodplain Soil Samples: Ten floodplain soil samples were also collected as part of the study. Low lying areas immediately adjacent to the river were selected, based on field judgment, as likely sites of significant fine particle deposition. The locations of the floodplain soil samples are identified in Figure 3. Latitudes and longitudes of floodplain soil sample locations are included in Table 2. Floodplain soil samples were collected from a one square foot location. The top one to two inches of soil was collected using a stainless steel scoop and thoroughly mixed in a stainless steel bowl. Large organic matter such as leaves and twigs were removed. Aliquots were taken for analysis of each of the study parameters listed in Table 1. A typical floodplain soil sampling location is shown in Figure 6.



Figure 6. Typical Floodplain Soil Sampling Location

Field Quality Control: As a quality control measure, duplicate samples were taken at river sediment location TF-C and floodplain soil location SS-7. These duplicate samples were analyzed for all study parameters.

Reference Locations: As the study area was the Tittabawassee River between the confluence of the Pine and Chippewa Rivers in the northwest to the Shiawassee River in the southeast, a transect core, composite, and

several discrete (reach) sediment and floodplain soil samples were taken above the confluence of the Tittabawassee and the Pine and the Tittabawassee and the Chippewa to serve as upstream controls. These upstream reference locations are listed in Table 4.

Additional Samples

Due to a broken chain-of-custody, dioxin and furan samples had to be recollected at transect sampling locations TC-C and TC-UC, and discrete reach sampling locations 1, 2, 3, and 11. Additional aliquots for the other study parameters were taken at the transect locations and serve as quality control replicates. The second set of samples collected from these locations is designated by an asterisk (1*, 2*, 3*, 11*, TC-C* and TC-UC*).

Analytical Methods

Analyses of sediments and flood plain soils at the selected locations were conducted using generally accepted sediment sampling and analytical techniques as identified below. Table 1 summarizes the analyses conducted on each sample and lists individual analytical parameters.

Volatile Organics: River sediment and floodplain soil samples for analysis of volatile organic compounds (VOCs) were methanol preserved in the field. Extraction was according to SW-846 Method 5035. Extracts were analyzed according to SW-846 Method 8260B. The list of analytes and detection limits is provided with the results in Table 5. Due to the lack of detections, no samples for VOCs were collected upstream of Transect F.

Semivolatile Organics: Semivolatile Organics (base neutral and acid extractable compounds and polynuclear aromatic hydrocarbons) were extracted using SW-846 Method 3510 and analyzed according to SW-846 Method 8270. The list of analytes and detection limits is provided with the results in Table 6.

Pesticides and PCBs: Pesticides and PCBs were extracted using SW-846 Method 3510 and analyzed according to SW-846 Method 8070. The list of analytes and detection limits is provided with the results in Table 7.

Metals: Samples were analyzed for metals using SW-846 6000 and 7000 series methods. The list of analytes and detection limits is provided with the results in Table 8.

Dioxins and Furans Chemical Analysis: Concentrations of seventeen 2,3,7,8-substituted polychlorinated dibenzo-p-dioxins (PCDDs) and

dibenzofurans (PCDFs) were analyzed by modifications of previously described methods (Yamashita et al., 2000; Kannan et al., 2001; Im et al., 2002). A copy of MSU-ATL's Standard Operating Procedure for the Extraction and Analysis of 2,3,7,8-substituted PCDDs and PCDFs in Sediments using High Resolution Gas Chromatography ñ High Resolution Mass Spectrometry is attached as Appendix 4 of this Report.

In Vitro Bioassay Analysis: H4IIE-luc bioassay was used to determine total dioxin-like activity (TCDD-EQs) in sediments. The bioassay procedures are described in detail in Appendix 5 of this Report, and in Villeneuve et al., 2000 and Hilscherova et al. 2001. Samples were tested as raw extracts and as acid-treated extracts using the *in vitro* H4IIE-luc recombinant cells for dioxin-like activity. A mass balance analysis of dioxin-like activity derived from instrumental and bioassay analyses was used to test for the presence of other dioxin-like compounds that can bind to the aromatic hydrocarbon receptor (AhR). Mass balance analysis (or potency balance analysis) was also used to examine whether or not the known composition of a sample (identified by instrumental analysis) can account for the magnitude or potency of biological response observed.

Total Organic Matter: Sediment and floodplain soil samples were analyzed for Total Organic Matter by the Michigan State University Soil Analysis Laboratory using their ñLoss by Ignitionñ protocol.

Total Organic Carbon: Sediment and floodplain soil samples were analyzed for TOC by the Michigan State University Soil Analysis Laboratory using their ñDry Combustion using Microcarbon Analyzerñ protocol.

Results

Results for VOCs, semivolatile organic compounds, pesticides, PCBs, and metals are presented in Tables 5, 6, 7 and 8, respectively. Geographic distribution of semivolatiles, PCBs, and pesticides are presented in Figure 7.

Dioxin and furan results are presented in Table 9. A full copy of the dioxin and furan analytical and bioassay results and quality assurance data is being retained by the MDEQ Waste Management Division. Table 9 also includes the results of the TOC and total organic matter analyses of these samples. The geographic distribution of dioxins and furans is presented in Figure 8.

Discussion

Volatiles:

Only one VOC was detected during this study. Tetrachloroethene was detected at 95 ppb at sample location TC-UC. Due to the flow regime of the Tittabawassee River, the lack of detectable volatile organic compounds is not surprising. The Tittabawassee is a shallow, fast moving river with considerable turbulence and scour during storm events. Volatile compounds, should they be released to the river, are not likely to persist in sediments that are frequently agitated. Given the lack of detects, the decision was made to cease sampling for VOCs above Transect F. None of the floodplain soil samples showed detectable levels of VOCs.

Semivolatiles:

Semivolatile organic compounds, when found, were typically present at very low concentrations. Semivolatile organic compounds, including phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and chrysene, were detected at sample locations TC-C, TF-CR, TE-C, TF-C, TF-UC, and TG-UC at levels below 400 ug/kg. Sample location TF-CR, in addition to having phenanthrene, fluoranthene, pyrene, and chrysene at very low levels, displayed hexachlorobenzene at 1300 ug/kg, a level that might indicate potential adverse impact to benthic organisms. Floodplain soil results were similar in displaying low levels of the same six semivolatile compounds at low levels (all below 510 ug/kg).

Pesticides and PCBs:

No PCBs were detected in sediment or floodplain soil samples. 4,4-DDT at 1,100 ug/kg and 4,4 DDD at 83 ug/kg in sediment sample TI-UC were the only target pesticides detected in sediment samples. Low levels of DDT and its breakdown products were detected at floodplain soil sampling locations SS-4 (Pine River), SS-5, and SS-7. There is a historical source of DDT on the Pine River that may have contributed to these detections. Hexabromobenzene was also detected at low levels at floodplain soil sampling locations SS-2, SS-4, and SS-7R. Detected levels of pesticides are not expected to have any significant impact on human health or the environment.

Metals:

Levels of metals in sediments are generally consistent with background levels. Of the floodplain soil samples, only SS-1 and SS-2 had concentrations that indicated the potential for minor aquatic life impacts (arsenic, chromium, copper, lead, mercury, nickel, and zinc). It is notable that SS-2 is immediately adjacent to and SS-1 is downstream of a former plate glass manufacturing facility which is known to have released metals to the river.

Dioxins and Furans:

Dioxins and furans were detected at each of the transect, reach, and individual sediment sampling locations analyzed during this study. Dioxins and furans were also present in each of the flood plain soil samples analyzed during this study. The concentrations of each of the 17 2,3,7,8-substituted PCDD and PCDF congeners, the calculated total toxic equivalent concentration (TEQ) relative to 2,3,7,8-TCDD, and the concentrations of the total tetra, penta, hexa, and hepta isomer groups are presented in Table 9 for each dioxin and furan sampling location.

The geographic distribution of the TEQ results is presented on Figure 8.

In general, the geographic distribution of dioxins and furans in the study area points to a source in the Midland area. The concentrations of dioxin in river sediments were less than 5 parts per trillion (ppt) TEQ in the seven reference samples that were taken above the junction of the Chippewa and Tittabawassee Rivers. Below the junction of the Chippewa and Tittabawassee Rivers, TEQ concentrations ranged from 5 to 2,000 ppt.

The concentrations of dioxins and furans were not significantly correlated with the TOC content of the samples. Correlation with the grain size of the samples with dioxin concentration was not completed in this study because the high levels of dioxins and furans in the samples resulted in an unanticipated health and safety concern during grain size analysis which involves drying and shaking of the samples. It is recommended that this evaluation be completed under the appropriate laboratory conditions.

Transect Results:

These samples are identified on Figure 8 by green boxes. The core composite samples are identified with a 'C' suffix (e.g. TA-C). The upper composite (dredge composite) samples are identified with a 'UC' suffix (e.g., TA-UC). The core sample results represent a mix of the surficial sediments and deeper sediments. The upper composite results represent only the top several inches of sediment.

In general, the concentrations of dioxins and furans were much higher in transect samples collected below the junction of the Tittabawassee and Chippewa Rivers than in the upstream reference samples. The transect reference samples were each less than 5 ppt total TEQ. Samples collected below the junction of the Tittabawassee River ranged in TEQ concentration from 5.1 ppt to 2000 ppt. It should be noted that the 5.1 ppt TEQ transect sample was collected at location TG-UC. No core sample could be collected from this location because of the coarse grained nature of the sediments. It is possible that the coarse grained nature of the sediments resulted in a relatively low concentration at this location.

The TEQ of the upper composite samples was similar to the core concentrations in most of the samples, with the exception of transects TC and TD where the concentration of dioxin and furans in the deeper cores was significantly higher than the upper composite samples. This suggests that in some parts of the study area, a reservoir of dioxin and furans may be present in deeper sediments. Further detailed coring work should be completed to determine if higher levels of dioxins and furans are present at lower depths in the river sediments.

Composite Results:

These samples show the distribution of dioxin and furans in the upper several inches of sediment in sediment accumulation areas in the study area. Due to resource limitations, adjacent sediment samples were carefully split and mixed in the lab to form a composite sample prior to analysis. The results of these analyses are shown on the maps as Composite #1 through Composite #19.

These results show that the composite concentrations are significantly elevated and quite variable below the junction of the Tittabawassee and Chippewa Rivers. This variability is probably reflective of the flow and depositional characteristics of the different segments of the river system.

In order to evaluate the variability within the composite locations, individual reach samples were analyzed at four locations in addition to the composite analyses. This analysis revealed that there can be considerable variability in the TEQ concentrations of the individual reach samples that were used to form a composite sample. In the case of Composite #15, the concentrations varied from 22 to 2000 ppt TEQ with a composite average analysis of 960 ppt. Composite #11 varied from 130 to 1000 ppt TEQ with a composite average analysis of 480 ppt TEQ. Based on the recognized variability, any future studies that are conducted to more fully understand of the distribution of dioxin contamination should avoid compositing samples.

Flood Plain Soil Samples:

Ten flood plain soil samples were taken as a part of this study. These samples are identified on Figure 8 by red hexagons. These samples were collected by scraping the upper one inch of soil from a one square foot area in selected low lying flood plain areas adjacent to the Tittabawassee River. Sample locations were also based on property access agreements.

Dioxin results in floodplain soils ranged from 2 to 11 ppt TEQ in control samples above the junction of the Chippewa and Tittabawassee Rivers. Below the junction, TEQ concentrations ranged from 300 to 1500 ppt. With the exception of SS#6, all of the samples were taken in the flood plain

within 100 feet of the edge of the river. SS#6 was taken from a recently tilled farm field several hundred yards away from the edge of the river.

The upstream reference sample results are consistent with Michigan's soil background dioxin levels. The soil concentrations below the confluence of the Tittabawassee and Chippewa are significantly elevated over Michigan's background soil concentration and exceed Michigan's Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, generic residential soil protection criterion of 90 ppt TEQ.

The downstream soil concentrations also exceed the Agency for Toxic Substances and Disease Registry (ATSDR) interim policy guidelines for PCDDs/PCDFs in residential soils near or on hazardous waste sites (De Rosa et al., 1997). When concentrations of TEQs exceed 50 pg /g TEQ dry weight, the ATSDR recommends evaluation of site-specific factors such as pathway analysis and soil cover. When soil concentrations exceed 1000 pg/g TEQ dry weight, the ATSDR recommends health surveillance and exposure investigations.

Based on the results of this investigation and follow up work conducted by the MDEQ in 2002, additional work is needed to determine if the level of exposure in the flood plain is resulting in health and/or ecological impacts.

Bioassay and Mass Balance Results:

H4IIE-luc bioassay was used to determine total dioxin-like activity (TCDD-EQs) in sediments and to direct the instrumental analyses. A mass balance analysis of dioxin-like activity derived from instrumental and bioassay analyses was used to test for the presence of other dioxin-like compounds that can bind to the aromatic hydrocarbon receptor (AhR). Earlier studies have demonstrated that the H4IIE-luc bioassay coupled with instrumental analysis is useful in the integrated assessment of dioxin-like activity in sediment (Khim et al., 1999; Hilscherova et al., 2000; Khim et al., 2001).

The instrumental and bioanalytical approaches provide different and complementary information. While instrumental analysis is a useful tool to identify the compounds of interest and to evaluate the concentrations of environmental contaminants, it provides little information regarding the integrated biological relevance of a complex mixture of compounds associated with environmental samples such as sediment. Where appropriate, bioassay-directed fractionation and mass balance analysis is a powerful tool to characterize the causative agents responsible for bioassay responses observed. Recent studies have indicated that organic extracts of sediments elicit both dioxin-like responses significantly *in vitro*, although the chemical concentrations often did not explain the bioassay

activities observed (Khim et al., 1999; Kannan et al., 2000; Hilscherova et al., 2001). Empirical bioassay results and mass balance analyses can suggest the magnitude of contribution of target organic compounds to total dioxin-like activity of sediment extracts. Thus, the use of bioassay-based toxicity identification and evaluation (TIE) and mass balance analysis are important approach to assess sediment contamination since the sediment extracts may contain many potentially AhR-active compounds, which were not analyzed by instrumental methods.

The results of this study showed that the results of the bioassay analyses matched very well with the results of the instrumental analysis. Therefore, the bioassay technique proved valuable in determining which samples showed significant dioxin-like activity. The bioassay technique could be used to direct further investigation in the watershed by screening out low activity samples and identifying areas of high dioxin like activity that would warrant follow up chemical confirmation.

Appendix 5 contains the results of the bioassay analyses and the mass balance calculations. The results suggest that PCDDs/PCDFs, are the major sources of dioxin-like activity in sediments/soils from the Tittabawassee River and that little, if any, activity was due to other compounds, such as PCBs, that exhibit dioxin-like activity. This was further supported by the lack of detectable concentrations of PCBs in soils and sediments.

Sources of Dioxins and Furans in the Tittabawassee River Watershed:

Figures 9, 10, 11, and 12 are congener profiles of the dioxin and furan samples collected during this study. The TEQ concentration of each sample has been normalized to 100 percent (%) and the normalized toxic equivalent concentration of each congener is plotted on the resulting bar chart. Congeners that were not detected at a specific sampling location were assigned a value of zero. The resulting bar chart is a fingerprint of the 17 dioxins and furans that exhibit dioxin-like toxicity. The upstream reference samples are plotted at the top of each of the graphs and are marked with an asterisk.

As can be seen by review of the graphs, all of the samples taken from below the confluence of the Chippewa and Tittabawassee Rivers are fairly similar to each other and markedly different from the upstream reference samples. The chemical fingerprint of the sediment samples is similar to the chemical fingerprint of the floodplain soil samples, indicating that the dioxins and furans in these media are likely from the same source(s).

The bulk of the dioxin-like toxicity in the downstream samples is contributed by furan congeners. 2,3,7,8-TCDF and 2,3,4,7,8-PeCDF

contribute the bulk of the dioxin-like toxicity in the study area downstream of the confluence of the Tittabawassee and Chippewa Rivers. 1,2,3,7,8-*p*-PeCDF and 1,2,3,4,7,8-HxCDF also make significant contributions to the dioxin-like toxicity of downstream sediment and soil samples. 2,3,7,8-TCDD, the most potent dioxin-like compound, typically contributes less than five percent of the TEQ in the downstream samples.

Different sources of PCDDs/PCDFs are characterized by different congener and homologue patterns (Kannan et al., 1998). Furthermore, differences in the physicochemical (mobility, solubility, etc.) and biological (biodegradation, bioaccumulation, etc.) properties may alter the congener profiles.

The fingerprints of PCDD and PCDF congeners in sediments collected from the Tittabawassee River downstream of Midland are all similar, suggesting the presence of a single major source. As noted above, the pattern of relative concentrations of PCDD/PCDF congeners was also different in soils and sediment collected downstream of Midland than in those collected upstream of the reference locations. A large proportion of OCDD and HpCDD has been suggested to be due to the sources originating from chlorophenol-related sources (Masunaga et al., 2001). Greater proportions of TCDFs suggest sources originating from PCB mixtures, chlorobenzenes, chlor-alkali processes, and incineration of PCBs and polyvinyl chloride (Wakimoto et al., 1988; Masunaga et al., 2001; Swami et al., 1992; Kannan et al., 1998). Total concentrations of PCBs in sediments from the Tittabawassee River were less than 150 nanograms/gram. This suggests that PCBs are not the source of the PCDD/PCDFs, but rather other sources such as chlorophenol and chlorobenzene production, incineration, or chlor-alkali processes are the sources of the PCDFs found in Tittabawassee River sediments collected below Midland.

The Dow Chemical Company (Dow) has a long history as a major manufacturer of chlorobenzenes, chlorophenols, and chlor-alkali products in Midland, Michigan. Additionally, Dow has conducted chemical waste incineration for many years. The geographic distribution of the contaminants combined with the dioxin and furan congener profile information strongly suggests that Dow's Midland facility is the most likely source of the elevated levels of dioxins and furans in the Tittabawassee River.

Conclusions and Recommendations

Summary: The data reviewed indicates that the potential for impacts to aquatic life to occur from the sediment chemicals analyzed, other than dioxins and furans, is minimal.

With regard to dioxins and furans, the following conclusions can be drawn:

1. The concentrations of dioxins and furans in sediments and soils represent a potential environmental and human health issue in the Tittabawassee River watershed that requires further study.
2. In the study area, the bulk of the dioxin-like toxicity in sediments and soils is contributed by the polychlorinated dibenzo-p-dioxins and furans. In particular, 2,3,7,8-TCDF and 2,3,4,7,8-PeCDF contribute the bulk of the dioxin-like toxicity to the samples collected from below the confluence of the Tittabawassee and Chippewa Rivers. Little dioxin-like toxicity appears to be contributed by other compounds that exhibit dioxin-like activity, such as PCBs.
3. The downstream extent of dioxin and furan contamination in sediments and floodplain soils has not been completely defined.
4. Deeper sediment cores are needed to determine the vertical extent of sediment contamination in the Tittabawassee and downstream in the Saginaw River.
5. The distribution of dioxins and furans in the study area sediments appears heterogeneous. This is most likely related to the flow regime of the Tittabawassee River. Any follow up sampling that is conducted should not involve compositing sediment samples. The relationship of grain size to dioxin and furan concentrations in the study area needs to be investigated.
6. The H4IIE-luc bioassay technique can be successfully used as a tool to direct further investigation of dioxin and furan contamination in the study area.
7. The most probable historic source of dioxins and furans in the Tittabawassee River watershed, based on the geographic distribution of the contaminants and the chemical profiles of the dioxin and furan congeners, is located in Midland, Michigan.

Recommendations:

Based on these conclusions, additional sampling is recommended to more completely define the horizontal and vertical distribution of dioxins and furans in the Tittabawassee River and Saginaw River watersheds. Periodic resampling should be conducted to determine if concentrations

are changing over time. The existing information should be used along with other available information to conduct an assessment of the risk to human health and the environment from the elevated concentrations of dioxins and furans present in the study area.

TABLES

TABLE 9

Part I

Analyte	TEF	TB-UC			TC-C			TC-UC					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	1.20	1.2000	1.2000	1.2000	0.92	0.9200	0.9200	0.9200	1.60	1.600	1.600	1.6000
12378-PeCDD	0.5	0.50	0.2500	0.1250	0.0000	ND	0.50	0.2500	0.1250	0.54	0.270	0.270	0.2700
123478-HxCDD	0.1	10.41	1.0410	1.0410	1.0410	13.32	1.3320	1.3320	1.3320	10.54	1.054	1.054	1.0540
123678-HxCDD	0.1	3.44	0.3440	0.3440	0.3440	1.43	0.1430	0.1430	0.1430	ND	0.50	0.050	0.0500
123789-HxCDD	0.1	0.50	0.0500	0.0250	0.0000	ND	0.50	0.0500	0.0250	ND	0.50	0.050	0.0500
1234678-HpCDD	0.01	53.56	0.5356	0.5356	0.5356	31.74	0.3174	0.3174	0.3174	23.64	0.236	0.236	0.2364
12346789-OCDD	0.001	483.51	0.4835	0.4835	0.4835	208.19	0.2082	0.2082	0.2082	186.10	0.186	0.186	0.1861
2378TCDF	0.1	547.68	54.7680	54.7680	54.7680	33.80	3.3800	3.3800	3.3800	162.20	16.220	16.220	16.2200
12378-PeCDF	0.05	198.27	9.9135	9.9135	9.9135	14.27	0.7135	0.7135	0.7135	96.44	4.822	4.822	4.8220
23478-PeCDF	0.5	130.15	65.0750	65.0750	65.0750	8.26	4.1300	4.1300	4.1300	52.75	26.375	26.375	26.3750
123478-HxCDF	0.1	90.04	9.0040	9.0040	9.0040	10.01	1.0010	1.0010	1.0010	54.51	5.451	5.451	5.4510
123678-HxCDF	0.1	23.34	2.3340	2.3340	2.3340	1.54	0.1540	0.1540	0.1540	12.66	1.266	1.266	1.2660
234678-HxCDF	0.1	10.21	1.0210	1.0210	1.0210	0.50	0.0500	0.0250	0.0000	4.85	0.485	0.485	0.4850
123789-HxCDF	0.1	0.87	0.0870	0.0870	0.0870	ND	0.50	0.0500	0.0250	0.50	0.050	0.050	0.0500
1234678-HpCDF	0.01	91.15	0.9115	0.9115	0.9115	43.12	0.4312	0.4312	0.4312	60.70	0.607	0.607	0.6070
1234789-HpCDF	0.01	8.37	0.0837	0.0837	0.0837	4.05	0.0405	0.0405	0.0405	69.57	0.696	0.696	0.6957
12346789-OCDF	0.001	88.81	0.0888	0.0888	0.0888	55.54	0.0555	0.0555	0.0555	39.12	0.039	0.039	0.0391
nondetects = detection limit		TEQ=	147.1906			TEQ=	13.2263			TEQ=	59.4573		
nondetects = 1/2 d.l.		teq=		147.0406		teq=		13.0263		teq=		59.3823	
nondetects = zero		teq=			146.8906	teq=			12.8263	teq=			59.3073
Moisture content (%)			18.59				18.64				20.77		
Organic carbon (%)			0.26				0.18				0.33		
Total organic matter (%)			0.45				0.31				0.57		
Sample ID.						TC-C				TC-UC			
tetra-PCDF (TCDF)		548.0				33.8				162.0			
penta-PCDF (PeCDF)		328.0				22.5				149.0			
hexa-PCDF (HxCDF)		124.0				11.6				72.0			
hepta-PCDF (HpCDF)		99.5				47.2				130.0			
octa-PCDF (OCDF)		88.8				55.5				39.1			
tetra-PCDD (TCDD)		1.2				0.9				1.6			
penta-PCDD (PeCDD)		0.5				0.5				0.5			
hexa-PCDD (HxCDD)		13.9				14.8				10.5			
hepta-PCDD (HpCDD)		53.6				31.7				23.6			
octa-PCDD (OCDD)		484.0				208.0				186.0			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account													
* OCDF concentrations were calculated ba: if required, OCDF concentrations can be n													
ND = non detected, the detection limits wil													

TABLE 9

Part I											
Analyte	TEF	TE-UC			TF-C			TF-CR			nondetect zero
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	
2378-TCDD	1	2.94	2.9400	2.9400	2.15	2.150	2.1500	2.97	2.970	2.9700	2.9700
12378-PeCDD	0.5	2.16	1.0800	1.0800	1.28	0.640	0.6400	1.20	0.600	0.6000	0.6000
123478-HxCDD	0.1	44.45	4.4450	4.4450	48.48	4.848	4.8480	84.18	8.418	8.4180	8.4180
123678-HxCDD	0.1	36.72	3.6720	3.6720	12.96	1.296	1.2960	12.62	1.262	1.2620	1.2620
123789-HxCDD	0.1	5.53	0.5530	0.5530	3.09	0.309	0.3090	2.62	0.262	0.2620	0.2620
1234678-HpCDD	0.01	715.59	7.1559	7.1559	302.17	3.022	3.0217	270.92	2.709	2.7092	2.7092
12346789-OCDD	0.001	4904.67	4.9047	4.9047	3880.96	3.881	3.8810	2763.04	2.763	2.7630	2.7630
2378TCDF	0.1	423.68	42.3680	42.3680	1085.39	108.539	108.5390	124.366	124.366	124.3660	124.3660
12378-PeCDF	0.05	218.95	10.9475	10.9475	590.27	29.514	29.5135	614.32	30.716	30.7160	30.7160
123478-HxCDF	0.5	134.41	67.2050	67.2050	313.37	156.685	156.6850	367.97	183.985	183.9850	183.9850
123478-HxCDF	0.1	144.23	14.4230	14.4230	318.40	31.840	31.8400	294.10	29.410	29.4100	29.4100
123678-HxCDF	0.1	23.23	2.3230	2.3230	74.01	7.401	7.4010	72.19	7.219	7.2190	7.2190
1234678-HxCDF	0.1	8.30	0.8300	0.8300	25.94	2.594	2.5940	25.92	2.592	2.5920	2.5920
123789-HxCDF	0.1	1.83	0.1830	0.1830	6.50	0.650	0.6500	5.72	0.572	0.5720	0.5720
1234678-HpCDF	0.01	625.86	6.2586	6.2586	359.70	3.597	3.5970	611.81	6.118	6.1181	6.1181
1234789-HpCDF	0.01	47.51	0.4751	0.4751	41.18	0.412	0.4118	39.96	0.400	0.3996	0.3996
12346789-OCDF	0.001	2134.61	2.1346	2.1346	617.51	0.618	0.6175	775.25	0.775	0.7753	0.7753
nondetects = detection limit		TEQ=	171.8984		TEQ=	357.9945		TEQ=	405.1372		
nondetects = 1/2 d.l.		teq=	171.8984		teq=	357.9945		teq=	405.1372		
nondetects = zero		teq=		171.8984	teq=		357.9945	teq=		405.1372	
Moisture content (%)			24.67			25.96			26.8		
Organic carbon (%)			0.71			0.65			0.62		
Total organic matter (%)			1.22			1.12			1.07		
Sample I.D.		TE-UC			TF-C			TF-CR			
tetra-PCDF (TCDF)		424.0			1085.0			1244.0			
penta-PCDF (PeCDF)		353.0			904.0			982.0			
hexa-PCDF (HxCDF)		178.0			425.0			398.0			
hepta-PCDF (HpCDF)		673.0			401.0			652.0			
octa-PCDF (OCDF)		2135.0			618.0			775.0			
tetra-PCDD (TCDD)		2.9			2.2			3.0			
penta-PCDD (PeCDD)		2.2			1.3			1.2			
hexa-PCDD (HxCDD)		86.7			64.5			99.4			
hepta-PCDD (HpCDD)		716.0			302.0			271.0			
octa-PCDD (OCDD)		4905.0			3881.0			2763.0			
Summary concentrations of the homolog group											
Concentrations of all compound (except of Recalculation for internal standards account											
* OCDF concentrations were calculated ba: if required, OCDF concentrations can be n											
ND = non detected, the detection limits wil											

TABLE 9

Part I											
Analyte	TF-UC			TG-UC			TH-C				
	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.		
2378-TCDD	1	2.56	2.5600	ND	0.50	0.2500	ND	0.500	0.500	0.0000	
12378-PeCDD	0.5	0.50	0.1250	ND	0.50	0.1250	ND	0.500	0.250	0.0000	
123478-HxCDD	0.1	24.71	2.4710	ND	0.92	0.0920	ND	0.500	0.050	0.0000	
123678-HxCDD	0.1	9.13	0.9130	ND	5.85	0.5850	ND	0.500	0.050	0.0000	
123789-HxCDD	0.1	4.61	0.4610	ND	0.50	0.0250	ND	0.500	0.050	0.0000	
1234678-HpCDD	0.01	121.15	1.2115	ND	31.80	0.3180	ND	6.382	0.064	0.0638	
12346789-OCDD	0.001	1099.11	1.0991	ND	224.25	0.2243	ND	52.715	0.053	0.0527	
2378TCDF	0.1	1718.24	171.8240	ND	8.96	0.8960	ND	2.790	0.279	0.2790	
12378-PeCDF	0.05	959.43	47.9715	ND	5.28	0.2640	ND	1.346	0.067	0.0673	
23478-PeCDF	0.5	507.40	253.7000	ND	2.52	1.2600	ND	0.500	0.250	0.0000	
123478-HxCDF	0.1	428.50	42.8500	ND	6.20	0.6200	ND	2.430	0.243	0.2430	
123678-HxCDF	0.1	90.64	9.0640	ND	0.78	0.0780	ND	0.500	0.050	0.0000	
234678-HxCDF	0.1	33.59	3.3590	ND	0.50	0.0250	ND	0.500	0.050	0.0000	
123789-HxCDF	0.1	3.59	0.3590	ND	0.50	0.0250	ND	0.500	0.050	0.0000	
1234678-HpCDF	0.01	234.05	2.3405	ND	30.42	0.3042	ND	3.730	0.037	0.0373	
1234789-HpCDF	0.01	27.71	0.2771	ND	2.59	0.0259	ND	0.640	0.006	0.0064	
12346789-OCDF	0.001	356.53	0.3565	ND	31.31	0.0313	ND	2.953	0.003	0.0030	
nondetects = detection limit		TEQ=			TEQ=			TEQ=			
nondetects = 1/2 d.l.		teq=	540.9422		teq=	5.1487		teq=	1.4025		
nondetects = zero		teq=	540.8172		teq=	4.6987		teq=	0.7525		
Moisture content (%)											
Organic carbon (%)		23.9			25.18				27.01		
Total organic matter (%)		0.33			0.26				0.41		
		0.57			0.45				0.71		
Sample ID.		TF-UC			TG-UC			TH-C			
tetra-PCDF (TCDF)		1718.0			9.0			2.8			
penta-PCDF (PeCDF)		1467.0			7.8			1.3			
hexa-PCDF (HxCDF)		556.0			7.0			2.4			
hepta-PCDF (HpCDF)		262.0			33.0			4.4			
octa-PCDF (OCDF)		357.0			31.3			3.0			
tetra-PCDD (TCDD)		2.6			0.5			0.5			
penta-PCDD (PeCDD)		0.5			0.5			0.5			
hexa-PCDD (HxCDD)		38.4			6.8			0.5			
hepta-PCDD (HpCDD)		121.0			31.8			6.4			
octa-PCDD (OCDD)		1099.0			224.0			52.7			
Summary concentrations of the homolog group											
Concentrations of all compound (except of Recalculation for internal standards account)											
* OCDF concentrations were calculated based on TEQ if required, OCDF concentrations can be non detected, the detection limits will be											

TABLE 9

Part 2

Analyte	TEF	C-4			C-5			C-6					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	1.54	1.540	1.5400	1.5400	1.57	1.570	1.5700	1.5700	1.74	1.740	1.7400	1.7400
12378-PeCDD	0.5	0.50	0.250	0.1250	0.0000	4.45	2.225	2.2250	2.2250	0.93	0.465	0.4650	0.4650
123478-HxCDD	0.1	53.25	5.325	5.3250	5.3250	23.59	2.359	2.3590	2.3590	32.64	3.264	3.2640	3.2640
123678-HxCDD	0.1	14.47	1.447	1.4470	1.4470	20.19	2.019	2.0190	2.0190	8.70	0.870	0.8700	0.8700
123789-HxCDD	0.1	3.29	0.329	0.3290	0.3290	5.66	0.566	0.5660	0.5660	2.09	0.209	0.2090	0.2090
1234678-HpCDD	0.01	149.46	1.495	1.4946	1.4946	95.30	0.953	0.9530	0.9530	95.18	0.952	0.9518	0.9518
12346789-OCDD	0.001	1281.52	1.282	1.2815	1.2815	715.05	0.715	0.7151	0.7151	974.11	0.974	0.9741	0.9741
2378TCDF	0.1	5449.06	544.906	544.9060	544.9060	1025.88	102.588	102.5880	102.5880	1716.96	171.696	171.6960	171.6960
12378-PeCDF	0.05	2261.76	113.088	113.0880	113.0880	1064.92	53.246	53.2460	53.2460	509.79	25.490	25.4895	25.4895
23478-PeCDF	0.5	1617.75	808.875	808.8750	808.8750	540.82	270.410	270.4100	270.4100	378.61	189.305	189.3050	189.3050
123478-HxCDF	0.1	895.98	89.598	89.5980	89.5980	551.68	55.168	55.1680	55.1680	220.90	22.090	22.0900	22.0900
123678-HxCDF	0.1	160.95	16.095	16.0950	16.0950	95.57	9.557	9.5570	9.5570	44.01	4.401	4.4010	4.4010
234678-HxCDF	0.1	97.50	9.750	9.7500	9.7500	50.15	5.015	5.0150	5.0150	28.92	2.892	2.8920	2.8920
123789-HxCDF	0.1	5.74	0.574	0.5740	0.5740	6.83	0.683	0.6830	0.6830	3.14	0.314	0.3140	0.3140
1234678-HpCDF	0.01	388.22	3.882	3.8822	3.8822	255.26	2.552	2.5526	2.5526	229.01	2.290	2.2901	2.2901
1234789-HpCDF	0.01	45.92	0.459	0.4592	0.4592	39.16	0.392	0.3916	0.3916	15.55	0.156	0.1555	0.1555
12346789-OCDF	0.001	450.79	0.451	0.4508	0.4508	139.79	0.140	0.1398	0.1398	182.65	0.183	0.1827	0.1827
nondetects = detection limit		TEQ=	1599.35			TEQ=	510.16			TEQ=	427.29		
nondetects = 1/2 d.l.		teq=		1599.22		teq=	510.16			teq=	427.29		
nondetects = zero		teq=		1599.10		teq=		510.16		teq=			427.29
Moisture content (%)		22.1				24.59				23.93			
Organic carbon (%)		0.66				0.38				0.49			
Total organic matter (%)		1.13				0.66				0.84			
Sample I.D.		C-4				C-5				C-6			
tetra-PCDF (TCDF)		5449				1026				1717			
penta-PCDF (PeCDF)		3880				1606				888			
hexa-PCDF (HxCDF)		1160				704				297			
hepta-PCDF (HpCDF)		434				294				245			
octa-PCDF (OCDF)		451				140				183			
tetra-PCDD (TCDD)		1.5				1.6				1.7			
penta-PCDD (PeCDD)	ND	0.5				4.5				0.9			
hexa-PCDD (HxCDD)		71				49.4				43.4			
hepta-PCDD (HpCDD)		149				95.3				95.2			
octa-PCDD (OCDD)		1282				715				974			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	C-7			C-8			C-9					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect 1/2 d.l.	toxic eq. pg/g	sampled pg/g	nondetect 1/2 d.l.	toxic eq. pg/g	sampled pg/g	nondetect 1/2 d.l.		
2378-TCDD	1	4.67	4.6700	4.6700	4.6700	4.6700	ND	1.40	1.4000	0.7000	2.99	2.9900	2.9900
12378-PeCDD	0.5	4.27	2.1350	2.1350	2.1350	2.1350		2.21	1.1050	1.1050	0.75	0.3750	0.1875
123478-HxCDD	0.1	103.43	10.3430	10.3430	10.3430	10.3430		64.35	6.4350	6.4350	30.09	3.0090	3.0090
123678-HxCDD	0.1	26.09	2.6090	2.6090	2.6090	2.6090		3.25	0.3250	0.3250	19.33	1.9330	1.9330
123789-HxCDD	0.1	7.11	0.7110	0.7110	0.7110	0.7110		2.29	0.2290	0.2290	2.20	0.2200	0.2200
1234678-HpCDD	0.01	271.62	2.7162	2.7162	2.7162	2.7162		234.30	2.3430	2.3430	186.48	1.8648	1.8648
12346789-OCDD	0.001	2943.76	2.9438	2.9438	2.9438	2.9438		1645.38	1.6454	1.6454	1540.70	1.5407	1.5407
2378TCDF	0.1	1045.95	104.5950	104.5950	104.5950	104.5950		333.59	33.3590	33.3590	1024.03	102.4030	102.4030
12378-PeCDF	0.05	665.06	33.2530	33.2530	33.2530	33.2530		239.80	11.9900	11.9900	673.81	33.6905	33.6905
23478-PeCDF	0.5	362.66	181.3300	181.3300	181.3300	181.3300		141.93	70.9650	70.9650	356.56	178.2800	178.2800
123478-HxCDF	0.1	392.42	39.2420	39.2420	39.2420	39.2420		127.71	12.7710	12.7710	243.52	24.3520	24.3520
123678-HxCDF	0.1	84.80	8.4800	8.4800	8.4800	8.4800		34.49	3.4490	3.4490	54.00	5.4000	5.4000
234678-HxCDF	0.1	41.46	4.1460	4.1460	4.1460	4.1460		2.69	0.2690	0.2690	20.47	2.0470	2.0470
123789-HxCDF	0.1	3.67	0.3670	0.3670	0.3670	0.3670		2.10	0.2100	0.2100	31.81	3.1810	3.1810
1234678-HpCDF	0.01	601.20	6.0120	6.0120	6.0120	6.0120		364.28	3.6428	3.6428	211.18	2.1118	2.1118
1234789-HpCDF	0.01	33.21	0.3321	0.3321	0.3321	0.3321		25.62	0.2562	0.2562	26.44	0.2644	0.2644
12346789-OCDF	0.001	389.61	0.3896	0.3896	0.3896	0.3896		291.78	0.2918	0.2918	401.07	0.4011	0.4011
nondetects = detection limit		TEQ=	404.27					TEQ=	150.69		TEQ=	364.06	
nondetects = 1/2 d.l.		teq=		404.27				teq=		149.99	teq=		363.88
nondetects = zero		teq=						teq=			teq=		363.69
Moisture content (%)		25.05						34.35			24.86		
Organic carbon (%)		0.43						1.3			0.51		
Total organic matter (%)		0.74						1.24			0.88		
Sample I.D.		C-7						C-8			C-9		
tetra-PCDF (TCDF)		1046						334			1024		
penta-PCDF (PeCDF)		1028						382			1030		
hexa-PCDF (HxCDF)		522						167			350		
hepta-PCDF (HpCDF)		634						390			238		
octa-PCDF (OCDF)		390						292			401		
tetra-PCDD (TCDD)		4.7						1.4			3		
penta-PCDD (PeCDD)		4.3						2.2			0.75		
hexa-PCDD (HxCDD)		137						69.9			51.6		
hepta-PCDD (HpCDD)		272						234			186		
octa-PCDD (OCDD)		2944						1645			1541		
Summary concentrations of the homolog group													
Concentrations of all compound (except of													
Recalculation for internal standards account													
* OCDF concentrations were calculated based on													
if required, OCDF concentrations can be n													
ND = non detected, the detection limits will													

TABLE 9
Part 2

Part 2 (continued)	TEF	C-10			C-11			C-12				
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.
2378-TCDD	1	8.00	8.0000	8.0000	8.0000	ND	1.00	1.0000	0.5000	0.0000	0.5000	0.0000
12378-PeCDD	0.5	1.50	0.7500	0.7500	0.7500	ND	0.59	0.2950	0.2950	0.2950	0.500	0.0000
123478-HxCDD	0.1	82.69	8.2690	8.2690	8.2690	ND	41.84	4.1840	4.1840	4.1840	3.165	3.1650
123678-HxCDD	0.1	10.62	1.0620	1.0620	1.0620	ND	6.82	0.6820	0.6820	0.6820	1.046	1.0460
123789-HxCDD	0.1	2.82	0.2820	0.2820	0.2820	ND	1.20	0.1200	0.0600	0.0000	0.110	0.055
1234678-HpCDD	0.01	293.86	2.9386	2.9386	2.9386	ND	65.03	0.6503	0.6503	0.6503	2.184	2.1837
12346789-OCDD	0.001	4383.43	4.3834	4.3834	4.3834	ND	854.33	0.8543	0.8543	0.8543	2.338	2.3378
2378TCDF	0.1	1972.76	197.2760	197.2760	197.2760	ND	1376.10	137.6100	137.6100	137.6100	72.561	72.5610
12378-PeCDF	0.05	1304.55	65.2275	65.2275	65.2275	ND	792.08	39.6040	39.6040	39.6040	18.594	18.5940
23478-PeCDF	0.5	664.49	332.2450	332.2450	332.2450	ND	470.51	235.2550	235.2550	235.2550	121.150	121.1500
123478-HxCDF	0.1	597.68	59.7680	59.7680	59.7680	ND	391.52	39.1520	39.1520	39.1520	17.073	17.0730
123678-HxCDF	0.1	126.67	12.6670	12.6670	12.6670	ND	106.53	10.6530	10.6530	10.6530	4.024	4.0240
234678-HxCDF	0.1	50.19	5.0190	5.0190	5.0190	ND	33.47	3.3470	3.3470	3.3470	1.582	1.5820
123789-HxCDF	0.1	1.68	0.1680	0.1680	0.1680	ND	1.52	0.1520	0.1520	0.1520	0.100	0.050
1234678-HpCDF	0.01	670.77	6.7077	6.7077	6.7077	ND	287.08	2.8708	2.8708	2.8708	2.758	2.7584
1234789-HpCDF	0.01	53.22	0.5322	0.5322	0.5322	ND	26.62	0.2662	0.2662	0.2662	0.234	0.2340
12346789-OCDF	0.001	434.54	0.4345	0.4345	0.4345	ND	113.81	0.1138	0.1138	0.1138	0.300	0.3003
nondetects = detection limit		TEQ=	705.73				TEQ=	476.81			TEQ=	248.72
nondetects = 1/2 d.l.		teq=	705.73				teq=	476.25			teq=	247.86
nondetects = zero		teq=	705.73				teq=	475.69			teq=	247.01
Moisture content (%)		24.55					28.37				23.18	
Organic carbon (%)		0.45					0.82				0.44	
Total organic matter (%)		0.78					1.42				0.76	
Sample I.D.		C-10					C-11				C-12	
tetra-PCDF (TCDF)		1973					1376				726	
penta-PCDF (PeCDF)		1969					1263				614	
hexa-PCDF (HxCDF)		776					533				227	
hepta-PCDF (HpCDF)		724					314				299	
octa-PCDF (OCDF)		435					114				300	
tetra-PCDD (TCDD)		8					1				1	
penta-PCDD (PeCDD)		1.5					0.6				1	
hexa-PCDD (HxCDD)		96.1					48.7				42.1	
hepta-PCDD (HpCDD)		294					65				218	
octa-PCDD (OCDD)		4383					854				2338	
Summary concentrations of the homolog group												
Concentrations of all compound (except of Recalculation for internal standards account)												
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will												

TABLE 9

Part 2

Analyte	TEF	C-13			C-14			C-15					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	0.54	0.540	0.540	0.540	0.55	0.550	0.550	0.550	2.40	2.400	2.400	2.4000
12378-PeCDD	0.5	ND	0.500	0.250	0.000	2.29	1.145	1.145	1.145	1.44	0.720	0.720	0.7200
123478-HxCDD	0.1	21.87	2.187	2.187	2.187	32.09	3.209	3.209	3.209	49.78	4.978	4.978	4.9780
123678-HxCDD	0.1	3.19	0.319	0.319	0.319	15.76	1.576	1.576	1.576	18.47	1.847	1.847	1.8470
123789-HxCDD	0.1	ND	0.100	0.050	0.000	ND	0.100	0.050	0.000	1.33	0.133	0.133	0.1330
1234678-HpCDD	0.01	116.71	1.167	1.167	1.167	277.48	2.775	2.775	2.775	252.82	2.528	2.528	2.5282
12346789-OCDD	0.001	1293.06	1.293	1.293	1.293	3260.86	3.261	3.261	3.261	3902.75	3.903	3.903	3.9028
2378TCDF	0.1	279.45	27.945	27.945	27.945	637.85	63.785	63.785	63.785	2734.66	273.466	273.466	273.4660
12378-PeCDF	0.05	175.84	8.792	8.792	8.792	313.39	15.670	15.670	15.670	1798.75	89.938	89.938	89.9375
23478-PeCDF	0.5	82.92	41.460	41.460	41.460	172.21	86.105	86.105	86.105	961.52	480.760	480.760	480.7600
123478-HxCDF	0.1	94.83	9.483	9.483	9.483	148.70	14.870	14.870	14.870	715.08	71.508	71.508	71.5080
123678-HxCDF	0.1	17.40	1.740	1.740	1.740	28.18	2.818	2.818	2.818	155.24	15.524	15.524	15.5240
234678-HxCDF	0.1	7.58	0.758	0.758	0.758	13.99	1.399	1.399	1.399	56.28	5.628	5.628	5.6280
123789-HxCDF	0.1	0.90	0.090	0.090	0.090	1.99	0.199	0.199	0.199	19.94	1.994	1.994	1.9940
1234678-HpCDF	0.01	156.34	1.563	1.563	1.563	290.16	2.902	2.902	2.902	538.14	5.381	5.381	5.3814
1234789-HpCDF	0.01	19.87	0.199	0.199	0.199	28.79	0.288	0.288	0.288	55.97	0.560	0.560	0.5597
12346789-OCDF	0.001	254.60	0.255	0.255	0.255	434.54	0.435	0.435	0.435	564.28	0.564	0.564	0.5643
nondetects = detection limit		TEQ=	98.39			TEQ=	201.09			TEQ=	961.83		
nondetects = 1/2 d.l.		teq=	98.09			teq=	201.04			teq=	961.83		
nondetects = zero		teq=		97.79		teq=		200.99		teq=			961.83
Moisture content (%)		29.29				30.35				29.66			
Organic carbon (%)		0.87				1.04				0.62			
Total organic matter (%)		1.5				1.79				1.07			
Sample I.D.		C-13				C-14				C-15			
tetra-PCDF (TCDF)		279				638				2735			
penta-PCDF (PeCDF)		259				486				2760			
hexa-PCDF (HxCDF)		121				193				947			
hepta-PCDF (HpCDF)		176				319				594			
octa-PCDF (OCDF)		255				435				564			
tetra-PCDD (TCDD)		0.5				0.5				2.4			
penta-PCDD (PeCDD)		1				2.3				1.4			
hexa-PCDD (HxCDD)		25.1				48				70			
hepta-PCDD (HpCDD)		117				277				253			
octa-PCDD (OCDD)		1293				3261				3903			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	C-16			C-17			C-18					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.			
2378-TCDD	1	ND	1.0000	0.5000	ND	1.00	1.000	0.5000	ND	1.00	1.000	0.5000	0.0000
12378-PeCDD	0.5	3.24	1.6200	1.6200	ND	1.28	0.640	0.6400	ND	1.00	0.500	0.2500	0.0000
123478-HxCDD	0.1	2.42	0.2420	0.2420	ND	1.50	0.150	0.0750	ND	1.30	0.130	0.0650	0.0000
123678-HxCDD	0.1	14.60	1.4600	1.4600	ND	1.50	0.150	0.0750	ND	1.30	0.130	0.0650	0.0000
123789-HxCDD	0.1	3.43	0.3430	0.3430	ND	1.49	0.149	0.1490	ND	1.30	0.130	0.0650	0.0000
1234678-HpCDD	0.01	499.92	4.9992	4.9992	7068.38	9.76	0.098	0.0976	83.25	8.31	0.083	0.0831	0.0831
12346789-OCDD	0.001	7068.38	7.0684	7.0684	104.60	104.60	0.105	0.1046	83.25	8.31	0.083	0.0833	0.0833
2378TCDF	0.1	27.98	2.7980	2.7980	ND	4.38	0.438	0.4380	3.11	3.11	0.311	0.3110	0.0000
12378-PeCDF	0.05	13.07	0.6535	0.6535	ND	3.39	0.170	0.1695	1.70	1.70	0.085	0.0425	0.0000
23478-PeCDF	0.5	5.82	2.9100	2.9100	ND	1.14	0.570	0.5700	1.70	1.70	0.850	0.4250	0.0000
123478-HxCDF	0.1	22.98	2.2980	2.2980	ND	1.41	0.141	0.1410	1.00	1.00	0.100	0.0500	0.0000
123678-HxCDF	0.1	5.54	0.5540	0.5540	ND	1.30	0.130	0.0650	13.20	13.20	1.320	1.3200	0.0000
234678-HxCDF	0.1	1.30	0.1300	0.0650	ND	1.00	0.100	0.0500	1.00	1.00	0.100	0.0500	0.0000
123789-HxCDF	0.1	1.00	0.1000	0.0500	ND	1.00	0.100	0.0500	1.00	1.00	0.100	0.0500	0.0000
1234678-HpCDF	0.01	263.91	2.6391	2.6391	9.16	9.16	0.092	0.0916	5.93	5.93	0.059	0.0593	0.0593
1234789-HpCDF	0.01	18.78	0.1878	0.1878	ND	1.95	0.020	0.0098	2.65	2.65	0.027	0.0133	0.0000
12346789-OCDF	0.001	675.27	0.6753	0.6753	7.55	7.55	0.008	0.0076	4.93	4.93	0.005	0.0049	0.0049
nondetects = detection limit		TEQ=	29.68		TEQ=	4.06			TEQ=	5.01			
nondetects = 1/2 d.l.		teq=	29.06		teq=	3.23			teq=	3.44			
nondetects = zero		teq=	28.45		teq=				teq=				1.86
Moisture content (%)		30.26				28.54				30.65			
Organic carbon (%)		0.58				0.61				0.95			
Total organic matter (%)		1.00				1.05				1.65			
Sample I.D.		C-16				C-17				C-18			
tetra-PCDF (TCDF)		28				4.4				3.1			
penta-PCDF (PeCDF)		18.9				4.5				0			
hexa-PCDF (HxCDF)		28.5				1.4				13.2			
hepta-PCDF (HpCDF)		283				9.2				5.9			
octa-PCDF (OCDF)		675				7.5				4.9			
tetra-PCDD (TCDD)		1			ND	1				1			
penta-PCDD (PeCDD)		3.2				1.3				1			
hexa-PCDD (HxCDD)		20.4				1.5				1.3			
hepta-PCDD (HpCDD)		500				9.8				8.3			
octa-PCDD (OCDD)		7068				104.6				83.3			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	C-19			13			14					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	ND	1.000	0.5000	0.0000	3.55	3.550	3.5500	3.5500	6.98	6.980	6.9800	6.9800
12378-PeCDD	0.5	ND	1.00	0.2500	0.0000	1.03	0.515	0.5150	0.5150	1.00	0.500	0.2500	0.0000
123478-HxCDD	0.1	ND	1.00	0.100	0.0500	50.84	5.084	5.0840	5.0840	69.79	6.979	6.9790	6.9790
123678-HxCDD	0.1	ND	2.06	0.2060	0.2060	26.61	2.661	2.6610	2.6610	5.89	0.589	0.5890	0.5890
123789-HxCDD	0.1	ND	1.15	0.115	0.0575	1.40	0.140	0.0700	0.0000	1.69	0.169	0.1690	0.1690
1234678-HpCDD	0.01	ND	15.98	0.160	0.1598	12.69	12.696	12.6961	12.6961	211.08	2.111	2.1108	2.1108
12346789-OCDD	0.001	ND	121.31	0.121	0.1213	18577.63	18.578	18.5776	18.5776	1909.95	1.910	1.9108	1.9108
2378TCDF	0.1	ND	36.21	3.6210	3.6210	3024.20	302.420	302.4200	302.4200	2839.23	283.923	283.9230	283.9230
12378-PeCDF	0.05	ND	31.34	1.567	1.5670	1958.51	97.926	97.9255	97.9255	1362.21	68.111	68.1105	68.1105
23478-PeCDF	0.5	ND	14.61	7.305	7.3050	1156.55	578.275	578.2750	578.2750	862.09	431.045	431.0450	431.0450
123478-HxCDF	0.1	ND	20.08	2.008	2.0080	815.44	81.544	81.5440	81.5440	618.89	61.889	61.8890	61.8890
123678-HxCDF	0.1	ND	1.35	0.135	0.0675	213.41	21.341	21.3410	21.3410	137.71	13.771	13.7710	13.7710
234678-HxCDF	0.1	ND	1.35	0.135	0.0675	88.29	8.829	8.8290	8.8290	59.10	5.910	5.9100	5.9100
123789-HxCDF	0.1	ND	1.00	0.100	0.0500	1.36	0.136	0.0680	0.0000	7.51	0.751	0.7510	0.7510
1234678-HpCDF	0.01	ND	12.22	0.122	0.1222	909.54	9.095	9.0954	9.0954	525.50	5.255	5.2550	5.2550
1234789-HpCDF	0.01	ND	2.15	0.022	0.0108	81.57	0.816	0.8157	0.8157	49.93	0.499	0.4993	0.4993
12346789-OCDF	0.001	ND	9.02	0.009	0.0090	2288.67	2.289	2.2887	2.2887	315.35	0.315	0.3154	0.3154
nondetects = detection limit			TEQ=	17.23		TEQ=	1145.89			TEQ=	890.71		
nondetects = 1/2 d.l.			teq=	16.17		teq=	1145.76			teq=	890.46		
nondetects = zero			teq=		15.17					teq=			890.21
Moisture content (%)			29.12			27.54				24.33			
Organic carbon (%)			0.58			0.94				1.17			
Total organic matter (%)			1.00			1.63				2.01			
Sample I.D.			C-19			13				14			
tetra-PCDF (TCDF)			36.2			3024				2839			
penta-PCDF (PeCDF)			45.9			3115				2224			
hexa-PCDF (HxCDF)			20.1			1117				823			
hepta-PCDF (HpCDF)			12.2			991				575			
octa-PCDF (OCDF)			9			2289				315			
tetra-PCDD (TCDD)			1			3.6				7			
penta-PCDD (PeCDD)			1			1				1			
hexa-PCDD (HxCDD)			2.1			77.4				77.4			
hepta-PCDD (HpCDD)			16			1270				211			
octa-PCDD (OCDD)			121			18578				1910			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	15			16			23					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	2.33	2.330	2.3300	2.3300	2.53	2.530	2.5300	2.5300	15.54	15.540	15.5400	15.5400
12378-PeCDD	0.5	2.10	1.050	1.0500	1.0500	ND	0.500	0.2500	0.0000	12.38	6.190	6.1900	6.1900
123478-HxCDD	0.1	51.09	5.109	5.1090	5.1090	41.24	4.124	4.1240	4.1240	121.86	12.186	12.1860	12.1860
123678-HxCDD	0.1	28.82	2.882	2.8820	2.8820	3.77	0.377	0.3770	0.3770	52.62	5.262	5.2620	5.2620
123789-HxCDD	0.1	1.85	0.185	0.1850	0.0000	1.99	0.199	0.1990	0.1990	15.85	1.585	1.5850	1.5850
1234678-HpCDD	0.01	480.00	4.800	4.8000	4.8000	142.76	1.428	1.4276	1.4276	882.86	8.829	8.8286	8.8286
12346789-OCDD	0.001	3460.10	3.460	3.4601	3.4601	1306.73	1.307	1.3067	1.3067	9539.41	9.539	9.5394	9.5394
2378TCDF	0.1	2117.93	211.793	211.7930	211.7930	5673.44	567.344	567.3440	567.3440	691.92	69.192	69.1920	69.1920
12378-PeCDF	0.05	1531.82	76.591	76.5910	76.5910	2131.69	106.585	106.5845	106.5845	538.39	26.920	26.9195	26.9195
23478-PeCDF	0.5	886.75	443.375	443.3750	443.3750	1413.24	706.620	706.6200	706.6200	329.69	164.845	164.8450	164.8450
123478-HxCDF	0.1	950.83	95.083	95.0830	95.0830	1000.74	100.074	100.0740	100.0740	279.69	27.969	27.9690	27.9690
123678-HxCDF	0.1	209.74	20.974	20.9740	20.9740	204.43	20.443	20.4430	20.4430	48.34	4.834	4.8340	4.8340
234678-HxCDF	0.1	85.80	8.580	8.5800	8.5800	100.29	10.029	10.0290	10.0290	30.70	3.070	3.0700	3.0700
123789-HxCDF	0.1	1.70	0.170	0.1700	0.1700	2.03	0.203	0.2030	0.0000	ND	1.95	0.0975	0.0000
1234678-HpCDF	0.01	554.31	5.543	5.5431	5.5431	485.14	4.851	4.8514	4.8514	1236.97	12.370	12.3697	12.3697
1234789-HpCDF	0.01	60.62	0.606	0.6062	0.6062	61.23	0.612	0.6123	0.6123	77.28	0.773	0.7728	0.7728
12346789-OCDF	0.001	578.04	0.578	0.5780	0.5780	344.26	0.344	0.3443	0.3443	863.59	0.864	0.8636	0.8636
nondetects = detection limit		TEQ=	883.11			TEQ=	1527.57			TEQ=	370.16		
nondetects = 1/2 d.l.		teq=	883.11			teq=	1527.32			teq=	370.06		
nondetects = zero		teq=		882.92		teq=		1526.87		teq=			369.97
Moisture content (%)		23.15				27.22				59.75			
Organic carbon (%)		0.38				0.46				4.05			
Total organic matter (%)		0.66				0.8				6.98			
Sample I.D.		15				16				23			
tetra-PCDF (TCDF)		2118				5673.0				692			
penta-PCDF (PeCDF)		2419				3545.0				868			
hexa-PCDF (HxCDF)		1248				1307.0				359			
hepta-PCDF (HpCDF)		615				546.0				1314			
octa-PCDF (OCDF)		578				344.0				864			
tetra-PCDD (TCDD)		2.3				2.5				15.5			
penta-PCDD (PeCDD)		2.1				1.0				12.4			
hexa-PCDD (HxCDD)		81.8				47.0				190			
hepta-PCDD (HpCDD)		480				143.0				883			
octa-PCDD (OCDD)		3460				1307.0				9539			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	37			38			39					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	5.13	5.130	5.1300	5.1300	ND	1.00	1.000	0.5000	ND	1.00	1.000	0.5000
12378-PeCDD	0.5	ND	0.500	0.2500	0.0000	ND	1.00	0.500	0.2500	ND	1.00	0.500	0.2500
123478-HxCDD	0.1	90.60	9.060	9.0600	9.0600	ND	13.22	1.322	1.3220	ND	8.46	0.846	0.8460
123678-HxCDD	0.1	18.20	1.820	1.8200	1.8200	ND	10.01	1.001	1.0010	ND	2.16	0.216	0.2160
123789-HxCDD	0.1	2.71	0.271	0.2710	0.2710	ND	10.35	1.035	1.0350	ND	1.30	0.130	0.1300
1234678-HpCDD	0.01	168.61	1.686	1.6861	1.6861	ND	91.38	0.914	0.9138	ND	47.13	0.471	0.4713
12346789-OCDD	0.001	2017.35	2.017	2.0174	2.0174	ND	563.92	0.564	0.5639	ND	377.90	0.378	0.3779
2378TCDF	0.1	2327.82	232.782	232.7820	232.7820	ND	559.37	55.937	55.9370	ND	281.15	28.115	28.1150
12378-PeCDF	0.05	1781.65	89.083	89.0825	89.0825	ND	493.93	24.697	24.6965	ND	314.81	15.741	15.7405
23478-PeCDF	0.5	1043.81	521.905	521.9050	521.9050	ND	273.21	136.605	136.6050	ND	135.13	67.565	67.5650
123478-HxCDF	0.1	1046.97	104.697	104.6970	104.6970	ND	233.31	23.331	23.3310	ND	151.64	15.164	15.1640
123678-HxCDF	0.1	247.59	24.759	24.7590	24.7590	ND	46.51	4.651	4.6510	ND	29.45	2.945	2.9450
234678-HxCDF	0.1	105.88	10.588	10.5880	10.5880	ND	16.51	1.651	1.6510	ND	12.39	1.239	1.2390
123789-HxCDF	0.1	ND	0.172	0.0860	0.0000	ND	1.95	0.195	0.0975	ND	1.00	0.100	0.0500
1234678-HpCDF	0.01	581.90	5.819	5.8190	5.8190	ND	121.12	1.211	1.2112	ND	87.65	0.877	0.8765
1234789-HpCDF	0.01	163.43	1.634	1.6343	1.6343	ND	23.47	0.235	0.2347	ND	11.83	0.118	0.1183
12346789-OCDF	0.001	188.70	0.189	0.1887	0.1887	ND	71.01	0.071	0.0710	ND	42.99	0.043	0.0430
nondetects = detection limit		TEQ=	1012.11				TEQ=	254.92			TEQ=	135.45	
nondetects = 1/2 d.l.		teq=		1011.78			teq=		254.07		teq=		134.65
nondetects = zero		teq=			1011.44		teq=				teq=		133.85
Moisture content (%)		35.03					23.82				20.63		
Organic carbon (%)		1.63					0.29				0.11		
Total organic matter (%)		2.81					0.51				0.19		
Sample I.D.		37					38				39		
tetra-PCDF (TCDF)		2328.0					559.0				281.0		
penta-PCDF (PeCDF)		2825.0					767.0				450.0		
hexa-PCDF (HxCDF)		1400.0					296.0				193.0		
hepta-PCDF (HpCDF)		745.0					145.0				99.5		
octa-PCDF (OCDF)		189.0					71.0				43.0		
tetra-PCDD (TCDD)		5.1				ND	1.0			ND	1.0		
penta-PCDD (PeCDD)		1.0				ND	1.0			ND	1.0		
hexa-PCDD (HxCDD)		112.0					33.6				11.9		
hepta-PCDD (HpCDD)		169.0					91.4				47.1		
octa-PCDD (OCDD)		2017.0					563.9				377.9		
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	52			53			54				
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	
2378-TCDD	1	ND	1.10	1.100	0.5500	0.0000	20.37	20.370	20.3700	20.3700	0.5500	0.0000
12378-PeCDD	0.5	ND	1.00	0.500	0.2500	0.0000	1.00	0.500	0.2500	0.0000	0.4450	0.4450
123478-HxCDD	0.1		13.58	1.358	1.3580	1.3580	29.87	2.987	2.9870	2.9870	4.0510	4.0510
123678-HxCDD	0.1		1.39	0.139	0.1390	0.1390	7.42	0.742	0.7420	0.7420	1.0370	1.0370
123789-HxCDD	0.1	ND	1.30	0.130	0.0650	0.0000	1.70	0.170	0.0850	0.0000	0.3080	0.3080
1234678-HpCDD	0.01		26.23	0.262	0.2623	0.2623	126.69	1.267	1.2669	1.2669	1.3940	1.3940
12346789-OCDD	0.001		288.55	0.289	0.2886	0.2886	1354.62	1.355	1.3546	1.3546	1.3758	1.3758
2378TCDF	0.1		61.80	6.180	6.1800	6.1800	1880.57	188.057	188.0570	188.0570	106.058	106.0580
12378-PeCDF	0.05		32.71	1.636	1.6355	1.6355	1395.81	69.791	69.7905	69.7905	14.935	14.9345
23478-PeCDF	0.5		17.49	8.745	8.7450	8.7450	991.73	495.865	495.8650	495.8650	111.545	111.5450
123478-HxCDF	0.1		12.97	1.297	1.2970	1.2970	595.09	59.509	59.5090	59.5090	12.299	12.2990
123678-HxCDF	0.1		3.80	0.380	0.3800	0.3800	143.57	14.357	14.3570	14.3570	2.836	2.8360
234678-HxCDF	0.1	ND	1.00	0.100	0.0500	0.0000	92.61	9.261	9.2610	9.2610	1.516	1.5160
123789-HxCDF	0.1	ND	1.00	0.100	0.0500	0.0000	7.06	0.706	0.7060	0.7060	0.100	0.0500
1234678-HpCDF	0.01		33.05	0.331	0.3305	0.3305	281.26	2.813	2.8126	2.8126	2.7948	2.7948
1234789-HpCDF	0.01		4.35	0.044	0.0435	0.0435	43.24	0.432	0.4324	0.4324	0.192	0.1921
12346789-OCDF	0.001		21.94	0.022	0.0219	0.0219	201.11	0.201	0.2011	0.2011	0.239	0.2387
nondetects = detection limit			TEQ=	22.61			TEQ=	868.38			TEQ=	262.22
nondetects = 1/2 d.l.			teq=		21.65		teq=		868.05		teq=	261.62
nondetects = zero			teq=			20.68	teq=				teq=	261.02
Moisture content (%)			21.77				27.84				22.02	
Organic carbon (%)			0.31				0.52				0.29	
Total organic matter (%)			0.54				0.89				0.49	
Sample I.D.			52				53				54	
tetra-PCDF (TCDF)			61.8				1881				1061	
penta-PCDF (PeCDF)			50.2				2388				522	
hexa-PCDF (HxCDF)			16.8				838				167	
hepta-PCDF (HpCDF)			37.4				325				299	
octa-PCDF (OCDF)			21.9				201				239	
tetra-PCDD (TCDD)		ND	1.1				20.4			ND	1.1	
penta-PCDD (PeCDD)		ND	1.0				1.00				0.9	
hexa-PCDD (HxCDD)			15.0				37.3				54	
hepta-PCDD (HpCDD)			26.2				127				139	
octa-PCDD (OCDD)			288.6				1355				1376	
Summary concentrations of the homolog group												
Concentrations of all compound (except of Recalculation for internal standards account)												
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will												

TABLE 9

Part 2

Analyte	TEF	55			59			60					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	4.34	4.340	4.3400	4.3400	ND	1.00	1.000	0.5000	0.0000	0.0000	0.0000	0.0000
12378-PeCDD	0.5	2.18	1.090	1.0900	1.0900	ND	1.00	0.500	0.2500	0.0000	0.0000	0.0000	0.0000
123478-HxCDD	0.1	155.02	15.502	15.5020	15.5020	ND	1.30	0.130	0.0650	0.0000	0.0000	0.0000	0.0000
123678-HxCDD	0.1	40.51	4.051	4.0510	4.0510	ND	1.30	0.130	0.0650	0.0000	0.0000	0.0000	0.0000
123789-HxCDD	0.1	1.44	0.144	0.1440	0.1440	ND	1.30	0.130	0.0650	0.0000	0.0000	0.0000	0.0000
1234678-HpCDD	0.01	531.96	5.320	5.3196	5.3196	ND	17.41	0.174	0.1741	0.1741	0.084	0.0840	0.0840
12346789-OCDD	0.001	6670.02	6.670	6.6700	6.6700	ND	142.08	0.142	0.1421	0.1421	0.064	0.0637	0.0637
2378TCDF	0.1	5518.05	551.805	551.8050	551.8050	ND	6.52	0.652	0.6520	0.6520	8.23	0.823	0.8230
12378-PeCDF	0.05	3949.58	197.479	197.4790	197.4790	ND	4.53	0.227	0.2265	0.2265	6.13	0.307	0.3065
23478-PeCDF	0.5	2029.73	1014.865	1014.8650	1014.8650	ND	1.40	0.700	0.3500	0.0000	1.78	0.890	0.8900
123478-HxCDF	0.1	2035.24	203.524	203.5240	203.5240	ND	2.12	0.212	0.2120	0.2120	3.75	0.375	0.3750
123678-HxCDF	0.1	376.46	37.646	37.6460	37.6460	ND	1.45	0.145	0.0725	0.0000	1.60	0.160	0.1600
234678-HxCDF	0.1	148.05	14.805	14.8050	14.8050	ND	1.00	0.100	0.0500	0.0000	1.60	0.160	0.1600
123789-HxCDF	0.1	25.80	2.580	2.5800	2.5800	ND	1.00	0.100	0.0500	0.0000	2.00	0.200	0.2000
1234678-HpCDF	0.01	1359.68	13.597	13.5968	13.5968	ND	7.53	0.075	0.0753	0.0753	5.08	0.051	0.0508
1234789-HpCDF	0.01	139.72	1.397	1.3972	1.3972	ND	1.00	0.010	0.0050	0.0000	2.50	0.025	0.0125
12346789-OCDF	0.001	1522.50	1.523	1.5225	1.5225	ND	6.10	0.006	0.0061	0.0061	5.62	0.006	0.0056
nondetects = detection limit		TEQ=	2076.34				TEQ=	4.43			TEQ=	5.23	
nondetects = 1/2 d.l.		teq=		2076.34			teq=		2.96		teq=		3.92
nondetects = zero		teq=			2076.34		teq=				teq=		2.60
Moisture content (%)		32.94					26.34				21.01		
Organic carbon (%)		0.49					0.23				0.6		
Total organic matter (%)		0.85					0.4				1.04		
Sample I.D.		55					59				60		
tetra-PCDF (TCDF)		5518					6.5				8.2		
penta-PCDF (PeCDF)		5979					4.5				7.9		
hexa-PCDF (HxCDF)		2586					2.1				3.8		
hepta-PCDF (HpCDF)		1499					7.5				5.1		
octa-PCDF (OCDF)		1523					6.1				5.6		
tetra-PCDD (TCDD)		4.3				ND	1.0				1.1		
penta-PCDD (PeCDD)		2.2				ND	1.0				1.2		
hexa-PCDD (HxCDD)		197				ND	1.3				1.3		
hepta-PCDD (HpCDD)		532					17.4				8.4		
octa-PCDD (OCDD)		6670					142.2				63.7		
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	SS-1			SS-2			SS-3					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	15.31	15.310	15.3100	15.3100	33.38	33.380	33.3800	33.3800	1.52	1.520	1.5200	1.5200
12378-PeCDD	0.5	11.89	5.945	5.9450	5.9450	17.97	8.985	8.9850	8.9850	ND	0.500	0.2500	0.0000
123478-HxCDD	0.1	99.18	9.918	9.9180	9.9180	208.10	20.810	20.8100	20.8100	ND	0.130	0.0650	0.0000
123678-HxCDD	0.1	58.69	5.869	5.8690	5.8690	105.33	10.533	10.5330	10.5330	ND	0.130	0.0650	0.0000
123789-HxCDD	0.1	23.36	2.336	2.3360	2.3360	31.82	3.182	3.1820	3.1820	ND	0.130	0.0650	0.0000
1234678-HpCDD	0.01	1016.20	10.162	10.1620	10.1620	2735.37	27.354	27.3537	27.3537	36.32	0.363	0.3632	0.3632
12346789-OCDD	0.001	11122.56	11.123	11.1226	11.1226	26560.18	26.560	26.5602	26.5602	369.60	0.370	0.3696	0.3696
2378TCDF	0.1	950.14	95.014	95.0140	95.0140	2443.05	244.305	244.3050	244.3050	13.64	1.364	1.3640	1.3640
12378-PeCDF	0.05	584.12	29.206	29.2060	29.2060	1430.97	71.549	71.5485	71.5485	9.07	0.454	0.4535	0.4535
23478-PeCDF	0.5	356.00	178.000	178.0000	178.0000	888.76	444.380	444.3800	444.3800	6.94	3.470	3.4700	3.4700
123478-HxCDF	0.1	482.45	48.245	48.2450	48.2450	1059.99	105.999	105.9990	105.9990	6.06	0.606	0.6060	0.6060
123678-HxCDF	0.1	73.48	7.348	7.3480	7.3480	186.34	18.634	18.6340	18.6340	1.29	0.129	0.1290	0.1290
234678-HxCDF	0.1	51.16	5.116	5.1160	5.1160	97.83	9.783	9.7830	9.7830	ND	0.100	0.0500	0.0000
123789-HxCDF	0.1	3.95	0.395	0.3950	0.3950	2.69	0.269	0.2690	0.2690	ND	0.100	0.0500	0.0000
1234678-HpCDF	0.01	1973.82	19.738	19.7382	19.7382	4060.38	40.604	40.6038	40.6038	15.66	0.157	0.1566	0.1566
1234789-HpCDF	0.01	76.70	0.767	0.7670	0.7670	204.74	2.047	2.0474	2.0474	ND	0.190	0.0095	0.0000
12346789-OCDF	0.001	2066.98	2.067	2.0670	2.0670	6795.69	6.796	6.7957	6.7957	11.90	0.012	0.0119	0.0119
nondetects = detection limit		TEQ=	446.56			TEQ=	1075.17			TEQ=	9.55		
nondetects = 1/2 d.l.		teq=	446.56			teq=	1075.17			teq=	9.00		
nondetects = zero		teq=	446.56			teq=	1075.17			teq=	8.44		
Moisture content (%)		41.17				30.88				28.32			
Organic carbon (%)		6.46				5.06				4.00			
Total organic matter (%)		11.14				8.72				6.89			
Sample I.D.		SS-1				SS-2				SS-3			
tetra-PCDF (TCDF)		950				2443				13.6			
penta-PCDF (PeCDF)		940				2320				16			
hexa-PCDF (HxCDF)		611				1347				7.3			
hepta-PCDF (HpCDF)		2051				4265				15.7			
octa-PCDF (OCDF)		2067				6796				11.9			
tetra-PCDD (TCDD)		15.3				33.4				1.5			
penta-PCDD (PeCDD)		11.9				18				ND			
hexa-PCDD (HxCDD)		181				345				ND			
hepta-PCDD (HpCDD)		1016				2735				36.3			
octa-PCDD (OCDD)		11123				26560				369.6			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2

Analyte	TEF	SS-4			SS-5			SS-6			
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.
2378-TCDD	1	1.55	1.550	1.5500	1.5500	40.99	40.990	40.9900	2.25	2.250	2.2500
12378-PeCDD	0.5	ND	1.00	0.500	0.2500	27.75	13.875	13.8750	1.21	0.605	0.6050
123478-HxCDD	0.1	ND	1.00	0.100	0.0500	287.88	28.788	28.7880	10.11	1.011	1.0110
123678-HxCDD	0.1	2.09	0.209	0.2090	0.2090	142.84	14.284	14.2840	22.40	2.240	2.2400
123789-HxCDD	0.1	ND	1.50	0.150	0.0750	53.02	5.302	5.3020	5.82	0.582	0.5820
1234678-HpCDD	0.01	61.29	0.613	0.6129	0.6129	2998.75	29.988	29.9875	221.05	2.211	2.2105
12346789-OCDD	0.001	380.13	0.380	0.3801	0.3801	34835.28	34.835	34.8353	2462.16	2.462	2.4622
2378TCDF	0.1	1.52	0.152	0.1520	0.1520	1315.76	131.576	131.5760	831.82	83.182	83.1820
12378-PeCDF	0.05	1.44	0.072	0.0720	0.0720	699.72	34.986	34.9860	429.69	21.485	21.4845
23478-PeCDF	0.5	ND	1.00	0.500	0.2500	456.51	228.255	228.2550	294.11	147.055	147.0550
123478-HxCDF	0.1	7.49	0.749	0.7490	0.7490	619.14	61.914	61.9140	216.36	21.636	21.6360
123678-HxCDF	0.1	ND	1.00	0.100	0.0500	115.82	11.582	11.5820	45.67	4.567	4.5670
234678-HxCDF	0.1	ND	1.00	0.100	0.0500	68.36	6.836	6.8360	27.18	2.718	2.7180
123789-HxCDF	0.1	ND	1.00	0.100	0.0500	1.70	0.170	0.1700	ND	0.140	0.0700
1234678-HpCDF	0.01	38.05	0.381	0.3805	0.3805	4131.74	41.317	41.3174	297.60	2.976	2.9760
1234789-HpCDF	0.01	2.25	0.023	0.0113	0.0000	243.70	2.437	2.4370	21.94	0.219	0.2194
12346789-OCDF	0.001	18.83	0.019	0.0188	0.0188	7565.38	7.565	7.5654	227.08	0.227	0.2271
nondetects = detection limit		TEQ=	5.70			TEQ=	694.70		TEQ=	295.57	
nondetects = 1/2 d.l.		teq=		4.91		teq=	694.70		teq=	295.50	
nondetects = zero		teq=		4.12		teq=	694.70		teq=	295.43	
Moisture content (%)		29.84				21.51			16.46		
Organic carbon (%)		4.36				2.38			1.30		
Total organic matter (%)		7.52				4.10			2.24		
Sample I.D.		SS-4				SS-5			SS-6		
tetra-PCDF (TCDF)		1.5				1316			832		
penta-PCDF (PeCDF)		1.4				1156			724		
hexa-PCDF (HxCDF)		7.5				805			289		
hepta-PCDF (HpCDF)		38.0				4375			320		
octa-PCDF (OCDF)		18.8				7565			227		
tetra-PCDD (TCDD)		1.5				41			2.2		
penta-PCDD (PeCDD)		1.0				27.8			1.2		
hexa-PCDD (HxCDD)		2.1				484			38.3		
hepta-PCDD (HpCDD)		61.3				2999			221		
octa-PCDD (OCDD)		380.1				34835			2462		
Summary concentrations of the homolog group											
Concentrations of all compound (except of Recalculation for internal standards account											
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will											

TABLE 9

Part 2

Analyte	TEF	SS-7			SS-7r			SS-8					
		sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	5.71	5.710	5.7100	5.7100	7.80	7.800	7.8000	7.8000	4.25	4.250	4.2500	4.2500
12378-PeCDD	0.5	5.08	2.540	2.5400	2.5400	4.17	2.085	2.0850	2.0850	3.71	1.855	1.8550	1.8550
123478-HxCDD	0.1	7.78	7.778	7.7780	7.7780	86.94	8.694	8.6940	8.6940	51.30	5.130	5.1300	5.1300
123678-HxCDD	0.1	85.83	8.583	8.5830	8.5830	68.48	6.848	6.8480	6.8480	19.15	1.915	1.9150	1.9150
123789-HxCDD	0.1	39.06	3.906	3.9060	3.9060	20.32	2.032	2.0320	2.0320	4.93	0.493	0.4930	0.4930
1234678-HpCDD	0.01	1209.01	12.090	12.0901	12.0901	917.28	9.173	9.1728	9.1728	422.36	4.224	4.2236	4.2236
12346789-OCDD	0.001	9453.71	9.454	9.4537	9.4537	11577.69	11.578	11.5777	11.5777	3765.17	3.765	3.7652	3.7652
2378TCDF	0.1	3920.61	392.061	392.0610	392.0610	3274.44	327.444	327.4440	327.4440	2637.92	263.792	263.7920	263.7920
12378-PeCDF	0.05	1917.22	95.861	95.8610	95.8610	1997.95	99.898	99.8975	99.8975	1579.22	78.961	78.9610	78.9610
23478-PeCDF	0.5	1137.82	568.910	568.9100	568.9100	1214.53	607.265	607.2650	607.2650	888.32	444.160	444.1600	444.1600
123478-HxCDF	0.1	1042.46	104.246	104.2460	104.2460	1068.01	106.801	106.8010	106.8010	865.35	86.535	86.5350	86.5350
123678-HxCDF	0.1	254.61	25.461	25.4610	25.4610	197.43	19.743	19.7430	19.7430	150.76	15.076	15.0760	15.0760
234678-HxCDF	0.1	106.63	10.663	10.6630	10.6630	83.06	8.306	8.3060	8.3060	59.84	5.984	5.9840	5.9840
123789-HxCDF	0.1	3.94	0.394	0.3940	0.3940	3.07	0.307	0.3070	0.3070	4.08	0.408	0.4080	0.4080
1234678-HpCDF	0.01	1131.51	11.315	11.3151	11.3151	1251.47	12.515	12.5147	12.5147	727.99	7.280	7.2799	7.2799
1234789-HpCDF	0.01	129.21	1.292	1.2921	1.2921	112.18	1.122	1.1218	1.1218	153.80	1.538	1.5380	1.5380
12346789-OCDF	0.001	859.23	0.859	0.8592	0.8592	2231.17	2.231	2.2312	2.2312	1364.57	1.365	1.3646	1.3646
nondetects = detection limit		TEQ=	1261.12			TEQ=	1233.84			TEQ=	926.73		
nondetects = 1/2 d.l.		teq=	1261.12			teq=	1233.84			teq=	926.73		
nondetects = zero		teq=		1261.12		teq=		1233.84		teq=			926.73
Moisture content (%)		24.18				24.11				24.07			
Organic carbon (%)		3.38				3.21				1.19			
Total organic matter (%)		5.82				5.54				2.05			
Sample I.D.		SS-7				SS-7r				SS-8			
tetra-PCDF (TCDF)		3921				3274				2638			
penta-PCDF (PeCDF)		3055				3212				2468			
hexa-PCDF (HxCDF)		1408				1352				1080			
hepta-PCDF (HpCDF)		1261				1364				882			
octa-PCDF (OCDF)		859				2231				1365			
tetra-PCDD (TCDD)		5.7				7.8				4.2			
penta-PCDD (PeCDD)		5.1				4.2				3.7			
hexa-PCDD (HxCDD)		203				176				75.4			
hepta-PCDD (HpCDD)		1209				917				422			
octa-PCDD (OCDD)		9454				11578				3765			
Summary concentrations of the homolog group													
Concentrations of all compound (except of Recalculation for internal standards account)													
* OCDF concentrations were calculated based on OCDF concentrations can be non detected, the detection limits will													

TABLE 9

Part 2 (continued)		SS-9		SS-10		SS-10			
Analyte	TEF	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero	sampled pg/g	toxic eq. pg/g	nondetect 1/2 d.l.	nondetect zero
2378-TCDD	1	4.58	4.580	4.5800	4.5800	ND	1.000	0.5000	0.0000
12378-PeCDD	0.5	4.39	2.195	2.1950	2.1950		0.360	0.3600	0.3600
123478-HxCDD	0.1	7.164	7.164	7.1640	7.1640	ND	0.120	0.0600	0.0000
123678-HxCDD	0.1	33.44	3.344	3.3440	3.3440		1.50	0.1500	0.1500
123789-HxCDD	0.1	7.17	0.717	0.7170	0.7170		1.37	0.1370	0.1370
1234678-HpCDD	0.01	574.20	5.742	5.7420	5.7420		11.73	0.1173	0.1173
12346789-OCDD	0.001	6320.70	6.321	6.3207	6.3207		103.53	0.1035	0.1035
2378TCDF	0.1	3406.24	340.624	340.6240	340.6240		1.00	0.1000	0.1000
12378-PeCDF	0.05	3084.30	154.215	154.2150	154.2150		1.21	0.061	0.0605
23478-PeCDF	0.5	1460.63	730.315	730.3150	730.3150		1.13	0.565	0.5650
123478-HxCDF	0.1	1749.01	174.901	174.9010	174.9010	ND	1.00	0.100	0.0500
123678-HxCDF	0.1	318.54	31.854	31.8540	31.8540	ND	1.00	0.100	0.0500
234678-HxCDF	0.1	116.26	11.626	11.6260	11.6260	ND	1.00	0.100	0.0500
123789-HxCDF	0.1	13.30	1.330	1.3300	1.3300	ND	1.00	0.100	0.0500
1234678-HpCDF	0.01	1243.62	12.436	12.4362	12.4362		3.91	0.039	0.0391
1234789-HpCDF	0.01	125.09	1.251	1.2509	1.2509	ND	2.00	0.020	0.0100
12346789-OCDF	0.001	1782.44	1.782	1.7824	1.7824	ND	3.40	0.003	0.0034
nondetects = detection limit		TEQ=	1490.40				TEQ=	3.18	
nondetects = 1/2 d.l.		teq=		1490.40			teq=	2.41	
nondetects = zero		teq=			1490.40		teq=		1.63
Moisture content (%)		18.58					25.38		
Organic carbon (%)		2.24					3.56		
Total organic matter (%)		3.85					6.14		
Sample I.D.		SS-9					SS-10		
tetra-PCDF (TCDF)		3406					1.0		
penta-PCDF (PeCDF)		4545					2.3		
hexa-PCDF (HxCDF)		2197				ND	1.0		
hepta-PCDF (HpCDF)		1369				ND	3.9		
octa-PCDF (OCDF)		1782					3.4		
tetra-PCDD (TCDD)		4.6				ND	1.0		
penta-PCDD (PeCDD)		4.4					0.7		
hexa-PCDD (HxCDD)		112					2.9		
hepta-PCDD (HpCDD)		574					11.7		
octa-PCDD (OCDD)		6321					104.0		
Summary concentrations of the homolog									
Concentrations of all compound (except of									
Recalculation for internal standards account									
* OCDF concentrations were calculated ba									
if required, OCDF concentrations can be n									
ND = non detected, the detection limits wi									

TABLE 9
Part 3

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports.

The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.

- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.

- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.

- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks.

- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.

- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.

- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.

- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.

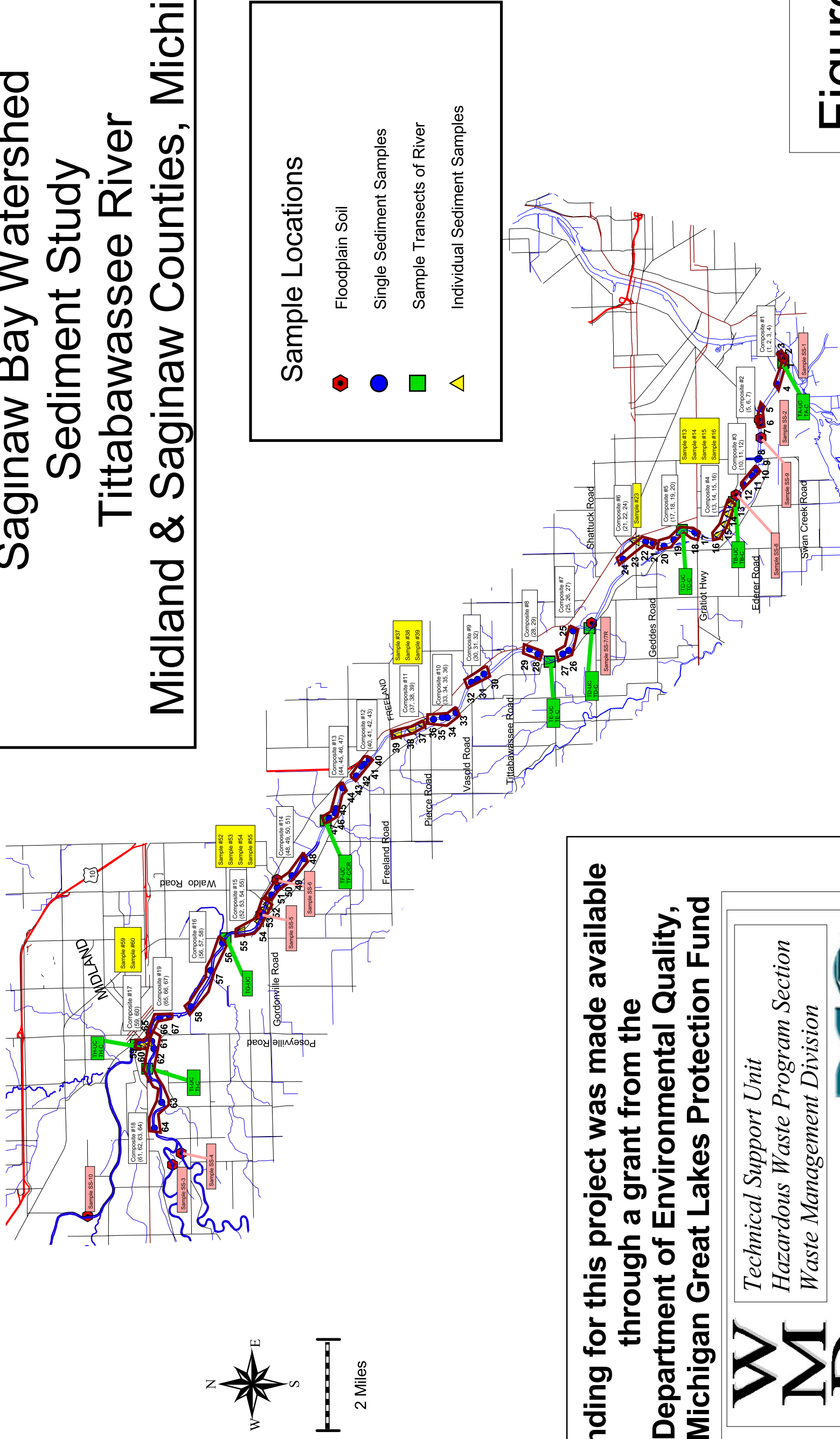
- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent.

FIGURES

Saginaw Bay Watershed Sediment Study Tittabawassee River Midland & Saginaw Counties, Michigan



Funding for this project was made available through a grant from the Department of Environmental Quality, Michigan Great Lakes Protection Fund

Technical Support Unit
Hazardous Waste Program Section
Waste Management Division



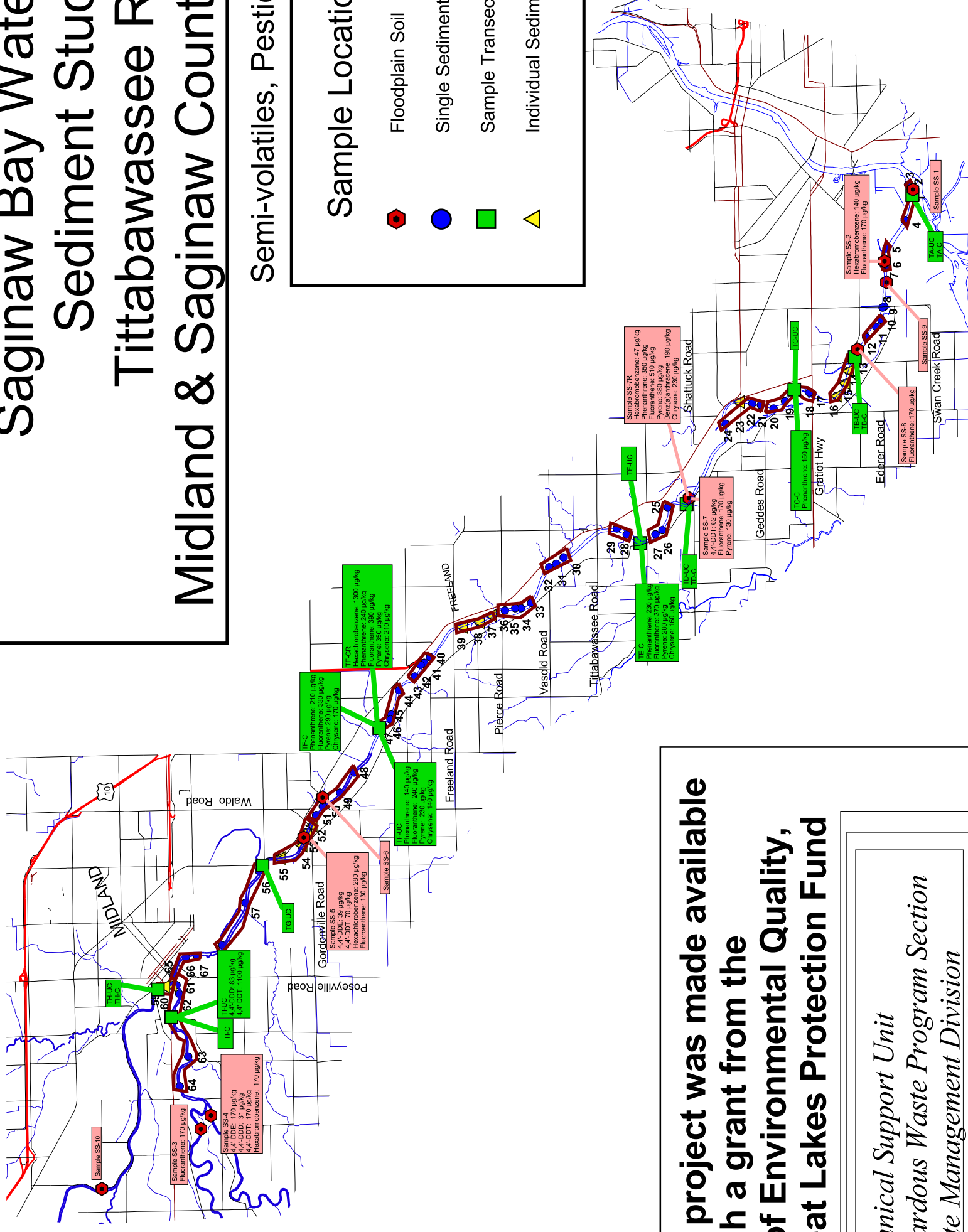
August 2002



Figure 3

Saginaw Bay Watershed Sediment Study Tittabawassee River Midland & Saginaw Counties, Michigan

Semi-volatiles, Pesticides and PCBs



Funding for this project was made available through a grant from the Department of Environmental Quality, Michigan Great Lakes Protection Fund



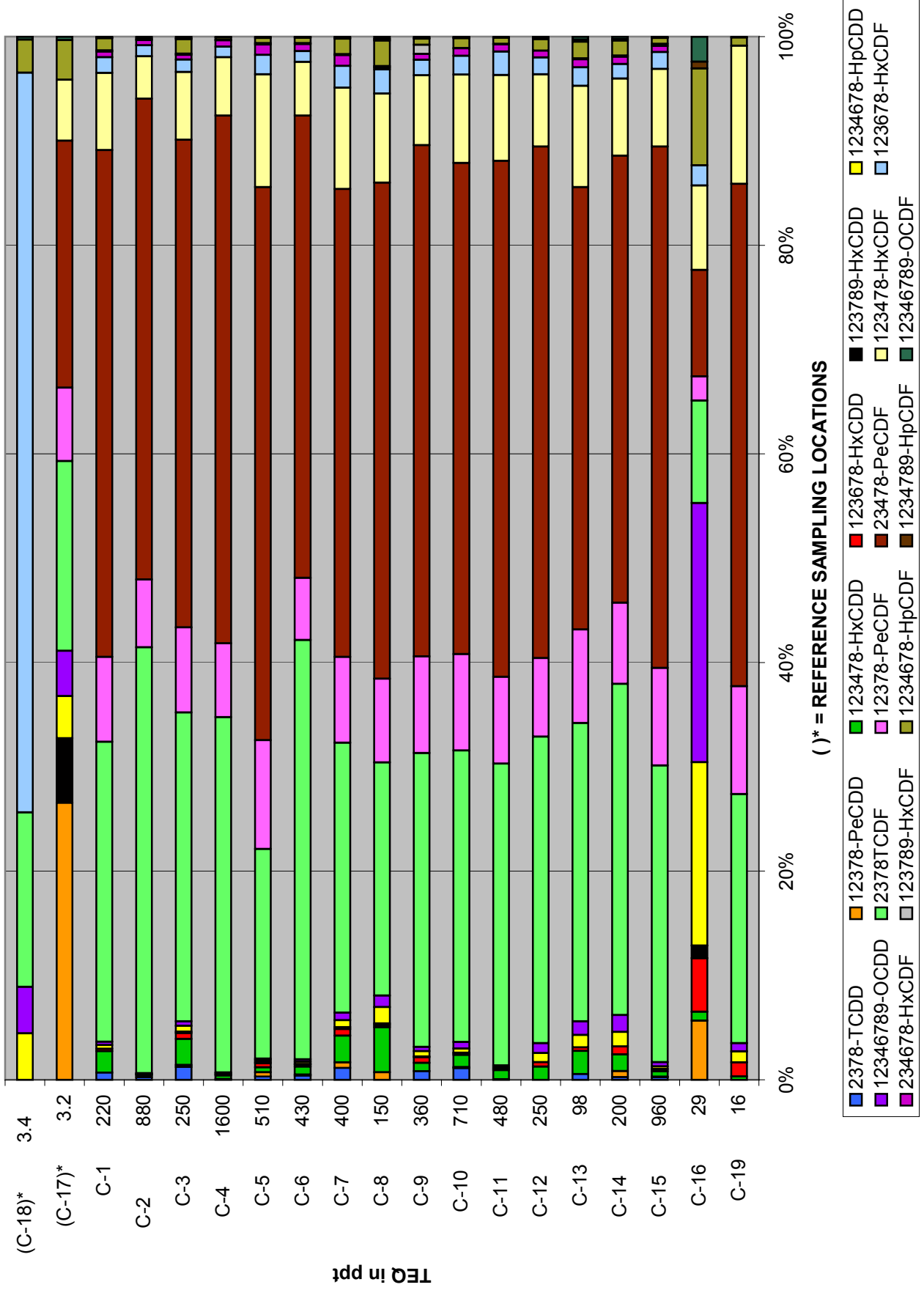
Technical Support Unit
Hazardous Waste Program Section
Waste Management Division



August 2002

Figure 7

Figure 10
TITTABAWASSEE RIVER STUDY **Composite Analyses**



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Appendix I

**U. S. Army Corps of Engineers
Dioxin Results of the Sediments
In the Saginaw River and Bay
Shipping Channel
1998/1999**

DATA FLAGS

In order to assist with data interpretation, data qualifier flags are used on the final reports.

The most commonly used flags are:

- ND** = analyte not detected. Value is the detection limit.
- B** = analyte has been detected in the laboratory method blank as well as in an associated field sample.
- E** = indicates a concentration based on an analyte to internal standard ratio which exceeds the range of the calibration curve. Values which are outside the calibration curve are estimates only.
- I** = indicates labeled standards have been interfered with on the GC column by coeluting, interferent peaks. All quantitations relative to this standard, therefore, may be underestimated.
- J** = indicates a concentration based on an analyte to internal standard ration which is below the calibration curve. Values outside the calibration curve are estimates only.
- PR** = indicates that a GC peak is poorly resolved. The concentrations or amounts reported for such peaks are most likely overestimated.
- Q** = indicates the presence of QC ion instabilities caused by quantitative interferences.
- S** = indicates that the response of a specific PCDD/PCDF isomer has exceeded the normal dynamic range of the mass spectrometer detection system. The corresponding signal is saturated and the reported analyte concentration is a 'minimum estimate'. Results for saturated analytes are reported as greater than the upper calibration limit.
- U** = indicates that a specific isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.
- V** = indicates that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.
- X** = indicates that a polychlorodibenzofuran (PCDF) peak has eluted at the same time as the associated diphenyl ether (DPE) and that the DPE peak intensity is at least ten percent of the total PCDF peak intensity. Total PCDF values are flagged "X" if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks
- EMPC** = are either reported as "estimated maximum possible concentration" {EMPC} values without regard to the isotopic abundance ratio, or are included in the detection limit value depending on the analytical method.

Army Corps of Engineers Saginaw Bay Sediment Results**SB9901**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.6
12378-PeCDD	1		8.7
123478-HxCDD	0.1	J	4.1
123678-HxCDD	0.1		22
123789-HxCDD	0.1		14.5
1234678-HpCDD	0.01		312
12346789-OCDD	0.0001		2830
2378TCDF	0.1		373
12378-PeCDF	0.05		189
23478-PeCDF	0.5		164
123478-HxCDF	0.1		200
123678-HxCDF	0.1		48.4
234678-HxCDF	0.1		32
123789-HxCDF	0.1	J	3.1
1234678-HpCDF	0.01		528
1234789-HpCDF	0.01		29
12346789-OCDF	0.0001		710
Total TEQ:	Non-Detects = Detection Limit		190
	Non-Detects = 1/2 d.l.		190
	Non-Detects = zero		190

Army Corps of Engineers Saginaw Bay Sediment Results**SB9902**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		12.3
12378-PeCDD	1		11.4
123478-HxCDD	0.1		6.1
123678-HxCDD	0.1		34.7
123789-HxCDD	0.1		19.9
1234678-HpCDD	0.01		532
12346789-OCDD	0.0001	E	4500
2378TCDF	0.1		338
12378-PeCDF	0.05		184
23478-PeCDF	0.5		147
123478-HxCDF	0.1		176
123678-HxCDF	0.1		52.1
234678-HxCDF	0.1		35.9
123789-HxCDF	0.1	J	2
1234678-HpCDF	0.01		746
1234789-HpCDF	0.01		36.4
12346789-OCDF	0.0001		1170
Total TEQ:	Non-Detects = Detection Limit		190
	Non-Detects = 1/2 d.l.		190
	Non-Detects = zero		190

Army Corps of Engineers Saginaw Bay Sediment Results**SB9903**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.4
12378-PeCDD	1		9.4
123478-HxCDD	0.1		5.3
123678-HxCDD	0.1		26
123789-HxCDD	0.1		17.9
1234678-HpCDD	0.01		346
12346789-OCDD	0.0001		2820
2378TCDF	0.1		255
12378-PeCDF	0.05	X	117
23478-PeCDF	0.5		98.1
123478-HxCDF	0.1		116
123678-HxCDF	0.1		36.3
234678-HxCDF	0.1		25.3
123789-HxCDF	0.1	J	2.7
1234678-HpCDF	0.01		597
1234789-HpCDF	0.01		23.5
12346789-OCDF	0.0001		555
Total TEQ:	Non-Detects = Detection Limit		130
	Non-Detects = 1/2 d.l.		130
	Non-Detects = zero		130

Army Corps of Engineers Saginaw Bay Sediment Results**SB9904**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7
12378-PeCDD	1		8
123478-HxCDD	0.1		5
123678-HxCDD	0.1		21.9
123789-HxCDD	0.1		14.3
1234678-HpCDD	0.01		270
12346789-OCDD	0.0001		2450
2378TCDF	0.1		210
12378-PeCDF	0.05		110
23478-PeCDF	0.5		77.3
123478-HxCDF	0.1		94.9
123678-HxCDF	0.1		30.3
234678-HxCDF	0.1		25.6
123789-HxCDF	0.1	J	1.8
1234678-HpCDF	0.01		436
1234789-HpCDF	0.01		22
12346789-OCDF	0.0001		491
Total TEQ:	Non-Detects = Detection Limit		110
	Non-Detects = 1/2 d.l.		110
	Non-Detects = zero		110

Army Corps of Engineers Saginaw Bay Sediment Results**SB9905**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		12.6
12378-PeCDD	1		13.7
123478-HxCDD	0.1		7.8
123678-HxCDD	0.1		32.4
123789-HxCDD	0.1		24.3
1234678-HpCDD	0.01		482
12346789-OCDD	0.0001	E	4490
2378TCDF	0.1		321
12378-PeCDF	0.05		139
23478-PeCDF	0.5		134
123478-HxCDF	0.1		132
123678-HxCDF	0.1		51
234678-HxCDF	0.1		37.8
123789-HxCDF	0.1	J	3.9
1234678-HpCDF	0.01		899
1234789-HpCDF	0.01		25.4
12346789-OCDF	0.0001		940
Total TEQ:	Non-Detects = Detection Limit		180
	Non-Detects = 1/2 d.l.		180
	Non-Detects = zero		180

Army Corps of Engineers Saginaw Bay Sediment Results**SB9906**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.5
12378-PeCDD	1		6.1
123478-HxCDD	0.1	J	3.5
123678-HxCDD	0.1		14.8
123789-HxCDD	0.1		9.8
1234678-HpCDD	0.01		190
12346789-OCDD	0.0001		1500
2378TCDF	0.1		89.3
12378-PeCDF	0.05		35.2
23478-PeCDF	0.5		32.5
123478-HxCDF	0.1		43.3
123678-HxCDF	0.1		18.3
234678-HxCDF	0.1		15.5
123789-HxCDF	0.1	J	1.5
1234678-HpCDF	0.01		372
1234789-HpCDF	0.01		11.1
12346789-OCDF	0.0001		379
Total TEQ:	Non-Detects = Detection Limit		55
	Non-Detects = 1/2 d.l.		55
	Non-Detects = zero		55

Army Corps of Engineers Saginaw Bay Sediment Results**SB9907**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.8
12378-PeCDD	1	J	3
123478-HxCDD	0.1	J	1.9
123678-HxCDD	0.1	B	6.4
123789-HxCDD	0.1	J	5
1234678-HpCDD	0.01		80.5
12346789-OCDD	0.0001		665
2378TCDF	0.1		46.3
12378-PeCDF	0.05		21.4
23478-PeCDF	0.5		17.8
123478-HxCDF	0.1		25
123678-HxCDF	0.1		9.3
234678-HxCDF	0.1		8
123789-HxCDF	0.1	J	0.89
1234678-HpCDF	0.01		143
1234789-HpCDF	0.01		5.7
12346789-OCDF	0.0001		141
Total TEQ:	Non-Detects = Detection Limit		28
	Non-Detects = 1/2 d.l.		28
	Non-Detects = zero		28

Army Corps of Engineers Saginaw Bay Sediment Results**SB9908**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.5
12378-PeCDD	1		5.8
123478-HxCDD	0.1	J	3.6
123678-HxCDD	0.1		11.9
123789-HxCDD	0.1		9.9
1234678-HpCDD	0.01		175
12346789-OCDD	0.0001		1400
2378TCDF	0.1		68.8
12378-PeCDF	0.05		28.6
23478-PeCDF	0.5		25.7
123478-HxCDF	0.1		36.8
123678-HxCDF	0.1		15.5
234678-HxCDF	0.1		14.9
123789-HxCDF	0.1	J	1.3
1234678-HpCDF	0.01		443
1234789-HpCDF	0.01		10.9
12346789-OCDF	0.0001		351
Total TEQ:	Non-Detects = Detection Limit		48
	Non-Detects = 1/2 d.l.		48
	Non-Detects = zero		48

Army Corps of Engineers Saginaw Bay Sediment Results

SB9909

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.7
12378-PeCDD	1	J	4.9
123478-HxCDD	0.1	J	3.2
123678-HxCDD	0.1		11.5
123789-HxCDD	0.1		8.1
1234678-HpCDD	0.01		188
12346789-OCDD	0.0001		1730
2378TCDF	0.1		65
12378-PeCDF	0.05		27
23478-PeCDF	0.5		21.2
123478-HxCDF	0.1		32.3
123678-HxCDF	0.1		12.9
234678-HxCDF	0.1		14.6
123789-HxCDF	0.1	J	0.95
1234678-HpCDF	0.01		309
1234789-HpCDF	0.01		8.9
12346789-OCDF	0.0001		286
Total TEQ:		Non-Detects = Detection Limit	42
		Non-Detects = 1/2 d.l.	42
		Non-Detects = zero	42

Army Corps of Engineers Saginaw River Sediment Results**SR9901**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.2
12378-PeCDD	1		6.7
123478-HxCDD	0.1	J	3
123678-HxCDD	0.1		23.6
123789-HxCDD	0.1		9.5
1234678-HpCDD	0.01		498
12346789-OCDD	0.0001	E	4510
2378TCDF	0.1		140
12378-PeCDF	0.05		50.9
23478-PeCDF	0.5		45
123478-HxCDF	0.1		65.1
123678-HxCDF	0.1		20.7
234678-HxCDF	0.1		14.7
123789-HxCDF	0.1	J	1.2
1234678-HpCDF	0.01		888
1234789-HpCDF	0.01		28.5
12346789-OCDF	0.0001		1340
Total TEQ:	Non-Detects = Detection Limit		83
	Non-Detects = 1/2 d.l.		83
	Non-Detects = zero		83

Army Corps of Engineers Saginaw River Sediment Results**SR9902**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.3
12378-PeCDD	1	J	2.1
123478-HxCDD	0.1	ND	1.7
123678-HxCDD	0.1		5.8
123789-HxCDD	0.1	J	2.5
1234678-HpCDD	0.01		91.5
12346789-OCDD	0.0001		862
2378TCDF	0.1		117
12378-PeCDF	0.05		41.4
23478-PeCDF	0.5		37
123478-HxCDF	0.1		32.7
123678-HxCDF	0.1		10.8
234678-HxCDF	0.1		6
123789-HxCDF	0.1	ND	1.3
1234678-HpCDF	0.01		134
1234789-HpCDF	0.01		6.7
12346789-OCDF	0.0001		191
Total TEQ:	Non-Detects = Detection Limit		45
	Non-Detects = 1/2 d.l.		45
	Non-Detects = zero		45

Army Corps of Engineers Saginaw River Sediment Results**SR9903**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		6.8
12378-PeCDD	1		8.8
123478-HxCDD	0.1		5.1
123678-HxCDD	0.1		45.2
123789-HxCDD	0.1		16.5
1234678-HpCDD	0.01		913
12346789-OCDD	0.0001	E	7440
2378TCDF	0.1	E	894
12378-PeCDF	0.05		340
23478-PeCDF	0.5		287
123478-HxCDF	0.1		362
123678-HxCDF	0.1		73.6
234678-HxCDF	0.1		40.5
123789-HxCDF	0.1	J	3.1
1234678-HpCDF	0.01		964
1234789-HpCDF	0.01		188
12346789-OCDF	0.0001		2030
Total TEQ:	Non-Detects = Detection Limit		340
	Non-Detects = 1/2 d.l.		340
	Non-Detects = zero		340

Army Corps of Engineers Saginaw River Sediment Results**SR9904**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		2.2
12378-PeCDD	1	J	2
123478-HxCDD	0.1	J	1
123678-HxCDD	0.1	J	5
123789-HxCDD	0.1	J	3
1234678-HpCDD	0.01		60.1
12346789-OCDD	0.0001		598
2378TCDF	0.1		114
12378-PeCDF	0.05		36.6
23478-PeCDF	0.5		32.7
123478-HxCDF	0.1		32
123678-HxCDF	0.1		8.4
234678-HxCDF	0.1		5.3
123789-HxCDF	0.1	ND	1
1234678-HpCDF	0.01		230
1234789-HpCDF	0.01		5.2
12346789-OCDF	0.0001		194
Total TEQ:	Non-Detects = Detection Limit		42
	Non-Detects = 1/2 d.l.		42
	Non-Detects = zero		42

Army Corps of Engineers Saginaw River Sediment Results

SR9905

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		19
12378-PeCDD	1		11.2
123478-HxCDD	0.1		5.6
123678-HxCDD	0.1		53.1
123789-HxCDD	0.1		24.2
1234678-HpCDD	0.01		822
12346789-OCDD	0.0001	E	9350
2378TCDF	0.1	E	567
12378-PeCDF	0.05		403
23478-PeCDF	0.5		246
123478-HxCDF	0.1		435
123678-HxCDF	0.1		97.8
234678-HxCDF	0.1		67.3
123789-HxCDF	0.1		6.5
1234678-HpCDF	0.01	E	2200
1234789-HpCDF	0.01		88
12346789-OCDF	0.0001		3120
Total TEQ: Non-Detects = Detection Limit			330
Non-Detects = 1/2 d.l.			330
Non-Detects = zero			330

Army Corps of Engineers Saginaw River Sediment Results

SR9906

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		1.5
12378-PeCDD	1	J	1.4
123478-HxCDD	0.1	ND,J	0.91
123678-HxCDD	0.1		6.4
123789-HxCDD	0.1	J	3.4
1234678-HpCDD	0.01		213
12346789-OCDD	0.0001		3320
2378TCDF	0.1		246
12378-PeCDF	0.05		44.8
23478-PeCDF	0.5		48.2
123478-HxCDF	0.1		38.6
123678-HxCDF	0.1		9.2
234678-HxCDF	0.1		8
123789-HxCDF	0.1	J	0.95
1234678-HpCDF	0.01		289
1234789-HpCDF	0.01		11.4
12346789-OCDF	0.0001		273
Total TEQ: Non-Detects = Detection Limit			66
Non-Detects = 1/2 d.l.			66
Non-Detects = zero			66

Army Corps of Engineers Saginaw River Sediment Results**SR9907**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1	J	0.64
12378-PeCDD	1	ND	0.1
123478-HxCDD	0.1	ND	0.1
123678-HxCDD	0.1	J	0.97
123789-HxCDD	0.1	J	0.61
1234678-HpCDD	0.01		12
12346789-OCDD	0.0001		97.9
2378TCDF	0.1		32.7
12378-PeCDF	0.05		10.2
23478-PeCDF	0.5		8.9
123478-HxCDF	0.1	B	7.9
123678-HxCDF	0.1	J	1.9
234678-HxCDF	0.1	J	1.4
123789-HxCDF	0.1	ND	0.1
1234678-HpCDF	0.01		44.9
1234789-HpCDF	0.01	J	1.2
12346789-OCDF	0.0001		36.5
Total TEQ:		Non-Detects = Detection Limit	11
		Non-Detects = 1/2 d.l.	11
		Non-Detects = zero	11

Army Corps of Engineers Saginaw River Sediment Results**SR9908**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		1.2
12378-PeCDD	1	J	1.1
123478-HxCDD	0.1	J	0.42
123678-HxCDD	0.1	J	2.6
123789-HxCDD	0.1	J	1.9
1234678-HpCDD	0.01		34.5
12346789-OCDD	0.0001		305
2378TCDF	0.1		84.7
12378-PeCDF	0.05		22.6
23478-PeCDF	0.5		18.5
123478-HxCDF	0.1		18.4
123678-HxCDF	0.1	J	4.3
234678-HxCDF	0.1	J	3.4
123789-HxCDF	0.1	ND	0.4
1234678-HpCDF	0.01		75.3
1234789-HpCDF	0.01	J	4
12346789-OCDF	0.0001		78.7
Total TEQ:		Non-Detects = Detection Limit	25
		Non-Detects = 1/2 d.l.	25
		Non-Detects = zero	25

Army Corps of Engineers Saginaw River Sediment Results

SR9909

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.2
12378-PeCDD	1	J	3.1
123478-HxCDD	0.1	J	1.5
123678-HxCDD	0.1		10.4
123789-HxCDD	0.1		6.8
1234678-HpCDD	0.01		151
12346789-OCDD	0.0001		1300
2378TCDF	0.1		225
12378-PeCDF	0.05		99.6
23478-PeCDF	0.5		77.1
123478-HxCDF	0.1		86.1
123678-HxCDF	0.1		19.2
234678-HxCDF	0.1		13.8
123789-HxCDF	0.1	J	1.2
1234678-HpCDF	0.01		292
1234789-HpCDF	0.01		15.3
12346789-OCDF	0.0001		378
Total TEQ: Non-Detects = Detection Limit			91
Non-Detects = 1/2 d.l.			91
Non-Detects = zero			91

Army Corps of Engineers Saginaw River Sediment Results

SR9910

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		3.6
12378-PeCDD	1	J	4
123478-HxCDD	0.1	J	2.1
123678-HxCDD	0.1		12.5
123789-HxCDD	0.1		8.2
1234678-HpCDD	0.01		173
12346789-OCDD	0.0001		1500
2378TCDF	0.1		241
12378-PeCDF	0.05		118
23478-PeCDF	0.5		86.4
123478-HxCDF	0.1		88.1
123678-HxCDF	0.1		20.9
234678-HxCDF	0.1		20.1
123789-HxCDF	0.1	J	2.2
1234678-HpCDF	0.01		332
1234789-HpCDF	0.01		18.7
12346789-OCDF	0.0001		344
Total TEQ: Non-Detects = Detection Limit			100
Non-Detects = 1/2 d.l.			100
Non-Detects = zero			100

Army Corps of Engineers Saginaw River Sediment Results**SR9911**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		4.7
12378-PeCDD	1	ND,J	3.8
123478-HxCDD	0.1	J	2.3
123678-HxCDD	0.1		12.1
123789-HxCDD	0.1		7.5
1234678-HpCDD	0.01		177
12346789-OCDD	0.0001		1490
2378TCDF	0.1	E	1510
12378-PeCDF	0.05		921
23478-PeCDF	0.5		471
123478-HxCDF	0.1		693
123678-HxCDF	0.1		128
234678-HxCDF	0.1		67.4
123789-HxCDF	0.1		8.5
1234678-HpCDF	0.01		483
1234789-HpCDF	0.01		30.5
12346789-OCDF	0.0001		378
Total TEQ:	Non-Detects = Detection Limit		540
	Non-Detects = 1/2 d.l.		540
	Non-Detects = zero		540

Army Corps of Engineers Saginaw River Sediment Results**SR9912**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		12
12378-PeCDD	1		12.8
123478-HxCDD	0.1		6.1
123678-HxCDD	0.1		36.1
123789-HxCDD	0.1		19.9
1234678-HpCDD	0.01		588
12346789-OCDD	0.0001	E	4820
2378TCDF	0.1		291
12378-PeCDF	0.05		151
23478-PeCDF	0.5		126
123478-HxCDF	0.1		164
123678-HxCDF	0.1		47.5
234678-HxCDF	0.1		30.5
123789-HxCDF	0.1	J	2.9
1234678-HpCDF	0.01		858
1234789-HpCDF	0.01		35.6
12346789-OCDF	0.0001		1170
Total TEQ:	Non-Detects = Detection Limit		170
	Non-Detects = 1/2 d.l.		170
	Non-Detects = zero		170

Army Corps of Engineers Saginaw River Sediment Results**SR9913**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.2
12378-PeCDD	1	ND	0.3
123478-HxCDD	0.1	ND	0.3
123678-HxCDD	0.1	J	0.36
123789-HxCDD	0.1	J	0.23
1234678-HpCDD	0.01	J	5
12346789-OCDD	0.0001		41.4
2378TCDF	0.1	B	6
12378-PeCDF	0.05	J,B	2.6
23478-PeCDF	0.5	J	2.2
123478-HxCDF	0.1	J,B	2.4
123678-HxCDF	0.1	J	0.73
234678-HxCDF	0.1	J	0.41
123789-HxCDF	0.1	ND	0.2
1234678-HpCDF	0.01	B	8.9
1234789-HpCDF	0.01	ND	0.3
12346789-OCDF	0.0001		10.3
Total TEQ:		Non-Detects = Detection Limit	2.9
		Non-Detects = 1/2 d.l.	2.7
		Non-Detects = zero	2.4

Army Corps of Engineers Saginaw River Sediment Results**SR9914**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.3
12378-PeCDD	1	ND	0.3
123478-HxCDD	0.1	ND	0.3
123678-HxCDD	0.1	J	0.35
123789-HxCDD	0.1	ND	0.3
1234678-HpCDD	0.01	J	4.9
12346789-OCDD	0.0001		36.7
2378TCDF	0.1		20.8
12378-PeCDF	0.05		9.7
23478-PeCDF	0.5		7.8
123478-HxCDF	0.1	B	7.2
123678-HxCDF	0.1	J	1.9
234678-HxCDF	0.1	J	0.93
123789-HxCDF	0.1	ND	0.2
1234678-HpCDF	0.01		14.6
1234789-HpCDF	0.01	J	1
12346789-OCDF	0.0001		14
Total TEQ:		Non-Detects = Detection Limit	8.4
		Non-Detects = 1/2 d.l.	8.1
		Non-Detects = zero	7.7

Army Corps of Engineers Saginaw River Sediment Results

SR9915

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1	J	0.41
12378-PeCDD	1	ND	0.2
123478-HxCDD	0.1	ND	0.2
123678-HxCDD	0.1	J	0.59
123789-HxCDD	0.1	ND	0.2
1234678-HpCDD	0.01		9
12346789-OCDD	0.0001		73.2
2378TCDF	0.1	B	6.7
12378-PeCDF	0.05	JB	2.7
23478-PeCDF	0.5	J	2.1
123478-HxCDF	0.1	JB	3.4
123678-HxCDF	0.1	J	0.87
234678-HxCDF	0.1	J	0.53
123789-HxCDF	0.1	ND	0.2
1234678-HpCDF	0.01		12.5
1234789-HpCDF	0.01	J	0.63
12346789-OCDF	0.0001		14.5
Total TEQ: Non-Detects = Detection Limit			3.3
Non-Detects = 1/2 d.l.			3.2
Non-Detects = zero			3.0

Army Corps of Engineers Saginaw River Sediment Results

SR9916

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		1.6
12378-PeCDD	1	J	1.6
123478-HxCDD	0.1	J	0.97
123678-HxCDD	0.1	J	4.4
123789-HxCDD	0.1	J	3
1234678-HpCDD	0.01		68.1
12346789-OCDD	0.0001		630
2378TCDF	0.1		83.2
12378-PeCDF	0.05		25.3
23478-PeCDF	0.5		21.9
123478-HxCDF	0.1		23.7
123678-HxCDF	0.1		6.9
234678-HxCDF	0.1		5.4
123789-HxCDF	0.1	J	0.57
1234678-HpCDF	0.01		131
1234789-HpCDF	0.01		5.4
12346789-OCDF	0.0001		143
Total TEQ: Non-Detects = Detection Limit			30
Non-Detects = 1/2 d.l.			30
Non-Detects = zero			30

Army Corps of Engineers Saginaw River Sediment Results**SR9917**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		7.8
12378-PeCDD	1		6.1
123478-HxCDD	0.1	J	3.2
123678-HxCDD	0.1		22.8
123789-HxCDD	0.1		12
1234678-HpCDD	0.01		347
12346789-OCDD	0.0001		2480
2378TCDF	0.1	E	530
12378-PeCDF	0.05		229
23478-PeCDF	0.5		182
123478-HxCDF	0.1		139
123678-HxCDF	0.1		36.2
234678-HxCDF	0.1		23.7
123789-HxCDF	0.1	J	2.8
1234678-HpCDF	0.01		506
1234789-HpCDF	0.01		22.6
12346789-OCDF	0.0001		622
Total TEQ:	Non-Detects = Detection Limit		200
	Non-Detects = 1/2 d.l.		200
	Non-Detects = zero		200

Army Corps of Engineers Saginaw River Sediment Results**SR9918**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.7
12378-PeCDD	1		8.3
123478-HxCDD	0.1	J	4.1
123678-HxCDD	0.1		15.2
123789-HxCDD	0.1		12
1234678-HpCDD	0.01		254
12346789-OCDD	0.0001		2120
2378TCDF	0.1	E	366
12378-PeCDF	0.05	X	57.6
23478-PeCDF	0.5		69
123478-HxCDF	0.1		44.6
123678-HxCDF	0.1		12.8
234678-HxCDF	0.1		16.9
123789-HxCDF	0.1	J	0.81
1234678-HpCDF	0.01		322
1234789-HpCDF	0.01	ND	1.5
12346789-OCDF	0.0001		493
Total TEQ:	Non-Detects = Detection Limit		110
	Non-Detects = 1/2 d.l.		110
	Non-Detects = zero		110

Army Corps of Engineers Saginaw River Sediment Results**SR9919**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		25.6
12378-PeCDD	1		13.4
123478-HxCDD	0.1		6.1
123678-HxCDD	0.1		32.7
123789-HxCDD	0.1		21.1
1234678-HpCDD	0.01		536
12346789-OCDD	0.0001	E	4580
2378TCDF	0.1		173
12378-PeCDF	0.05		67.9
23478-PeCDF	0.5		63.1
123478-HxCDF	0.1		92.5
123678-HxCDF	0.1		29
234678-HxCDF	0.1		25.1
123789-HxCDF	0.1	J	3.1
1234678-HpCDF	0.01		748
1234789-HpCDF	0.01		36.6
12346789-OCDF	0.0001		1140
Total TEQ:	Non-Detects = Detection Limit		130
	Non-Detects = 1/2 d.l.		130
	Non-Detects = zero		130

Army Corps of Engineers Saginaw River Sediment Results**SR9920**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.5
12378-PeCDD	1		6.4
123478-HxCDD	0.1	ND	0.9
123678-HxCDD	0.1		29.5
123789-HxCDD	0.1		16.2
1234678-HpCDD	0.01		378
12346789-OCDD	0.0001		3390
2378TCDF	0.1		201
12378-PeCDF	0.05	X	129
23478-PeCDF	0.5		79.2
123478-HxCDF	0.1		123
123678-HxCDF	0.1		35.4
234678-HxCDF	0.1		30.4
123789-HxCDF	0.1	ND	0.7
1234678-HpCDF	0.01		732
1234789-HpCDF	0.01		35.6
12346789-OCDF	0.0001		1070
Total TEQ:	Non-Detects = Detection Limit		110
	Non-Detects = 1/2 d.l.		110
	Non-Detects = zero		110

Army Corps of Engineers Saginaw River Sediment Results**SR9921**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		5.1
12378-PeCDD	1		6.3
123478-HxCDD	0.1	J	2.9
123678-HxCDD	0.1		17
123789-HxCDD	0.1		11
1234678-HpCDD	0.01		256
12346789-OCDD	0.0001		2770
2378TCDF	0.1		334
12378-PeCDF	0.05		202
23478-PeCDF	0.5		117
123478-HxCDF	0.1		130
123678-HxCDF	0.1		35.1
234678-HxCDF	0.1		23.6
123789-HxCDF	0.1	J	1.8
1234678-HpCDF	0.01		412
1234789-HpCDF	0.01		25.8
12346789-OCDF	0.0001		673
Total TEQ:	Non-Detects = Detection Limit		140
	Non-Detects = 1/2 d.l.		140
	Non-Detects = zero		140

Army Corps of Engineers Saginaw River Sediment Results**SR9922**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1	ND	0.2
12378-PeCDD	1	ND	0.2
123478-HxCDD	0.1	ND	0.2
123678-HxCDD	0.1	JB	0.61
123789-HxCDD	0.1	ND	0.2
1234678-HpCDD	0.01	B	8.4
12346789-OCDD	0.0001		67.7
2378TCDF	0.1		19.1
12378-PeCDF	0.05		13.9
23478-PeCDF	0.5		9.7
123478-HxCDF	0.1		10.4
123678-HxCDF	0.1	J	2.7
234678-HxCDF	0.1	JB	1.7
123789-HxCDF	0.1	ND	0.2
1234678-HpCDF	0.01		14.3
1234789-HpCDF	0.01	J	1.4
12346789-OCDF	0.0001		17.7
Total TEQ:	Non-Detects = Detection Limit		9.7
	Non-Detects = 1/2 d.l.		9.5
	Non-Detects = zero		9.2

Army Corps of Engineers Saginaw River Sediment Results**SR9923**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		9.9
12378-PeCDD	1		6.8
123478-HxCDD	0.1	J	3.5
123678-HxCDD	0.1		30.4
123789-HxCDD	0.1		14.3
1234678-HpCDD	0.01		426
12346789-OCDD	0.0001	E	5180
2378TCDF	0.1		197
12378-PeCDF	0.05		90.4
23478-PeCDF	0.5		65
123478-HxCDF	0.1		92.8
123678-HxCDF	0.1		29.4
234678-HxCDF	0.1		27
123789-HxCDF	0.1	J	2.3
1234678-HpCDF	0.01		844
1234789-HpCDF	0.01		36.3
12346789-OCDF	0.0001		1270
Total TEQ:	Non-Detects = Detection Limit		110
	Non-Detects = 1/2 d.l.		110
	Non-Detects = zero		110

Army Corps of Engineers Saginaw River Sediment Results**SR9924**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		19.9
12378-PeCDD	1		19.1
123478-HxCDD	0.1		14.3
123678-HxCDD	0.1		47.6
123789-HxCDD	0.1		43.1
1234678-HpCDD	0.01		751
12346789-OCDD	0.0001	E	6050
2378TCDF	0.1		442
12378-PeCDF	0.05	X	214
23478-PeCDF	0.5		160
123478-HxCDF	0.1		258
123678-HxCDF	0.1		72.3
234678-HxCDF	0.1		47.8
123789-HxCDF	0.1	J	4.4
1234678-HpCDF	0.01	E	2290
1234789-HpCDF	0.01		69.1
12346789-OCDF	0.0001		2030
Total TEQ:	Non-Detects = Detection Limit		250
	Non-Detects = 1/2 d.l.		250
	Non-Detects = zero		250

Army Corps of Engineers Saginaw River Sediment Results**SR9925**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.2
12378-PeCDD	1		8
123478-HxCDD	0.1	J	3.6
123678-HxCDD	0.1		18.5
123789-HxCDD	0.1		11.3
1234678-HpCDD	0.01		250
12346789-OCDD	0.0001		2240
2378TCDF	0.1		276
12378-PeCDF	0.05		117
23478-PeCDF	0.5		99.9
123478-HxCDF	0.1		102
123678-HxCDF	0.1		33.2
234678-HxCDF	0.1		24.5
123789-HxCDF	0.1	J	2
1234678-HpCDF	0.01		400
1234789-HpCDF	0.01		23.8
12346789-OCDF	0.0001		585
Total TEQ:	Non-Detects = Detection Limit		130
	Non-Detects = 1/2 d.l.		130
	Non-Detects = zero		130

Army Corps of Engineers Saginaw River Sediment Results**SR9926**

Analyte	TEF	Flags	Concentration pg/g (ppt)
2378-TCDD	1		8.1
12378-PeCDD	1		8.1
123478-HxCDD	0.1	J	4
123678-HxCDD	0.1		24.2
123789-HxCDD	0.1		13.5
1234678-HpCDD	0.01		285
12346789-OCDD	0.0001		2470
2378TCDF	0.1		309
12378-PeCDF	0.05		139
23478-PeCDF	0.5		118
123478-HxCDF	0.1		139
123678-HxCDF	0.1		38.3
234678-HxCDF	0.1		26
123789-HxCDF	0.1	J	3.3
1234678-HpCDF	0.01		595
1234789-HpCDF	0.01		26.7
12346789-OCDF	0.0001		827
Total TEQ:	Non-Detects = Detection Limit		150
	Non-Detects = 1/2 d.l.		150
	Non-Detects = zero		150

Appendix J

Dioxin Congener Profile Charts

Appendix J presents two series of color charts that provide, for each sample, a visual display of the relative amount of each individual dioxin congener present in that sample. These visual displays are referred to as "congener profiles". Refer to Page 10 of the Phase II Final Report for a discussion of the term "congener".

Each chart consists of a series of multi-color bars. Each multi-color bar represents an individual soil sample. The soil sample label is presented along the left border of the chart. Each color on the multi-color bar represents an individual dioxin congener. A color key is presented at the bottom of the each page. The amount of a color on a multi-color bar directly relates to the amount of the corresponding dioxin congener that is present in the sample. Congener profile charts have been prepared for Phase II soil (including chicken eggs), Phase I soil, Sediment Study, and U.S. Army Corps of Engineers (USACE) sediment data.

Two sets of congener profile charts are included in Appendix J:

- **Part A-Concentration Profiles** were generated using the actual concentration of dioxin congeners that were identified in the sample. These charts can be used to evaluate the percentage of the total dioxin concentration that is made up by specific dioxin congeners.
- **Part B-TEQ Profiles** were generated using the total toxic equivalence (TEQ) that the concentration of dioxin congeners in the soil represents. The TEQ Profiles were developed to provide a visual representation of the toxic contribution of the dioxin congener relative to the total dioxin toxicity contained in the sample.

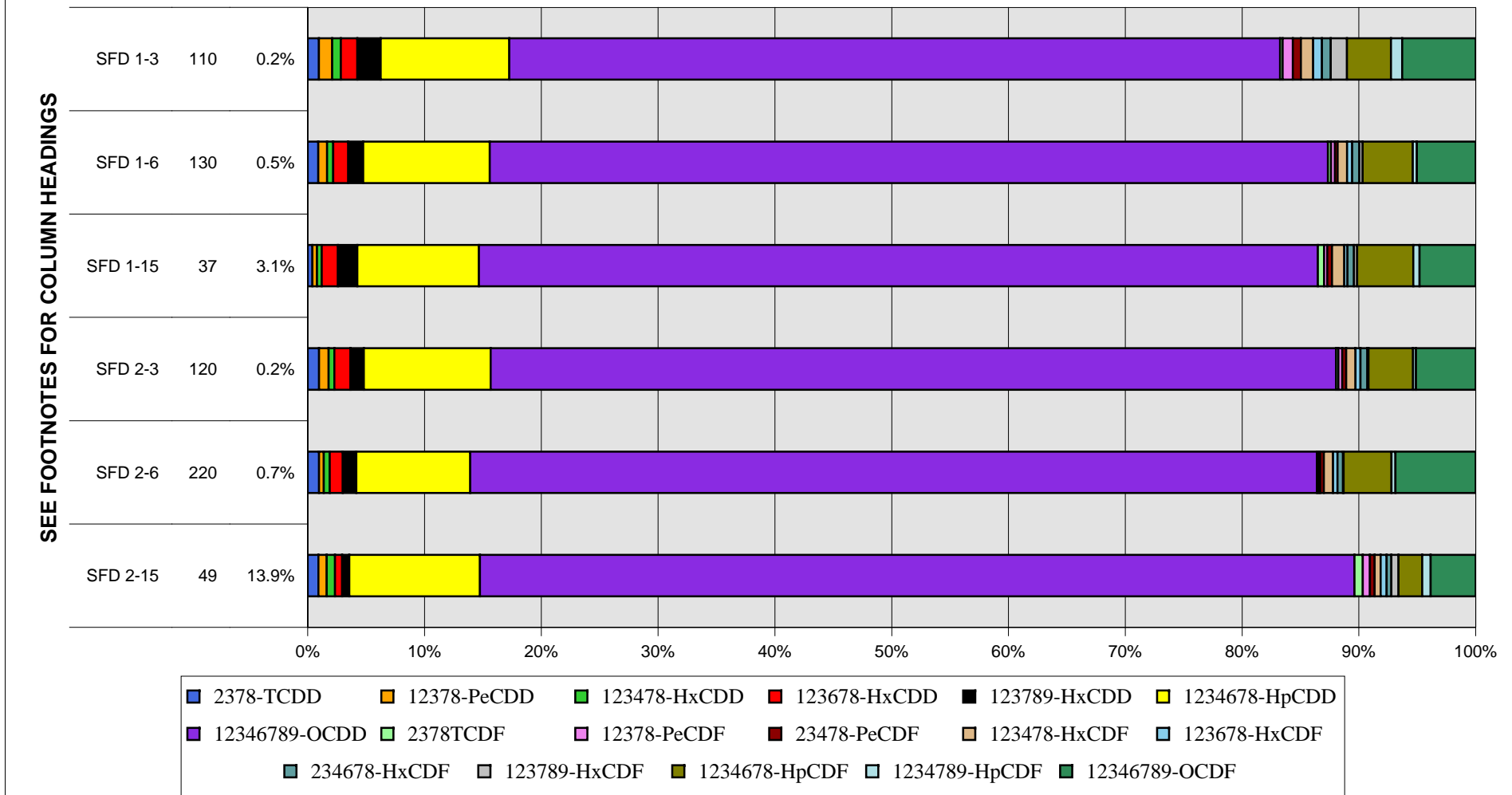
It is the intent of the DEQ that presenting congener profiles based on both soil concentration and TEQ will assist in understanding the similarities and differences among the sample locations.

A variety of methods are available to graphically display dioxin congener data, although there is no accepted best practice. The DEQ recognizes that all graphical techniques have certain strengths and weaknesses. The charts contained in this appendix are most useful for providing a general understanding of the makeup of each sample in terms of the most prevalent congener(s), and the congeners(s) that are most toxic. However, similarities and differences among the congeners that make up only a small percentage of the total may not be readily discernable in these charts.

The DEQ is continuing to analyze the Phase II data to better understand the dioxin contamination that has been identified. Patterns observed in these congener profile charts may be used to help direct this ongoing effort and to help formulate a more rigorous quantitative analysis of the patterns observed.

CONCENTRATION PROFILES

TITTABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY DIOXIN SOIL SAMPLES



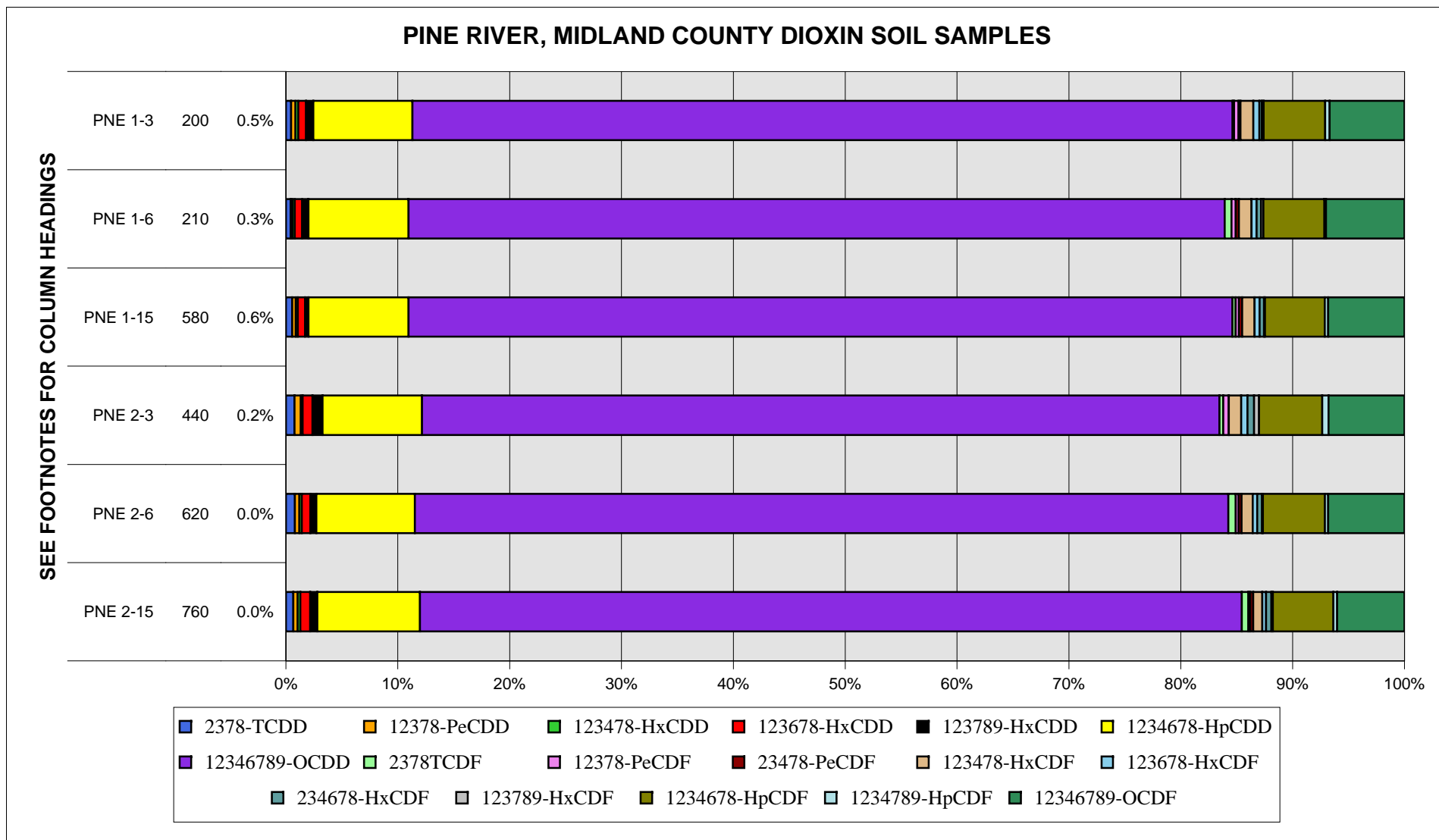
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

PINE RIVER, MIDLAND COUNTY DIOXIN SOIL SAMPLES



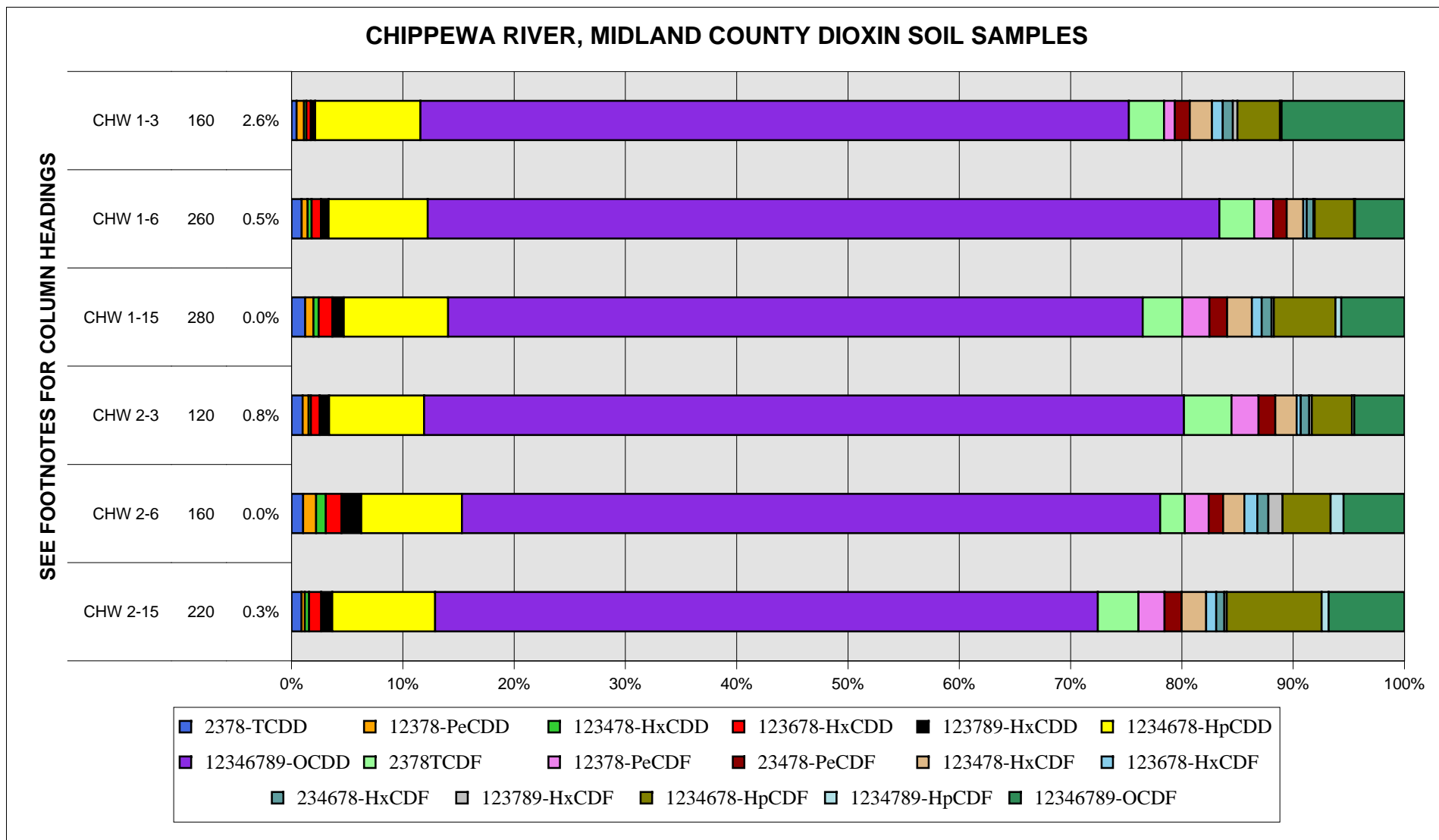
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

CHIPPEWA RIVER, MIDLAND COUNTY DIOXIN SOIL SAMPLES



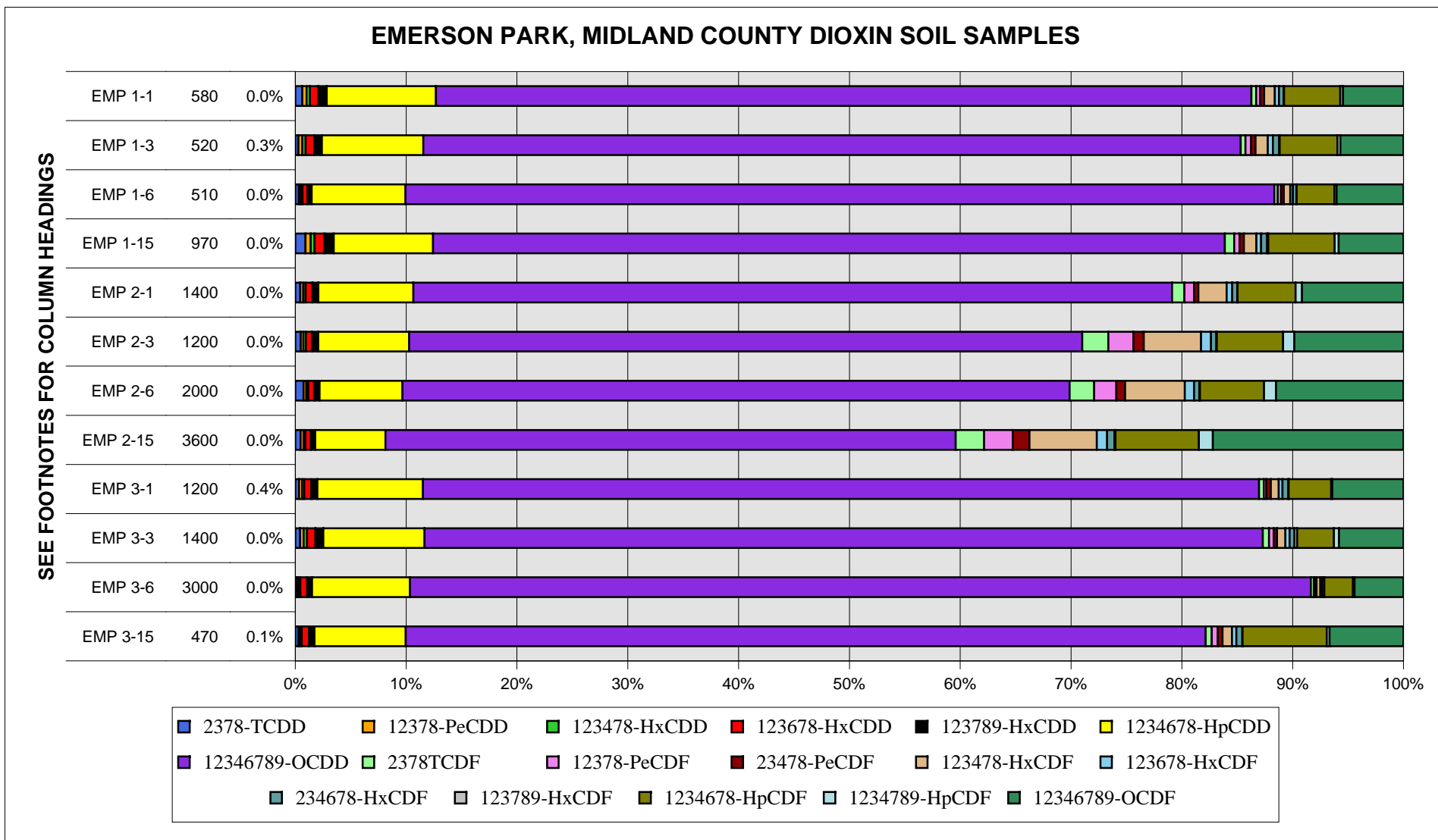
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

EMERSON PARK, MIDLAND COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

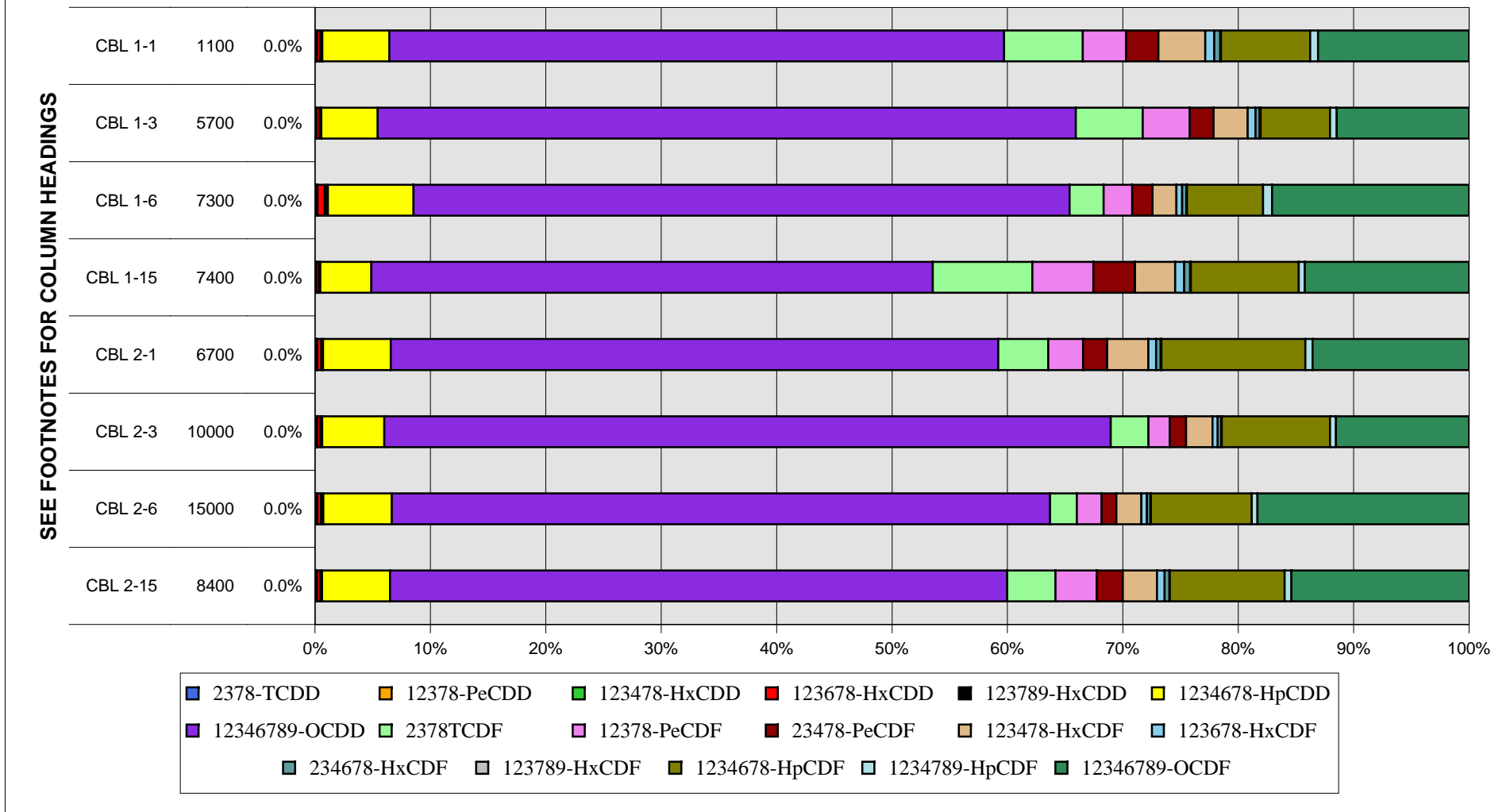
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

CONCENTRATION PROFILES

CALDWELL BOAT LAUNCH, MIDLAND COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

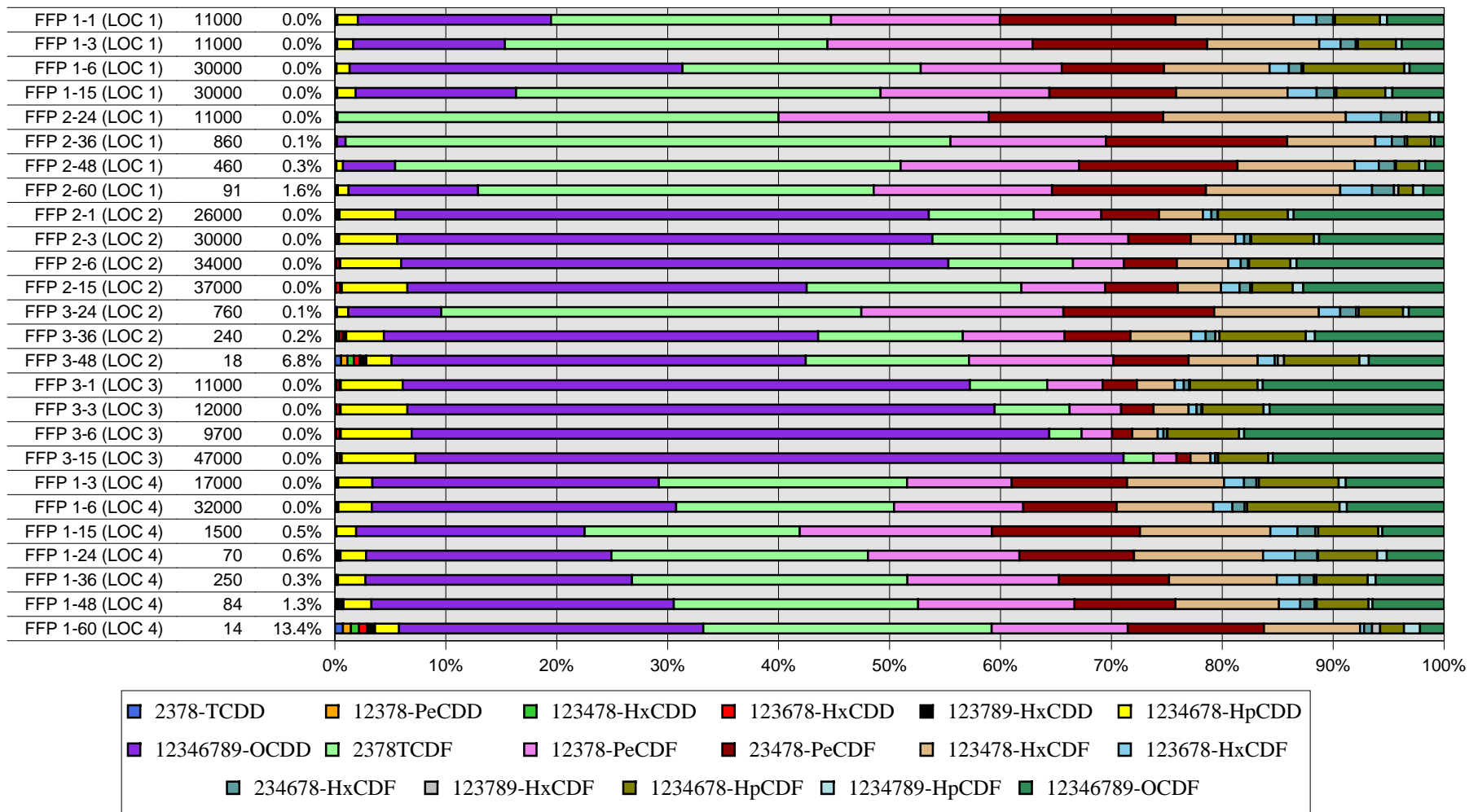
Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

FREELAND FESTIVAL PARK, SAGINAW COUNTY DIOXIN SOIL SAMPLES

SEE FOOTNOTES FOR COLUMN HEADINGS



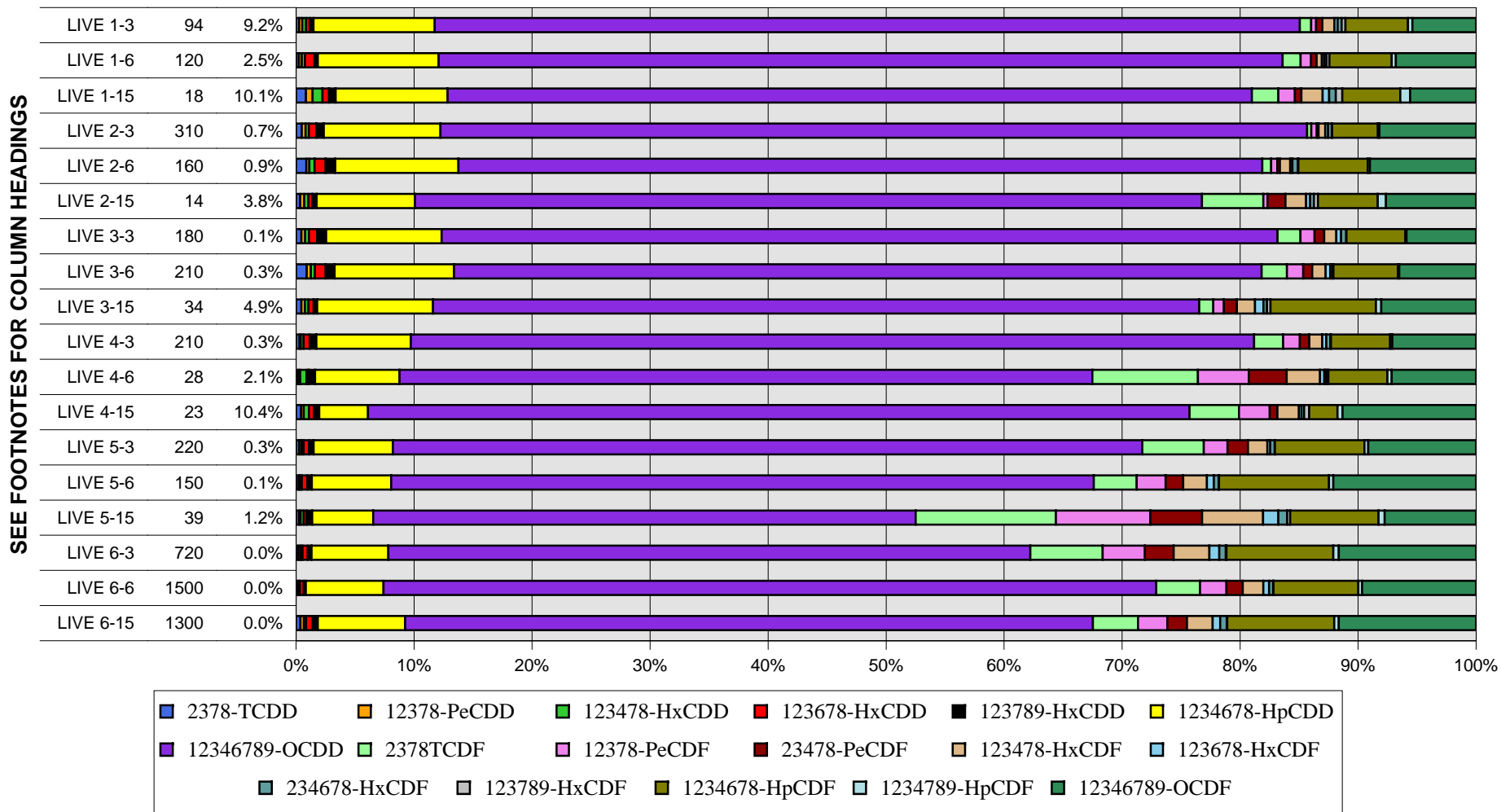
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

LIVESTOCK FARM, SAGINAW COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

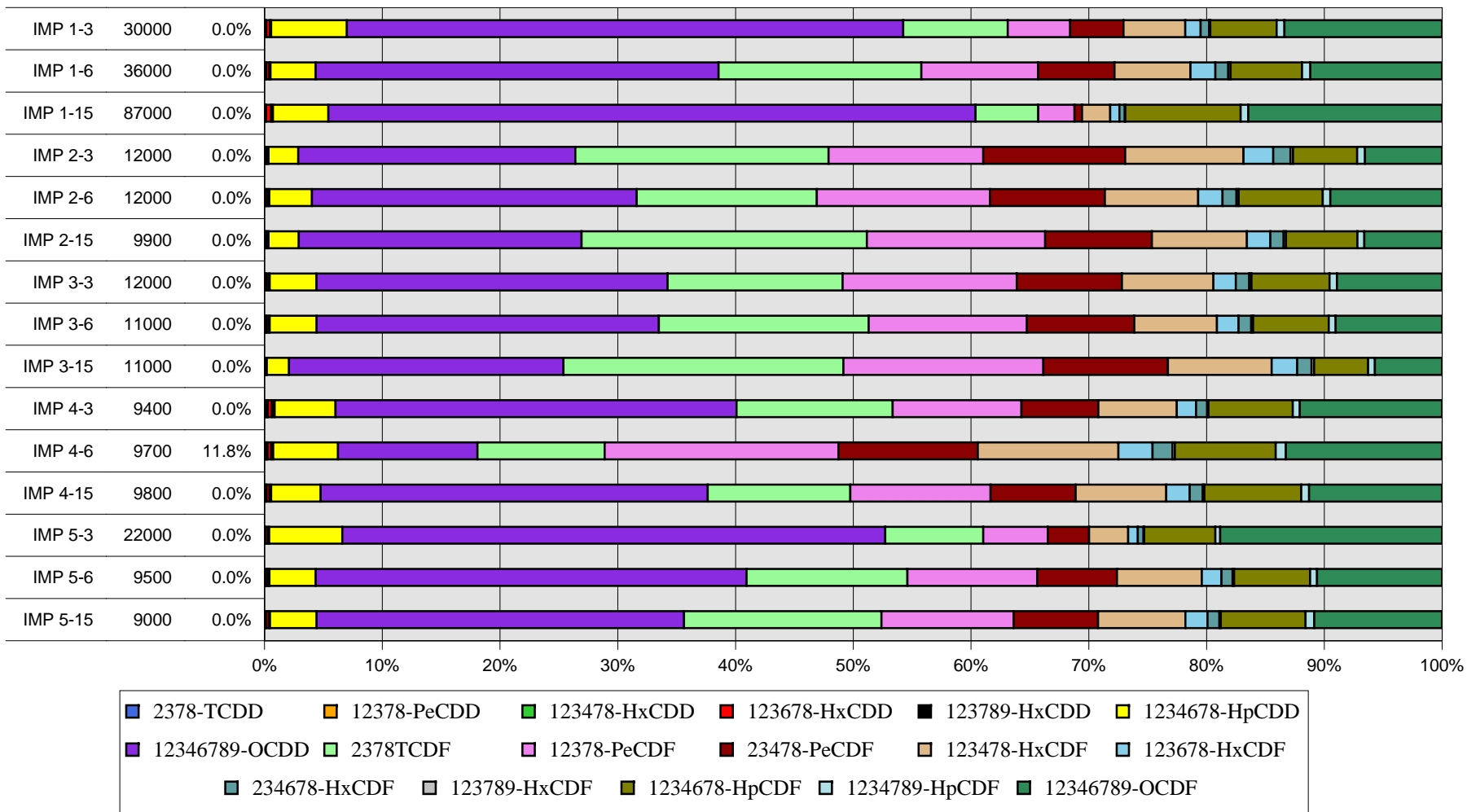
Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

IMERMAN PARK, SAGINAW COUNTY, DIOXIN SOIL SAMPLES 1 - 5

SEE FOOTNOTES FOR COLUMN HEADINGS



Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

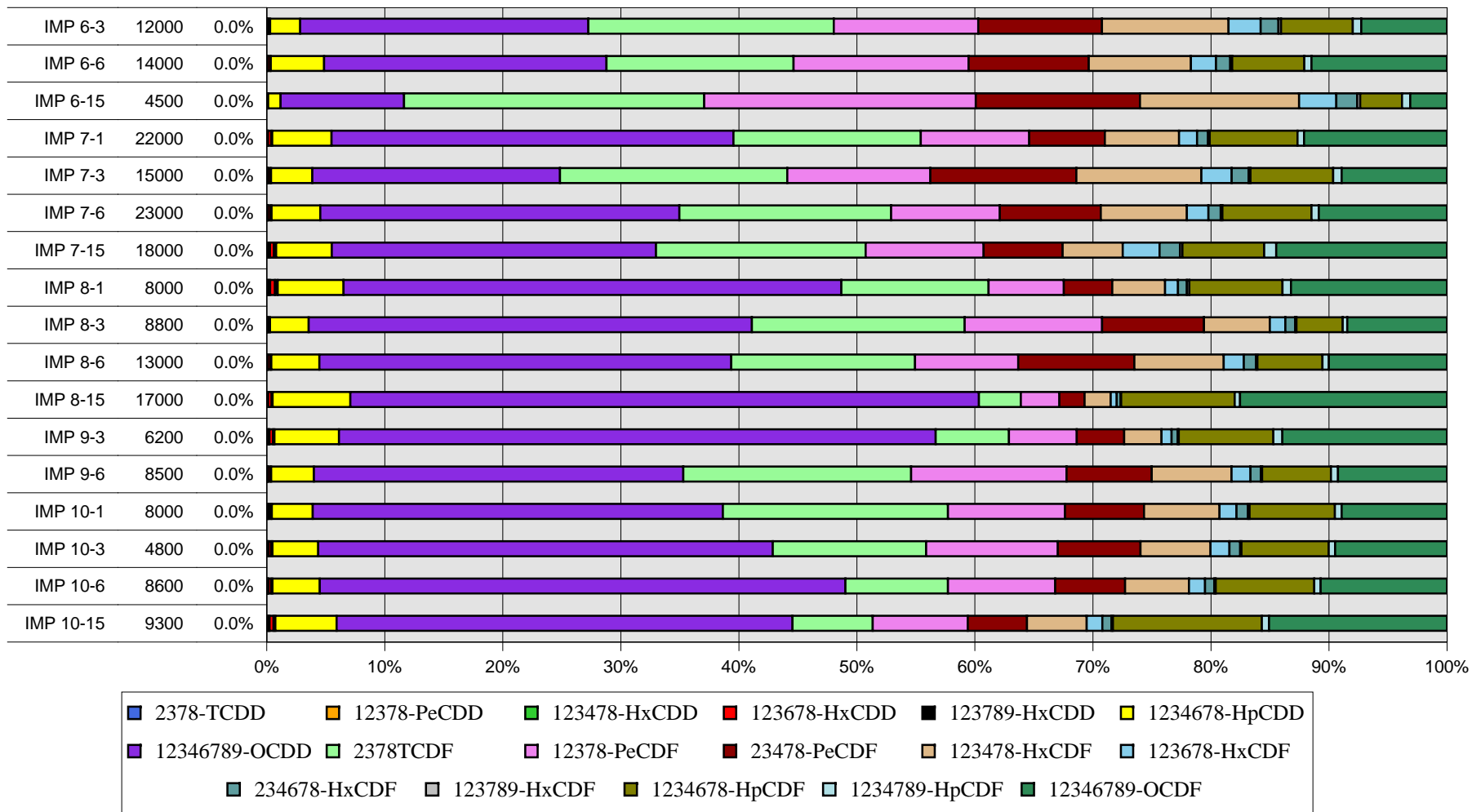
Date: 7/30/2003

Data Subject to Revisions and/or Updates

CONCENTRATION PROFILES

IMERMAN PARK , SAGINAW COUNTY, DIOXIN SOIL SAMPLES 6 - 10

SEE FOOTNOTES FOR COLUMN HEADINGS



Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

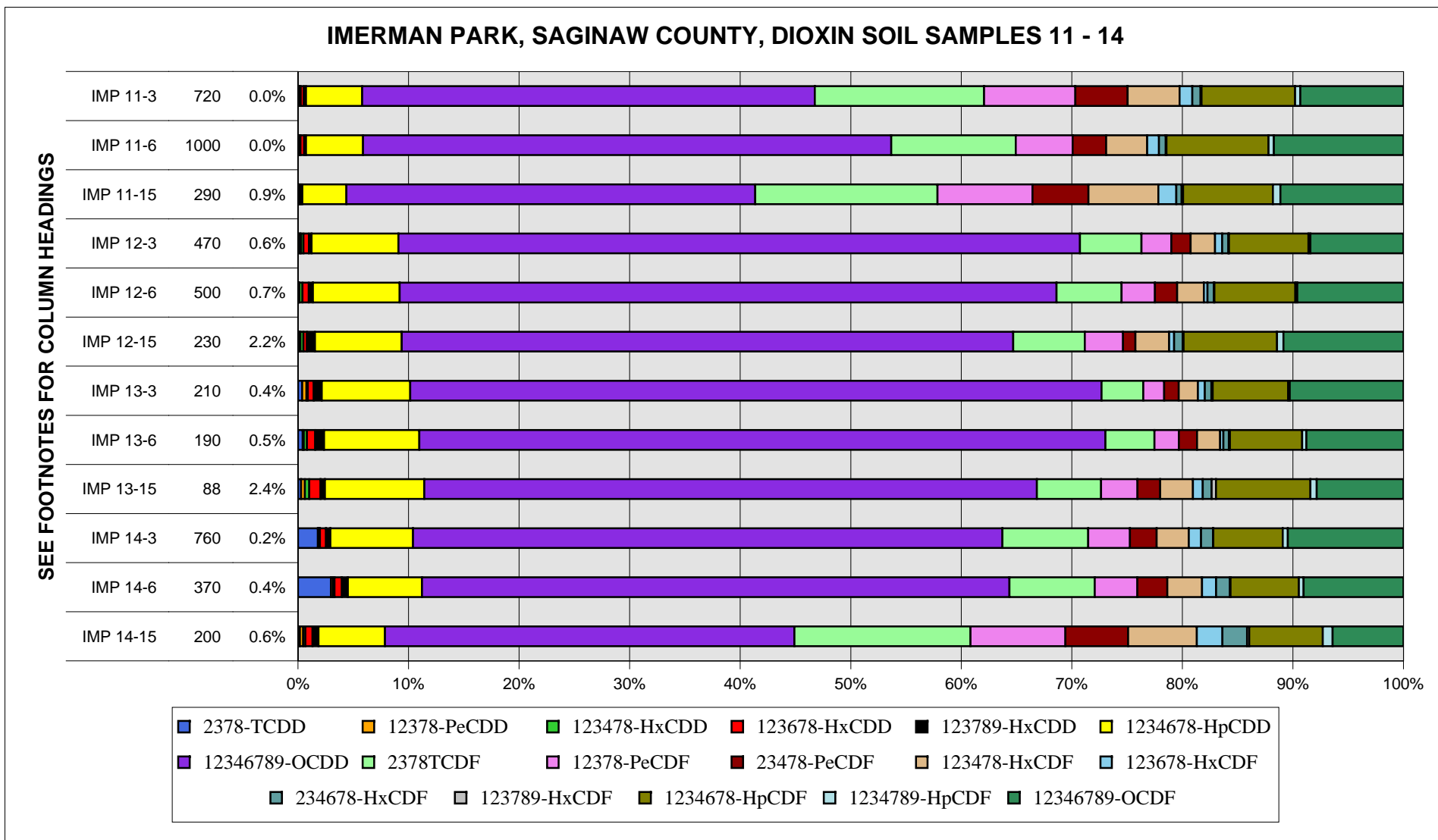
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

CONCENTRATION PROFILES

IMERMAN PARK, SAGINAW COUNTY, DIOXIN SOIL SAMPLES 11 - 14



Column 1 - Sample Location

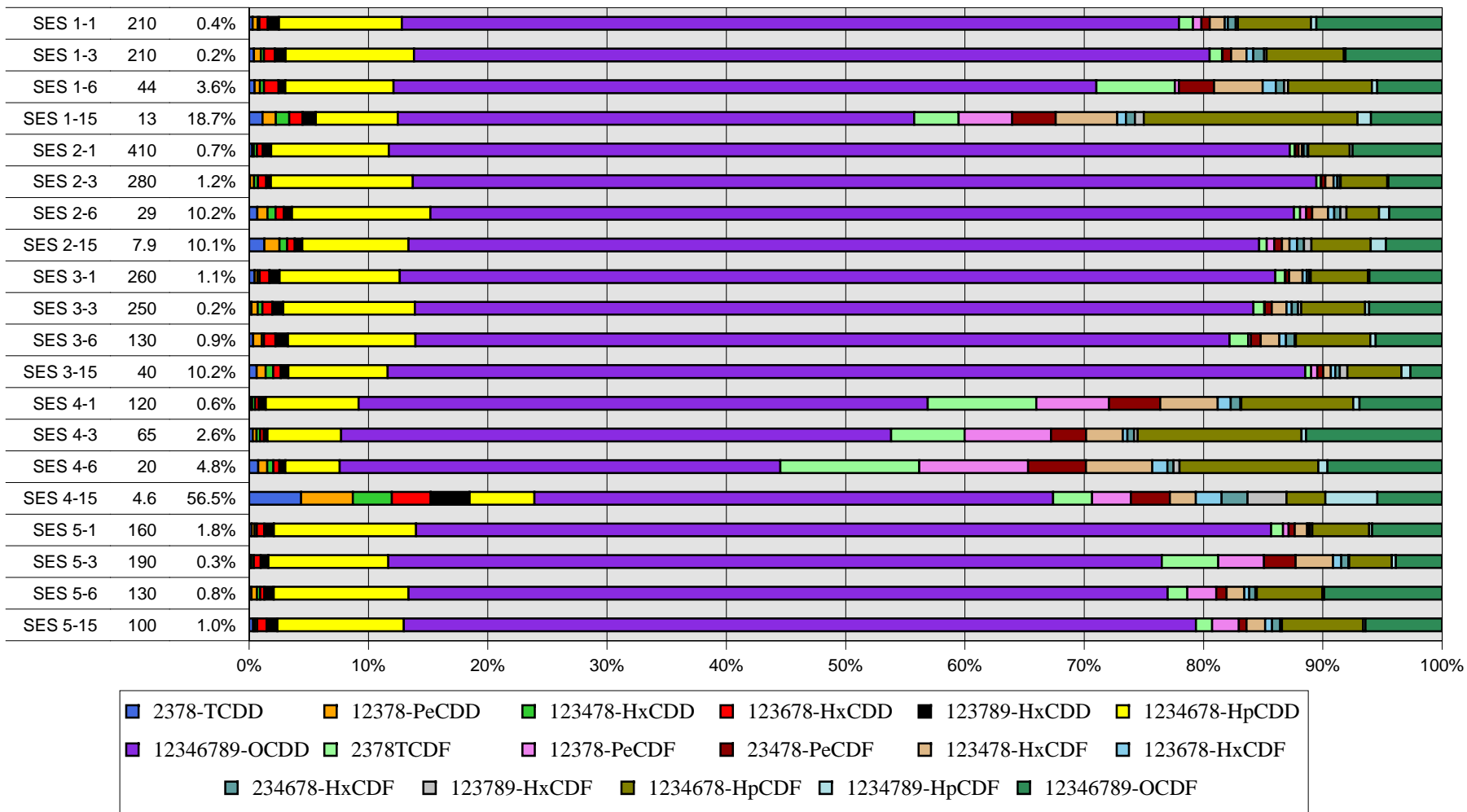
Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY DIOXIN SOIL SAMPLES

SEE FOOTNOTES FOR COLUMN HEADINGS



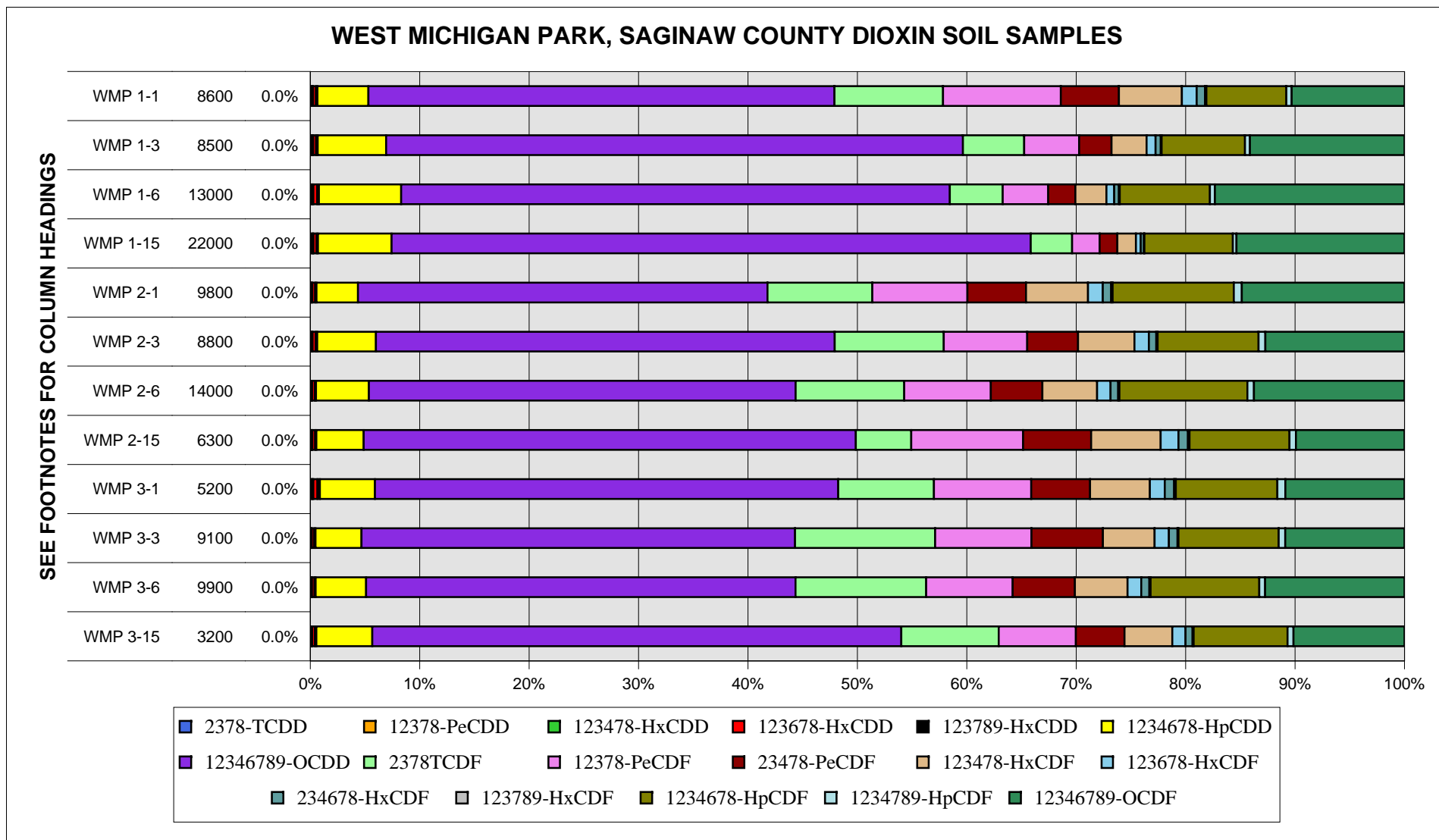
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

WEST MICHIGAN PARK, SAGINAW COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

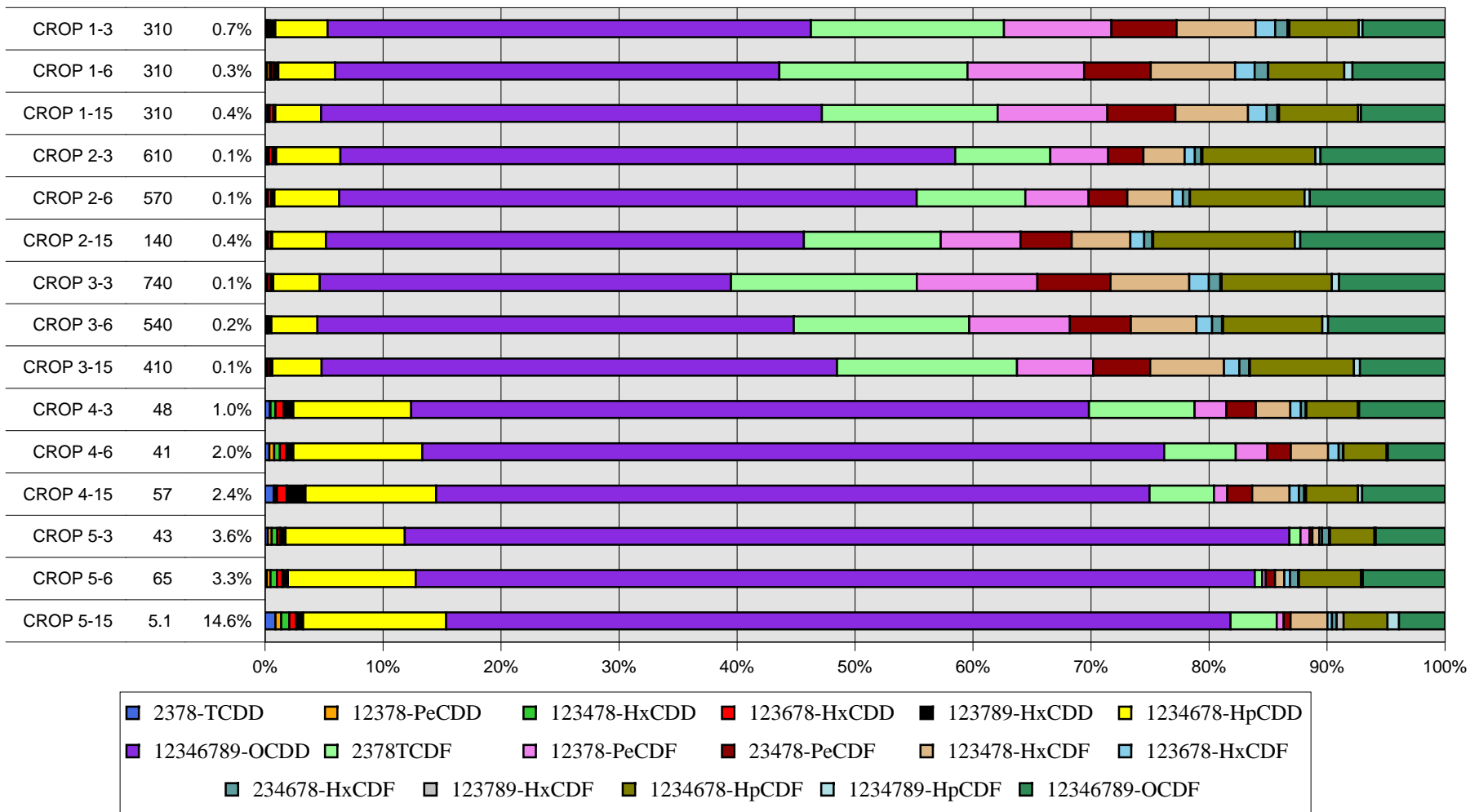
Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

CROPLAND, SAGINAW COUNTY DIOXIN SOIL SAMPLES

SEE FOOTNOTES FOR COLUMN HEADINGS



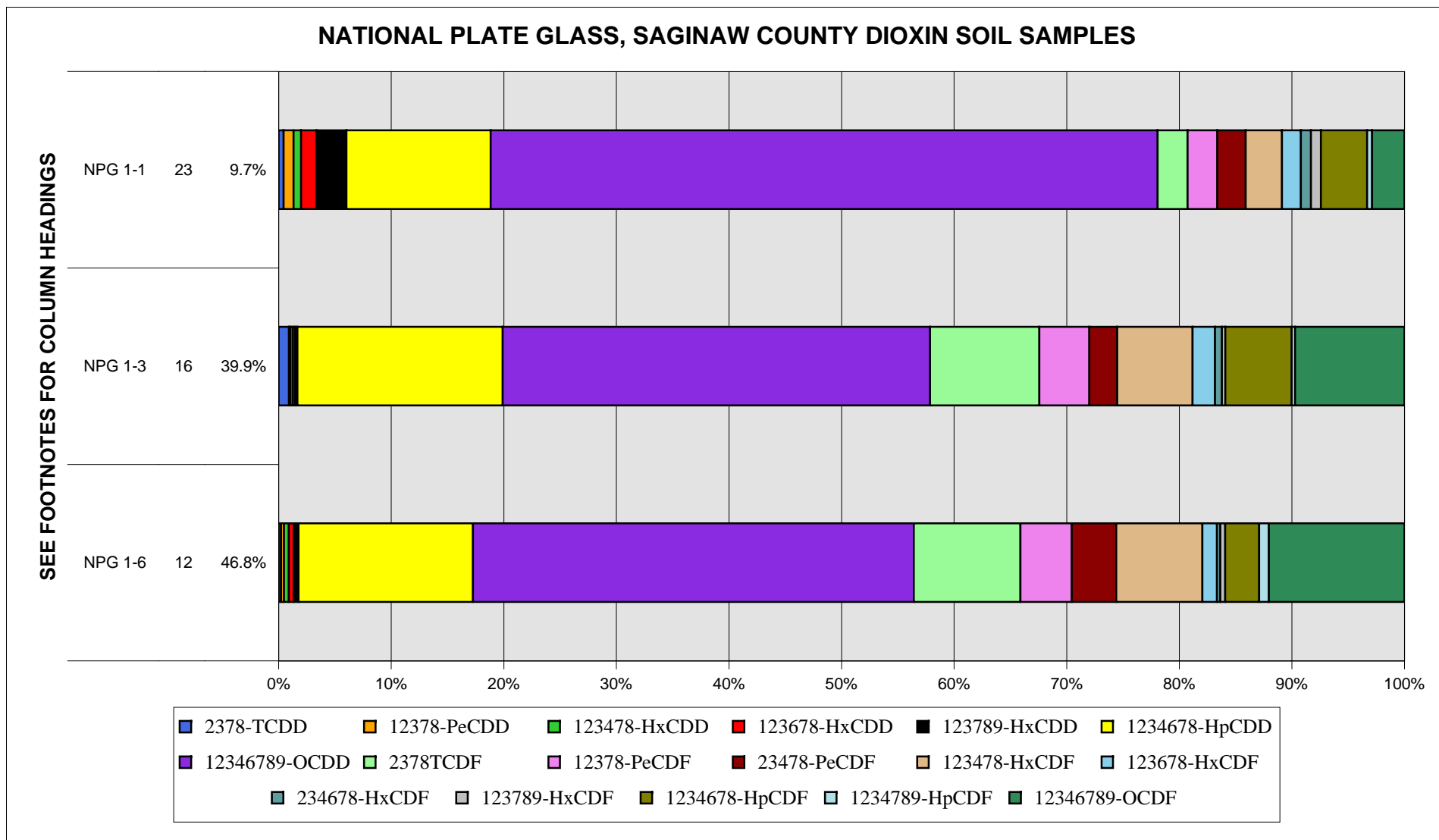
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

NATIONAL PLATE GLASS, SAGINAW COUNTY DIOXIN SOIL SAMPLES



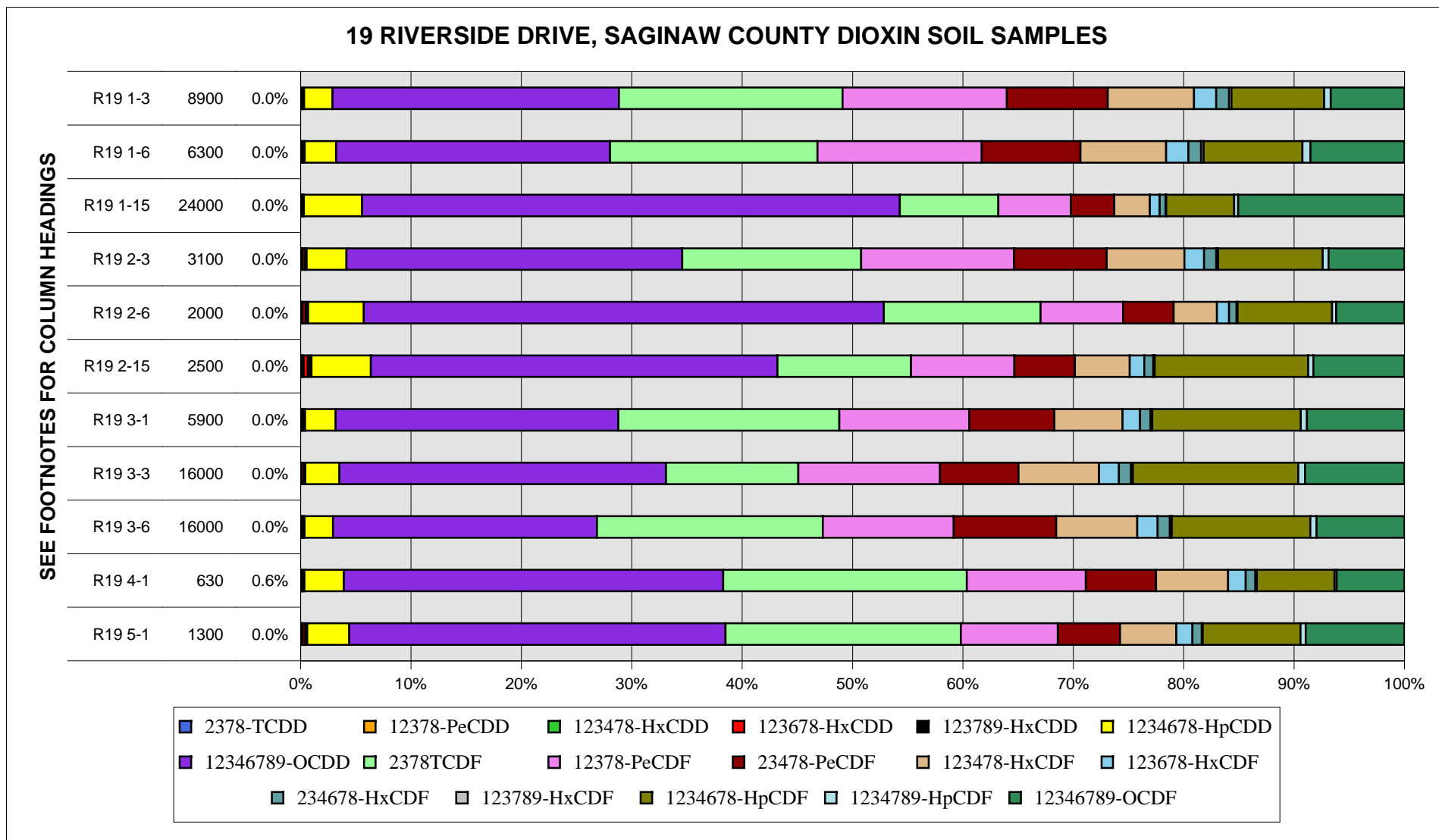
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

19 RIVERSIDE DRIVE, SAGINAW COUNTY DIOXIN SOIL SAMPLES



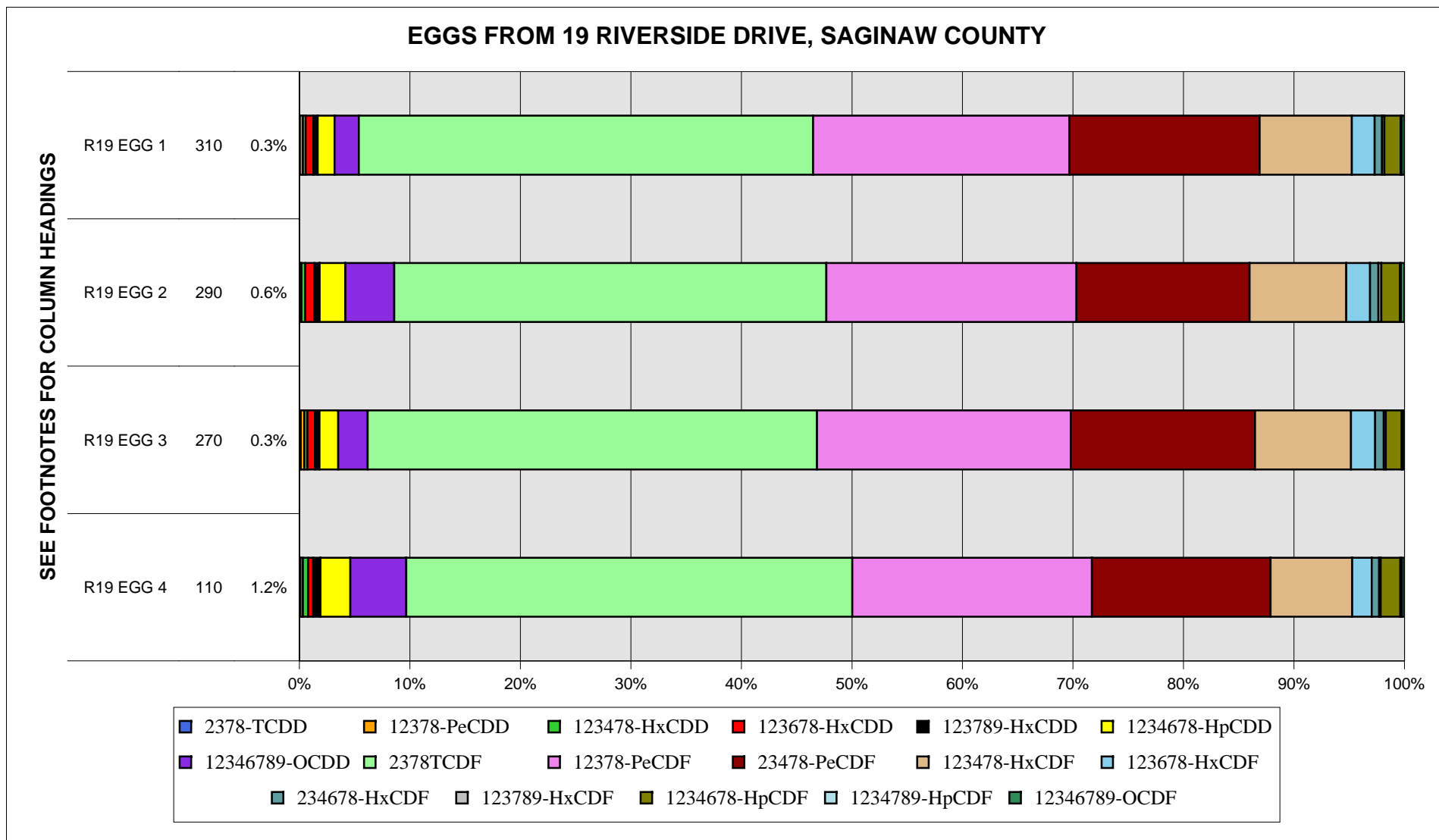
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY



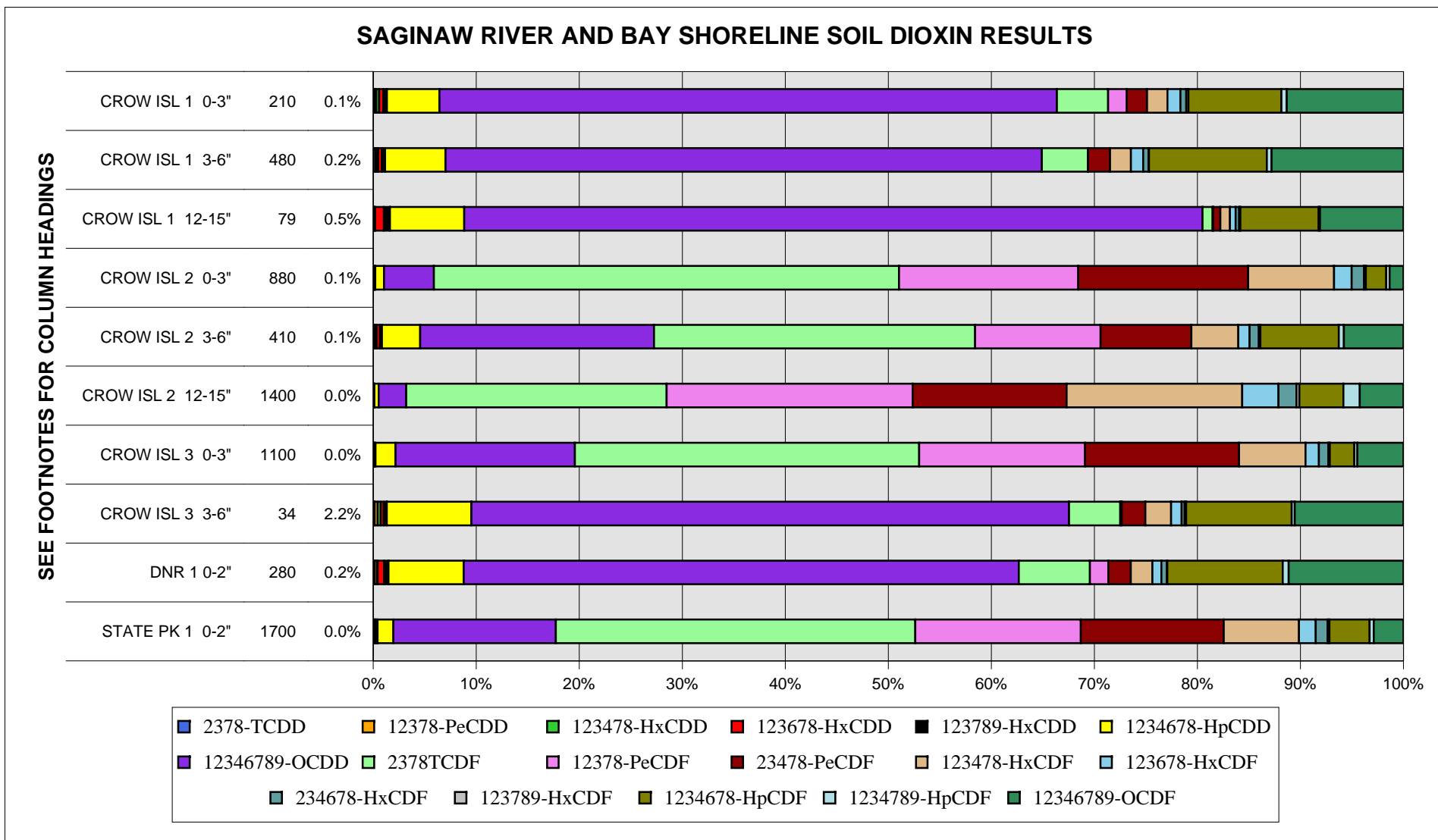
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

SAGINAW RIVER AND BAY SHORELINE SOIL DIOXIN RESULTS



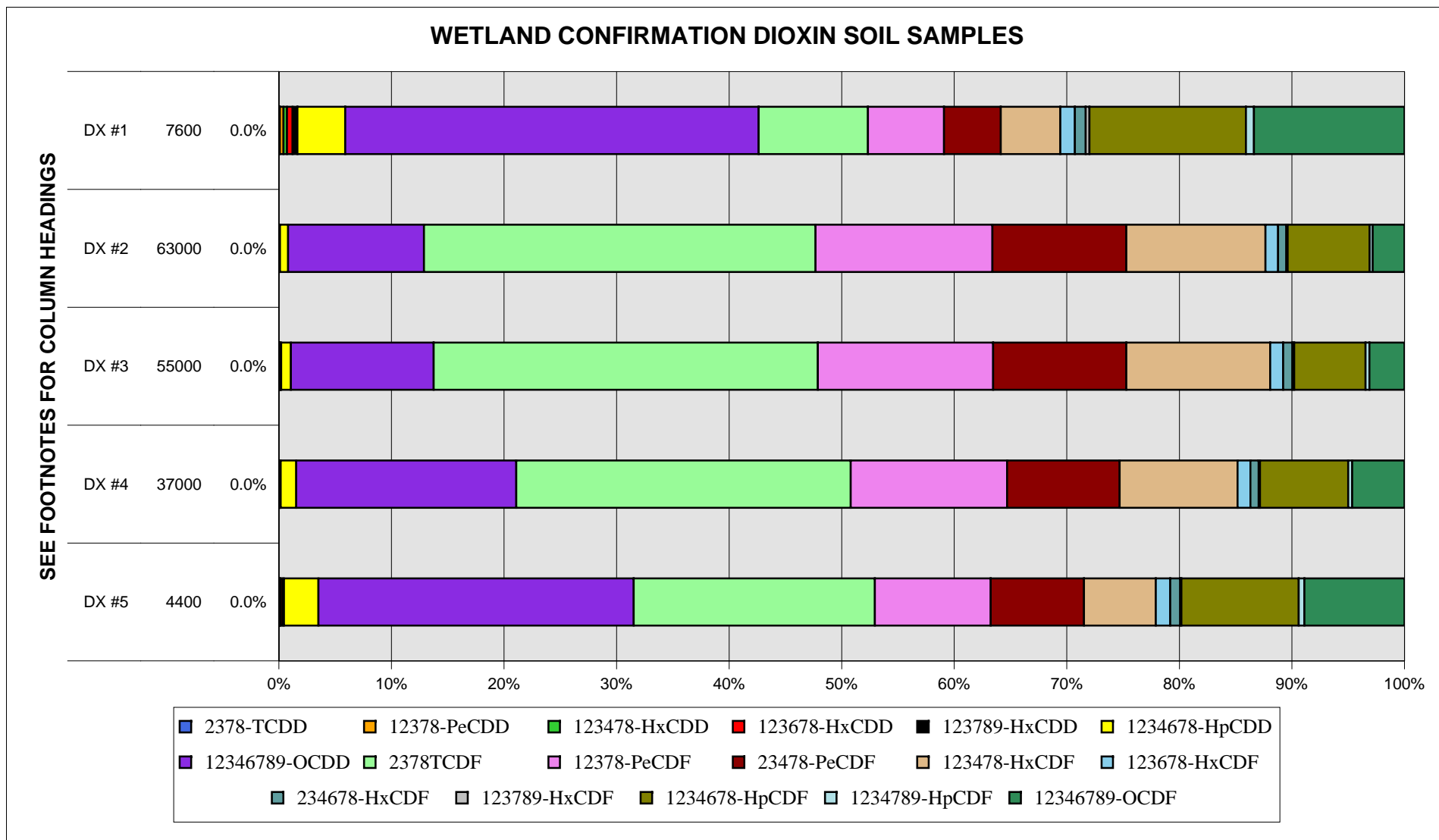
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

WETLAND CONFIRMATION DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

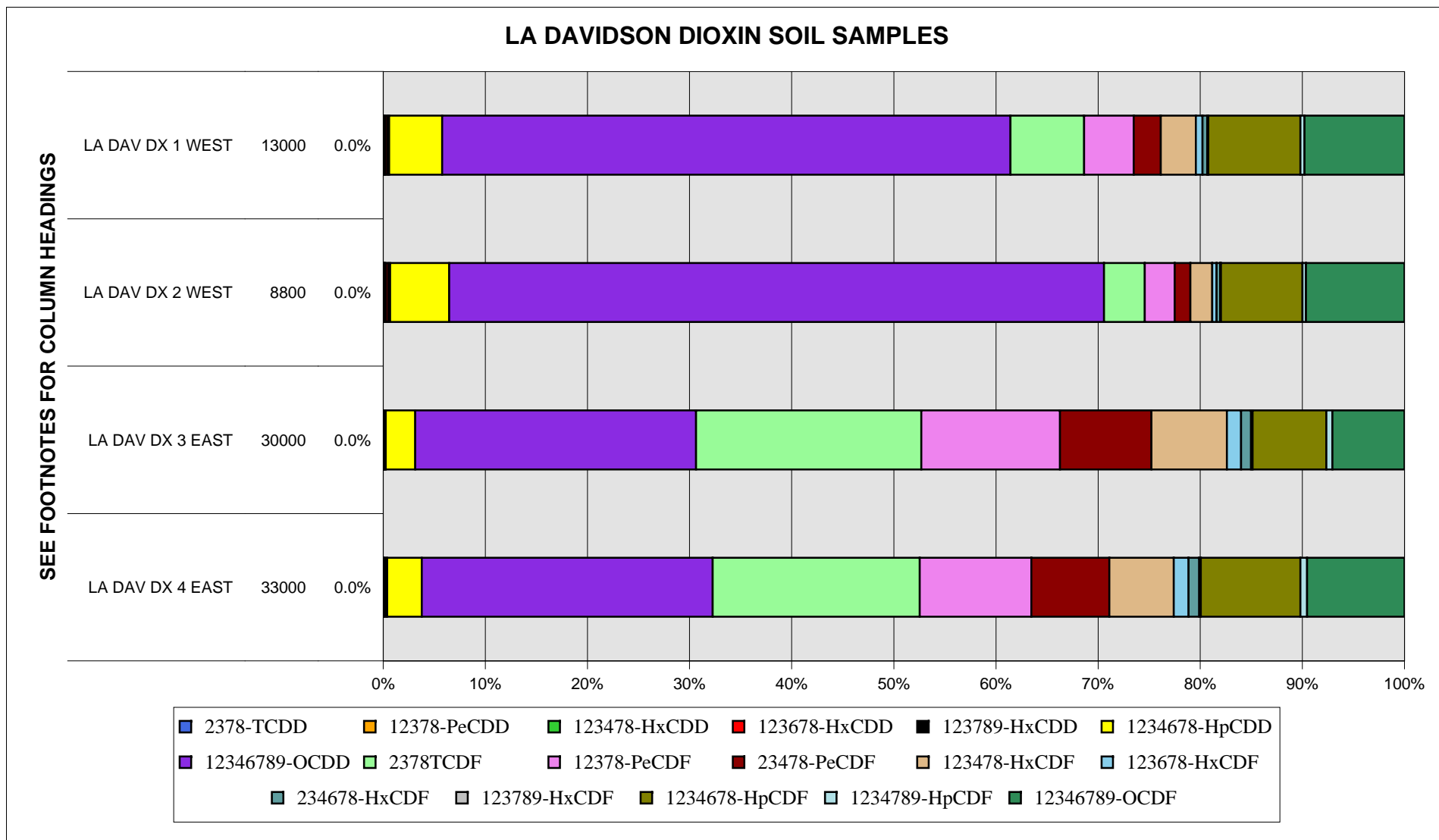
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

CONCENTRATION PROFILES

LA DAVIDSON DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

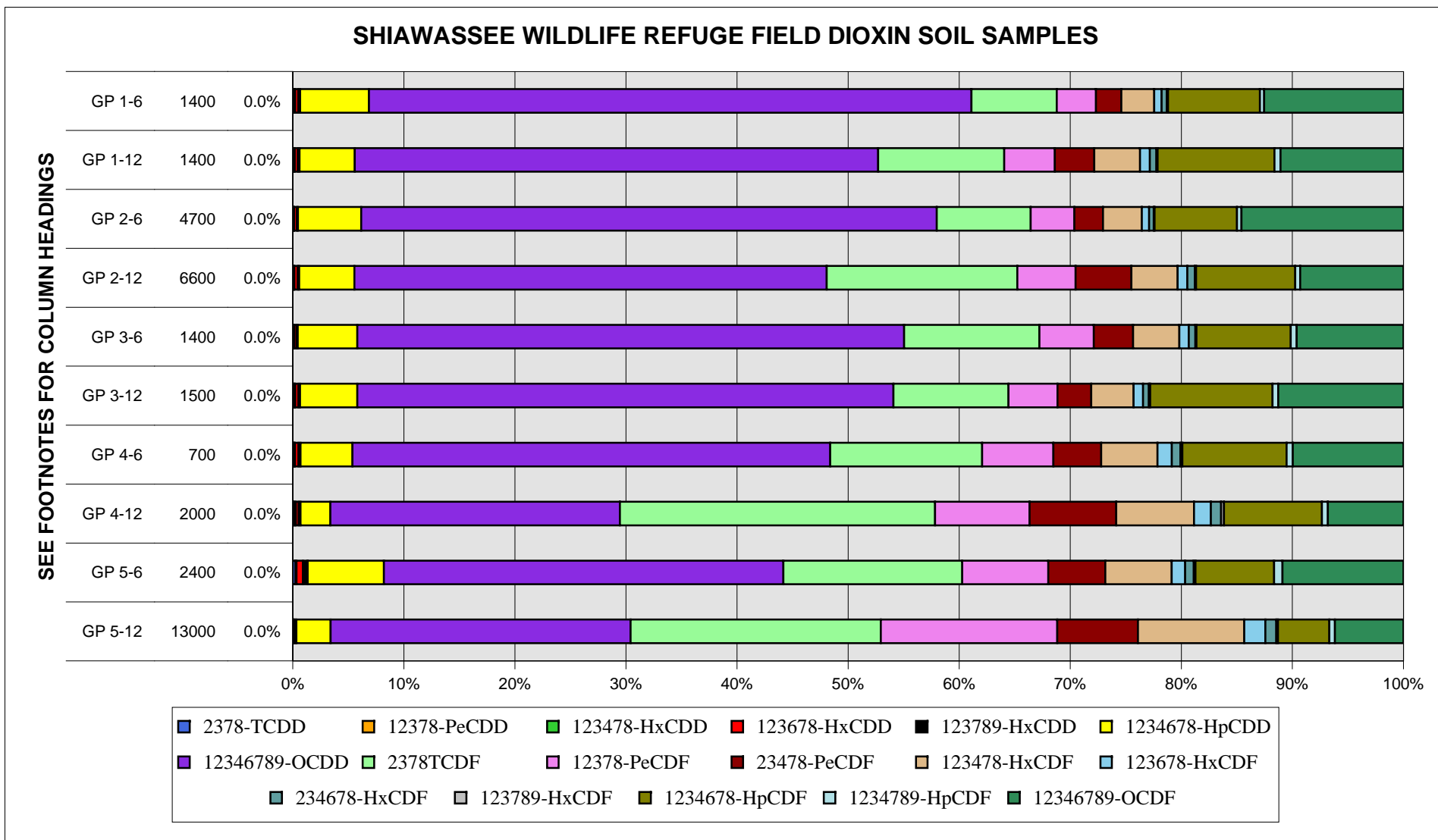
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

CONCENTRATION PROFILES

SHIAWASSEE WILDLIFE REFUGE FIELD DIOXIN SOIL SAMPLES



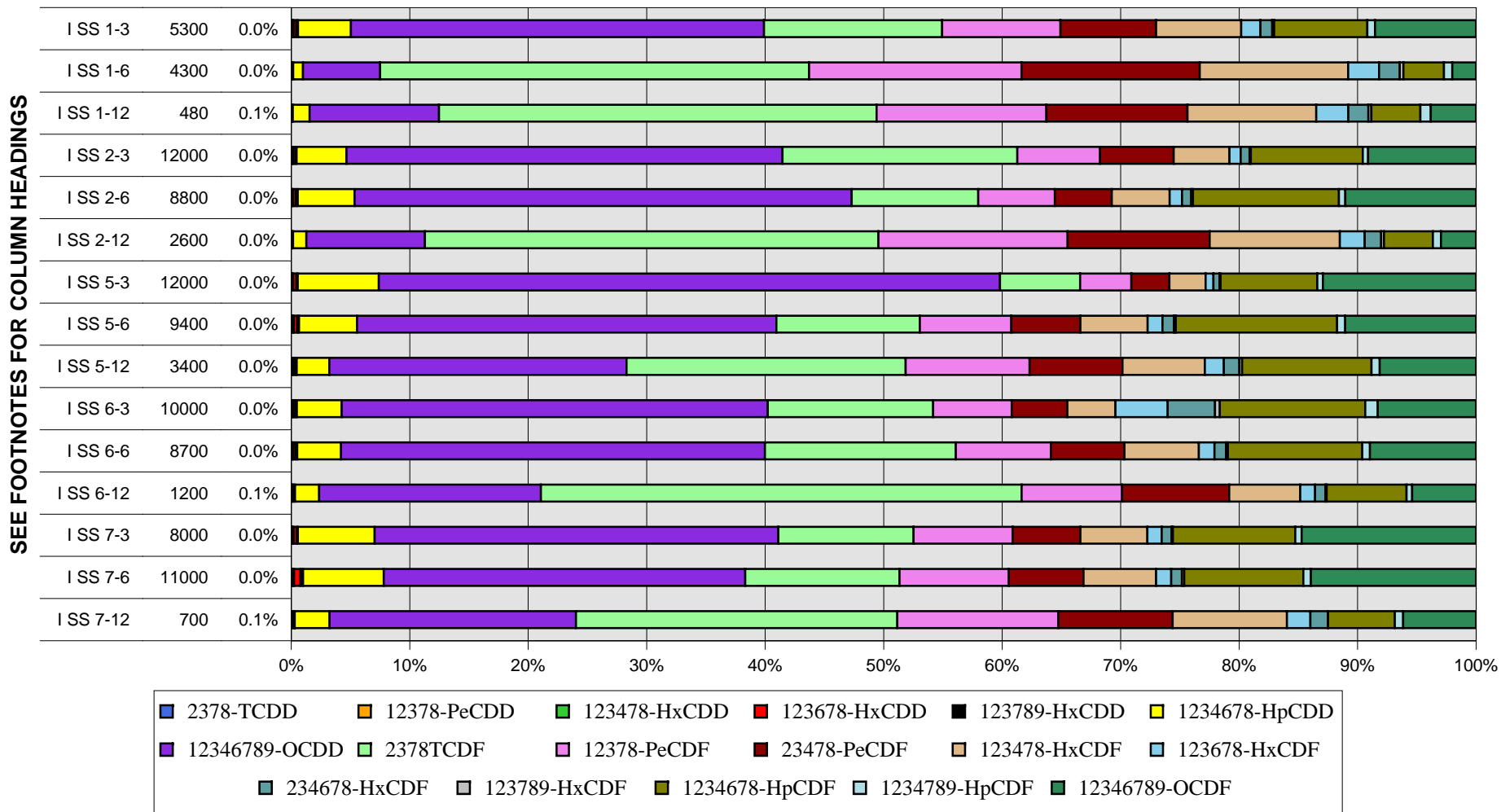
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

SHIAWASSEE WILDLIFE REFUGE FOREST DIOXIN SOIL SAMPLES



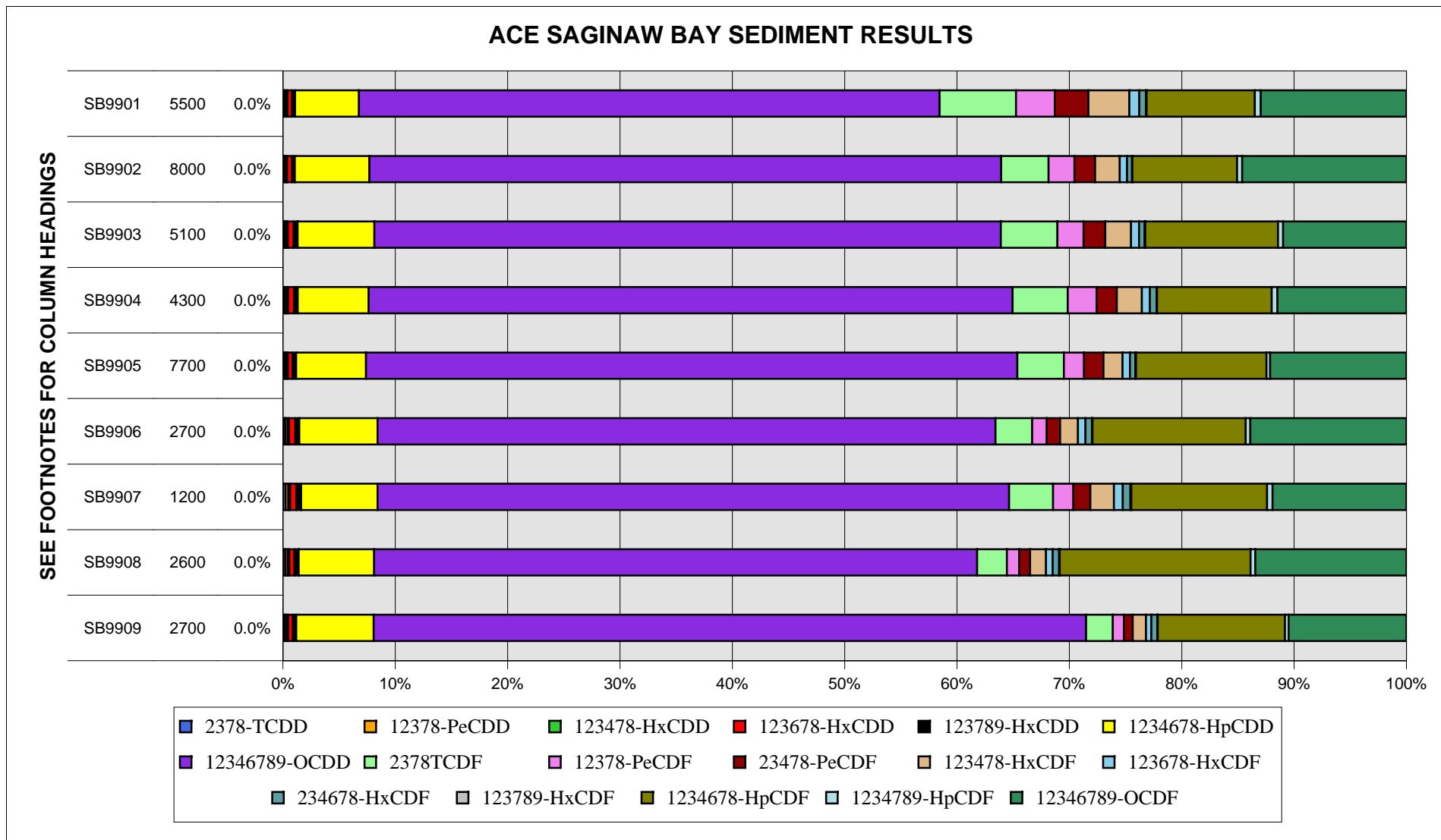
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

ACE SAGINAW BAY SEDIMENT RESULTS



Column 1 - Sample Location

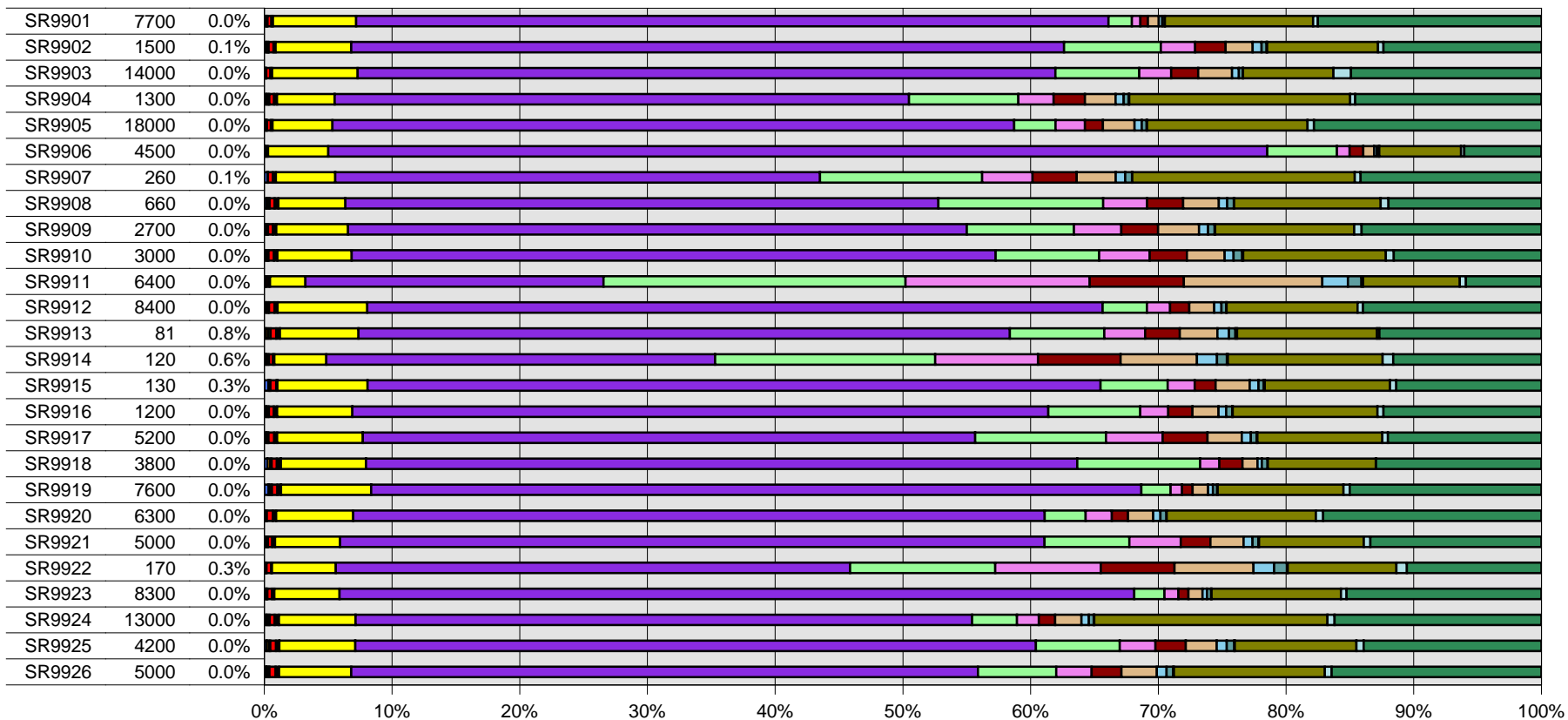
Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

CONCENTRATION PROFILES

ACE SAGINAW RIVER SEDIMENT RESULTS

SEE FOOTNOTES FOR COLUMN HEADINGS



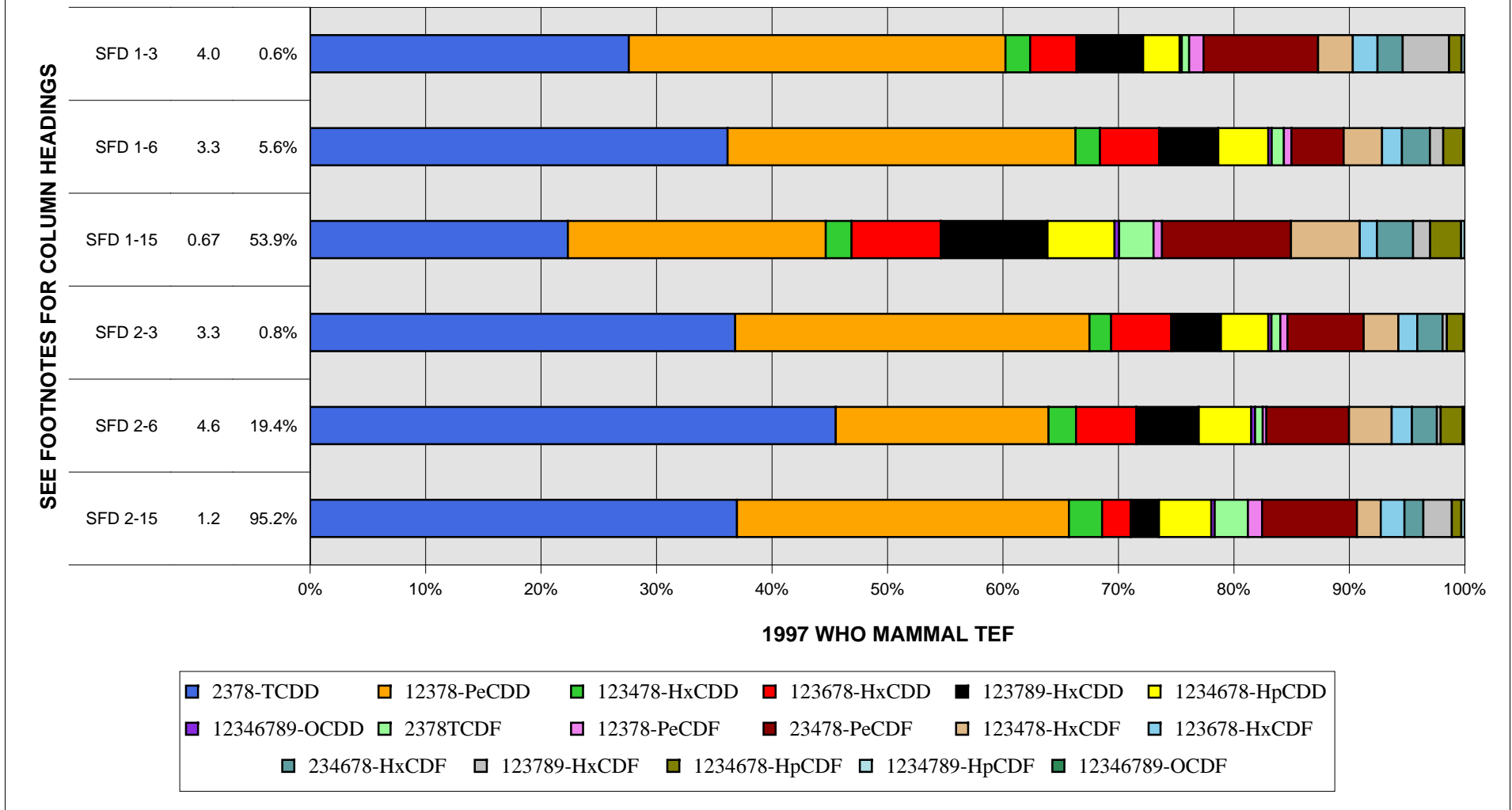
Column 1 - Sample Location

Column 2 - Total Concentration: This value does not represent toxicity and should not be compared to Part 201 criteria. All total concentrations represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

TITTABAWASSEE RIVER AT SANFORD, MIDLAND COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

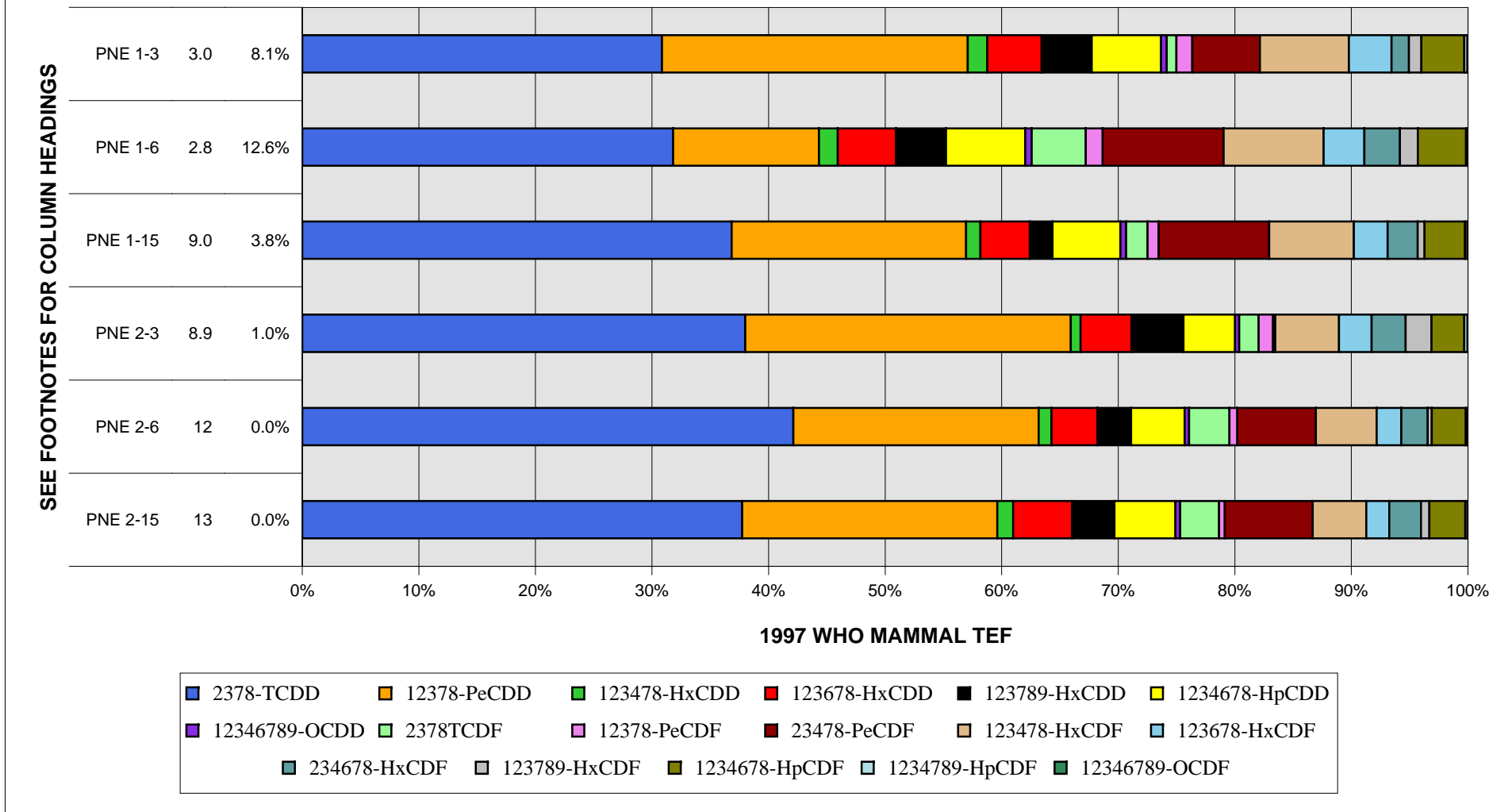
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

PINE RIVER, MIDLAND COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

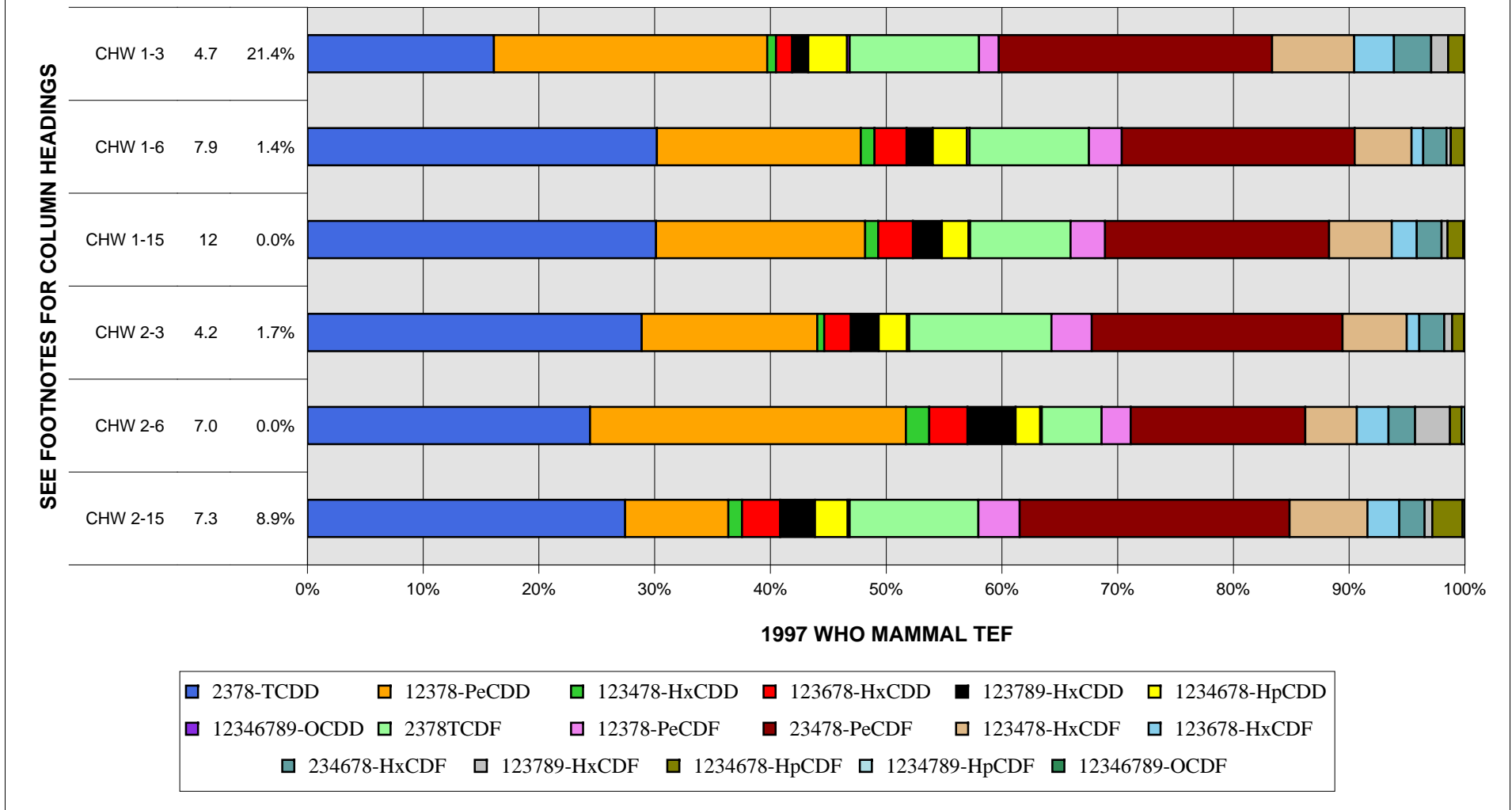
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

CHIPPEWA RIVER, MIDLAND COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

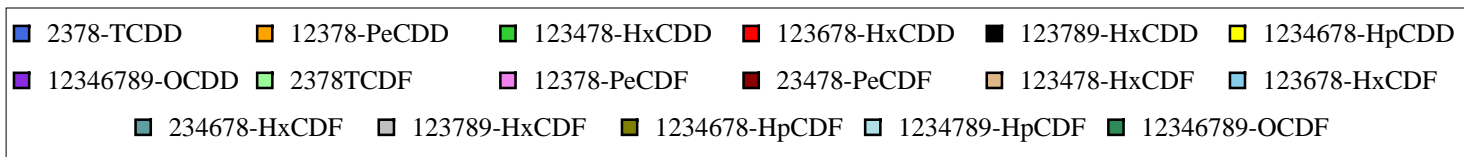
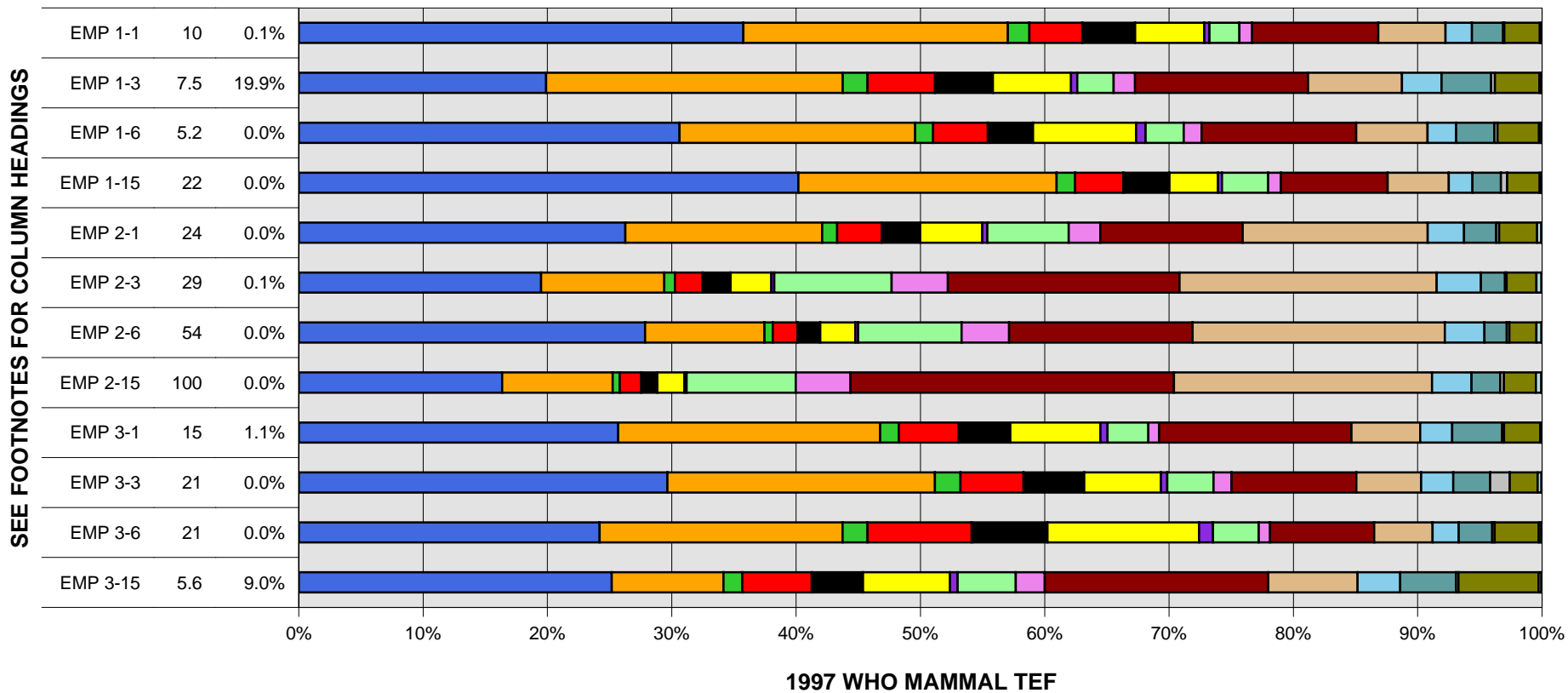
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

EMERSON PARK, MIDLAND COUNTY DIOXIN SOIL SAMPLES



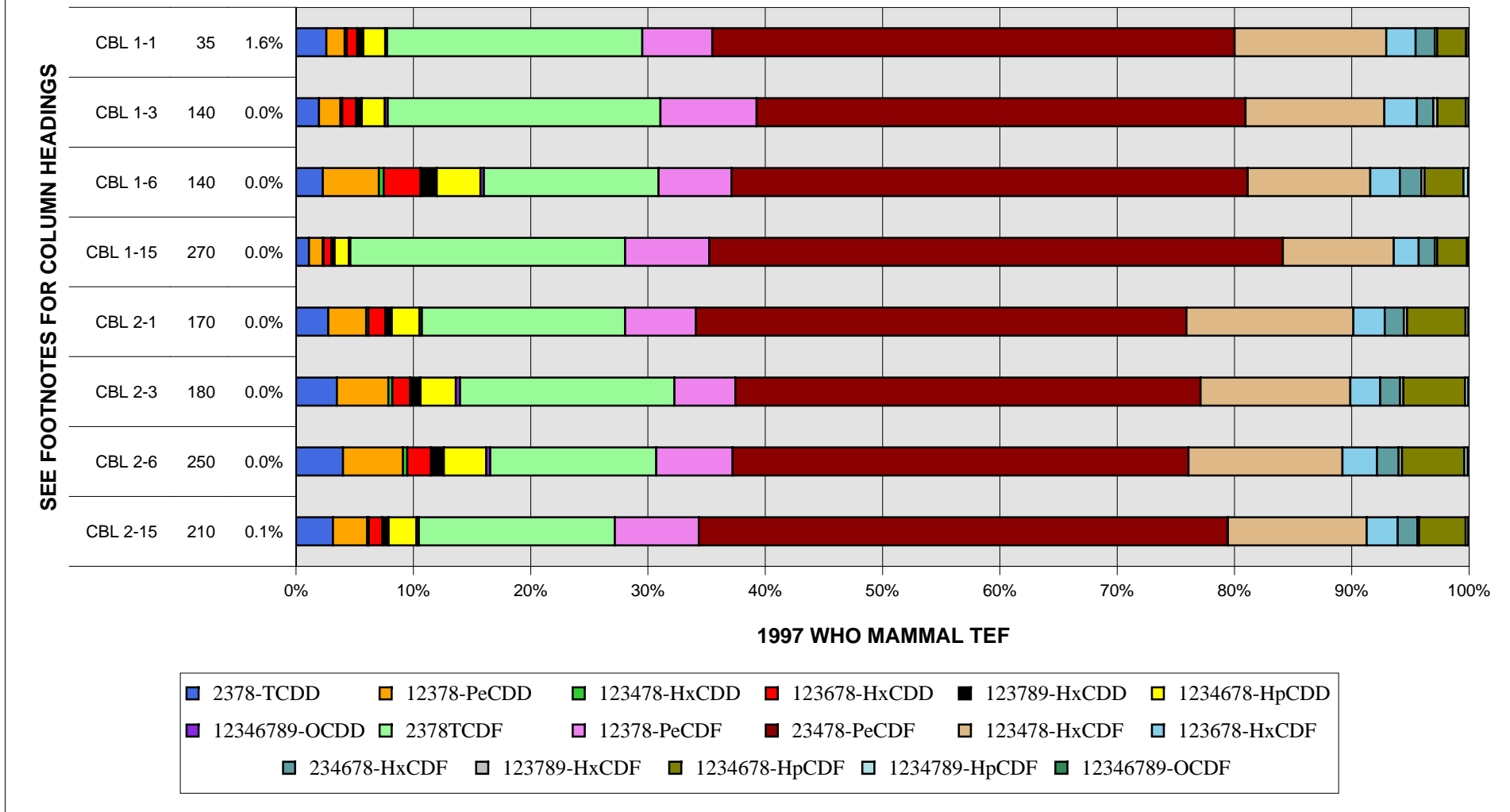
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

CALDWELL BOAT LAUNCH, MIDLAND COUNTY DIOXIN SOIL SAMPLES



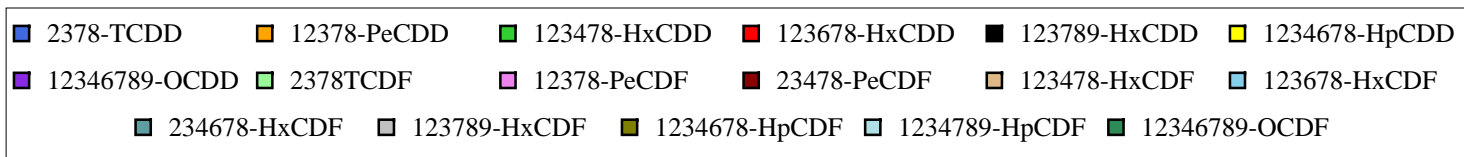
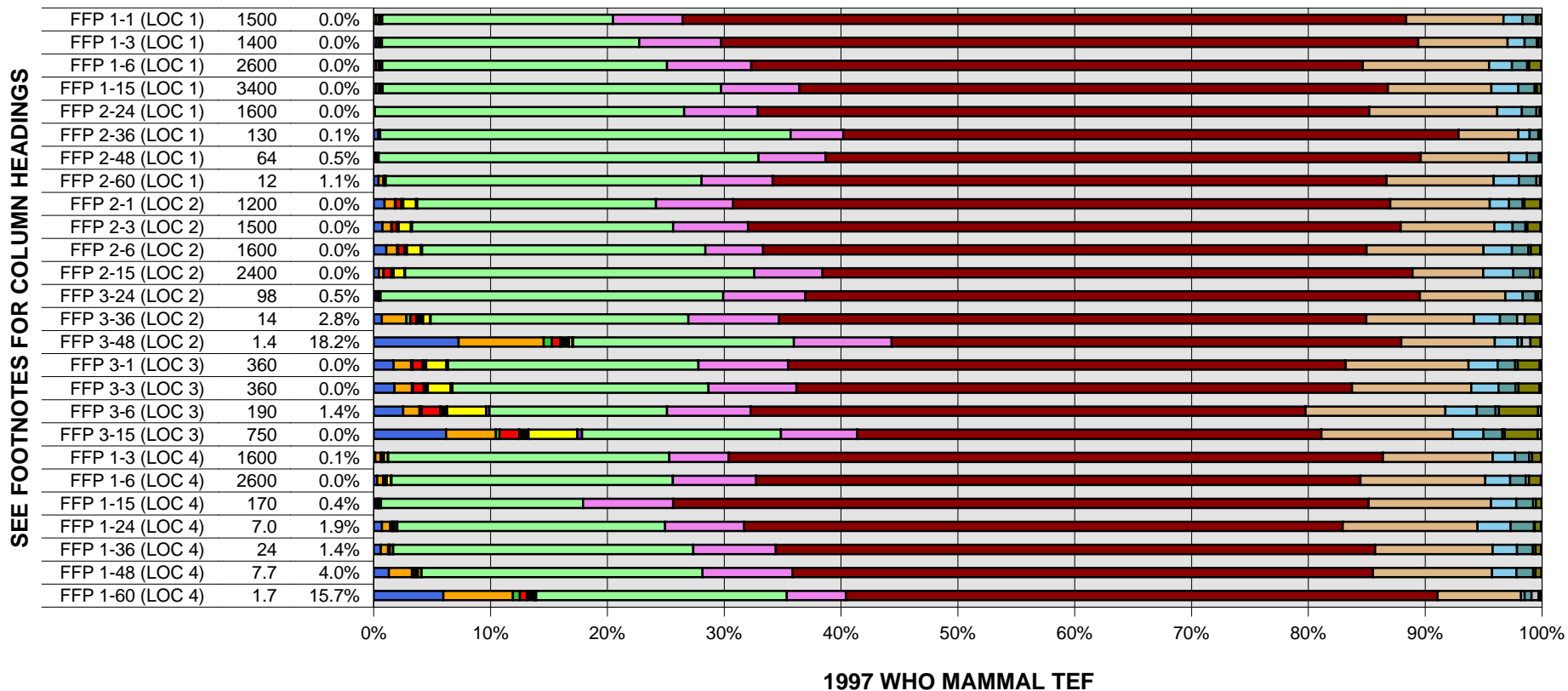
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

FREELAND FESTIVAL PARK, SAGINAW COUNTY DIOXIN SOIL SAMPLES



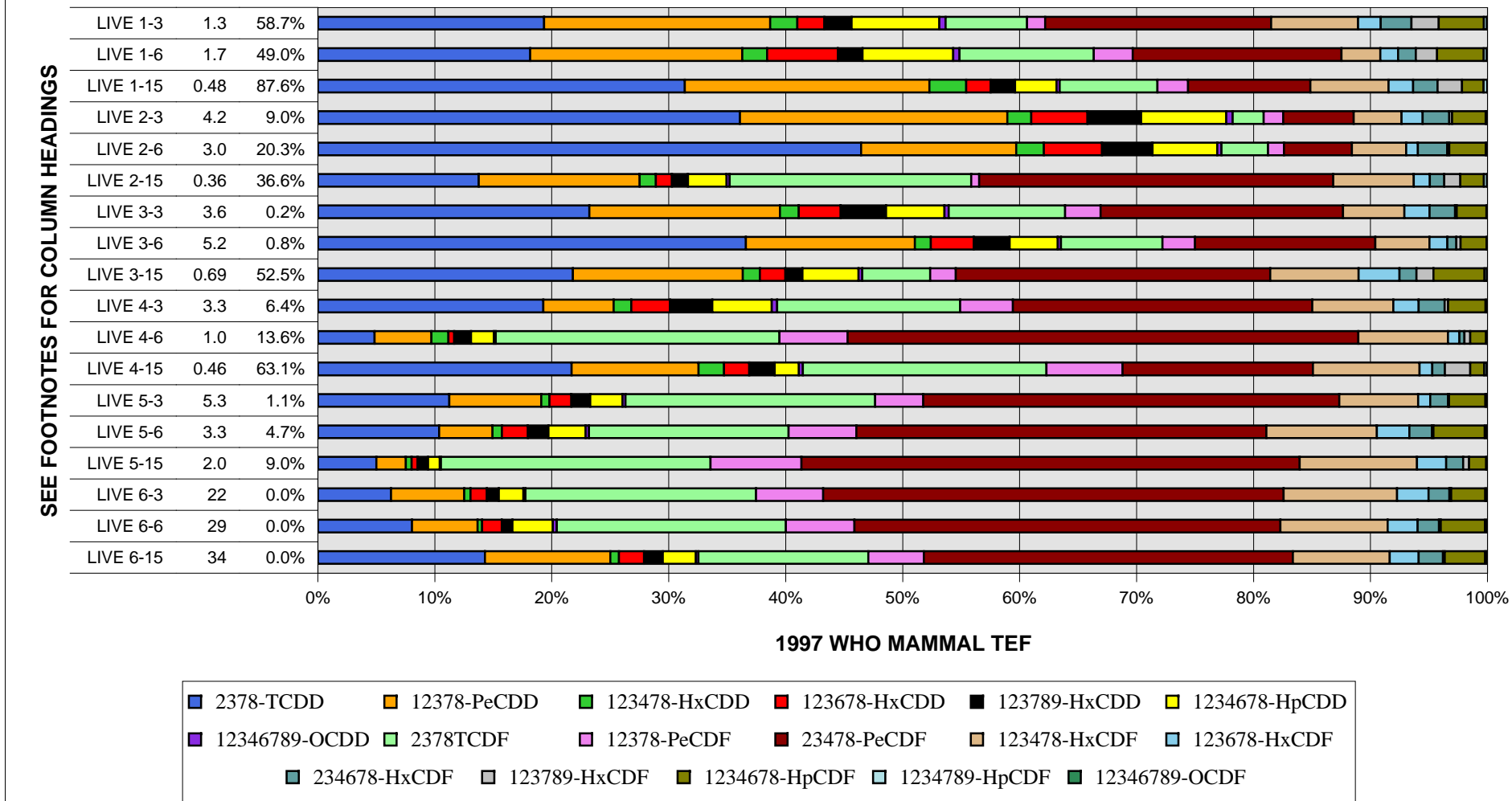
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

LIVESTOCK FARM, SAGINAW COUNTY DIOXIN SOIL SAMPLES



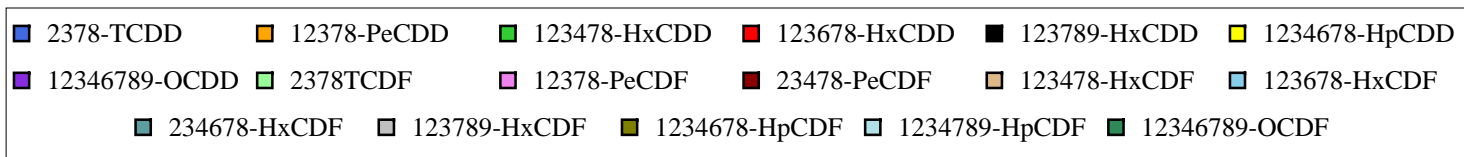
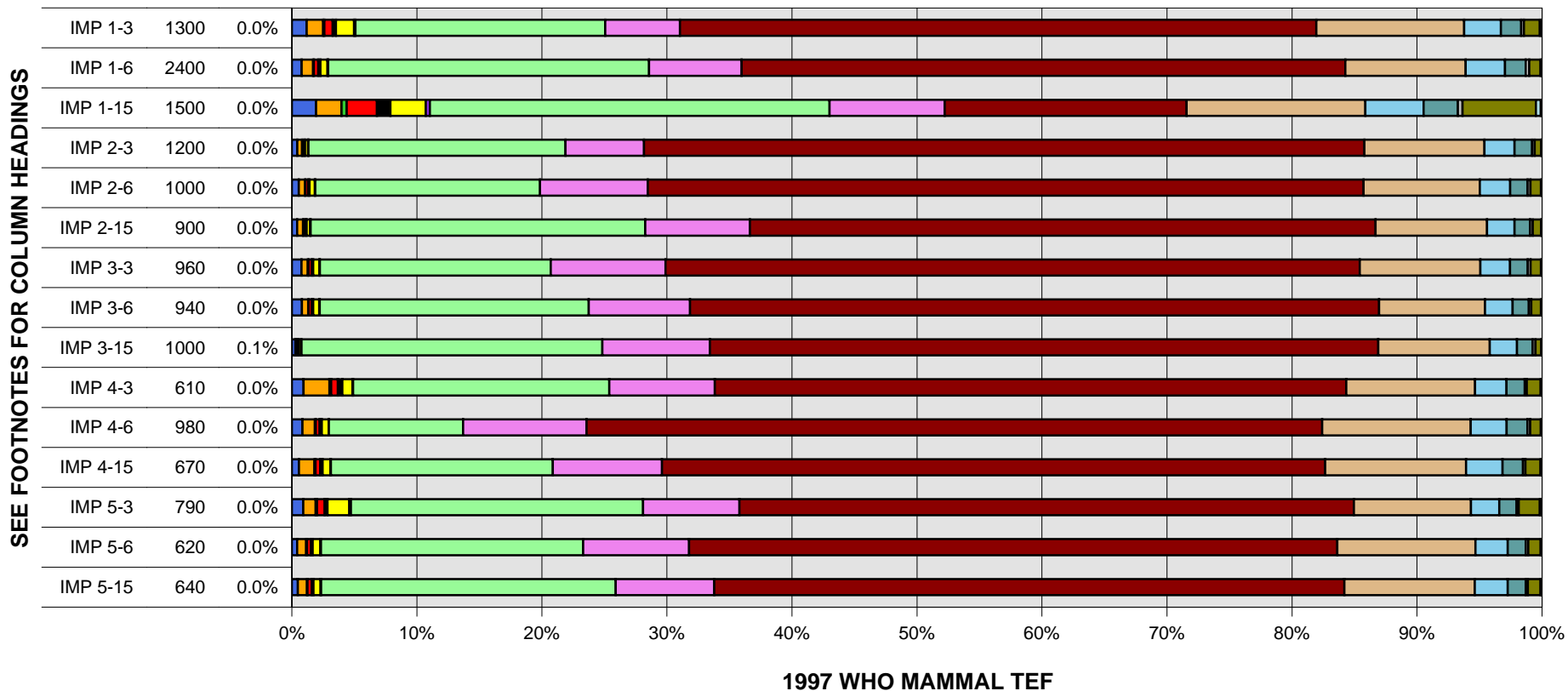
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

IMERMAN PARK, SAGINAW COUNTY, DIOXIN SOIL SAMPLES 1 - 5



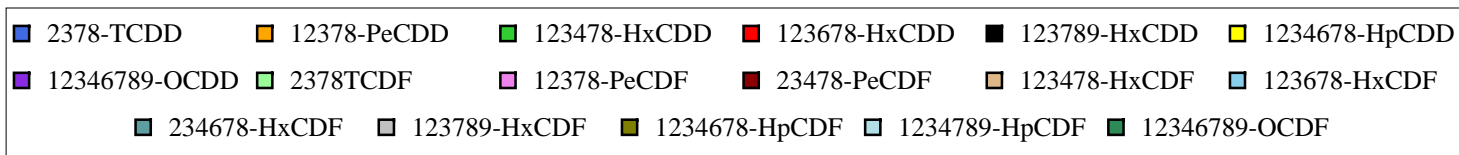
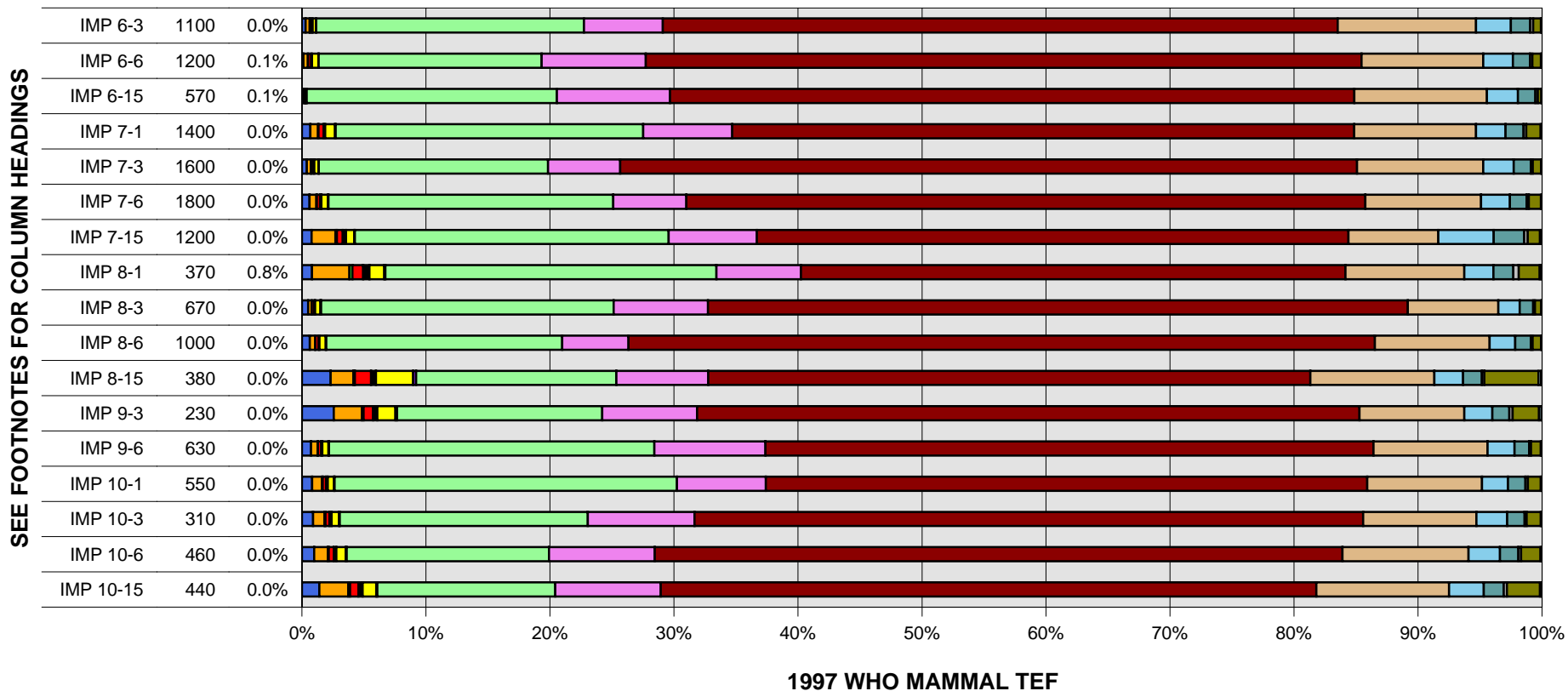
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

IMERMAN PARK , SAGINAW COUNTY, DIOXIN SOIL SAMPLES 6 - 10



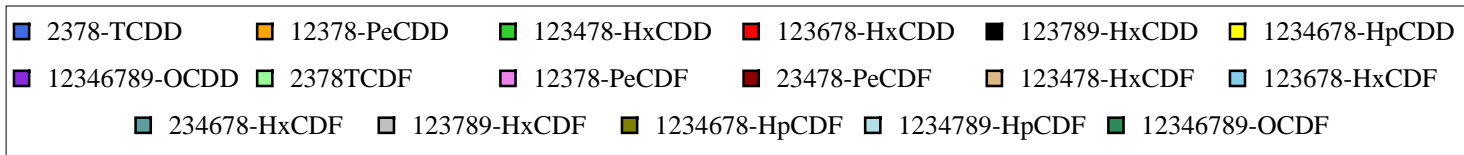
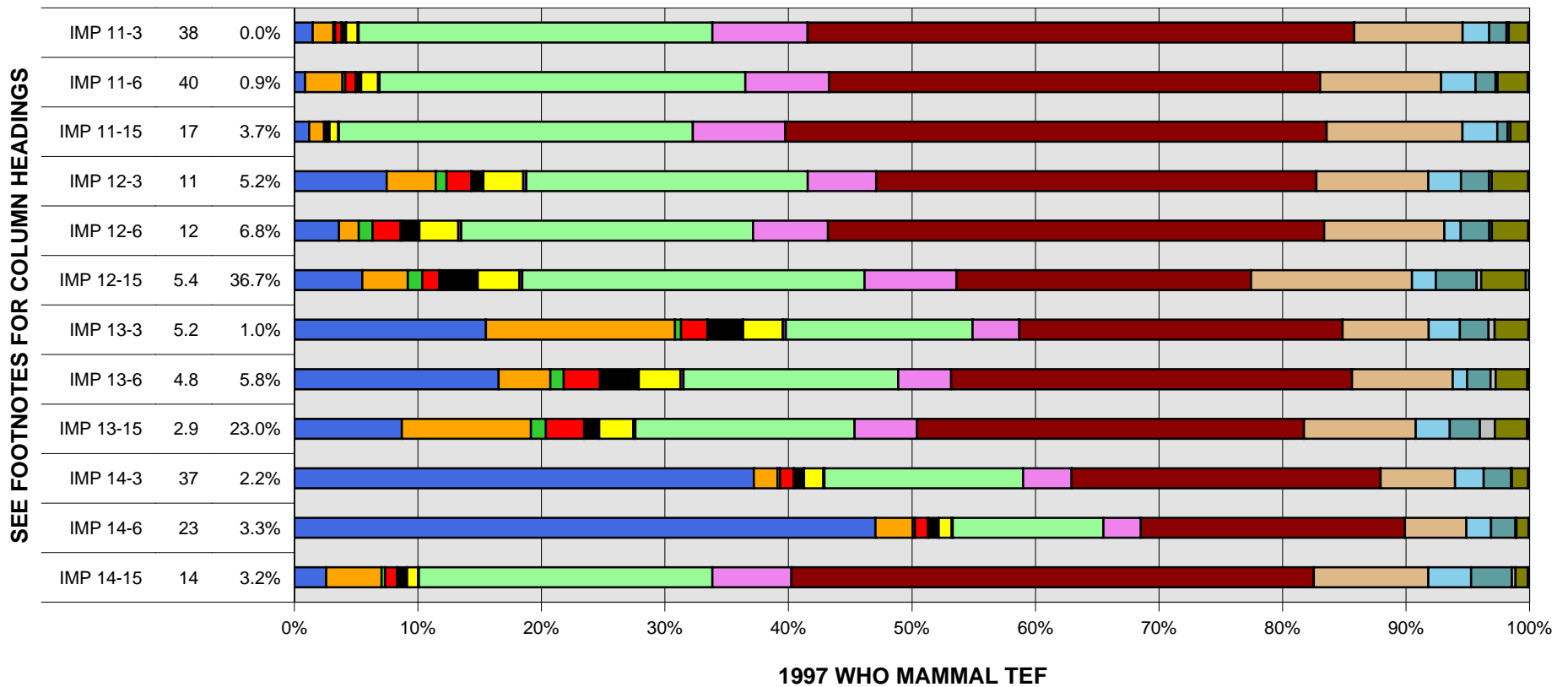
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

IMERMAN PARK, SAGINAW COUNTY, DIOXIN SOIL SAMPLES 11 - 14



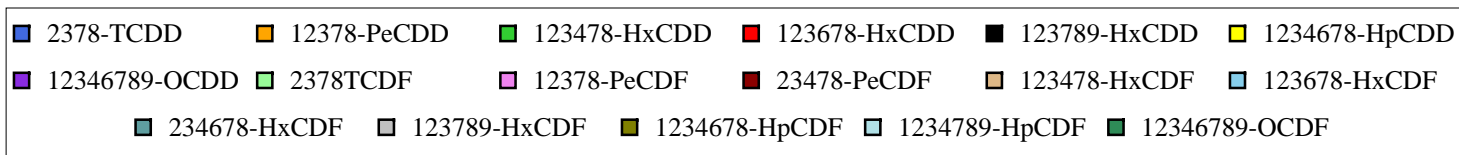
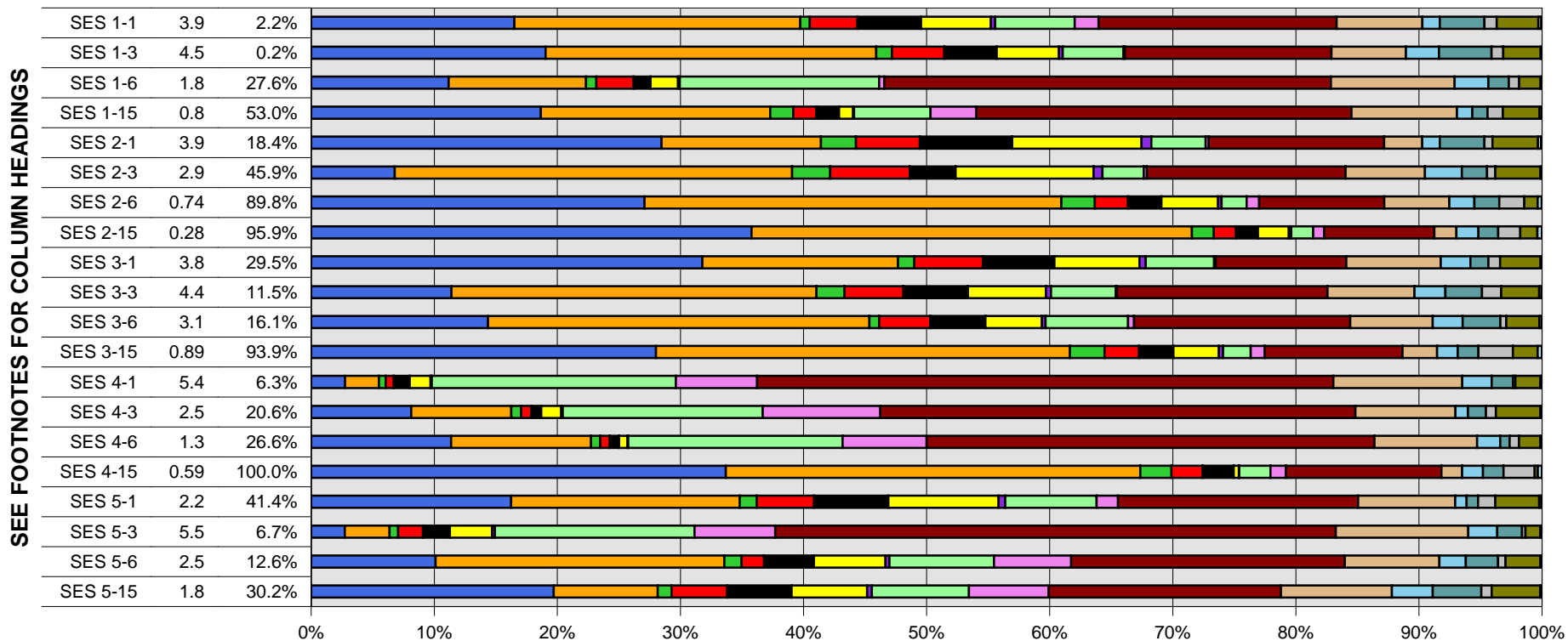
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

SHIELDS ELEMENTARY SCHOOL, SAGINAW COUNTY DIOXIN SOIL SAMPLES



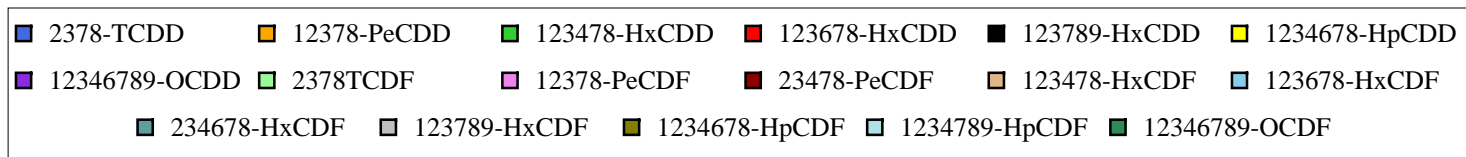
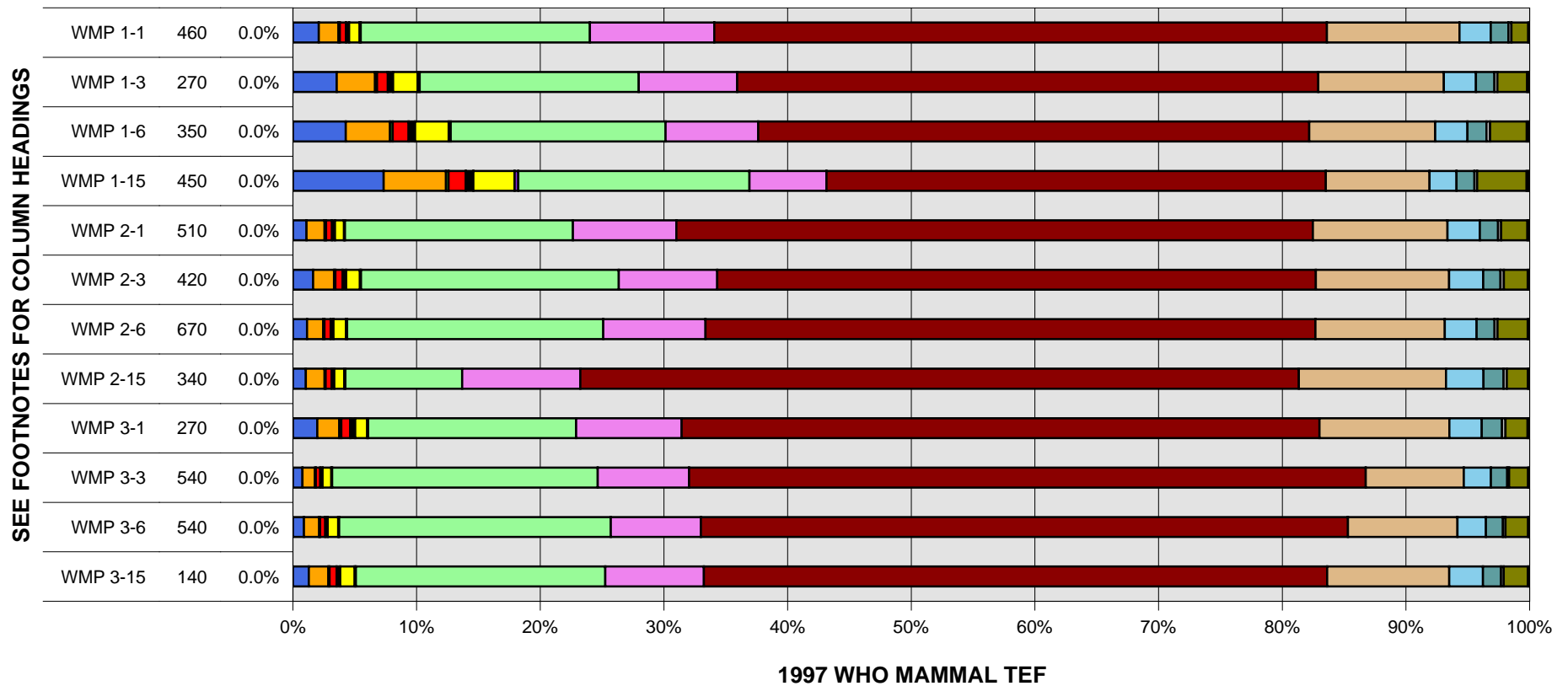
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

WEST MICHIGAN PARK, SAGINAW COUNTY DIOXIN SOIL SAMPLES



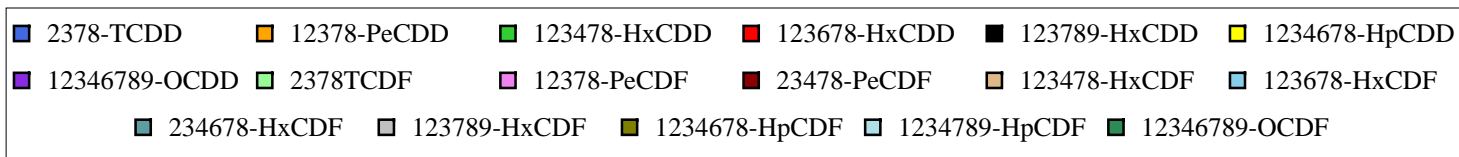
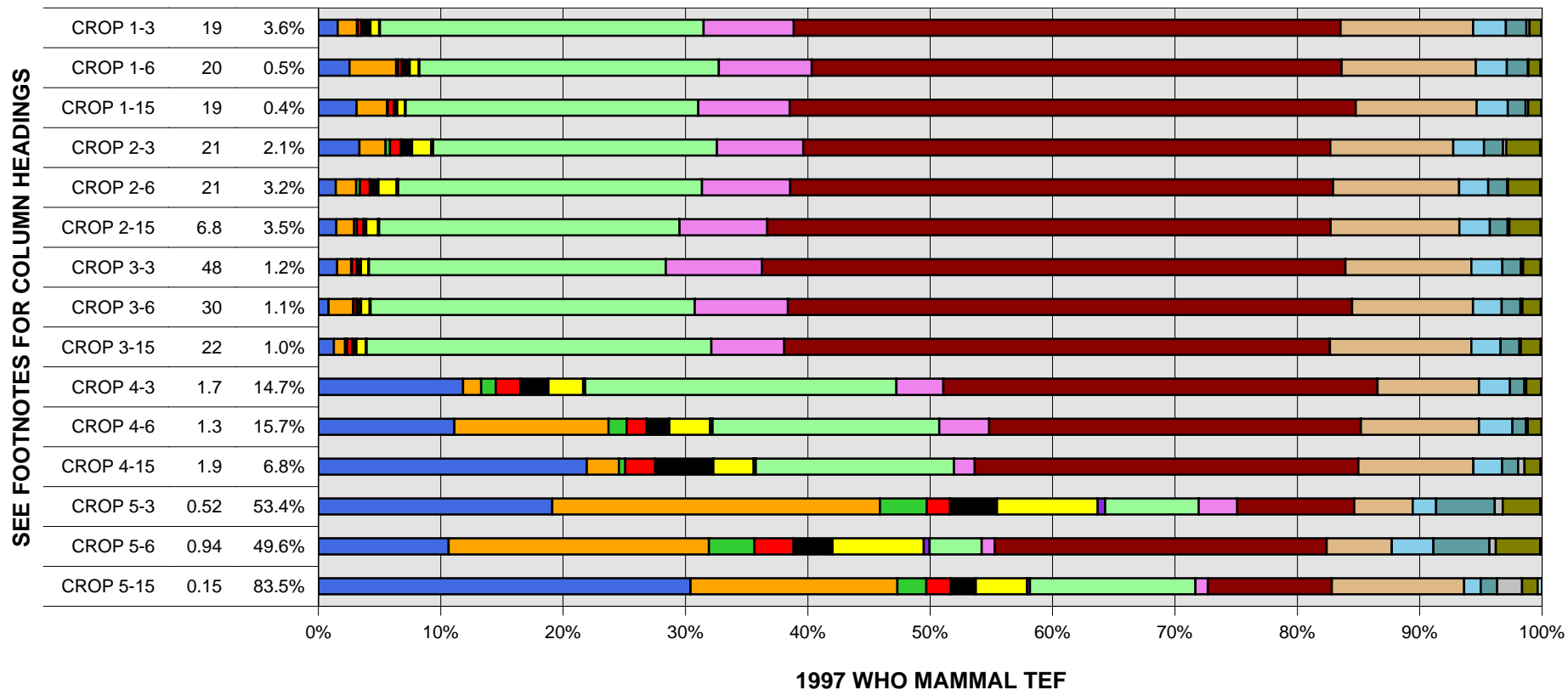
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

CROPLAND, SAGINAW COUNTY DIOXIN SOIL SAMPLES



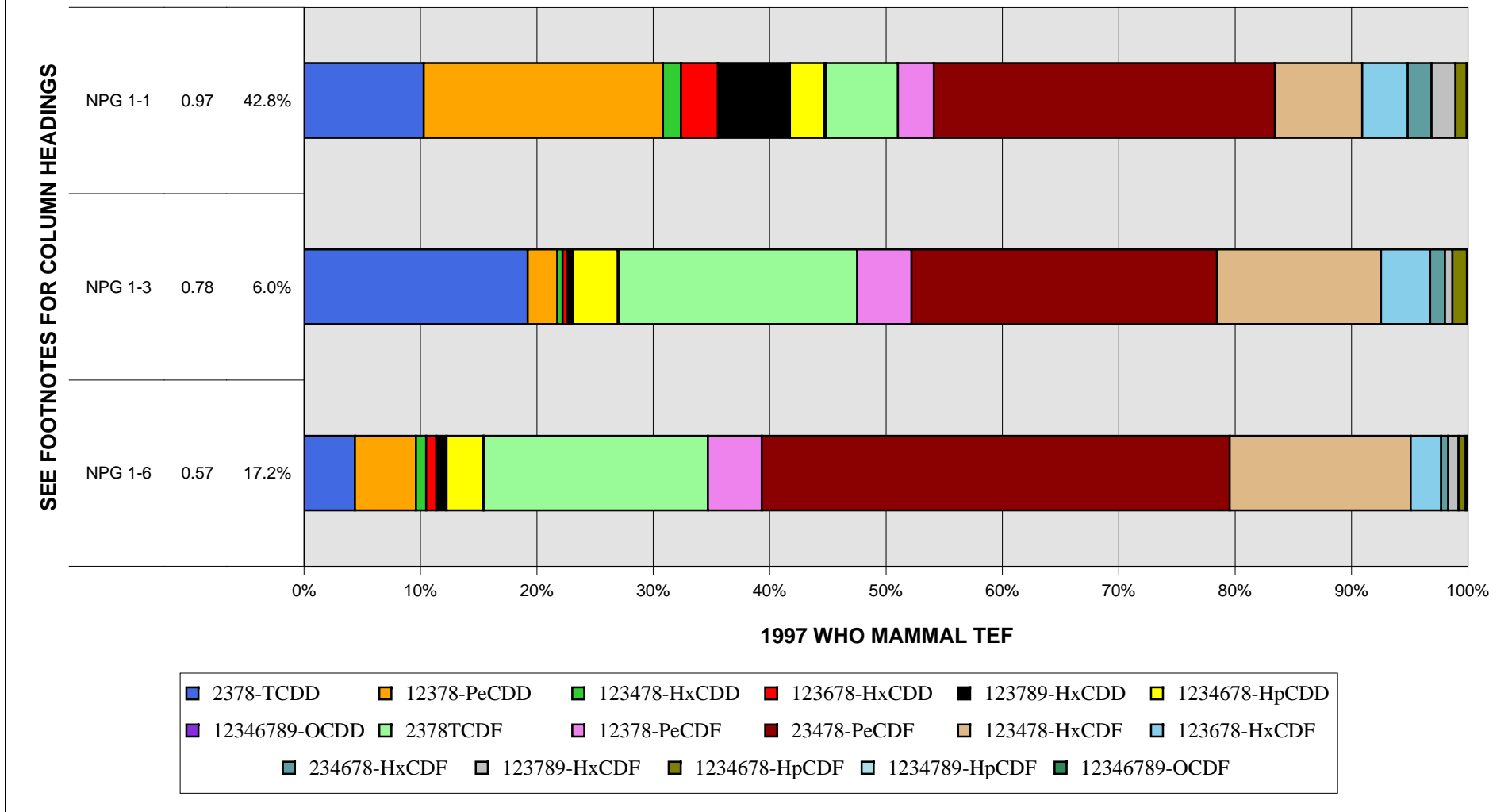
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

NATIONAL PLATE GLASS, SAGINAW COUNTY DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at ½ of the detection level.

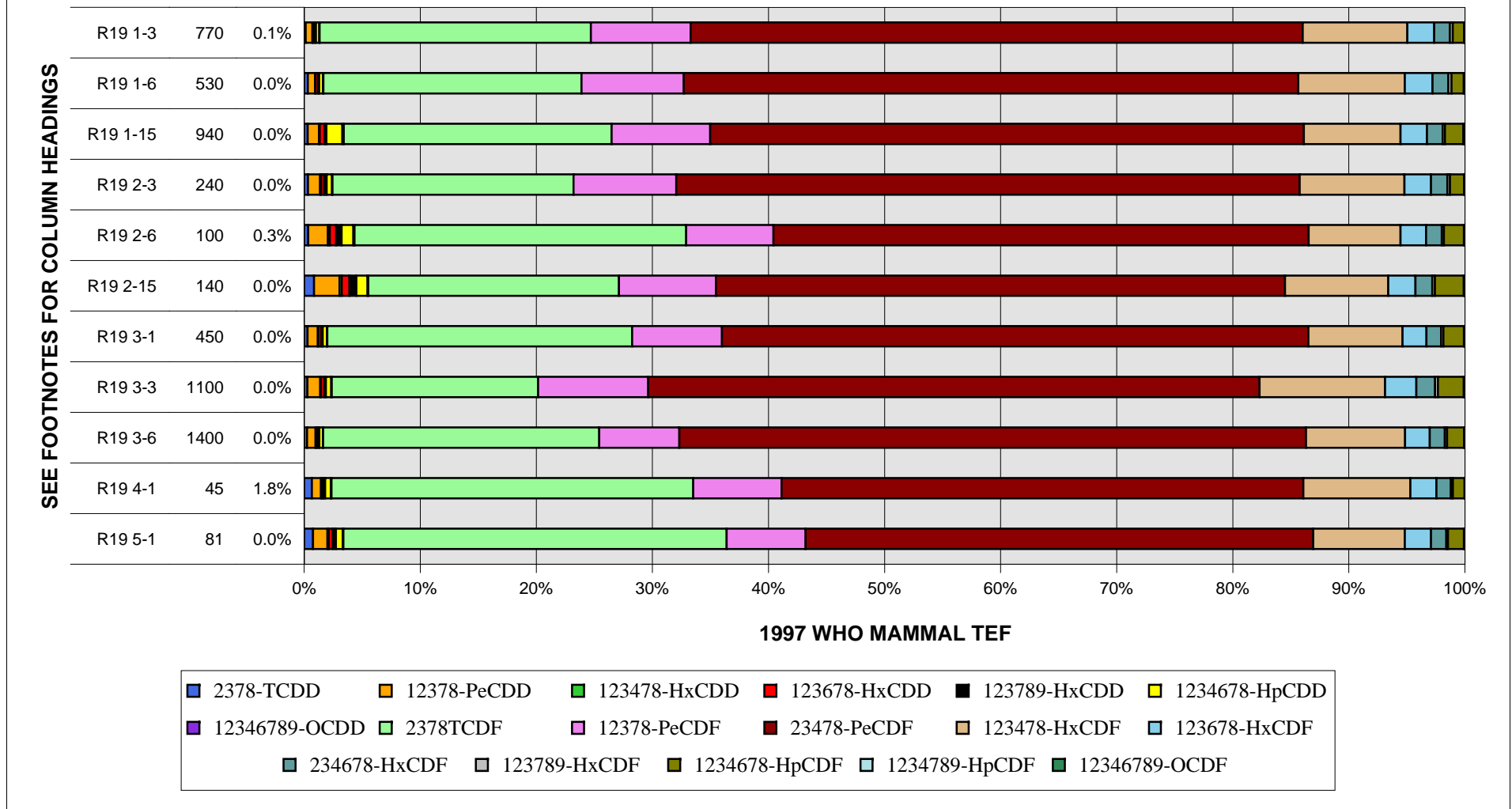
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

19 RIVERSIDE DRIVE, SAGINAW COUNTY DIOXIN SOIL SAMPLES



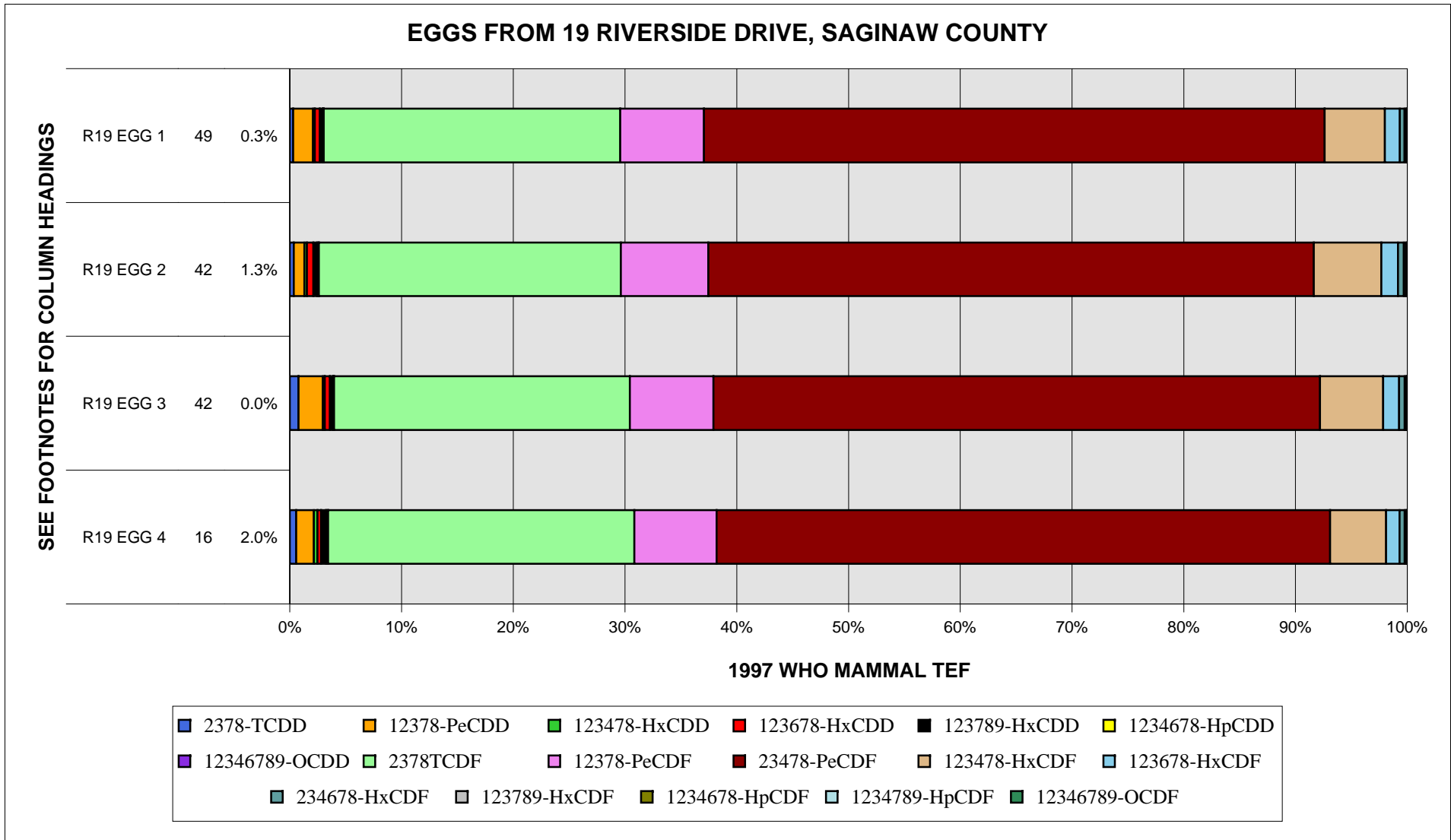
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

EGGS FROM 19 RIVERSIDE DRIVE, SAGINAW COUNTY



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

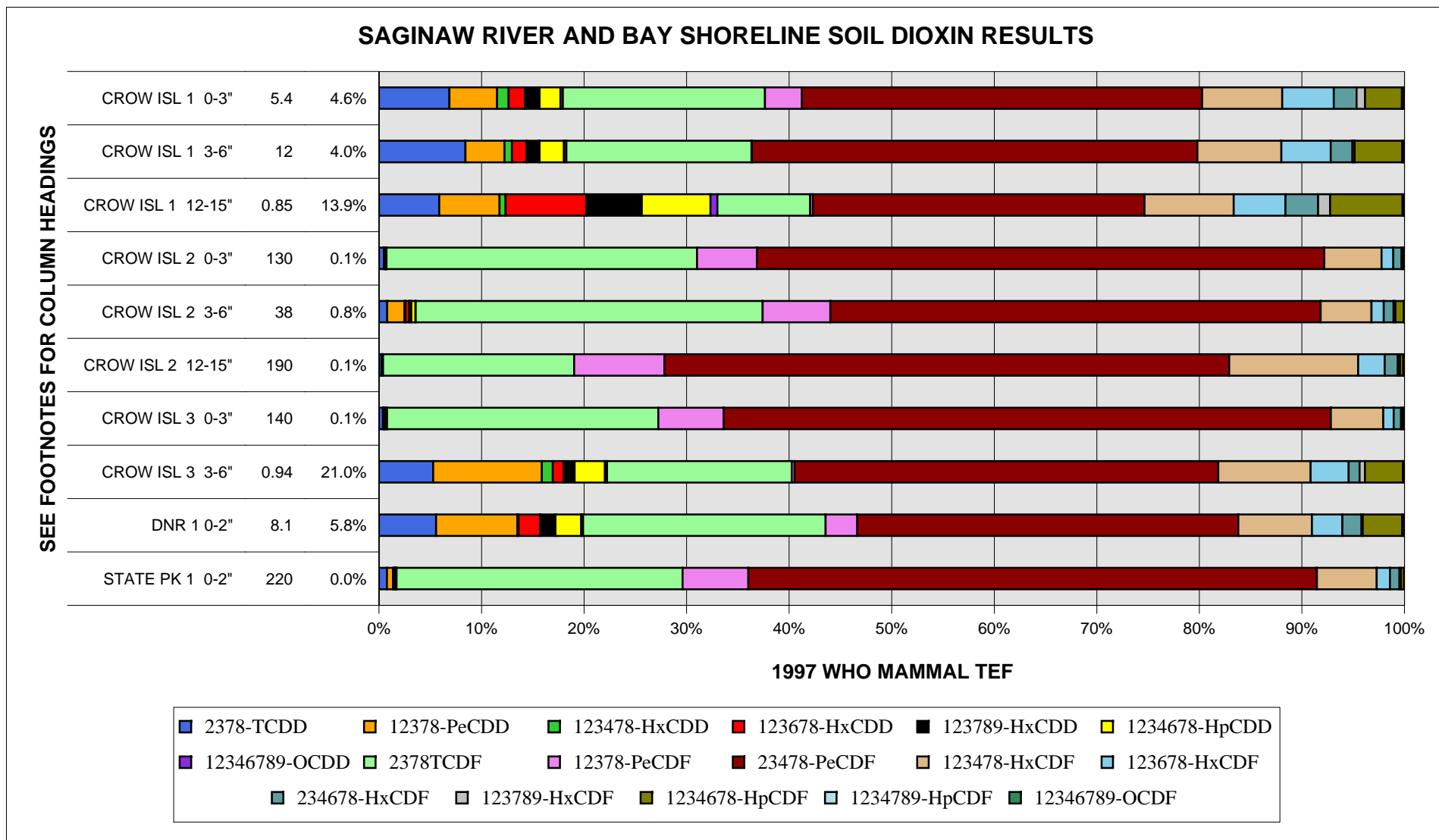
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

SAGINAW RIVER AND BAY SHORELINE SOIL DIOXIN RESULTS



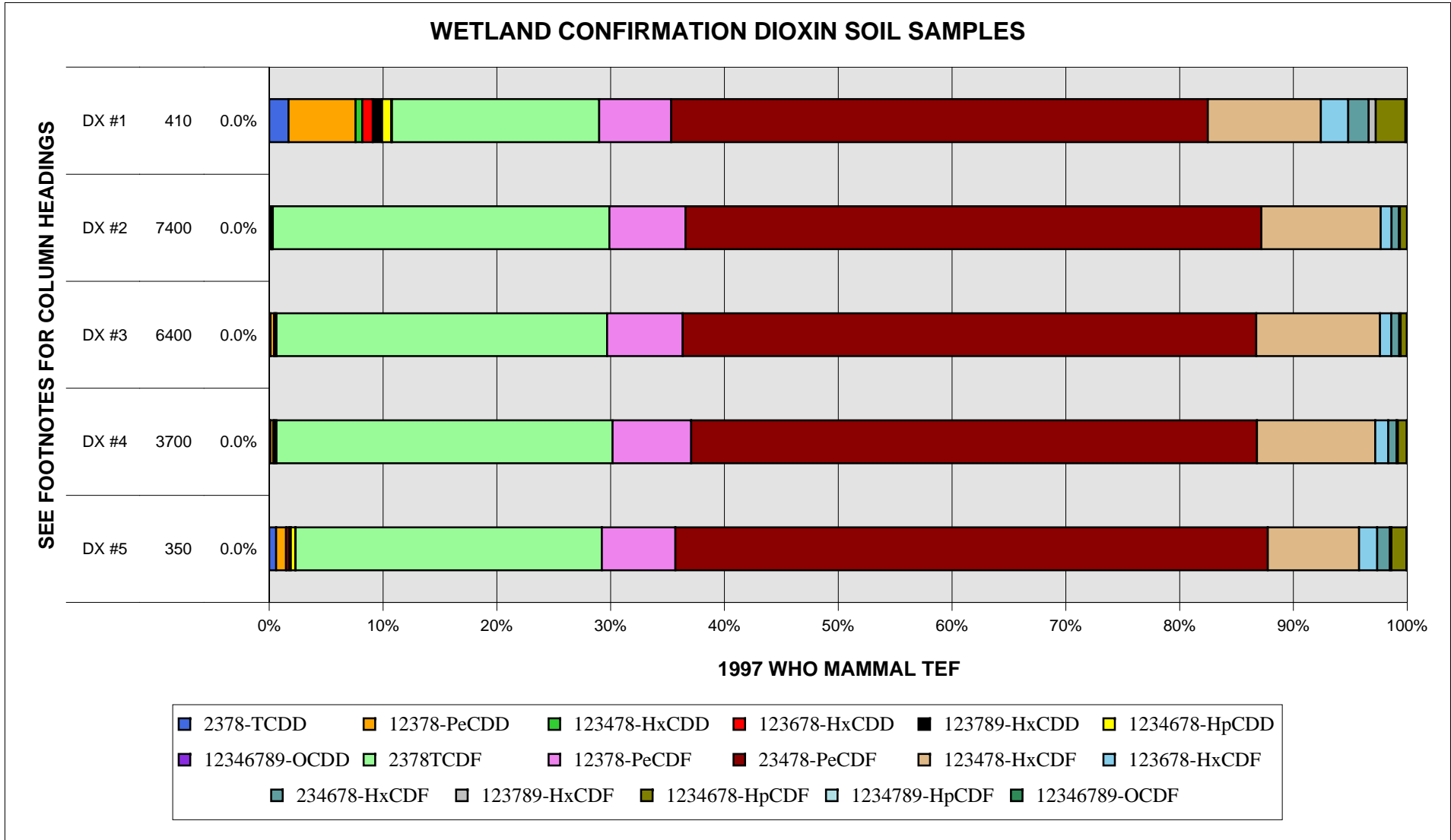
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

WETLAND CONFIRMATION DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

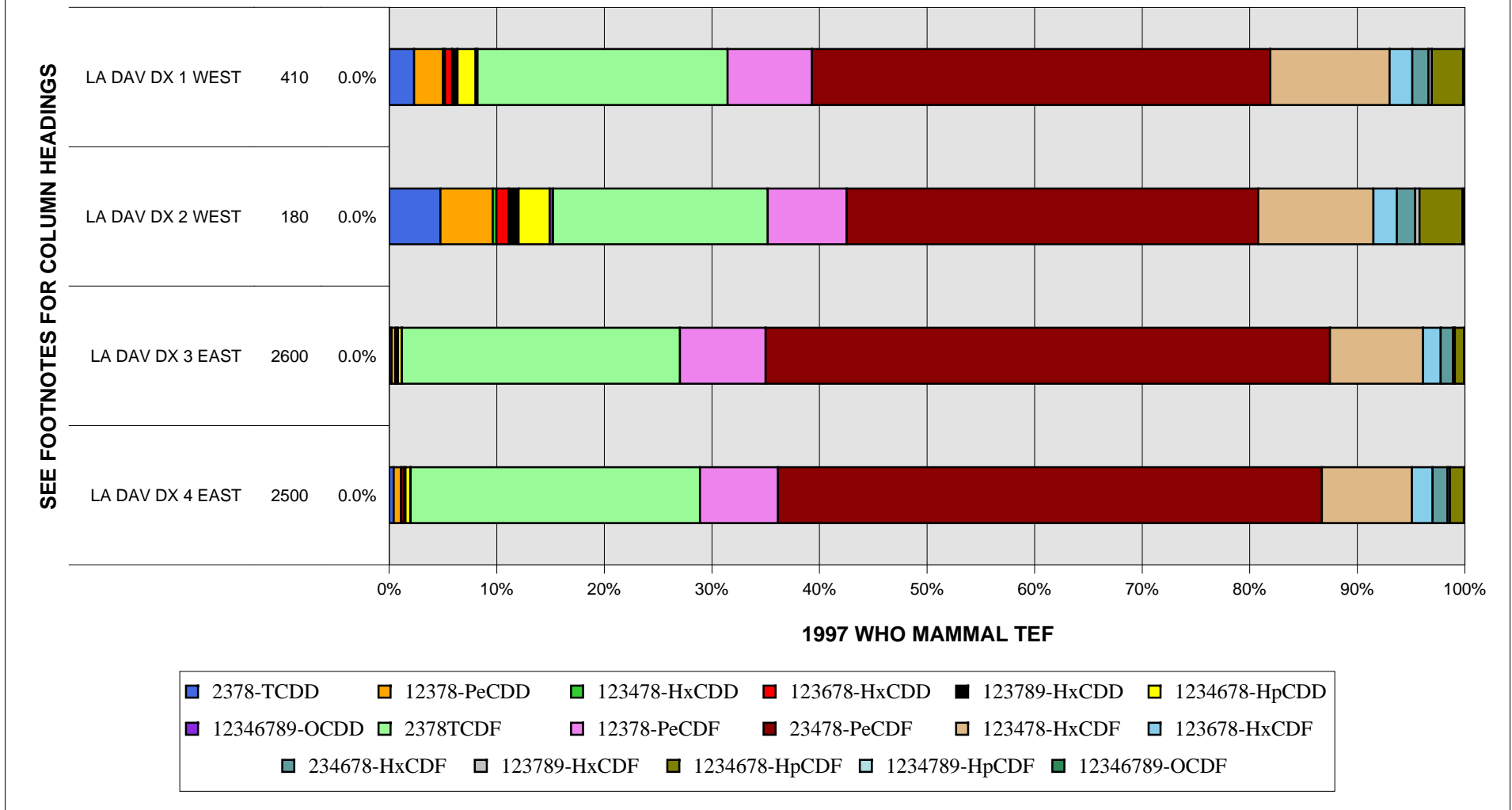
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

LA DAVIDSON DIOXIN SOIL SAMPLES



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

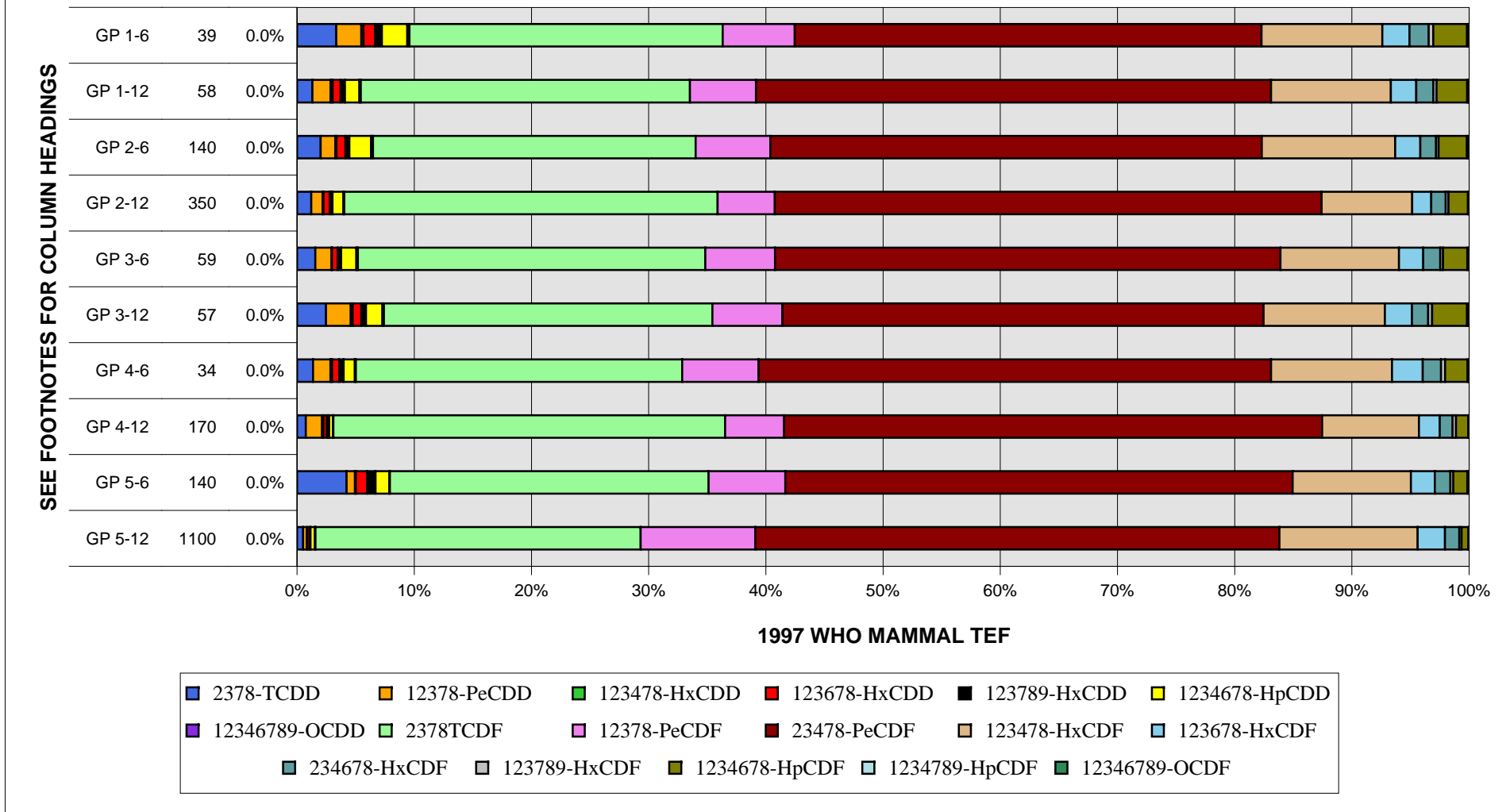
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

SHIAWASSEE WILDLIFE REFUGE FIELD DIOXIN SOIL SAMPLES



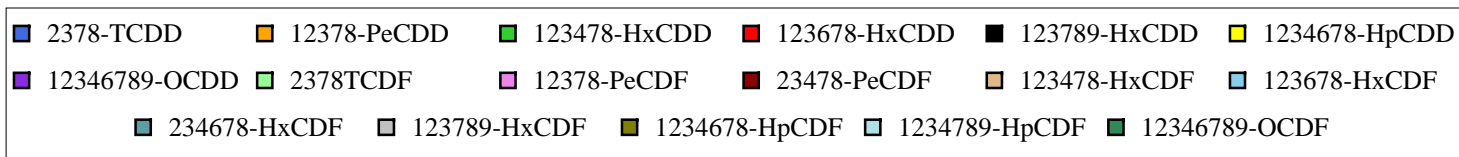
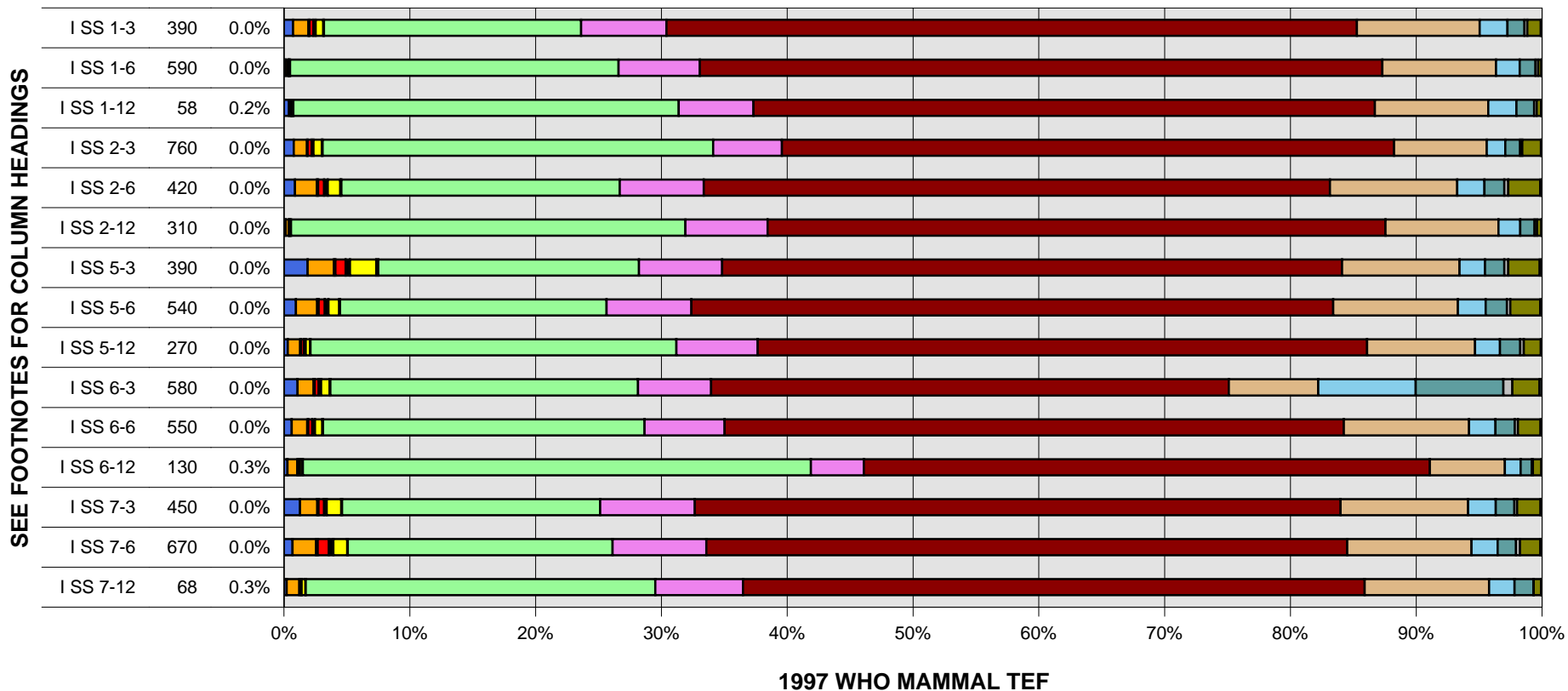
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

SHIAWASSEE WILDLIFE REFUGE FOREST DIOXIN SOIL SAMPLES



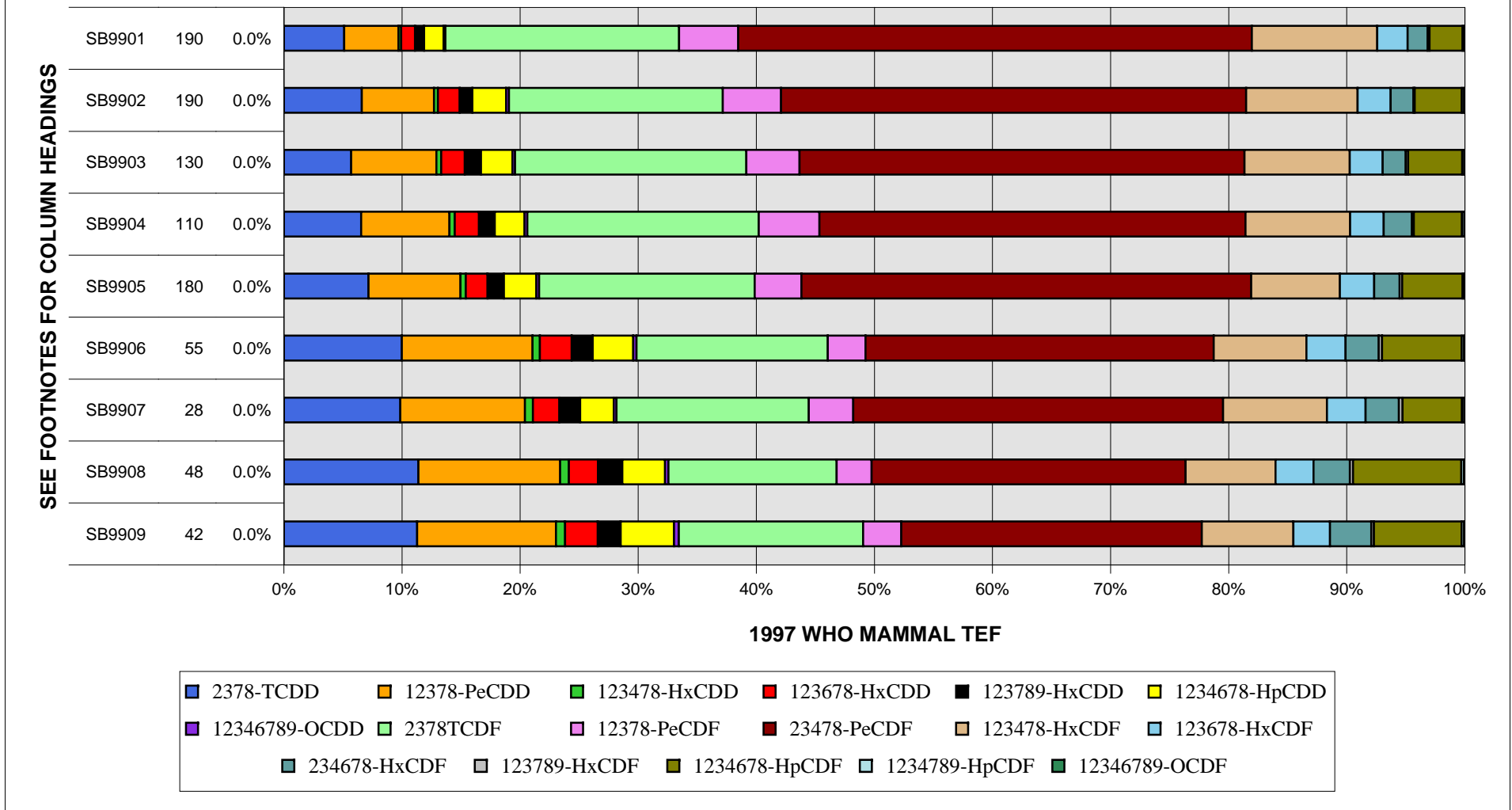
Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

TEQ PROFILES

ACE SAGINAW BAY SEDIMENT RESULTS



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

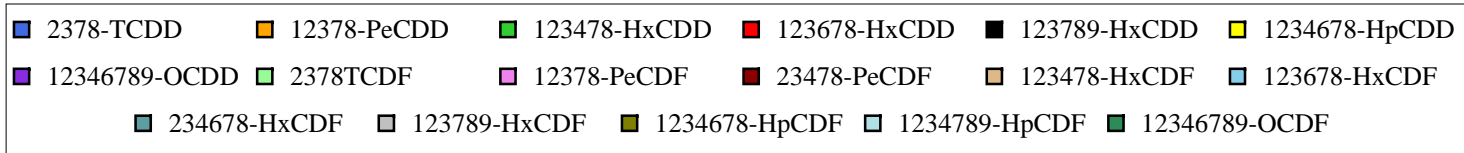
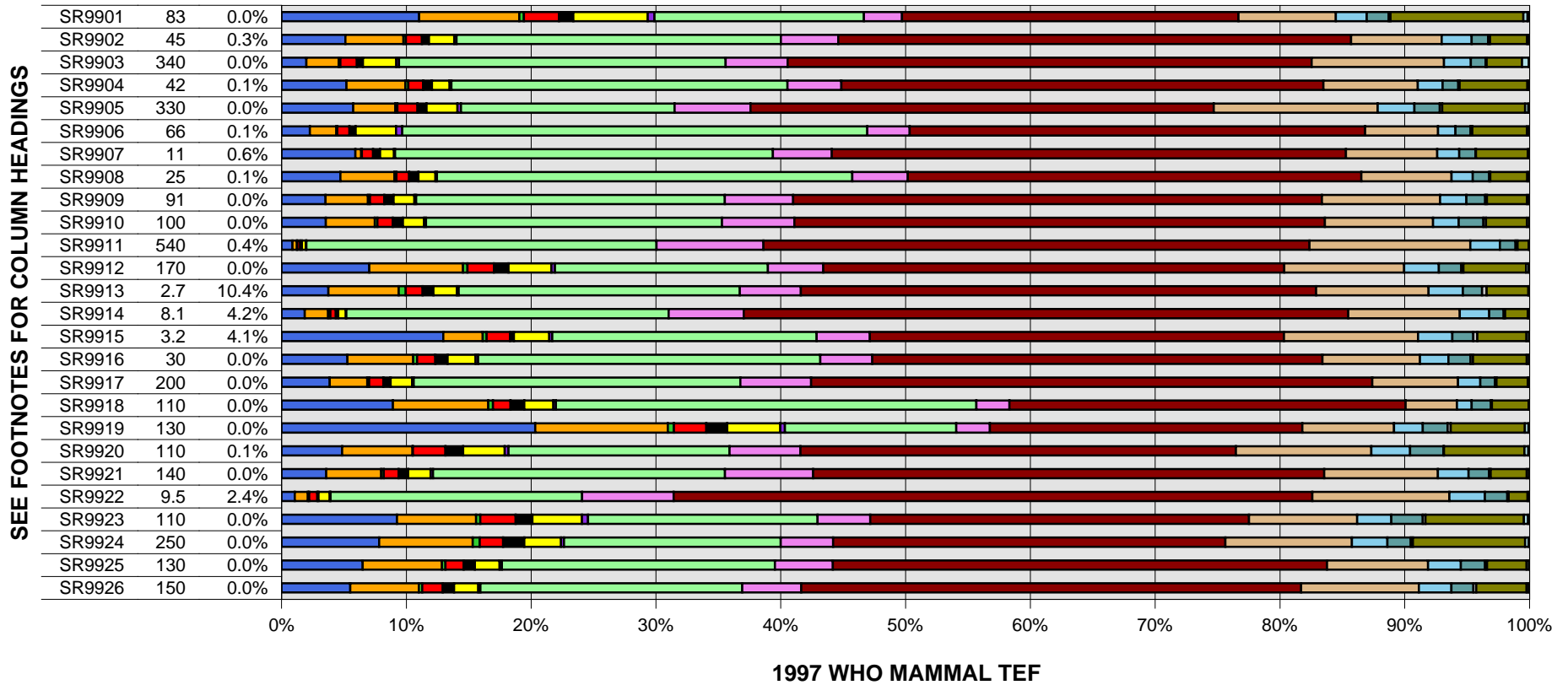
Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.

Date: 7/30/2003

Data Subject to Revisions and/or Updates

TEQ PROFILES

ACE SAGINAW RIVER SEDIMENT RESULTS



Column 1 - Sample Location

Column 2 - Total TEQ: This value represents the toxicity of the sample and may be compared to Part 201 criteria. All total TEQs represent those dioxins and furans with known TEFs and include non-detects valued at 1/2 of the detection level.

Column 3 - Percent Non-Detect: The percent value represents the percentage of a sample comprised of non-detects (NDs). A higher percentage composition of NDs (e.g., > 5%) makes it more difficult to visually interpret the profile.