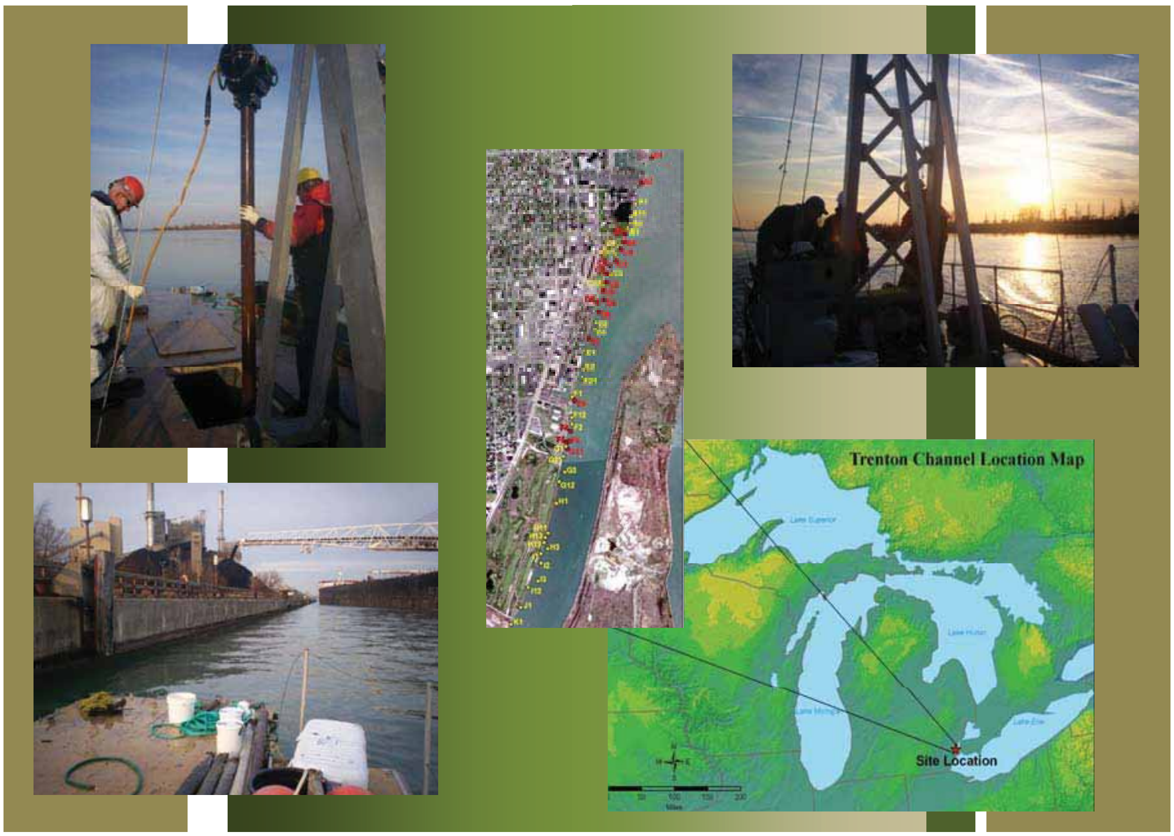
Trenton Channel
Remedial Investigation Report

Interim Final, July 2010



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Remedial Investigation Report

Great Lakes Legacy Act Program

Prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

AFDW	Ash-free Dried Weight
AOC	Area of Concern
ASTM	American Society for Testing and Materials
AVS	Acid Volatile Sulfide
BUI	Beneficial Use Impairment
CLP	Contract Laboratory Program
COC	Contaminants of Concern
CBSQG	Consensus-based Sediment Quality Guideline
CSO	Combined Sewer Overflow
DGPS	Differential Global Positioning System
DQO	Data Quality Objective
DW	Dried Weight
DRO	Diesel Range Organic
EDD	Electronic Data Deliverable
EPA	U.S. Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbon
ESBTU	Equilibrium Sediment Benchmark Toxic Unit
FD	Field Duplicate Sample
GLLA	Great Lakes Legacy Act
GLNPO	Great Lakes National Program Office
GLSED	Great Lakes Sediment Database
GPS	Global Positioning System
LEL	Lowest Effect Level
MDEQ	Michigan Department of Environmental Quality
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ORO	Oil Range Organic
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCN	Polychlorinated Naphthalene
PEC	Probable Effects Concentration
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RFS	Routine Field Sample
RI	Remedial Investigation
SEM-AVS	Simultaneously Extracted Metals-Acid Volatile Sulfide
SGeMS	Stanford Geostatistical Modeling Software
SVOC	Semivolatile Organic Compound
SW-846	Test Methods for Evaluating Solid Waste
TCLP	Toxic Characteristic Leaching Procedure
TOC	Total Organic Carbon
U.S.	United States
USACE	U.S. Army Corps of Engineers

USDA	United States Department of Agriculture
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This report describes a joint effort between U.S. Environmental Protection Agency Great Lakes National Program Office and Michigan Department of Environmental Quality to conduct a Remedial Investigation that assesses the nature and extent of sediment contamination in the Trenton Channel in order to aid in eventual remediation.. The Trenton Channel is an eight-mile strait that flows from the north to the south into the Detroit River in the area of Wyandotte, Riverview, Trenton, and Gross Ille, Michigan. The channel is within the Detroit River Area of Concern, a binational area of concern for both the United States of America and Canada that drains approximately 700 square miles of land in Michigan and Ontario. The Trenton Channel also lies within the Detroit River International Wildlife Refuge, the first international refuge designated in North America.

The U.S. Environmental Protection Agency Great Lakes National Program Office has identified 11 beneficial use impairments in the Detroit River Area of Concern which also impact the Trenton Channel (http://epa.gov/glnpo/aoc/detroit.html). The known causes of impairments include bacteria, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, heavy metals, and oil and grease. Combined sewer overflows and municipal and industrial discharges are major sources of contaminants within the Detroit River Area of Concern. Stormwater runoff and tributaries (e.g., Ecorse River) in Michigan are also major sources of contaminants. Additional environmental concerns include invasive species, changes in the fish community structure, and reductions in fish and wildlife habitats.

The Trenton Channel Remedial Investigation was funded under the Great Lakes Legacy Act of 2002. This legislation was specifically developed to address the contaminated sediment problem in the Great Lakes Areas of Concern. The primary objective of the Trenton Channel Remedial Investigation was to develop the most appropriate method applicable to remediate contaminated sediments within the boundaries of the Trenton Channel site.

Sediment sampling activities at the Trenton Channel site began in mid June 2006 and continued through July 2007. A full suite of chemical classes were analyzed over the course of both project phases including semivolatile organic compounds, metals, polychlorinated biphenyls, simultaneously extracted metals-acid volatile sulfide, toxic characteristic leaching procedure for metals, volatile organic compounds, extractable petroleum hydrocarbons, and oil and grease. Additional sediment parameters include total organic carbon, pH, grain size, density, moisture content and Atterberg limits and toxicity data in sediments.

The results of the analytical testing indicate the presence of a wide range of contaminants within the sediments. Some areas of the site exceeded the Consensus-based Sediment Quality Guidelines probable effect concentrations (MacDonald, D.D., *et al.*, 2000) for several contaminants; however, in other areas, several contaminants were found to be well below the Consensus-based Sediment Quality Guidelines probable effect concentrations. Overall, 31%, 36%, and 27% of samples for mercury, total polycyclic aromatic hydrocarbons, and total polychlorinated biphenyls, respectively, exceeded the Consensus-based Sediment Quality Guidelines probable effect concentrations.

The results of the analytical testing also indicate that sediment samples collected along a reach in southern Wyandotte contain contaminants well below the Consensus-based Sediment Quality Guidelines probable effect concentrations. In addition, the analytical results from sediment samples collected within a northern part of the study area demonstrate a trend of relatively high levels of mercury contamination. Geostatistical analysis of sediment contaminant data for mercury, total polycyclic aromatic hydrocarbons, and total polychlorinated biphenyls was conducted to estimate the concentrations and the vertical and horizontal extent of contamination.

Based on the statistical sampling design and supported through the geostatistical models, additional work by the U.S. Environmental Protection Agency Great Lakes National Program Office and Michigan Department of Environmental Quality may be deemed necessary to further assess the site conditions and determine the next course of action.

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report describes the results of the Remedial Investigation (RI) for the Trenton Channel site within the Detroit River Area of Concern (AOC). The RI for the Trenton Channel site was a joint partnership between U.S. Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO) and Michigan Department of Environmental Quality (MDEQ). EPA GLNPO and MDEQ initiated Phase I sampling and analysis in December 2006 and completed Phase II sampling in July 2007. The RI was performed under the authority of the Great Lakes Legacy Act of 2002.

Trenton Channel is an eight-mile strait that flows north to south into the Detroit River. The Trenton Channel site, shown in Figure 1-1, is part of the Detroit River AOC. The Detroit River is a 32-mile international connecting channel linking Lake Saint Clair and the upper Great Lakes to Lake Erie. The Detroit River AOC is a binational AOC that drains approximately 700 square miles of land in Michigan and Ontario as well as the 107-square mile City of Detroit "sewershed." Approximately 75 percent of the total land area of the Detroit River watershed is in Michigan (607.7 square miles). Eleven beneficial use impairments (BUI) have been identified in the Detroit River and most of these are impaired in the Trenton Channel. The known causes of impairments in the Detroit River AOC result primarily from urban and industrial development in the watershed and include bacteria, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH), metals, and oil and grease. Combined sewer overflows (CSO) and municipal and industrial discharges are major sources of contaminants within the AOC. Stormwater runoff and tributaries in Michigan are also major sources of contaminants. Additional environmental concerns include invasive species, changes in the fish community structure, and reductions in fish and wildlife habitats.

The Trenton Channel has been severely impacted by historical contamination from industries, municipal discharges, sewer overflows, and urban runoff from surrounding communities located along the channel. In addition, upstream sources include municipal and industrial discharges located along the Rouge River and from water and sewer departments, as well as industries that ultimately affect the channel. These impacts include the channel's reduced capacity to support recreational activities such as swimming, and fishing. The health of the aquatic life in the water and sediments of the Trenton Channel and wildlife along the shoreline are also adversely affected by the pollution.

Contaminants in the sediment underlying the channel are a primary pollution concern. Contaminated sediments are ingested by bottom-dwelling benthic organisms as they feed and can be toxic to many of the invertebrates inhabiting the sediment. In addition, the chemical toxins are concentrated up the food chain as larger organisms consume the smaller organisms. Contaminated sediments also have the potential to be resuspended by storms and ship propellers, potentially contaminating other areas downstream. Remediation of the contaminated sediments has been deemed necessary to lessen or eliminate these pollution-associated risks.

The long-term goal of the Trenton Channel project is to develop the most appropriate method applicable to remediate contaminated sediments within the boundaries of the Trenton Channel site (Figure 1-1). Because previous investigations have characterized downstream areas of the Trenton Channel (Section 2.3), this project focused on upstream sediment characterization to further assess the nature and extent of contamination of the Trenton Channel sediments. EPA GLNPO and MDEQ personnel managed sampling and analysis in two study phases between December 2006 and July 2007. The objective of Phase I was to collect representative samples to assess and evaluate the magnitude and extent of contaminated sediments in upstream sections of the Trenton Channel site that were not previously investigated for use in a remedial alternatives analysis. The objective of Phase II was to further define the extent and nature of contamination at the site.

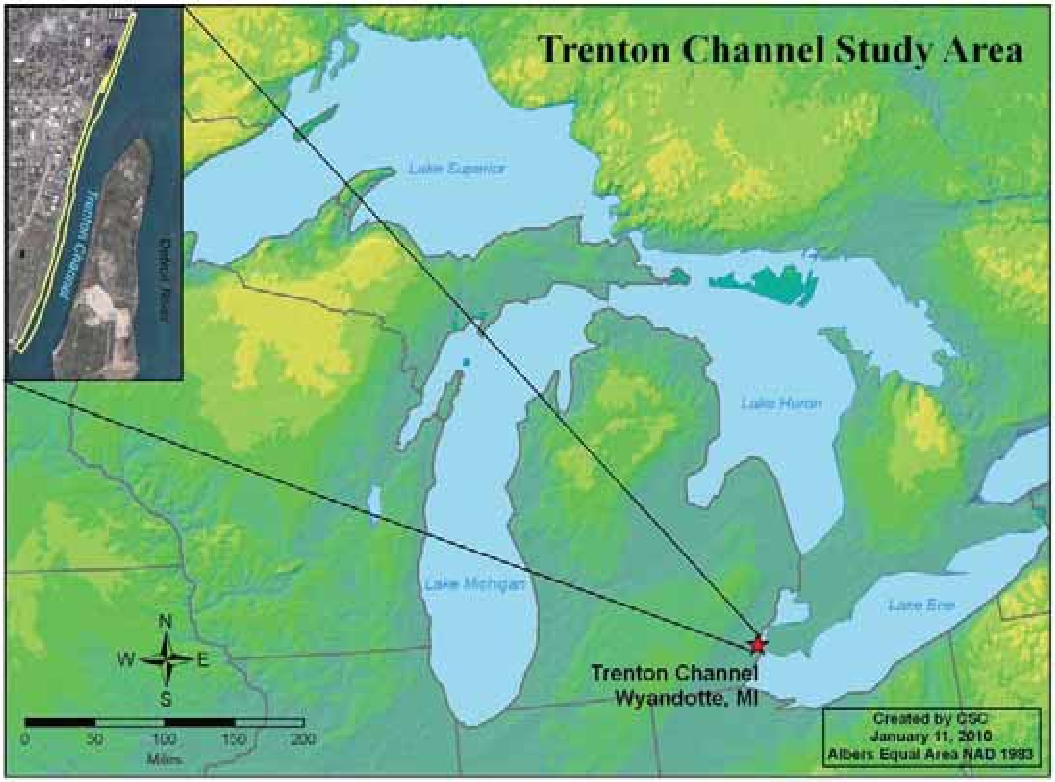

Figure 1-1 Trenton Channel Site Location Map

2.0 SITE BACKGROUND

2.1 GENERAL SITE DESCRIPTION

Trenton Channel is a 13-kilometer (approximately eight-mile) strait that flows from the north to the south into the Detroit River. The Trenton Channel study site extends over 2.5 miles of continuous shoreline located along the western shore of the channel. A series of islands are located across the channel and to the east of the site. Several cities are located adjacent to and west of the Trenton Channel site including, from north to south: Wyandotte, Riverview, and Trenton, Michigan. The Trenton Channel site lies within the U.S. Fish and Wildlife Services' Detroit River International Wildlife Refuge, the first international refuge designated in North America, and within the Detroit River AOC. Figure 2-1 provides a complete visual of the Trenton Channel site and the project sampling areas for each phase. The property boundaries illustrated in maps within this report are estimated and may vary slightly from actual property boundaries. The sampling areas for Phase I and Phase II are further defined in Section 5.2.

More specific information pertaining to site's demographics and land use, hydrology, geology, and ecological assessment is provided in Section 3, Site Characteristics.

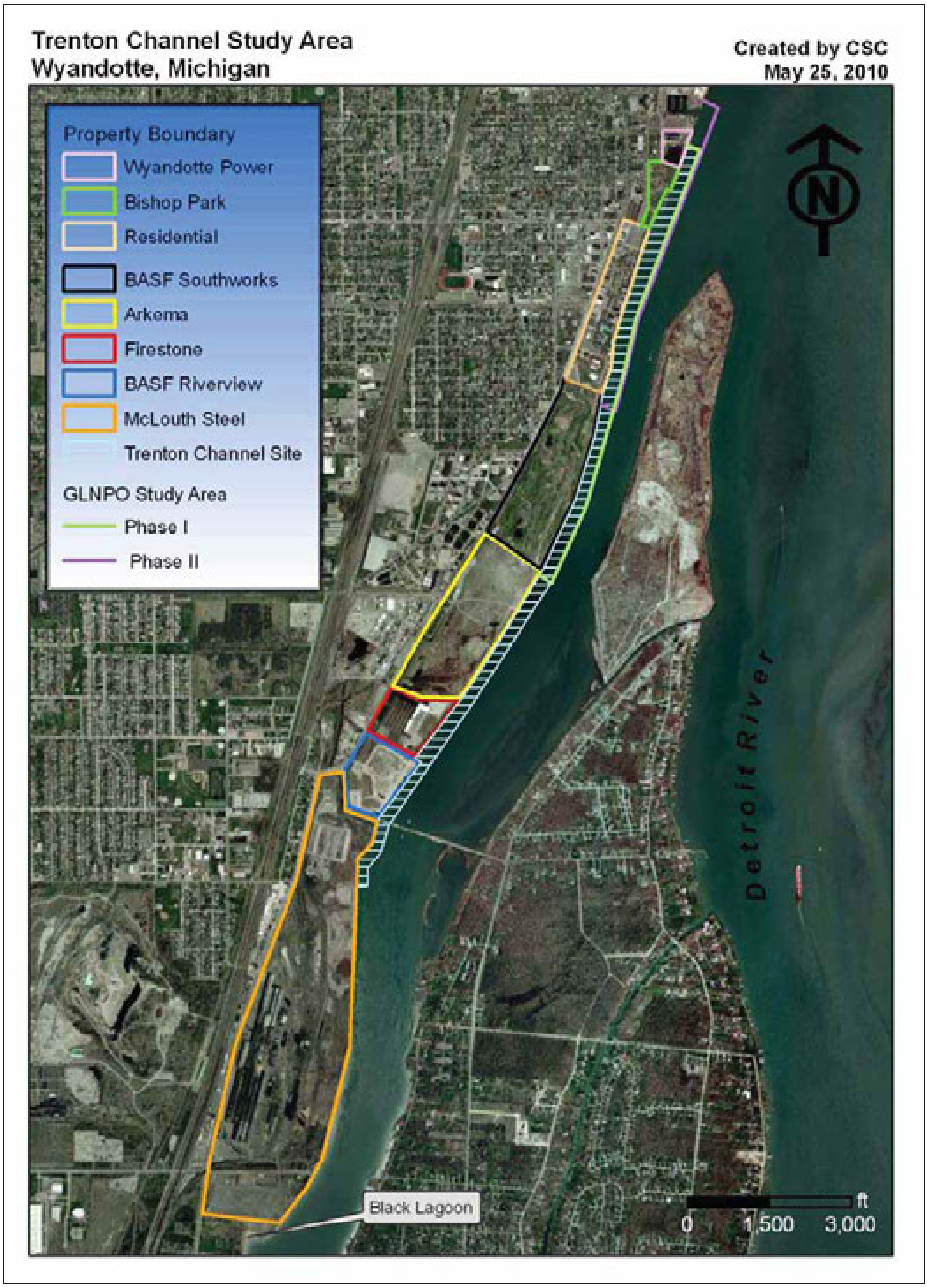

Figure 2-1 Trenton Channel Site and Project Sampling Areas

2.2 SITE HISTORY

The Detroit River is 51 kilometers (km) (about 32 miles) in length. The river's name is derived from French *Rivière du Détroit,* which translates as "River of the Strait." The Detroit River connects Lake Saint Clair to Lake Erie and serves as a part of the international boundary between Canada and the United States. In the early twentieth century, the river was used for transport of materials and goods supporting industrial companies such as steel mills, chemical facilities, coal-generated power plants and others. There are several channels, including the Livingston and Amhurstburg Channels, in the southern portion of the river used by ships as navigational channels. Another major use of the Detroit River is for industrial and drinking water supplies. The river provides approximately 25 industries with process or cooling water and is one of the sources of drinking water for more than five million people. The river is also used for recreational purposes including fishing, boating, swimming, and hunting.

CSOs and municipal and industrial discharges have been the most significant and long-term major sources of contaminants in the Trenton Channel. Stormwater runoff and upstream inputs from Lake Saint Clair and Detroit River tributaries (e.g., Ecorse River) are also sources of pollution within the channel. The known causes of impairments include heavy metals such as cadmium, chromium, cobalt, copper, lead, mercury, nickel and zinc, organic contaminants consisting of PCBs, hexachlorobenzene, and a variety of PAHs, bacteria, and oil and grease. Due to the nature and characteristics of the pollutants, they are primarily found in the sediments and pore waters (water filling the spaces between grains of sediment) of the channel. These contaminated sediments severely and adversely impact the ecosystem in and around the channel and could potentially affect the human population as well. In 2006, BASF Wyandotte Corporation sponsored a dredging effort along the BASF Riverview site resulting in the removal of approximately 30,000 cubic yards (EPA, 2010).

2.3 INVENTORY OF EXISTING DATA

Numerous environmental studies were conducted in the Trenton Channel and Detroit River between 1985 and 2007, as listed in Appendix E. The results of these studies have been instrumental in identifying contaminated sites and subsequent remediation efforts.

Studies have been conducted throughout the Trenton Channel to assess the level of contamination, locate specific hot spots, identify the contaminants of concern, evaluate physical characteristics of sediment and river hydrology (including velocity, bathymetry, and bulk properties), and measure sediment depths. In 2000, EPA GLNPO and MDEQ conducted a study to assess the Firestone site, BASF Riverview site, and downstream past Monguagon Creek to the southernmost boundary of the Trenton Channel site (Figure 2-1). This study involved collection of 14 sediment cores, and the analytical results confirmed elevated concentrations of mercury (up to 212 parts per million), heavy metals, and PCBs. In addition, the approximate area and depth of the sediment contamination were evaluated at multiple distinct locations along the Trenton Channel. Based on this study, the total area along the shoreline in front of Firestone site, BASF Riverview site, and upstream of Monguagon Creek was estimated to contain approximately 100,000 cubic yards of mercury- and PCB-contaminated sediments (MDEQ, June 2000).

The United States Army Corps of Engineers (USACE) and EPA GLNPO collected sediment samples from 26 distinct locations adjacent to Firestone site in 2004. The analytical results showed elevated concentrations of mercury, PCBs, and various heavy metals in the sediment. In addition, concentrations of mercury and PCBs were identified in fish tissue samples from select fish species collected in the Trenton Channel (Lakeshore Engineering Services, Inc., October 26, 2004).

In 2005, a sediment survey along the shoreline of BASF Riverview site was conducted by BASF Wyandotte Corporation. This study included completing a bathymetric survey and determining river velocities and sediment depths. Results identified water velocities ranging between 0.01 to 2.4 feet per second (fps) with depth average velocities of 2.2 fps. The water depth measurements ranged from 3 to 38 feet in this region of the channel and the shoreline sediment depths ranged from less than 1 foot to 9.5 feet (STN Environmental JV, December 12, 2006; STN Environmental JV, July 6, 2007). In addition, a portion of this site was remediated under Part 201 of the Natural Resources and Environmental Protection Act. Contaminated groundwater was found to be discharging mercury, PCBs, dioxin, and PAHs from the site into the river. As part of the interim response activities required in a 2006 Consent Decree between the MDEQ and BASF Wyandotte Corporation, BASF was required to remove up to 30,000 cubic yards of sediment adjacent to their property. Removal was conducted to the top of river-bottom clay. Sediments will be capped onsite under the final site cover (EPA, 2010).

Also in 2005, Arkema East Plant completed a sediment survey along the shoreline of the Arkema site to assess specific contaminants of concern, bulk properties, and sediment depth. The analytical results identified metals and several semivolatile organic compounds (SVOC) including 2-chloronaphthalene and chlorinated benzenes in the sediment samples. The sediment SVOC sample concentrations decreased from north to south over the channel area being assessed. The grain size analysis demonstrated that area sediment consisted primarily of sand and gravel with some debris. The study also determined that as the channel depth increased, sand and gravel decreased and clay and consolidated sediment increased. The thickness of the sediment in this region was found to range from less than 0.5 feet to 9.5 feet (Jon, Andrade and Zwick Associates, Inc., November 2003; STN Environmental JV, July 6, 2007).

3.0 SITE CHARACTERISTICS

3.1 DEMOGRAPHICS AND LAND USE

The Trenton Channel encompasses a 13-kilometer (approximately eight-mile) stretch of the lower Detroit River, which flows into Lake Erie. The channel is bound by Michigan mainland on the western shore and a series of islands on the eastern shore. The exact boundaries of Trenton Channel begin at a line running west-northwest from the head of Fighting Island to the Michigan mainland, and continuing downstream to Celeron Island. The northern portion of channel is primarily used as a navigational canal that the USACE dredges periodically for commercial shipping.

Several municipalities are located on the Michigan mainland along the Trenton Channel including the cities of, from north to south, Ecorse, Wyandotte, Riverview, Trenton, and the townships of Grosse Ile and Gibralter. The western shoreline of the channel has historically been developed to support industries such as several steel mills, chemical facilities, coal-generated power plants and landfill/disposal sites. Many of the facilities that once operated with discharges to the river have been either abandoned or demolished. Today, the land use along the western shore is primarily recreational and the surrounding municipalities have provided public access points on the river, including walkways, fishing piers, parks, and boat launching facilities. There are also numerous private marinas, restaurants, apartment complexes and homes, and a public golf course that line the channel.

3.2 HYDROLOGY

The Detroit River discharges water into Lake Erie with flow rates between 4,810 and 5,950 cubic meters per second (m^3/s). Approximately 20-25% of this water discharge flows directly through the Trenton Channel (Jon, Andrade and Zwick Associates, Inc., November 6, 2003; STN Environmental JV, July 6, 2007). In 2006, the flow through Trenton Channel was estimated at 0.5 feet per second (MACTEC, June 2006). The channel ranges from one to ten meters in depth in the main portion of the channel and tracks inversely to depth, from 0.25 kilometer in the Hennepin Point area to 1.2 kilometer near the outlet of the channel (Jon, Andrade and Zwick Associates, Inc., November 6, 2003; STN Environmental JV, July 6, 2007).

3.3 GEOLOGY

The Trenton Channel contains a wide range of sediment types, organic carbon concentrations, and heavy metal concentrations in the bulk sediment and pore waters. Approximately 60% of the Trenton Channel is composed of 50% or more fine-grained material (EPA Office of Research and Development, 1988).

The river sediments in the Phase I sampling area primarily consist of sandy silt, clayey silt, silty sand, clay, and sand (STN Environmental JV, January 4, 2007). The river sediments near BASF Southworks site are in agreement with the sediment types found in the Phase I sampling area. Hardpan exists beneath the soft river sediments in the channel. Because the Trenton Channel serves primarily as a navigational channel, the middle of the channel has the thinnest sediment depths while the areas along the shorelines contain the thickest sediment depths. Therefore, the soft sediments in the Trenton Channel are estimated to range between 8 to 10 feet thick near the shoreline and 1 to 2 feet thick in the navigation channel, approximately 200 to 300 feet east of the shoreline (STN Environmental JV, December 12, 2006; STN Environmental JV, July 6, 2007).

The total volume of soft sediments in the Trenton Channel site is estimated to be approximately 463,000 cubic yards (STN Environmental JV, December 12, 2006; STN Environmental JV, July 6, 2007). This estimate includes:

- 300,000 cubic yards between the northernmost section of the project area between Bishop Park and the Municipal Power Plant and the northern property line of the Arkema site (STN Environmental JV, July 6, 2007)
- 67,500 cubic yards in front of the Arkema site (STN Environmental JV, July 6, 2007)
- 97,800 cubic yards between the southern property line of Arkema site and the southern extent of the Trenton Channel site (1,300 feet south of the Grosse Ile Toll Bridge) (Fully Integrated Environmental Decision System Team, June 23, 2004)

3.4 ECOLOGICAL ASSESSMENT

As stated in Section 2.3, numerous studies have been conducted to assess the ecological state of the Trenton Channel and Detroit River. The Detroit River Canadian Cleanup assessment entitled “2006 Status of Beneficial Use Impairments in the Detroit River” (December 2006) and Friends of the Detroit River report entitled “Restoration Criteria Review for the Detroit River Area of Concern” (December 2008) serve as excellent resources in describing the ecological condition of the Detroit River and Trenton Channel, along with the references listed in this report and in Appendix E. The following information summarizes the findings published in the two aforementioned documents:

- Tainting of Fish and Wildlife Flavor – Walleye collected from Trenton Channel in 1992 and 1993 were found to have an impaired flavor; however, this finding was contrasted by a 1996-1997 survey of shoreline anglers collected along the Detroit River that were categorized as tasting good. The status of this BUI is currently unknown.
- Fish Consumption Advisories – Models show that the high PCB concentrations in fish are due to contamination of sediments, not water. In particular, contaminated sediments in the lower U.S. reach of the Detroit River contribute most heavily to restrictions on fish consumption in the Detroit River. The Trenton Channel and the area directly downstream of the channel should be marked as areas of high priority for remedial activities. The Michigan Division of Environmental Health has issued several fish consumption advisories due to PCB contamination that are categorized according to the fish species, fish length, and the human population.
- Fish Tumor and Deformities – Contaminants in the sediment such as mercury, PCBs and PAHs in particular, can lead to tumors in fish.
- Toxicity of Sediments to Benthic Macroinvertebrates – Sediments from the Trenton Channel in the Detroit River are highly contaminated, and adult mayflies (Hexagenia) are not found in this area because of the toxicity of the sediments.
- Trends in Benthic Community Composition – Benthic taxonomic richness was negatively correlated with the abundance of oligochaetes in sediments; i.e., oligochaete dominated areas (primarily the Trenton Channel) had low overall taxonomic richness and high sediment contamination.
- Levels of PCBs in Sediments – Based on sediment sampling in 1999-2000, the area downstream of the Trenton Channel showed PCB concentrations exceeding the Ontario Ministry of Environment’s lowest effect level (LEL=70 mg/kg dry weight) (Persaud *et al.*, 1992). The ratio of percent PCB mass versus percent area was 2.07 along the Trenton Channel.
- Levels of PAHs in Sediments – In a 1999 sediment study, the Trenton Channel showed moderate PAH contamination.

- Levels of other Organic Chemicals in Sediments –
    - In a 1994 study of sediment contamination in the Detroit River, concentrations of PCBs, PAHs, and dichlorodiphenyltrichloroethane in sediments were highest at Zug Island near the outflow of the Rouge River, at Elizabeth Park in the Trenton Channel, and at Celeron Island downstream of the Trenton Channel.
    - Contaminant levels were measured in suspended sediments from nine sampling stations in the Detroit River in 1999-2000. Levels of dioxins and furans, dioxin-like PCBs, and polychlorinated naphthalenes (PCN) were dramatically elevated at Trenton Channel sites.
    - In 1999-2000, the highest concentrations of PCNs (8,200 µg/g) in suspended sediments were found at a site in the Trenton Channel. Toxic equivalents for PCNs in the Trenton Channel ranged from 73 pg/g to 3,300 pg/g, meaning that PCNs contribute significantly to the dioxin-like biological activity in Detroit River suspended sediments. The relatively low PCN concentrations at upstream sampling sites indicate there are few major sources of PCNs upstream of the Trenton Channel.
- Levels of Mercury in Sediments – Based on sediment studies conducted in 1999-2000, 69 (of 150) sediment sampling sites (39 U.S. and 30 Canadian) had mercury concentrations exceeding the LEL (0.2 mg/kg dry weight) (Persaud *et al., 1992*). All sites downstream of the Trenton Channel had mercury concentrations above the LEL, and one site downstream of Celeron Island had a mercury concentration exceeding the severe effect level (2.0 mg/kg dry weight) (Persaud *et al., 1992*). These data confirm that local sources of mercury exist in the Detroit River watershed.
- It is clear that sediments in many areas of the Detroit River (particularly the Trenton Channel) have concentrations of metals and/or organic contaminants above the LEL (Persaud *et al., 1992*), which means that dredging restrictions are necessary. Thus, it can be concluded this BUI is impaired.

3.5 FEATURES AND CHALLENGES UNIQUE TO THE PROJECT

The Trenton Channel RI has several interesting features and challenges, some of which were unique to the site, while others were common for sediment assessment projects. A common challenge of sediment assessment projects is obtaining representative data with the available resources. To address this challenge the study was conducted using a sequential sampling design including two phases: sampling the site in Phase I, assessing the resulting data, and then developing a second sampling event that focused on specific questions. Information collected about the site in Phase I was used to develop a cost effective targeted statistical sampling design for the second phase.

The sampling design and sampling locations for the Phase I study area was developed using an approach based on sampling at regular intervals. Transects were oriented perpendicular to the shore and followed a structure used in previous studies to maintain consistency with previous study designs. Samples were collected from each grid node or adjacent to it within that grid. The analytical data generated in Phase I were evaluated through mapping of observed concentrations and geostatistical analysis of sediment depth and several primary contaminants of concern, specifically, total PCBs and mercury. Several kriging maps of the sediment contaminant data were generated and overlaid on satellite imagery of the site. The specific data collected in Phase I were used to develop several study questions that formed the basis of the sampling approach for Phase II.

The sampling designs for Phase II of the remedial investigation were developed in accordance with EPA's seven-step, systematic planning process known as the Data Quality Objective (DQO) process (U.S. EPA Guidance for the Data Quality Objective Process [EPA G-4], February 2006). As part of the DQO process, decision statements were developed that addressed three primary questions of concern (Section 5.2.2). Data results from the Phase I sampling were used to provide site-specific estimates of concentration ranges and expected variability at the site. Most often, sampling designs are not statistically based, and if they are, must use estimates of variability from other sites, or studies that are many years old. The specific data collected in Phase I was used to develop the Phase II sampling design. This approach meant the sampling design was optimized to answer the specific study questions, was cost effective, and resulted in the ability to answer study questions with known power and confidence. These efforts created a sound and scientific means for developing the sampling designs for the Phase II study area.

Another challenge and feature of the project was that the study was designed to assess sediment results down the entire length of the sediment core. Often, sediment sampling studies focus on specific intervals of interest down the core and may not assess each interval for the entire core. For both phases of this project, the entire length of the core was sampled and analyzed. This resulted in a robust data set and allowed for a more comprehensive assessment of the nature and extent of contamination at the project study areas.

4.0 PROJECT DESCRIPTION

4.1 PROJECT QUALITY DOCUMENTATION

The Quality Assurance Project Plan (QAPP) was the primary quality document that guided this study. Phase I sampling and analyses were conducted according to STN Environmental JV (December 2006).

Based on review of the Phase I data, EPA GLNPO and MDEQ developed a series of specific questions and DQOs that required additional sampling and analytical data from the Trenton Channel site. The QAPP dated December 2006 was appended on July 3, 2007 through an approved QAPP addendum (STN Environmental JV, March 7, 2007). The addendum addressed quality assurance/quality control (QA/QC) issues and concerns that arose during and after the Phase I sampling event was completed. The changes were implemented and included updating sample extract holding times, changing laboratory analytical procedures, revising quality assurance objectives for measurement of data, and including the reporting of tentatively identified compounds as part of the laboratory final data package.

4.2 PROJECT OBJECTIVES

Phase I of the RI was conducted to collect representative samples in order to assess and evaluate the magnitude and extent of contaminated sediments in upstream sections of the Trenton Channel site that had not previously been investigated for use in a remedial alternatives analysis. Specific Phase I field sampling objectives included:

- Collecting representative samples within Transects A-K (Figure 4-1 displays the sampling grid illustrating the use of transects) to assess and evaluate the magnitude and extent of contaminated sediments
- Collecting toxicological samples to assess site-specific risks posed by the contaminants
- Gathering critical chemical and geotechnical data for the RI
- Sample areas not assessed in previous studies to further describe the extent and nature of sediment contamination across the site
- Estimating contaminated sediment volumes requiring remediation

- Generating a preliminary data set for use in developing detailed study questions and DQOs

Phase II of the RI was conducted to generate data to answer several specific questions regarding the distribution of contaminant of concerns (COC) at the site to further define the extent and nature of contamination at the site. Specific Phase II field sampling objectives included:

- Identifying and resolving the PCB hot spot identified in Transect C
- Providing contaminant concentrations in Transects D-F, to determine if concentrations are below the Consensus-based Sediment Quality Guidelines (CBSQG) probable effect concentrations (MacDonald, D.D., *et al.*, 2000) or level of interest as dictated by EPA and MDEQ
- Determining if there is an increasing trend in mercury concentrations moving north from Transect F to Transect A
- Determining if there is a potential source of mercury within 1,000-feet upriver from Transect A (Transect S)

The technical approach used to accomplish these activities in discussed in detail in Section 5 of this report.

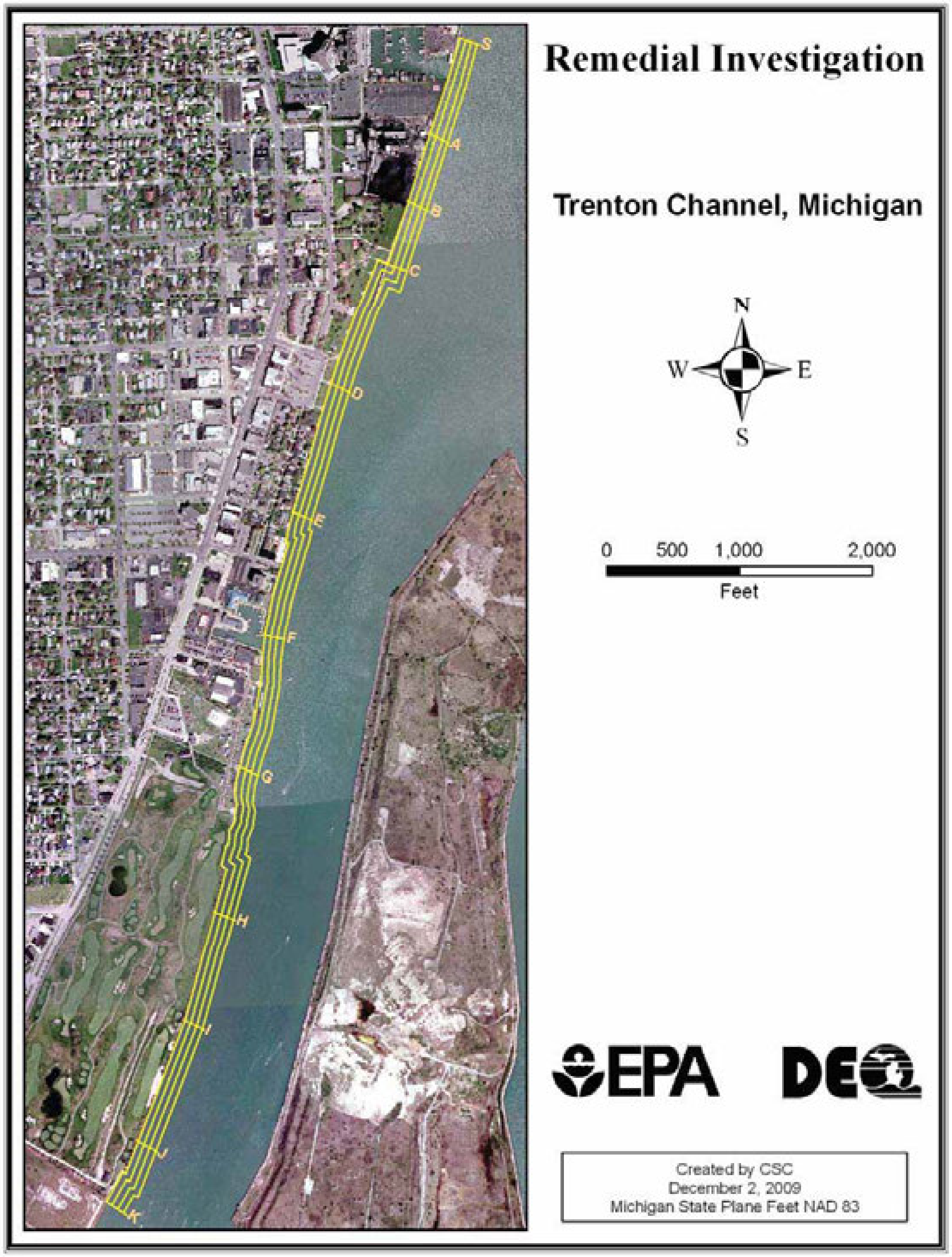

Figure 4-1 Phase I and Phase II Sampling Grid Illustrating the Use of Transects

4.3 PROJECT FUNDING

The Trenton Channel project proposal was submitted by MDEQ to conduct an investigation for contaminated sediment in the upper Trenton Channel. EPA GLNPO approved the proposal and entered into a Great Lakes Legacy Act Project Agreement with MDEQ on September 19, 2006 to conduct the study.

The $500,000 RI of the Trenton Channel site was funded with $325,000 from EPA GLNPO under the Great Lakes Legacy Act and $175,000 in non-federal matching funds from MDEQ.

4.4 PROJECT MANAGEMENT

Because the Trenton Channel project was a collaborative effort involving multiple partners, a project management team was established to ensure effective communication, clear understanding of responsibilities, and adherence to project requirements by all parties. These project management strategies are summarized below.

4.4.1 Project Planning, Permits and Notifications

The Great Lakes Legacy Act Project Agreement documented the financial, technical, and logistical obligations and responsibilities of EPA GLNPO and MDEQ, the non-federal sponsor, and included the financial coordination process that would be used to jointly fund the project. Through this agreement, EPA GLNPO and MDEQ developed a formal strategy of commitment and communication to facilitate successful completion of the project.

All specifications and quality documents that provided sampling and analysis support were reviewed. Project planning meetings were conducted to discuss and finalize key project activities (e.g., plans, permits, technical methods, quality control requirements and procedures).

A suite of project plans were developed and included: a Project Work Plan, a QAPP, a Field Sampling Plan for each phase, and a Site Safety and Health Plan. The Project Work Plan documented the project goals, strategies, and implementation plans. The work plan was approved by EPA GLNPO and was supplemented by a QAPP that documented the management and quality systems implemented to achieve the objectives for the project (Section 4.1). The Field Sampling Plan was site-specific and provided additional details regarding the scope of the field investigation, field equipment and use, field and laboratory analyses, and investigation-derived waste management. The Site Safety and Health Plan specified known potential site hazards and the measures to be taken to protect worker safety and health. Together, these documents provided a mechanism for ensuring that all project objectives and strategies were clearly understood by all involved parties and that project design and quality control procedures were in place to ensure that data collected during the project would be reliable and of sufficient quantity and quality to support EPA GLNPO decisions regarding the project.

Copies of all permits, licenses, agreements, and notifications were maintained at the project site at all times.

4.4.2 Project Communication, Roles and Responsibilities

Communication procedures were defined in the QAPP and included regularly scheduled conference calls, progress meetings, and project management team meetings. EPA GLNPO and MDEQ also assembled a project management team composed of managers and staff from all organizations involved in project planning and implementation. The role of the project team managers (shown in Table 4-1) was to ensure communication among all staff involved in the project, address technical and logistical issues as they arose, and communicate problem resolution to all involved parties. The purpose and details of the Project Agreement were clearly communicated to all members of the project team management. EPA GLNPO was responsible for serving as EPA's lead organization on the project. The roles and responsibilities of key project management personnel are identified in Table 4-1.

Table 4-1 Roles and Responsibilities of Key Governmental Project Management Personnel

Key Person	Organization/Role	Responsibility
Amy Mucha (current) Diana Mally and David Wethington (former)	EPA GLNPO Project Officer	▪ Primary GLNPO contact ▪ Monitor financial and contractual obligations ▪ Ensure that objectives are met at project completion ▪ Coordinate with MDEQ and project contractor to ensure effectiveness of sampling program ▪ Communicate with MDEQ Project Manager regarding sampling procedure and protocol ▪ Monitor staff and contractor compliance with project technical and quality requirements
Marc Tuchman	EPA GLNPO Secondary Project Officer	▪ Secondary GLNPO Project Officer contact ▪ Assume responsibilities of GLNPO Project Officer when on duty
Louis Blume	EPA GLNPO QA Manager	▪ Assist in the development of quality documentation and identification of project quality objectives ▪ Ensure that environmental collection activities achieve appropriate quality documentation ▪ Monitor and ensure quality requirements were met ▪ Address issues affecting quality of information collected
Michael Alexander	MDEQ Project Manager	▪ Primary MDEQ contact for project contractor ▪ Coordinate with GLNPO on project requirements ▪ Monitor financial and contractual obligations ▪ Ensure that project objectives are met at project completion ▪ Monitor performance of staff and contractors regarding technical and quality requirements

Regularly scheduled conference calls were conducted during the course of the project to provide progress updates and status reports to all team members. These meetings also were used as a forum to communicate new issues and challenges that required resolution or decisions. Urgent issues and challenges were communicated through *ad hoc* conference calls, meetings, or onsite discussions. Decisions resulting from meetings and conference calls were documented through meeting minutes and group electronic mail.

5.0 SEDIMENT SAMPLING AND ANALYSIS METHODS

5.1 SAMPLING DESIGN AND TECHNICAL APPROACH

In December 2006, EPA GLNPO and MDEQ initiated the sampling and analysis phases of the RI to evaluate the goals of:

1) determining whether contaminated sediments were present in the upstream stretch of the Trenton Channel,
2) accurately estimating contaminated sediment volume, and
3) guiding decisions regarding engineering and design in anticipation of remedial activities.

Figure 5-1 includes the exact locations of the Phase I and Phase II sampling sites within the area of interest and Figure 5-2 displays the Phase I and Phase II sampling sites overlaid on the transects.

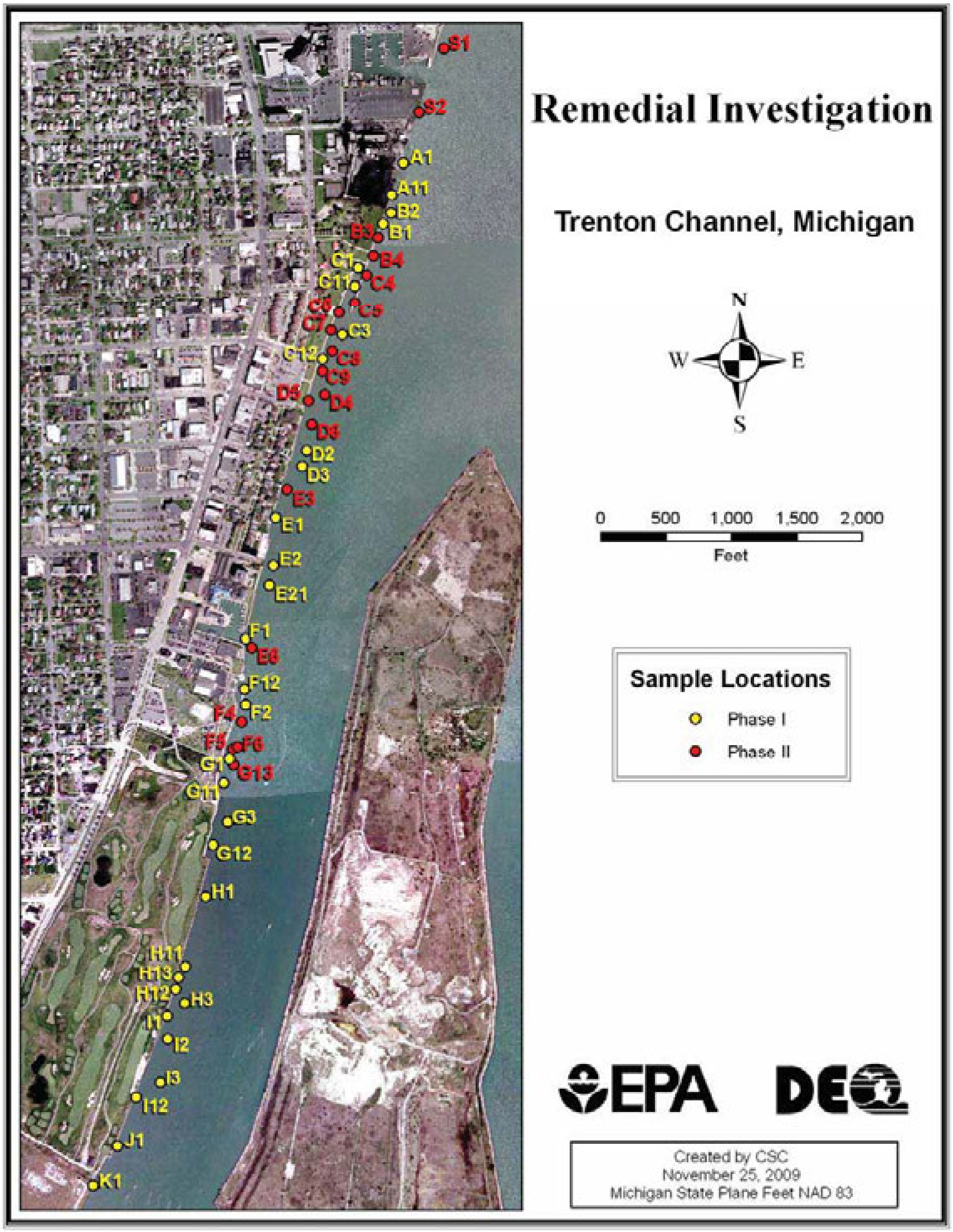

Figure 5-1 Phase I and Phase II Sampling Locations

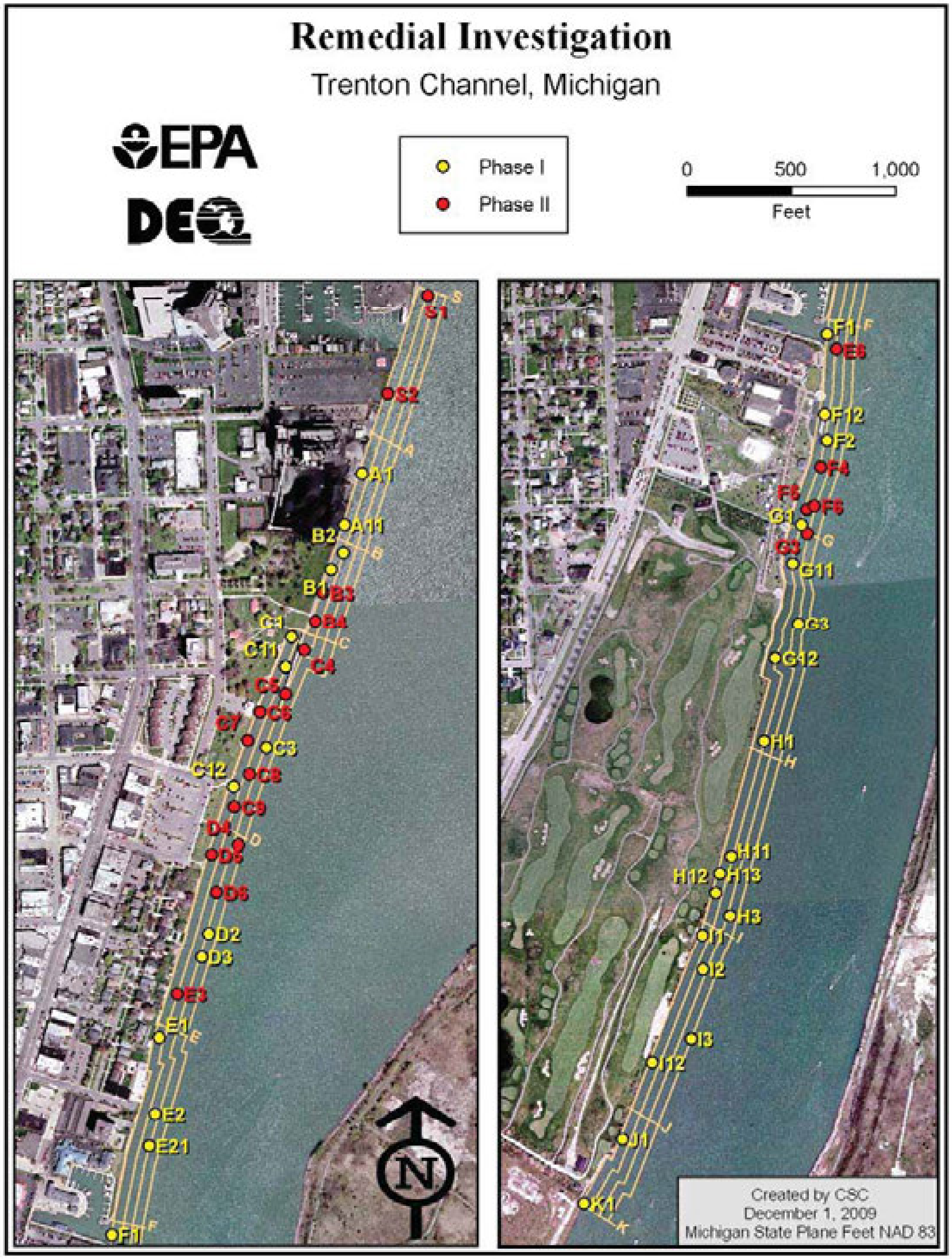

Figure 5-2 Phase I and Phase II Sampling Locations Overlaid on the Transects

5.2 SAMPLING DESIGN

5.2.1 Phase I Sampling Design

The sampling design and procedures documented in the Field Sampling Plan and QAPP and implemented during Phase I were based on the following considerations (STN Environmental JV, December 12, 2006):

- Selection of sampling and coring sites in accordance with the project-specific needs
- Frequency of sampling
- Methods of sampling to be employed
- Media to be sampled
- Number of samples
- Volume of sample required for analysis, including additional laboratory QC analyses
- Types of field QC samples to be collected
- Analyses to be performed in the field laboratory
- Sample turnaround requirements
- Specific procedures and precautions to be followed during sampling
- Sample preservation methods
- Shipment procedures

To maintain consistency with previously conducted studies and to have adequate coverage of the site, 11 transects (Transects A-K) were oriented perpendicular to the shore of the channel. The transects began along the shoreline and were spaced 50 feet apart moving east to 150 feet into the channel; thereby creating four transects running parallel to the shoreline (e.g., A1, A2, A3, and A4, B1, B2, B3, and B4, etc.). Transects A and B (northernmost) and K (southernmost) were 500 feet from north to south while the transects in the middle of the sampling region were spaced at 1,000-foot intervals (Figure 4-1). After this grid of potential sampling stations was developed, a systematic random stratified sampling approach was utilized to select sampling locations based on sediment thickness, physical observations (e.g., odors, outfalls, etc.), and current and past land usage.

Table 5-1 summarizes the Phase I sediment sampling sites which includes the collection of 81 discrete samples.

Table 5-1 Sample Identifiers and Locational Information for Phase I Sediment Sampling

Station ID	Latitude (NAD 83)	Longitude (NAD 83)	Number of Discrete Samples*	Water Depth (decimal feet)	Sediment Depth (decimal feet)
A1	42.207944	-83.144472	3	18.6	5.3
A11	42.207278	-83.144806	3	22.5	6.0
B1	42.206694	-83.145056	1	27.1	3.0
B2	42.206917	-83.144833	1	27.2	3.9
C1	42.205778	-83.145778	3	8.5	6.0
C11	42.205389	-83.145889	4	9.0	8.3
C12	42.203833	-83.146833	3	8.6	5.0
C3	42.204333	-83.14625	3	23.8	6.4
D2	42.201917	-83.147306	1	24.4	4.5
D3	42.201583	-83.147444	1	32.6	4.8
E1	42.200528	-83.148222	2	18.5	3.6
E2	42.199528	-83.148306	2	30.7	5.8
E21	42.199111	-83.148417	1	31.0	2.0
F1	42.197944	-83.149111	2	8.5	5.3
F12	42.196889	-83.149167	1	20.0	2.0
F2	42.196556	-83.149139	2	28.1	6.8
G1	42.195444	-83.149611	1	15.3	1.8
G11	42.194944	-83.149778	4	20.7	7.8
G12	42.193667	-83.150111	2	23.6	4.3
G13	42.19533	-83.14951	3	27.2	5.2
G3	42.194139	-83.149694	1	30.3	2.3
H1	42.192583	-83.150333	1	25.0	1.4
H11	42.191083	-83.150944	3	19.0	4.0
H12	42.190611	-83.151222	5	18.5	10.0
H13	42.190861	-83.151139	5	18.0	11.0
H3	42.190306	-83.150972	3	28.5	5.3
I1	42.190056	-83.151472	3	22.6	11.3
I12	42.188361	-83.152389	3	19.8	5.5
I2	42.189583	-83.151472	3	27.1	6.3
I3	42.188667	-83.151694	2	30.2	4.4
J1	42.187361	-83.152944	3	20.4	7.3
K1	42.186528	-83.153639	6	8.1	12.0

* Number of discrete samples does not include field duplicates. Samplers collected and prepared one field duplicate for every 20 routine field samples.

NAD – North American Datum

5.2.2 Phase II Sampling Design

Based on review and analysis of the Phase I results, a series of specific questions were developed that required additional data from the site. For the purposes of generating statistical sampling designs for Phase II of the RI, mercury, total PCBs, and total PAHs were considered the COCs for the site. These COCs were selected based on evaluations of the results obtained from Phase I sampling and analytical efforts, data obtained from previously conducted studies, and site expertise of the EPA and MDEQ. CBSQGs were used to assess COCs and were set to the probable effects concentrations (PEC) of 1.06 parts per million (ppm), 676 parts per billion (ppb), and 22,800 ppb for mercury, total PCBs (as Aroclors), and total PAHs, respectively (MacDonald, D.D., *et al.*, 2000). The Project Team selected PECs as the most appropriate screening levels at this stage of the remedial investigation.

Phase II also focused on areas containing soft sediments. These areas were defined as:

- Depositional areas with at least one foot of sediment
- Areas that do not routinely experience high currents (not high energy areas)
- Areas in which sediment is not predominantly clay

To further define the nature and extent of contamination at the site, three specific questions were proposed:

Question 1 − Are the contaminant concentrations in Transects D, E, and F, below the CBSQGs?

Question 2 − Can the PCB hot spot identified in Transect C be further resolved?

Question 3 − Is there an increasing trend in mercury concentrations moving north from Transect F to A? Further, is there a potential source of mercury within 1,000-feet upriver from Transect A (Transect S)?

The sampling designs for Phase II of the RI were driven by the DQO process and documented in separate DQO Tables. Each Phase II sampling objective and corresponding sampling design is summarized in the sections 5.2.2.1 – 5.2.2.4 which follow. Section 5.2.2.5 provides the exact sampling locations for Phase II collection efforts.

5.2.2.1 Distribution of Contaminants in Transects D, E, and F

The project question for Transects D, E and F was "Are the contaminant concentrations in Transects D, E, and F, below the CBSQGs?" Sediment sampling and analysis was conducted in accordance with the Field Sampling Plan and QAPP to determine if: 1) the concentration of COCs within the sub areas is less than or equal to the associated CBSQGs; or 2) the concentration of the COCs within the sub areas is greater than the associated CBSQGs.

To address this project question, a power analysis was conducted using the existing data from Phase I. To develop the sampling design, a power curve was utilized for the sediment sampling and data analysis in the style recommended by EPA's DQO process (EPA, February 2006). Based on the power curve, an estimated 12 sediment samples were needed to assess site conditions and COC concentrations. The power curve also allowed for evaluation and determination of limits on the decision error. A false positive decision may cause an inappropriate rejection of the null hypothesis and the inappropriate cost of potential remedial activities. For this decision, a false positive level of 20% for each COC test was maintained. A false negative decision is inappropriately determining that one or more COCs is below their CBSQG. This, in turn, may cause an inappropriate risk to human health and the environment. Based on the needs of the project and considerations of the consequences of the two types of errors, 80% confidence level/20% false positive level was identified as the most appropriate level for the sampling design and subsequent analyses.

In developing the power curve, the mean log-transformed COC concentrations were compared to the CBSQGs using a one-sample t-test. The Phase I sampling design of four samples per transition zone achieved an 80% power in detecting an exceedence of the CBSQG (i.e., the PEC, equal to 1.06 ppm for mercury, 0.676 ppm for total PCBs, and 22.8 ppm for total PAHs) when the true average mercury concentration is equal to two times the CBSQG (i.e., 2.12 ppm for mercury, 1.36 ppm for total PCBs, and 45.6 ppm for total PAHs).

5.2.2.2 Refined Horizontal Extent of PCBs in Transects B and C

The project questions for Transects B-C were: "What is the distribution of total PCBs within Transects B and C?" and "Are the contaminant concentrations below the CBSQGs?" Based on the evaluation of data generated in Phase I of the RI, an area of sediment within Transect C appeared to be contaminated with PCBs. Additional sampling was conducted in Phase II to further define this area, or hot spot, of PCB contamination.

Kriged concentration maps for total PCBs and mercury were developed for Transect C. Kriging is a spatial and variance interpolation method used to predict values across the site in areas where samples were not collected (Cressie, 1990). After a review of the maps and data analysis, the sampling design was extended into Transect B in order to fully evaluate the distribution of total PCBs. The search ellipse method was applied using Visual Sampling Plan (VSP, v 4.0, U.S. DOE, 2005) the "Locating a Hot Spot" routine. A 150-foot square grid was applied to the 6.4-acre area to detect the defined hot spot with 95 % probability. The resulting search ellipse had a target diameter of 150 feet with 95% probability of detecting the hot spot. Phase I sample analysis of PCB concentrations revealed a 300-foot smear of contamination down the coast line. This determined the 150-foot diameter for the search ellipse in the hot spot detection algorithm. With these criteria, 13 total samples were required. Six samples were collected in Phase I of this project; therefore, seven additional samples were targeted for collection in Phase II. Upon review and analysis, eight sample locations were randomly generated in the grids without coverage for Transects B-C.

5.2.2.3 Distribution of Mercury Contamination in the Northernmost Section

The project question for Transects A-F and S was "Is there an increasing trend in mercury concentrations as you move north from Transect F to A?" Sediment sampling was conducted to determine if: 1) an increasing trend in the concentration of mercury in sediment occurs moving North from Transect F to A; or 2) an increasing trend in the concentration of mercury in sediment does not occur moving north from Transect F to A.

In order to address this objective, a linear regression analysis was conducted of the data generated in Phase I. A regression line was fitted to the mercury concentration data collected from Transects A through D against location along the shoreline. Prediction intervals for the expected concentrations of samples collected upstream of the A1 Transect also were fit based on the regression curve. These prediction intervals were used to form the basis of the sampling design. Based on the needs of the project and considerations of the consequences of the two types of errors (i.e., concluding there is a significant trend when in fact there is none, and concluding there is no trend when in fact there is one), the Project Team identified the 80% confidence level as the most appropriate level for the sampling design and subsequent analyses.

Statistical analysis was conducted to test the hypothesis that an increasing trend in the concentration of mercury occurs moving north from Transects F through A. Mercury was the focus of the sampling design; however, sample analyses also were conducted for the other COCs (total PCBs and total PAHs) to describe the extent and nature of contamination across the site. Statistical tests were conducted to evaluate the concentrations of mercury across Transects A through F and to determine if an increasing trend of mercury exists. A regression curve was fit to the data collected in Phase I. Prediction intervals for the expected concentrations of samples collected upstream of the A1 Transect also were fit based on the regression curve. Phase II data were incorporated into the regression curve and the slope of the line re-calculated, as presented in Section 7.2.3.2.

5.2.2.4 Source of Mercury Contamination in the Northernmost Section

The project question for Transects A-F and S was "Is there a potential source of mercury within 1,000-feet upriver from A (Transect S)?"

Sediment sampling was conducted within each of the transects using a combination of purposeful and stratified random sampling in accordance with the Field Sampling Plan. The sampling focused on areas of interest that were defined based on Phase I results and employed random selection within these areas of interest.

5.2.2.5 Phase II Sampling Locations

After specific Phase II sampling sites were established (Figure 5-1), sediment sampling (core and ponar samples) was conducted as described in Section 5.2. As shown in Table 5-2, 47 discrete samples were collected in Phase II of the RI.

Table 5-2 Sample Identifiers and Locational Information for Phase II Sediment Sampling

Station ID	Latitude (NAD 83)	Longitude (NAD 83)	Number of Discrete Samples*	Water Depth (decimal feet)	Sediment Depth (decimal feet)
B3	42.20639	-83.1452	2	26.3	1.8
B4	42.20601	-83.14534	2	26.0	2.5
C4	42.20561	-83.14555	3	23.3	4.7
C5	42.20503	-83.14589	3	25.9	6.2
C6	42.2048	-83.14635	5	6.0	9.5
C7	42.20443	-83.14658	2	5.9	3.3
C8	42.20399	-83.14655	2	20.2	3.5
C9	42.20357	-83.14683	1	17.6	1.4
D4	42.20308	-83.14677	2	30.1	2.0
D5	42.20295	-83.14724	2	17.5	3.5
D6	42.20246	-83.14716	1	11.0	1.5
E3	42.2011	-83.14789	2	29.3	3.2
E4	No samples were collected due to hard clay sediments				
E5	No samples were collected due to hard clay sediments				
E6	42.19775	-83.14895	2	23.5	2.0
F4	42.1962	-83.14926	3	18.5	3.75
F5	42.19565	-83.14952	3	20.0	5.2
F6	42.19569	-83.14938	2	29.5	3.3
S1	42.21031	-83.14327	6	15.2	10.5
S2	42.20899	-83.144	4	18.2	7.3

* Number of discrete samples does not include field duplicates. Samplers collected and prepared one field duplicate for every 20 routine field samples.
NAD – North American Datum

5.3 SAMPLE COLLECTION AND ANALYSIS METHODS

5.3.1 Sediment Core Sampling

Field sampling efforts were conducted onboard a barge. A Field Sampling Plan was developed for each project phase where sampling methods were described in detail including *Final Field Sampling Plan for Remedial Investigation and Focused Feasibility Study, Riverview - Trenton Channel, Wayne County, Michigan*, dated December 12, 2006 for Phase I and *Final Field Sampling Plan for Remedial Investigation and Focused Feasibility Study, Riverview - Trenton Channel, Wayne County, Michigan*, dated July 6, 2007 for Phase II. Coupled with the appropriate Field Sampling Plans, the *Sediment Sampling Standard Operating Procedures* (Appendix A of the QAPP) provided additional sampling method information and are presented in brief in this section.

Sediment core samples were collected for chemical analyses using a vibracore sampler capable of collecting 20 feet of sediment. Depending on the conditions in the field, vibracore samples were collected to refusal (from zero to eight feet depth or more) and sectioned each core into four intervals including zero to one foot, one to three feet, three to five feet, and above five feet in length. Samples above five feet in length were sectioned at additional subsequent two-foot depth intervals.

Routine field samples (RFS) were collected at established sampling locations. Each individual RFS was thoroughly homogenized per the appropriate standard operating procedure (provided as appendices in the QAPP) until a uniform texture and color was obtained and then filled the required sample containers with the homogenized sediment sample. The sampling equipment and mixing utensils were cleaned and decontaminated before and after collecting each sample, and whenever oil or grease was visible on the sampling equipment. The cleaning and decontamination procedures are described in detail in *Sediment Sampling Standard Operating Procedures* (Appendix A of the QAPP).

Sample location, sediment thickness, and sediment physical observations were recorded in a field log notebook. Latitude and longitude coordinates for all sampling locations were recorded during both sampling phases using a calibrated global positioning system (GPS) unit. During Phase II sampling, a minimum of two GPS reference points were collected to ensure consistent field location determinations between sampling events. Reference points were used to document any variability in GPS readings between sampling events. In the event an issue occurred preventing the collection of a sample, the sampler moved five or more feet from the original sampling location. The sample was then collected and the latitude and longitude coordinates of the adjusted location were recorded. If an obstruction was encountered after adjusting their position or if insufficient sediment volume was collected, the sampler took an offset near that pre-determined location before relocating a sample location in the same grid. The field log notebook was updated to note that an obstruction was encountered or not enough sediment was readily available to obtain a sample at that location and the original sampling location was relocated. Sediment thickness, or depth, at which significant changes or inclusions (e.g., wood debris, sand layers, etc.) occurred in the core was recorded. Observations included the gross physical characteristics of the sediment, such as obvious odor, oily sheen, texture, color, and the presence of debris.

Due to the importance of the sediment samples in determining the nature and extent of sediment contamination, additional samples were collected for QC purposes. These QC samples included:

- *Field Duplicates (FDs):* Field duplicates were prepared by using extra volume from each composite created when preparing the RFSs. One FD was collected and prepared for every 20 RFSs at sampling locations. FDs were placed in the same type of sample containers used for collection of RFSs and labeled FDs so that they appeared to the analytical laboratories to be routine samples which were sent as "blind" QC samples (the laboratories did not know the samples were splits). Laboratories analyzed the FDs for the same parameters for which the RFSs were analyzed.
- *Matrix Spikes/Matrix Spike Duplicates (MS/MSDs):* MS/MSDs were prepared by using extra volume of the final homogenized composite obtained when preparing the RFSs. Unlike the FDs, the MS/MSD samples were sent to the laboratories clearly designated as QC samples. MS/MSDs sampling locations were randomly selected and a MS/MSD was collected for every 20 field samples or sample delivery group, whichever was more frequent.

5.3.2 Surficial Sediment Sampling

A ponar dredge sampler was used to collect sediment samples for toxicity testing during both phases of the project. During Phase I, surficial sediment samples (zero to two inches deep) were collected from four locations (C3, C11, G11, and K1) to assess toxicological effects of contamination. During Phase II, four surface grab samples were collected for toxicity analysis from four locations (S2, B3, E3 and F5).

5.3.3 Analytical Methods

Sediment samples were analyzed during both Phase I and Phase II of the project. The specific analyses and methods differed slightly in each of the two phases of the project. A full suite of analytes were assessed during Phase I of the project to help evaluate the nature and extent of contamination. This list was refined for the Phase II sampling and analytical effort based on results obtained during Phase I. Table 5-3 displays the classes of analytes assessed during Phases I and II. The green dot signifies that class of analytes was assessed for at least some of the samples while a red "x" indicates that class of analytes was not assessed.

Table 5-3 Classes of Analytes Assessed in Sediment Samples During Phase I and Phase II

Classes of Analytes	Phase I	Phase II
SVOCs	•	•
PCBs as Aroclors (1016, 1221, 1232, 1242, 1248, 1254, 1262, and 1268)	•	•
209 PCB Congeners	•	•
Metals, including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc	•	•
Simultaneously extracted metals including cadmium, copper, lead, mercury, nickel and zinc- acid volatile sulfides (SEM-AVS), as a measure of bioavailability of metals in the sediments	•	x
Toxicity characteristic leaching procedure (TCLP) metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc	•	x
Volatile organic compounds (VOC)	•	x
Extractable petroleum hydrocarbons (EPH) in the oil and diesel ranges	•	•
Oil and grease	•	x
Total organic carbon	•	•
Grain size	•	x
Specific gravity	•	•
Moisture content	•	•
Atterberg limits	•	x
pH	•	x

Samples were collected and analyzed in Phase I for volatile organics and selected metals in leachates from sediment samples that were prepared using the toxicity characteristic leaching procedure. The purpose of these analyses was to determine if sediments removed from the site met the definition of a hazardous waste under the Resource Conservation and Recovery Act and therefore were required to be disposed of as hazardous.

Sediment samples were also subjected to toxicity tests to assess the impact of sediment contamination on infaunal organisms for both phases.

The analytical methods used for sediment analyses are summarized in Table 5-4.

Table 5-4 Analytical Methods and Reporting Limits, by Laboratory

Sediment Characteristics	Analysis		Lab	Analytical Methods	Target Reporting Limits[A]
Chemistry	SVOCs/PAHs		MDEQ	SW-846 8270C	100 – 500 µg/kg
	PCBs as Aroclors	Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268	MDEQ	SW-846 8082	100 µg/kg
	PCBs as congeners	Homologues & congeners (at 25% of the sample sites)	Contracted Lab	Method 1668A (modified)	200 pg/g
	Total Metals	Arsenic	MDEQ	SW-846 7060	500 µg/kg
		Barium		SW-846 6010B/6020	1,000 µg/kg
		Cadmium		SW-846 6010B/6020	2,000 µg/kg
		Chromium		SW-846 6010B/6020	2,000 µg/kg
		Copper		SW-846 6010B/6020	1,000 µg/kg
		Lead		SW-846 6010B/6020	5,000 µg/kg
		Mercury		SW-846 7471	1,000 µg/kg
		Selenium		SW-846 6020	200 µg/kg
		Silver		SW-846 6020	100 µg/kg
		Zinc		SW-846 6010B/6020	5,000 µg/kg
	TCLP Metals[B]	Arsenic	MDEQ	SW-846 7760	10 µg/L
		Barium		SW-846 6010B	10 µg/L
		Cadmium		SW-846 6010B	20 µg/L
		Chromium		SW-846 6010B	50 µg/L
		Copper		SW-846 6010B	20 µg/L
		Lead		SW-846 6010B	100 µg/L
		Mercury		SW-846 7470	0.4 µg/L
		Selenium		SW-846 7740	10 µg/L
		Silver		SW-846 7761	5 µg/L
		Zinc		SW-846 6010B	20 µg/L
	VOCs		MDEQ	SW-846 1311/8260B	Not Available[C]
	EPH	Diesel-range organics	MDEQ	SW-846 8015 (Modified)	5,000 ppb
		Oil-range organics			20,000 ppb

Sediment Characteristics	Analysis	Lab	Analytical Methods	Target Reporting Limits[A]
	SEM-AVS	Contracted Lab	EPA 1629	0.5 µmole/g
	Oil and grease		SW-846 9071B	500 mg/kg
	pH		DPA Method 9045C	0.1 pH units
Bulk Properties	Total organic carbon	Contracted Lab	ASTM D 2974	Not applicable
	Grain size		ASTM D 422	
	Moisture content		ASTM D 2216	
	Atterberg limits		ASTM D 4318	
	Specific gravity		ASTM D 854	
Toxicity	*Hyalella azteca* at 25% of the sample sites (28-day – survival, growth, and reproduction)	Contracted Lab	EPA Method100.1	Not applicable
	Chironomus dilutus at 25% of the sample sites (20-day – survival and growth)		EPA Method100.2	Not applicable

A Target reporting limits are based on dry weight. Actual reporting limits may be sample specific and incorporate adjustments for moisture, dilutions, etc.

B TCLP analyses are reported in weight/volume units (e.g., µg/L), based on the total volume of the leachate

C Target reporting limits were not identified for this method, because VOC analyses were not originally intended. See Section 6.3.1.1 for more details.

5.4 SEDIMENT DEPTH SURVEY

A bathymetric survey was conducted in June 2006 to delineate the channel and shoreline areas and provide depth contours to assist in the development sample designs and collection efforts. Sonar devices were used to quantify the volume of soft sediment in the Trenton Channel site by conducting vertical and lateral surveys. The sediment volume quantification when combined with sediment core data collected with a vibracore sampler allowed for the assessment of sediment thickness.

The survey was performed in accordance with the USACE Manual EM 1110-2-1003, *Hydrographic Surveying* (January 1, 2002). The sounding data was collected from a 23-foot Whaler Challenger using a calibrated Odom Echotrac™ MKIII precision recording fathometer. The Trimble® DSM-132™ Differential Global Positioning System (DGPS) equipped with a beacon receiver was utilized to ensure accurate horizontal positioning. A laptop computer using the latest version of HYPACK® hydrographic surveying software assisted in navigation guidance and data collection and processing. The Whaler

Challenger never exceeded 5 knots during survey data collection efforts to ensure the highest quality of data (MACTEC, June 2006).

The results of the hydrographic survey were reviewed and used to assist in determining the specific locations to collect sediment probe data. A vibracore sampler was used to collect the samples at over 40 sampling locations and the locational data for each probing was captured through the use of the same DGPS equipment and software used for the hydrographic survey. General observations regarding the sediment types were documented in a field log notebook (MACTEC, June 2006).

5.5 DATA MANAGEMENT AND DATA QUALITY

Data collected during Phase I and Phase II of the Trenton Channel project were managed using procedures outlined in the project planning documents. These procedures included using standard protocols for recording field data, defined electronic data deliverables (EDD) for laboratory data, chain-of-custody forms for transferred samples, a data logging system to track all field and laboratory data submitted for independent data verification, and a standardized database to store all project data. More information regarding data management and data quality is provided within this section.

5.5.1 Data Management

The field data, laboratory data, and other project information gathered during preparation and implementation of the project included:

- Original planning documents developed for the project.
- All permits, licenses, and agreements. Copies of these were maintained at the project site at all times throughout the RI activities.
- Site survey data, including pre-work survey data and surveys conducted throughout and upon completion of RI activities.
- Standard forms used to document inspections and data quality verifications as specified by EPA GLNPO and MDEQ.
- Field information recorded each day in daily logbooks. This included weather conditions, personnel present, all field measurements and observations, and any deviations from the original sampling plan. Entries into the logbooks were made as activities occurred or samples were collected. Calibrations of any field

equipment were documented in the logbooks. Instrument readings taken during the sample collection efforts were documented in boring logs, in the field logbook, or both. Daily logbooks were stored at the project site.

- Field sampling records. Once samples were collected, a chain-of-custody record was created for each sample. This record then accompanied the sample to the laboratory.
- Laboratory data generated during analysis of sediment samples. These data were reported electronically and in hard copy.

To ensure effective handling of such data, field-related work plans and quality control procedures for technical data generated by field staff were developed and implemented.

Data management strategies for managing data associated with the sediment contamination sampling activities after completion of each phase of sampling are described below.

5.5.2 Laboratory Data Collection

The laboratory provided data for sediment contaminant results in the form of summary-level data reports that included laboratory-applied data qualifiers and reporting limits. All laboratory data and records were included in final analytical reports. Laboratories delivered data in the form of EDDs, as well as in hard-copy data packages that included the analytical results, quality control results, narratives from the analytical laboratory, and the chain-of-custody forms. These data packages then underwent data verification, validation and processing that included the application of validator-applied qualifiers.

5.5.3 Database

EPA GLNPO developed a sediment contaminant database used to maintain and archive all sediment contaminant data from GLLA projects, referred to as the Great Lakes Sediment Database (GLSED). This database contains sediment chemistry and toxicity data for target analytes included in each project. Field observations, locational data, and all relevant collection information also are stored in the database. Both the laboratory-applied and validator-applied qualifiers are maintained in GLSED at the sample-specific level. The data review narratives prepared by the data validator also are appended to the project GLSED. The database is compatible with the Query Manager Data Management

System administered by National Oceanic and Atmospheric Administration. All Trenton Channel sample results presented in this report are maintained in GLSED.

5.5.4 Data Quality

Due to the importance of the environmental samples in determining the nature and extent of contamination at the project site, all data were reviewed as described in the project QAPP. The analytical laboratories reviewed the analytical data sets internally to confirm compliance with laboratory QC criteria. The data review identified any out-of control data points and data omissions and the laboratories corrected these data deficiencies.

The data validator reviewed each data package from the participating laboratories to verify the quality control requirements were met and to identify questionable data. The data were evaluated using the U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA, February 1994) and U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA, October 1999) and laboratory established quality control parameters. The data were flagged with “usability” qualifiers as necessary for clarity. The data qualifiers applied by the laboratories as well as the validator are maintained at the sample level in the GLSED.

Efforts to assess the quality of the data identified a number of data quality concerns that are typical of sediment sample analyses. Foremost among those concerns were issues related to the bias and precision information available from the MS/MSD analyses. In many instances, the amounts of the analytes of interest the analytical laboratories spiked into the MS/MSD samples were well below the background concentrations in these contaminated sediments. The end result was that the spiked sample results were not appreciably different from those for the unspiked aliquot of the sample, and the “recovery” of the spiked analytes will appear to be quite low.

In some instances, the matrix spike recoveries were only marginally outside of the acceptance limits in the QAPP for this project (e.g., 74% recovery for acid volatile sulfide versus a lower limit of 75%). Such minor deviations from the acceptance limits are not a significant concern. However, in other instances, the apparent recoveries were well below reasonable expectations, and could suggest the analytical methods applied to the sediment samples were not optimal choices. In other instances, the analytes that were spiked into the MS/MSD samples did not represent the project-specific analytes of interest, but were based on generic recommendations in the methods used.

Many of these concerns were addressed during the course of the project. For example, one of the analytical laboratories during the Phase I analyses ensured the PAHs of interest were spiked into the MS/MSD samples for the latter stages of Phase I and all of the Phase II analyses, rather than using a generic spiking solution that contained only one PAH compound.

Laboratories also worked to improve analytical sensitivities through the application of specific cleanup procedures for the organics. By removing interferences from the sample extracts, the laboratories were able to identify and quantify the target analytes at lower concentrations, rather than resorting to diluting the extracts to remove the interferences and reporting non-detects at high levels. The improved cleanup techniques also reduced interferences with the surrogate compounds added to every sample analyzed for organics. Thus, the surrogate recoveries, which are a sample-specific QC indicator of extraction efficiency, provided more useful results than without the cleanup. These improvements were documented in conference call summaries as well as an addendum to the project QAPP (STN Environmental JV, March 7, 2007).

Although adaptive management techniques were used to address the issues over the course of the project, the inherent difficulties in the analyses of the sediment samples resulted in QC data that are less robust than originally planned (e.g., fewer meaningful matrix spike recoveries). These data quality concerns and the qualifier flags applied to the analytical results do not mean the results are invalid. Rather, the qualifiers are intended to caution the user about an aspect of the data that does not meet the acceptance criteria originally established for the project. Therefore, additional consideration should be paid to the potential effects of uncertainty in using these results. As noted above, the final data review narratives, as well as the sample-specific qualifiers applied by the laboratory and validator, are stored in GLSED. During data validation, no results were determined to be invalid for use in describing extent and nature of contamination for the purposes of the remedial investigation and the data interpretation presented in this report.

6.0 PROJECT RESULTS

From December 2006 to July 2007, 128 discrete samples were collected and analyzed from 50 sampling stations. A suite of target analytes were determined in each of the sediment samples including, semivolatile organic compounds, metals, polychlorinated biphenyls, simultaneously extracted metals-acid volatile sulfide, toxic characteristic leaching procedure for volatile organic compounds and metals, extractable petroleum hydrocarbons, and oil and grease. Additional sediment parameters included total organic carbon, grain size, density, pH, moisture content and Atterberg limits and toxicity data in sediments. Observed results for individual samples described in this report (location and depth interval for each sample is specified in the sample ID) are provided in Appendix H.

Sections 6.1 through 6.6 present summary statistics of the various analytes included in the Phase I and II data collection efforts. Data from both phases are combined for all assessments; however, the results are summarized separately for each depth category, and combined over all depth categories. For the purposes of data interpretation for this report, non-detect results were handled as follows. In developing the summary statistics for individual analytes, one-half the reporting limit was substituted for the analyte for any non-detect values. When calculating aggregate analyte totals (e.g., total PAHs, total Aroclors, total PCB congeners), the non-detect results for individual analytes was set to zero. When all of the individual analytes comprising a total were non-detect values, the value for the total was set to half the highest individual reporting limit. Because the sample-specific reporting limits for individual analytes typically were less than two times the target reporting limit presented in Table 5-4, and because non-detects were replaced with one-half the sample specific reporting limit when descriptive statistics were calculated, the minimum concentration for many of the analytes presented in the following sections is below the target reporting limit.

6.1 SEDIMENT DEPTH

As detailed in Section 5.4, sediment depth data was selected based on sediment probe measurements and observed sediment core lengths. Sediment depth measurements were collected at 127 sampling locations during the 2006 sediment survey, Phase I, and Phase

II sampling events. Fifty of the sediment depth measurements were based on the depth of sediment cores taken to refusal and 77 were based on sediment probe measurements (Figure 6-1). Sediment depth ranged from no soft sediment, or zero feet of sediment, to 19 feet (Table 6-1). Geostatistical analysis also was conducted on the sediment depth results observed in the Phase I and Phase II study areas to generate a kriging map of sediment depth as illustrated in Figure 6-2 (Appendix A provides the technical approach for the geostatistical analysis). Based on the geostatistical analysis, sediment depth estimates ranged from 0.5 feet to 18.2 feet.

Table 6-1 Descriptive statistics of Sediment Depth Measurements

Measurement Type	Number of Results	Mean (ft)	Median (ft)	Standard Deviation (ft)	Min (ft)	Max (ft)
Core Depth	50	4.02	2.97	2.60	0.99	10.9
Probe Depth	77	7.01	7.00	4.64	0	19

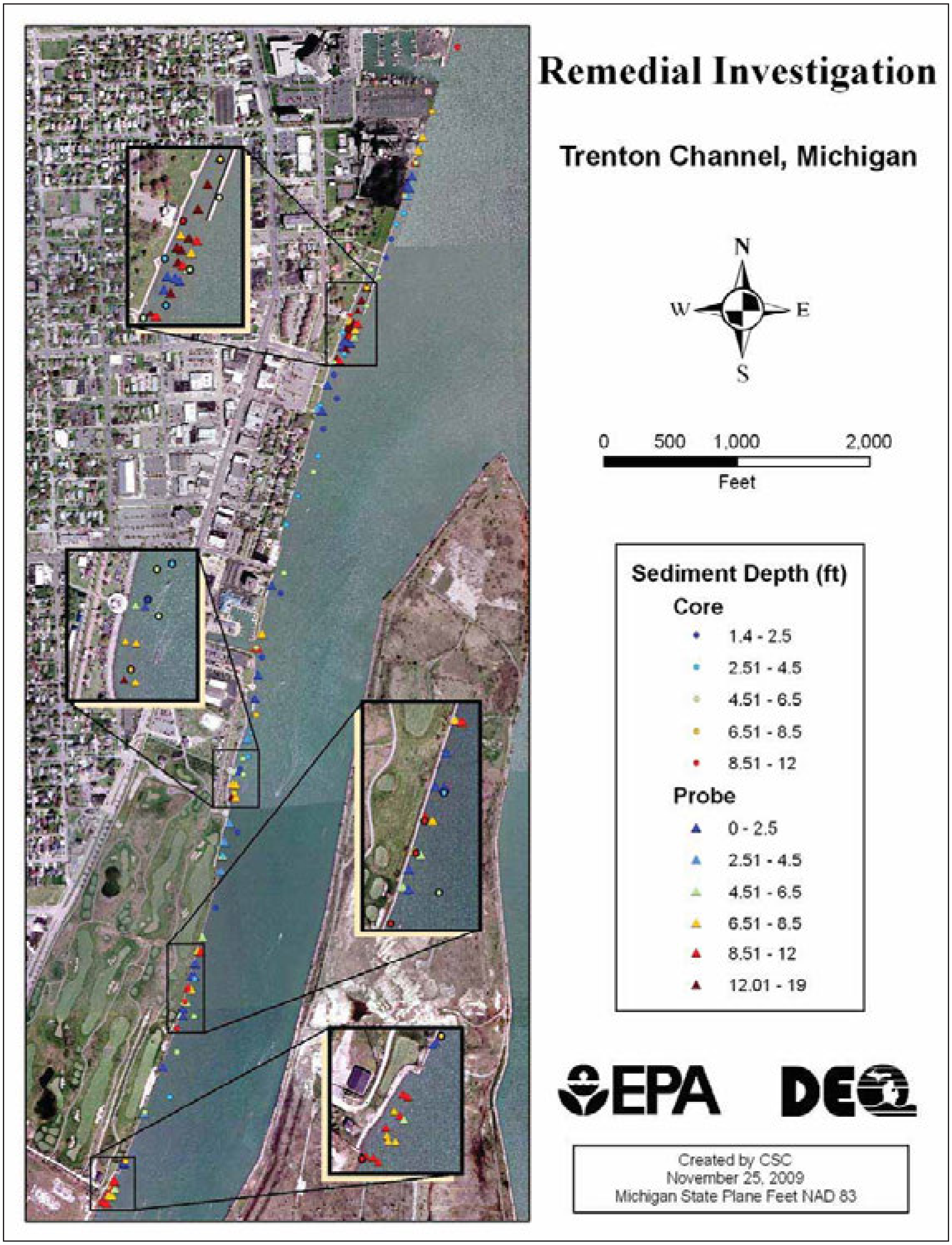

Figure 6-1 Project Sediment Depth Results

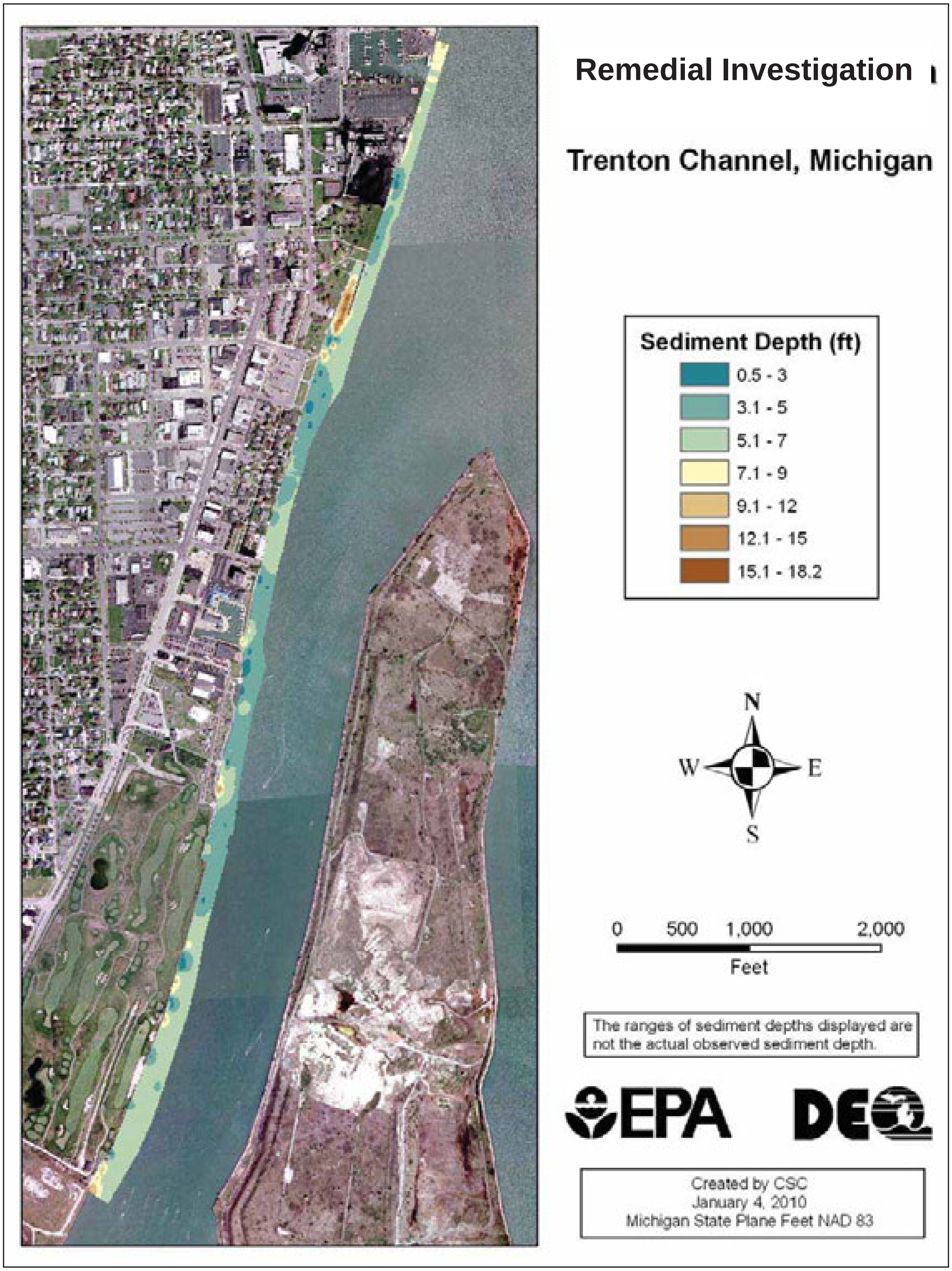

Figure 6-2 Kriged Sediment Depth at the Trenton Channel Site

6.2 SEDIMENT PHYSICAL CHARACTERISTIC

Sediment samples were collected for physical analysis of grain size distribution through the length of the sediment core (Phase I samples only). Using the United States Department of Agriculture (USDA) soil taxonomy (USDA, 1999), the grain size data was classified into distinct soil textures. Figures 6-3 through 6-5 illustrate the soil texture characterization for specific depth intervals for Phase I sampling locations. On average, samples contained mostly silt (34.6%), clay (26.4%) and fine sand (19%) content. At surface depths, samples contained a higher percentage of gravel and medium sand than samples collected at deeper depths. Appendix H provides individual sample results for the sediment physical characteristics including clay content, silt content, gravel content, coarse sand content, fine sand content and medium sand content.

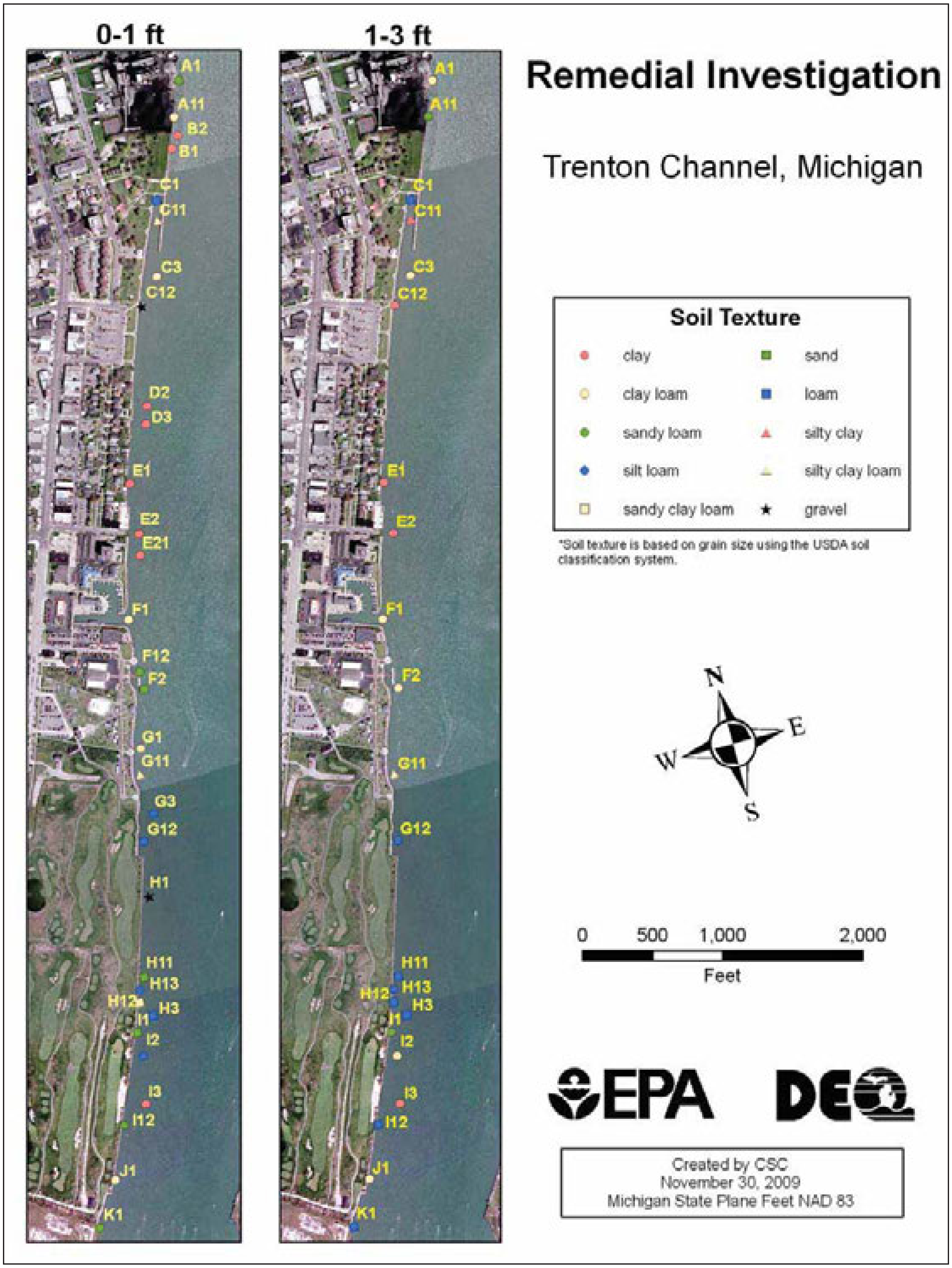

Figure 6-3 Soil Texture Classification Results for 0-1 Foot and 1-3 Foot Depth Intervals

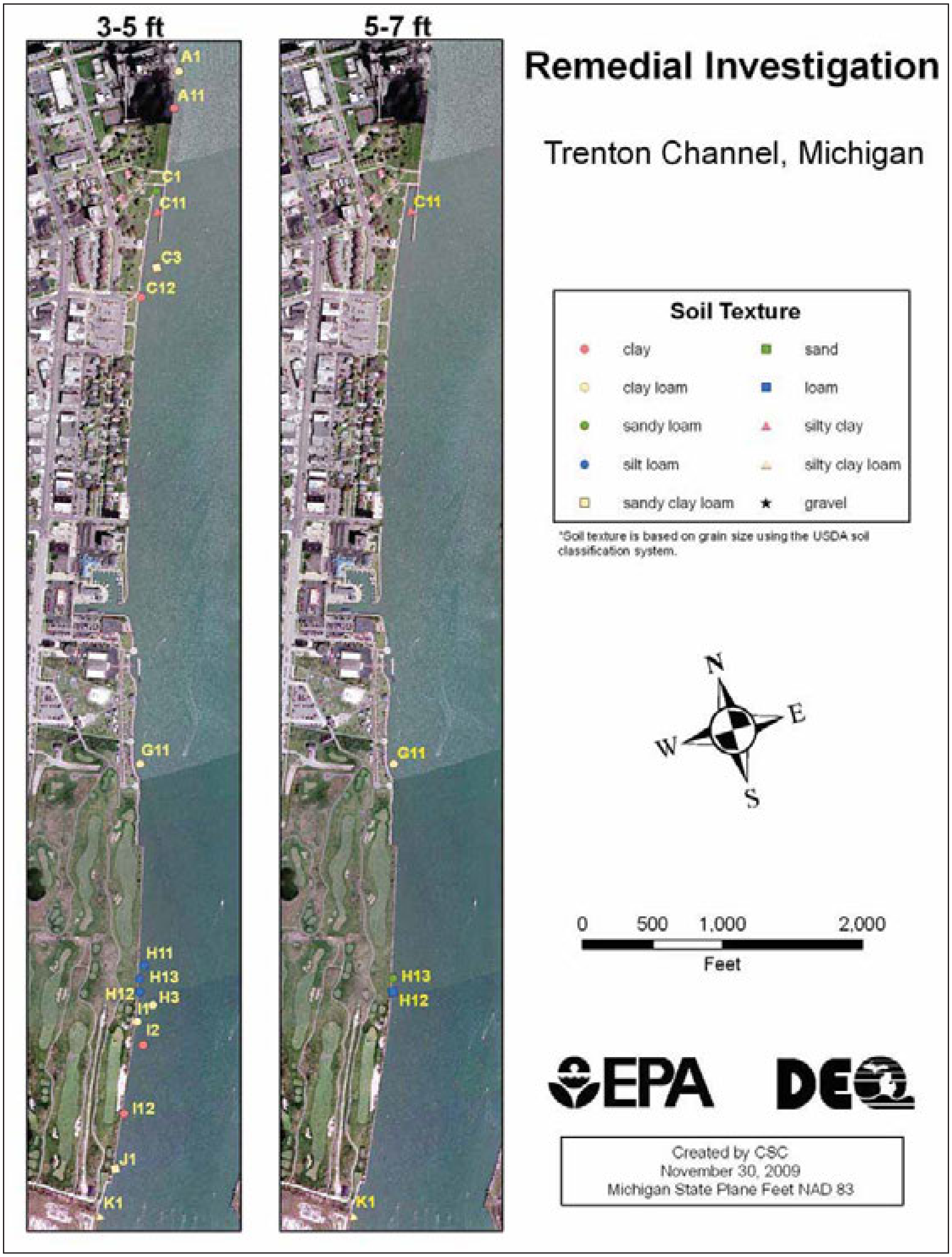

Figure 6-4 Soil Texture Classification Results for 3-5 Foot and 5-7 Foot Depth Intervals

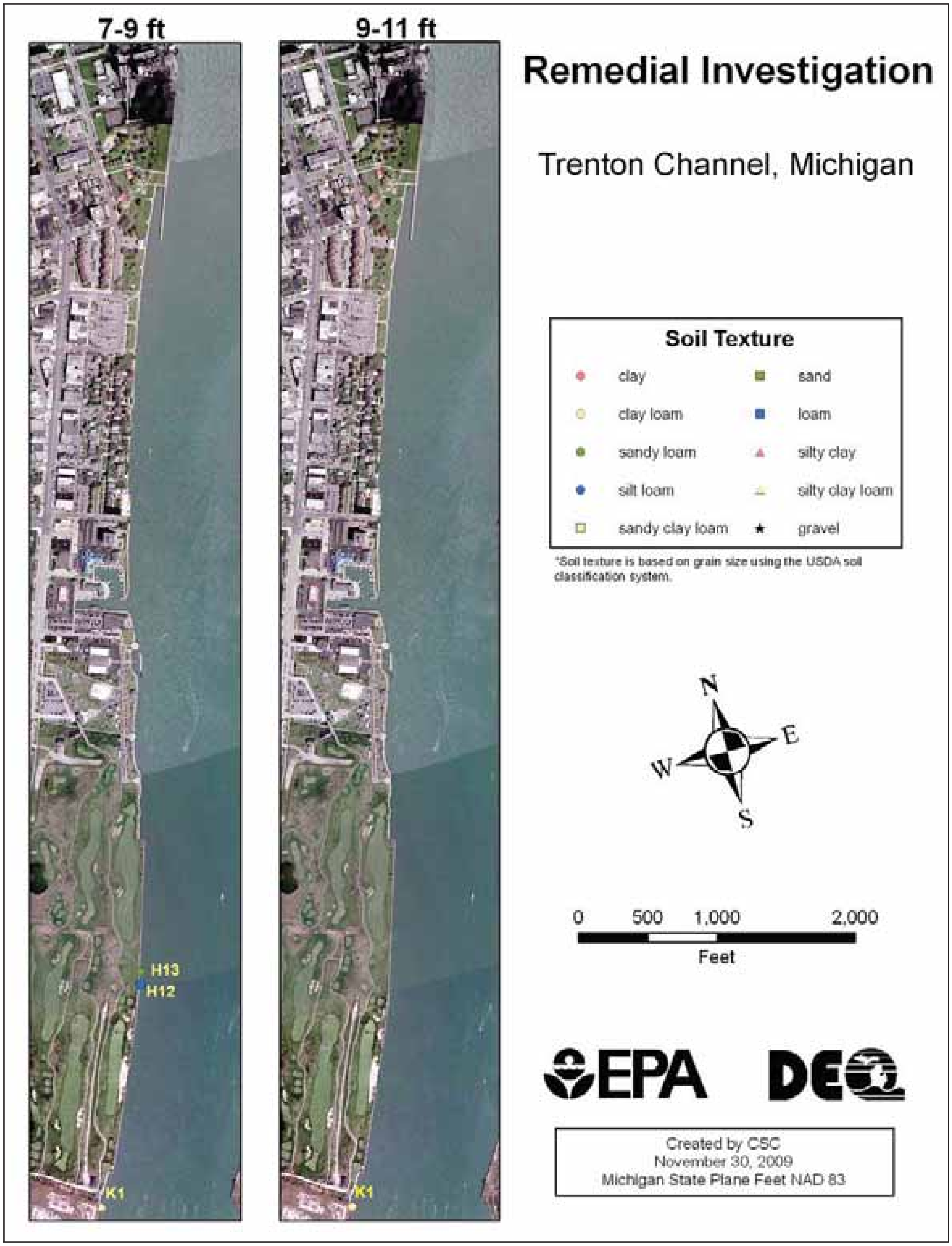

Figure 6-5 Soil Texture Classification Results for 7-9 Foot and 9-11 Foot Depth Intervals

6.3 SEDIMENT CHEMISTRY

6.3.1 Organics

6.3.1.1 Volatile and Semivolatile Organic Compounds

PAHs and other semi-volatile organic compounds were analyzed using Method 8270 for all 128 samples. At least one individual PAH was detected in 95.3% of the Phase I and II samples. Among individual PAHs, the percentage of samples yielding non-detect results ranged from 4.7% (phenanthrene) to 95% (dibenz[a,h]anthracene). The largest contribution to the total PAHs typically resulted from phenanthrene, fluoranthene, and pyrene. The highest total PAH concentrations tended to be located in Transect K.

Descriptive statistics of the calculated total PAHs are presented in the Table 6-2. Descriptive statistics of the 17 individual PAHs are presented in Appendix B and individual PAH results are provided in Appendix H.

Table 6-2 Descriptive Statistics of Calculated Total PAH Results

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Total PAH	0-1	50	39,218	12,790	88,697	226	84	534,600	2.0
	1-3	39	42,327	13,300	75,892	179	87	388,500	5.1
	3-5	24	45,000	7,277	98,020	218	180	407,400	8.3
	5-7	8	39,507	16,415	57,252	145	1,400	172,500	0
	7-9	5	39,108	20,170	45,074	115	450	106,800	0
	9-11	2	29,045	29,045	40,652	140	300	57,790	50
	All	128	41,104	12,375	82,242	200	84	534,600	4.7

SD – Standard Deviation
RSD – Relative Standard Deviation

Among the 45 additional SVOCs, only dibenzofuran and bis(2-ethylhexyl)phthalate were detected in more than 20% of the samples. Twenty-nine of the 45 additional SVOCs were not detected in any of the 128 samples. Descriptive statistics of the 45 additional SVOCs are presented in Appendix C.

The analyses of the Phase I samples for semivolatile organics indicated the presence of some non-target compounds in relatively large amounts. Because there is some overlap between the organic compounds that can be analyzed as semivolatiles and those that can be analyzed as volatiles, a subset of samples from the site were analyzed for VOCs to determine if the non-target compounds observed during the semivolatile analyses might be VOCs. If so, VOC analyses might be warranted during future sampling activities.

All of the VOC results on the Phase I samples were considered to be estimated concentrations because the analyses were performed two months after the samples were collected, well outside the nominal 14-day holding time for volatile analyses. In addition, the samples were collected and stored in the screw-cap glass jars used for the semivolatile samples, and not the septum-sealed 40-mL glass vials typically used for VOC samples. Thus, one might expect to lose some of the lighter, more volatile components of the samples, but the results could still be used as a screening tool for the less volatile organics that overlap the semivolatile target analyte list.

Based on these screening results, it did not appear the non-target compounds found during the original semivolatile analyses were VOCs, and thus, no further VOC analyses were conducted.

6.3.1.2 Oil and Grease

Phase I samples were analyzed for oil and grease. Oil and grease was detected in 17% of the 78 samples. Four of the 78 samples were additional and collected at site G11 for oil and grease analysis only. The results of these additional four samples and analyses were included in the statistical summary. Observed concentrations ranged between 115 and 12,100 ppm. The rate of detection, and the mean concentration, was highest at the surface depths. The descriptive statistics of the oil and grease Phase I results are presented in Table 6-3 and Appendix H provides the individual oil and grease results.

Table 6-3 Descriptive Statistics of Oil and Grease Results

Depth (ft)	Number of results	Mean (ppm)	Median (ppm)	SD (ppm)	RSD (%)	Min (ppm)	Max (ppm)	Non-detects (%)
0-1	31	711	162	2,178	306	119	12,100	77
1-3	22	351	164	511	145	120.5	1,950	82
3-5	16	172	151	76	44	115.5	435	94
5-7	5	244	193	157	64	120	518	80
7-9	3	188	191	13	7	173.5	199	100
9-11	1	171	171	N/A	N/A	171	171	100
All	78	442	166	1,405	318	115.5	12,100	83

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.3.1.3 Extractable Petroleum Hydrocarbons (Oil and Diesel Range)

All Phase I and II samples were analyzed for oil range organics (ORO) and diesel range organics (DRO). DRO and ORO were detected in all samples. DRO results ranged between 27 and 26,000 ppb, with an overall mean of 1,436 ppb. ORO results ranged between 52 ppb and 25,000 ppb, with an overall mean of 3,970 ppb. A strong pattern between concentration and sampling depth was not observed for either analyte. Descriptive statistics for these two analytes are presented in Table 6-4 and Appendix H provides the individual DRO and ORO results.

Table 6-4 Descriptive Statistics of ORO and DRO Results

Analyte	Depth (ft)	Number of Results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detects (%)
Diesel Range Organics	0-1	50	1,453	315	3,753	258	44	26,000	0
	1-3	39	1,573	660	2,728	173	40	14,000	0
	3-5	24	1,285	480	1,719	134	69	7,200	0
	5-7	8	1,665	1,500	1,537	92	98	4,200	0
	7-9	5	909	280	1,115	123	27	2,600	0
	9-11	2	548	548	640	117	95	1,000	0
	All	128	1,436	360	2,899	202	27	26,000	0
Oil Range Organics	0-1	50	3,881	1,300	5,389	139	52	23,000	0
	1-3	39	4,369	1,900	5,714	131	74	25,000	0
	3-5	24	3,818	1,490	5,230	137	77	19,000	0
	5-7	8	4,453	2,850	4,435	100	110	12,000	0
	7-9	5	2,884	1,300	3,860	134	140	9,500	0
	9-11	2	1,035	1,035	1,223	118	170	1,900	0
	All	128	3,970	1,500	5,267	133	52	25,000	0

SD – Standard Deviation
RSD – Relative Standard Deviation

6.3.1.4 Polychlorinated Biphenyls

Total polychlorinated biphenyls were quantified as both Aroclors and as congeners. All Phase I and II samples were analyzed for nine Aroclors. Calculated total Aroclors ranged between 60 ppb and 460,000 ppb. None of the nine Aroclors were detected in 65% of the analyzed samples. Among the nine individual Aroclors, only four (1242, 1248, 1254, and 1260) were detected in any of the samples. Of the other four, Aroclor 1242 was detected in only three samples, while Aroclors 1248, 1254, and 1260 were detected in 30, 28, and 26 samples, respectively. Total Aroclors tended to be highest at the 1-3 foot depth interval. The maximum total Aroclor concentration (460,000 ppb) was found at Transect K. At least one Aroclor was detected most frequently at Transects K (100% of samples) and C (69% of samples). Appendix D provides descriptive statistics on individual Aroclors and Appendix H presents individual Aroclor results for all samples. Descriptive statistics of total Aroclors are presented in Table 6-5.

Table 6-5 Descriptive Statistics of Total Aroclor Results

Analyte	Depth (ft)	Number of Results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detects (%)
Total Aroclors	0-1	50	6,627	203	35,361	534	60	250,000	56
	1-3	39	12,852	160	73,543	572	60	460,000	69
	3-5	24	8125	150	26,791	330	60	130,000	71
	5-7	8	5,724	188	11,761	205	95	33,000	75
	7-9	5	911	175	1287	141	80	3,100	80
	9-11	2	810	810	976	120	120	1,500	50
	All	128	8,434	180	47,427	562	60	460,000	65

SD – Standard Deviation
RSD – Relative Standard Deviation

In addition to quantifying PCBs as Aroclors, 38 samples were analyzed for individual PCB congeners. At least one PCB congener was detected in all 38 samples. Calculated total PCB congeners ranged between 0.077 ppb and 503,484 ppb. Total PCB congener concentrations tended to decrease with increasing sample depth.

Total Aroclor and congener concentrations tended to be fairly consistent. On average, the total Aroclor concentration was approximately 10% greater than the total congener concentration. The two totals correlated strongly based on Spearman's rank correlation (r=0.92). Among samples for which both Aroclor and congener analyses were performed, only two samples yielded discordant totals when compared to the CBSQG (i.e., where one total exceeded the CBSQG and the other did not). Specifically, for samples C4 1-3 and C8 1-3, the total PCB congeners exceeded the CBSQG of 676 ppb at 708 and 1,137 ppb, respectively, while the total Aroclors were below the CBSQG at 280 ppb. Descriptive statistics of total PCB congeners are presented in Table 6-6. Appendix

F presents descriptive statistics for each PCB congener combined over all depth categories and Appendix H presents individual PCB congener results for all samples.

Table 6-6 Descriptive Statistics of Total PCB Congeners

Analyte	Depth (ft)	Number of Results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detects (%)
Total PCB Congeners	0-1	12	46,826	484	144,249	308	1.39	503,484	0
	1-3	12	25,390	465	76,466	301	0.196	267,473	0
	3-5	7	11,611	448	26,201	226	0.142	70,496	0
	5-7	4	4,623	82	9,136	198	0.077	18,327	0
	7-9	2	1,346	1,346	1,800	134	73.5	2,619	0
	9-11	1	858	858	N/A	N/A	858	858	0
	All	38	25,524	370	91,223	357	0.077	503,484	0

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.3.2 Metals

6.3.2.1 Total Metals

Ten different metals were analyzed in all Phase I and II samples including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc. Among the ten metals, only cadmium, mercury, selenium, and silver were not detected in all samples. Cadmium was detected in 91% of the samples, while mercury, selenium, and silver were each detected in approximately 75% of the samples. For most metals, the concentrations tended to be highest at the surface and 1-3 foot depth interval. Descriptive statistics for these metals are presented in Table 6-7 and individual sample results for total metals are located in Appendix H.

Table 6-7 Descriptive Statistics of Total Metals

Analyte	Depth (ft)	Number of Results	Mean (ppm)	Median (ppm)	SD (ppm)	RSD (%)	Min (ppm)	Max (ppm)	Non-detects (%)
Arsenic	0-1	50	8.2	7.4	2.2	26.3	5.7	16	0
	1-3	39	8.9	7.4	4.2	47.2	1.7	22	0
	3-5	24	7.6	6.95	2.8	37.4	1.9	12	0
	5-7	8	7.1	6.45	3.4	48.2	2.2	13	0
	7-9	5	4.6	3.7	3.1	67.1	2.2	9.8	0
	9-11	2	6.9	6.85	0.2	3.1	6.7	7	0
	All	128	8.1	7.25	3.2	39.8	1.7	22	0

Analyte	Depth (ft)	Number of Results	Mean (ppm)	Median (ppm)	SD (ppm)	RSD (%)	Min (ppm)	Max (ppm)	Non-detects (%)
Barium	0-1	50	106.4	88.5	61.2	57.5	42	330	0
	1-3	39	124.9	91	92.5	74.1	22	500	0
	3-5	24	131.8	89	156.4	118.7	33	810	0
	5-7	8	115.0	86	68.3	59.4	52	230	0
	7-9	5	84.4	64	53.6	63.5	56	180	0
	9-11	2	69.5	69.5	12.0	17.3	61	78	0
	All	128	115.9	83.5	94.7	81.7	22	810	0
Cadmium	0-1	50	4.9	1.5	7.7	158.2	0.1	32	2
	1-3	39	4.9	1.2	6.9	140.7	0.1	24	13
	3-5	24	4.0	0.78	5.4	133.8	0.1	16	4
	5-7	8	5.5	0.525	8.7	160.1	0.1	25	25
	7-9	5	1.9	0.47	3.6	188.8	0.1	8.3	40
	9-11	2	0.3	0.335	0.2	52.8	0.21	0.46	0
	All	128	4.6	0.885	6.9	151.3	0.1	32	9
Chromium	0-1	50	73.9	28.5	96.9	131.1	8.4	490	0
	1-3	39	88.5	24	134.1	151.6	4.4	600	0
	3-5	24	64.7	16.5	92.5	143.0	5.1	350	0
	5-7	8	64.9	14.5	83.8	129.2	6.8	230	0
	7-9	5	19.6	10	19.8	100.7	7.2	54	0
	9-11	2	13.5	13.5	3.5	26.2	11	16	0
	All	128	73.0	20	105.9	145.1	4.4	600	0
Copper	0-1	50	79.5	47.5	76.4	96.1	17	260	0
	1-3	39	90.7	46	90.8	100.2	12	420	0
	3-5	24	80.4	44	76.1	94.7	14	230	0
	5-7	8	86.5	66.5	76.8	88.8	19	210	0
	7-9	5	71.6	27	85.4	119.2	20	220	0
	9-11	2	44.0	44	33.9	77.1	20	68	0
	All	128	82.6	46	79.9	96.7	12	420	0
Lead	0-1	50	136.0	80.5	150.6	110.7	7.5	590	0
	1-3	39	134.5	83	142.9	106.3	7.9	520	0
	3-5	24	105.1	58.5	110.4	105.1	8.6	330	0
	5-7	8	101.5	56.5	101.9	100.4	9	220	0
	7-9	5	94.6	18	150.0	158.5	14	360	0
	9-11	2	37.0	36.95	39.7	107.4	8.9	65	0
	All	128	124.4	67	136.8	109.9	7.5	590	0

Analyte	Depth (ft)	Number of Results	Mean (ppm)	Median (ppm)	SD (ppm)	RSD (%)	Min (ppm)	Max (ppm)	Non-detects (%)
Mercury	0-1	50	2.5	0.455	9.6	388.1	0.025	67	22
	1-3	39	3.2	0.68	13.6	420.7	0.025	85	26
	3-5	24	1.4	0.605	3.2	230.9	0.025	16	25
	5-7	8	0.9	0.905	0.8	84.7	0.025	2.4	25
	7-9	5	1.0	0.49	1.3	134.6	0.08	3.3	0
	9-11	2	0.4	0.4025	0.5	132.6	0.025	0.78	50
	All	128	2.3	0.545	9.7	417.8	0.025	85	23
Selenium	0-1	50	0.5	0.415	0.4	69.7	0.1	1.5	18
	1-3	39	0.5	0.5	0.4	75.0	0.1	1.4	28
	3-5	24	0.5	0.305	0.4	77.8	0.1	1.1	25
	5-7	8	0.5	0.565	0.3	58.8	0.1	0.93	13
	7-9	5	0.4	0.1	0.4	106.5	0.1	1	60
	9-11	2	0.2	0.165	0.1	55.7	0.1	0.23	50
	All	128	0.5	0.39	0.4	73.4	0.1	1.5	24
Silver	0-1	50	1.1	0.405	1.7	148.6	0.05	8.1	24
	1-3	39	1.3	0.37	1.8	142.8	0.05	7.7	31
	3-5	24	1.1	0.325	1.5	145.1	0.05	5.8	25
	5-7	8	1.3	0.32	1.7	124.5	0.1	3.8	0
	7-9	5	1.6	0.15	3.2	195.3	0.13	7.4	0
	9-11	2	0.2	0.2	0.2	106.1	0.05	0.35	50
	All	128	1.2	0.36	1.7	147.3	0.05	8.1	24
Zinc	0-1	50	257.7	145	246.7	95.7	44	910	0
	1-3	39	255.2	120	254.8	99.8	24	910	0
	3-5	24	242.8	145	261.6	107.7	38	1,000	0
	5-7	8	276.5	125.5	293.4	106.1	36	750	0
	7-9	5	298.8	57	506.3	169.5	32	1,200	0
	9-11	2	96.0	96	62.2	64.8	52	140	0
	All	128	254.4	125	262.0	103.0	24	1,200	0

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.3.2.2 TCLP Metals

Ten TCLP metals (in Phase I samples only) were analyzed including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc. Zinc and barium were the only TCLP metals detected in all samples. Among the other eight TCLP metals, only arsenic, cadmium, and copper were detected in more than 5% of the samples. All detected results were below the corresponding TCLP hazardous waste limits. Descriptive statistics of the ten TCLP metals are presented in Table 6-8 and individual total metal results are presented in Appendix H.

Table 6-8 Descriptive Statistics of TCLP Metals

Analyte	Depth (ft)	Number of Results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detects (%)
Arsenic - TCLP	0-1	31	11.5	5	10.2	89.2	5	38	65
	1-3	22	16.3	5	16.4	101.0	5	53	59
	3-5	16	12.1	5	11.6	95.6	5	42	63
	5-7	5	9.6	5	10.3	107.1	5	28	80
	7-9	3	5.0	5	0.0	0.0	5	5	100
	9-11	1	5.0	5	N/A	N/A	5	5	100
	All	78	12.5	5	12.4	99.3	5	53	65
Barium - TCLP	0-1	31	1,012.6	930	426.3	42.1	300	1,800	0
	1-3	22	1,030.9	1,000	355.4	34.5	440	1,600	0
	3-5	16	1,031.9	1,050	431.9	41.9	280	1,700	0
	5-7	5	808.0	790	476.7	59.0	280	1,500	0
	7-9	3	510.0	320	373.2	73.2	270	940	0
	9-11	1	980.0	980	N/A	N/A	980	980	0
	All	78	988.9	980	411.3	41.6	270	1,800	0
Cadmium - TCLP	0-1	31	9.4	5	12.5	133.0	5	60	84
	1-3	22	13.7	5	17.7	128.9	5	81	68
	3-5	16	14.9	5	29.0	195.2	5	120	81
	5-7	5	13.8	5	17.0	123.3	5	44	80
	7-9	3	5.0	5	0.0	0.0	5	5	100
	9-11	1	5.0	5	N/A	N/A	5	5	100
	All	78	11.8	5	18.3	154.8	5	120	79
Chromium - TCLP	0-1	31	25.0	25	0.0	0.0	25	25	100
	1-3	22	26.6	25	7.7	28.8	25	61	95
	3-5	16	25.0	25	0.0	0.0	25	25	100
	5-7	5	25.0	25	0.0	0.0	25	25	100
	7-9	3	25.0	25	0.0	0.0	25	25	100
	9-11	1	25.0	25	N/A	N/A	25	25	100
	All	78	25.5	25	4.1	16.0	25	61	99
Copper - TCLP	0-1	31	12.5	10	5.3	42.1	10	26	81
	1-3	22	13.3	10	7.7	58.3	10	40	82
	3-5	16	13.4	10	7.5	56.0	10	31	81
	5-7	5	13.8	10	8.5	61.6	10	29	80
	7-9	3	16.7	10	11.5	69.3	10	30	67
	9-11	1	10.0	10	N/A	N/A	10	10	100
	All	78	13.1	10	6.8	51.8	10	40	81

Analyte	Depth (ft)	Number of Results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detects (%)
Lead - TCLP	0-1	31	71.6	50	104.9	146.5	50	630	94
	1-3	22	55.9	50	27.7	49.6	50	180	95
	3-5	16	55.0	50	20.0	36.4	50	130	94
	5-7	5	50.0	50	0.0	0.0	50	50	100
	7-9	3	50.0	50	0.0	0.0	50	50	100
	9-11	1	50.0	50	N/A	N/A	50	50	100
	All	78	61.3	50	68.2	111.2	50	630	95
Mercury - TCLP	0-1	31	0.2	0.2	0.0	17.4	0.2	0.4	97
	1-3	22	0.2	0.2	0.0	0.0	0.2	0.2	100
	3-5	16	0.2	0.2	0.0	0.0	0.2	0.2	100
	5-7	5	0.2	0.2	0.0	0.0	0.2	0.2	100
	7-9	3	0.2	0.2	0.0	0.0	0.2	0.2	100
	9-11	1	0.2	0.2	N/A	N/A	0.2	0.2	100
	All	78	0.2	0.2	0.0	11.2	0.2	0.4	99
Selenium - TCLP	0-1	31	5.0	5	0.0	0.0	5	5	100
	1-3	22	5.0	5	0.0	0.0	5	5	100
	3-5	16	5.0	5	0.0	0.0	5	5	100
	5-7	5	5.0	5	0.0	0.0	5	5	100
	7-9	3	5.0	5	0.0	0.0	5	5	100
	9-11	1	5.0	5	N/A	N/A	5	5	100
	All	78	5.0	5	0.0	0.0	5	5	100
Silver - TCLP	0-1	31	2.5	2.5	0.0	0.0	2.5	2.5	100
	1-3	22	2.5	2.5	0.0	0.0	2.5	2.5	100
	3-5	16	2.5	2.5	0.0	0.0	2.5	2.5	100
	5-7	5	2.5	2.5	0.0	0.0	2.5	2.5	100
	7-9	3	2.5	2.5	0.0	0.0	2.5	2.5	100
	9-11	1	2.5	2.5	N/A	N/A	2.5	2.5	100
	All	78	2.5	2.5	0.0	0.0	2.5	2.5	100
Zinc - TCLP	0-1	31	940.7	330	1173.2	124.7	62	4100	0
	1-3	22	1,430.0	520	1,949.1	136.3	190	8200	0
	3-5	16	1,195.0	320	2,649.3	221.7	210	11,000	0
	5-7	5	1,344.0	250	2,329.3	173.3	170	5,500	0
	7-9	3	280.0	190	182.5	65.2	160	490	0
	9-11	1	550.0	550	N/A	N/A	550	550	0
	All	78	1,126.3	355	1,816.3	161.3	62	11,000	0

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.3.2.3 Simultaneously Extracted Metals-Acid Volatile Sulfide

A subset of 22 samples from Phase I were analyzed for simultaneously extracted metals including cadmium, copper, lead, mercury, nickel, and zinc. Among the six simultaneously extracted metals, only cadmium and mercury were detected in the majority of the 22 samples. Descriptive statistics of the six simultaneously extracted metals are presented in Table 6-9 and individual results are presented in Appendix H.

Table 6-9 Descriptive Statistics of Simultaneously Extracted Metals

Analyte	Depth (ft)	Number of Results	Mean (µmg)	Median (µmg)	SD (µmg)	RSD (%)	Min (µmg)	Max (µmg)	Non-detects (%)
Cadmium	0-1	8	0.0085	0.0009	0.0123	145.5	0.00065	0.028	63
	1-3	6	0.0183	0.0054	0.0249	135.7	0.0006	0.06	33
	3-5	4	0.0211	0.0018	0.0393	186.7	0.0006	0.08	50
	5-7	2	0.0008	0.0008	0.0003	38.6	0.0006	0.00105	100
	7-9	1	0.0023	0.0023	N/A	N/A	0.0023	0.0023	0
	9-11	1	0.0009	0.0009	N/A	N/A	0.0009	0.0009	100
	All	22	0.0121	0.0011	0.0217	179.3	0.0006	0.08	55
Copper	0-1	8	1.77	0.35	2.76	155.7	0.005	7.1	13
	1-3	6	1.75	1.15	2.26	128.8	0.0048	5.8	33
	3-5	4	1.28	1.32	1.30	101.1	0.0048	2.5	25
	5-7	2	0.84	0.84	1.08	128.1	0.079	1.6	0
	7-9	1	1.10	1.10	N/A	N/A	1.10	1.10	0
	9-11	1	0.73	0.73	N/A	N/A	0.73	0.73	0
	All	22	1.52	0.55	2.04	134.9	0.0048	7.1	18
Lead	0-1	8	0.40	0.20	0.50	126.3	0.027	1.4	0
	1-3	6	0.68	0.45	0.84	122.5	0.00115	2.1	33
	3-5	4	0.55	0.46	0.54	98.2	0.00115	1.3	25
	5-7	2	0.25	0.25	0.31	120.8	0.037	0.47	0
	7-9	1	0.33	0.33	N/A	N/A	0.33	0.33	0
	9-11	1	0.26	0.26	N/A	N/A	0.26	0.26	0
	All	22	0.48	0.29	0.57	117.7	0.00	2.1	14
Mercury	0-1	8	0.0016	0.0001	0.0042	265.8	0.00007	0.012	88
	1-3	6	0.0002	0.0001	0.0004	152.5	0.00007	0.001	83
	3-5	4	0.0001	0.0001	0.0000	27.7	0.00007	0.000125	100
	5-7	2	0.0001	0.0001	0.0000	37.2	0.00007	0.00012	100
	7-9	1	0.0001	0.0001	N/A	N/A	0.00012	0.00012	100
	9-11	1	0.0001	0.0001	N/A	N/A	0.0001	0.0001	100
	All	22	0.0007	0.0001	0.0025	374.1	0.00007	0.012	91

Analyte	Depth (ft)	Number of Results	Mean (µmg)	Median (µmg)	SD (µmg)	RSD (%)	Min (µmg)	Max (µmg)	Non-detects (%)
Nickel	0-1	8	0.26	0.25	0.13	49.5	0.12	0.48	0
	1-3	6	0.51	0.19	0.75	148.1	0.00385	2	17
	3-5	4	0.62	0.14	1.06	169.9	0.0035	2.2	25
	5-7	2	0.13	0.13	0.04	33.3	0.099	0.16	0
	7-9	1	0.12	0.12	N/A	N/A	0.12	0.12	0
	9-11	1	0.12	0.12	N/A	N/A	0.12	0.12	0
	All	22	0.37	0.17	0.58	156.1	0.0035	2.2	9
Zinc	0-1	8	2.14	1.30	2.88	134.2	0.4	9	0
	1-3	6	3.33	2.63	3.32	99.5	0.24	7.9	0
	3-5	4	3.71	2.15	4.48	120.5	0.35	10.2	0
	5-7	2	1.69	1.69	1.99	118.0	0.28	3.1	0
	7-9	1	2.40	2.40	N/A	N/A	2.4	2.4	0
	9-11	1	1.60	1.60	N/A	N/A	1.6	1.6	0
	All	22	2.70	1.65	3.00	111.2	0.24	10.2	0

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

Additionally, acid volatile sulfide (AVS) and the SEM/AVS ratio was analyzed in 22 samples. AVS was detected in only six of the 22 samples. Mean AVS concentration ranged between 0.275 µmole/g and 12.4 µmole/g. SEM/AVS ratios ranged between 0 and 12.52. Descriptive statistics for these two analytes are presented in Table 6-10 and individual AVS and SEM/AVS results are presented in Appendix H.

Table 6-10 Descriptive Statistics of AVS and SEM/AVS Ratio Results

Analyte	Depth (ft)	Number of Results	Mean	Median	SD	RSD (%)	Min	Max	Non-detects (%)
Acid Volatile Sulfide (µmole/g)	0-1	8	2.92	0.59	4.23	145	0.29	12.40	50
	1-3	6	0.77	0.44	0.90	117	0.275	2.60	83
	3-5	4	0.59	0.40	0.48	81	0.275	1.30	75
	5-7	2	0.38	0.38	0.13	35	0.285	0.48	100
	7-9	1	0.48	0.48	N/A	N/A	0.475	0.48	100
	9-11	1	0.40	0.40	N/A	N/A	0.4	0.40	100
	All	22	1.45	0.45	2.74	188	0.275	12.40	73

Analyte	Depth (ft)	Number of Results	Mean	Median	SD	RSD (%)	Min	Max	Non-detects (%)
SEM/AVS Ratio	0-1	8	0.29	0.16	0.38	131	0	1.06	50
	1-3	6	0.03	0.00	0.07	245	0	0.17	83
	3-5	4	3.13	0.00	6.26	200	0	12.52	75
	5-7	2	0.00	0.00	0.00	N/A	0	0.00	100
	7-9	1	0.00	0.00	N/A	N/A	0	0.00	100
	9-11	1	0.00	0.00	N/A	N/A	0	0.00	100
	All	22	0.68	0.00	2.66	389	0	12.52	73

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.4 PHYSICAL CHEMISTRY AND GEOTECHNICAL PARAMETERS

6.4.1 Total Organic Carbon

Total organic carbon (TOC) was measured in all 128 Phase I and II samples. Percent TOC ranged between 0.4% and 20%, with an overall site mean of 5.19%. TOC tended to be lowest at the 1-3 and 3-5 foot sampling depth intervals. Descriptive statistics of TOC measurements are presented in Table 6-11 and individual results for TOC are presented in Appendix H.

Table 6-11 Descriptive Statistics of Total Organic Carbon Results

Depth (ft)	Number of Results	Mean (%)	Median (%)	SD (%)	RSD (%)	Min (%)	Max (%)	Non-detects (%)
0-1	50	5.34	4.85	3.73	69.9	0.4	15.5	0
1-3	39	5.01	3.80	3.73	74.6	0.5	17.1	0
3-5	24	4.79	3.90	4.31	89.9	0.9	20	0
5-7	8	6.21	6.65	3.88	62.4	0.9	12.2	0
7-9	5	6.82	5.60	3.19	46.8	3.7	11.8	0
9-11	2	1.80	1.80	1.41	78.6	0.8	2.8	0
All	128	5.19	4.60	3.80	73.3	0.4	20	0

SD – Standard Deviation
RSD – Relative Standard Deviation

6.4.2 pH

pH was analyzed in Phase I samples only. As indicated by the QAPP addendum (STN Environmental JV, March 7, 2007),

> *"Informal measurements (including the observation of chemical deterioration of aluminum pans) of several of the samples submitted to the contract laboratory presented caustic properties, with pHs reporting around 12. Due to the potentially hazardous nature of these samples, the decision was made to report pH on all samples submitted for geotechnical analysis. This data is to be considered screening level only and shall not be held to rigorous QA acceptance criteria."*

Overall, pH ranged between 6.9 and 12.5 for the Phase I samples, with a mean pH of 9.02. The highest pH values were observed in samples collected in Transect H.

Descriptive statistics of pH results are presented in Table 6-12. Figure 6-6 illustrates the mean pH results across all depth intervals for each Phase I sampling location and individual pH results are presented in Appendix H.

Table 6-12 Descriptive Statistics of pH Results

Depth (ft)	Number of Results	Mean	Median	SD	Min	Max
0-1	31	8.84	8.30	1.53	6.9	12
1-3	22	8.86	8.20	1.50	7	12.3
3-5	16	8.98	8.45	1.55	7.3	12.5
5-7	5	9.78	8.50	2.13	8.1	12.3
7-9	3	11.17	12.10	1.62	9.3	12.1
9-11	1	8.30	8.30	N/A	8.3	8.3
All	78	9.02	8.35	1.59	6.9	12.5

N/A – Not Applicable
SD – Standard Deviation

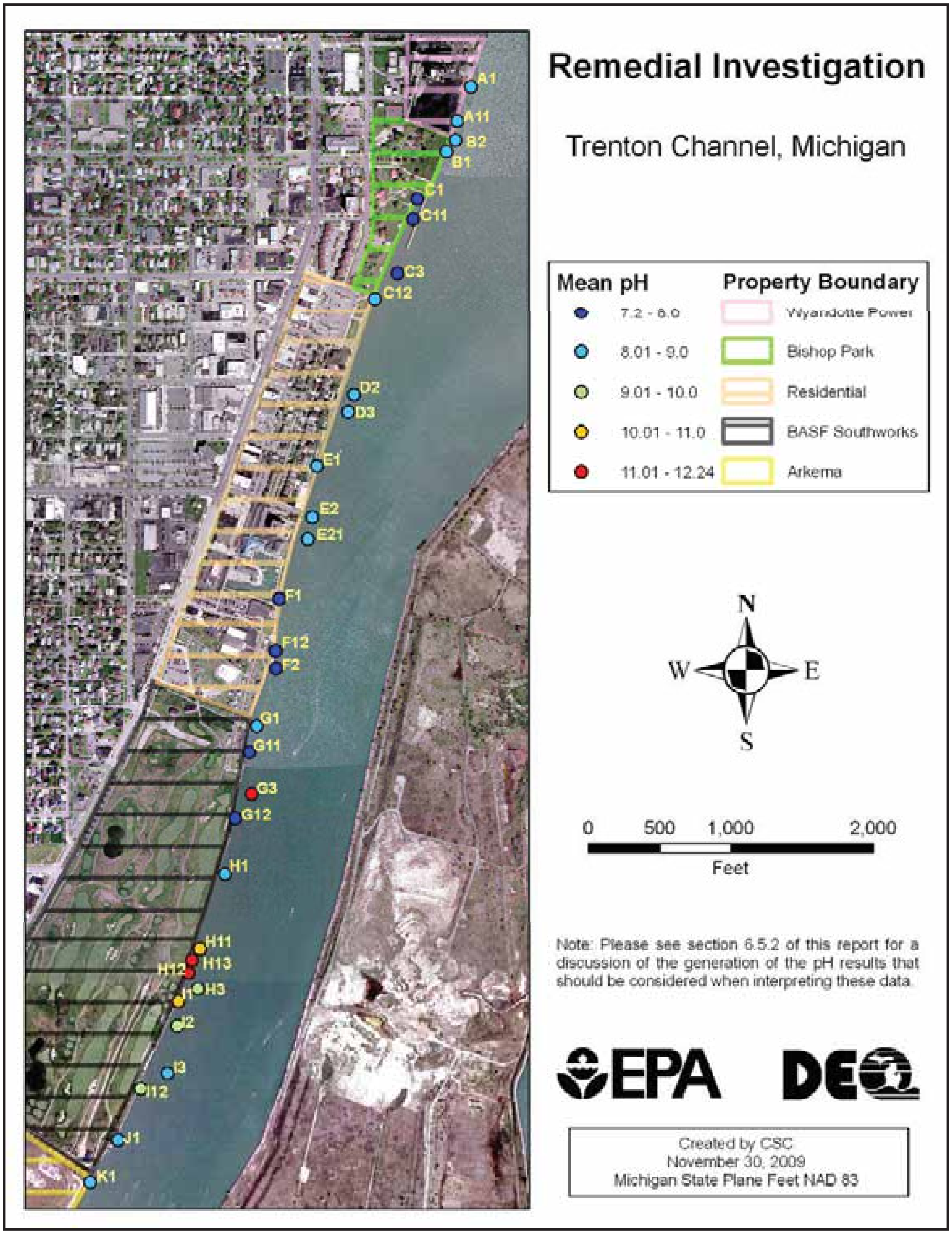

Figure 6-6 Mean pH Results for all Depth Intervals for Each Phase I Sampling Location

6.4.3 Percent Solids

Percent solids and moisture content were analyzed independently for each sample in both project phases. Percent solids ranged between 37.3% and 86.5%, with an overall mean of 67%. Generally, percent solids tended to be greater at shallower sampling depths. Descriptive statistics of percent solids and moisture are presented in Table 6-13. Moisture content ranged between 15.2% and 160.5%, with a mean of 54.9%, indicating that on average the mass of the water removed from the sample when drying was slightly greater than half of the mass of the dried sample.

The distinct analytical laboratories participating in the project measured percent solids and moisture in study samples they received as a part of their analysis. These measurements are available in the project GLSED. The data presented in Table 6-13 were determined from the data generated in the laboratories responsible for measuring TOC and percent moisture.

Table 6-13 Descriptive Statistics of Total Solids

Analyte	Depth (ft)	Number of Results	Mean	Median	SD	RSD (%)	Min	Max	Non-detects (%)
Percent Solids	0-1	50	67.9	68.7	13.4	19.8	37.3	85.4	0
	1-3	39	68.4	68	12.7	18.6	47.3	85.8	0
	3-5	24	66.9	64.6	12.8	19.1	46.3	86.5	0
	5-7	8	60.5	54.3	14.4	23.7	49.5	84.6	0
	7-9	5	56.6	57.8	7.4	13.1	48.4	66.1	0
	9-11	2	69.2	69.2	20.2	29.2	54.9	83.5	0
	All	128	67.0	64.6	13.1	19.6	37.3	86.5	0
Moisture Content (%)	0-1	50	53.0	44.3	34.6	65.2	17.7	160.5	0
	1-3	39	52.9	51.2	27.8	52.6	17.8	116.5	0
	3-5	24	50.7	44.3	30.9	61.0	15.2	117.6	0
	5-7	8	79.0	90.7	39.7	50.3	18.6	132.6	0
	7-9	5	74.8	77.3	20.3	27.1	51.5	101.3	0
	9-11	2	47.6	47.6	37.8	79.6	20.8	74.3	0
	All	128	54.9	51.0	32.2	58.6	15.2	160.5	0

SD – Standard Deviation
RSD – Relative Standard Deviation

6.4.4 Atterberg Limits

Atterberg limits, which measures the nature of fine-grained soils, were analyzed in Phase I samples only. Liquid limits varied between 0 and 71 while plastic limits varied between 0 and 45. Plasticity index, calculated as the difference between the liquid and plasticity indices, ranged between 0.05 and 32. On average, the three Atterberg limits tended to be slightly lower at surface depth. Descriptive statistics for the three different Atterberg limits are presented in Table 6-14 and individual results are presented in Appendix H.

Table 6-14 Descriptive Statistics of Atterberg Limits

Analyte	Depth (ft)	Number of Results	Mean	Median	SD	RSD (%)	Min	Max	Non-detects (%)
Liquid Limit	0-1	31	18.1	0	21.5	118.9	0	62	0
	1-3	22	22.7	24	24.6	108.5	0	71	0
	3-5	16	26.2	25.5	22.5	85.8	0	64	0
	5-7	5	27.6	25	28.5	103.1	0	61	0
	7-9	3	16.3	0	28.3	173.2	0	49	0
	9-11	1	41.0	41	N/A	N/A	41	41	0
	All	78	21.9	24.5	22.9	104.7	0	71	0
Plastic Limit	0-1	31	10.4	0	13.2	127.6	0	37	0
	1-3	22	14.0	16	14.8	105.5	0	40	0
	3-5	16	17.4	16	15.1	86.7	0	44	0
	5-7	5	19.4	16	20.5	105.6	0	44	0
	7-9	3	15.0	0	26.0	173.2	0	45	0
	9-11	1	34.0	34	N/A	N/A	34	34	0
	All	78	13.9	16	15.0	108.2	0	45	0
Plasticity Index	0-1	31	6.4	0.05	8.1	127.9	0.05	25	55
	1-3	22	8.7	8.5	10.2	117.2	0.05	32	45
	3-5	16	8.8	8.5	8.4	96.0	0.05	27	31
	5-7	5	8.4	9	9.8	116.3	0.05	24	40
	7-9	3	1.4	0.05	2.3	166.9	0.05	4	67
	9-11	1	7.0	7	N/A	N/A	7	7	0
	All	78	7.4	7	8.7	116.7	0.05	32	46

N/A – Not Applicable
SD – Standard Deviation
RSD – Relative Standard Deviation

6.4.5 Specific Gravity

Specific gravity was assessed for all Phase I and II samples. Specific gravity ratios ranged between 2.136 and 2.752. The mean specific gravity ratio was 2.63, indicating that samples were an average of 2.63 times denser than water at standard conditions for temperature and pressure. Specific gravity ratios did not vary between sampling depths. Descriptive statistics of specific gravity ratios are presented in Table 6-15 and individual results for specific gravity are presented in Appendix H.

Table 6-15 Descriptive Statistics of Specific Gravity

Depth	Number of Results	Mean	Median	SD	RSD (%)	Min	Max
0-1	50	2.63	2.64	0.086	3.28	2.345	2.751
1-3	39	2.61	2.63	0.138	5.27	2.136	2.752
3-5	24	2.67	2.69	0.064	2.38	2.525	2.746
5-7	8	2.63	2.62	0.083	3.17	2.516	2.75
7-9	5	2.62	2.63	0.067	2.55	2.545	2.718
9-11	2	2.69	2.69	0.059	2.21	2.651	2.735
All	128	2.63	2.64	0.101	3.85	2.136	2.752

SD – Standard Deviation
RSD – Relative Standard Deviation

6.5 SEDIMENT TOXICITY

Surface sediment toxicity was assessed during Phase I at four locations (Stations C3, C11, G11, and K1). The results and analysis of these toxicity results are presented in "Results of *Hyalella azteca* and *Chironomus tentans* Toxicity Tests with TN&A Whole Sediment Samples Received December 21, 2006" (ASci Corporation, February 2007) (Appendix I). For each sample, the *Hyalella azteca* endpoints were 28-day survival and growth and the *Chironomus dilutus* (formerly known as *Chironomus tentans*) endpoints were 20-day survival and growth. For *Hyalella azteca*, growth was quantified as milligrams per organisms and mean length, while for *Chironomus dilutus*, growth was quantified based on dried weight (DW) and ash-free dry weight (AFDW). The West Bearskin control sample, prepared from samples collected at West Bearskin Lake located in Cook County, Minnesota, was used as the control sample for all toxicity analyses. All toxicity endpoints were compared to those measured in the West Bearskin sample to assess whether the survival and growth observed at each site were significantly reduced from that of the control sample.

Chironomus dilutus survival and *Hyalella azteca* mean length were determined to be significantly lower than the West Bearskin control sample for all four Trenton Channel sampling locations. Additionally, *Hyalella azteca* growth by weight was found to be significantly less at locations C11 and K1 compared to the control. All other toxicity endpoints were not significantly different from the control for any of the four locations.

Phase I toxicity results, as well as results of the West Bearskin control, are presented in Table 6-16. Figures 6-7 and 6-8 display the survival results for Phase I and Phase II for *Chironomus dilutus* and *Hyalella azteca*, respectively.

Table 6-16 Toxicity Results, Phase I

Toxicity Endpoint	West Bearskin Result	Trenton Channel Station Sample Result			
		C3	C11	G11	K1
H. azteca survival (%)	90	76.3	78.8	60.0	60.0
H. azteca growth (mg/org)	0.405	0.346	0.248	0.351	0.313
H. azteca growth (mean length)	4.3	3.8	3.4	3.7	3.6
C. dilutus survival (%)	77.4	30.2	13.5	0	48.8
C. dilutus dried weight (mg/org)	1.35	1.21	0.80	N/A	1.10
C. dilutus AFDW (mg/org)	1.14	1.00	0.62	N/A	0.87

N/A – Not Applicable

Surface sediment toxicity was also assessed during Phase II at four additional locations (Stations B3, E3, F5, and S2). The results and analysis of these toxicity results are presented in "Results of *Hyalella azteca* and *Chironomus tentans* Toxicity Tests with TN&A Whole Sediment Samples Received July 11, 2007" (ASci Corporation, August 2007) (Appendix I). The West Bearskin control sample also was reanalyzed along with the Phase II toxicity samples. These four samples, as well as the West Bearskin control, were assessed for the same toxicity endpoints as the Phase I toxicity data, and each toxicity endpoint was statistically compared to that of the control.

Four of the toxicity endpoints, including *Chironomus dilutus* survival and AFDW, *Hyalella azteca* mean length and growth, were determined to be significantly lower than the control sample for all four Phase II Trenton Channel sampling locations. Additionally, *Hyalella azteca* survival and *Chironomus dilutus* dry weight were found to be significantly less than the control for only two of the sample locations (stations F5 and S2).

Phase II toxicity results, as well as results of the West Bearskin control, are presented in Table 6-17. Figures 6-7 and 6-8 display the survival results for Phase I and Phase II for *Chironomus dilutus* and *Hyalella azteca*, respectively.

Table 6-17 Toxicity Results, Phase II

Toxicity Endpoint	West Bearskin Result	Trenton Channel Station Sample Result			
		B3	E3	F5	S2
H. azteca survival (%)	96.3	85	85	51.3	3.8
H. azteca growth (mg/org)	0.424	0.225	0.202	0.125	0.005
H. azteca growth (mean length)	4.2	3.8	3.7	3.8	0.6
C. dilutus survival (%)	80	28.8	45	0	0
C. dilutus dried weight (mg/org)	2.1	1.84	1.79	N/A	N/A
C. dilutus AFDW (mg/org)	1.8	1.31	1.3	N/A	N/A

N/A – Not Applicable

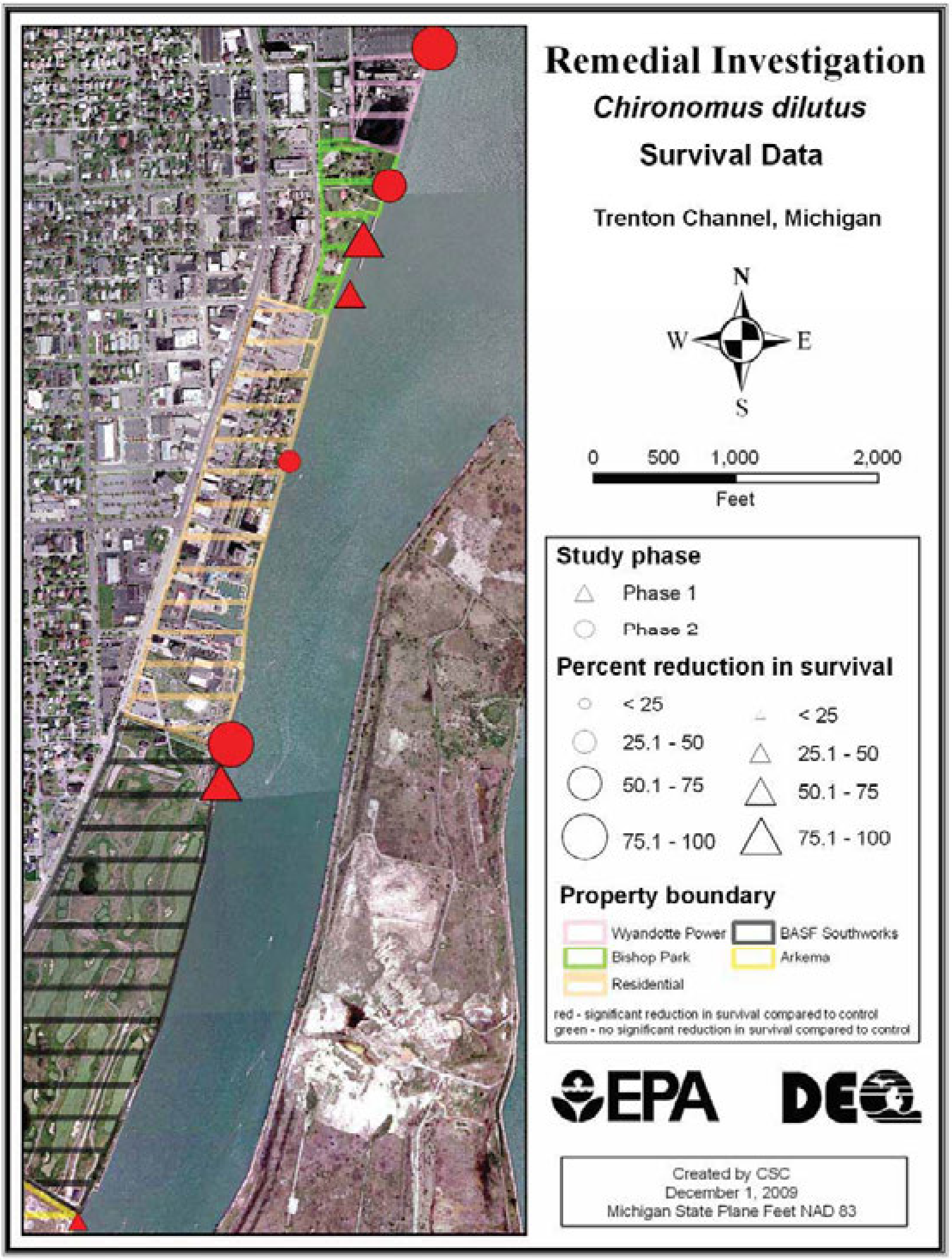

Figure 6-7 Phase I and Phase II Survival Data for *Chironomus dilutus*

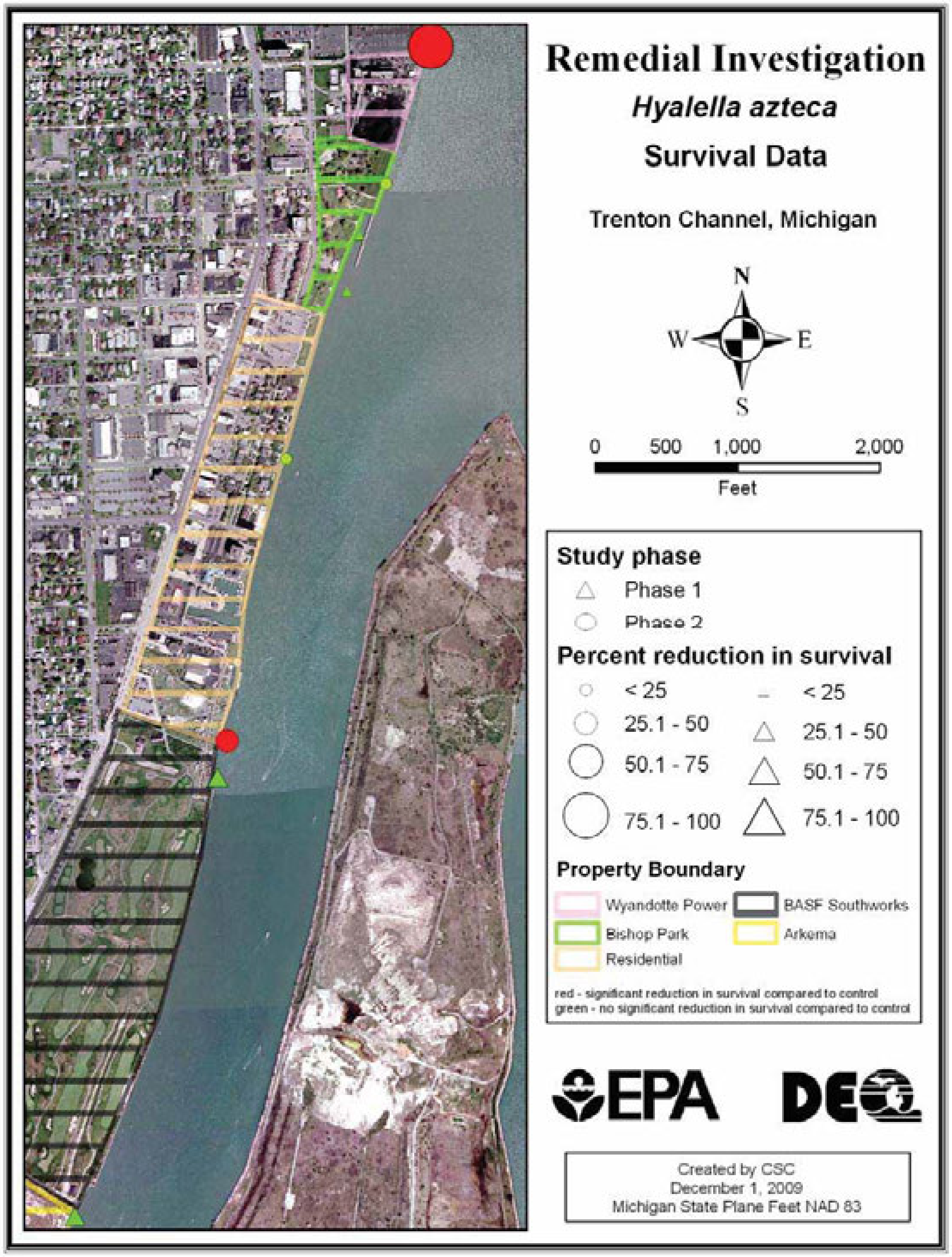

Figure 6-8 Phase I and Phase II Survival Data for *Hyalella azteca*

6.6 CORRELATION BETWEEN SEDIMENT CHEMISTRY AND TOXICITY DATA

Because collocated chemistry samples were collected at each of the Phase I and II sampling locations, associations between chemistry and toxicity results could be assessed. For each toxicity endpoint, nonparametric Spearman rank correlations were calculated for each analyte, and analytes were identified with strong negative correlations (i.e., where low survival or growth occurred with high concentration).

Generally, associations between concentrations and toxicity endpoints were weak. Among analytes that were included in both Phase I and Phase II analyses, correlations less than -0.7 (a cutoff approximately at where the association is statistically significant at the 95% confidence level and where half the variability of the toxicity endpoint would be "in common" with the analyte concentration) were observed for five analytes, including barium, chromium, lead, zinc, and total Aroclors. In addition, lead yielded correlations below -0.7 for *Hyalella azteca* survival, and *Chironomus dilutus* DW and AFDW. No other correlations below -0.7 were observed between any analyte concentration and toxicity endpoint.

Among the four Phase I toxicity samples collected and analyzed, only one sample exhibited high pH values (K1, with a pH result of 9.4). While that location yielded relatively low *Hyalella azteca* survival (60% - tied for the lowest among the four Phase 1 toxicity samples), it also exhibited the highest *Chironomus dilutus* survival (49%) among those samples.

6.7 OBSERVED COC RESULTS IN SEDIMENT IN COMPARISON TO CBSQGS

Final observed concentrations for the three COCs (mercury, total PCBs, and total PAHs) were compared to the CBSQGs to assist in the assessment of the nature and extent of contamination at the site. Results of the COCs for each sample were compared to the corresponding CBSQG, and the results are summarized within three transect groups: Transects A-C and S, Transects D-F, and Transects G-K. The transects were grouped into these three categories per guidance from EPA GLNPO. Figures illustrating observed concentrations of mercury and total Aroclors at each specified depth interval are provided within this section.

6.7.1 Mercury

Descriptive statistics for mercury results are provided in Section 6.3.2.1 and Appendix H provides the individual sample results for each specified depth interval. The mercury concentration is below the CBSQG for the majority of samples for each of the specified transect groups as shown in Table 6-18. The percentage of samples exceeding the CBSQG ranged between 10.3% for Transects D-F and 39.6% for Transects G-K. Figure 6-9 displays box plots of the observed mercury results for the specified transects.

Table 6-18 Observed Mercury Results in Sediments in Comparison to CBSQGs

CBSQG	Transect	Number of Samples	Minimum Concentration (ppm)	Median Concentration (ppm)	Maximum Concentration (ppm)	Number of Samples above CBSQG	% above CBSQG
1.06 ppm	A-C, S	51	0.025	0.80	3.3	18	35.3%
	D-F	29	0.025	0.10	1.6	3	10.3%
	G-K	48	0.025	0.80	85	19	39.6%

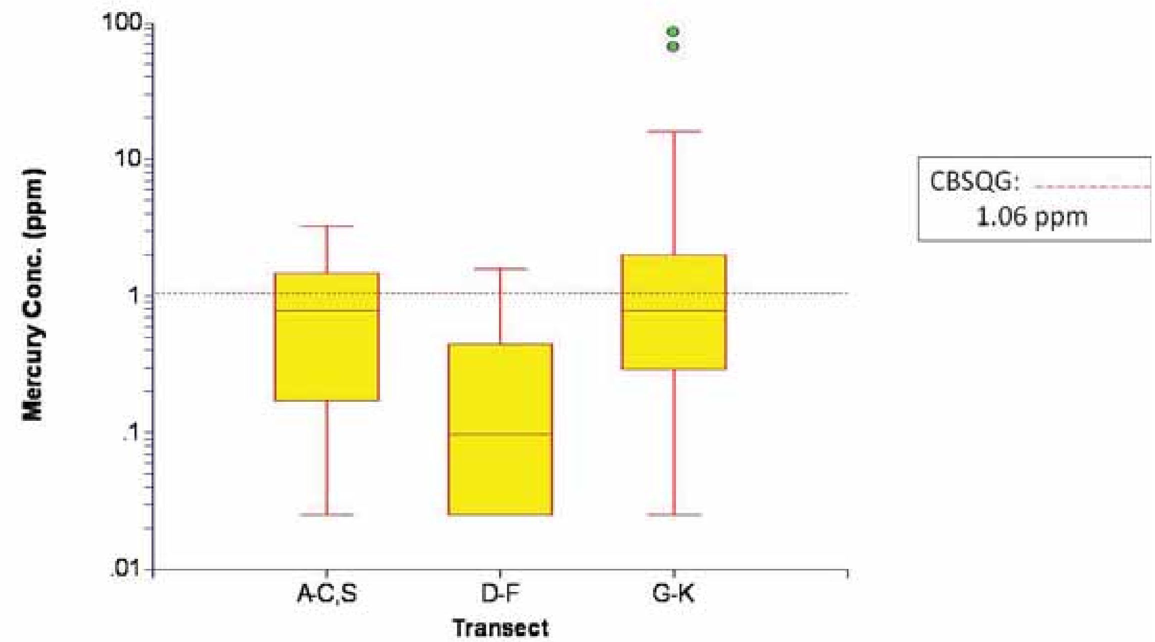

Figure 6-9 Box Plots of the Observed Mercury Results in the Specified Transects

Figures 6-10 through 6-12 display the observed mercury concentrations for the specific depth intervals at Phase I and Phase II sampling locations.

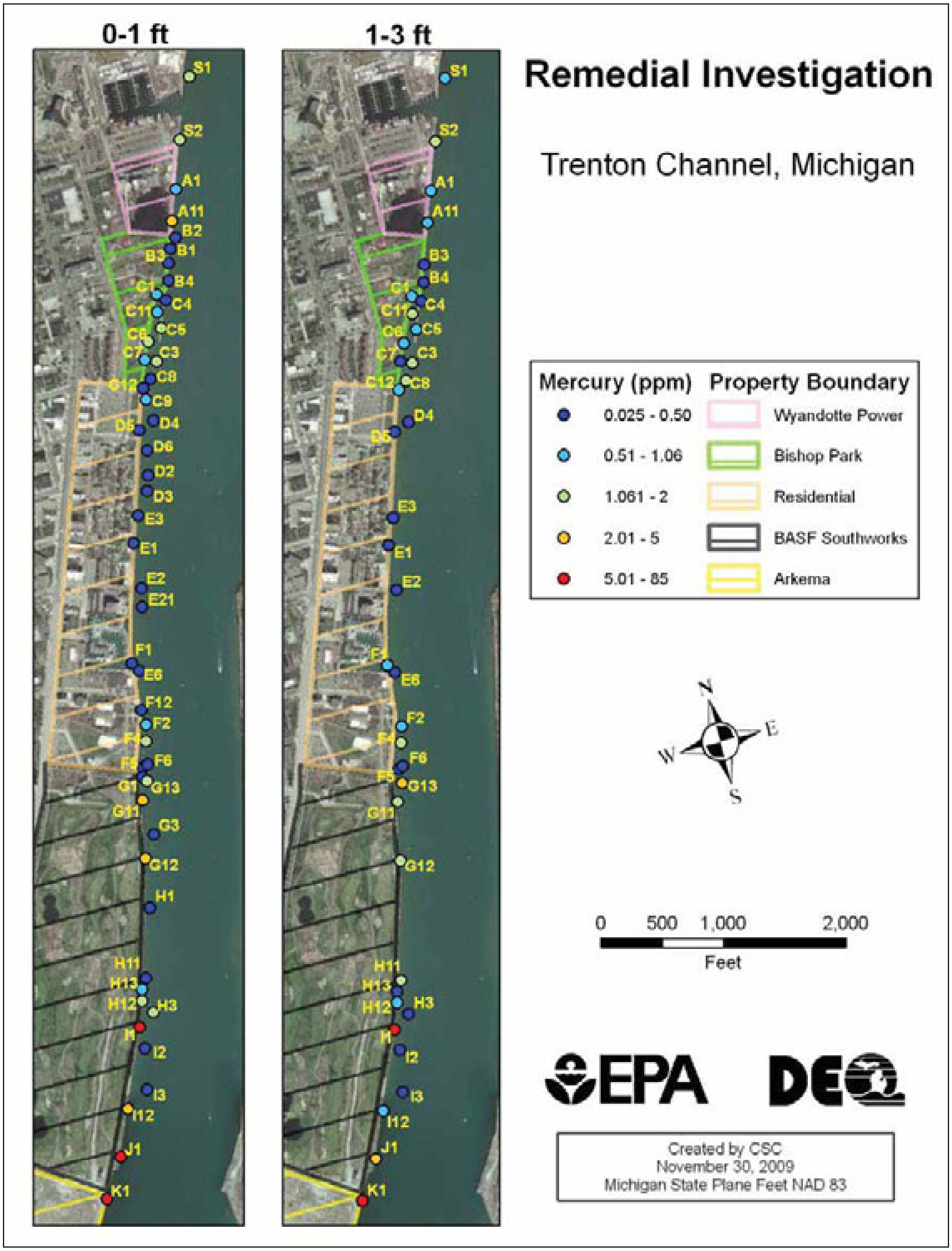

Figure 6-10 Observed Mercury Results for 0-1 Foot and 1-3 Foot Depth Intervals

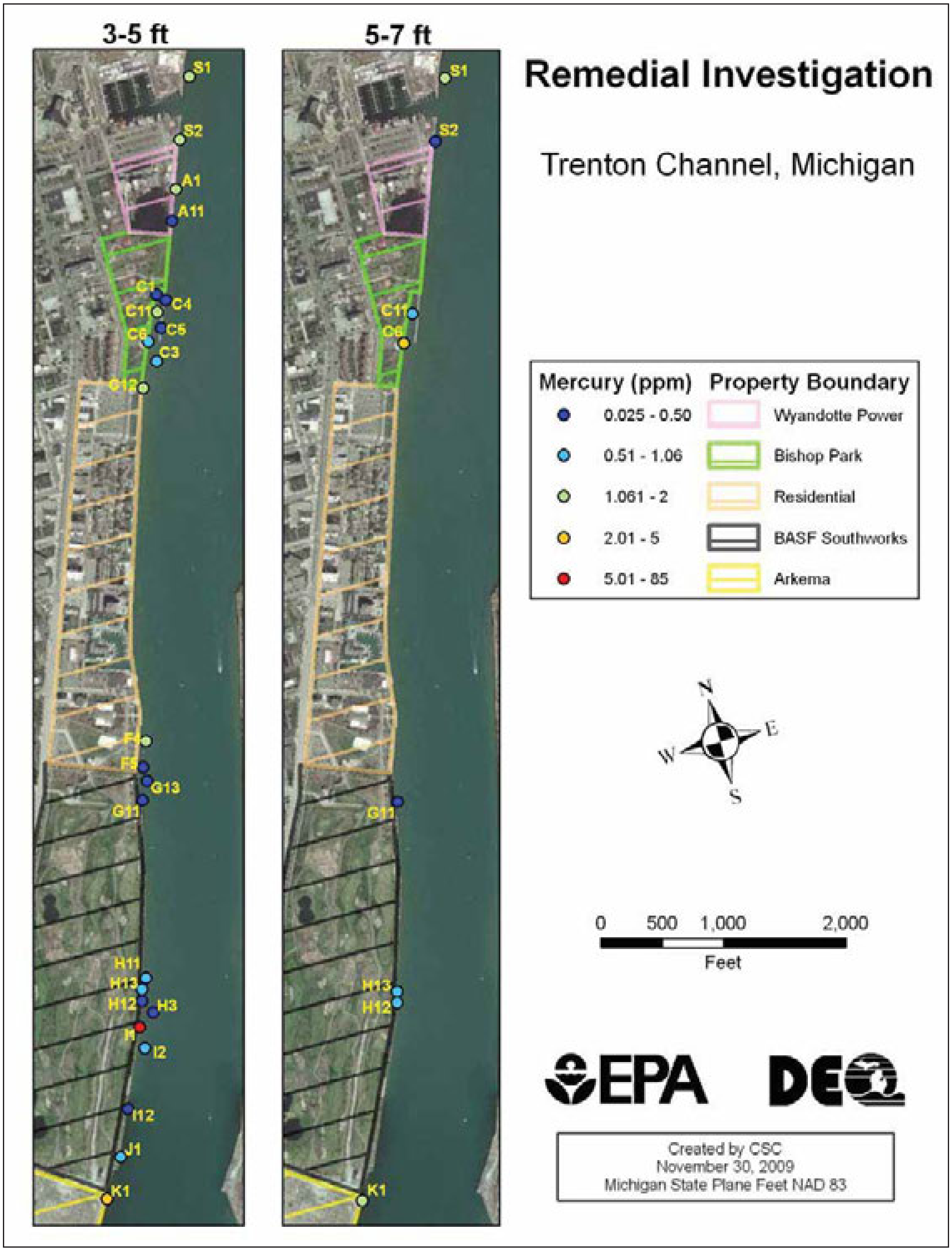

Figure 6-11 Observed Mercury Results for 3-5 Foot and 5-7 Foot Depth Intervals

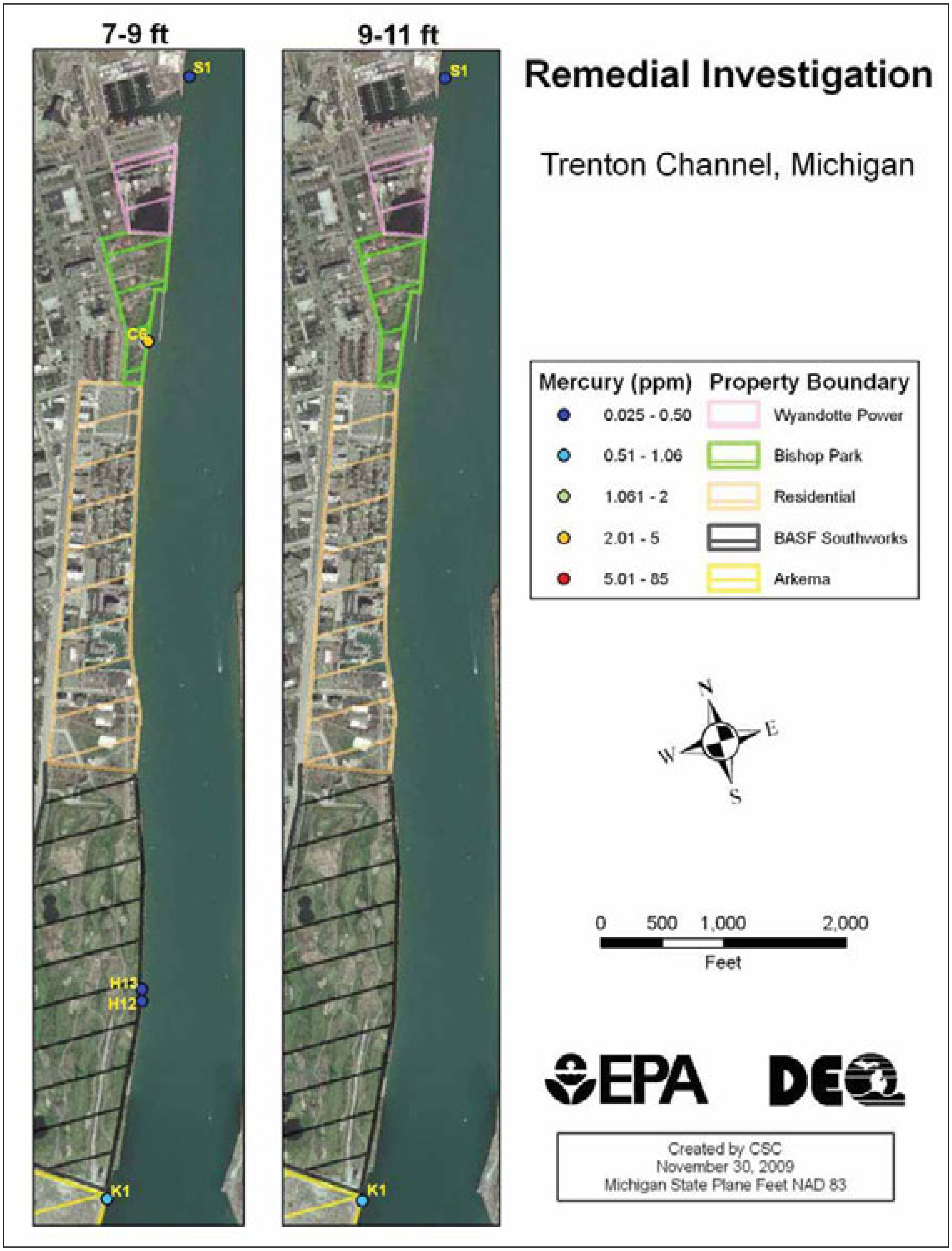

Figure 6-12 Observed Mercury Results for 7-9 Foot and 9-11 Foot Depth Intervals

6.7.2 Total Aroclors

Descriptive statistics for total Aroclor results are provided in Section 6.3.1.4. The total Aroclor concentration is below the CBSQG for the majority of the samples collected within each of the specified transect groups as shown in Table 6-19. The percentage of samples exceeding the CBSQG ranged between 3.5% for Transects D-F and 43.1% for Transects A-C, S. Figure 6-13 displays box plots of the observed total Aroclor results for the specified transects.

Table 6-19 Observed Total Aroclors Results in Sediments in Comparison to CBSQGs

CBSQG	Transect	Number of Samples	Minimum Concentration (ppb)	Median Concentration (ppb)	Maximum Concentration (ppb)	Number of Samples above CBSQG	% above CBSQG
676 ppb	A-C, S	51	120	280	21,600	22	43.1%
	D-F	29	115	120	1,210	1	3.5%
	G-K	48	60	183	460,000	11	22.9%

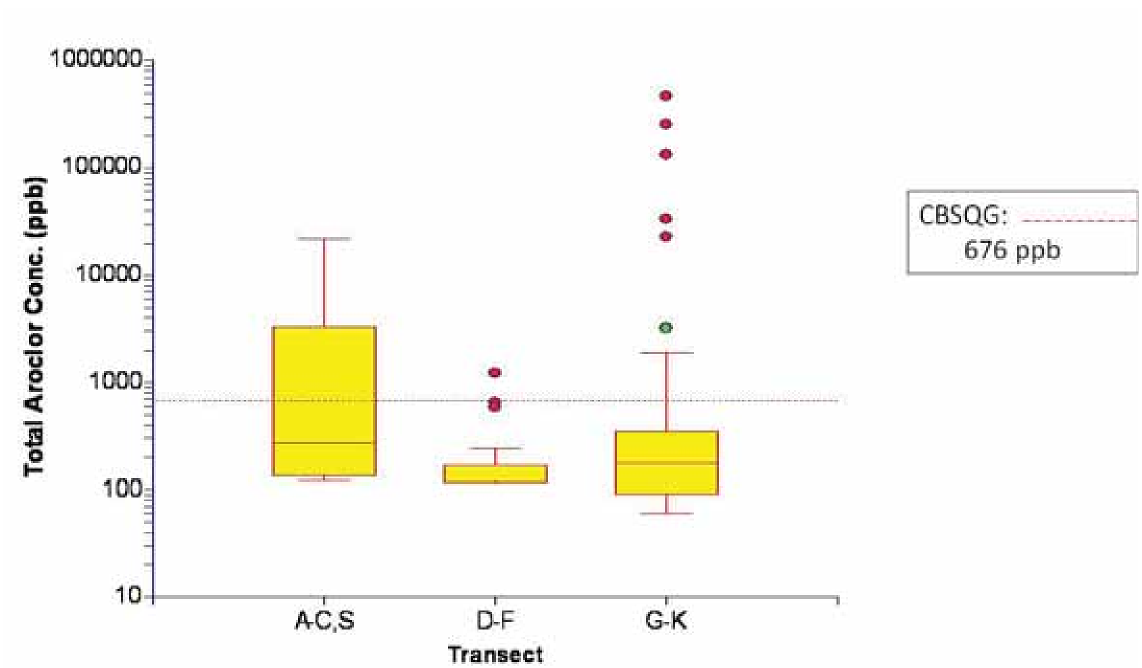

Figure 6-13 Box Plots of the Observed Total Aroclor Results in the Specified Transects

Figures 6-14 through 6-16 display the observed total Aroclor concentrations for the specific depth intervals at Phase I and Phase II sampling locations.

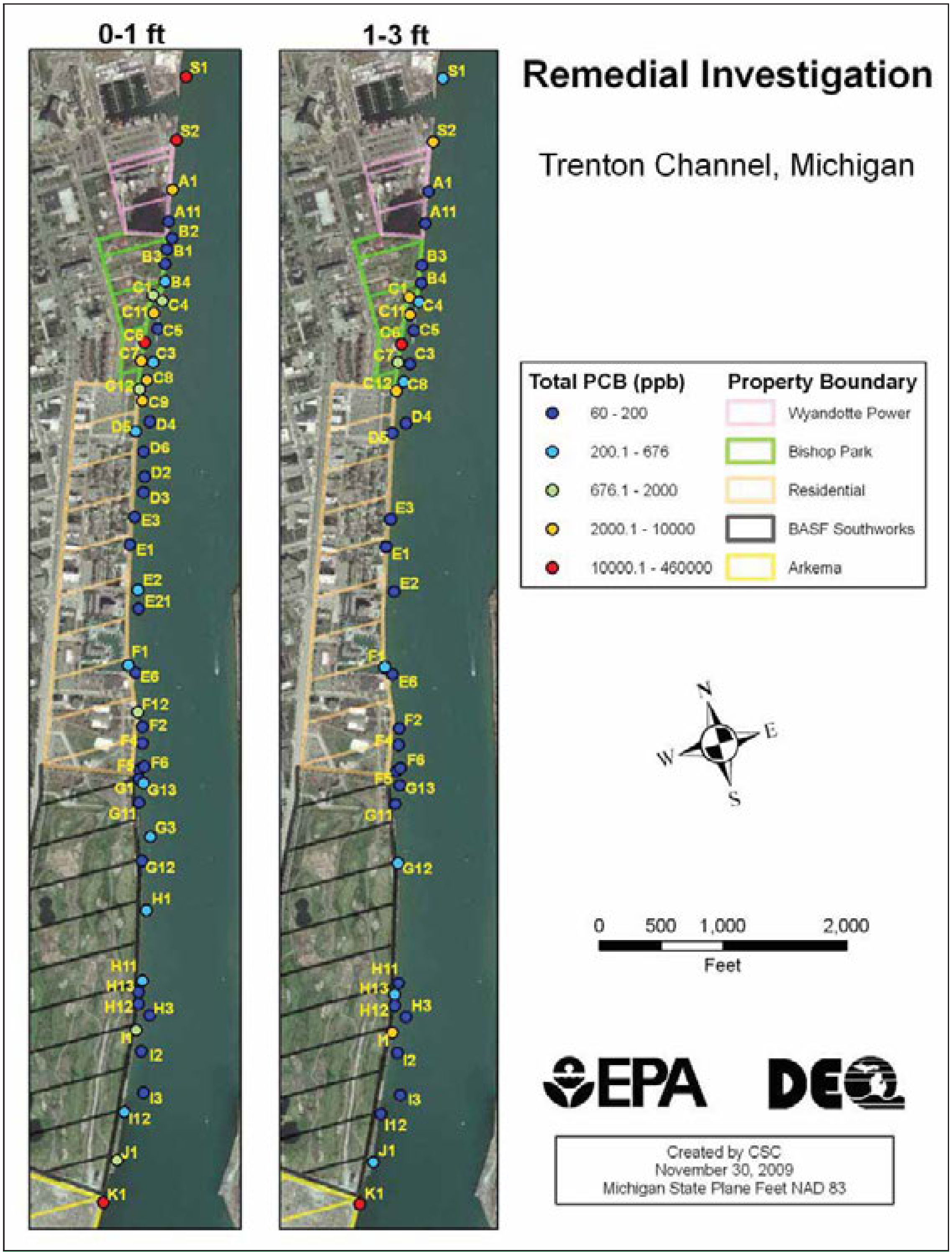

Figure 6-14 Observed Total PCB Results (as Aroclors) for 0-1 Foot and 1-3 Foot Depth Intervals

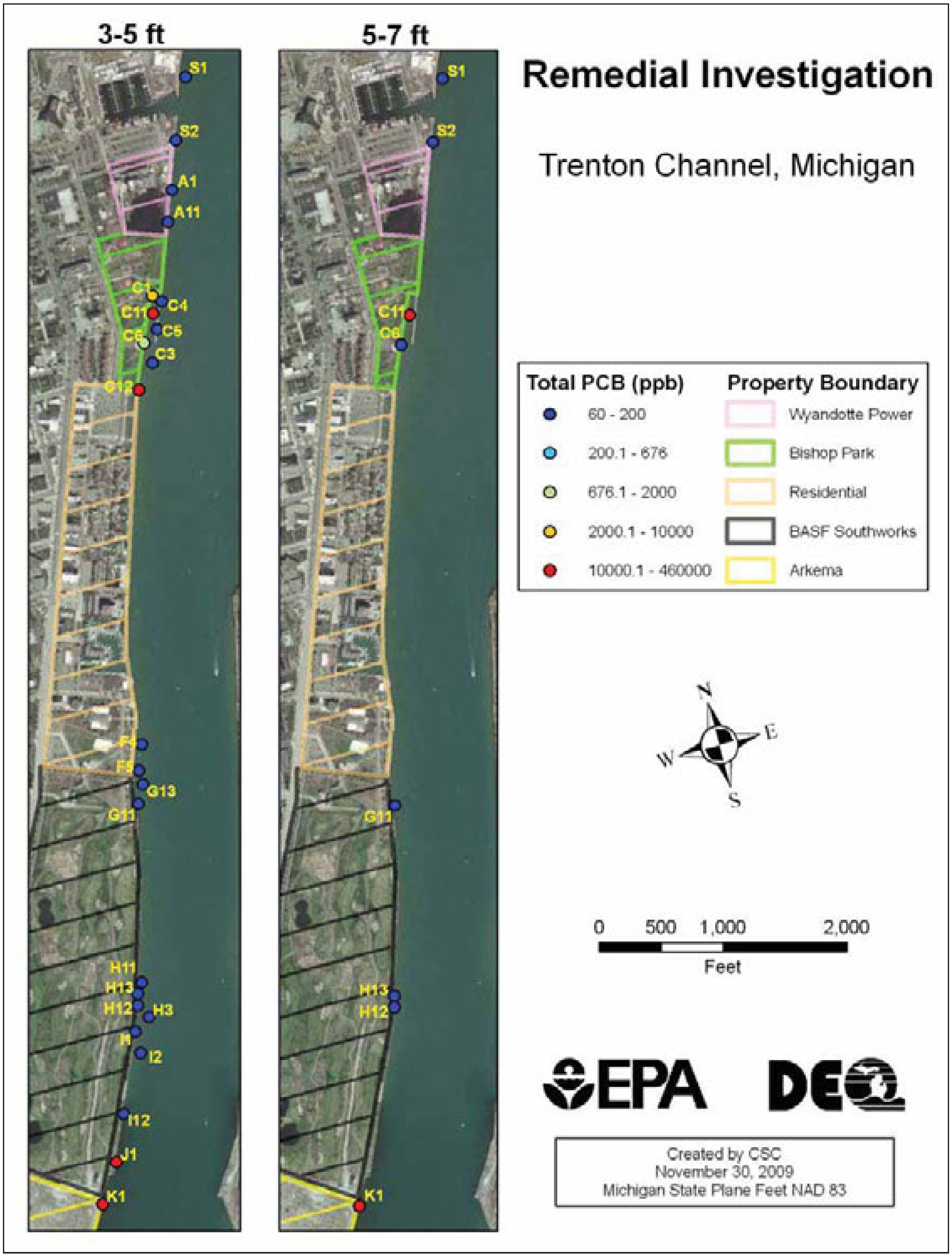

Figure 6-15 Observed Total PCB Results (as Aroclors) for 3-5 Foot and 5-7 Foot Depth Intervals

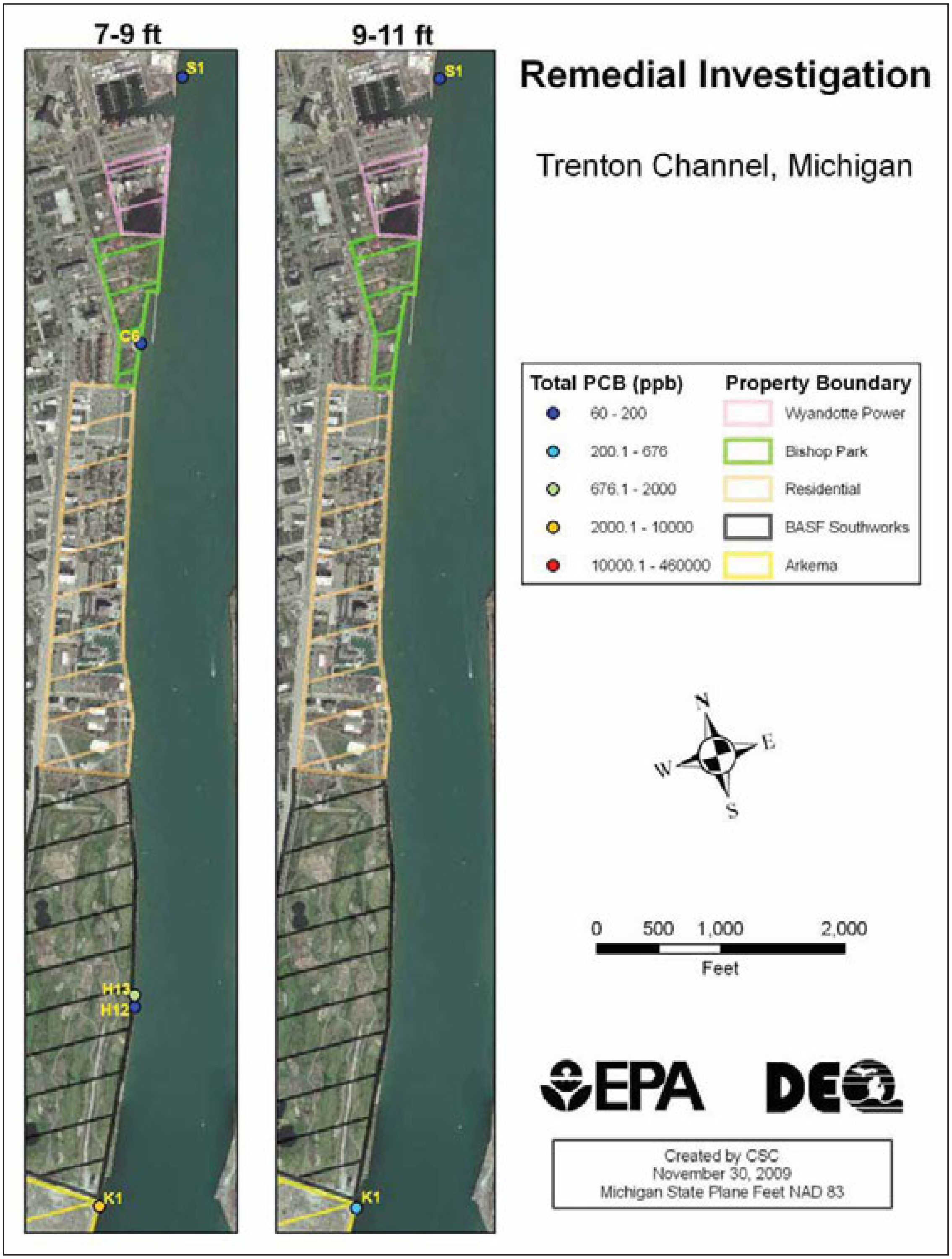

Figure 6-16 Observed Total PCB Results for 7-9 Foot and 9-11 Foot Depth Intervals

6.7.3 Total PAHs

Descriptive statistics for total PAH results are provided in Section 6.3.2.1. The total PAH concentration is below the CBSQG for the majority of samples collected within each of the specified transect groups as shown in Table 6-20. The percentage of samples exceeding the CBSQG ranged between 31.0% for Transects D-F and 43.1% for Transects A-C, S.

Table 6-20 Observed Total PAH Results in Sediments in Comparison to CBSQGs

CBSQG	Transect	Number of Samples	Minimum Concentration (ppb)	Median Concentration (ppb)	Maximum Concentration (ppb)	Number of Samples above CBSQG	% above CBSQG
22,800 ppb	A-C, S	51	84	17,950	407,400	22	43.1%
	D-F	29	87	4,020	180,800	9	31.0%
	G-K	48	180	9,402	534,600	15	31.3%

7.0 NATURE AND EXTENT OF SEDIMENT CONTAMINATION

7.1 POTENTIAL CONTAMINATION SOURCES

The potential contaminant sources within the Trenton Channel project site include:

1) permitted and non-permitted point sources such as stormwater runoff and combined sewer overflows,
2) bank sources for contaminated baseflow such as legacy industrial and active properties, and
3) non-point sources such as industrial and commercial operations and agricultural/landscaping operations.

These potential sources may release contaminants to the Detroit River and upstream tributaries (e.g., Ecorse River) through direct discharge, baseflow flux, and runoff. These primary contaminant release and transport mechanisms may contaminate river sediments and surface water. Figure 7.1 displays the active CSOs and former industrial outfalls along the Trenton Channel Phase I and Phase II sampling areas. Secondary release and transport mechanisms (e.g., uptake through food webs) can result in potential contamination of shoreline sediment along the river and of aquatic life (such as fish).

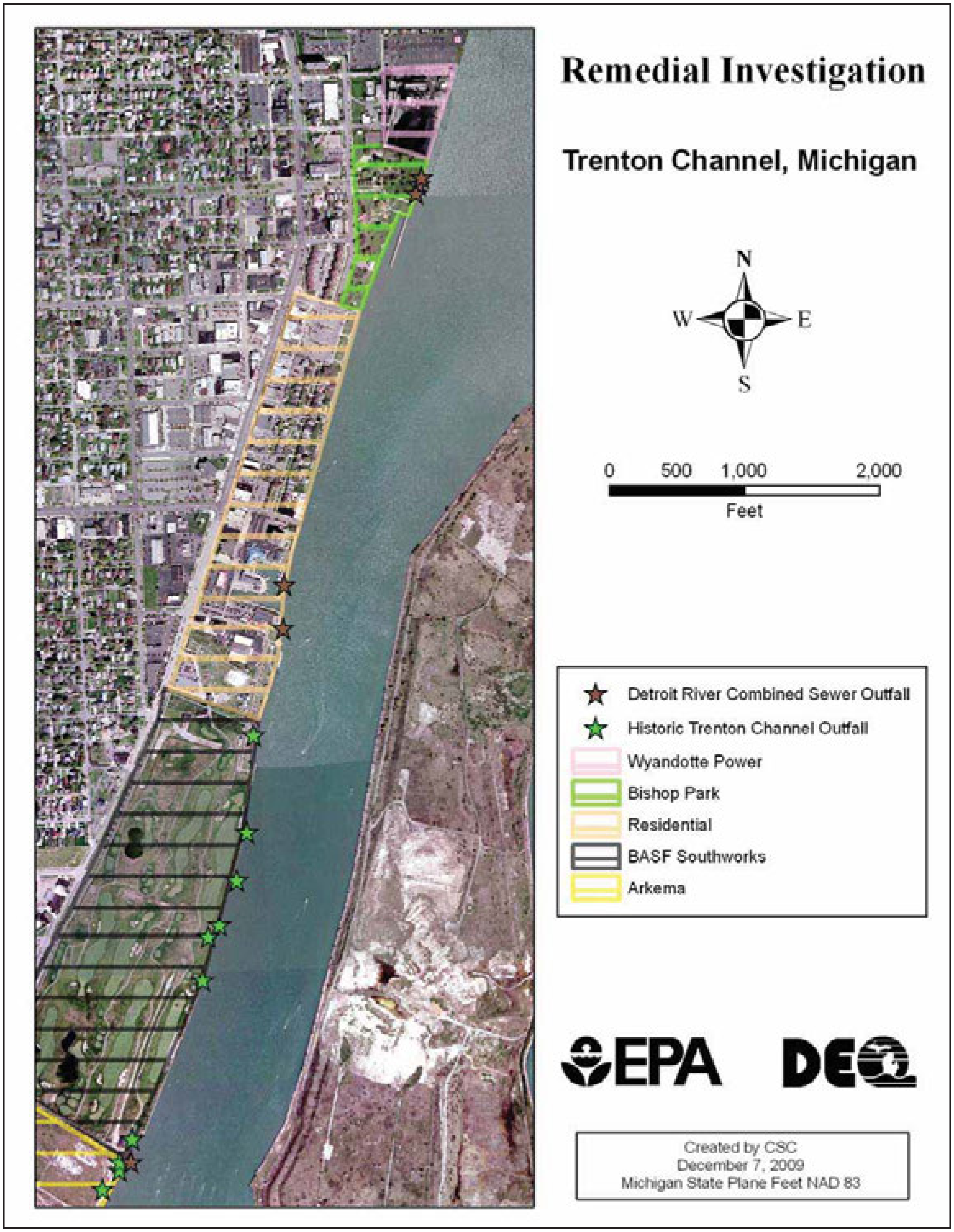

Figure 7-1 Active Combined Sewer Outfalls and Former Industrial Outfalls Located along the Trenton Channel Remedial Investigation Site

7.2 VERTICAL AND HORIZONTAL EXTENT OF CONTAMINANTS OF CONCERN

Geostatistical analysis of sediment contaminant data was conducted using Stanford Geostatistical Modeling Software (SGeMS; more information about SGeMS is available at http://sgems.sourceforge.net/#Download) to estimate concentrations and describe the horizontal and vertical contamination. Three COCs were selected for data interpretation as primary contaminants of concern at the Trenton Channel site, specifically, mercury, total PCBs and total PAHs. Based on the results of the geostatistical model, a series of maps were generated that illustrate estimated contaminant concentrations across the site. Model results were overlaid onto aerial photography to assist in visualization and orientation at the site. The illustrations were exaggerated twenty-five times in the vertical direction to better visualize the concentrations throughout the sediment. The contaminant concentration scales for each map were selected to facilitate discrimination among estimated concentrations and should be considered when evaluating these illustrations. The geostatistical model is based on all data generated at the site for the three COCs as presented in Section 6 and the model provides estimated concentrations for the site of interest for this remedial investigation, as shown in the site boundary detailed in Figure 7-2. All data collected at the site were used in the generation of the model in order to develop the best estimates at the site based on all available information.

Geostatistical analysis of sediment data for the fourth contaminant of concern (pH) was not conducted. Instead, an assessment of the pH results and contaminant concentrations in associated samples was conducted to provide a better understanding of the horizontal and vertical distribution of pH values across the site and the consequences for remedial activity as detailed in Section 7.2.5. In addition, section 6.4.2 presents the results of the analytical data for pH obtained during the Phase I sampling effort and Figure 6-6 provides a visual representation of the means at each sampling location.

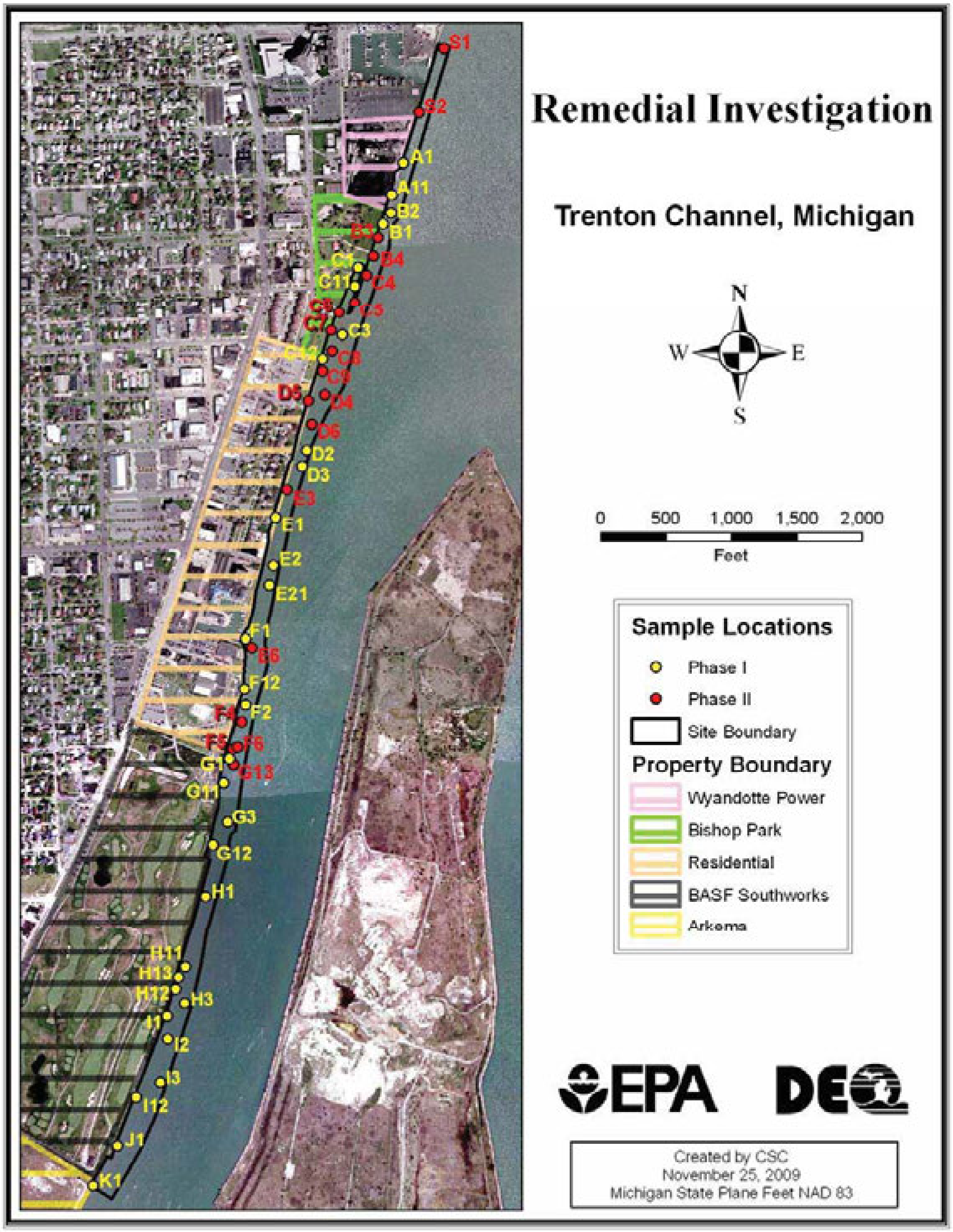

Figure 7-2 Trenton Channel Site Boundary Map

7.2.1 Distribution of Total PAHs

Estimated concentrations at the site for total PAHs in surficial sediments (0 to 1 foot) are illustrated in Figure 7-3. Figure 7-4 displays the estimated total PAH concentrations in the surficial sediments in relation to the location of the active combined sewer outfalls and former industrial outfalls located along the Trenton Channel. Several three-dimensional views of estimated concentrations are provided in Figures 7-5 through 7-7. Estimated concentrations of total PAHs for all sediment depths throughout the site range from 96.6 to 500,000 ppb. Distinct areas of the site have lower concentrations throughout the sediment column whereas other areas of the site have higher concentrations of total PAHs sometimes at depth. The highest concentrations estimated at the site occur in the northern and southern sections of the site.

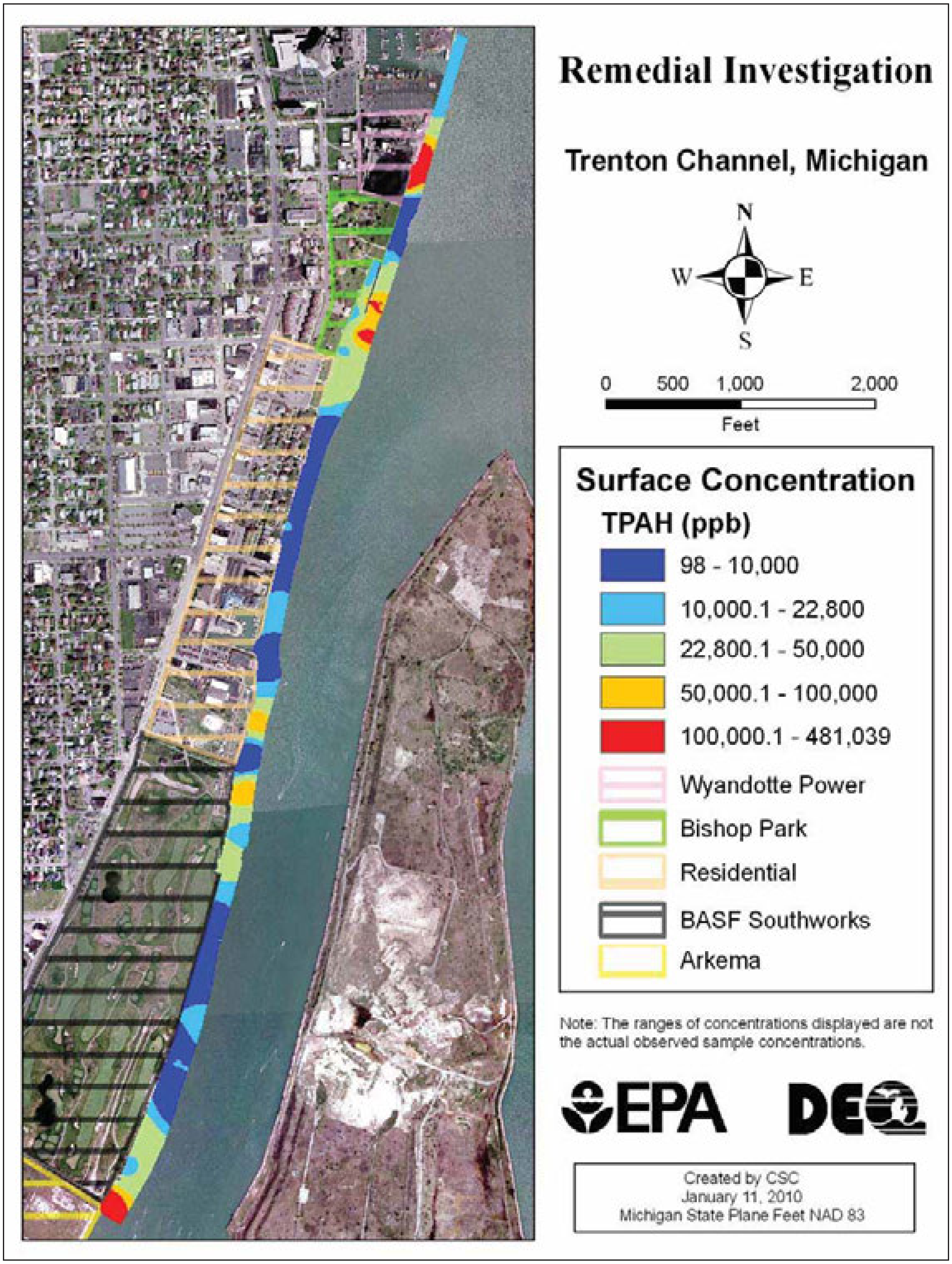

Figure 7-3 Sediment Surface Total PAH Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot)

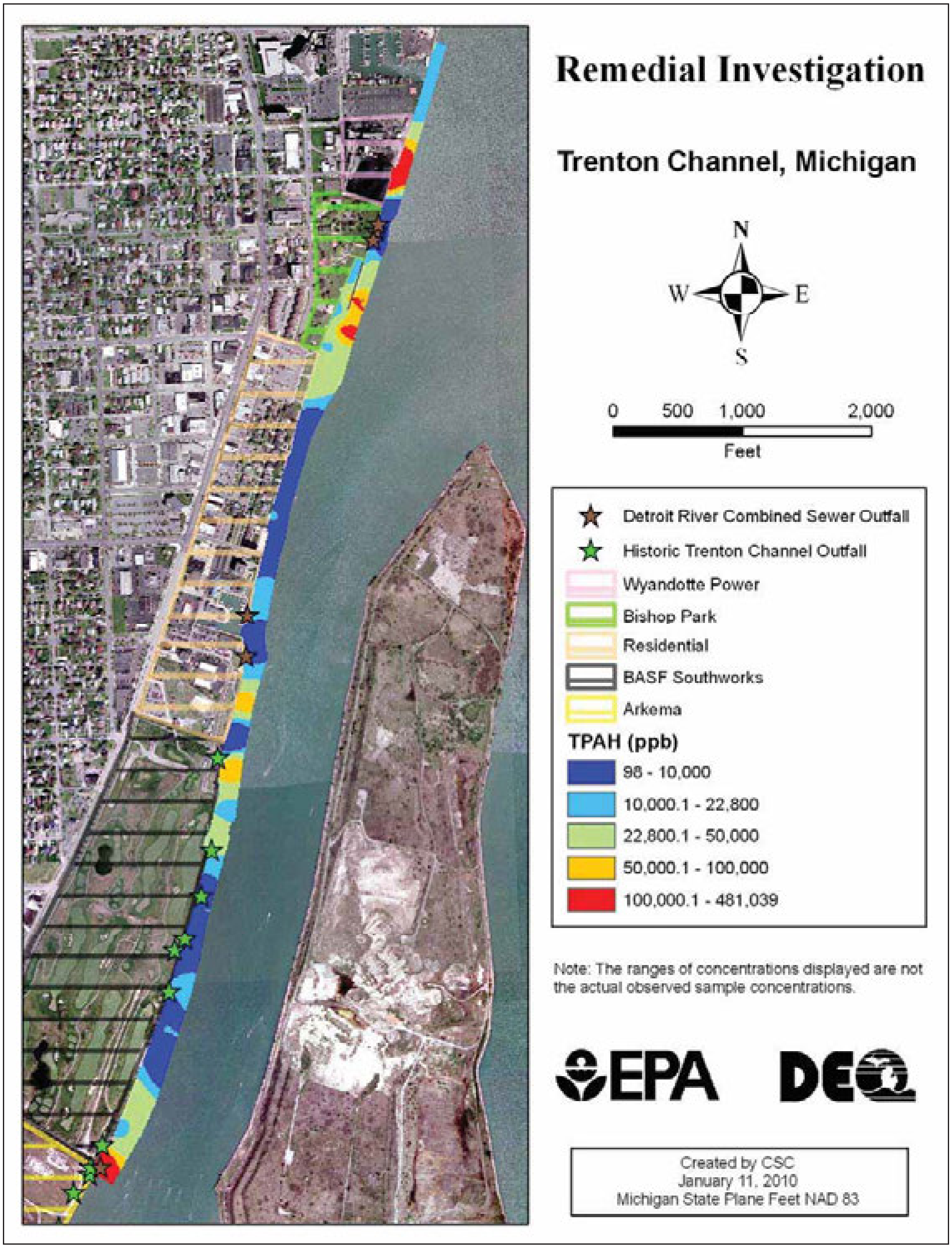

Figure 7-4 Sediment Surface Total PAH Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot) in Relation to the Active Combined Sewer Outfalls and Former Industrial Outfalls

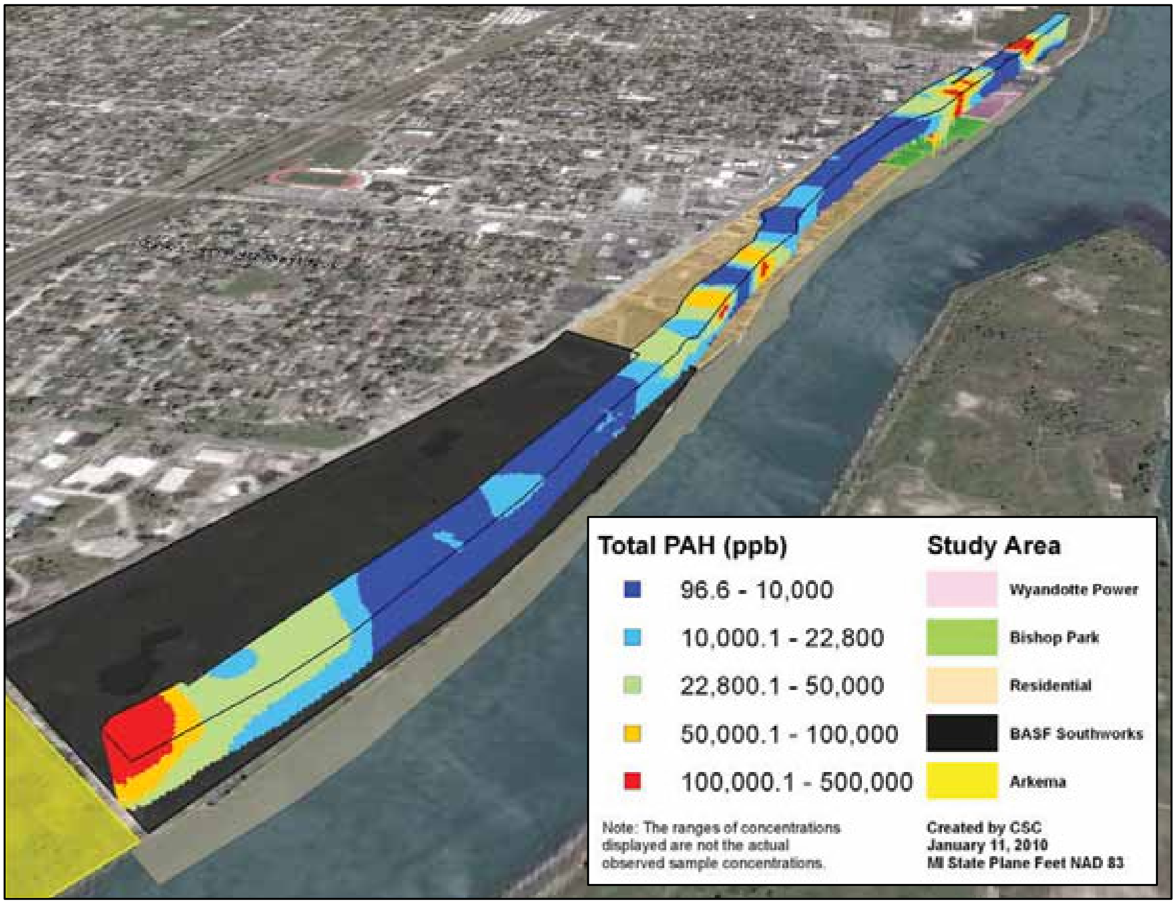

Figure 7-5 Estimated Total PAH Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Southeast of the Site (exaggerated 25 times in the vertical direction)

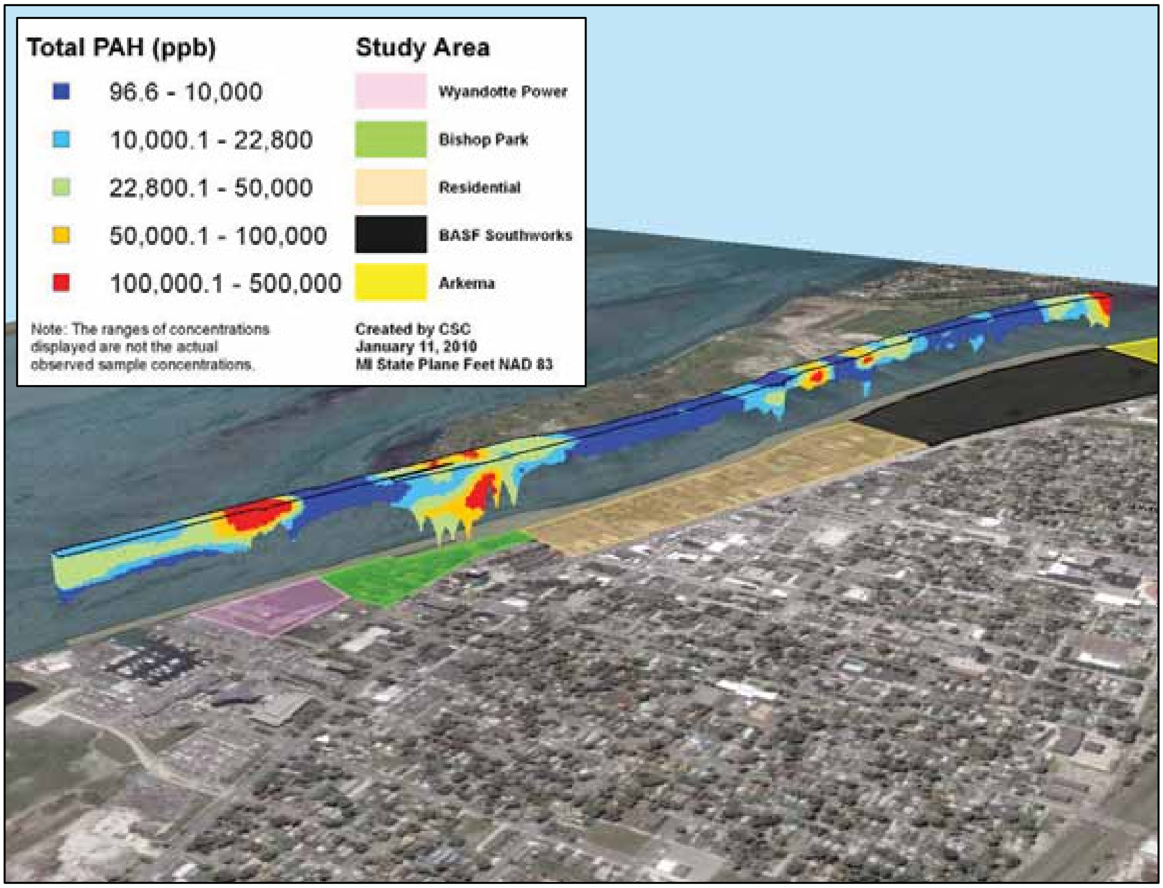

Figure 7-6 Total PAH Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northwest of the Site (exaggerated 25 times in the vertical direction)

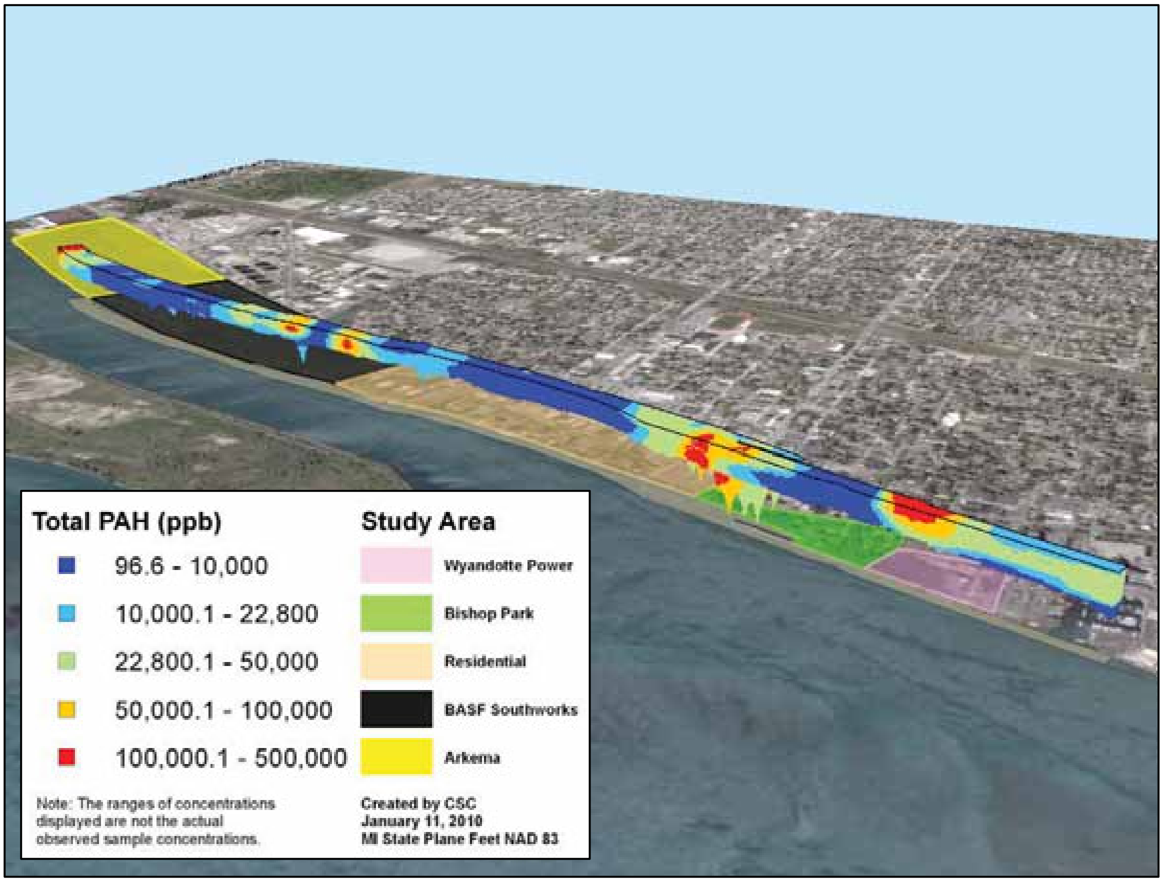

Figure 7-7 Total PAH Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northeast of the Site (exaggerated 25 times in the vertical direction)

7.2.2 Distribution of Total PCBs

7.2.2.1 Distribution of Total PCBs throughout the Site

Estimated concentrations at the site for total PCBs in surficial sediments (0 to 1 foot) are illustrated in Figure 7-8. Figure 7-9 displays the estimated total PAH concentrations in the surficial sediments in relation to the location of the active combined sewer outfalls and former industrial outfalls located along the Trenton Channel. Several three-dimensional views of estimated concentrations are provided in Figures 7-10 through 7-11. Estimated concentrations of total PCBs for all sediment depths throughout the site range from 60 to 424,826 ppb. Elevated concentrations are estimated to occur at three distinct areas of the site including areas at the northern and southern tips of the site and an area surrounding Transects B and C.

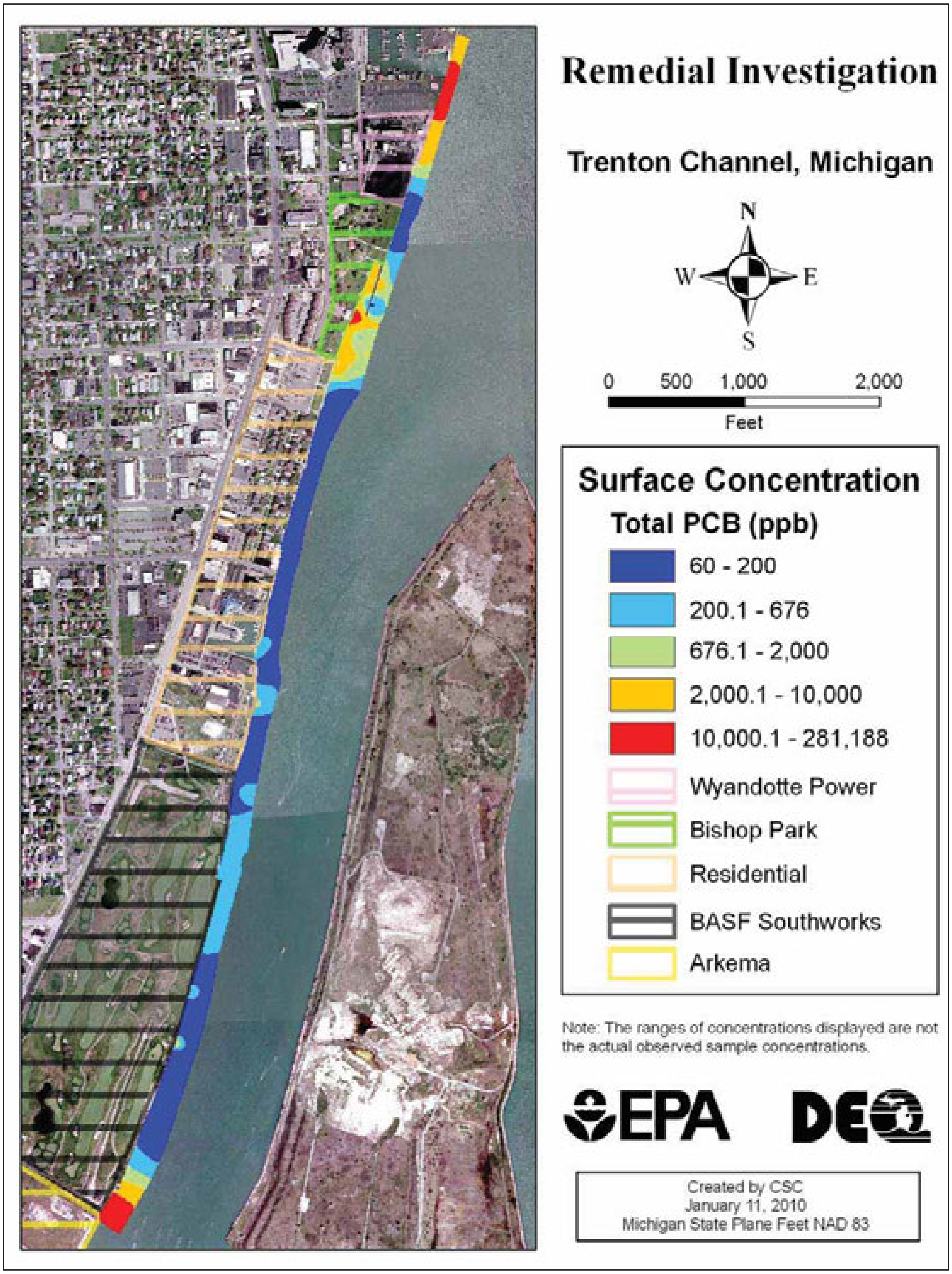

Figure 7-8 Sediment Surface Total PCB Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot)

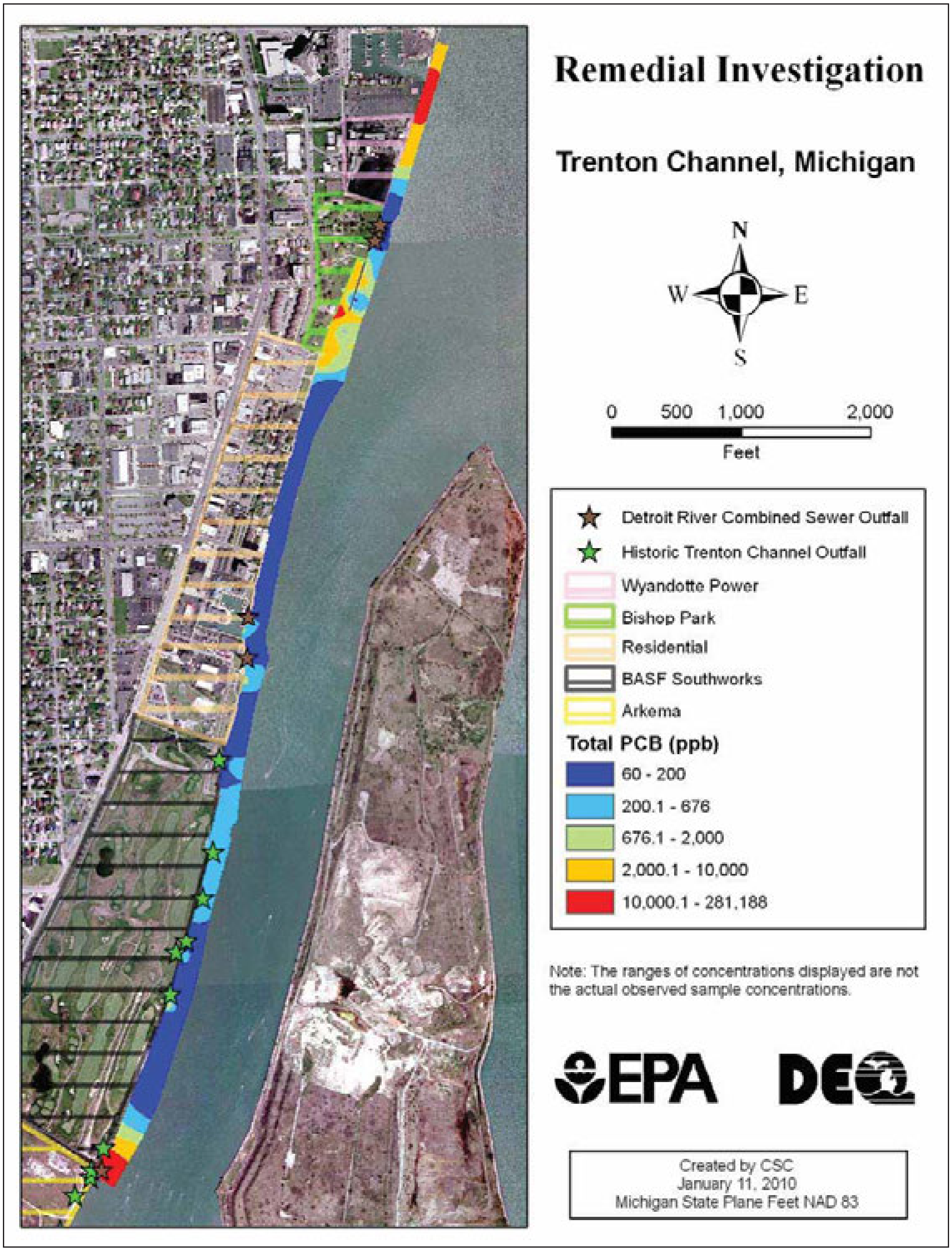

Figure 7-9 Sediment Surface Total PCB Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot) in Relation to the Active Combined Sewer Outfalls and Former Industrial Outfalls

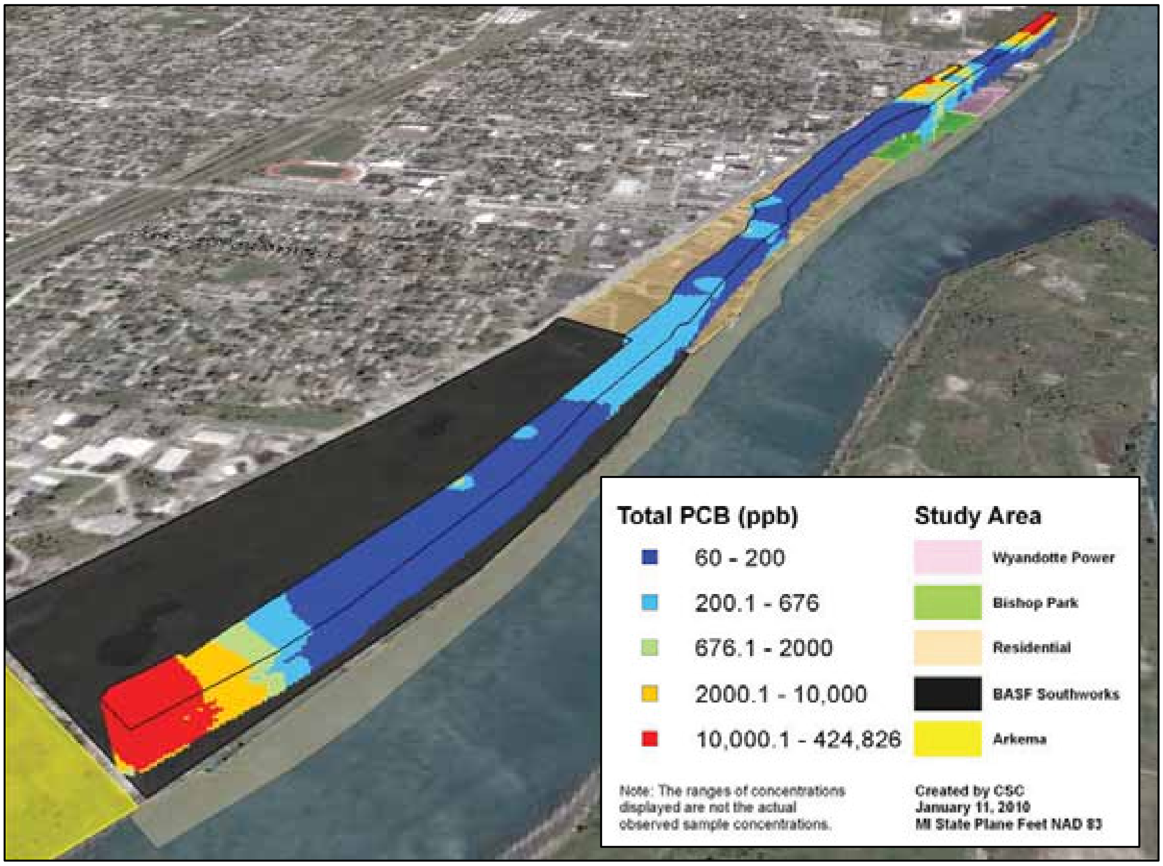

Figure 7-10 Total PCB Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Southeast of the Site (exaggerated 25 times in the vertical direction)

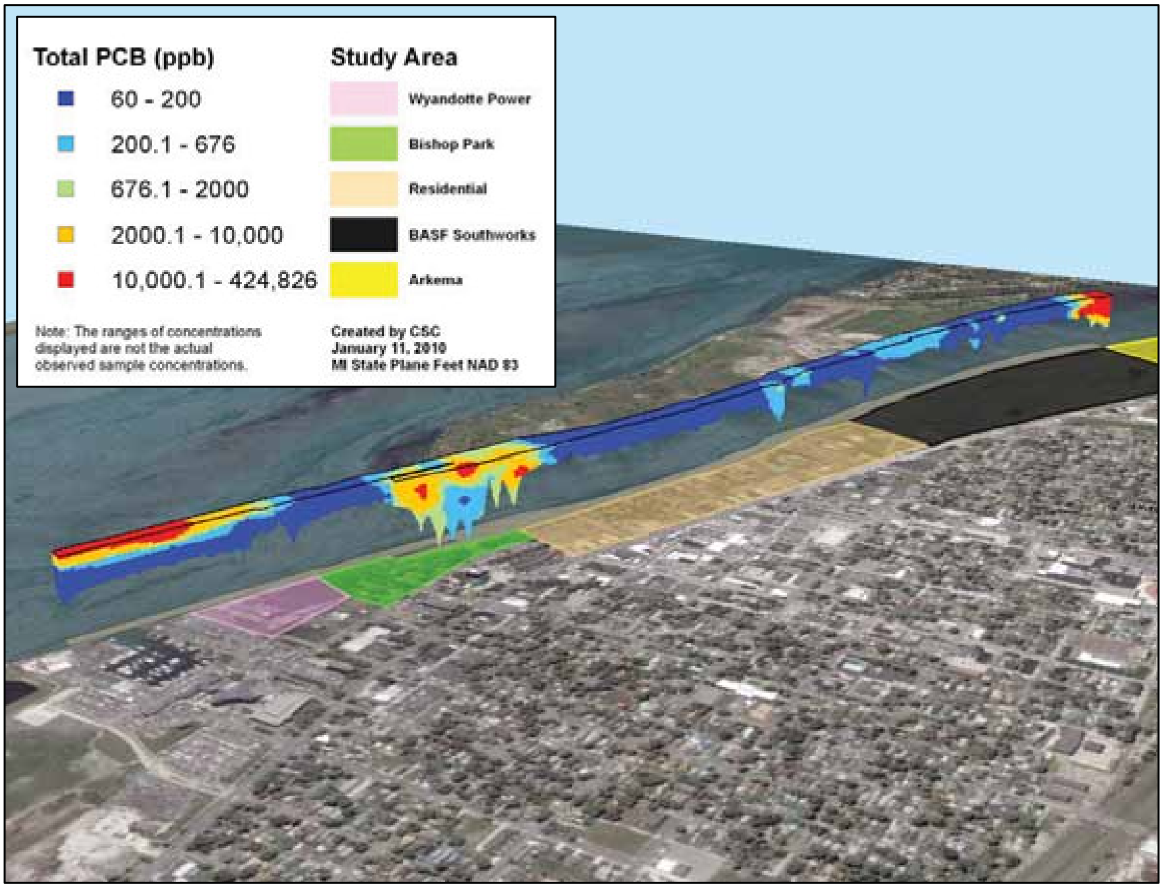

Figure 7-11 Total PCB Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northwest of the Site (exaggerated 25 times in the vertical direction)

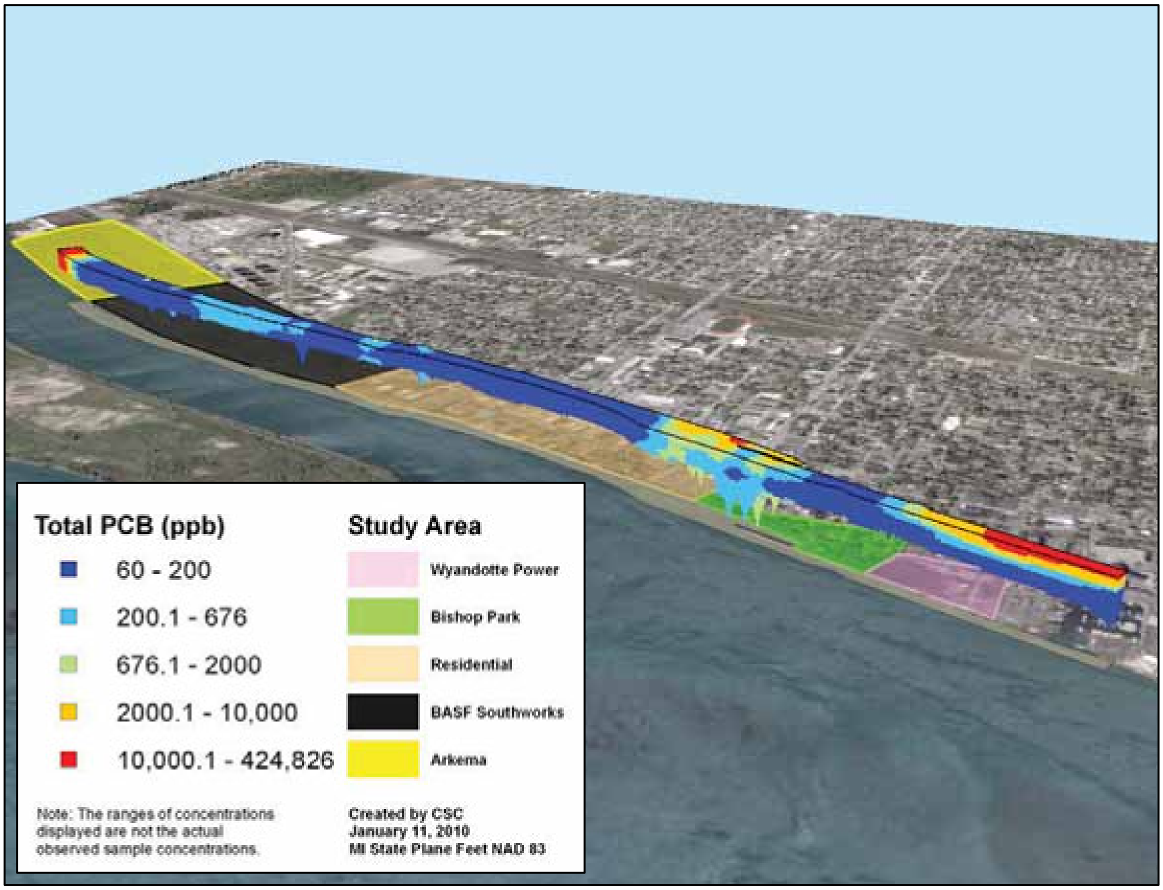

Figure 7-12 Total PCB Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northeast of the Site (exaggerated 25 times in the vertical direction)

7.2.2.2 Refined Horizontal Extent of PCBs in Transects B and C

As detailed in Section 5.2.2, elevated PCB concentrations were observed in areas surrounding Transects B and C. This area was selected for additional sampling in Phase II of the study to further detail the vertical and horizontal extent of the PCB contamination in this area. Figure 7-13 provides additional detail for the estimated concentrations on this area based on the geostatistical model. Concentrations in this area of the site are estimated to range from 60 to 255,540 ppb.

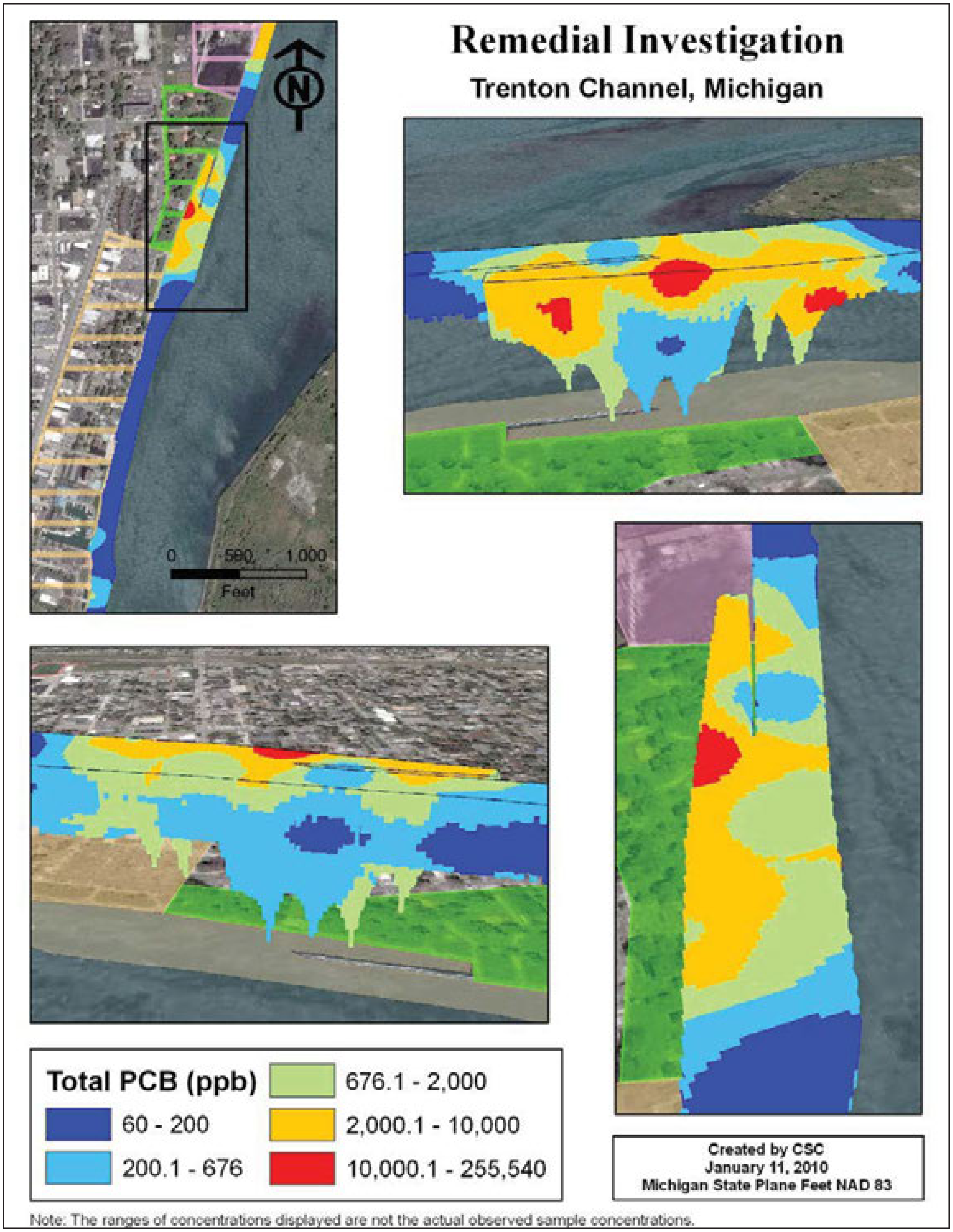

Figure 7-13 Total PCB Concentrations in Sediment at the Trenton Channel Site in Transects B and C Based on Geostatistical Modeling (exaggerated 25 times in the vertical direction)

7.2.3 Distribution of Mercury

7.2.3.1 Distribution of Mercury throughout the Site

Estimated concentrations at the site for mercury in surficial sediments (0 to 1 foot) are illustrated in Figure 7-14. Figure 7-15 displays the estimated total PAH concentrations in the surficial sediments in relation to the location of the active combined sewer outfalls and former industrial outfalls located along the Trenton Channel. Several three-dimensional views of estimated concentrations are provided in Figures 7-16 through 7-18. Estimated concentrations of mercury for all sediment depths throughout the site range from 0.19 to 80 ppm. The highest concentrations are estimated to occur at the southern areas of the site.

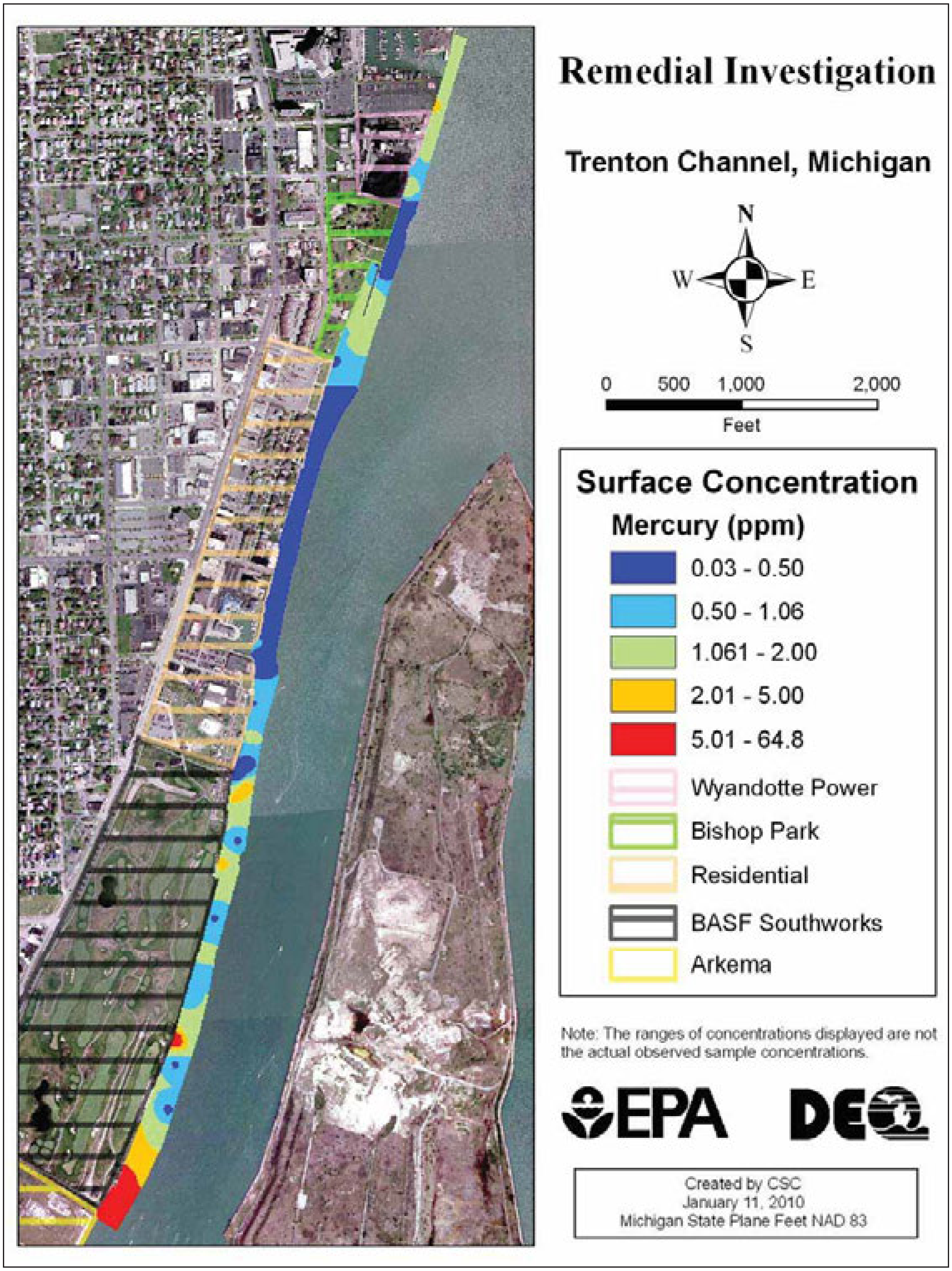

Figure 7-14 Sediment Surface Mercury Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot)

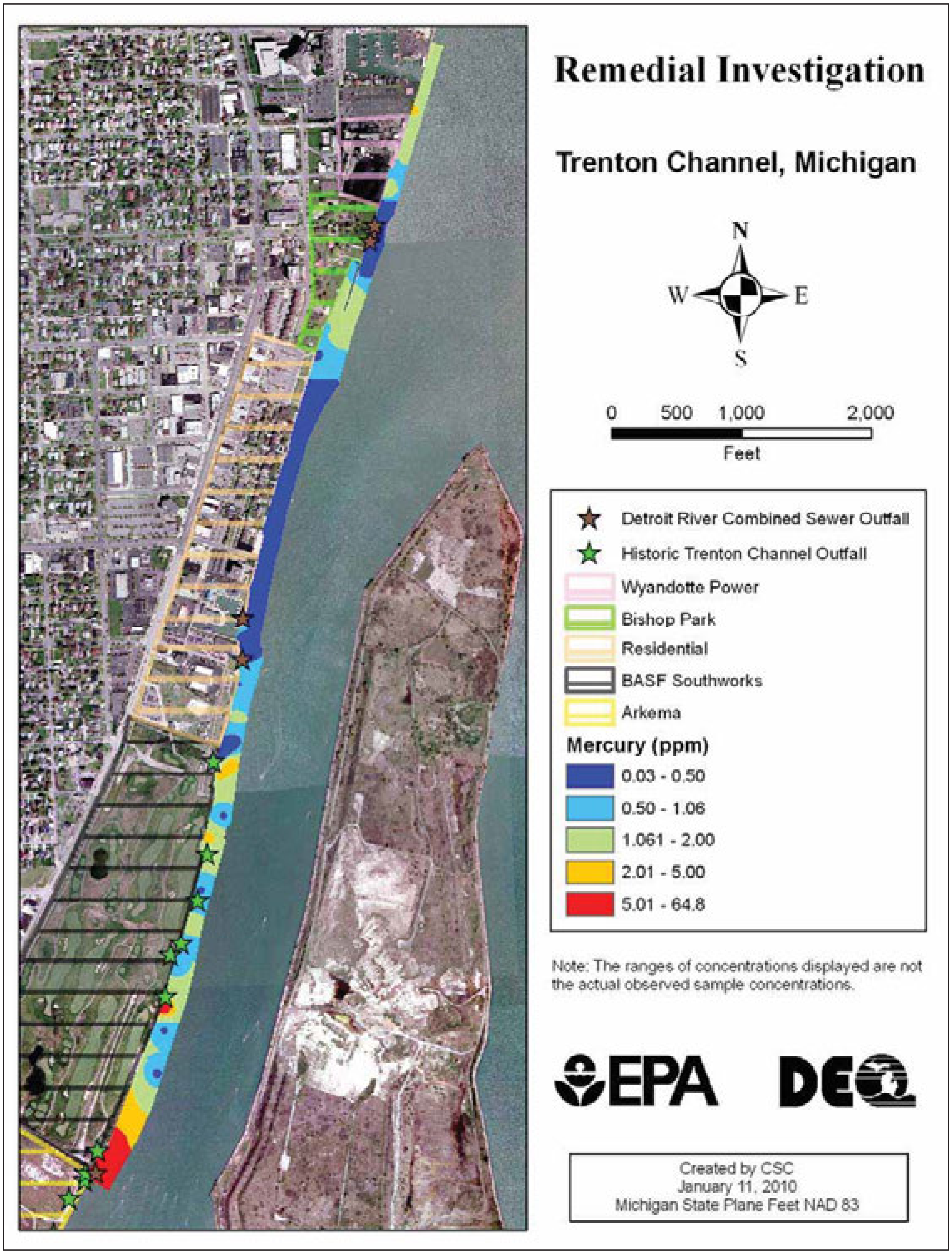

Figure 7-15 Sediment Surface Mercury Concentrations at the Trenton Channel Site Based on Geostatistical Modeling (0 to 1 foot) in Relation to the Active Combined Sewer Outfalls and Former Industrial Outfalls

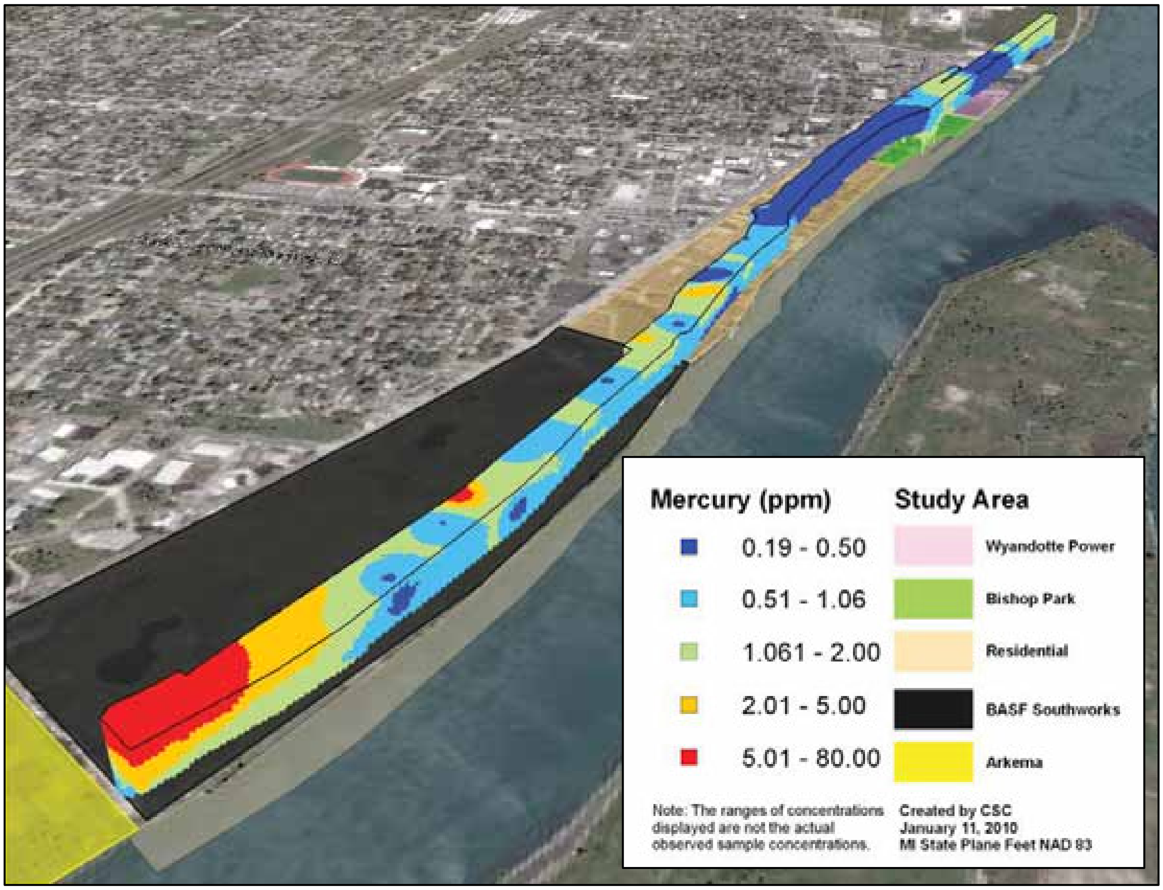

Figure 7-16 Mercury Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Southeast of the Site (exaggerated 25 times in the vertical direction)

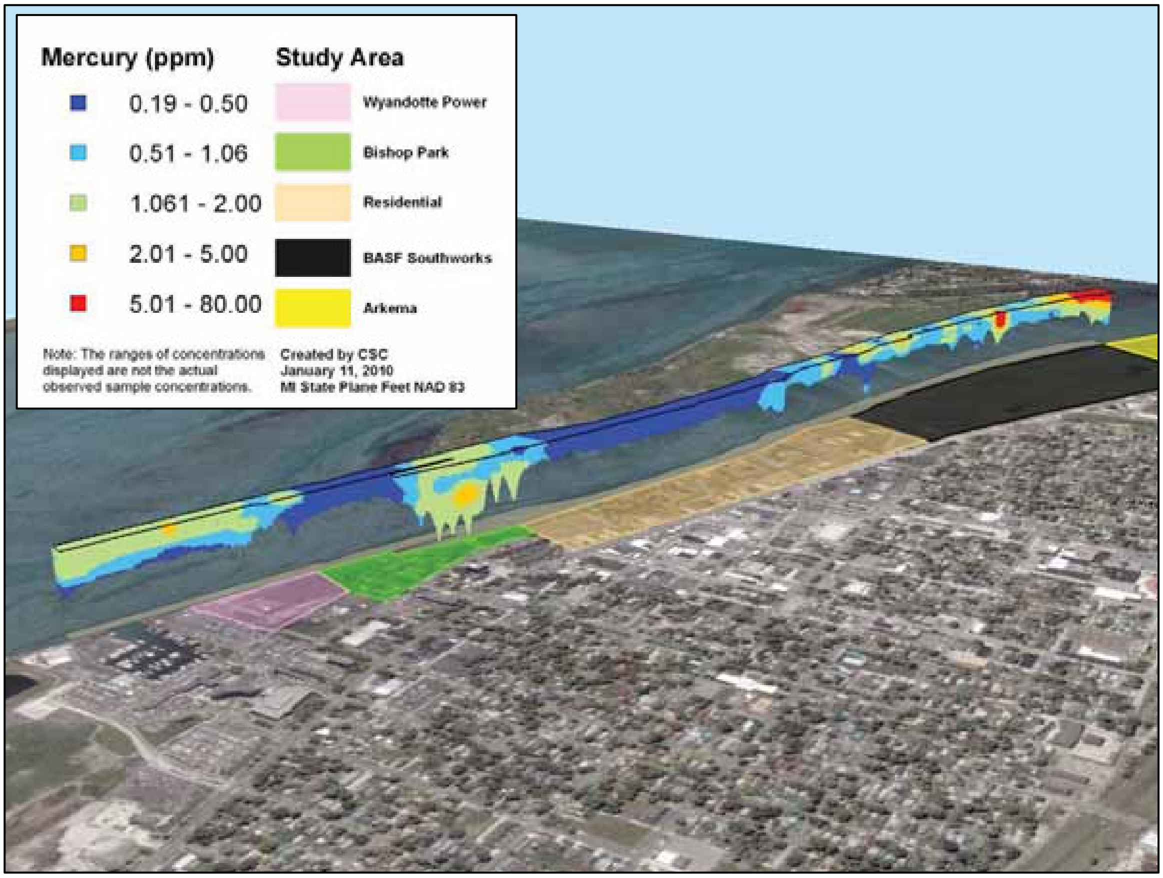

Figure 7-17 Mercury Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northwest of the Site (exaggerated 25 times in the vertical direction)

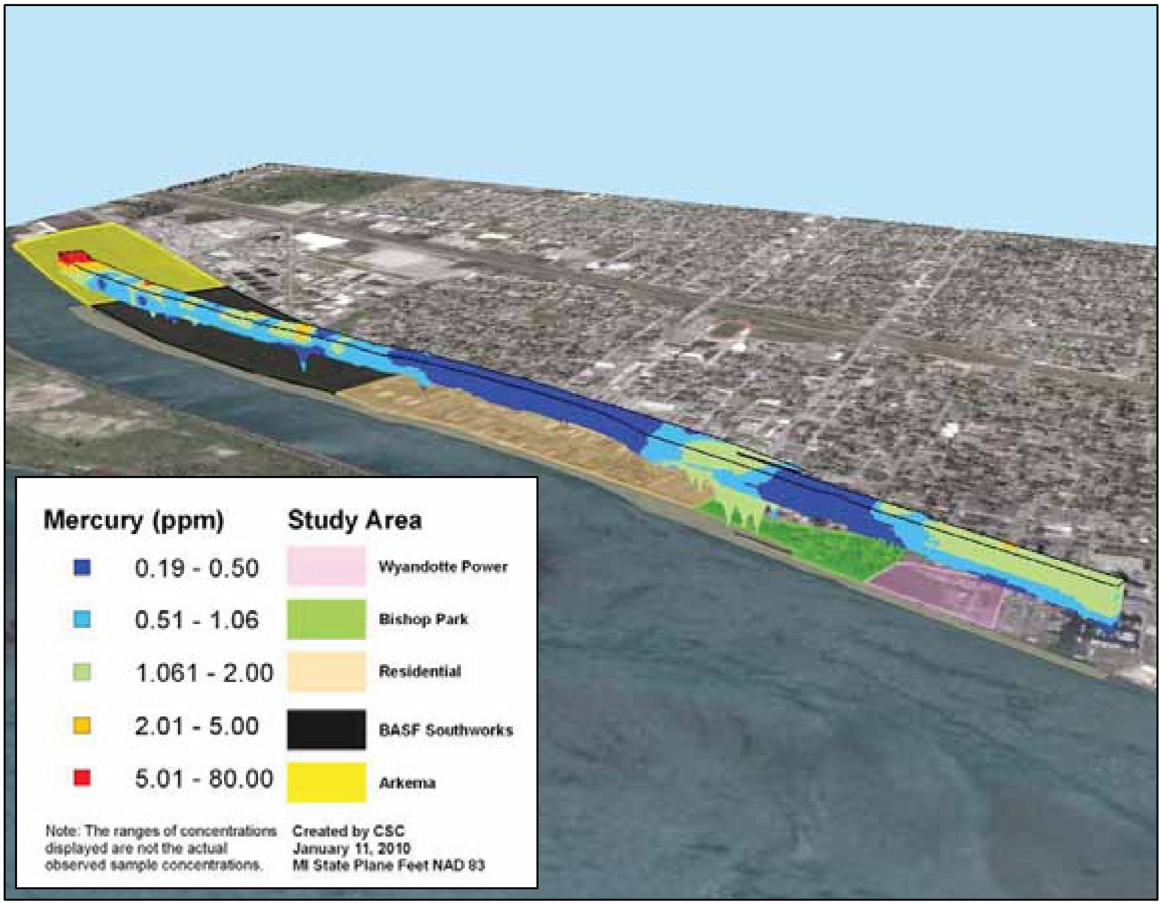

Figure 7-18 Mercury Concentrations in Sediment at the Trenton Channel Site Based on Geostatistical Modeling, View from Northeast of the Site (exaggerated 25 times in the vertical direction)

7.2.3.2 Distribution of Mercury Contamination in the Northernmost Section

As discussed in Section 5.2.2.3, one of the project questions is whether there is an increasing trend in mercury concentration moving north between Transects F and A. Additional Phase II samples were collected north of Transect A (in Transect S) to help answer this question. Per the study design, a regression model was fit between sample location and observed mercury concentration.

To quantify location, the distance in feet between each sampling location to the northernmost station in Transect A (station A1) was calculated. For stations south of A1, the distance was negative. For the two stations north of A1, the distance was positive. For station A1, the distance was set to zero.

While the study was designed based on the assumption of mercury results following a normal distribution, graphical analyses and the D'Agostino omnibus normality test using the Phase I and II results indicate that this assumption could not be met. The failure to meet the assumed normal distribution was mainly due to the large number of "ties" resulting from the high frequency of non-detects based on the same reporting limit. In addition, the assumption of results following a lognormal distribution also could not be met. Therefore, a nonparametric Sen regression model was fit to estimate the effect of location on mercury concentration. The resulting regression model was:

$$Hg = 0.59556 + 0.000085 * X$$

where, Hg is the concentration of mercury in surficial sediments in ppm and X is the distance upstream in feet

From this model, it would be estimated that mercury would increase by 0.000085 ppm as one moved north by one foot.

To assess the statistical significance of the estimated slope, a lower confidence limit for the slope was determined using Bootstrap estimation. As described in Section 5.2.2.3, the 80% was chosen as the most appropriate confidence level for the purposes of the study, and as a result, the lower limit for the slope was calculated at the 80% confidence level. The estimated lower limit was 0.00019 ppm; because this limit exceeded zero, it could be concluded there is a statistically significant increasing trend in mercury concentration as one moves north from Transect F to Transect S. The figures listed in Section 7.2.3.1 also illustrate these results. This analysis is heavily affected by the lower concentrations and higher frequency of non-detect results found in Transects D, E, and F. Because of these lower concentrations and their strong impact on this analysis, the analysis does not necessarily indicate there is a large decrease in concentration between Transects S and A. Therefore, the impact of the non-detects in Transects D-F should be considered when evaluating these results and additional samples may be warranted to fully answer this question in the context of the remedial investigation.

7.2.4 Distribution of Contaminants of Concern in Transects D, E, and F

As discussed in Section 5.2.2.1, one of the project questions for which Phase II samples were collected is whether concentrations within Transects D, E, and F, were below the CBSQGs for mercury, total Aroclors, and total PAHs. The Phase II sampling design was designed to answer this question using one-sample t-tests at the 80% confidence level, and as a result the statistical analyses described in this section were performed at that confidence level. Graphical analyses and the D'Agostino omnibus test performed on the final observed concentrations suggested the distribution of Phase I and Phase II concentrations did not follow a normal or lognormal distribution, and therefore, the nonparametric Wilcoxon signed-rank test was used for this analysis. While the signed-rank test is nonparametric, it assumes a symmetric distribution. Because graphical assessments of the data revealed the natural log-transformation yielded a more symmetric distribution, transformed results were used for this test.

Results of the Wilcoxon signed-rank test for the three COCs are presented in Table 7-1 below, and are shown graphically in Figure 7-19.

Table 7-1 Results of CBSQG Comparison for Transects D-F (n=29)

COC	CBSQG	Median Concentration	Number of Samples above CBSQG	% above CBSQG	Median Significantly Greater than CBSQG	p-value
Mercury	1.06 ppm	0.10 ppm	3	10.3%	No	>0.999
Total PAH	22,800 ppb	4,020 ppb	9	31.0%	No	>0.999
Total Aroclor	676 ppb	120 ppb	1	3.4%	No	>0.999

The hypothesis that the median concentration is below the CBSQG could not be rejected for any of the three COCs. The percentage of samples exceeding the CBSQG ranged between 3.4% for total Aroclors and 31% for total PAHs. The majority of the samples that exceeded the CBSQG were collected from Transect F. The kriging model results presented in Sections 7.2.1 – 7.2.3 provide more specific information on the distribution of concentrations within this area.

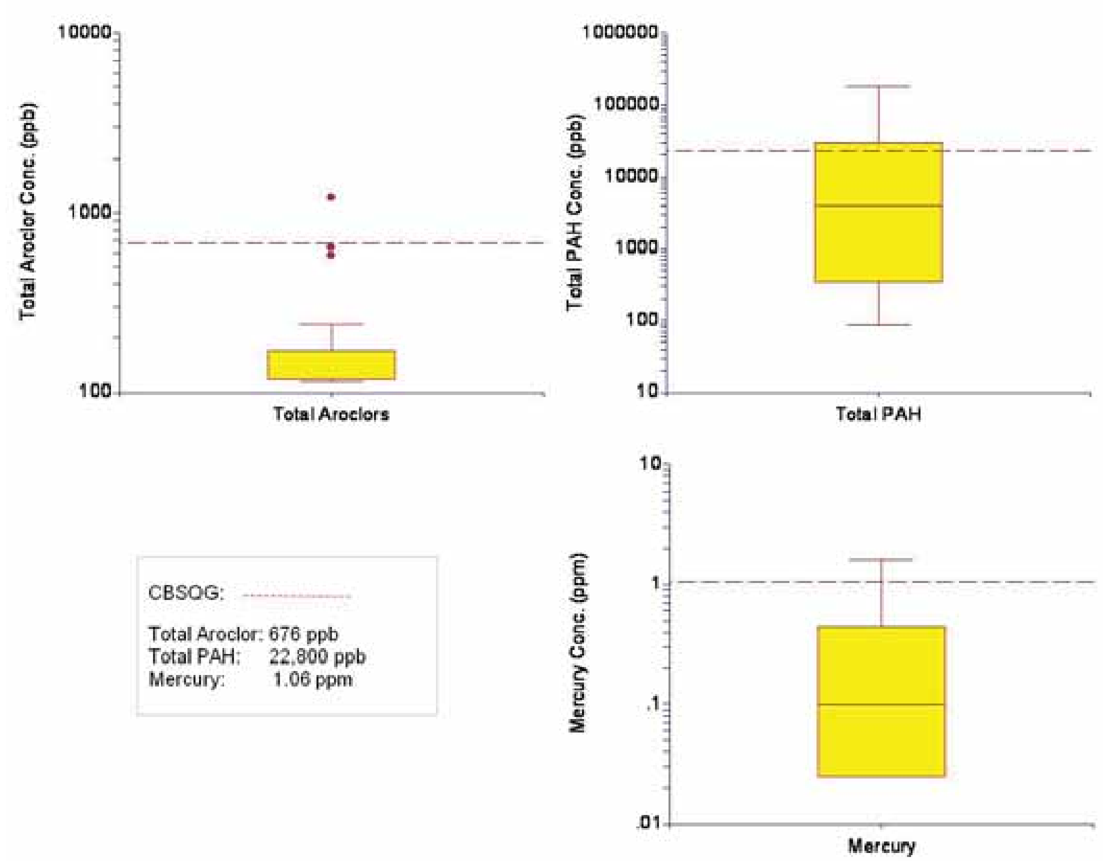

Figure 7-19 Box Plots of the Results of the Wilcoxon Signed-rank Test for the Three COCs

7.2.5 Assessment of pH

A measurement of pH was performed on samples collected at multiple depths at 31 stations, resulting in a total of 78 pH results. pH values greater than 8.5 were considered above the level of interest. Of these 31 stations, pH exceeded the value of 8.5 for at least one sample at 13 stations; overall, 42% of these samples exceeded the level of interest. An assessment of the pH results and contaminant concentrations in associated samples was conducted to provide a better understanding of the horizontal and vertical distribution of pH values across the site and the consequences for remedial activity. Correlation analysis of the observed pH results and log-transformed concentrations for the three COCs was conducted separately for each depth category. For all COCs and depth categories, the calculated correlations were not statistically significant at the 95% confidence level. An evaluation of the depth of contamination for pH and the three COCs was conducted to evaluate whether a remedial focus on the three COCs was likely to address areas across the site with observed high pH values as presented in Table 7-2. For seven of the thirteen stations with pH above 8.5, concentrations of at least one of the COCs exceeded the CBSQG PEC at a depth equal to or greater than that of the highest pH value. For the other six stations with a pH value greater than 8.5, concentrations of the three COCs did not exceed CBSQG PEC or exceedances were observed at a lesser depth (i.e., the pH value exceeding 8.5 was observed at a greater depth than results exceeding TOCs for any of the three COCs) as indicated by the asterisks next to the station IDs in Table 7-2. Additional monitoring and assessment of pH across the site may be warranted to further understand the extent of pH contamination.

Table 7-2 Assessment of Depth of Contamination for Three COCs in Comparison to pH

Station ID	Max Depth Sampled (feet)	Greatest Depth Mercury Exceeds 1.06 ppm (feet)	Max Mercury Result at Station (ppm)	Greatest Depth Total PCBs Exceeds 676 ppb (feet)	Max Total PCB Result at Station (ppb)	Greatest Depth Total PAH Exceeds 22,800 ppb (feet)	Max Total PAH Result at Station (ppb)	Greatest Depth pH Exceeds 8.5 (feet)	Max pH Result at Station
H12*	9	1	1.200	-	95	-	10,470	5	12.50
H13	9	-	0.810	9	1,050	-	20,170	9	12.10
G3*	1	-	0.250	-	280	-	13,970	1	11.80
H11*	5	3	1.100	-	260	-	4,859	5	11.40
H3	5	1	1.200	-	80	1	27,040	1	11.20
I2*	5	-	0.540	-	100	-	11,900	1	11.20
I1	5	3	85.000	3	3,150	-	6,770	3	11.20
I12	5	1	2.100	-	232	3	39,370	1	11.00
K1	11	1	67.000	3	460,000	1	534,600	3	9.50
C12	5	5	1.500	5	21,600	1	25,800	1	8.80
I3*	3	-	0.290	-	95	-	860	3	8.80
J1	5	1	9.500	5	22,500	-	14,440	1	8.60
D3*	1	-	0.025	-	120	-	3,940	1	8.60

* The pH value exceeding 8.5 was observed at a greater depth than results exceeding CBSQGs for any of the three COCs.

7.3 SEDIMENT THICKNESS AND VOLUME

Based on the geostatistical modeling results presented in Section 6.1, the sediment thickness at the site is estimated to range from 0.2 to 18.2 feet. The total sediment volume also was calculated for the Phase I and Phase II study areas within the Trenton Channel project site and was estimated at 275,851 cubic yards (Appendix A details how the volume estimate was calculated).

7.4 RELATIONSHIP OF CONTAMINANTS OF CONCERN CONCENTRATIONS TO SCREENING LEVELS

The Trenton Channel Phase I and Phase II project data included a total of 128 samples collected at 50 stations. Mercury, PAH and PCB analyses were performed for all 128 samples. For each sample, the total PAH concentration was determined by calculating the sum of 17 different individual PAH analytes, and the total PCB concentration was determined by calculating the sum of nine different PCBs (as Aroclors). When an individual PAH or PCB was not detected in that sample, the concentration was assumed to be zero when calculating the sum. If no PAHs or no PCBs were detected for a given sample, the concentration was set to one-half the highest individual analyte reporting limit. For samples for which mercury was not detected, the concentration was set to one-half the reporting limit for that sample. Overall descriptive statistics of the three COCs are presented in Table 7-3.

Table 7-3 Overall Descriptive Statistics of Trenton Channel

COC	Number of Results	Mean	Median	Min	Max	SD	RSD (%)	Non-detects (%)	% Exceeding CBSQG
Mercury (ppm)	128	2.3	0.55	0.025	85	9.7	418	23	31
Total PCBs (ppb)	128	8,434	180	60	460,000	47,427	562	65	27
Total PAHs (ppb)	128	41,104	12,375	84	534,600	82,242	200	5	36

SD – Standard Deviation
RSD – Relative Standard Deviation

The probability of exceeding at least one COC at the associated CBSQG also was calculated based on the geostatistical analysis. Portions of the site have very low probability of exceeding whereas other areas of the site have very high probabilities of exceeding for at least one COC. This information can be used to determine the need for additional sampling. Areas of the site with mid-range probabilities (interval 0.3 - 0.7) may be considered for additional sampling depending on the next steps for the site (Goovaerts, 1999). Figures 7-20 through 7-22 display the probability of exceeding at least one COC at the associated CBSQG based on the geostatistical analysis.

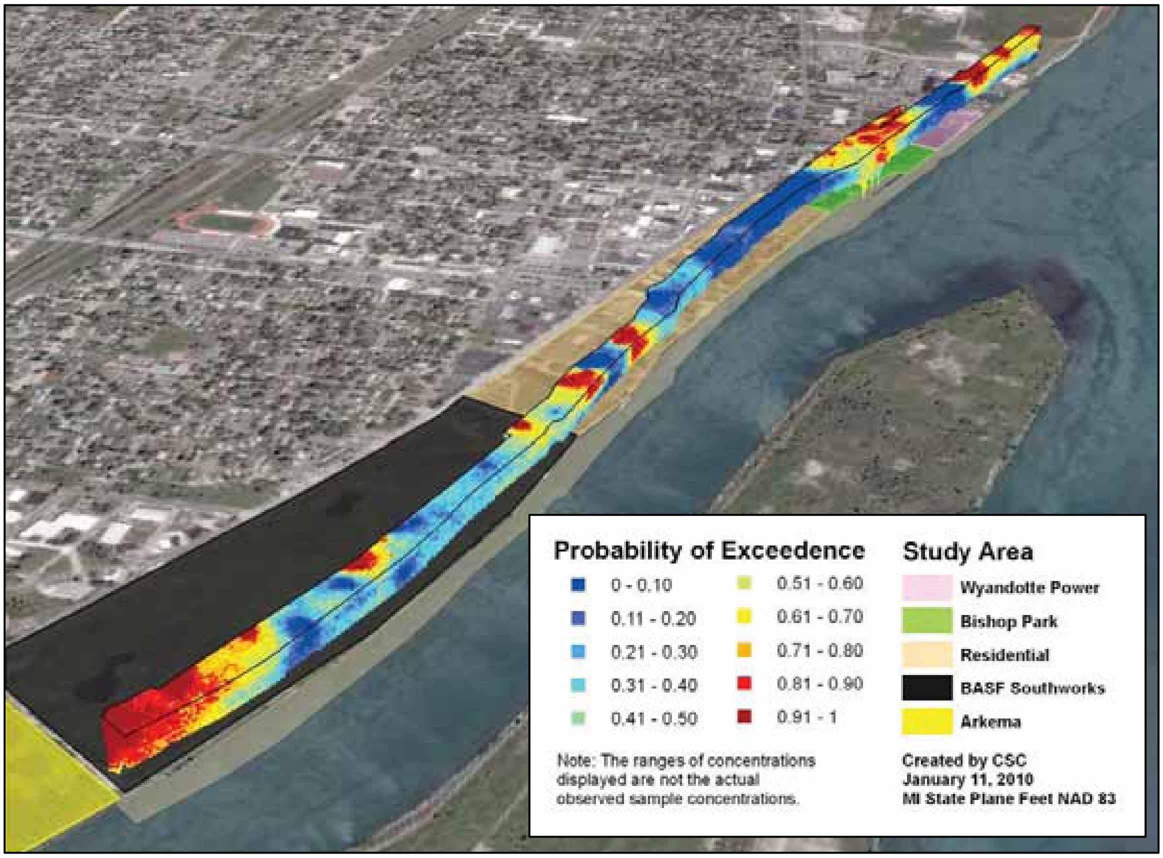

Figure 7-20 Probability of Exceedence at the Trenton Channel Site Based on Geostatistical Modeling, View from Southeast of the Site (exaggerated 25 times in the vertical direction)

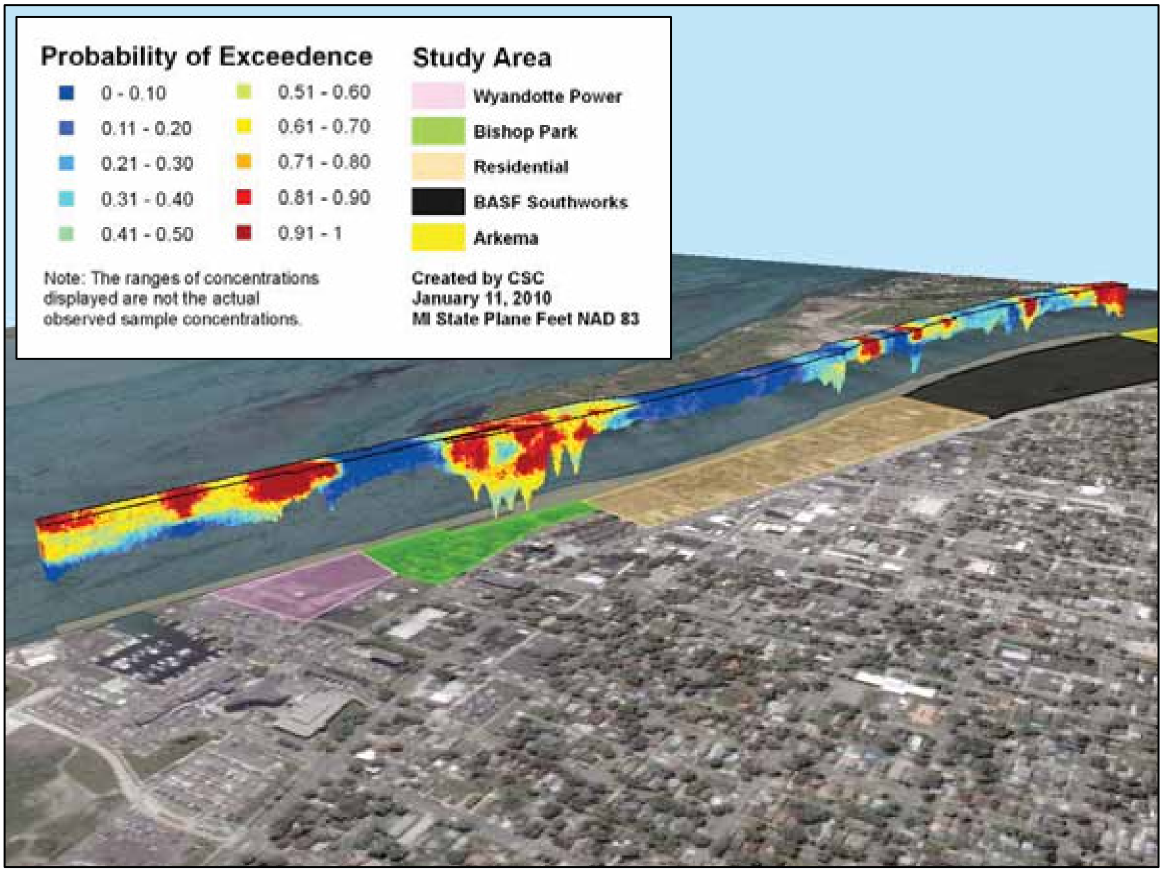

Figure 7-21 Probability of Exceedence at the Trenton Channel Site Based on Geostatistical Modeling, View from Northwest of the Site (exaggerated 25 times in the vertical direction)

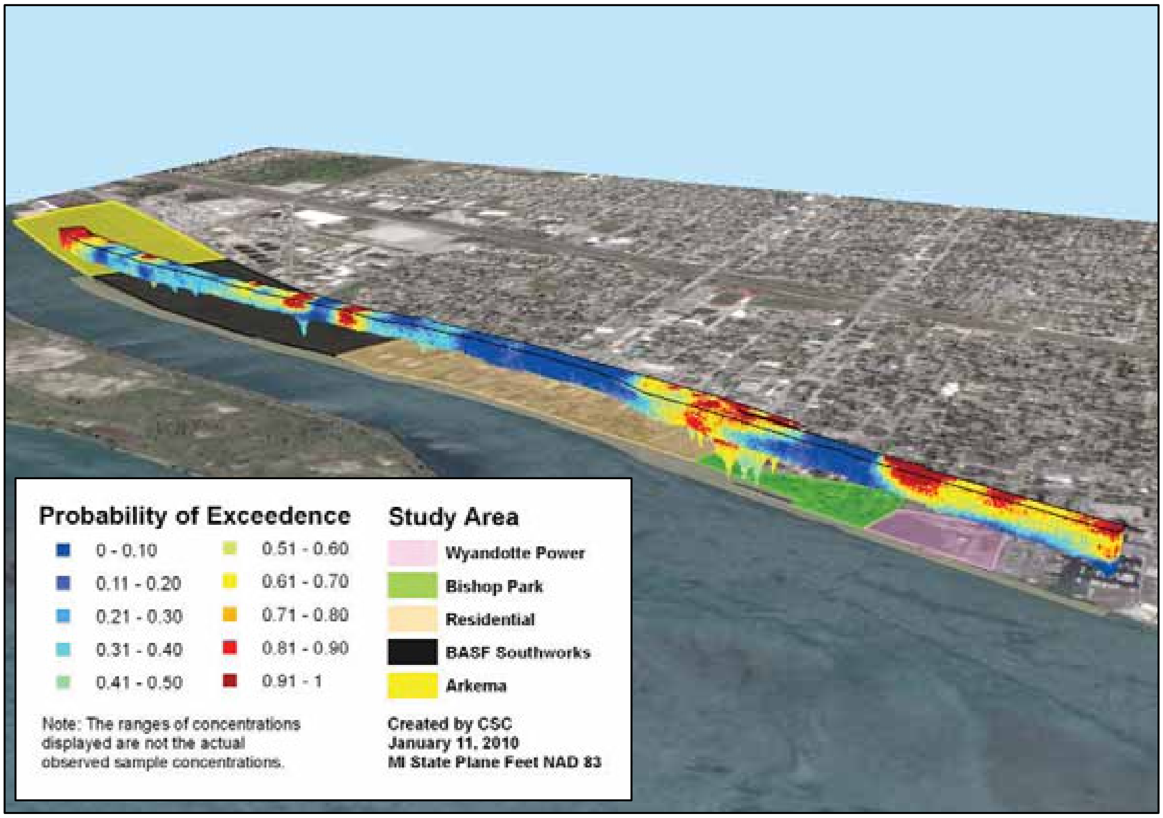

Figure 7-22 Probability of Exceedence at the Trenton Channel Site Based on Geostatistical Modeling, View from Northeast of the Site (exaggerated 25 times in the vertical direction)

8.0 SUMMARY OF SITE RISKS

8.1 ECOLOGICAL AND HUMAN HEALTH

A formal human health risk assessment evaluating potential human exposures to contaminants present in fish tissue, sediment, and surface water in the Trenton Channel Phase I and II study areas has not been completed but may be considered as a subsequent step in the RI. Similarly, a formal ecological health risk assessment evaluating potential benthic, avian, and mammalian exposures to contaminants present in fish tissue, sediment, and surface water also has not been completed but may be a continued step in the RI. EPA GLNPO and MDEQ will evaluate if formal ecological and human health risk assessments should be conducted and assessed prior to the initiation of remedial activities. Because concentrations observed during the remedial investigation exceed the Consensus-based Sediment Quality Guidelines probable effect concentrations in some areas of the site, this suggests the sediment could be a significant risk to the ecological health of the benthic and macroinvertebrate communities and ultimately those fish and wildlife that consume those organisms as well as other potential receptors.

8.2 CONSENSUS-BASED SEDIMENT QUALITY GUIDELINES

The CBSQGs were developed by MacDonald *et al.* in 2000 with the publication of "Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems" in the Archives of Environmental Contamination and Toxicology. These sediment quality guidelines use the effect-level concentrations from several guidelines of similar narrative intent combined through averaging to yield consensus-based lower and upper effect values for contaminants of concern (e.g., MacDonald, D.D., *et al.*, 2000). The consensus-based values have been evaluated for their reliability in predicting toxicity in sediments by using matching sediment chemistry and toxicity data from field studies. The results of the reliability evaluation showed that most of the consensus-based values for individual contaminants provide an accurate basis for predicting the presence or absence of toxicity (MacDonald, D.D., *et al.*, 2000). To predict the toxicity for mixtures of various contaminants in sediments, the concentration of each contaminant is divided by its corresponding probable effect concentration. The

CBSQGs as developed only involve effects to benthic macroinvertebrate species. A large amount of databases from toxicological research have established the cause and effect or correlations of sediment contaminants to benthic organism and benthic community assessment endpoints. The guidelines do not consider the potential for bioaccumulation in aquatic organisms and subsequent food chain transfers and effects to humans or wildlife that consume the upper food chain organisms. For the most part where noncarcinogenic or nonbioaccumulative organic chemicals are involved, the guidelines should be protective of human health and wildlife concerns. Where bioaccumulative compounds such as PCBs and methyl mercury are involved, protection of human health or wildlife-based endpoints could result in more restrictive sediment concentrations than contained in the CBSQGs. Where these bioaccumulative compounds are involved, the CBSQGs need to be used in conjunction with other tools, such as human health and ecological risk assessments, bioaccumulation-based guidelines, bioaccumulation studies, and tissue residue guidelines to evaluate the direct toxicity and upper food chain effects of these compounds (Wisconsin Department of Natural Resources, December 2003).

8.3 EQUILIBRIUM SEDIMENT BENCHMARK TOXIC UNITS FOR PAHS IN SEDIMENT SAMPLES

The Equilibrium Sediment Benchmark Toxic Units (ESBTU) for PAHs in sediment samples from the Trenton Channel project site was calculated. The calculations were based on the EPA reference “Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures” (EPA, November 2003).

The goal of this effort was to assess the toxicity of PAHs in the sediments on the basis of equilibrium partitioning of the contaminants between sediment particles and the interstitial pore water to which benthic organisms living in the contaminated sediments are exposed. The toxic effects of the PAHs on benthic organisms are believed to be the result of narcosis, which is a state of stupor, unconsciousness, or arrested activity. The extent of the narcotic effect differs for each PAH, based in part on its solubility and ability to cross cell membranes. The toxicity is cumulative when the organisms are exposed to mixtures of PAHs in sediments.

The results for sediment samples collected during Phase I and Phase II of the Trenton Channel Remedial Investigation were examined and PAH results were determined to be available for all 128 sediment samples. Results for 17 PAHs were available as part of the broader suite of semivolatile organics and TOC results were available for these 128 sediment samples, as those data are required for the ESB calculations.

The 2003 EPA procedures document provides the data and example calculations needed to derive a single measure of PAH toxicity for a given sediment sample. Ideally, the calculation is based on the concentrations of 34 PAHs in each sediment sample (18 parent PAHs and 16 alkylated PAHs). However, the document also provides a series of uncertainty factors that can be used to estimate the toxicity of all 34 PAHs when analytical data only are available for a subset of the 34 PAHs. The EPA document advises against using the uncertainty factor "when important decisions are to be made based on the ESB," which should be considered when evaluating the calculations described below.

The two subsets of PAHs for which uncertainty factors are available are for 13 PAHs and 23 PAHs, and the uncertainty factors are significantly different for each subset. Although the 2003 procedures document makes frequent references to the subset of 13 PAHs, and occasionally describes it as the non-alkylated PAHs**.** Other documents, including "Evaluating Ecological Risk to Invertebrate Receptors from PAHs in Sediments at Hazardous Waste Sites" (EPA, 2009), state the 13 PAHs are those on EPA's Priority Pollutant List (EPA, 2010). The four additional PAHs are shown at the right side of Table 8-1 and were not used in any of the subsequent calculations.

Table 8-1 List of PAHs Used and Unused in ESBTU Calculations

13 PAHs used in ESBTU Calculations		4 PAHs not used in ESBTU Calculations
Acenaphthene	Chrysene	Benzo[g,h,i]perylene
Acenaphthylene	Fluoranthene	Dibenz[a,h]anthracene
Anthracene	Fluorene	Indeno(1,2,3-c,d)pyrene
Benzo[a]anthracene	Naphthalene	2-Methylnaphthalene
Benzo[a]pyrene	Phenanthrene	
Benzo[b]fluoranthene	Pyrene	
Benzo[k]fluoranthene		

ESBTU Calculations

Based on the examples in the 2003 procedures document, the following steps were performed:

1. Dry-weight sediment concentrations of PAHs were reported in units of µg/kg, so these results were converted to µg/g (the units used in the ESBTU calculation**)** by dividing the result by 1**,**000.
2. The PAH results were converted from µg/g of dry-weight sediment to µg/g organic carbon, by dividing the PAH result by the TOC result in percent, which itself is divided by 100 to express the TOC result as a decimal value (e.g., 1% = 0.01).
3. The data for $C_{OC,PAHi,FCVi}$, the effect concentration of a PAH in sediment, was transcribed from the 2003 document and the PAH results expressed on an organic carbon basis were divided by the ESBTU for each PAH.
4. In cases where the sediment concentration of a PAH exceeds its water solubility, the ESBTU procedure substitutes the maximum solubility for the observed concentration of that PAH. The observed results were compared to the maximum solubilities from the 2003 document, and where appropriate, substitutions were made.
5. The ESBTUs for each PAH were added together to develop the value termed as $ESBTU_{13}$.
6. Because data were not available for all 34 PAHs, the ESBTU values derived from the results for 13 PAHs were multiplied by the uncertainty factor defined in the 2003 document. For the purposes of this site, two factors were used including 1) the 50th percentile uncertainty factor of 2.75 and 2) the 95th percentile uncertainty factor of 11.5. The $ESBTU_{FCV,TOT}$ results were provided using the two uncertainty factors in separate columns for each sample (Table 8-2).

Treatment of Non-Detects

No explicit discussion in the 2003 document was identified regarding the treatment of PAHs that were not detected in a given sample. However, one of the example calculations presented in Table 6-3A of the 2003 document involves a sample where only 13 PAHs were measured and shows the results for one PAH, acenaphthene, as “0.” GLNPO requested the ESBTU calculations be performed in two ways: substituting zero for any non-detects, and substituting one-half the sample-specific quantitation limit for any non-detects. Both of these substitutions are fairly common. The data set included the SSQL values for every PAH in every sample.

Evaluation of Toxicity

Although the acute and chronic toxic effects of PAHs vary by species, the 2003 procedures document states that any sediment sample with an $ESBTU_{FCV,TOT}$ greater than 1.0 may not be protective of benthic organisms. The frequencies at which samples from the site exceeded the 1.0 threshold were examined, using both substitution schemes for the non-detects, and using both of the uncertainty factors (50% and 95%). The results are summarized in the Table 8-2 and Appendix G provides the individual results for all 128 samples.

Table 8-2 Results for Evaluation of Toxicity using ESBTU Calculations

Samples Exceeding Threshold	Substituting ½ SSQL for Non-detects			Substituting Zero for Non-detects		
	$ESBTU_{13}$	$ESBTU_{tot}$ using Upper 50% Limit	$ESBTU_{tot}$ using Upper 95% Limit	$ESBTU_{13}$	$ESBTU_{tot}$ using Upper 50% Limit	$ESBTU_{tot}$ using Upper 95% Limit
Number of samples exceeding 1.0	41	78	123	31	59	99
Percent of samples exceeding 1.0	32.03%	60.94%	96.09%	24.22%	46.09%	77.34%

Using the 95% uncertainty factor of 11.5, between 99 and 123 of the 128 samples exceeded the 1.0 threshold, compared to 59 to 78 of the samples when the 50% uncertainty factor is used. Even without the use of the uncertainty factors, 24% to 32% of the samples exceeded the 1.0 threshold and may be toxic to benthic organisms.

8.4 LIMITED CONCEPTUAL SITE MODEL

A conceptual site model is a representation of the environmental system and the physical, chemical, and biological processes that determine the transport of contaminants from sources to receptors. For sediment sites, the conceptual site model can be an important element for evaluating risk and risk reduction approaches. EPA GLNPO and MDEQ will determine whether the development of one or more conceptual site models that highlight different aspects of the site is warranted. EPA GLNPO and MDEQ will consider developing a conceptual site model to assess:

1. sources, release, and media,
2. human health receptors, and

3. ecological health receptors.

In addition, it may be necessary to develop separate models for contaminants or groups of contaminants driving risks if these contaminants behave differently in the environment (e.g., PCBs versus metals) (EPA, December 2005).

Contaminants in sediment have direct exposure to the benthic community and indirect exposure to the biota that consume them. Some contaminants at the site, including mercury, are known to bioaccumulate in the food chain and could pose risk to fish and birds that prey on benthic macroinvertebrates or predators that consume them. Contaminated sediments also can pose risk to humans that have direct contact with associated water bodies. These issues and other factors may be assessed for further development of a conceptual site model specific to the Trenton Channel site if deemed necessary by EPA GLNPO and MDEQ.

9.0 PROPOSED REMEDIAL ACTION OBJECTIVE

9.1 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND PRELIMINARY REMEDIATION GOALS

9.1.1 Remedial Action Objectives

The remedial action objectives for the Trenton Channel project site will provide a general description of the expected accomplishments of the remedial activities and will focus the development of the remedial activities. The information presented in this report will be considered during development of the remedial action objectives as well as the ecological risks, human health risks, and contaminant transport mechanisms. Specific remedial action objectives may be developed separately for different areas of the site based on exposure pathways and receptors. Remedial options for the contaminated sediments of the project site will be designed to address adverse human health and ecological impacts at the site and to aid in eventual delisting of the site as an Area of Concern. The remedial action objectives will also consider net environmental effects, including health, safety and welfare, natural recovery rates, engineering feasibility, costs, and compliance with applicable laws and regulations. All considerations will be evaluated prior to establishing the remedial action objectives (EPA, December 2005).

9.1.2 Preliminary Remediation Goals

Preliminary remediation goals protective of human and environmental health and aimed towards contributing to the delisting of BUIs will be developed. The analytical results from the Trenton Channel Phase I and Phase II studies will be evaluated and the necessity for collection and analysis of additional samples and analytes will be determined. With an improved understanding of site conditions due to evaluation of the analytical results, area-specific remediation goals will be developed. The preliminary remediation goals will consider both human and ecological risks and will be selected to achieve concentrations in sediment that will result in appropriate reductions in risks (EPA, December 2005).

9.2 ESTIMATION OF REMEDIAL AREA AND SEDIMENT VOLUMES

In support of the sediment investigation, geostatistical analysis of the sediment data generated in the Phase I and Phase II studies was conducted to further detail site conditions for the Trenton Channel site. The analyses produced estimates of the vertical and horizontal extent of mercury, total PAH, and total PCB concentrations in sediments across the site as illustrated through the three-dimensional maps presented in Section 7.2.

This section presents the results of the geostatistical analysis of Phase I and II Trenton Channel sediment data. A summary of the technical approach used for this analysis is also provided in Appendix A. The geostatistical models also were used to estimate volumes of contaminated sediments where COC concentrations exceeded specific criteria of interest for the site.

9.2.1 Remedial Area and Sediment Volume Estimates

To estimate the volume of sediment that could potentially be of concern, CBSQG PECs, which are not remediation or cleanup goals, were compared to concentrations found in the sediment. Both the area and volume estimates were calculated when mercury, total PAH, or total PCB concentrations exceeded the CBSQGs at any point in the sediment depth. The volume estimates include the volume of less contaminated sediment that would be removed to reach more contaminated sediment. These following CBSQGs were used as comparison points:

- Mercury ≥ 1.06 ppm or
- Total PAH ≥ 22,800 ppb or
- Total PCB ≥ 676 ppb.

The sediment volume estimates range from 163,446 to 190,065 cubic yards to remove sediments where contaminant concentrations of COCs exceeded the CBSQGs, as detailed in Table 9-1. Mean estimates of the mass of contaminant removed for each COC and remedial scenario also are included in Table 9-1. Total mass (mean) for mercury, total PAH, and total PCB concentrations across the Trenton Channel site is 2,148 pounds, 32,933 pounds, and 5,576 pounds, respectively. It should be noted that sediment volumes might be higher depending on core compaction.

Table 9-1 Volume Estimates and Mass of Contaminant for the Sediment Exceeding the CBSQGs per the Project Criteria

Trenton Channel		Estimates when sediment exceeds criteria		
		Mean	Min	Max
Mercury ≥ 1.06 ppm or Total PAH ≥ 22,800 ppb or Total PCB ≥ 676 ppb	Area (square feet)	1,034,077	923,522	1,102,178
	Volume (cubic yards)	176,821	163,446	190,065
	Mercury mass removed (pounds)	2,092 (97%)	1,418	3,029
	Total PAH mass removed (pounds)	31,858 (97%)	27,056	38,447
	Total PCB mass removed (pounds)	5,540 (99%)	2,414	10,686

Percent of total mass removed provided in parentheses.

Table 9-2 displays the sediment area, volume, and mass estimates for each COC when contamination occurred in the sediment column. Figure 9-1 displays the sediment depth to dredge if one of the COCs exceeds the CBSQGs.

Table 9-2 Volume Estimates and Mass of Contaminant for the Sediment Exceeding the CBSQGs per COC

Trenton Channel		Estimates when sediment exceeds criteria		
		Mean	Min	Max
Mercury ≥ 1.06 ppm	Area (square feet)	828,209	758,262	885,731
	Volume (cubic yards)	136,503	121,593	147,092
	Mercury mass removed (pounds)	2,039 (95%)	1,361	2,978
Total PAH ≥ 22.8 ppm	Area (square feet)	913,960	815,648	981,607
	Volume (cubic yards)	153,097	141,678	165,038
	Total PAH mass removed (pounds)	31,394 (96%)	26,558	38,105
Total PCB ≥ 0.676 ppm	Area (square feet)	693,526	629,893	753,463
	Volume (cubic yards)	112,073	101,389	121,600
	Total PCB mass removed (pounds)	5,508 (99%)	2,375	10,657

Percent of total mass removed provided in parentheses.

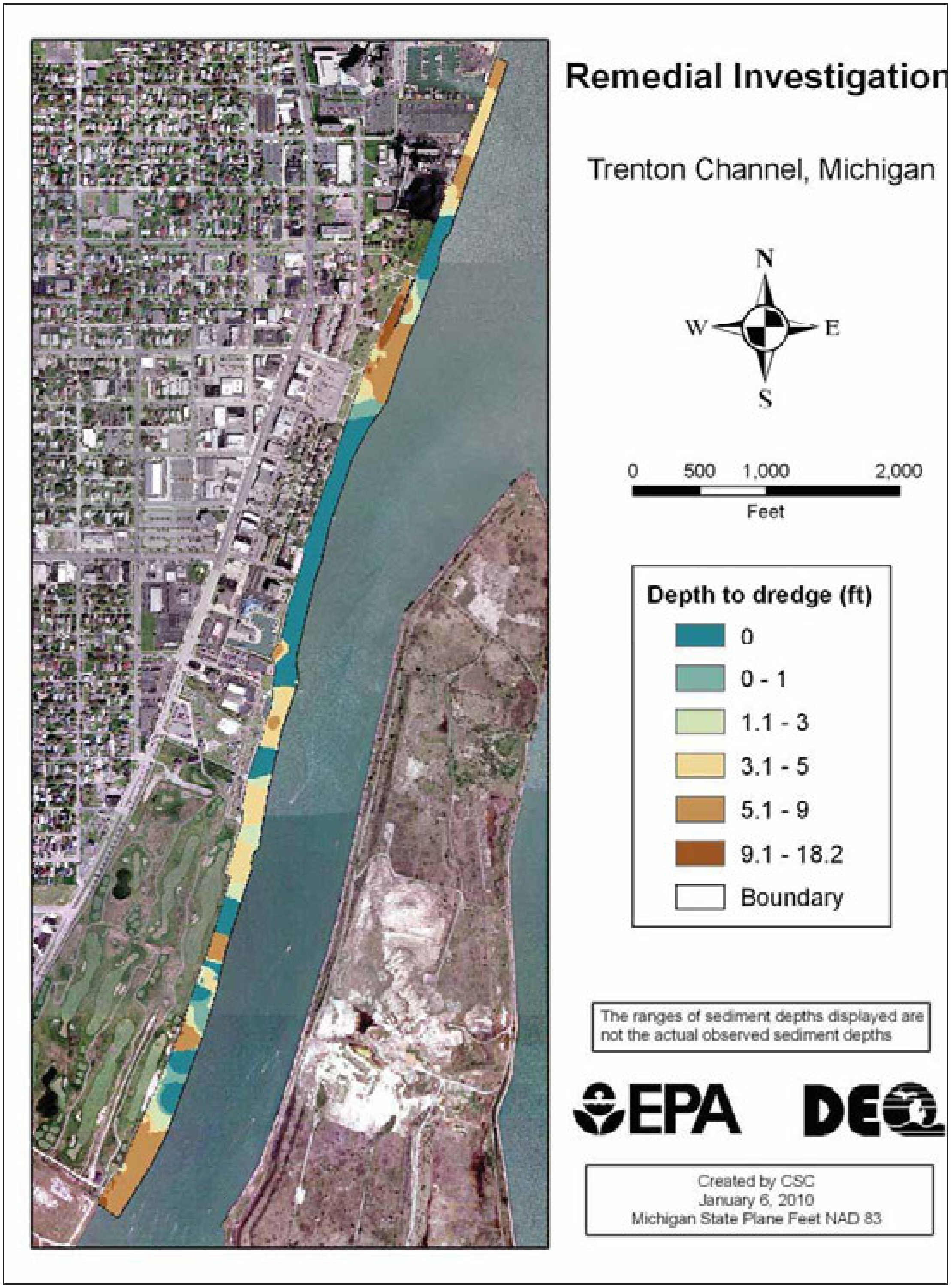

Figure 9-1 Sediment Depth to Dredge Where COCs in Sediments Exceed the Consensus-based Sediment Quality Guidelines Based on Geostatistical Modeling

9.2.2 Uncertainty Analysis

Uncertainty in models usually results from the necessity for models to use equations that are simplifications and approximations of complex processes, which can result in uncertainty in just how well the equations represent the actual processes. Uncertainty in models also exists due to uncertainty about how well the input data represent actual conditions (EPA, December 2005). The level of uncertainty with the geostatistical modeling of Phase I and Phase II Trenton Channel sediment data is presented in the technical approach provided in Appendix A through the assessment of false positive and false negative rates. Uncertainty also is addressed in the analysis conducted to estimate the probability that contaminant concentrations across the site exceed CBSQGs detailed in Section 7.4. Areas of the site with mid-range probabilities (interval 0.3 - 0.7) may be considered for additional sampling depending on the next steps for the site.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 SUMMARY

Sediment sampling activities at the Trenton Channel project site began in mid June 2006 and continued through July 2007. A full suite of chemical classes were analyzed over the course of both project phases including semi-volatile organic compounds, metals, polychlorinated biphenyls, simultaneously extracted metals-acid volatile sulfide, toxic characteristic leaching procedure for volatile organic compounds and metals, extractable petroleum hydrocarbons, and oil and grease. Additional sediment parameters include total organic carbon, grain size, density, moisture content, Atterberg limits, and pH (Phase I only) and toxicity data in sediments. The three contaminants of concern specific to this project included mercury, total polycyclic aromatic hydrocarbons, and total polychlorinated biphenyls.

The results of the analytical testing indicate the presence of a wide range of contaminants within the sediments. Some areas of the site exceeded the contaminant levels provided in the Consensus-based Sediment Quality Guidelines for several contaminants. Other areas of the site were well below the contaminant levels provided in the Consensus-based Sediment Quality Guidelines for several contaminants. Overall, 31%, 36%, and 27% of samples for mercury, total polycyclic aromatic hydrocarbons, and total polychlorinated biphenyls, respectively, exceeded the Consensus-based Sediment Quality Guidelines.

The results of the analytical testing also indicate the majority of the sediment samples collected within Transects D through F contain contaminants well below the Consensus-based Sediment Quality Guidelines, as the median concentrations for mercury, total PAHs, and total PCBs are approximately 5-10 times below the corresponding CBSQG.

Based on the statistical sampling design and supported through the geostatistical models, additional work by EPA GLNPO and MDEQ may be deemed necessary to further assess the site conditions and determine the next course of action.

10.2 NEXT STEPS

The project team will evaluate if the collection and analyses of additional data is necessary in order to fully understand the nature and extent of contamination across the project site. Formal human health and ecological health risk assessments may be conducted if deemed necessary to evaluate potential human, benthic, avian, and mammalian exposures to contaminants present in media within the project site.

10.3 DATA NEEDS

Evaluations of the collected sediment vibracore and probe depth data (see Section 6.1 Sediment Depth and Section 7.3 Sediment Thickness and Volume) illustrated high variability in these measurements even though sampling locations were within close range of each other. This high variability could be a result from differences in these sampling methods, sampling techniques, sampling team members, etc. Regardless, establishing more concrete sediment depth data would enhance the development of remedial action objectives and preliminary remedial goals and refine sediment volume and contaminant mass estimates. For areas of the site where probe data is deeper than core data (Figure 6-2), additional sampling may be desired to better define the contaminant concentrations at the depth that exceeds the collected cores.

As detailed in Section 6.5 Sediment Toxicity, surface sediment toxicity was assessed in four samples collected during Phase I sampling efforts and four samples collected during Phase II sampling efforts. Although the results were helpful in reviewing levels of toxicity in surface sediments, eight samples does not typically provide enough representation to make definitive statements. In addition, the number of organisms analyzed could also be increased. However, more detailed analyses of previously conducted toxicity testing and associated results along this section of the Trenton Channel may negate the need for additional surface sediment toxicity analyses.

The project team will evaluate if the collection and analyses of additional data is necessary after reviewing all project data and taking into consideration the next steps.

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APPENDIX A – TECHNICAL APPROACH FOR GEOSTATISTICAL MODELING AND ESTIMATION OF SEDIMENT VOLUMES

The technical approach developed for the three-dimensional (3D) geostatistical models and kriged concentration maps is described in this section. This technical description is written to an audience with expertise in geostatistical modeling. The estimation of contaminated sediment volumes was based on the following CBSQG for mercury concentration of 1.06 ppm, total PAH concentration of 22,800 ppb, and total Aroclor concentration of 676 ppb.

The analysis was conducted using a combination of three software that are all compatible in terms of data file format:

1. Space-time Information System (STIS) that is commercialized by TerraSeer (www.terraseer.com/products_stis.php) and offers two-dimensional (2D) geostatistical methods,
2. Modified kriging and simulation codes of the Geostatistical Software Library (GSLIB) described in Deutsch CV, Journal AG. *GSLIB: Geostatistical Software Library and Use's Guide*, 2nd edition, Oxford University Press 1998, and
3. Stanford Geostatistical Modeling Software (SGeMS), described in Remy N, Boucher Al, Wu J. *Applied Geostatistics with SGeMS: A User's Guide*. Cambridge University Press 2009.

The last two software were developed at Stanford University and are public-domain. The SGeMS software is available for free download (http://sgems.sourceforge.net/), while GSLIB programs can be downloaded from http://pangea.stanford.edu/ERE/research/scrf/software/.

The 3D modeling of the spatial distribution of the three COC (mercury [Hg], total PAH and total Aroclor) concentrations at the Trenton Channel site involved the following steps:

1. A 10-foot spacing grid (13,804 nodes) was overlaid over a 31.7-acre zone bordered by the location of samples.

2. The sediment depth was interpolated at each node of the 2D grid using ordinary kriging and a dataset including 50 core data (data = end depth value for the deepest sample of each core) and 77 probe samples.

   Ordinary kriging is a spatial interpolation technique that estimates depth at each grid node as a linear combination of the closest 64 depth data. The weight assigned to each observation depends on the distance between observations and the grid node, plus the spatial autocorrelation of the data as modeled using the variogram. The experimental variogram of 127 depth data was fitted with an exponential model that has no nugget effect and a longer range of autocorrelation (138 feet versus 90 feet) in the direction of azimuth 75 degrees which is parallel to the shoreline. Cross-validation (i.e., one depth sample is removed at a time and its value is estimated from remaining data, "leave-one-out" approach) indicated a good correlation (0.60) between observed and estimated depth values (Figure A-1), despite the fact that the nature of the data (i.e., core versus probe) was ignored in the analysis. The scatterplot of Figure A-1 demonstrates the lack of bias in the estimation (i.e., the means of observed and estimated depths are very close) although, as expected, large depth values tend to be underestimated while small values are overestimated.

   The sediment depth map displayed in Figure 6-2 of the report was used to create a 3D grid (155,792 nodes) with 10-foot spacing in the lateral direction and 0.5-foot resolution along the vertical direction. In doing so and in agreement with most modeling studies of contaminated sediments, it was decided not to propagate the uncertainty attached to sediment depth throughout the subsequent analysis. Figure A-2 indicates that 90% of the sediments are located within five feet of the surface, which means that estimation errors for large depth values should have a small impact on the computation of the total volume of contaminated sediments. This graph also suggests that the vertical distribution of samples (only 15 samples out of 128 were taken at depths greater than five feet) is appropriate for this site. If further resolution of the interpolation grid is needed then sensitivity analyses could be conducted.

Note: For areas of the site where probe data is deeper than core data (Figure 6-2), additional sampling may be desired to better define the contaminant concentrations at the depth that exceeds the collected cores.

3. The geostatistical analysis of each of the three COCs was conducted on 128 samples collected for 50 cores. To attenuate the impact of extreme values in the analysis (in particular for the estimation of experimental variograms), the COC concentrations were first transformed into a set of normally distributed values with a zero mean and unit variance. The method, known as "normal-score transform," is implemented into all three aforementioned software and is described in details in Goovaerts (1997, pages 266-271). Since this algorithm requires all data to be ordered from the smallest to the largest, same-valued observations (e.g., data below the detection limit) were ordered according to the mean of the eight closest neighbors.

   The decision to conduct a normal-transform of the data was guided by the following considerations: 1) multiGaussian kriging used in Step 4 requires the distribution of the data to be normal, 2) other types of transform, such as log-transform or Box-Cox transformation, typically reduce the asymmetry of the sample histogram, yet fail to guarantee that the sample distribution is perfectly Gaussian after transform, and 3) a cross-validation study was performed in Step 5 to ensure that the transform does not create any bias in the estimation results.

4. A 3D variogram was computed for the normal scores of each COC and a model was fitted using weighted least-square regression. Over the range of distances considered for the interpolation in Step 5 (i.e., 1,500 feet), there was no evidence of anisotropic (direction-dependent) variability in the horizontal plane; hence only two variograms (lateral and vertical) were computed for each COC (Figure A-3). Each variogram is bounded in that it reaches a sill for a given distance, known as the range of autocorrelation. The existence of a sill indicates the lack of spatial trend in the data for a distance up to 1,500 feet, which does not contradict the fact that a large-scale trend was detected for mercury in Section 7.2.3.2 when moving from Transect F to Transect S. Indeed the shortest distance between samples from these two transects is

4,250 feet, so well beyond the distance used in the computation of the variograms and the selection of neighbors for kriging.

The Hg model includes a 1% nugget effect, a spherical model with a vertical range of 6.91 feet, and two spherical models with lateral ranges of 182 and 1,201 feet. The total PAH model includes a 5% nugget effect, a spherical model with a vertical range of 6.14 feet, and two spherical models with lateral ranges of 327 and 1,034 feet. The total Aroclor model includes a 5% nugget effect, a spherical model with a vertical range of 5.70 feet, and two spherical models with lateral ranges of 200 and 1,342 feet. For each COC, the vertical range and the two lateral ranges define the axis of an ellipsoid that models the anisotropic variability of pollutant concentrations in a 3D space (geometric anisotropy). In doing so, we make the implicit assumption that the dip and plunge angles (Deutsch and Journel, 1998, page 28) are zero, which seems reasonable for depositional environments. Furthermore, the number of data does not suffice for a complex modeling of the directions of anisotropy. For all COCs, an additional structure was included to account for the larger sill of the lateral variogram (zonal anisotropy, Goovaerts, 1997, pages 93-95).

5. COC concentrations were estimated for 155,792 blocks of 50 cubic feet (10×10×0.5) or 1.852 cubic yards centered on each node of the 3D grid using multiGaussian block kriging (i.e., kriging of normal score-transformed data; Goovaerts, 1997). The closest 12 normal score data within a radius of 1,500 feet were used in the estimation; to reduce the screening effect a maximum of two samples per core was retained. Cross-validation (i.e., one core is removed at a time and all its samples are estimated from remaining cores) indicated a moderate correlation between observed and estimated normal score values (0.47 for Hg, 0.36 for total PAH, and 0.53 for total Aroclor). The magnitude of the correlation is smaller than what has been observed for the same COCs on other sites (e.g., 0.70 for Hg and total PAH at Division Street Outfall site in Muskegon, Michigan). The culprit is the elongated shape of the Trenton Channel site which reduces the number of neighboring samples available for estimates: only samples located North and South of the removed core are available, instead of samples located in all directions for more spatially compact sites. For visualization purposes, each COC was estimated using the p-quantile (e.g., median corresponds to

p=0.50) that ensures that the percentages of false positives (FP) and false negatives computed during the cross-validation are the same: Hg: p=0.63 (FP=18.0%), total PAH p=0.59 (FP=12.5%), and total Aroclor p=0.62 (FP=12.5%).

6. COC concentrations were simulated over the same 3D grid of 155,792 nodes using p-field simulation with conditional probability fields (Goovaerts, 2002). P-field simulation proceeds in two steps:

   - The probability distribution of the average block concentration of each COC is modeled for each of the 155,792 blocks. By theory, the multiGaussian kriging estimate and standard deviation, z_{MG} and s_{MG}, correspond to the mean and standard deviation of the probability distribution of the COC that is Gaussian within the framework of multiGaussian kriging (Goovaerts, 1997, pages 265-266).
   - The set of probability distributions is sampled by a set of spatially autocorrelated probability values, known as p-field. In practice, because the probability distributions are Gaussian the simulated COC concentrations are computed as: $z_{MG} + y^{(l)} s_{MG}$, where $y^{(l)}$ is a normal score value generated by sequential Gaussian simulation (Goovaerts, 1997, pages 380-393).

   Fifty simulation models were generated by creating fifty sets of normal score values, that is only Step 2 is repeated. To attenuate fluctuations between simulation models, the sequential Gaussian simulation algorithm was adapted in the following manner: 1) the random visit of simulation grid nodes was replaced by a path that visits first the nodes with the smallest uncertainty as quantified by the multiGaussian kriging variance (in other words, the first nodes to be simulated are the ones in the vicinity of the observations), and 2) the set of simulated normal scores was conditioned to the observations (sampled normal scores = 0; Goovaerts, 2002) instead of being generated by non-conditional simulation (in other words, one tends to sample the center of the probability distribution around the sampled locations). This modified version of p-field simulation was accomplished using modified GSLIB codes.

7. The probability p_{COC} that the critical threshold (CBSQG) is exceeded by a COC for a given block is simply computed by counting the proportion of 50 simulated block

concentrations that exceeds this threshold. Because the COC concentrations are weakly correlated, the probability that at least one of the COC exceeds its CBSQG was computed as $1 – (1-p_{Hg}) \times (1-p_{TPAH}) \times (1-p_{Aroclor})$.

8. For each COC, the maximum depth at which a simulated concentration is greater or equal to its CBSQG was computed for each node of the 2D grid and multiplied by the pixel size (100 square feet) to derive the volume of sediments to be dredged. The operation was repeated for each of the 50 simulation models to account for the uncertainty in the spatial distribution of COC concentrations, resulting in a histogram of 50 volume estimates (Figure A-4). These histograms allow one to identify extreme scenarios (i.e., minimum and maximum volumes that could be encountered given the uncertainty attached to the model). These minimum and maximum volume estimates are reported in Table 9-1 of the report, along with the mean of the set of 50 estimates. Below each histogram in Figure A-4, there is the corresponding boxplot and a black dot that represents the volume estimated from the average of 50 simulation models (i.e., analogous to a kriging model). These graphs highlight the risk of overestimating the total volume of contaminated sediments when the computation is based on smoothed concentration estimates, such as the ones provided by kriging or inverse distance methods, instead of simulated concentrations. This overestimation is caused by the positive skewness of the histograms of 128 sampled concentrations.

9. Besides estimating the volume of sediment to be dredged for each COC considered separately (Table 9-1), the volume associated with the joint remediation of all three COCs was also computed: a block is contaminated if at least one COC exceeds its CBSQG. Results are reported in Table 9-2.

References for Technical Approach for Geostatistical Modeling and Estimation of Sediment Volumes

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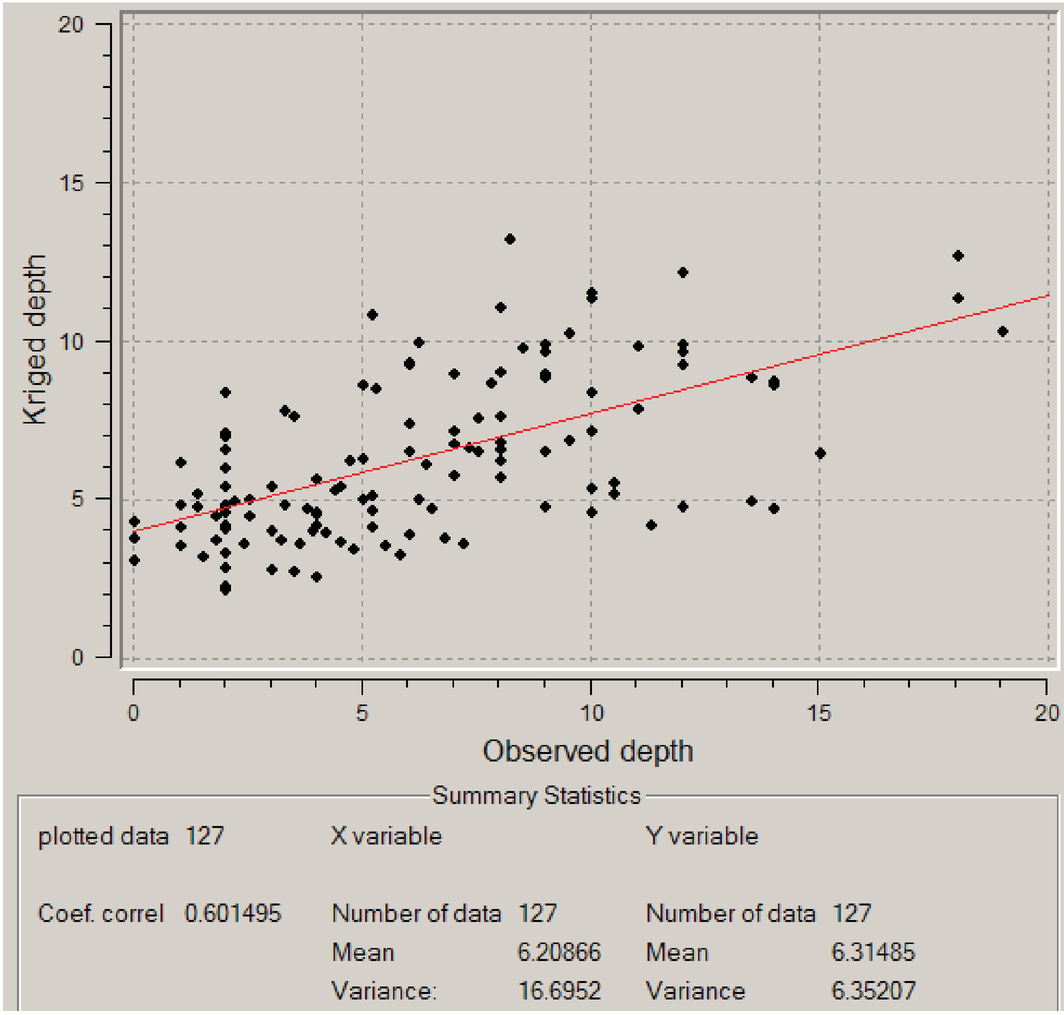

Figure A-1 Scatterplots of observed versus estimated depths values computed using ordinary kriging and a cross-validation (leave-one-out) approach

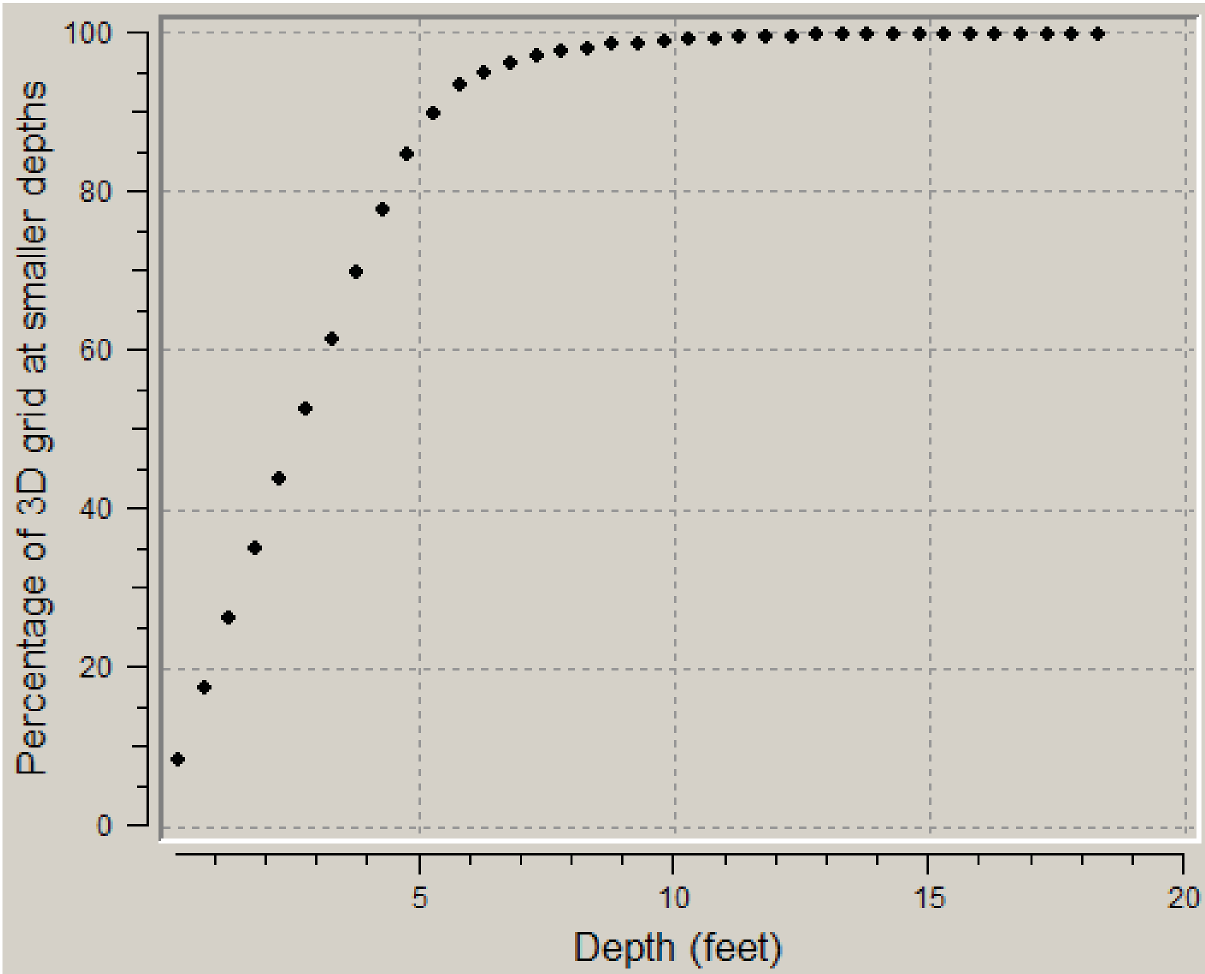

Figure A-2 Cumulative percentage of nodes of the 3D modeling grid as a function of the depth of the bottom layer. Less than 10% of the total volume of sediments is found deeper than 5 feet

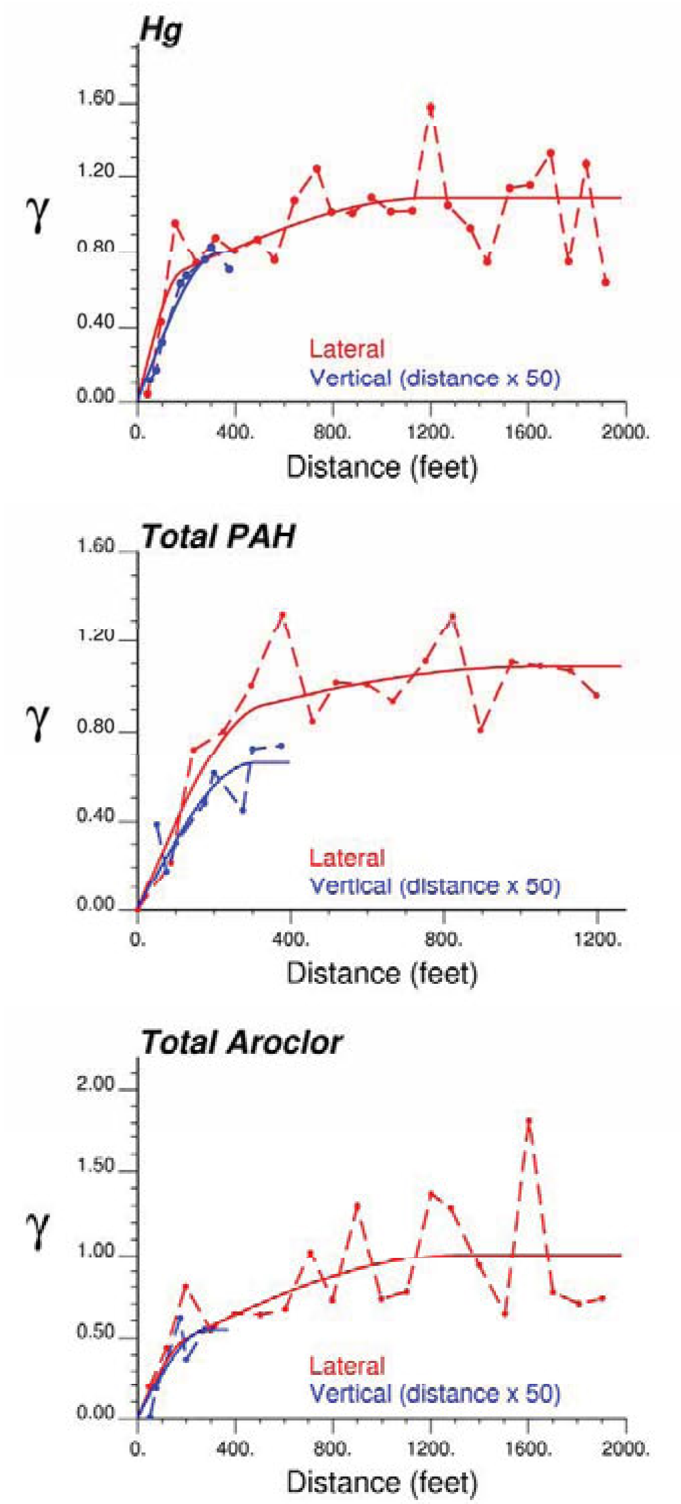

Figure A-3 Experimental variograms for all three COCs, with the 3D model fitted

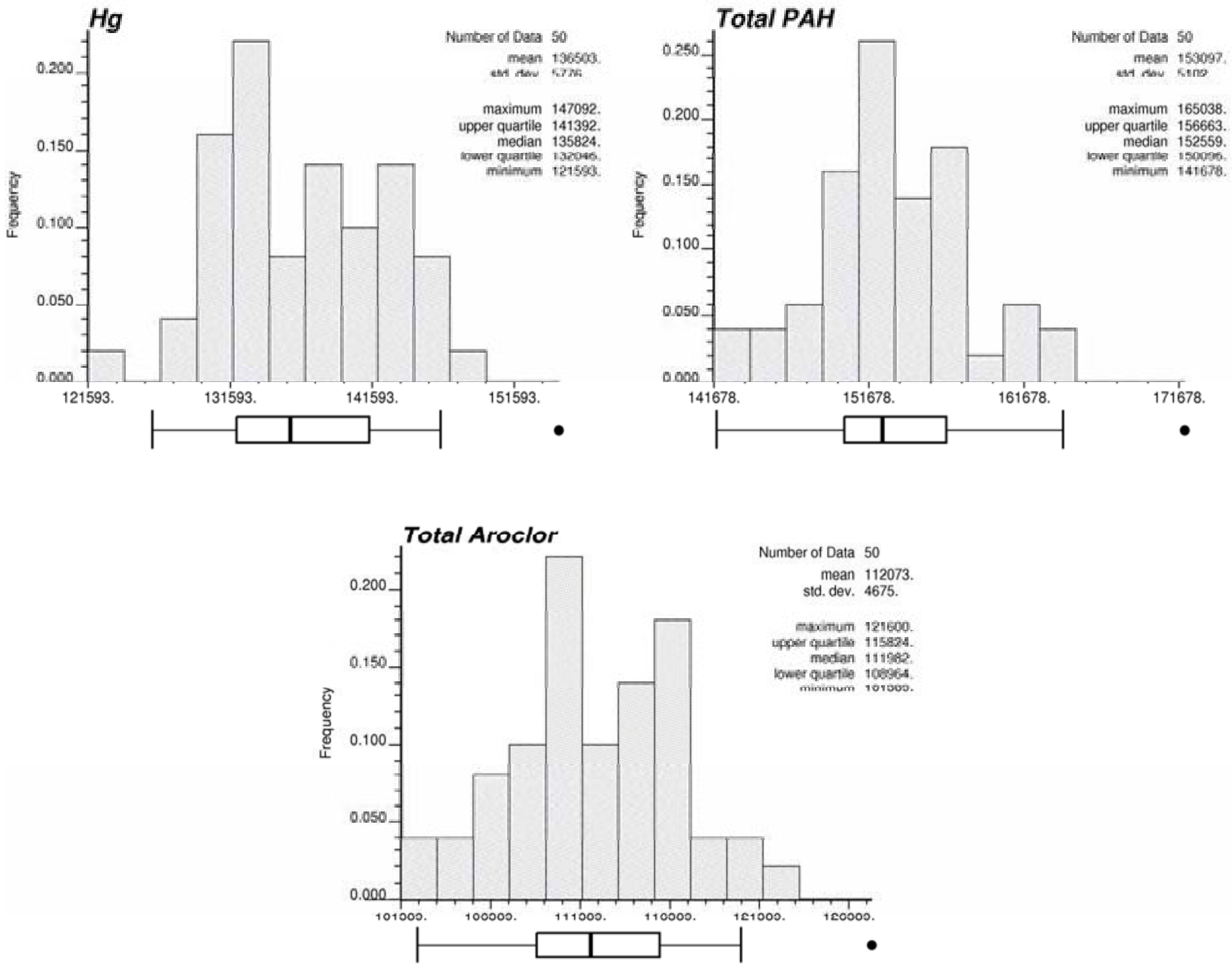

Figure A-4 Histograms of volumes of sediments to be dredged according to each of the 50 simulation models. For each COC, dredging aims to remove any contaminated block (10×10×0.5 ft). The black dot in the box plot below each histogram is the volume estimate obtained from the average of 50 simulation models. Five vertical lines are the 0.025 quantile, lower quartile, median, upper quartile, and 0.975 quantile of the distribution.

APPENDIX B – DESCRIPTIVE STATISTICS OF PAH RESULTS

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
2-Methylnaphthalene	0-1	50	1,616	330	2,236	138	89	10,500	52
	1-3	39	1,608	440	1,929	120	150	7,000	56
	3-5	24	1,871	500	3,546	190	79	17,000	46
	5-7	8	1,164	845	1,108	95	130	3,300	13
	7-9	5	1,520	1,000	1,599	105	320	4,200	20
	9-11	2	900	900	849	94	300	1,500	50
	All	128	1,618	445	2,346	145	79	17,000	48
Acenaphthene	0-1	50	870	215	1,314	151	60	7,500	64
	1-3	39	897	220	1,314	147	60	7,200	69
	3-5	24	724	160	1,376	190	54	6,500	63
	5-7	8	819	265	913	111	60	2,000	88
	7-9	5	1,087	205	1,338	123	80	3,000	80
	9-11	2	260	260	198	76	120	400	50
	All	128	846	200	1,280	151	54	7,500	67
Acenaphthylene	0-1	50	839	195	1,322	158	60	7,500	72
	1-3	39	675	170	763	113	60	2,100	74
	3-5	24	720	162.5	1,373	191	60	6,500	67
	5-7	8	818	260	914	112	60	2,000	88
	7-9	5	832	180	957	115	80	2,000	80
	9-11	2	355	355	332	94	120	590	50
	All	128	757	185	1,129	149	60	7,500	73
Anthracene	0-1	50	1,755	860	2,680	153	60	14,000	42
	1-3	39	1,941	710	2,838	146	60	11,000	31
	3-5	24	2,462	575	5,969	242	60	29,000	33
	5-7	8	1,856	875	2,229	120	94	6,400	13
	7-9	5	2,286	860	2,624	115	150	6,000	20
	9-11	2	1,760	1,760	2,319	132	120	3,400	50
	All	128	1,971	835	3,498	177	60	29,000	34
Benzo[a]anthracene	0-1	50	4,371	1,350	11,350	260	54	75,000	22
	1-3	39	3,120	1,100	4,558	146	60	19,000	26
	3-5	24	4,026	835	8,605	214	60	39,000	29
	5-7	8	2,201	1,095	2,383	108	140	6,500	0
	7-9	5	2,840	1,600	3,076	108	150	7,300	20
	9-11	2	1,910	1,910	2531	133	120	3,700	50
	All	128	3,691	1,300	8,397	227	54	75,000	23

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Benzo[a]pyrene	0-1	50	6,254	1,700	21,329	341	120	150,000	46
	1-3	39	4,436	2,500	7,883	178	120	37,500	46
	3-5	24	4,704	1,140	9,715	207	125	35,500	50
	5-7	8	6,538	1,815	13,815	211	120	40,500	38
	7-9	5	2,389	1,000	2,653	111	305	6,400	20
	9-11	2	1,720	1,720	2,093	122	240	3,200	50
	All	128	5,205	1,650	14,942	287	120	150,000	45
Benzo[b]fluoranthene	0-1	50	6,519	2,250	21,386	328	120	150,000	46
	1-3	39	4,667	2,600	7,977	171	120	37,500	44
	3-5	24	4,264	1,250	8,322	195	125	35,500	50
	5-7	8	6,494	1,180	13,838	213	120	40,500	25
	7-9	5	2,577	1,400	2,982	116	305	7,500	20
	9-11	2	1,920	1,920	2,376	124	240	3,600	50
	All	128	5,304	1,650	14,846	280	120	150,000	44
Benzo[g,h,i]perylene	0-1	50	5,246	1,300	21,176	404	120	150,000	70
	1-3	39	3,407	950	7,611	223	120	37,500	74
	3-5	24	3,487	780	7,514	215	125	35,500	71
	5-7	8	6,293	1,000	13,903	221	120	40,500	88
	7-9	5	1,717	415	1,952	114	165	4,000	80
	9-11	2	1,945	1,945	2,411	124	240	3,650	100
	All	128	4,232	945	14,584	345	120	150,000	73
Benzo[k]fluoranthene	0-1	50	5,282	950	21,189	401	120	150,000	68
	1-3	39	3,345	1,400	7,589	227	120	37,500	69
	3-5	24	3,461	430	7,502	217	120	35,500	75
	5-7	8	6,268	900	13,913	222	120	40,500	88
	7-9	5	1,698	570	1,866	110	165	4,000	80
	9-11	2	1,770	1,770	2,164	122	240	3,300	50
	All	128	4,217	870	14,590	346	120	150,000	71
Chrysene	0-1	50	4,431	1,600	11,209	253	58	75,000	20
	1-3	39	3,262	1,600	4,656	143	60	19,000	23
	3-5	24	4,178	950	8,902	213	60	41,000	25
	5-7	8	2,290	1,310	2,412	105	140	6,400	0
	7-9	5	2,786	1,200	3,433	123	150	8,400	20
	9-11	2	1,910	1,910	2,531	133	120	3,700	50
	All	128	3,790	1,350	8,401	222	58	75,000	21

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Dibenz[a,h]anthracene	0-1	50	5,027	300	21,202	422	120	150,000	96
	1-3	39	3,130	310	7,631	244	120	37,500	92
	3-5	24	3,164	292.5	7,480	236	120	35,500	92
	5-7	8	6,138	382.5	13,969	228	120	40,500	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	1,945	1,945	2,411	124	240	3,650	100
	All	128	3,990	317.5	14,603	366	120	150,000	95
Fluoranthene	0-1	50	5,169	2,500	9,279	180	60	58,000	12
	1-3	39	5,598	2,200	7,416	132	60	28,000	15
	3-5	24	5,459	1,500	12,515	229	100	61,000	13
	5-7	8	4,155	2,550	4,100	99	250	11,000	0
	7-9	5	5,538	2,600	6,656	120	180	16,000	0
	9-11	2	3,160	3,160	4,299	136	120	6,200	50
	All	128	5,274	2,200	8,984	170	60	61,000	13
Fluorene	0-1	50	1,143	555	1,590	139	60	7,500	50
	1-3	39	1,161	480	1,587	137	60	7,400	51
	3-5	24	1,041	375	1,786	172	60	8,400	46
	5-7	8	1,015	490	1,084	107	72	2,900	38
	7-9	5	1,562	480	2,056	132	80	4,900	40
	9-11	2	810	810	976	120	120	1,500	50
	All	128	1,133	480	1,589	140	60	8,400	48
Indeno(1,2,3-c,d)pyrene	0-1	50	5,298	1,200	21,178	400	120	150,000	66
	1-3	39	3,402	1,500	7,593	223	120	37,500	72
	3-5	24	3,343	525	7,536	225	120	35,500	79
	5-7	8	6,268	900	13,913	222	120	40,500	88
	7-9	5	1,660	380	1,897	114	165	4,000	80
	9-11	2	1,945	1,945	2,411	124	240	3,650	100
	All	128	4,220	1,045	14,589	346	120	150,000	73
Naphthalene	0-1	50	11,492	720	73,399	639	60	520,000	44
	1-3	39	10,827	570	57,482	531	60	360,000	36
	3-5	24	10,376	555	42,622	411	90	210,000	33
	5-7	8	13,896	2,000	34,812	251	120	100,000	13
	7-9	5	3,854	3,900	3,830	99	150	9,400	20
	9-11	2	3,610	3,610	4,936	137	120	7,100	50
	All	128	10,809	705	58,884	545	60	520,000	37

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Phenanthrene	0-1	50	4,402	2,550	7,121	162	73	40,000	2.0
	1-3	39	5,638	2,400	8,457	150	87	37,000	5.1
	3-5	24	5,413	1,950	11,323	209	120	54,000	8.3
	5-7	8	5,231	3,150	6,037	115	280	18,000	0
	7-9	5	6,910	2,500	8,267	120	140	19,000	0
	9-11	2	4,360	4,360	5,996	138	120	8,600	50
	All	128	5,117	2,400	8,310	162	73	54,000	4.7
Pyrene	0-1	50	6,266	2,650	12,471	199	60	75,000	14
	1-3	39	5,626	3,500	7,718	137	60	36,000	15
	3-5	24	6,346	1,900	12,698	200	60	60,000	21
	5-7	8	4,966	2,250	6,142	124	220	18,000	0
	7-9	5	5,644	2,500	6,459	114	130	15,000	0
	9-11	2	5,560	5,560	7,693	138	120	11,000	50
	All	128	5,969	2,450	10,538	177	60	75,000	15
Total PAH	0-1	50	39,218	12,790	88,697	226	84	534,600	2.0
	1-3	39	42,327	13,300	75,892	179	87	388,500	5.1
	3-5	24	45,000	7,277	98,020	218	180	407,400	8.3
	5-7	8	39,507	16,415	57,252	145	1,400	172,500	0
	7-9	5	39,108	20,170	45,074	115	450	106,800	0
	9-11	2	29,045	29,045	40,652	140	300	57,790	50
	All	128	41,104	12,375	82,242	200	84	534,600	4.7

SD – Standard Deviation
RSD – Relative Standard Deviation

APPENDIX C – DESCRIPTIVE STATISTICS OF ADDITIONAL SVOC RESULTS

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
1,2,4-Trichlorobenzene	0-1	50	1,553	278	2,616	169	120	15,000	100
	1-3	39	1,219	260	1,502	123	120	4,250	100
	3-5	24	1,366	293	2,873	210	120	13,500	96
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,378	283	2,264	164	120	15,000	99
2,4,5-Trichlorophenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,215	430	4,700	212	200	22,000	100
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,269	463	3,738	165	195	25,000	100
2,4,6-Trichlorophenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,215	430	4,700	212	200	22,000	100
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,269	463	3,738	165	195	25,000	100
2,4-Dichlorophenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,215	430	4,700	212	200	22,000	100
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,269	463	3,738	165	195	25,000	100
2,4-Dimethylphenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,195	403	4,707	214	200	22,000	96
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,265	458	3,740	165	195	25,000	99

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
2,4-Dinitrophenol	0-1	50	13,305	2,350	22,653	170	1,000	130,000	100
	1-3	39	10,376	2,200	12,769	123	1,000	36,000	100
	3-5	24	11,483	2,225	24,511	213	1,000	115,000	100
	5-7	8	13,625	3,200	15,813	116	1,050	34,500	100
	7-9	5	14,190	3,500	16,126	114	1,400	34,000	100
	9-11	2	2,575	2,575	742	29	2,050	3,100	100
	All	128	11,958	2,375	19,515	163	1,000	130,000	100
2,4-Dinitrotoluene	0-1	50	1,948	348	3,296	169	150	19,000	100
	1-3	39	1,531	325	1,891	124	150	5,500	100
	3-5	24	1,691	325	3,619	214	150	17,000	100
	5-7	8	2,002	470	2,322	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,757	350	2,859	163	150	19,000	100
2,6-Dinitrotoluene	0-1	50	1,948	348	3,296	169	150	19,000	100
	1-3	39	1,531	325	1,891	124	150	5,500	100
	3-5	24	1,691	325	3,619	214	150	17,000	100
	5-7	8	2,002	470	2,322	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,757	350	2,859	163	150	19,000	100
2-Chloronaphthalene	0-1	50	16,053	278	104,486	651	120	740,000	98
	1-3	39	12,662	260	71,888	568	120	450,000	97
	3-5	24	9,868	293	38,574	391	120	190,000	92
	5-7	8	19,821	293	52,624	265	120	150,000	75
	7-9	5	2,576	360	3,638	141	165	8,600	60
	9-11	2	7,620	7,620	10,437	137	240	15,000	50
	All	128	13,437	280	78,707	586	120	740,000	93
2-Chlorophenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,195	403	4,707	214	200	22,000	96
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,265	458	3,740	165	195	25,000	99

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
2-Methyl-4,6-dinitrophenol	0-1	50	14,106	2,525	22,640	161	1,000	130,000	100
	1-3	39	11,195	2,200	13,333	119	1,000	36,000	100
	3-5	24	13,283	2,475	24,715	186	1,000	115,000	100
	5-7	8	10,138	3,050	14,452	143	1,050	34,500	100
	7-9	5	14,190	3,500	16,126	114	1,400	34,000	100
	9-11	2	2,575	2,575	742	29	2,050	3,100	100
	All	128	12,640	2,475	19,620	155	1,000	130,000	100
2-Methylphenol (o-Cresol)	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,199	403	4,706	214	200	22,000	96
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,266	458	3,740	165	195	25,000	99
2-Nitroaniline	0-1	50	3,903	700	6,564	168	300	37,500	100
	1-3	39	3,070	650	3,778	123	300	10,500	100
	3-5	24	3,383	650	7,164	212	300	33,500	100
	5-7	8	3,971	950	4,591	116	305	10,000	100
	7-9	5	4,142	1,050	4,698	113	410	10,000	100
	9-11	2	750	750	212	28	600	900	100
	All	128	3,516	700	5,685	162	300	37,500	100
2-Nitrophenol	0-1	50	2,566	458	4,342	169	195	25,000	100
	1-3	39	2,019	425	2,493	123	200	7,000	100
	3-5	24	2,215	430	4,700	212	200	22,000	100
	5-7	8	1,968	600	2,802	142	200	6,500	100
	7-9	5	2,694	700	3,042	113	270	6,500	100
	9-11	2	498	498	145	29	395	600	100
	All	128	2,269	463	3,738	165	195	25,000	100
3 & 4-Methylphenol	0-1	50	5,136	975	8,704	169	300	50,000	94
	1-3	39	4,055	950	4,964	122	395	14,000	92
	3-5	24	4,683	900	9,428	201	395	44,500	71
	5-7	8	4,000	1,250	5,576	139	400	13,500	88
	7-9	5	5,480	1,350	6,209	113	550	13,000	100
	9-11	2	745	745	78	10	690	800	50
	All	128	4,595	975	7,491	163	300	50,000	88

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
3-Nitroaniline	0-1	50	3,903	700	6,564	168	300	37,500	100
	1-3	39	3,070	650	3,778	123	300	10,500	100
	3-5	24	3,383	650	7,164	212	300	33,500	100
	5-7	8	3,971	950	4,591	116	305	10,000	100
	7-9	5	4,142	1050	4,698	113	410	10,000	100
	9-11	2	750	750	212	28	600	900	100
	All	128	3,516	700	5,685	162	300	37,500	100
4-Bromophenyl phenyl ether	0-1	50	1,647	300	2,615	159	120	15,000	100
	1-3	39	1,316	260	1,569	119	120	4,250	100
	3-5	24	1,564	293	2,904	186	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,482	295	2,285	154	120	15,000	100
4-Chloro-3-methyl-phenol	0-1	50	1,553	278	2,616	169	120	15,000	100
	1-3	39	1,219	260	1,502	123	120	4,250	100
	3-5	24	1,350	260	2,879	213	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,375	280	2,265	165	120	15,000	100
4-Chlorodiphenylether	0-1	50	777	140	1,310	169	60	7,500	100
	1-3	39	612	130	755	123	60	2,100	100
	3-5	24	664	130	1,393	210	60	6,500	100
	5-7	8	800	188	927	116	60	2,000	100
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	699	140	1,127	161	60	7,500	100
4-Nitroaniline	0-1	50	3,903	700	6,564	168	300	37,500	100
	1-3	39	3,070	650	3,778	123	300	10,500	100
	3-5	24	3,383	650	7,164	212	300	33,500	100
	5-7	8	3,971	950	4,591	116	305	10,000	100
	7-9	5	4,142	1050	4,698	113	410	10,000	100
	9-11	2	750	750	212	28	600	900	100
	All	128	3,516	700	5,685	162	300	37,500	100

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
4-Nitrophenol	0-1	50	13,305	2,350	22,653	170	1,000	130,000	100
	1-3	39	10,376	2,200	12,769	123	1,000	36,000	100
	3-5	24	11,483	2,225	24,511	213	1,000	115,000	100
	5-7	8	13,625	3,200	15,813	116	1,050	34,500	100
	7-9	5	14,190	3,500	16,126	114	1,400	34,000	100
	9-11	2	2,575	2,575	742	29	2,050	3,100	100
	All	128	11,958	2,375	19,515	163	1,000	130,000	100
Azobenzene	0-1	50	1,647	300	2,615	159	120	15,000	100
	1-3	39	1,316	260	1,569	119	120	4,250	100
	3-5	24	1,564	293	2,904	186	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,482	295	2,285	154	120	15,000	100
Benzyl Alcohol	0-1	50	19,483	3,475	32,955	169	1,500	190,000	100
	1-3	39	15,305	3,250	18,911	124	1,500	55,000	100
	3-5	24	16,913	3,250	36,190	214	1,500	170,000	100
	5-7	8	14,844	4,500	21,122	142	1,500	50,000	100
	7-9	5	20,870	5,000	23,760	114	2,050	50,000	100
	9-11	2	3,775	3,775	1,096	29	3,000	4,550	100
	All	128	17,247	3,500	28,504	165	1,500	190,000	100
Bis(2-chloroethoxy)methane	0-1	50	1,553	278	2,616	169	120	15,000	100
	1-3	39	1,219	260	1,502	123	120	4,250	100
	3-5	24	1,350	260	2,879	213	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,375	280	2,265	165	120	15,000	100
Bis(2-chloroethyl)ether	0-1	50	777	140	1,310	169	60	7,500	100
	1-3	39	612	130	755	123	60	2,100	100
	3-5	24	664	130	1,393	210	60	6,500	100
	5-7	8	592	180	840	142	60	2,000	100
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	686	140	1,124	164	60	7,500	100

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Bis(2-chloroisopropyl)ether	0-1	50	2,859	163	8,203	287	60	41,000	86
	1-3	39	994	140	2,456	247	60	15,000	92
	3-5	24	666	130	1,392	209	60	6,500	92
	5-7	8	592	180	840	142	60	2,000	100
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	1,617	155	5,404	334	60	41,000	91
Bis(2-ethylhexyl)phthalate	0-1	50	7,691	415	27,381	356	140	190,000	74
	1-3	39	4,715	1,100	9,947	211	150	47,000	69
	3-5	24	4,566	393	9,900	217	150	44,500	83
	5-7	8	2,367	480	2,930	124	150	7,500	88
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	5,532	480	18,466	334	140	190,000	77
Butyl benzyl phthalate	0-1	50	5,936	348	26,903	453	150	190,000	100
	1-3	39	2,731	325	7,519	275	150	47,000	100
	3-5	24	3,626	365	9,425	260	150	44,500	100
	5-7	8	1,979	480	2,289	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	4,042	353	17,757	439	150	190,000	100
Carbazole	0-1	50	2,066	378	3,294	159	150	19,000	94
	1-3	39	1,622	325	1,930	119	150	5,500	92
	3-5	24	1,955	365	3,650	187	150	17,000	96
	5-7	8	1,484	450	2,112	142	150	5,000	100
	7-9	5	2,049	380	2,409	118	205	5,000	80
	9-11	2	240	240	85	35	180	300	50
	All	128	1,845	348	2,869	156	150	19,000	93
Dibenzofuran	0-1	50	1,835	308	3,250	177	68	19,000	72
	1-3	39	1,497	325	1,838	123	72	5,500	74
	3-5	24	1,689	303	3,621	214	110	17,000	67
	5-7	8	1,977	390	2,342	118	150	5,000	63
	7-9	5	2,085	490	2,378	114	205	5,000	80
	9-11	2	355	355	78	22	300	410	50
	All	128	1,700	320	2,829	166	68	19,000	71

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Diethylphthalate	0-1	50	1,948	348	3,296	169	150	19,000	100
	1-3	39	1,531	325	1,891	124	150	5,500	100
	3-5	24	1,691	325	3,619	214	150	17,000	100
	5-7	8	2,002	470	2,322	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,757	350	2,859	163	150	19,000	100
Dimethyl phthalate	0-1	50	1,948	348	3,296	169	150	19,000	100
	1-3	39	1,531	325	1,891	124	150	5,500	100
	3-5	24	1,691	325	3,619	214	150	17,000	100
	5-7	8	2,002	470	2,322	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,757	350	2,859	163	150	19,000	100
Di-n-butyl phthalate	0-1	50	2,066	375	3,294	159	140	19,000	98
	1-3	39	1,646	325	1,962	119	150	5,500	100
	3-5	24	1,953	365	3,651	187	110	17,000	96
	5-7	8	1,478	425	2,116	143	150	5,000	88
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,854	368	2,873	155	110	19,000	98
Di-n-octyl phthalate	0-1	50	5,936	348	26,903	453	150	190,000	100
	1-3	39	2,731	325	7,519	275	150	47,000	100
	3-5	24	3,626	365	9,425	260	150	44,500	100
	5-7	8	1,979	480	2,289	116	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	4,042	353	17,757	439	150	190,000	100
Hexachlorobenzene	0-1	50	3,599	323	15,454	429	120	110,000	94
	1-3	39	1,764	285	2,596	147	120	13,000	92
	3-5	24	2,057	313	3,333	162	120	13,500	83
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	2,473	323	9,866	399	120	110,000	92

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
Hexachlorobutadiene	0-1	50	1,444	150	5,493	380	60	39,000	94
	1-3	39	3,246	140	11,542	356	60	56,000	92
	3-5	24	4,842	158	17,493	361	60	86,000	83
	5-7	8	654	180	969	148	60	2,500	88
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	2,537	160	10,443	412	60	86,000	91
Hexachlorocyclopenta diene	0-1	50	7,769	1,400	13,102	169	600	75,000	100
	1-3	39	6,122	1,300	7,548	123	600	21,000	100
	3-5	24	6,638	1,300	13,928	210	600	65,000	100
	5-7	8	5,919	1,800	8,400	142	600	20,000	100
	7-9	5	8,370	2,050	9,527	114	800	20,000	100
	9-11	2	1,500	1,500	424	28	1,200	1,800	100
	All	128	6,865	1,400	11,236	164	600	75,000	100
Hexachloroethane	0-1	50	1,797	160	8,158	454	60	58,000	94
	1-3	39	621	140	750	121	60	2,100	95
	3-5	24	67,330	148	326,460	485	60	1,600,000	92
	5-7	8	592	180	840	142	60	2,000	100
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	13,588	155	141,418	1041	60	1,600,000	95
Isophorone	0-1	50	777	140	1,310	169	60	7,500	100
	1-3	39	612	130	755	123	60	2,100	100
	3-5	24	664	130	1,393	210	60	6,500	100
	5-7	8	592	180	840	142	60	2,000	100
	7-9	5	837	205	953	114	80	2,000	100
	9-11	2	150	150	42	28	120	180	100
	All	128	686	140	1,124	164	60	7,500	100
Nitrobenzene	0-1	50	1,553	278	2,616	169	120	15,000	100
	1-3	39	1,219	260	1,502	123	120	4,250	100
	3-5	24	1,350	260	2,879	213	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,375	280	2,265	165	120	15,000	100

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
N-Nitrosodimethylamine	0-1	50	1,948	348	3,296	169	150	19,000	100
	1-3	39	1,531	325	1,891	124	150	5,500	100
	3-5	24	1,691	325	3,619	214	150	17,000	100
	5-7	8	1,484	450	2,112	142	150	5,000	100
	7-9	5	2,087	500	2,376	114	205	5,000	100
	9-11	2	378	378	110	29	300	455	100
	All	128	1,725	350	2,850	165	150	19,000	100
N-Nitrosodi-n-propylamine	0-1	50	1,553	278	2,616	169	120	15,000	100
	1-3	39	1,219	260	1,502	123	120	4,250	100
	3-5	24	1,350	260	2,879	213	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,375	280	2,265	165	120	15,000	100
N-Nitrosodiphenylamine	0-1	50	1,647	300	2,615	159	120	15,000	100
	1-3	39	1,316	260	1,569	119	120	4,250	100
	3-5	24	1,564	293	2,904	186	120	13,500	100
	5-7	8	1,188	358	1,693	143	120	4,050	100
	7-9	5	1,667	415	1,891	113	165	4,000	100
	9-11	2	303	303	88	29	240	365	100
	All	128	1,482	295	2,285	154	120	15,000	100
Pentachlorophenol	0-1	50	14,106	2,525	22,640	161	1,000	130,000	100
	1-3	39	11,195	2,200	13,333	119	1,000	36,000	100
	3-5	24	13,260	2,475	24,728	186	480	115,000	96
	5-7	8	10,138	3,050	14,452	143	1,050	34,500	100
	7-9	5	14,190	3,500	16,126	114	1,400	34,000	100
	9-11	2	2,575	2,575	742	29	2,050	3,100	100
	All	128	12,635	2,475	19,622	155	480	130,000	99
Phenol	0-1	50	2,584	458	4,336	168	195	25,000	94
	1-3	39	1,984	550	2,373	120	200	7,000	87
	3-5	24	2,468	500	4,661	189	200	22,000	83
	5-7	8	1,762	600	2,305	131	200	6,500	75
	7-9	5	2,014	1,600	2,103	104	270	5,500	60
	9-11	2	448	448	74	17	395	500	50
	All	128	2,272	500	3,667	161	195	25,000	87

SD – Standard Deviation
RSD – Relative Standard Deviation

APPENDIX D – DESCRIPTIVE STATISTICS OF INDIVIDUAL AROCLOR RESULTS

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)*	Non-detect (%)
Aroclor 1016	0-1	50	8,059	163	52,968	657	60	375,000	100
	1-3	39	2,889	140	15,171	525	60	95,000	100
	3-5	24	2,430	158	5,831	240	60	21,500	100
	5-7	8	1,426	188	2,364	166	95	5,500	100
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	360	360	339	94	120	600	100
	All	128	4,591	160	34,146	744	60	375,000	100
Aroclor 1221	0-1	50	8,059	163	52,968	657	60	375,000	100
	1-3	39	2,889	140	15,171	525	60	95,000	100
	3-5	24	2,430	158	5,831	240	60	21,500	100
	5-7	8	1,426	188	2,364	166	95	5,500	100
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	360	360	339	94	120	600	100
	All	128	4,591	160	34,146	744	60	375,000	100
Aroclor 1232	0-1	50	8,059	163	52,968	657	60	375,000	100
	1-3	39	2,889	140	15,171	525	60	95,000	100
	3-5	24	2,430	158	5,831	240	60	21,500	100
	5-7	8	1,426	188	2,364	166	95	5,500	100
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	360	360	339	94	120	600	100
	All	128	4,591	160	34,146	744	60	375,000	100
Aroclor 1242	0-1	50	8,197	163	52,967	646	60	375,000	96
	1-3	39	2,925	140	15,169	519	60	95,000	97
	3-5	24	2,430	158	5,831	240	60	21,500	100
	5-7	8	1,426	188	2,364	166	95	5,500	100
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	360	360	339	94	120	600	100
	All	128	4,656	160	34,150	733	60	375,000	98
Aroclor 1248	0-1	50	8,340	175	52,954	635	60	375,000	70
	1-3	39	3,120	155	15,211	488	60	95,000	74
	3-5	24	3,072	158	6,584	214	60	21,500	83
	5-7	8	2,114	188	3,971	188	95	11,000	88
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	360	360	339	94	120	600	100
	All	128	4,935	168	34,173	693	60	375,000	77

Analyte	Depth (ft)	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)*	Non-detect (%)
Aroclor 1254	0-1	50	50,583	183	353,472	699	60	2,500,000	66
	1-3	39	8,075	155	47,983	594	60	300,000	82
	3-5	24	6,426	150	24,639	383	60	120,000	83
	5-7	8	4,101	188	10,676	260	95	30,500	100
	7-9	5	1,191	175	1,892	159	80	4,500	100
	9-11	2	1,735	1,735	2,284	132	120	3,350	100
	All	128	23,754	168	222,439	936	60	2,500,000	78
Aroclor 1260	0-1	50	5,366	155	35,306	658	60	250,000	76
	1-3	39	12,080	140	73,613	609	60	460,000	85
	3-5	24	6,467	158	26,591	411	60	130,000	83
	5-7	8	4,349	188	11,580	266	95	33,000	75
	7-9	5	742	175	1,319	178	80	3,100	80
	9-11	2	810	810	976	120	120	1,500	50
	All	128	7,303	155	47,428	649	60	460,000	80
Aroclor 1262	0-1	50	2,908	145	18,346	631	60	130,000	100
	1-3	39	6,285	140	37,589	598	60	235,000	100
	3-5	24	3,716	155	13,607	366	60	65,000	100
	5-7	8	2,294	188	5,943	259	95	17,000	100
	7-9	5	442	175	649	147	80	1,600	100
	9-11	2	435	435	445	102	120	750	100
	All	128	3,915	153	24,312	621	60	235,000	100
Aroclor 1268	0-1	50	1,019	143	5,282	518	60	37,500	100
	1-3	39	2,669	140	15,178	569	60	95,000	100
	3-5	24	1,401	155	4,545	324	60	21,500	100
	5-7	8	761	180	1,713	225	95	5,000	100
	7-9	5	322	175	382	119	80	1,000	100
	9-11	2	288	288	237	82	120	455	100
	All	128	1,539	148	9,178	596	60	95,000	100

* Non-detects set to zero when calculating totals, but ½ reporting limit for individual Aroclors. Therefore, individual Aroclor maximums may be higher than total Aroclor maximum.

SD – Standard Deviation

RSD – Relative Standard Deviation

APPENDIX E – REFERENCES FOR ENVIRONMENTAL STUDIES CONDUCTED IN THE TRENTON CHANNEL BETWEEN 1985 AND 2007

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APPENDIX F – DESCRIPTIVE STATISTICS OF PCB CONGENER RESULTS

Appendix F provides descriptive statistics for PCB congener results from 16 samples collected during Phase I and 22 samples collected during Phase II. Two distinct laboratories analyzed the samples for PCB congeners and these laboratories did not always use the same congener coelution scheme; as a result, there are fewer than 38 results for some congeners or coeluting groups of congeners.

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
1	38	66.3	0.19	296.4	447	0.012	1800	26.3
2	38	4.0	0.18	13.6	341	0.00977	80	55.3
3	38	47.3	0.23	200.1	423	0.0101	1200	34.2
4	16	25.8	1.36	62.2	241	0.0393	247	6.3
4+10	22	54.2	0.18	186.7	345	0.0115	860	59.1
5	16	2.0	0.32	4.7	240	0.00718	19	31.3
5+8	22	401.8	0.49	1229.3	306	0.078	5400	22.7
6	38	26.4	0.67	80.6	305	0.0115	440	36.8
7	16	5.1	0.28	12.7	250	0.0127	50.7	18.8
7+9	22	24.1	0.18	77.9	324	0.0115	350	72.7
8	16	102.0	7.17	239.8	235	0.152	949	0.0
9	16	7.1	0.39	17.7	249	0.0104	70.8	12.5
10	16	1.7	0.27	4.0	228	0.02995	16	31.3
11	38	4.0	0.19	13.6	343	0.00782	80	52.6
12+13	38	6.9	0.35	16.9	245	0.0115	80	42.1
14	38	3.9	0.16	13.6	353	0.0115	80	84.2
15	38	106.0	1.32	381.7	360	0.0115	2200	18.4
16	16	71.2	3.89	136.5	192	0.157	509	0.0
16+32	22	67.0	0.35	195.5	292	0.0115	870	36.4
17	38	65.8	2.24	154.4	235	0.0115	655	23.7
18	38	164.9	5.39	381.9	232	0.0115	1600	18.4
19	38	10.1	0.44	23.3	231	0.0115	112	55.3
20+21+33	22	82.7	0.39	227.6	275	0.0115	1000	27.3
20+28	16	249.3	23.55	478.4	192	0.509	1800	0.0
21+33	16	142.7	14.15	276.0	193	0.3	1040	0.0
22	38	60.2	2.53	137.0	227	0.0115	595	23.7
23	16	0.6	0.30	0.9	146	0.02995	3.43	56.3
23+34	22	6.3	0.16	17.6	278	0.0115	80	90.9
24	16	3.1	0.33	6.6	209	0.00551	25.9	31.3
24+27	22	6.8	0.19	17.5	256	0.0115	80	77.3
25	38	10.8	0.69	24.5	228	0.0115	122	39.5
26	22	15.8	0.19	42.1	267	0.0115	190	50.0
26+29	16	37.3	3.55	74.0	198	0.0863	281	0.0
27	16	11.1	0.96	21.3	191	0.0216	79.5	6.3

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
28	22	173.5	0.82	501.6	289	0.0115	2200	22.7
29	22	6.3	0.16	17.6	278	0.0115	80	90.9
30	38	4.2	0.18	13.6	320	0.0115	80	100.0
31	38	171.4	7.75	383.1	223	0.0115	1610	13.2
32	16	55.0	4.21	101.1	184	0.123	371	0.0
34	16	1.6	0.34	2.9	175	0.00526	11.2	37.5
35	38	4.8	0.19	13.8	289	0.0102	80	57.9
36	38	3.9	0.17	13.6	349	0.0115	80	97.4
37	38	52.1	2.15	135.2	259	0.0115	700	26.3
38	38	3.9	0.18	13.6	344	0.0115	80	94.7
39	38	4.4	0.18	13.6	307	0.0115	80	71.1
40	22	17.9	0.28	42.6	238	0.0115	180	54.5
40+71	16	107.9	13.35	175.0	162	0.296	570	0.0
41	16	23.4	2.22	37.9	162	0.0496	109	0.0
41+64+68	22	92.0	1.05	247.3	269	0.0115	1100	31.8
42	16	69.3	7.90	121.2	175	0.171	432	0.0
42+59	22	32.4	0.39	81.0	250	0.0115	340	50.0
43+49	22	130.9	2.00	373.8	286	0.0115	1700	27.3
43+73	16	12.4	1.41	22.2	180	0.0278	80.8	6.3
44	22	141.5	2.00	415.9	294	0.0115	1900	27.3
44+47+65	16	236.9	27.50	408.4	172	0.678	1450	0.0
45	22	19.2	0.24	48.1	250	0.0115	210	54.5
45+51	16	55.5	6.55	97.9	177	0.136	353	0.0
46	38	13.0	0.73	26.4	204	0.0115	121	44.7
47+48+75	22	56.1	0.46	156.1	278	0.0115	700	45.5
48	16	69.4	7.44	122.9	177	0.155	442	0.0
49	16	164.0	18.85	284.7	174	0.465	1020	0.0
50	22	6.4	0.16	17.6	277	0.0115	80	90.9
50+53	16	38.6	4.66	66.9	173	0.0906	239	0.0
51	22	7.8	0.19	18.0	230	0.0115	80	68.2
52	16	279.4	32.35	477.8	171	0.868	1690	0.0
52+73	22	304.6	4.35	991.7	326	0.0115	4600	27.3
53	22	21.4	0.32	56.2	263	0.0115	250	54.5
54	38	4.0	0.18	13.6	339	0.0115	80	86.8
55	38	6.3	0.27	14.8	237	0.0115	80	60.5
56	16	112.4	11.48	193.8	172	0.289	680	0.0
56+60	22	98.0	1.28	253.3	259	0.0115	1100	31.8
57	38	4.4	0.19	13.6	310	0.0115	80	73.7
58	38	5.7	0.29	14.3	252	0.0115	80	63.2
59+62+75	16	23.1	2.54	41.7	180	0.0573	153	0.0
60	16	60.3	5.01	106.3	176	0.138	359	0.0
61	16	1.4	0.67	1.7	118	0.06	4.2	100.0
61+74	22	106.2	1.17	290.4	274	0.0115	1300	31.8
62	22	6.3	0.16	17.6	282	0.0115	80	100.0
63	38	8.8	0.43	17.9	203	0.0115	80	44.7
64	16	105.9	12.16	176.1	166	0.295	593	0.0

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
65	22	6.3	0.16	17.6	282	0.0115	80	100.0
66	16	222.4	22.45	387.5	174	0.586	1380	0.0
66+76+80	22	111.6	1.62	294.1	264	0.0115	1300	27.3
67	38	7.6	0.39	16.4	215	0.0115	80	52.6
68	16	1.1	0.33	1.8	169	0.02995	7.11	50.0
69	38	3.9	0.17	13.6	346	0.0115	80	100.0
70	22	188.9	4.00	497.9	264	0.0115	2200	22.7
70+74+76	16	407.6	43.10	705.9	173	1.2	2500	0.0
71	22	27.7	0.39	70.1	253	0.0115	300	50.0
72	38	4.4	0.19	13.6	310	0.0115	80	73.7
77	38	12.5	0.45	26.7	214	0.00115	124	28.9
78	38	3.9	0.17	13.6	346	0.0115	80	97.4
79	38	4.4	0.18	13.6	311	0.00836	80	68.4
80	16	0.7	0.33	0.8	118	0.0115	2.1	93.8
81	38	1.6	0.09	4.6	293	0.00115	27.5	73.7
82	38	29.2	1.90	68.5	235	0.0115	350	31.6
83+108	22	7.5	0.27	17.7	236	0.0115	80	72.7
83+99	16	112.5	15.30	199.1	177	0.284	722	0.0
84	38	63.5	2.24	171.9	271	0.0115	980	21.1
85+116+117	16	39.2	4.72	67.5	172	0.112	234	0.0
85+120	22	37.7	0.75	119.3	317	0.0115	550	54.5
86+87+97+109+119+125	16	129.6	16.40	226.2	175	0.34	802	0.0
86+87+97+111+117+125	22	184.1	3.25	548.3	298	0.0115	2500	27.3
88	16	0.7	0.33	0.8	118	0.02995	2.1	100.0
88+121	22	6.3	0.17	17.6	278	0.0115	80	86.4
89	16	5.2	0.43	9.1	173	0.02995	31.9	37.5
89+90+101	22	408.2	3.05	1229.7	301	0.0115	5400	27.3
90+101+113	16	167.1	25.30	300.8	180	0.44	1110	0.0
91	38	32.1	1.82	90.1	281	0.0115	520	28.9
92	38	46.7	1.84	138.8	297	0.0115	810	23.7
93	16	3.0	0.33	5.8	193	0.02995	20.7	75.0
93+95	22	432.8	3.95	1352.4	312	0.0115	6100	27.3
94	38	4.4	0.19	13.6	307	0.0115	80	76.3
95+100	16	136.2	21.65	239.3	176	0.36	870	0.0
96	38	5.0	0.26	13.7	273	0.0115	80	65.8
98+102	38	8.4	0.45	17.3	206	0.0115	80	50.0
99	22	121.4	1.60	389.7	321	0.0115	1800	27.3
100	22	6.3	0.16	17.6	279	0.0115	80	90.9
103	38	4.4	0.28	13.6	306	0.0115	80	65.8
104	38	3.9	0.17	13.6	346	0.0115	80	100.0
105	38	83.1	4.25	242.7	292	0.00115	1400	5.3
106	38	118.6	0.36	492.6	415	0.0115	2900	57.9
107	16	11.5	1.66	21.6	189	0.0286	82.2	0.0
107+109	22	8.9	0.26	19.6	219	0.0115	80	68.2
108+124	16	5.7	0.70	10.4	183	0.0188	38.3	6.3
110	22	249.4	4.55	717.7	288	0.0115	3200	22.7

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
110+115	16	188.6	28.30	329.2	175	0.504	1190	0.0
111	16	0.7	0.33	0.8	118	0.02995	2.1	100.0
112	38	4.1	0.22	13.6	334	0.0115	80	92.1
113	22	7.1	0.17	17.8	251	0.0115	80	95.5
114	38	6.5	0.25	20.3	312	0.00115	120	34.2
115	22	6.3	0.16	17.6	282	0.0115	80	100.0
118	38	176.0	9.15	508.4	289	0.0034	2900	2.6
119	22	6.8	0.19	17.5	259	0.0115	80	77.3
120	16	0.6	0.33	0.7	117	0.02995	2.08	68.8
121	16	0.7	0.33	0.8	118	0.02995	2.1	100.0
122	38	4.9	0.22	13.7	279	0.0115	80	60.5
123	38	13.6	0.24	48.1	353	0.00115	255	63.2
124	22	9.1	0.19	21.4	236	0.0115	80	72.7
126	38	2.5	0.13	8.1	318	0.00115	44	50.0
127	38	58.7	0.33	238.3	406	0.0115	1400	47.4
128	38	41.8	1.73	137.6	329	0.0115	800	31.6
129	22	31.9	0.19	92.1	289	0.0115	390	63.6
129+138+160+163	16	138.7	19.90	269.3	194	0.33	1040	0.0
130	38	19.8	0.87	65.7	332	0.0115	380	39.5
131	16	2.3	0.36	4.5	194	0.02995	17.3	31.3
131+142+165	22	8.4	0.19	18.3	217	0.0115	80	68.2
132	16	51.0	6.81	98.7	193	0.131	380	0.0
132+168	22	205.0	0.52	595.0	290	0.0115	2500	31.8
133	38	5.4	0.36	15.0	277	0.0115	80	52.6
134	22	30.3	0.19	87.3	288	0.0115	370	63.6
134+143	16	9.3	1.48	17.6	189	0.0191	67.7	18.8
135+144	22	266.0	0.51	749.5	282	0.0115	3000	31.8
135+151+154	16	48.5	5.77	100.0	206	0.113	393	0.0
136	38	149.9	1.57	530.1	354	0.0115	2700	18.4
137	38	7.3	0.59	16.2	221	0.0115	80	47.4
138+163+164	22	977.2	2.65	2857.1	292	0.0115	12000	22.7
139+140	16	2.9	0.45	5.4	184	0.0155	20.9	25.0
139+149	22	1488.9	2.45	4157.2	279	0.0115	16000	22.7
140	22	6.4	0.16	17.6	276	0.0115	80	86.4
141	38	220.6	2.42	782.9	355	0.0115	4000	15.8
142	16	0.7	0.33	0.8	118	0.02995	2.1	100.0
143	22	6.3	0.16	17.6	280	0.0115	80	95.5
144	16	8.1	1.32	16.4	202	0.02995	64.2	25.0
145	38	3.9	0.17	13.6	346	0.0115	80	100.0
146	38	96.3	1.38	343.8	357	0.0115	1900	21.1
147	22	6.6	0.19	17.6	264	0.0115	80	77.3
147+149	16	109.7	16.20	215.2	196	0.231	838	0.0
148	38	3.9	0.17	13.6	345	0.0115	80	94.7
150	38	3.9	0.18	13.6	345	0.0115	80	97.4
151	22	751.1	0.70	2105.5	280	0.0115	8000	27.3
152	38	3.9	0.18	13.6	345	0.0115	80	97.4

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
153	22	1719.3	1.85	4961.3	289	0.0115	20000	22.7
153+168	16	109.4	14.45	218.6	200	0.254	853	0.0
154	22	6.4	0.18	17.6	273	0.0115	80	81.8
155	38	3.9	0.17	13.6	346	0.0115	80	100.0
156	22	58.1	0.28	204.3	352	0.00115	950	27.3
156+157	16	14.8	1.95	28.1	190	0.0314	107	0.0
157	22	11.6	0.06	35.8	309	0.00115	160	31.8
158	16	14.3	2.08	27.0	190	0.0403	103	0.0
158+160	22	95.8	0.36	294.1	307	0.0115	1300	45.5
159	38	49.9	0.19	188.9	378	0.0115	970	52.6
161	38	3.9	0.17	13.6	346	0.0115	80	100.0
162	38	18.8	0.23	72.8	386	0.0115	390	63.2
164	16	10.0	1.21	19.4	194	0.0185	74.8	6.3
165	16	0.7	0.33	0.8	115	0.02995	2.1	93.8
166	38	4.2	0.19	13.6	321	0.0097	80	68.4
167	38	11.1	0.44	41.3	373	0.00115	250	23.7
169	38	0.7	0.04	1.5	218	0.00115	8	86.8
170	38	492.5	2.28	1957.8	398	0.0054	11000	7.9
171	22	267.1	0.19	792.7	297	0.0115	3300	50.0
171+173	16	10.2	1.16	20.6	202	0.02995	80.5	12.5
172	16	6.0	0.85	12.3	203	0.0245	48.6	25.0
172+192	22	149.6	0.19	438.7	293	0.0115	1800	54.5
173	22	16.4	0.18	48.4	295	0.0115	200	72.7
174	38	839.4	2.69	3090.0	368	0.0115	15000	13.2
175	38	27.3	0.24	102.0	373	0.0115	530	52.6
176	38	123.8	0.39	457.4	369	0.0115	2200	39.5
177	38	381.8	1.37	1414.5	370	0.0115	7100	18.4
178	38	192.7	0.50	711.8	369	0.0115	3500	34.2
179	38	512.9	1.13	1890.5	369	0.0115	9100	18.4
180	22	3404.8	1.19	10070.3	296	0.00115	42000	4.5
180+193	16	68.5	8.51	140.7	205	0.135	552	0.0
181	38	4.0	0.18	13.6	342	0.0115	80	92.1
182	16	0.7	0.33	0.8	118	0.02995	2.1	93.8
182+187	22	2235.7	0.63	6414.5	287	0.0115	25000	22.7
183	38	688.5	1.63	2649.7	385	0.0115	14000	18.4
184	38	3.9	0.17	13.6	346	0.0115	80	100.0
185	38	186.6	0.39	701.7	376	0.0115	3500	39.5
186	38	3.9	0.17	13.6	346	0.0115	80	100.0
187	16	43.1	5.59	89.7	208	0.0789	355	0.0
188	38	3.9	0.17	13.6	346	0.011	80	94.7
189	38	12.4	0.16	57.5	464	0.00115	350	39.5
190	38	481.9	0.71	1960.0	407	0.0115	11000	23.7
191	38	25.4	0.24	104.4	411	0.0115	600	55.3
192	16	0.7	0.33	0.8	118	0.02995	2.1	100.0
193	22	156.0	0.19	457.7	293	0.0115	1900	54.5
194	38	1586.9	1.86	6866.9	433	0.0115	40000	15.8

PCB Congener	Number of results	Mean (ppb)	Median (ppb)	SD (ppb)	RSD (%)	Min (ppb)	Max (ppb)	Non-detect (%)
195	38	317.5	0.49	1316.2	415	0.0115	7500	39.5
196	16	8.6	1.05	17.8	208	0.02995	70.6	12.5
196+203	22	3794.6	0.43	11658.0	307	0.0115	50000	27.3
197	38	46.1	0.19	178.4	387	0.0115	940	55.3
198	22	129.8	0.18	397.3	306	0.0115	1700	59.1
198+199	16	20.1	3.04	41.2	205	0.0287	163	0.0
199	22	3309.3	0.38	9977.0	301	0.0115	42000	31.8
200	38	209.9	0.33	816.5	389	0.0115	4300	39.5
201	38	205.8	0.37	789.4	384	0.0115	4100	36.8
202	38	320.7	0.69	1223.9	382	0.0115	6400	39.5
203	16	11.4	1.52	23.0	203	0.02995	90.3	6.3
204	38	3.9	0.17	13.6	346	0.0115	80	100.0
205	38	68.6	0.23	304.6	444	0.0115	1800	55.3
206	38	1291.3	1.85	5644.5	437	0.0115	33000	18.4
207	38	165.4	0.30	698.3	422	0.0115	4000	52.6
208	38	248.0	0.55	1035.8	418	0.0115	5900	34.2
209	38	146.2	0.90	694.5	475	0.0115	4200	28.9

SD – Standard Deviation
RSD – Relative Standard Deviation

APPENDIX G – PAH EQUILIBRIUM SEDIMENT BENCHMARK TOXIC UNITS CALCULATED FOR SEDIMENT SAMPLES FROM THE TRENTON CHANNEL REMEDIAL INVESTIGATION SITE

Summary of the Equilibrium Sediment Benchmark Toxic Unit Calculations for Individual Sediment Samples from the Trenton Channel Site						
	Substituting ½ SSQL for Non-detects			Substituting 0 for Non-detects		
Sample ID	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot
A1 0-1	3.38	9.30	38.90	3.38	9.30	38.90
A1 1-3	4.04	11.11	46.45	4.04	11.11	46.45
A1 3-5	3.06	8.42	35.19	2.94	8.08	33.81
A11 0-1	2.05	5.63	23.55	2.05	5.63	23.55
A11 1-3	3.39	9.32	38.96	3.39	9.32	38.96
A11 3-5	0.40	1.10	4.62	0.38	1.04	4.35
B1 0-1	0.11	0.30	1.26	0.04	0.10	0.44
B2 0-1	0.13	0.36	1.51	0.01	0.04	0.15
B3 0-1	0.17	0.48	2.00	0.01	0.03	0.13
B3 1-2	0.56	1.53	6.39	0.03	0.09	0.39
B4 0-1	1.27	3.49	14.58	1.25	3.45	14.41
B4 1-3	0.24	0.65	2.72	0.15	0.43	1.78
C1 0-1	0.32	0.88	3.66	0.13	0.37	1.55
C1 1-3	0.26	0.71	2.98	0.11	0.30	1.26
C1 3-5	0.56	1.54	6.45	0.34	0.93	3.87
C11 0-1	0.61	1.67	7.00	0.22	0.61	2.54
C11 1-3	0.42	1.16	4.87	0.23	0.64	2.66
C11 3-5	0.42	1.16	4.85	0.26	0.72	3.00
C11 5-7	0.46	1.27	5.30	0.38	1.03	4.33
C12 0-1	1.25	3.45	14.43	0.89	2.45	10.26
C12 1-3	1.56	4.29	17.93	0.30	0.82	3.44
C12 3-5	2.33	6.40	26.75	0.09	0.26	1.08
C3 0-1	2.57	7.07	29.55	2.57	7.07	29.55
C3 1-3	1.44	3.96	16.55	1.35	3.71	15.53
C3 3-5	22.20	61.04	255.24	22.09	60.75	254.03
C4 0-1	0.40	1.10	4.61	0.40	1.10	4.61
C4 1-3	0.35	0.96	4.00	0.33	0.91	3.80

Summary of the Equilibrium Sediment Benchmark Toxic Unit Calculations for Individual Sediment Samples from the Trenton Channel Site						
	Substituting ½ SSQL for Non-detects			Substituting 0 for Non-detects		
Sample ID	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot
C4 3-5	0.36	0.99	4.15	0.12	0.34	1.43
C5 0-1	2.50	6.87	28.73	2.50	6.87	28.73
C5 1-3	0.94	2.59	10.85	0.78	2.13	8.93
C5 3-5	0.17	0.47	1.98	0.10	0.27	1.13
C6 0-1	0.44	1.21	5.08	0.09	0.25	1.06
C6 1-3	0.57	1.57	6.58	0.21	0.56	2.36
C6 3-5	0.65	1.78	7.45	0.42	1.14	4.77
C6 5-7	1.20	3.30	13.79	1.04	2.85	11.91
C6 7-9	1.95	5.35	22.38	1.85	5.10	21.32
C7 0-1	0.71	1.96	8.22	0.32	0.88	3.68
C7 1-3	2.58	7.09	29.64	2.57	7.06	29.54
C8 0-1	1.00	2.75	11.51	0.39	1.07	4.48
C8 1-3	0.42	1.17	4.88	0.30	0.82	3.42
C9 0-1	0.87	2.38	9.97	0.87	2.38	9.97
D2 0-1	0.12	0.34	1.44	0.04	0.12	0.50
D3 0-1	0.31	0.85	3.57	0.27	0.75	3.13
D4 0-1	9.74	26.79	112.04	9.74	26.79	112.04
D4 1-2	1.07	2.94	12.28	0.81	2.23	9.31
D5 0-1	0.77	2.11	8.82	0.53	1.46	6.13
D5 1-3	0.41	1.12	4.68	0.39	1.06	4.45
D6 0-1	0.23	0.64	2.66	0.08	0.23	0.97
E1 0-1	1.22	3.36	14.04	1.04	2.86	11.98
E1 1-3	0.41	1.14	4.77	0.34	0.94	3.91
E2 0-1	0.11	0.29	1.23	0.03	0.08	0.34
E2 1-3	0.13	0.36	1.52	0.01	0.04	0.15
E210-1	1.33	3.66	15.30	1.31	3.60	15.05
E3 0-1	0.69	1.90	7.95	0.04	0.12	0.48
E3 1-3	0.56	1.54	6.44	0.00	0.00	0.00
E6 0-1	0.11	0.31	1.29	0.03	0.08	0.35
E6 1-2	0.49	1.35	5.65	0.44	1.22	5.11
F1 0-1	1.80	4.94	20.65	0.11	0.32	1.32

Summary of the Equilibrium Sediment Benchmark Toxic Unit Calculations for Individual Sediment Samples from the Trenton Channel Site						
	Substituting ½ SSQL for Non-detects			Substituting 0 for Non-detects		
Sample ID	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot
F1 1-3	1.08	2.97	12.44	0.75	2.07	8.65
F12 0-1	0.38	1.04	4.36	0.35	0.95	3.98
F2 0-1	1.27	3.49	14.60	1.22	3.37	14.09
F2 1-3	8.86	24.36	101.89	8.86	24.36	101.89
F4 0-1	0.49	1.36	5.67	0.49	1.36	5.67
F4 1-3	0.75	2.06	8.60	0.75	2.06	8.60
F4 3-5	0.34	0.92	3.86	0.34	0.92	3.86
F5 0-1	0.25	0.70	2.91	0.20	0.56	2.32
F5 1-3	0.25	0.69	2.91	0.02	0.04	0.18
F5 3-5	0.38	1.05	4.41	0.00	0.00	0.00
F6 0-1	0.20	0.55	2.31	0.00	0.00	0.00
F6 1-3	0.27	0.75	3.12	0.00	0.00	0.00
G1 0-1	0.22	0.59	2.47	0.16	0.43	1.81
G11 0-1	1.53	4.20	17.55	1.41	3.87	16.16
G11 1-3	3.22	8.86	37.03	3.22	8.86	37.03
G11 3-5	1.19	3.27	13.67	1.19	3.27	13.67
G11 5-7	0.33	0.92	3.84	0.26	0.73	3.04
G12 0-1	0.41	1.14	4.75	0.28	0.78	3.27
G12 1-3	0.90	2.48	10.36	0.72	1.97	8.24
G13 0-1	1.53	4.21	17.61	0.69	1.89	7.92
G13 1-3	1.17	3.22	13.46	1.17	3.22	13.46
G13 3-5	0.22	0.59	2.48	0.13	0.35	1.44
G3 0-1	1.92	5.27	22.06	1.04	2.86	11.98
H1 0-1	0.06	0.17	0.71	0.05	0.14	0.58
H11 0-1	0.06	0.16	0.66	0.05	0.13	0.54
H11 1-3	0.07	0.19	0.78	0.04	0.11	0.47
H11 3-5	0.18	0.51	2.12	0.17	0.47	1.96
H12 0-1	0.09	0.24	1.02	0.07	0.20	0.83
H12 1-3	0.41	1.12	4.68	0.40	1.09	4.57
H12 3-5	0.26	0.72	3.00	0.18	0.48	2.02
H12 5-7	0.24	0.66	2.75	0.23	0.63	2.62

Summary of the Equilibrium Sediment Benchmark Toxic Unit Calculations for Individual Sediment Samples from the Trenton Channel Site						
	Substituting ½ SSQL for Non-detects			Substituting 0 for Non-detects		
Sample ID	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot
H12 7-9	0.15	0.40	1.67	0.13	0.37	1.54
H13 0-1	0.16	0.43	1.81	0.14	0.37	1.56
H13 1-3	0.22	0.61	2.54	0.21	0.58	2.41
H13 3-5	0.23	0.63	2.64	0.22	0.60	2.52
H13 5-7	0.23	0.63	2.64	0.21	0.58	2.42
H13 7-9	0.26	0.73	3.03	0.26	0.72	2.99
H3 0-1	0.58	1.59	6.65	0.57	1.58	6.59
H3 1-3	0.15	0.42	1.74	0.08	0.23	0.94
H3 3-5	0.19	0.51	2.15	0.02	0.06	0.23
I1 0-1	0.05	0.15	0.62	0.03	0.09	0.37
I1 1-3	0.15	0.41	1.71	0.14	0.39	1.63
I1 3-5	0.11	0.30	1.24	0.04	0.12	0.51
I12 0-1	0.56	1.54	6.43	0.56	1.54	6.43
I12 1-3	0.98	2.70	11.29	0.98	2.70	11.29
I12 3-5	1.81	4.99	20.86	1.81	4.99	20.86
I2 0-1	0.79	2.17	9.07	0.76	2.08	8.70
I2 1-3	0.26	0.73	3.04	0.05	0.14	0.58
I2 3-5	0.20	0.55	2.31	0.00	0.00	0.00
I3 0-1	0.08	0.23	0.97	0.03	0.09	0.36
I3 1-3	0.32	0.89	3.73	0.07	0.20	0.83
J1 0-1	0.37	1.03	4.29	0.37	1.02	4.25
J1 1-3	0.38	1.04	4.37	0.31	0.84	3.52
J1 3-5	0.32	0.88	3.69	0.25	0.68	2.83
K1 0-1	62.76	172.60	721.78	45.49	125.09	523.09
K1 1-3	10.37	28.51	119.21	8.63	23.74	99.28
K1 3-5	9.92	27.29	114.13	9.92	27.29	114.13
K1 5-7	8.27	22.73	95.05	6.05	16.63	69.54
K1 7-9	2.22	6.09	25.49	1.96	5.40	22.59
K1 9-11	3.11	8.56	35.81	3.11	8.56	35.81
S1 0-1	1.37	3.78	15.79	0.59	1.63	6.83
S1 1-3	1.26	3.45	14.44	0.84	2.32	9.69

Summary of the Equilibrium Sediment Benchmark Toxic Unit Calculations for Individual Sediment Samples from the Trenton Channel Site						
	Substituting ½ SSQL for Non-detects			Substituting 0 for Non-detects		
Sample ID	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot	ESBTU13	Upper 50% Limits for ESBTUtot	Upper 95% Limit for ESBTUtot
S1 3-5	0.74	2.05	8.56	0.58	1.59	6.64
S1 5-7	0.58	1.60	6.67	0.49	1.34	5.61
S1 7-9	0.10	0.26	1.10	0.02	0.05	0.21
S1 9-11	0.35	0.97	4.04	0.00	0.00	0.00
S2 0-1	0.35	0.97	4.06	0.21	0.57	2.39
S2 1-3	0.60	1.66	6.95	0.44	1.20	5.02
S2 3-5	1.22	3.34	13.98	1.22	3.34	13.98
S2 5-7	0.34	0.92	3.86	0.19	0.51	2.15

Where:

$ESBTU_{13}$	Equilibrium Sediment Benchmark Toxic Unit, based on 13 individual PAHs
$ESBTU_{tot}$	Equilibrium Sediment Benchmark Toxic Unit, based on the total of 34 individual PAHs
Upper 50% Limit	Refers to the use of a correction factor of 2.75 that is applied to the ESBTU 13 to derive an estimate for ESBTU from the total of 34 PAHs with 50% confidence in the corrected result
Upper 95% Limit	Refers to the use of a correction factor of 11.5 that is applied to the ESBTU 13 to derive an estimate for ESBTU from the total of 34 PAHs with 95% confidence in the corrected result

APPENDIX H – OBSERVED RESULTS FOR INDIVIDUAL SAMPLES DESCRIBED IN THE TRENTON CHANNEL REMEDIAL INVESTIGATION REPORT

(location and depth interval for each sample is specified in the sample ID)

Notes for the tables provided within this appendix:

- J – Value is an estimate.
- U – Indicates that the compound was analyzed for, but not detected.
- NA – Not applicable
- PCT – percent
- PPB – parts per billion
- PPM – parts per million
- UMG – µmole/gram
- Totals – Results are calculated totals rather than results reported by the laboratory, and therefore were not directly flagged. "U" flag reflects that all individual analyses were non-detect. The value reported with the U flag is the maximum individual reporting limit.

Individual Results for Trenton Channel Remedial Investigation, Analytes Measured in Phase I Only

Sample ID	Sample Date	Oil and Grease (PPM)	pH	Atterberg Limits			Sediment Physical Characteristics					
				Liquid Limit	Plasticity Index	Plastic Limit	Clay Content (PCT)	Silt Content (PCT)	Gravel Content (PCT)	Coarse Sand Content (PCT)	Fine Sand Content (PCT)	Medium Sand Content (PCT)
A1 0-1	20061222	270U	7.7J	0	0U	0	12.9	32.8	1.2	3	37.4	12.7
A1 1-3	20061222	314U	8.1J	45	13	32	28.8	33.8	0	0.8	32.7	3.9
A1 3-5	20061222	378U	8.5J	48	15	33	39.4	39.4	0.7	0.8	17.3	2.3
A11 0-1	20061222	372U	8J	54	17	37	35.2	43.1	0.3	2.9	14.3	4.2
A11 1-3	20061222	279U	8.2J	0	0U	0	10.4	21.4	3.2	1.4	60.3	3.2
A11 3-5	20061222	244U	8.1J	25	9	16	40.4	31.5	3.1	3.4	16	5.6
B1 0-1	20061222	261U	8.5J	26	10	16	43.5	31.5	2.7	3.1	13.4	5.8
B2 0-1	20061222	238U	8.3J	27	11	16	43.1	31.5	3.1	3.1	13.4	5.8
C1 0-1	20061221	324U	7J	44	0U	0	21.5	38.8	2.8	1.1	32.2	3.6
C1 1-3	20061221	840	7J	0	0U	0	19.7	29.4	4.2	3	38.6	5.1
C1 3-5	20061221	300U	7.9J	0	0U	0	12.7	22.6	8.6	5.4	40.1	10.6
C11 0-1	20061221	398U	6.9J	62	25	37	33.3	53.2	0.4	0	12.2	0.8
C11 1-3	20061221	440U	7.9J	71	31	40	47.5	48.7	0	0	3.8	0
C11 3-5	20061221	386U	7.3J	61	25	36	41.5	52.3	0	0	6.1	0.1
C11 5-7	20061221	380U	8.5J	61	24	37	47.2	43.2	0	0	9.2	0.4
C12 0-1	20061221	2780	8.8J	0	0U	0	3.2	8.1	63.8	7.6	9.7	7.5
C12 1-3	20061221	1760	8.1J	66	32	34	35.5	27.5	11.3	9.4	9.6	6.7
C12 3-5	20061221	350U	8J	64	27	37	48.7	37.2	0	0.8	10.9	2.4
C3 0-1	20061221	361U	7.6J	0	0U	0	28.6	35.2	0.2	0.6	32.2	3.2
C3 1-3	20061221	370U	7.4J	0	0U	0	29.5	34.7	0	0.9	32.5	2.5
C3 3-5	20061221	303U	8.2J	0	0U	0	21.5	21.8	2.6	2.9	46.4	4.8
D2 0-1	20061221	244U	8.2J	26	10	16	44.7	25.2	6	4.1	13.5	6.5
D3 0-1	20061221	252U	8.6J	25	9	16	40.4	31.2	3.2	4.1	15.2	5.8
E1 0-1	20061221	245U	8.3J	26	9	16	40.9	29.1	6.3	4	13.8	6
E1 1-3	20061221	241U	8.3J	24	9	16	43.4	31.6	2.6	3.1	13.6	5.6
E2 0-1	20061222	244U	8.3J	27	11	16	43.1	23.7	7.7	4.6	13.5	7.5
E2 1-3	20061222	243U	8.2J	26	9	16	49.4	23.1	6.9	3	12.3	5.3
E21 0-1	20061221	255U	8.2J	28	11	17	42	28.6	6.6	2.7	14.6	5.4
F1 0-1	20061221	442U	7.1J	59	25	34	36.5	41.4	0	0.5	20.6	1
F1 1-3	20061221	324U	7.7J	43	16	27	33.9	40	1.6	2.5	18	4

Individual Results for Trenton Channel Remedial Investigation, Analytes Measured in Phase I Only

Sample ID	Sample Date	Oil and Grease (PPM)	pH	Atterberg Limits			Sediment Physical Characteristics					
				Liquid Limit	Plasticity Index	Plastic Limit	Clay Content (PCT)	Silt Content (PCT)	Gravel Content (PCT)	Coarse Sand Content (PCT)	Fine Sand Content (PCT)	Medium Sand Content (PCT)
F12 0-1	20061221	342U	7.2J	0	0U	0	9.9	20.1	20.5	6.4	31.4	11.6
F2 0-1	20061221	1420	7.6J	0	0U	0	6.2	14.6	15.6	8	38.1	17.4
F2 1-3	20061221	276U	8J	34	12	22	34.1	24.9	3.1	3.5	26.4	8
G1 0-1	20061221	249U	8.2J	25	10	16	38.4	36	1	4.7	14.1	5.8
G11 0-1	20061220	359U	7.3J	54	23	31	31.4	55.8	4.1	1.3	5.9	1.5
G11 1-3	20061220	360U	7.6J	56	23	33	38.4	51.3	0.6	0.5	7.1	2.1
G11 3-5	20061220	285U	8J	26	9	17	27.6	24	13.8	6.1	20.1	8.3
G11 5-7	20061220	240U	8.1J	25	9	16	35.3	31	10.4	2.8	14.5	6
G12 0-1	20061221	326U	7.7J	0	0U	0	7.1	35.7	37	6	9.2	5.1
G12 1-3	20061221	404U	7.8J	0	0U	0	12.5	70.2	5	4	4.5	3.9
G3 0-1	20061221	692	11.8J	0	0U	0	0	63.5	0	2.6	17.3	16.5
H1 0-1	20061220	264U	8.5J	0	0U	0	1	27.2	45.5	2.5	9.6	14.1
H11 0-1	20061220	280U	10.1J	0	0U	0	2.7	5.3	13.8	9.8	17.8	50.7
H11 1-3	20061220	331U	11.4J	0	0U	0	14.4	42.2	5.9	4.8	10.7	22.1
H11 3-5	20061220	382U	11.4J	0	0U	0	18	64.3	0	0.5	11.8	5.4
H12 0-1	20061219	655	12J	0	0U	0	19.9	21.8	1.2	1.1	40.7	15.2
H12 1-3	20061219	334U	12.3J	0	0U	0	21.2	40.2	1.7	0.6	26.4	9.9
H12 3-5	20061219	379U	12.5J	0	0U	0	24.7	60.7	0	0.4	10.4	3.9
H12 5-7	20061219	386U	12.3J	0	0U	0	27.2	40.8	0	0.8	21.7	9.4
H12 7-9	20061219	347U	12.1J	0	0U	0	22.8	39.6	1.2	3.5	19.5	13.5
H13 0-1	20061221	388	11.2J	0	0U	0	7.8	49.4	5.6	7.6	12.9	16.7
H13 1-3	20061221	358U	11.7J	0	0U	0	15.2	75.9	0	0.8	5.6	2.5
H13 3-5	20061221	367U	11.9J	0	0U	0	16.2	63.3	0.6	0.2	14.2	5.4
H13 5-7	20061221	518	11.9J	0	0U	0	12.4	22.1	4.9	3.5	36.2	20.9
H13 7-9	20061221	381U	12.1J	0	0U	0	15.1	17.4	16	7.6	23.7	20.2
H3 0-1	20061220	336U	11.2J	0	0U	0	22.2	33	2.1	7.7	20.1	15
H3 1-3	20061220	248U	9.3J	26	8	18	22.9	33.9	10.7	4.2	18.7	9.7
H3 3-5	20061220	231U	8.7J	19	5	14	27.3	33.1	4.7	4.5	21.1	9.4
I1 0-1	20061219	419	10.8J	0	0U	0	3.9	6.5	12.6	21.8	23	32.3
I1 1-3	20061219	298U	11.2J	0	0U	0	10	12.6	4.3	7.5	28.4	37.1

Individual Results for Trenton Channel Remedial Investigation, Analytes Measured in Phase I Only

Sample ID	Sample Date	Oil and Grease (PPM)	pH	Atterberg Limits			Sediment Physical Characteristics					
				Liquid Limit	Plasticity Index	Plastic Limit	Clay Content (PCT)	Silt Content (PCT)	Gravel Content (PCT)	Coarse Sand Content (PCT)	Fine Sand Content (PCT)	Medium Sand Content (PCT)
I1 3-5	20061219	237U	9.4J	23	8	15	37.4	31.1	2.9	4.6	16.1	7.9
I12 0-1	20061219	274U	11J	0	0U	0	8.1	8.2	31.4	18.6	16.4	17.4
I12 1-3	20061219	291U	9.4J	0	0U	0	23.9	28.6	7.4	6.3	22.9	11
I12 3-5	20061219	251U	8.5J	31	12	19	41.1	30.8	3.5	2.7	15.4	6.5
I2 0-1	20061220	273U	11.2J	0	0U	0	4.1	46.3	12.5	2.7	23.4	11
I2 1-3	20061220	243U	9.1J	24	9	16	36.3	34.9	2.5	5.2	13.9	7.2
I2 3-5	20061220	243U	8.9J	27	10	16	43.5	33.7	2.5	2.1	12.8	5.5
I3 0-1	20061220	239U	8.8J	25	9	16	38.8	26.7	4.5	4.9	15.6	9.5
I3 1-3	20061220	241U	8.8J	27	10	16	39.2	26.1	6.8	5	14.6	8.3
J1 0-1	20061219	298U	8.6J	53	16	37	25.6	23.2	14.6	7.9	16.3	12.5
J1 1-3	20061219	385	8J	57	18	39	29.5	25.2	12.2	6.3	17.6	9.2
J1 3-5	20061219	292U	8J	44	13	31	20.3	13.6	28.3	10.2	14.6	13.1
K1 0-1	20061220	12100	9.4J	0	0U	0	8.8	11.1	20.4	9.6	25.6	24.5
K1 1-3	20061220	1950	9.5J	0	0U	0	13.5	36	1	3.2	25.6	20.7
K1 3-5	20061220	435	8.4J	51	7	44	30.1	51.9	0	0.9	11.7	5.4
K1 5-7	20061220	397U	8.1J	52	9	44	37	56.5	0	0	5.7	0.8
K1 7-9	20061220	398U	9.3J	49	4	45	33	60.7	0	0	5.6	0.7
K1 9-11	20061220	342U	8.3J	41	7	34	27.6	46.7	0.7	1.3	21	2.7

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo[a]-anthracene	Dibenz[a,h]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene
A1 0-1	20061222	1300	1400	14000	29000	2500J	23000	27000	6200J	9500
A1 1-3	20061222	1700J	2100J	11000	14000	6200UJ	12000	14000	3900J	4600J
A1 3-5	20061222	3700U	1700J	9000	13000	7500UJ	11000	8700	4900J	7500U
A11 0-1	20061222	1800J	2300J	7900	10000	7900UJ	8800	9600	2800J	3600J
A11 1-3	20061222	1100	790	4900	6300	520J	6000	5700	1900U	2100
A11 3-5	20061222	54J	120U	200	250	240U	240	220J	1900	240U
B1 0-1	20061222	130U	130U	130U	71J	260U	260U	260U	260U	260U
B2 0-1	20061222	120U	120U	120U	120U	240U	240U	240U	240U	240U
B3 0-1	20070710	240U	240U	240U	240U	470U	470U	470U	470U	470U
B3 1-2	20070710	240U	240U	240U	240U	480U	480U	480U	480U	480U
B4 0-1	20070711	570	250U	860	1300	500U	1100	1400	750J	550
B4 1-3	20070711	240U	240U	130J	180J	480U	480U	480U	480U	480U
C1 0-1	20061221	140J	320U	430	3200U	6500UJ	6500U	6500U	6500UJ	6500U
C1 1-3	20061221	340U	340U	240J	420	6700UJ	6700U	6700U	6700UJ	6700U
C1 3-5	20061221	180J	310U	470	770	6200UJ	6200U	6200U	6200UJ	6200U
C11 0-1	20061221	4200U	4200U	4200U	1800J	8500U	8500U	8500U	8500U	8500U
C11 1-3	20061221	330J	420U	4200U	4200U	8400U	8400U	8400U	8400U	8400U
C11 3-5	20061221	330J	390U	3900U	1600	7800U	7800U	7800U	7800U	7800U
C11 5-7	20061221	330J	320J	1200	1600	7000U	7000U	1700	7000U	7000U
C12 0-1	20061221	2700U	2700U	1400J	2100J	5400UJ	1900J	2600J	5400UJ	5400U
C12 1-3	20061221	3200U	3200U	3200U	1500J	64000UJ	64000U	64000U	64000UJ	64000U
C12 3-5	20061221	3600U	3600U	3600U	36000U	71000UJ	71000U	71000U	71000UJ	71000U
C3 0-1	20061221	2500J	1800J	9000	14000	7400U	13000	12000	5000J	4400J
C3 1-3	20061221	3600U	3600U	4600	7300	7100U	6800J	6900J	3400J	2500J
C3 3-5	20061221	13000U	13000U	29000	39000	27000U	35000	24000J	15000J	13000J
C4 0-1	20070711	410	200J	1200	2400	550U	2500	2900	1500	980
C4 1-3	20070711	130J	250U	320	540	510U	490J	640	350J	510U
C4 3-5	20070711	240U	240U	240U	240U	480U	480U	480U	480U	480U
C5 0-1	20070710	2400J	2500J	4900	13000	7200U	13000	15000	5500J	5300J
C5 1-3	20070710	2600U	2600U	2300J	3800	5100U	3700J	3600J	5100U	5100U
C5 3-5	20070710	240U	240U	100J	150J	480U	480U	480U	480U	480U

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo[a]-anthracene	Dibenz[a,h]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene
C6 0-1	20070711	3800U	3800U	3800U	3800U	7600U	7600U	7600U	7600U	7600U
C6 1-3	20070711	3800U	3800U	3800U	3800U	7600U	7600U	7600U	7600U	7600U
C6 3-5	20070711	3500U	3500U	1800J	2700J	7100U	7100U	7100U	7100U	7100U
C6 5-7	20070711	3800UJ	3800UJ	3700J	4400J	7600UJ	3900J	4400J	7600UJ	7600UJ
C6 7-9	20070711	3000J	3500U	6000	7300	6900U	6400	7500J	3700J	6900U
C7 0-1	20070710	3400U	3400U	3400U	1900J	6700U	6700U	6700U	6700U	6700U
C7 1-3	20070710	1100	280U	2700	4700	570U	4300	5300	2600	1800
C8 0-1	20070711	3400U	3400U	3400U	1400J	6800U	6800U	6800U	6800U	6800U
C8 1-3	20070711	3500U	3500U	3500U	3600	7000U	3500J	4600J	7000U	7000U
C9 0-1	20070710	350	230J	1600J	3000	680U	3200	4100	2000	1200
D2 0-1	20061221	120U	120U	120U	120U	240U	240U	240U	240U	240U
D3 0-1	20061221	240U	240U	210J	380	480UJ	380J	460J	480UJ	170J
D4 0-1	20070711	580	280	1900	2800	480U	2800	2700	1600	920
D4 1-2	20070711	240U	240U	170J	330	480U	360J	290J	480U	480U
D5 0-1	20070710	2900U	2900U	2900U	3200	5800U	2900J	4000J	5800U	5800U
D5 1-3	20070710	260U	260U	250J	680	520U	680	840	520U	330J
D6 0-1	20070710	230U	230U	230U	130J	470U	470U	470U	470U	470U
E1 0-1	20061221	240U	140J	520	1300	4800U	1600	1800	4800U	4800U
E1 1-3	20061221	240U	240U	170J	440	480U	470J	430J	170J	150J
E2 0-1	20061222	120U	120U	120U	54J	240U	240U	240U	240U	240U
E2 1-3	20061222	120U	120U	120U	120U	240U	240U	240U	240U	240U
E21 0-1	20061221	160J	250U	660	1000	490U	990	1200	300J	440J
E3 0-1	20070710	240U	240U	240U	240U	470U	470U	470U	470U	470U
E3 1-3	20070710	240U	240U	240U	240U	470U	470U	470U	470U	470U
E6 0-1	20070711	240U	240U	240U	240U	480U	480U	480U	480U	480U
E6 1-2	20070711	260U	260U	380	860	510U	860	1000	510	430J
F1 0-1	20061221	2200U	2200U	2200U	22000U	44000U	44000U	44000U	44000U	44000U
F1 1-3	20061221	3200U	3200U	1900J	2900J	6300UJ	2500J	2800J	6300UJ	6300U
F12 0-1	20061221	350	220J	1300	2200	6800UJ	1700J	2200J	6800UJ	6800U
F2 0-1	20061221	1500J	2900U	3300	5800	5800UJ	4800J	5800	1900J	2300J
F2 1-3	20061221	7200	1700J	9700	10000	5500U	9600	12000	5500U	4200J

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo[a]-anthracene	Dibenz[a,h]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene
F4 0-1	20070711	680	260J	1600	3000	680U	2700	3800	1300	1000
F4 1-3	20070711	550	260J	1800	3600	680U	3000	4200	820	1400
F4 3-5	20070711	570	330	2200	4300	620U	4200	5300	2400	2100
F5 0-1	20070710	120J	240U	160J	180J	480U	130J	150J	480U	480U
F5 1-3	20070710	240U	240U	240U	240U	480U	480U	480U	480U	480U
F5 3-5	20070710	360U	360U	360U	360U	720U	720U	720U	720U	720U
F6 0-1	20070711	240U	240U	240U	240U	480U	480U	480U	480U	480U
F6 1-3	20070711	230U	230U	230U	230U	470U	470U	470U	470U	470U
G1 0-1	20061221	240U	240U	110J	170J	490UJ	160J	170J	490UJ	490U
G11 0-1	20061220	1800U	1800U	3100	6500	3600U	5600	5200	1300J	1700J
G11 1-3	20061220	3100J	1600J	11000	16000	7100U	14000	14000	7200	3900J
G11 3-5	20061220	230J	170J	680	1300	550UJ	830	1200	490J	390J
G11 5-7	20061220	120U	120U	94J	140	240U	240U	240U	240U	240U
G12 0-1	20061221	3700U	3700U	2100J	3500J	7500UJ	2800J	3300J	7500UJ	7500U
G12 1-3	20061221	4200U	4200U	3400J	4600	8500UJ	3800J	4300J	8500UJ	8500U
G13 0-1	20070711	8600U	8600U	8600U	6000	17000U	17000U	17000U	17000U	17000U
G13 1-3	20070711	950	570	3500	6100	800U	5100	5600	2600	1700
G13 3-5	20070711	240U	240U	140J	250	490U	490U	490U	490U	490U
G3 0-1	20061221	230J	540U	730	1300	11000U	11000U	11000U	11000U	11000U
H1 0-1	20061220	260U	260U	210J	290	510U	240J	510U	510U	510U
H11 0-1	20061220	140U	140U	71J	170	280U	180J	230J	280U	280U
H11 1-3	20061220	160U	160U	81J	110J	320U	320U	320U	320U	320U
H11 3-5	20061220	180U	180U	340	380	370U	240J	340J	370U	370U
H12 0-1	20061219	180U	180U	1800U	500	370U	440	510	370U	370U
H12 1-3	20061219	170U	240	710	660	340U	500	590	340U	340U
H12 3-5	20061219	180U	150J	1800U	1800U	360U	350J	370	360U	360U
H12 5-7	20061219	190U	190U	380	520	370U	530	660	370U	370U
H12 7-9	20061219	160U	160U	320	450	330U	440	480	330U	330U
H13 0-1	20061221	160U	160U	220	240	330U	330U	220J	330U	330U
H13 1-3	20061221	170U	120J	230	280	160J	190J	250J	340U	340U
H13 3-5	20061221	190U	82J	320	420	370U	350J	330J	370U	370U

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo[a]-anthracene	Dibenz[a,h]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene
H13 5-7	20061221	400U	400U	550	590	800U	510J	610J	800U	800U
H13 7-9	20061221	410U	180J	860	1600	830UJ	1000	1400	830UJ	570J
H3 0-1	20061220	320U	340	860	2800	260J	1700	2300	590J	820J
H3 1-3	20061220	240U	240U	240U	130J	480U	480U	140J	480U	480UJ
H3 3-5	20061220	230U	230U	230U	230U	460U	460U	460U	460U	460UJ
I1 0-1	20061219	130U	130U	130U	130U	260U	260U	260U	260U	260U
I1 1-3	20061219	150U	150U	240	390	290U	260J	390	290U	290U
I1 3-5	20061219	120U	120U	120U	120U	250U	250U	250U	250U	250U
I12 0-1	20061219	180	290	1700	1900	270U	1700	1600	710	510
I12 1-3	20061219	330	390	2100	3000	310	2800	2600	1100	820
I12 3-5	20061219	140	210	1100	1400	210J	1500	1300	620	470
I2 0-1	20061220	330U	190J	810	860	650U	780	820	370J	650UJ
I2 1-3	20061220	230U	230U	230U	230U	470U	470U	470U	470UJ	470UJ
I2 3-5	20061220	240U	240U	240U	240U	480U	480U	480U	480UJ	480UJ
I3 0-1	20061220	250U	250U	250U	130J	490U	490U	490U	490UJ	490UJ
I3 1-3	20061220	240U	240U	240U	240U	480U	480U	480U	480UJ	480UJ
J1 0-1	20061219	200	150U	730	820	290U	720	920	290U	320
J1 1-3	20061219	220	160U	520	1100	3200U	3200U	3200U	3200U	3200U
J1 3-5	20061219	95J	150U	99J	310	2900U	2900U	2900U	2900U	2900U
K1 0-1	20061220	15000U	15000U	15000U	150000U	300000U	300000U	300000U	300000U	300000UJ
K1 1-3	20061220	3800U	3800U	2000J	38000U	75000U	75000U	75000U	75000U	75000UJ
K1 3-5	20061220	550	740	3600	4700	8600UJ	4300J	5000J	8600UJ	9000J
K1 5-7	20061220	4000U	4000U	6400	6500	81000U	81000U	81000U	81000U	81000UJ
K1 7-9	20061220	4000U	4000U	4100	4700	8000U	3800J	3200J	8000U	8000UJ
K1 9-11	20061220	400	590	3400	3700	7300U	3200	3600	7300U	3300
S1 0-1	20070711	3600U	3600U	3600U	2300J	7100U	7100U	7100U	7100U	7100U
S1 1-3	20070711	3800U	3800U	1700J	2900J	7500U	7500U	7500U	7500U	7500U
S1 3-5	20070711	3400U	3400U	2100J	3100J	6800U	2700J	2800J	6800U	6800U
S1 5-7	20070711	3700U	3700U	2400J	3700	730U	3100J	3800J	1600J	1400
S1 7-9	20070711	300U	300U	300U	300U	610U	610U	610U	610U	610U
S1 9-11	20070711	240U	240U	240U	240U	480U	480U	480U	480U	480U

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo[a]-anthracene	Dibenz[a,h]-anthracene	Benzo[a]-pyrene	Benzo[b]-fluoranthene	Benzo[g,h,i]-perylene	Benzo[k]-fluoranthene
S2 0-1	20070710	290J	190J	680	880	8100UJ	8100UJ	8100UJ	8100UJ	8100UJ
S2 1-3	20070710	410	300J	1400	1500	7400UJ	7400UJ	7400UJ	7400UJ	7400UJ
S2 3-5	20070710	510	730	2700	3500	350J	3000	3600	940	1100
S2 5-7	20070710	240U	240U	240U	160J	470U	140J	160J	470U	470U

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Total PAH
A1 0-1	20061222	25000	58000	3500	8200	820	1400	40000J	43000	293820
A1 1-3	20061222	14000	27000	4500	4200J	2300J	6100	22000J	22000	165400
A1 3-5	20061222	12000	18000	3600J	7500U	3200J	7800	21000	20000	133900
A11 0-1	20061222	10000	17000	5500	2900J	4500J	6600	21000J	19000	133300
A11 1-3	20061222	5900	10000	2100	1800	1500	1500	12000J	13000	75210
A11 3-5	20061222	250	400	100J	240U	100J	100J	540	510	4864
B1 0-1	20061222	86J	72J	130U	260U	320U	130U	73J	110J	412
B2 0-1	20061222	120U	120U	120U	240U	300U	120U	84J	120U	84
B3 0-1	20070710	240U	240U	240U	470U	590U	240U	110J	240U	110
B3 1-2	20070710	240U	240U	240U	480U	600U	240U	100J	240U	100
B4 0-1	20070711	1300	2800	590	650J	290J	790	2900	2100	17950
B4 1-3	20070711	220J	380	240U	480U	600U	150J	430	310	1800
C1 0-1	20061221	3200U	1900	250J	6500U	290J	550	1400	1700J	6660
C1 1-3	20061221	550	1000	200J	6700U	290J	460	1200	1100	5460
C1 3-5	20061221	1000	1800	520	6200U	370J	590	2000	2200	9900
C11 0-1	20061221	2700J	3400J	4200U	8500U	11000U	4200U	2800J	3500J	14200
C11 1-3	20061221	2200	3300	610	8400U	1200	1300	3500	3500	15940
C11 3-5	20061221	2300	3000	600	7800U	1400	1300	3800	3600	17930
C11 5-7	20061221	2100	3700	720	7000U	1100	1500	4400	3200	21870
C12 0-1	20061221	2200J	5500	2700U	5400U	6800U	2700U	5500	4600	25800
C12 1-3	20061221	2200J	3700	3200U	64000U	1600J	1400J	4100J	4300J	18800
C12 3-5	20061221	36000U	2500J	3600U	71000U	8900U	3600U	2800J	36000U	5300
C3 0-1	20061221	15000	24000	4600	4700J	1900J	8800	21000	22000	163700
C3 1-3	20061221	7400	12000	1700J	3200J	8900U	9600	9700	10000	85100
C3 3-5	20061221	41000	61000	8400J	15000J	34000U	13000	54000	60000	407400
C4 0-1	20070711	2600	4700	800	1300	560J	1100	3800	4000	30950
C4 1-3	20070711	680	1400	200J	510U	630U	330	1100	1000	7180
C4 3-5	20070711	150J	200J	240U	480U	600U	240U	240	180J	770
C5 0-1	20070710	14000	23000	3900	5800J	9000U	2900J	20000	22000	153200
C5 1-3	20070710	3500	5200	2600U	5100U	6400U	1300J	5500	6200	35100
C5 3-5	20070710	150J	470	240U	480U	600U	240U	370	380	1620

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Grouping II

Sample ID	Sample Date	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Total PAH
C6 0-1	20070711	3800U	2000J	3800U	7600U	9600U	3800U	2200J	2100J	6300
C6 1-3	20070711	3800U	4800	3800U	7600U	9500U	3800U	4600	3900	13300
C6 3-5	20070711	2900J	6200	3500U	7100U	8800U	2200J	4500	4800	25100
C6 5-7	20070711	4800J	8000J	2000J	7600UJ	2300J	2500J	9300J	8900J	54200
C6 7-9	20070711	8400	16000	4900	6900U	4200J	5400	19000	15000	106800
C7 0-1	20070710	1900J	4600	3400U	6700U	8400U	3400U	4000	3500	15900
C7 1-3	20070710	4400	14000	1800	2200	410J	800	11000	10000	67110
C8 0-1	20070711	1800J	3400	3400U	6800U	8500U	3400U	2900J	3100J	12600
C8 1-3	20070711	4400	7300	3500U	7000U	8700U	3500U	7200	7400	38000
C9 0-1	20070710	3200	6900	640	2000	470J	930	4700	6900	41420
D2 0-1	20061221	81J	84J	120U	240U	300U	120U	120	100J	385
D3 0-1	20061221	470	570	240U	160J	600U	200J	390	550	3940
D4 0-1	20070711	2700	6000	770	1200	250J	1700	4900	5600	36700
D4 1-2	20070711	350	460	240U	480U	600U	240U	530	520	3010
D5 0-1	20070710	2900	7000	2900U	5800U	7300U	2900U	5300	5500	30800
D5 1-3	20070710	690	1800	160J	520U	650U	130J	950	1200	7710
D6 0-1	20070710	230U	230	230U	470U	590U	230U	230	220J	810
E1 0-1	20061221	1300	1700	150J	4800U	600U	120J	1100J	2100	11830
E1 1-3	20061221	470	580	240U	160J	600U	240U	380J	600	4020
E2 0-1	20061222	58J	120U	120U	240U	300U	120U	94J	90J	296
E2 1-3	20061222	120U	120U	120U	240U	300U	120U	87J	120U	87
E21 0-1	20061221	1000	2100	300	300J	150J	180J	2000J	2200	12980
E3 0-1	20070710	240U	240U	240U	470U	590U	240U	100J	240U	100
E3 1-3	20070710	240U	240U	240U	470U	590U	240U	240U	240U	590U
E6 0-1	20070711	240U	250	240U	480U	600U	240U	340	240U	590
E6 1-2	20070711	790	1700	260U	490J	640U	260U	770	1400	9190
F1 0-1	20061221	22000U	3000	2200U	44000U	5500U	2200U	2400	22000U	5400
F1 1-3	20061221	3100J	5300	3200U	6300U	7900U	3200U	4900	5300	28700
F12 0-1	20061221	2600	4300	800	6800U	330J	780	3200	5500	25480
F2 0-1	20061221	6100	11000	1800J	1900J	7300U	1400J	8400	10000	66000
F2 1-3	20061221	11000	26000	7400	5500U	7000	19000	34000J	22000	180800

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Total PAH
F4 0-1	20070711	3600	7200	1100	1200	600J	1300	5000	6300	40640
F4 1-3	20070711	4400	8400	990	1500	850	1200	5200	7300	45470
F4 3-5	20070711	5000	8800	1000	1900	600J	1200	6100	7600	53600
F5 0-1	20070710	200J	390	100J	480U	610U	240U	390	410	2230
F5 1-3	20070710	240U	240U	240U	480U	600U	240U	100J	240U	100
F5 3-5	20070710	360U	360U	360U	720U	900U	360U	360U	360U	900U
F6 0-1	20070711	240U	240U	240U	480U	600U	240U	240U	240U	600U
F6 1-3	20070711	230U	230U	230U	470U	590U	230U	230U	230U	590U
G1 0-1	20061221	180J	270	240U	490U	610U	130J	340	310	1840
G11 0-1	20061220	6000	8600	990J	2400J	770J	1800U	6900	9200	58260
G11 1-3	20061220	17000	28000	5700	6200J	5300J	2400J	37000	36000	208400
G11 3-5	20061220	1400	2600	590	430J	790	690	3200	2900	17890
G11 5-7	20061220	140	250	72J	240U	130J	130	370	310	1636
G12 0-1	20061221	3800	6100	3700U	7500U	9300U	3700U	5100	5900	32600
G12 1-3	20061221	5000	8100	4200U	8500U	11000U	1900J	8000	7900	47000
G13 0-1	20070711	7300	10000	8600U	17000U	21000U	8600U	8500	9500	41300
G13 1-3	20070711	6000	12000	1500	2300	790J	1500	9600	9900	69710
G13 3-5	20070711	280	330	240U	490U	610U	240U	370	390	1760
G3 0-1	20061221	1600	2900	570	11000U	330J	710	2700J	2900	13970
H1 0-1	20061220	320	570	120J	510U	290J	270	600	630	3540
H11 0-1	20061220	170	320	140U	280U	97J	120J	230	310	1898
H11 1-3	20061220	120J	200	160U	320U	400U	86J	180	170	947
H11 3-5	20061220	310	1100	180	370U	79J	170J	810	910	4859
H12 0-1	20061219	520	1300	180	370U	190J	190	1300	1600	6730
H12 1-3	20061219	600	2100	440	340U	440	390	2100	1700	10470
H12 3-5	20061219	1800U	1200	290	360U	360J	180U	1900	1600	6220
H12 5-7	20061219	520	1400	260	370U	400J	820	1400	1100	7990
H12 7-9	20061219	480	710	160U	330U	320J	420	910	890	5420
H13 0-1	20061221	280	590	120J	330U	110J	98J	620	550	3048
H13 1-3	20061221	300	610	190	170J	190J	210	1100	620	4620
H13 3-5	20061221	380	900	190	370U	220J	520	910	870	5492

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Total PAH
H13 5-7	20061221	510	1300	400U	800U	590J	3100	1900	1300	10960
H13 7-9	20061221	1200	2600	480	380J	1000	3900	2500	2500	20170
H3 0-1	20061220	2900	4700	160J	810	250J	850	3400	4300J	27040
H3 1-3	20061220	170J	310	240U	480U	600U	240U	440	260	1450
H3 3-5	20061220	230U	230U	230U	460U	580U	230U	180J	230U	180
I1 0-1	20061219	110J	230	130U	260U	89J	130	250	160	969
I1 1-3	20061219	490	1500	190	290U	340J	570	1100	1300	6770
I1 3-5	20061219	120U	100J	120U	250U	310U	120	180	120U	400
I12 0-1	20061219	1800	4100	800	670	610	370	4900	3800	25640
I12 1-3	20061219	2800	6700	980	1100	920	520	6400	6500	39370
I12 3-5	20061219	1400	3200	460	620	620	370	3000	3300	19920
I2 0-1	20061220	950	1500	400	340J	340J	340	2200	2000J	11900
I2 1-3	20061220	230U	230U	230U	470U	580U	230U	220J	130J	350
I2 3-5	20061220	240U	240U	240U	480U	610U	240U	240U	240UJ	610U
I3 0-1	20061220	110J	190J	250U	490U	620U	250U	210J	220J	860
I3 1-3	20061220	240U	130J	240U	480U	600U	240U	150J	150J	430
J1 0-1	20061219	980	2200	390	270J	570	730	1900	2900	13650
J1 1-3	20061219	1600	2200	480	3200U	520	700	2400	4700	14440
J1 3-5	20061219	780	410	150U	2900U	550	3800	1500	790	8334
K1 0-1	20061220	150000U	15000U	15000U	300000U	6300J	520000	8300J	150000U	534600
K1 1-3	20061220	38000U	9900	1600J	75000U	3000J	360000	12000	38000U	388500
K1 3-5	20061220	5100	7500	1500	8600U	3300	210000	11000	13000J	279290
K1 5-7	20061220	6400	11000	2900J	81000U	3300J	100000	18000	18000	172500
K1 7-9	20061220	3700J	8200	2200J	8000U	1700J	9400	12000	9700	62700
K1 9-11	20061220	3700	6200	1500	7300U	1500	7100	8600	11000	57790
S1 0-1	20070711	2300J	4100	3600U	7100U	8900U	3600U	3400J	3900	16000
S1 1-3	20070711	3300J	8500	3800U	7500U	9400U	2900J	5500	5700	30500
S1 3-5	20070711	3000J	6300	3400U	6800U	8500U	2500J	5400	4900	32800
S1 5-7	20070711	3700J	7300J	3700U	1400J	1200	3000J	6200J	6700J	45500
S1 7-9	20070711	300U	180J	300U	610U	760U	300U	140J	130J	450
S1 9-11	20070711	240U	240U	240U	480U	600U	240U	240U	240U	600U

Individual and Total PAHs Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)-pyrene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Total PAH
S2 0-1	20070710	1300	1700	540	8100UJ	800J	670	2700	2400	12150
S2 1-3	20070710	1900	3100	930	7400UJ	880J	1300	4100	3800	19620
S2 3-5	20070710	3500	4600	1400	990	1100	2000	5800	5900	41720
S2 5-7	20070710	150J	290	240U	470U	590U	240U	280	220J	1400

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	2-Nitro-phenol	4-Nitro-phenol	2,4-Dinitro-toluene	2,6-Dinitro-toluene	Hexachloro-benzene	Hexachloro-cyclopentadiene	Isophorone	Azobenzene
A1 0-1	20061222	920U	4700U	700U	700U	560U	2800UJ	280U	560U
A1 1-3	20061222	10000U	53000U	7800U	7800U	6200U	31000UJ	3100U	6200U
A1 3-5	20061222	12000U	64000U	9300U	9300U	7500U	37000UJ	3700U	7500U
A11 0-1	20061222	13000U	67000U	9900U	9900U	7900U	39000UJ	3900U	7900U
A11 1-3	20061222	930U	4800U	700U	700U	560U	2800UJ	280U	560U
A11 3-5	20061222	400U	2000U	300U	300U	240U	1200U	120U	240U
B1 0-1	20061222	420U	2200U	320U	320U	260U	1300U	130U	260U
B2 0-1	20061222	400U	2000U	300U	300U	240U	1200U	120U	240U
B3 0-1	20070710	780U	4000U	590U	590U	470U	2400U	240U	470U
B3 1-2	20070710	790U	4000U	600U	600U	480U	2400U	240U	480U
B4 0-1	20070711	820U	4200U	620U	620U	500U	2500U	250U	500U
B4 1-3	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
C1 0-1	20061221	1100U	5500U	810U	810U	650U	3200U	320U	650U
C1 1-3	20061221	1100U	5700U	840U	840U	670U	3400U	340U	670U
C1 3-5	20061221	1000U	5200U	770U	770U	620U	3100U	310U	620U
C11 0-1	20061221	14000U	72000U	11000U	11000U	8500U	42000U	4200U	8500U
C11 1-3	20061221	1400U	7100U	1000U	1000U	8400U	4200U	420U	8400U
C11 3-5	20061221	1300U	6600U	970U	970U	7800U	3900U	390U	7800U
C11 5-7	20061221	1200U	6000U	880U	880U	700U	3500U	350U	700U
C12 0-1	20061221	8900U	46000U	6800U	6800U	5400U	27000U	2700U	5400U
C12 1-3	20061221	11000U	54000U	8000U	8000U	6400U	32000UJ	3200U	6400U
C12 3-5	20061221	12000U	60000U	8900U	8900U	7100U	36000UJ	3600U	7100U
C3 0-1	20061221	12000U	63000U	9200U	9200U	7400U	37000U	3700U	7400U
C3 1-3	20061221	12000U	60000U	8900U	8900U	7100U	36000U	3600U	7100U
C3 3-5	20061221	44000U	230000U	34000U	34000U	27000U	130000U	13000U	27000U
C4 0-1	20070711	910U	4700U	690U	690U	550U	2800U	280U	550U
C4 1-3	20070711	840U	4300U	630U	630U	510U	2500U	250U	510U
C4 3-5	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
C5 0-1	20070710	12000U	61000U	9000U	9000U	7200U	36000U	3600U	7200U
C5 1-3	20070710	8500U	44000U	6400U	6400U	5100U	26000U	2600U	5100U
C5 3-5	20070710	790U	4100U	600U	600U	480U	2400U	240U	480U
C6 0-1	20070711	13000U	65000U	9600U	9600U	7600U	38000U	3800U	7600U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	2-Nitro-phenol	4-Nitro-phenol	2,4-Dinitro-toluene	2,6-Dinitro-toluene	Hexachloro-benzene	Hexachloro-cyclopentadiene	Isophorone	Azobenzene
C6 1-3	20070711	13000U	64000U	9500U	9500U	7600U	38000U	3800U	7600U
C6 3-5	20070711	12000U	60000U	8800U	8800U	7100U	35000U	3500U	7100U
C6 5-7	20070711	13000UJ	65000UJ	9600UJ	9600UJ	7600UJ	38000UJ	3800UJ	7600UJ
C6 7-9	20070711	11000U	59000U	8700U	8700U	6900U	35000U	3500U	6900U
C7 0-1	20070710	11000U	57000U	8400U	8400U	6700U	34000U	3400U	6700U
C7 1-3	20070710	940U	4800U	710U	710U	570U	2800U	280U	570U
C8 0-1	20070711	11000U	58000U	8500U	8500U	6800U	34000U	3400U	6800U
C8 1-3	20070711	12000U	59000U	8700U	8700U	7000U	35000U	3500U	7000U
C9 0-1	20070710	1100U	5800U	850U	850U	6800U	3400U	340U	6800U
D2 0-1	20061221	390U	2000UJ	300U	300U	240U	1200U	120U	240U
D3 0-1	20061221	800U	4100U	600U	600U	480U	2400U	240U	480U
D4 0-1	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
D4 1-2	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
D5 0-1	20070710	9600U	49000U	7300U	7300U	5800U	29000U	2900U	5800U
D5 1-3	20070710	850U	4400U	650U	650U	520U	2600U	260U	520U
D6 0-1	20070710	770U	4000U	590U	590U	470U	2300U	230U	470U
E1 0-1	20061221	800U	4100U	600U	600U	480U	2400UJ	240U	480U
E1 1-3	20061221	790U	4100U	600U	600U	480U	2400UJ	240U	480U
E2 0-1	20061222	400U	2100UJ	300U	300U	240U	1200U	120U	240U
E2 1-3	20061222	400U	2000U	300U	300U	240U	1200U	120U	240U
E21 0-1	20061221	810U	4200U	620U	620U	490U	2500UJ	250U	490U
E3 0-1	20070710	780U	4000U	590U	590U	470U	2400U	240U	470U
E3 1-3	20070710	780U	4000U	590U	590U	470U	2400U	240U	470U
E6 0-1	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
E6 1-2	20070711	850U	4400U	640U	640U	510U	2600U	260U	510U
F1 0-1	20061221	7300U	38000U	5500U	5500U	4400U	22000U	2200U	4400U
F1 1-3	20061221	10000U	54000U	7900U	7900U	6300U	32000U	3200U	6300U
F12 0-1	20061221	1100U	5800U	850U	850U	680U	3400U	340U	680U
F2 0-1	20061221	9600U	49000U	7300U	7300U	5800U	29000U	2900U	5800U
F2 1-3	20061221	9100U	47000U	6900U	6900U	5500U	27000UJ	2700U	5500U
F4 0-1	20070711	1100U	5800U	850U	850U	680U	3400U	340U	680U
F4 1-3	20070711	1100U	5800U	850U	850U	680U	3400U	340U	680U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	2-Nitro-phenol	4-Nitro-phenol	2,4-Dinitro-toluene	2,6-Dinitro-toluene	Hexachloro-benzene	Hexachloro-cyclopentadiene	Isophorone	Azobenzene
F4 3-5	20070711	1000U	5300U	780U	780U	620U	3100U	310U	620U
F5 0-1	20070710	800U	4100U	610U	610U	480U	2400U	240U	480U
F5 1-3	20070710	790U	4100U	600U	600U	480U	2400U	240U	480U
F5 3-5	20070710	1200U	6100U	900U	900U	720U	3600U	360U	720U
F6 0-1	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
F6 1-3	20070711	770U	4000U	590U	590U	470U	2300U	230U	470U
G1 0-1	20061221	800U	4100U	610U	610U	490U	2400U	240U	490U
G11 0-1	20061220	5900U	31000U	4500U	4500U	3600U	18000U	1800U	3600U
G11 1-3	20061220	12000U	61000U	8900U	8900U	7100U	36000U	3600U	7100U
G11 3-5	20061220	910U	4700U	690U	690U	220J	2800U	280U	550U
G11 5-7	20061220	400U	2100UJ	300U	300U	240U	1200UJ	120U	240U
G12 0-1	20061221	12000U	64000U	9300U	9300U	7500U	37000U	3700U	7500U
G12 1-3	20061221	14000U	72000U	11000U	11000U	8500U	42000U	4200U	8500U
G13 0-1	20070711	28000U	150000U	21000U	21000U	17000U	86000U	8600U	17000U
G13 1-3	20070711	1300U	6800U	1000U	1000U	800U	4000U	400U	800U
G13 3-5	20070711	810U	4200U	610U	610U	490U	2400U	240U	490U
G3 0-1	20061221	1800U	9100U	1300U	1300U	1600	5400UJ	540U	1100U
H1 0-1	20061220	850U	4400U	640U	640U	510U	2600U	260U	510U
H11 0-1	20061220	460U	2400UJ	350U	350U	280U	1400U	140U	280U
H11 1-3	20061220	520U	2700UJ	400U	400U	320U	1600U	160U	320U
H11 3-5	20061220	610UJ	3100U	460U	460U	370U	1800U	180U	370U
H12 0-1	20061219	610UJ	3100U	460U	460U	3700U	1800UJ	180U	3700U
H12 1-3	20061219	560UJ	2900U	420U	420U	340U	1700UJ	170U	340U
H12 3-5	20061219	590UJ	3000U	450U	450U	3600U	1800UJ	180U	3600U
H12 5-7	20061219	610UJ	3100U	460U	460U	370U	1900UJ	190U	370U
H12 7-9	20061219	540UJ	2800U	410U	410U	330U	1600UJ	160U	330U
H13 0-1	20061221	540U	2800UJ	410U	410U	330U	1600U	160U	330U
H13 1-3	20061221	560U	2900U	420U	420U	340U	1700U	170U	340U
H13 3-5	20061221	620U	3200UJ	470U	470U	370U	1900UJ	190U	370U
H13 5-7	20061221	1300U	6800U	1000U	1000U	800U	4000U	400U	800U
H13 7-9	20061221	1400U	7000U	1000U	1000U	830U	4100U	410U	830U
H3 0-1	20061220	1100U	5400U	800U	800U	640U	3200U	320U	640U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping I

Sample ID	Sample Date	2-Nitro-phenol	4-Nitro-phenol	2,4-Dinitro-toluene	2,6-Dinitro-toluene	Hexachloro-benzene	Hexachloro-cyclopentadiene	Isophorone	Azobenzene
H3 1-3	20061220	800U	4100U	600U	600U	480U	2400U	240U	480U
H3 3-5	20061220	760U	3900U	580U	580U	460U	2300U	230U	460U
I1 0-1	20061219	430UJ	2200U	330U	330U	1700	1300UJ	130U	260U
I1 1-3	20061219	490UJ	2500U	370U	370U	7800	1500UJ	150U	290U
I1 3-5	20061219	410UJ	2100U	310U	310U	480	1200UJ	120U	250U
I12 0-1	20061219	450UJ	2300U	340U	340U	270U	1400UJ	140U	270U
I12 1-3	20061219	480UJ	2500U	360U	360U	290U	1400UJ	140U	290U
I12 3-5	20061219	440UJ	2300U	330U	330U	270U	1300UJ	130U	270U
I2 0-1	20061220	1100U	5500U	810U	810U	650U	3300U	330U	650U
I2 1-3	20061220	770U	4000U	580U	580U	470U	2300U	230U	470U
I2 3-5	20061220	800U	4100U	610U	610U	480U	2400U	240U	480U
I3 0-1	20061220	820U	4200U	620U	620U	490U	2500U	250U	490U
I3 1-3	20061220	790U	4100U	600U	600U	480U	2400U	240U	480U
J1 0-1	20061219	490UJ	2500U	370U	370U	290U	1500UJ	150U	290U
J1 1-3	20061219	530UJ	2800U	400U	400U	730	1600UJ	160U	320U
J1 3-5	20061219	480UJ	2500U	360U	360U	10000	1500UJ	150U	290U
K1 0-1	20061220	50000U	260000U	38000U	38000U	110000	150000U	15000U	30000U
K1 1-3	20061220	12000U	64000U	9400U	9400U	13000	38000U	3800U	7500U
K1 3-5	20061220	1400U	7300U	1100U	1100U	2100	4300U	430U	860U
K1 5-7	20061220	13000U	69000U	10000U	10000U	8100U	40000U	4000U	8100U
K1 7-9	20061220	13000U	68000U	10000U	10000U	8000U	40000U	4000U	8000U
K1 9-11	20061220	1200U	6200U	910U	910U	730U	3600U	360U	730U
S1 0-1	20070711	12000U	60000U	8900U	8900U	7100U	36000U	3600U	7100U
S1 1-3	20070711	12000U	64000U	9400U	9400U	7500U	38000U	3800U	7500U
S1 3-5	20070711	11000U	58000U	8500U	8500U	6800U	34000U	3400U	6800U
S1 5-7	20070711	1200U	62000U	9200U	9200U	730U	3700U	370U	730U
S1 7-9	20070711	1000U	5100U	760U	760U	610U	3000U	300U	610U
S1 9-11	20070711	790U	4100U	600U	600U	480U	2400U	240U	480U
S2 0-1	20070710	1300U	6900U	1000U	1000U	810U	4100U	410U	810U
S2 1-3	20070710	1200U	6300U	930U	930U	740U	3700U	370U	740U
S2 3-5	20070710	1000U	5400U	790U	790U	630U	3200U	320U	630U
S2 5-7	20070710	780U	4000U	590U	590U	470U	2400U	240U	470U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Bis(2-chloroethyl)-ether	Bis(2-chloroisopropyl)-ether	Bis(2-ethylhexyl)-phthalate	Bis(2-chloroethoxy)-methane	Benzyl Alcohol	4-Bromophenyl phenyl ether
A1 0-1	20061222	280U	280U	1600	560U	7000U	560U
A1 1-3	20061222	3100U	3100U	7800U	6200U	78000U	6200U
A1 3-5	20061222	3700U	3700U	9300U	7500U	93000U	7500U
A11 0-1	20061222	3900U	3900U	9900U	7900U	99000U	7900U
A11 1-3	20061222	280U	280UJ	700U	560U	7000U	560U
A11 3-5	20061222	120U	120U	300U	240U	3000U	240U
B1 0-1	20061222	130U	130U	320U	260U	3200U	260U
B2 0-1	20061222	120U	120U	300U	240U	3000U	240U
B3 0-1	20070710	240U	240U	590U	470U	5900U	470U
B3 1-2	20070710	240U	240U	600U	480U	6000U	480U
B4 0-1	20070711	250U	250U	620U	500U	6200U	500U
B4 1-3	20070711	240U	240U	600U	480U	6000U	480U
C1 0-1	20061221	320U	320U	9000	650U	8100U	650U
C1 1-3	20061221	340U	340U	3900	670U	8400U	670U
C1 3-5	20061221	310U	310U	2100	620U	7700U	620U
C11 0-1	20061221	4200U	4200U	43000	8500U	110000U	8500U
C11 1-3	20061221	420U	420UJ	34000	840U	10000UJ	8400U
C11 3-5	20061221	390U	390UJ	17000	780U	9700UJ	7800U
C11 5-7	20061221	350U	350UJ	7500	700U	8800UJ	700U
C12 0-1	20061221	2700U	2700U	5900J	5400U	68000U	5400U
C12 1-3	20061221	3200U	3200U	31000J	6400U	80000U	6400U
C12 3-5	20061221	3600U	3600U	89000UJ	7100U	89000U	7100U
C3 0-1	20061221	3700U	3700U	9200U	7400U	92000U	7400U
C3 1-3	20061221	3600U	3600U	8900U	7100U	89000U	7100U
C3 3-5	20061221	13000U	13000U	34000U	27000U	340000U	27000U
C4 0-1	20070711	280U	280U	2100	550U	6900U	550U
C4 1-3	20070711	250U	250U	1100	510U	6300U	510U
C4 3-5	20070711	240U	240U	1400	480U	6000U	480U
C5 0-1	20070710	3600U	3600U	9000U	7200U	90000U	7200U
C5 1-3	20070710	2600U	2600U	6400U	5100U	64000U	5100U
C5 3-5	20070710	240U	240U	600U	480U	6000U	480U
C6 0-1	20070711	3800U	3800U	14000	7600U	96000U	7600U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Bis(2-chloroethyl)-ether	Bis(2-chloroisopropyl)-ether	Bis(2-ethylhexyl)-phthalate	Bis(2-chloroethoxy)-methane	Benzyl Alcohol	4-Bromophenyl phenyl ether
C6 1-3	20070711	3800U	3800U	9500U	7600U	95000U	7600U
C6 3-5	20070711	3500U	3500U	12000	7100U	88000U	7100U
C6 5-7	20070711	3800UJ	3800UJ	9600UJ	7600UJ	96000UJ	7600UJ
C6 7-9	20070711	3500U	3500U	8700U	6900U	87000U	6900U
C7 0-1	20070710	3400U	3400U	14000	6700U	84000U	6700U
C7 1-3	20070710	280U	280U	1100	570U	7100U	570U
C8 0-1	20070711	3400U	3400U	8500U	6800U	85000U	6800U
C8 1-3	20070711	3500U	3500U	8700U	7000U	87000U	7000U
C9 0-1	20070710	340U	340U	7400	680U	8500U	6800U
D2 0-1	20061221	120U	120UJ	300U	240U	3000UJ	240U
D3 0-1	20061221	240U	240U	600U	480U	6000U	480U
D4 0-1	20070711	240U	240U	600U	480U	6000U	480U
D4 1-2	20070711	240U	240U	2000	480U	6000U	480U
D5 0-1	20070710	2900U	2900U	7300U	5800U	73000U	5800U
D5 1-3	20070710	260U	260U	2700	520U	6500U	520U
D6 0-1	20070710	230U	230U	590U	470U	5900U	470U
E1 0-1	20061221	240U	240U	600U	480U	6000U	480U
E1 1-3	20061221	240U	240U	600U	480U	6000U	480U
E2 0-1	20061222	120U	120UJ	300U	240U	3000UJ	240U
E2 1-3	20061222	120U	120U	300U	240U	3000U	240U
E21 0-1	20061221	250U	250U	620U	490U	6200U	490U
E3 0-1	20070710	240U	240U	590U	470U	5900U	470U
E3 1-3	20070710	240U	240U	7800	470U	5900U	470U
E6 0-1	20070711	240U	240U	600U	480U	6000U	480U
E6 1-2	20070711	260U	260U	640U	510U	6400U	510U
F1 0-1	20061221	2200U	2200UJ	55000U	4400U	55000UJ	4400U
F1 1-3	20061221	3200U	3200U	2000J	6300U	79000U	6300U
F12 0-1	20061221	340U	340U	860	680U	8500U	680U
F2 0-1	20061221	2900U	2900U	7300U	5800U	73000U	5800U
F2 1-3	20061221	2700U	2700U	6900U	5500U	69000U	5500U
F4 0-1	20070711	340U	340U	850U	680U	8500U	680U
F4 1-3	20070711	340U	340U	850U	680U	8500U	680U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Bis(2-chloroethyl)-ether	Bis(2-chloroisopropyl)-ether	Bis(2-ethylhexyl)-phthalate	Bis(2-chloroethoxy)-methane	Benzyl Alcohol	4-Bromophenyl phenyl ether
F4 3-5	20070711	310U	310U	780U	620U	7800U	620U
F5 0-1	20070710	240U	240U	610U	480U	6100U	480U
F5 1-3	20070710	240U	240U	600U	480U	6000U	480U
F5 3-5	20070710	360U	360U	900U	720U	9000U	720U
F6 0-1	20070711	240U	240U	600U	480U	6000U	480U
F6 1-3	20070711	230U	230U	590U	470U	5900U	470U
G1 0-1	20061221	240U	240U	610U	490U	6100U	490U
G11 0-1	20061220	1800U	1800U	4500U	3600U	45000U	3600U
G11 1-3	20061220	3600U	3600U	8900U	7100U	89000U	7100U
G11 3-5	20061220	280U	280U	690U	550U	6900U	550U
G11 5-7	20061220	120U	120UJ	300U	240U	3000UJ	240U
G12 0-1	20061221	3700U	13000	9300U	7500U	93000U	7500U
G12 1-3	20061221	4200U	15000	11000U	8500U	110000U	8500U
G13 0-1	20070711	8600U	8600U	21000U	17000U	210000U	17000U
G13 1-3	20070711	400U	400U	1000U	800U	10000U	800U
G13 3-5	20070711	240U	240U	610U	490U	6100U	490U
G3 0-1	20061221	540U	41000	1300U	1100U	13000U	1100U
H1 0-1	20061220	260U	24000	310J	510U	6400U	510U
H11 0-1	20061220	140U	710J	350U	280U	3500UJ	280U
H11 1-3	20061220	160U	180J	400U	320U	4000UJ	320U
H11 3-5	20061220	180U	110J	460U	370U	4600UJ	370U
H12 0-1	20061219	180U	180U	460U	370U	4600U	3700U
H12 1-3	20061219	170U	170U	420U	340U	4200U	340U
H12 3-5	20061219	180U	180U	4500U	360U	4500U	3600U
H12 5-7	20061219	190U	190U	460U	370U	4600U	370U
H12 7-9	20061219	160U	160U	410U	330U	4100U	330U
H13 0-1	20061221	160U	160UJ	410U	330U	4100UJ	330U
H13 1-3	20061221	170U	170U	420U	340U	4200U	340U
H13 3-5	20061221	190U	190UJ	470U	370U	4700UJ	370U
H13 5-7	20061221	400U	400U	1000U	800U	10000U	800U
H13 7-9	20061221	410U	410U	1000U	830U	10000U	830U
H3 0-1	20061220	320UJ	320UJ	800UJ	640U	8000UJ	640U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping II

Sample ID	Sample Date	Bis(2-chloroethyl)-ether	Bis(2-chloroisopropyl)-ether	Bis(2-ethylhexyl)-phthalate	Bis(2-chloroethoxy)-methane	Benzyl Alcohol	4-Bromophenyl phenyl ether
H3 1-3	20061220	240UJ	240UJ	600UJ	480U	6000UJ	480U
H3 3-5	20061220	230UJ	230UJ	580UJ	460U	5800UJ	460U
I1 0-1	20061219	130U	150	140J	260U	3300U	260U
I1 1-3	20061219	150U	150U	700	290U	3700U	290U
I1 3-5	20061219	120U	100J	310U	250U	3100U	250U
I12 0-1	20061219	140U	140U	340U	270U	3400U	270U
I12 1-3	20061219	140U	140U	360U	290U	3600U	290U
I12 3-5	20061219	130U	130U	330U	270U	3300U	270U
I2 0-1	20061220	330U	330UJ	810UJ	650U	8100U	650U
I2 1-3	20061220	230U	230UJ	580UJ	470U	5800U	470U
I2 3-5	20061220	240U	240UJ	610UJ	480U	6100U	480U
I3 0-1	20061220	250U	260J	620UJ	490U	6200U	490U
I3 1-3	20061220	240U	240UJ	600UJ	480U	6000U	480U
J1 0-1	20061219	150U	150U	2100	290U	3700U	290U
J1 1-3	20061219	160U	160U	1200	320U	4000U	320U
J1 3-5	20061219	150U	150U	360U	290U	3600U	290U
K1 0-1	20061220	15000U	35000	380000U	30000U	380000U	30000U
K1 1-3	20061220	3800U	3800	94000U	7500U	94000U	7500U
K1 3-5	20061220	430U	430UJ	1100UJ	860U	11000U	860U
K1 5-7	20061220	4000U	4000U	10000U	8100U	100000U	8100U
K1 7-9	20061220	4000U	4000U	10000U	8000U	100000U	8000U
K1 9-11	20061220	360UJ	360UJ	910UJ	730U	9100UJ	730U
S1 0-1	20070711	3600U	3600U	8900U	7100U	89000U	7100U
S1 1-3	20070711	3800U	3800U	9400U	7500U	94000U	7500U
S1 3-5	20070711	3400U	3400U	8500U	6800U	85000U	6800U
S1 5-7	20070711	370U	370U	920U	730U	9200U	730U
S1 7-9	20070711	300U	300U	760U	610U	7600U	610U
S1 9-11	20070711	240U	240U	600U	480U	6000U	480U
S2 0-1	20070710	410U	410U	12000	810U	10000U	810U
S2 1-3	20070710	370U	370U	5700	740U	9300U	740U
S2 3-5	20070710	320U	320U	790U	630U	7900U	630U
S2 5-7	20070710	240U	240U	590U	470U	5900U	470U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping III

Sample ID	Sample Date	Butyl benzyl phthalate	Carbazole	4-Chloro-3-methyl-phenol	1,2,4-Trichloro-benzene	Hexachloro-butadiene	Hexachloro-ethane	2-Chloro-naphthalene
A1 0-1	20061222	700U	450J	560U	560U	280U	280U	560U
A1 1-3	20061222	7800U	7800U	6200U	6200U	3100U	3100U	6200U
A1 3-5	20061222	9300U	9300U	7500U	7500U	3700U	3700U	7500U
A11 0-1	20061222	9900U	9900U	7900U	7900U	3900U	3900U	7900U
A11 1-3	20061222	700U	340J	560U	560U	280U	280U	560U
A11 3-5	20061222	300U	300U	240U	240U	120U	120U	240U
B1 0-1	20061222	320U	320U	260U	260U	130U	130U	260U
B2 0-1	20061222	300U	300U	240U	240U	120U	120U	240U
B3 0-1	20070710	590U	590U	470U	470U	240U	240U	470U
B3 1-2	20070710	600U	600U	480U	480U	240U	240U	480U
B4 0-1	20070711	620U	350J	500U	500U	250U	250U	500U
B4 1-3	20070711	600U	600U	480U	480U	240U	240U	480U
C1 0-1	20061221	8100U	810U	650U	650U	320U	320U	650U
C1 1-3	20061221	840U	840U	670U	670U	340U	340U	670U
C1 3-5	20061221	770U	770U	620U	620U	310U	310U	620U
C11 0-1	20061221	11000U	11000U	8500U	8500U	4200U	4200U	8500U
C11 1-3	20061221	10000U	10000U	840U	840U	420U	420U	840U
C11 3-5	20061221	9700U	9700U	780U	780U	390U	390U	780U
C11 5-7	20061221	8800U	880U	700U	700U	350U	350U	700U
C12 0-1	20061221	6800U	6800U	5400U	5400U	2700U	2700U	5400U
C12 1-3	20061221	8000U	8000UJ	6400U	6400U	3200U	3200U	6400U
C12 3-5	20061221	89000U	8900U	7100U	7100U	3600U	3600U	7100U
C3 0-1	20061221	9200U	9200U	7400U	7400U	3700U	3700U	7400U
C3 1-3	20061221	8900U	8900U	7100U	7100U	3600U	3600U	7100U
C3 3-5	20061221	34000U	34000U	27000U	27000U	13000U	13000U	27000U
C4 0-1	20070711	690U	690U	550U	550U	280U	280U	550U
C4 1-3	20070711	630U	630U	510U	510U	250U	250U	510U
C4 3-5	20070711	600U	600U	480U	480U	240U	240U	480U
C5 0-1	20070710	9000U	9000U	7200U	7200U	3600U	3600U	7200U
C5 1-3	20070710	6400U	6400U	5100U	5100U	2600U	2600U	5100U
C5 3-5	20070710	600U	600U	480U	480U	240U	240U	480U
C6 0-1	20070711	9600U	9600U	7600U	7600U	3800U	3800U	7600U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB) Grouping III

Sample ID	Sample Date	Butyl benzyl phthalate	Carbazole	4-Chloro-3-methyl-phenol	1,2,4-Trichloro-benzene	Hexachloro-butadiene	Hexachloro-ethane	2-Chloro-naphthalene
C6 1-3	20070711	9500U	9500U	7600U	7600U	3800U	3800U	7600U
C6 3-5	20070711	8800U	8800U	7100U	7100U	3500U	3500U	7100U
C6 5-7	20070711	9600UJ	9600UJ	7600UJ	7600UJ	3800UJ	3800UJ	7600UJ
C6 7-9	20070711	8700U	8700U	6900U	6900U	3500U	3500U	6900U
C7 0-1	20070710	8400U	8400U	6700U	6700U	3400U	3400U	6700U
C7 1-3	20070710	710U	1500	570U	570U	280U	280U	570U
C8 0-1	20070711	8500U	8500U	6800U	6800U	3400U	3400U	6800U
C8 1-3	20070711	8700U	8700U	7000U	7000U	3500U	3500U	7000U
C9 0-1	20070710	850U	8500U	680U	680U	340U	340U	680U
D2 0-1	20061221	300U	300U	240U	240U	120U	120U	240U
D3 0-1	20061221	600U	600U	480U	480U	240U	240U	480U
D4 0-1	20070711	600U	600U	480U	480U	240U	240U	480U
D4 1-2	20070711	600U	600U	480U	480U	240U	240U	480U
D5 0-1	20070710	7300U	7300U	5800U	5800U	2900U	2900U	5800U
D5 1-3	20070710	650U	650U	520U	520U	260U	260U	520U
D6 0-1	20070710	590U	590U	470U	470U	230U	230U	470U
E1 0-1	20061221	600U	600U	480U	480U	240U	240U	480U
E1 1-3	20061221	600U	600U	480U	480U	240U	240U	480U
E2 0-1	20061222	300U	300U	240U	240U	120U	120U	240U
E2 1-3	20061222	300U	300U	240U	240U	120U	120U	240U
E21 0-1	20061221	620U	620U	490U	490U	250U	250U	490U
E3 0-1	20070710	590U	590U	470U	470U	240U	240U	470U
E3 1-3	20070710	590U	590U	470U	470U	240U	240U	470U
E6 0-1	20070711	600U	600U	480U	480U	240U	240U	480U
E6 1-2	20070711	640U	640U	510U	510U	260U	260U	510U
F1 0-1	20061221	55000U	5500U	4400U	4400U	2200U	2200U	4400U
F1 1-3	20061221	7900U	7900U	6300U	6300U	3200U	3200U	6300U
F12 0-1	20061221	850U	850U	680U	680U	340U	340U	680U
F2 0-1	20061221	7300U	7300U	5800U	5800U	2900U	2900U	5800U
F2 1-3	20061221	6900U	1400J	5500U	5500U	2700U	2700U	5500U
F4 0-1	20070711	850U	850U	680U	680U	340U	340U	680U
F4 1-3	20070711	850U	850U	680U	680U	340U	340U	680U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping III

Sample ID	Sample Date	Butyl benzyl phthalate	Carbazole	4-Chloro-3-methyl-phenol	1,2,4-Trichloro-benzene	Hexachloro-butadiene	Hexachloro-ethane	2-Chloro-naphthalene
F4 3-5	20070711	780U	780U	620U	620U	310U	310U	620U
F5 0-1	20070710	610U	610U	480U	480U	240U	240U	480U
F5 1-3	20070710	600U	600U	480U	480U	240U	240U	480U
F5 3-5	20070710	900U	900U	720U	720U	360U	360U	720U
F6 0-1	20070711	600U	600U	480U	480U	240U	240U	480U
F6 1-3	20070711	590U	590U	470U	470U	230U	230U	470U
G1 0-1	20061221	610U	610U	490U	490U	240U	240U	490U
G11 0-1	20061220	4500U	4500U	3600U	3600U	1800U	1800U	3600U
G11 1-3	20061220	8900U	8900U	7100U	7100U	3600U	3600U	7100U
G11 3-5	20061220	690U	690U	550U	550U	370	280U	550U
G11 5-7	20061220	300U	300U	240U	240U	120U	120U	240U
G12 0-1	20061221	9300U	9300U	7500U	7500U	3700U	3700U	7500U
G12 1-3	20061221	11000U	11000U	8500U	8500U	4200U	4200U	8500U
G13 0-1	20070711	21000U	21000U	17000U	17000U	8600U	8600U	17000U
G13 1-3	20070711	1000U	1000U	800U	800U	400U	400U	800U
G13 3-5	20070711	610U	610U	490U	490U	240U	240U	490U
G3 0-1	20061221	1300U	1300U	1100U	1100U	540U	540U	1100U
H1 0-1	20061220	640U	640U	510U	510U	260U	260U	510U
H11 0-1	20061220	350U	350U	280U	280U	140U	140U	280U
H11 1-3	20061220	400U	400U	320U	320U	160U	160U	320U
H11 3-5	20061220	460U	460U	370U	370U	180U	180U	370U
H12 0-1	20061219	460U	4600U	370U	370U	180U	180U	370U
H12 1-3	20061219	420U	420U	340U	340U	170U	170U	340U
H12 3-5	20061219	4500U	4500U	360U	360U	180U	180U	360U
H12 5-7	20061219	460U	460U	370U	370U	190U	190U	370U
H12 7-9	20061219	410U	410U	330U	330U	160U	160U	330U
H13 0-1	20061221	410U	410U	330U	330U	160U	160U	330U
H13 1-3	20061221	420U	420U	340U	340U	170U	170U	340U
H13 3-5	20061221	470U	470U	370U	370U	190U	190U	370U
H13 5-7	20061221	1000U	1000U	800U	800U	400U	400U	230J
H13 7-9	20061221	1000U	310J	830U	830U	410U	410U	360J
H3 0-1	20061220	800U	270J	640U	640U	320U	320U	640U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping III

Sample ID	Sample Date	Butyl benzyl phthalate	Carbazole	4-Chloro-3-methyl-phenol	1,2,4-Trichloro-benzene	Hexachloro-butadiene	Hexachloro-ethane	2-Chloro-naphthalene
H3 1-3	20061220	600U	600U	480U	480U	240U	240U	480U
H3 3-5	20061220	580U	580U	460U	460U	230U	230U	460U
I1 0-1	20061219	330U	330U	260U	260U	1900	330	260U
I1 1-3	20061219	370U	370U	290U	290U	56000	420	290U
I1 3-5	20061219	310U	310U	250U	250U	2400	120U	250U
I12 0-1	20061219	340U	340U	270U	270U	140U	300	270U
I12 1-3	20061219	360U	360U	290U	290U	140U	140U	290U
I12 3-5	20061219	330U	330U	270U	270U	130U	130U	270U
I2 0-1	20061220	810UJ	810U	650U	650U	330U	330U	650U
I2 1-3	20061220	580U	580UJ	470U	470U	230U	230U	470U
I2 3-5	20061220	610U	610UJ	480U	480U	240U	240U	480U
I3 0-1	20061220	620U	620UJ	490U	490U	250U	250U	490U
I3 1-3	20061220	600UJ	600UJ	480U	480U	240U	240U	480U
J1 0-1	20061219	370U	370U	290U	290U	77J	150U	290U
J1 1-3	20061219	400U	400U	320U	320U	790	160U	320U
J1 3-5	20061219	360U	360U	290U	520	86000	1600000	15000
K1 0-1	20061220	380000U	38000U	30000U	30000U	39000	58000	740000
K1 1-3	20061220	94000U	9400U	7500U	7500U	48000	1900J	450000
K1 3-5	20061220	1100U	490J	860U	860U	12000	290J	190000
K1 5-7	20061220	10000U	10000U	8100U	8100U	2500	4000U	150000
K1 7-9	20061220	10000U	10000U	8000U	8000U	4000U	4000U	8600
K1 9-11	20061220	910U	180J	730U	730U	360U	360U	15000J
S1 0-1	20070711	8900U	8900U	7100U	7100U	3600U	3600U	7100U
S1 1-3	20070711	9400U	9400U	7500U	7500U	3800U	3800U	7500U
S1 3-5	20070711	8500U	8500U	6800U	6800U	3400U	3400U	6800U
S1 5-7	20070711	920U	920U	730U	730U	370U	370U	7300U
S1 7-9	20070711	760U	760U	610U	610U	300U	300U	610U
S1 9-11	20070711	600U	600U	480U	480U	240U	240U	480U
S2 0-1	20070710	1000U	1000U	810U	810U	410U	410U	810U
S2 1-3	20070710	930U	930U	740U	740U	370U	370U	740U
S2 3-5	20070710	790U	790U	630U	630U	320U	320U	630U
S2 5-7	20070710	590U	590U	470U	470U	240U	240U	470U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping IV

Sample ID	Sample Date	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2,4-Dichloro-phenol	Penta-chlorophenol	2-Chloro-phenol	4-Chloro-diphenylether	Diethyl-phthalate	Dibenzo-furan
A1 0-1	20061222	920U	920U	920U	4700U	920U	280U	700U	1100
A1 1-3	20061222	10000U	10000U	10000U	53000U	10000U	3100U	7800U	1700J
A1 3-5	20061222	12000U	12000U	12000U	64000U	12000U	3700U	9300U	9300U
A11 0-1	20061222	13000U	13000U	13000U	67000U	13000U	3900U	9900U	2500J
A11 1-3	20061222	930U	930U	930U	4800U	930U	280U	700U	740
A11 3-5	20061222	400U	400U	400U	2000U	400U	120U	300U	300U
B1 0-1	20061222	420U	420U	420U	2200U	420U	130U	320U	320U
B2 0-1	20061222	400U	400U	400U	2000U	400U	120U	300U	300U
B3 0-1	20070710	780U	780U	780U	4000U	780U	240U	590U	590U
B3 1-2	20070710	790U	790U	790U	4000U	790U	240U	600U	600U
B4 0-1	20070711	820U	820U	820U	4200U	820U	250U	620U	330J
B4 1-3	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
C1 0-1	20061221	1100U	1100U	1100U	5500U	1100U	320U	810U	160J
C1 1-3	20061221	1100U	1100U	1100U	5700U	1100U	340U	840U	840U
C1 3-5	20061221	1000U	1000U	1000U	5200U	1000U	310U	770U	210J
C11 0-1	20061221	14000U	14000U	14000U	72000U	14000U	4200U	11000U	11000U
C11 1-3	20061221	1400U	1400U	1400U	71000U	1400U	420U	1000U	1000U
C11 3-5	20061221	1300U	1300U	1300U	66000U	1300U	390U	970U	970U
C11 5-7	20061221	1200U	1200U	1200U	6000U	1200U	350U	880U	430J
C12 0-1	20061221	8900U	8900U	8900U	46000U	8900U	2700U	6800U	6800U
C12 1-3	20061221	11000U	11000U	11000U	54000U	11000U	3200U	8000U	8000U
C12 3-5	20061221	12000U	12000U	12000U	60000U	12000U	3600U	8900U	8900U
C3 0-1	20061221	12000U	12000U	12000U	63000U	12000U	3700U	9200U	1800J
C3 1-3	20061221	12000U	12000U	12000U	60000U	12000U	3600U	8900U	8900U
C3 3-5	20061221	44000U	44000U	44000U	230000U	44000U	13000U	34000U	34000U
C4 0-1	20070711	910U	910U	910U	4700U	910U	280U	690U	430J
C4 1-3	20070711	840U	840U	840U	4300U	840U	250U	630U	630U
C4 3-5	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
C5 0-1	20070710	12000U	12000U	12000U	61000U	12000U	3600U	9000U	9000U
C5 1-3	20070710	8500U	8500U	8500U	44000U	8500U	2600U	6400U	6400U
C5 3-5	20070710	790U	790U	790U	4100U	790U	240U	600U	600U
C6 0-1	20070711	13000U	13000U	13000U	65000U	13000U	3800U	9600U	9600U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping IV

Sample ID	Sample Date	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2,4-Dichloro-phenol	Penta-chlorophenol	2-Chloro-phenol	4-Chloro-diphenylether	Diethyl-phthalate	Dibenzo-furan
C6 1-3	20070711	13000U	13000U	13000U	64000U	13000U	3800U	9500U	9500U
C6 3-5	20070711	12000U	12000U	12000U	60000U	12000U	3500U	8800U	8800U
C6 5-7	20070711	13000UJ	13000UJ	13000UJ	65000UJ	13000UJ	3800UJ	9600UJ	9600UJ
C6 7-9	20070711	11000U	11000U	11000U	59000U	11000U	3500U	8700U	8700U
C7 0-1	20070710	11000U	11000U	11000U	57000U	11000U	3400U	8400U	8400U
C7 1-3	20070710	940U	940U	940U	4800U	940U	280U	710U	850
C8 0-1	20070711	11000U	11000U	11000U	58000U	11000U	3400U	8500U	8500U
C8 1-3	20070711	12000U	12000U	12000U	59000U	12000U	3500U	8700U	8700U
C9 0-1	20070710	1100U	1100U	1100U	58000U	1100U	340U	850U	850U
D2 0-1	20061221	390U	390U	390U	2000UJ	390U	120U	300U	300U
D3 0-1	20061221	800U	800U	800U	4100U	800U	240U	600U	600U
D4 0-1	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
D4 1-2	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
D5 0-1	20070710	9600U	9600U	9600U	49000U	9600U	2900U	7300U	7300U
D5 1-3	20070710	850U	850U	850U	4400U	850U	260U	650U	650U
D6 0-1	20070710	770U	770U	770U	4000U	770U	230U	590U	590U
E1 0-1	20061221	800U	800U	800U	4100U	800U	240U	600U	600U
E1 1-3	20061221	790U	790U	790U	4100U	790U	240U	600U	600U
E2 0-1	20061222	400U	400U	400U	2100UJ	400U	120U	300U	300U
E2 1-3	20061222	400U	400U	400U	2000U	400U	120U	300U	300U
E21 0-1	20061221	810U	810U	810U	4200U	810U	250U	620U	110J
E3 0-1	20070710	780U	780U	780U	4000U	780U	240U	590U	590U
E3 1-3	20070710	780U	780U	780U	4000U	780U	240U	590U	590U
E6 0-1	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
E6 1-2	20070711	850U	850U	850U	4400U	850U	260U	640U	640U
F1 0-1	20061221	7300U	7300U	7300U	38000U	7300U	2200U	5500U	5500U
F1 1-3	20061221	10000U	10000U	10000U	54000U	10000U	3200U	7900U	7900U
F12 0-1	20061221	1100U	1100U	1100U	5800U	1100U	340U	850U	290J
F2 0-1	20061221	9600U	9600U	9600U	49000U	9600U	2900U	7300U	7300U
F2 1-3	20061221	9100U	9100U	9100U	47000U	9100U	2700U	6900U	3400J
F4 0-1	20070711	1100U	1100U	1100U	5800U	1100U	340U	850U	470J
F4 1-3	20070711	1100U	1100U	1100U	5800U	1100U	340U	850U	460J

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping IV

Sample ID	Sample Date	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2,4-Dichloro-phenol	Penta-chlorophenol	2-Chloro-phenol	4-Chloro-diphenylether	Diethyl-phthalate	Dibenzo-furan
F4 3-5	20070711	1000U	1000U	1000U	5300U	1000U	310U	780U	380J
F5 0-1	20070710	800U	800U	800U	4100U	800U	240U	610U	610U
F5 1-3	20070710	790U	790U	790U	4100U	790U	240U	600U	600U
F5 3-5	20070710	1200U	1200U	1200U	6100U	1200U	360U	900U	900U
F6 0-1	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
F6 1-3	20070711	770U	770U	770U	4000U	770U	230U	590U	590U
G1 0-1	20061221	800U	800U	800U	4100U	800U	240U	610U	610U
G11 0-1	20061220	5900U	5900U	5900U	31000U	5900U	1800U	4500U	4500U
G11 1-3	20061220	12000U	12000U	12000U	61000U	12000U	3600U	8900U	8900U
G11 3-5	20061220	910U	910U	910U	4700U	910U	280U	690U	210J
G11 5-7	20061220	400U	400U	400U	2100UJ	400U	120U	300U	300U
G12 0-1	20061221	12000U	12000U	12000U	64000U	12000U	3700U	9300U	9300U
G12 1-3	20061221	14000U	14000U	14000U	72000U	14000U	4200U	11000U	11000U
G13 0-1	20070711	28000U	28000U	28000U	150000U	28000U	8600U	21000U	21000U
G13 1-3	20070711	1300U	1300U	1300U	6800U	1300U	400U	1000U	550J
G13 3-5	20070711	810U	810U	810U	4200U	810U	240U	610U	610U
G3 0-1	20061221	1800U	1800U	1800U	9100U	1800U	540U	1300U	270J
H1 0-1	20061220	850U	850U	850U	4400U	850U	260U	640U	640U
H11 0-1	20061220	460U	460U	460U	2400UJ	460U	140U	350U	350U
H11 1-3	20061220	520U	520U	520U	2700UJ	520U	160U	400U	400U
H11 3-5	20061220	610U	610U	610U	3100UJ	610U	180U	460U	460U
H12 0-1	20061219	610U	610U	610U	31000U	610UJ	180U	460U	460U
H12 1-3	20061219	560UJ	560U	560U	2900U	560UJ	170U	420U	160J
H12 3-5	20061219	590U	590U	590U	30000U	590UJ	180U	450U	450U
H12 5-7	20061219	610U	610U	610U	3100U	610UJ	190U	460U	190J
H12 7-9	20061219	540U	540U	540U	2800U	540UJ	160U	410U	410U
H13 0-1	20061221	540U	540U	540U	2800UJ	540U	160U	410U	68J
H13 1-3	20061221	560U	560U	560U	2900U	560U	170U	420U	72J
H13 3-5	20061221	620U	620U	620U	3200UJ	620U	190U	470U	110J
H13 5-7	20061221	1300U	1300U	1300U	6800U	1300U	400U	1000U	350J
H13 7-9	20061221	1400U	1400U	1400U	7000U	1400U	410U	1000U	490J
H3 0-1	20061220	1100U	1100U	1100U	5400U	1100U	320UJ	800UJ	150J

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping IV

Sample ID	Sample Date	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2,4-Dichloro-phenol	Penta-chlorophenol	2-Chloro-phenol	4-Chloro-diphenylether	Diethyl-phthalate	Dibenzo-furan
H3 1-3	20061220	800U	800U	800U	4100U	800U	240UJ	600UJ	600U
H3 3-5	20061220	760U	760U	760U	3900U	760U	230UJ	580UJ	580U
I1 0-1	20061219	430U	430U	430U	2200U	430UJ	130U	330U	330U
I1 1-3	20061219	490U	490U	490U	2500U	490UJ	150U	370U	370U
I1 3-5	20061219	410UJ	410U	410U	480J	410UJ	120U	310U	310U
I12 0-1	20061219	450U	450U	450U	2300U	450UJ	140U	340U	180J
I12 1-3	20061219	480U	480U	480U	2500U	480UJ	140U	360U	300J
I12 3-5	20061219	440U	440U	440U	2300U	440UJ	130U	330U	160J
I2 0-1	20061220	1100U	1100U	1100U	5500U	1100U	330UJ	810UJ	810U
I2 1-3	20061220	770U	770U	770U	4000U	770U	230UJ	580UJ	580U
I2 3-5	20061220	800U	800U	800U	4100U	800U	240UJ	610UJ	610U
I3 0-1	20061220	820U	820U	820U	4200U	820U	250UJ	620UJ	620U
I3 1-3	20061220	790U	790U	790U	4100U	790U	240UJ	600UJ	600U
J1 0-1	20061219	490UJ	490U	490U	2500U	490UJ	150U	370U	230J
J1 1-3	20061219	530UJ	530U	530U	2800U	530UJ	160U	400U	230J
J1 3-5	20061219	480UJ	480U	480U	2500U	480UJ	150U	360U	210J
K1 0-1	20061220	50000U	50000U	50000U	260000U	50000U	15000UJ	38000UJ	38000U
K1 1-3	20061220	12000U	12000U	12000U	64000U	12000U	3800UJ	9400UJ	9400U
K1 3-5	20061220	1400U	1400U	1400U	7300U	230J	430UJ	1100UJ	740J
K1 5-7	20061220	13000U	13000U	13000U	69000U	13000U	4000UJ	10000UJ	10000U
K1 7-9	20061220	13000U	13000U	13000U	68000U	13000U	4000UJ	10000UJ	10000U
K1 9-11	20061220	1200U	1200U	1200U	6200U	1200U	360U	910U	410J
S1 0-1	20070711	12000U	12000U	12000U	60000U	12000U	3600U	8900U	8900U
S1 1-3	20070711	12000U	12000U	12000U	64000U	12000U	3800U	9400U	9400U
S1 3-5	20070711	11000U	11000U	11000U	58000U	11000U	3400U	8500U	8500U
S1 5-7	20070711	1200U	1200U	1200U	6200U	1200U	3700U	9200U	9200U
S1 7-9	20070711	1000U	1000U	1000U	5100U	1000U	300U	760U	760U
S1 9-11	20070711	790U	790U	790U	4100U	790U	240U	600U	600U
S2 0-1	20070710	1300U	1300U	1300U	6900U	1300U	410U	1000U	1000U
S2 1-3	20070710	1200U	1200U	1200U	6300U	1200U	370U	930U	930U
S2 3-5	20070710	1000U	1000U	1000U	5400U	1000U	320U	790U	580J
S2 5-7	20070710	780U	780U	780U	4000U	780U	240U	590U	590U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping V

Sample ID	Sample Date	Di-n-butyl phthalate	2-Methyl-4, 6-dinitrophenol	Dimethyl phthalate	2,4-Dinitro-phenol	3 & 4-Methylphenol	2-Methylphenol (o-Cresol)	2,4-Dimethyl-phenol	2-Nitro-aniline
A1 0-1	20061222	700U	4700U	700U	4700UJ	570J	920U	920U	1400U
A1 1-3	20061222	7800U	53000U	7800U	53000UJ	21000U	10000U	10000U	16000U
A1 3-5	20061222	9300U	64000U	9300U	64000U	25000U	12000U	12000U	19000U
A11 0-1	20061222	9900U	67000U	9900U	67000UJ	26000U	13000U	13000U	20000U
A11 1-3	20061222	700U	4800U	700U	4800UJ	1900U	930U	930UJ	1400U
A11 3-5	20061222	300U	2000U	300U	2000U	790U	400U	400U	600U
B1 0-1	20061222	320U	2200U	320U	2200U	850U	420U	420U	640U
B2 0-1	20061222	300U	2000U	300U	2000U	790U	400U	400U	600U
B3 0-1	20070710	590U	4000U	590U	4000U	1600U	780U	780U	1200U
B3 1-2	20070710	600U	4000U	600U	4000U	1600U	790U	790U	1200U
B4 0-1	20070711	620U	4200U	620U	4200U	1600U	820U	820U	1200U
B4 1-3	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
C1 0-1	20061221	810U	5500U	810U	5500U	2100U	1100U	1100U	1600U
C1 1-3	20061221	840U	5700U	840U	5700U	2200U	1100U	1100U	1700U
C1 3-5	20061221	770U	5200U	770U	5200U	2000U	1000U	1000U	1500U
C11 0-1	20061221	11000U	72000U	11000U	72000U	28000U	14000U	14000U	21000U
C11 1-3	20061221	10000U	71000U	1000U	7100U	1200J	1400U	1400U	2100U
C11 3-5	20061221	9700U	66000U	970U	6600U	2400J	1300U	1300U	1900U
C11 5-7	20061221	390J	6000U	880U	6000U	1700J	1200U	1200U	1800U
C12 0-1	20061221	6800U	46000U	6800U	46000U	18000U	8900U	8900U	14000U
C12 1-3	20061221	8000U	54000U	8000U	54000UJ	21000U	11000U	11000U	16000U
C12 3-5	20061221	8900U	60000U	8900U	60000UJ	23000U	12000U	12000U	18000U
C3 0-1	20061221	9200U	63000U	9200U	63000U	24000U	12000U	12000U	18000U
C3 1-3	20061221	8900U	60000U	8900U	60000U	23000U	12000U	12000U	18000U
C3 3-5	20061221	34000U	230000U	34000U	230000U	89000U	44000U	44000U	67000U
C4 0-1	20070711	690U	4700U	690U	4700U	1800U	910U	910U	1400U
C4 1-3	20070711	630U	4300U	630U	4300U	1700U	840U	840U	1300U
C4 3-5	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
C5 0-1	20070710	9000U	61000U	9000U	61000U	24000U	12000U	12000U	18000U
C5 1-3	20070710	6400U	44000U	6400U	44000U	17000U	8500U	8500U	13000U
C5 3-5	20070710	600U	4100U	600U	4100U	1600U	790U	790U	1200U
C6 0-1	20070711	9600U	65000U	9600U	65000U	25000U	13000U	13000U	19000U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping V

Sample ID	Sample Date	Di-n-butyl phthalate	2-Methyl-4, 6-dinitrophenol	Dimethyl phthalate	2,4-Dinitro-phenol	3 & 4-Methylphenol	2-Methylphenol (o-Cresol)	2,4-Dimethyl-phenol	2-Nitro-aniline
C6 1-3	20070711	9500U	64000U	9500U	64000U	25000U	13000U	13000U	19000U
C6 3-5	20070711	8800U	60000U	8800U	60000U	23000U	12000U	12000U	18000U
C6 5-7	20070711	9600UJ	65000UJ	9600UJ	65000UJ	25000UJ	13000UJ	13000UJ	19000UJ
C6 7-9	20070711	8700U	59000U	8700U	59000U	23000U	11000U	11000U	17000U
C7 0-1	20070710	8400U	57000U	8400U	57000U	22000U	11000U	11000U	17000U
C7 1-3	20070710	710U	4800U	710U	4800U	1900U	940U	940U	1400U
C8 0-1	20070711	8500U	58000U	8500U	58000U	22000U	11000U	11000U	17000U
C8 1-3	20070711	8700U	59000U	8700U	59000U	23000U	12000U	12000U	17000U
C9 0-1	20070710	8500U	58000U	850U	5800U	2200U	1100U	1100U	1700U
D2 0-1	20061221	300U	2000U	300U	2000U	790U	390U	390U	600U
D3 0-1	20061221	600U	4100U	600U	4100U	1600U	800U	800U	1200U
D4 0-1	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
D4 1-2	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
D5 0-1	20070710	7300U	49000U	7300U	49000U	19000U	9600U	9600U	15000U
D5 1-3	20070710	650U	4400U	650U	4400U	1700U	850U	850U	1300U
D6 0-1	20070710	590U	4000U	590U	4000U	1500U	770U	770U	1200U
E1 0-1	20061221	600U	4100U	600U	4100UJ	1600U	800U	800U	1200U
E1 1-3	20061221	600U	4100U	600U	4100UJ	1600U	790U	790U	1200U
E2 0-1	20061222	300U	2100U	300U	2100U	800U	400U	400U	600U
E2 1-3	20061222	300U	2000U	300U	2000U	790U	400U	400U	600U
E21 0-1	20061221	620U	4200U	620U	4200UJ	1600U	810U	810U	1200U
E3 0-1	20070710	590U	4000U	590U	4000U	1600U	780U	780U	1200U
E3 1-3	20070710	590U	4000U	590U	4000U	1600U	780U	780U	1200U
E6 0-1	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
E6 1-2	20070711	640U	4400U	640U	4400U	1700U	850U	850U	1300U
F1 0-1	20061221	5500U	38000U	5500U	38000U	15000U	7300U	7300U	11000U
F1 1-3	20061221	7900U	54000U	7900U	54000U	21000U	10000U	10000U	16000U
F12 0-1	20061221	850U	5800U	850U	5800U	2200U	1100U	1100U	1700U
F2 0-1	20061221	7300U	49000U	7300U	49000U	19000U	9600U	9600U	15000U
F2 1-3	20061221	6900U	47000U	6900U	47000UJ	18000U	9100U	9100U	14000U
F4 0-1	20070711	850U	5800U	850U	5800U	2200U	1100U	1100U	1700U
F4 1-3	20070711	850U	5800U	850U	5800U	2200U	1100U	1100U	1700U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping V

Sample ID	Sample Date	Di-n-butyl phthalate	2-Methyl-4, 6-dinitrophenol	Dimethyl phthalate	2,4-Dinitro-phenol	3 & 4-Methylphenol	2-Methylphenol (o-Cresol)	2,4-Dimethyl-phenol	2-Nitro-aniline
F4 3-5	20070711	780U	5300U	780U	5300U	2000U	1000U	1000U	1600U
F5 0-1	20070710	610U	4100U	610U	4100U	1600U	800U	800U	1200U
F5 1-3	20070710	600U	4100U	600U	4100U	1600U	790U	790U	1200U
F5 3-5	20070710	900U	6100U	900U	6100U	2400U	1200U	1200U	1800U
F6 0-1	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
F6 1-3	20070711	590U	4000U	590U	4000U	1500U	770U	770U	1200U
G1 0-1	20061221	610U	4100U	610U	4100U	1600U	800U	800U	1200U
G11 0-1	20061220	4500U	31000U	4500U	31000U	12000U	5900U	5900U	9000U
G11 1-3	20061220	8900U	61000U	8900U	61000U	24000U	12000U	12000U	18000U
G11 3-5	20061220	690U	4700U	690U	4700U	540J	910U	910U	1400U
G11 5-7	20061220	300U	2100U	300U	2100U	800U	400U	400U	610U
G12 0-1	20061221	9300U	64000U	9300U	64000U	25000U	12000U	12000U	19000U
G12 1-3	20061221	11000U	72000U	11000U	72000U	28000U	14000U	14000U	21000U
G13 0-1	20070711	21000U	150000U	21000U	150000U	57000U	28000U	28000U	43000U
G13 1-3	20070711	1000U	6800U	1000U	6800U	2700U	1300U	1300U	2000U
G13 3-5	20070711	610U	4200U	610U	4200U	1600U	810U	810U	1200U
G3 0-1	20061221	1300U	9100U	1300U	9100UJ	3500U	1800U	1800U	2700U
H1 0-1	20061220	640U	4400U	640U	4400U	1700U	850U	850U	1300U
H11 0-1	20061220	140J	2400U	350U	2400U	920U	460U	460U	700U
H11 1-3	20061220	400U	2700U	400U	2700U	1000U	520U	520U	790U
H11 3-5	20061220	110J	3100U	460U	3100U	1200U	610U	610U	920U
H12 0-1	20061219	4600U	31000U	460U	3100U	1200U	610U	610U	920U
H12 1-3	20061219	420U	2900U	420U	2900U	1100U	560U	560U	840U
H12 3-5	20061219	4500U	30000U	450U	3000U	1200U	590U	590U	890U
H12 5-7	20061219	460U	3100U	460U	3100U	1200U	610U	610U	930U
H12 7-9	20061219	410U	2800U	410U	2800U	1100U	540U	540U	820U
H13 0-1	20061221	410U	2800U	410U	2800U	1100U	540U	540U	820U
H13 1-3	20061221	420U	2900U	420U	2900U	1100U	560U	560U	850U
H13 3-5	20061221	470U	3200U	470U	3200U	490J	620U	620U	930U
H13 5-7	20061221	1000U	6800U	1000U	6800U	2600U	1300U	1300U	2000U
H13 7-9	20061221	1000U	7000U	1000U	7000U	2700U	1400U	1400U	2100U
H3 0-1	20061220	800U	5400U	800U	5400U	2100U	1100UJ	1100U	1600UJ

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping V

Sample ID	Sample Date	Di-n-butyl phthalate	2-Methyl-4, 6-dinitrophenol	Dimethyl phthalate	2,4-Dinitro-phenol	3 & 4-Methylphenol	2-Methylphenol (o-Cresol)	2,4-Dimethyl-phenol	2-Nitro-aniline
H3 1-3	20061220	600U	4100U	600U	4100U	1600U	800UJ	800U	1200UJ
H3 3-5	20061220	580U	3900U	580U	3900U	1500U	760UJ	760U	1200UJ
I1 0-1	20061219	330U	2200U	330U	2200U	870U	430U	430U	660U
I1 1-3	20061219	370U	2500U	370U	2500U	970U	490U	490U	740U
I1 3-5	20061219	310U	2100U	310U	2100U	470J	410U	410U	620U
I12 0-1	20061219	340U	2300U	340U	2300U	300J	450U	450U	680U
I12 1-3	20061219	360U	2500U	360U	2500U	710J	480U	480U	720U
I12 3-5	20061219	330U	2300U	330U	2300U	1400	440U	440U	670U
I2 0-1	20061220	810U	5500U	810U	5500U	2100U	1100U	1100U	1600U
I2 1-3	20061220	580U	4000U	580U	4000U	1500U	770U	770U	1200U
I2 3-5	20061220	610U	4100U	610U	4100U	1600U	800U	800U	1200U
I3 0-1	20061220	620U	4200U	620U	4200U	1600U	820U	820U	1200U
I3 1-3	20061220	600U	4100U	600U	4100U	1600U	790U	790U	1200U
J1 0-1	20061219	370U	2500U	370U	2500U	1100	490U	490U	740U
J1 1-3	20061219	400U	2800U	400U	2800U	1100	530U	530U	810U
J1 3-5	20061219	360U	2500U	360U	2500U	690J	480U	480U	730U
K1 0-1	20061220	38000U	260000U	38000U	260000U	100000U	50000U	50000U	75000U
K1 1-3	20061220	9400U	64000U	9400U	64000U	25000U	12000U	12000U	19000U
K1 3-5	20061220	1100U	7300U	1100U	7300U	5600	310J	230J	2200U
K1 5-7	20061220	10000U	69000U	10000U	69000U	27000U	13000U	13000U	20000U
K1 7-9	20061220	10000U	68000U	10000U	68000U	26000U	13000U	13000U	20000U
K1 9-11	20061220	910U	6200U	910U	6200U	690J	1200UJ	1200U	1800UJ
S1 0-1	20070711	8900U	60000U	8900U	60000U	23000U	12000U	12000U	18000U
S1 1-3	20070711	9400U	64000U	9400U	64000U	25000U	12000U	12000U	19000U
S1 3-5	20070711	8500U	58000U	8500U	58000U	22000U	11000U	11000U	17000U
S1 5-7	20070711	920U	6200U	9200U	62000U	2400U	1200U	1200U	18000U
S1 7-9	20070711	760U	5100U	760U	5100U	2000U	1000U	1000U	1500U
S1 9-11	20070711	600U	4100U	600U	4100U	1600U	790U	790U	1200U
S2 0-1	20070710	1000U	6900U	1000U	6900U	2700U	1300U	1300U	2000U
S2 1-3	20070710	930U	6300U	930U	6300U	2500U	1200U	1200U	1900U
S2 3-5	20070710	790U	5400U	790U	5400U	2100U	1000U	1000U	1600U
S2 5-7	20070710	590U	4000U	590U	4000U	1600U	780U	780U	1200U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB) Grouping VI

Sample ID	Sample Date	3-Nitro-aniline	4-Nitro-aniline	Nitro-benzene	N-Nitrosodi-n-propylamine	N-Nitrosodi-methylamine	N-Nitrosodi-phenylamine	Di-n-octyl phthalate	Phenol
A1 0-1	20061222	1400U	1400U	560U	560U	700U	560U	700U	920U
A1 1-3	20061222	16000U	16000U	6200U	6200U	7800U	6200U	7800U	10000U
A1 3-5	20061222	19000U	19000U	7500U	7500U	9300U	7500U	9300U	12000U
A11 0-1	20061222	20000U	20000U	7900U	7900U	9900U	7900U	9900U	13000U
A11 1-3	20061222	1400U	1400UJ	560UJ	560U	700UJ	560U	700U	930U
A11 3-5	20061222	600U	600U	240U	240U	300U	240U	300U	400U
B1 0-1	20061222	640U	640U	260U	260U	320U	260U	320U	420U
B2 0-1	20061222	600U	600U	240U	240U	300U	240U	300U	400U
B3 0-1	20070710	1200U	1200U	470U	470U	590U	470U	590U	780U
B3 1-2	20070710	1200U	1200U	480U	480U	600U	480U	600U	790U
B4 0-1	20070711	1200U	1200U	500U	500U	620U	500U	620U	820U
B4 1-3	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
C1 0-1	20061221	1600U	1600UJ	650U	650U	810U	650U	8100U	1100U
C1 1-3	20061221	1700U	1700UJ	670U	670U	840U	670U	840U	1100U
C1 3-5	20061221	1500U	1500U	620U	620U	770U	620U	770U	1000U
C11 0-1	20061221	21000U	21000U	8500U	8500U	11000U	8500U	11000U	14000U
C11 1-3	20061221	2100U	2100U	840U	840U	1000U	8400U	10000U	1400U
C11 3-5	20061221	1900U	1900U	780U	780U	970U	7800U	9700U	1300U
C11 5-7	20061221	1800U	1800U	700U	700U	880U	700U	8800U	1200U
C12 0-1	20061221	14000U	14000U	5400U	5400U	6800U	5400U	6800U	8900U
C12 1-3	20061221	16000U	16000UJ	6400U	6400U	8000U	6400U	8000UJ	11000U
C12 3-5	20061221	18000U	18000UJ	7100U	7100U	8900U	7100U	89000U	12000U
C3 0-1	20061221	18000U	18000U	7400U	7400U	9200U	7400U	9200U	12000U
C3 1-3	20061221	18000U	18000U	7100U	7100U	8900U	7100U	8900U	12000U
C3 3-5	20061221	67000U	67000U	27000U	27000U	34000U	27000U	34000U	44000U
C4 0-1	20070711	1400U	1400U	550U	550U	690U	550U	690U	910U
C4 1-3	20070711	1300U	1300U	510U	510U	630U	510U	630U	840U
C4 3-5	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
C5 0-1	20070710	18000U	18000U	7200U	7200U	9000U	7200U	9000U	12000U
C5 1-3	20070710	13000U	13000U	5100U	5100U	6400U	5100U	6400U	8500U
C5 3-5	20070710	1200U	1200U	480U	480U	600U	480U	600U	790U
C6 0-1	20070711	19000U	19000U	7600U	7600U	9600U	7600U	9600U	13000U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB) Grouping VI

Sample ID	Sample Date	3-Nitro-aniline	4-Nitro-aniline	Nitro-benzene	N-Nitrosodi-n-propylamine	N-Nitrosodi-methylamine	N-Nitrosodi-phenylamine	Di-n-octyl phthalate	Phenol
C6 1-3	20070711	19000U	19000U	7600U	7600U	9500U	7600U	9500U	13000U
C6 3-5	20070711	18000U	18000U	7100U	7100U	8800U	7100U	8800U	12000U
C6 5-7	20070711	19000UJ	19000UJ	7600UJ	7600UJ	9600UJ	7600UJ	9600UJ	13000UJ
C6 7-9	20070711	17000U	17000U	6900U	6900U	8700U	6900U	8700U	11000U
C7 0-1	20070710	17000U	17000U	6700U	6700U	8400U	6700U	8400U	11000U
C7 1-3	20070710	1400U	1400U	570U	570U	710U	570U	710U	940U
C8 0-1	20070711	17000U	17000U	6800U	6800U	8500U	6800U	8500U	11000U
C8 1-3	20070711	17000U	17000U	7000U	7000U	8700U	7000U	8700U	12000U
C9 0-1	20070710	1700U	1700U	680U	680U	850U	6800U	850U	1100U
D2 0-1	20061221	600U	600U	240UJ	240U	300U	240U	300U	390U
D3 0-1	20061221	1200U	1200UJ	480U	480U	600U	480U	600U	800U
D4 0-1	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
D4 1-2	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
D5 0-1	20070710	15000U	15000U	5800U	5800U	7300U	5800U	7300U	9600U
D5 1-3	20070710	1300U	1300U	520U	520U	650U	520U	650U	850U
D6 0-1	20070710	1200U	1200U	470U	470U	590U	470U	590U	770U
E1 0-1	20061221	1200U	1200U	480U	480U	600UJ	480U	600U	800U
E1 1-3	20061221	1200U	1200U	480U	480U	600UJ	480U	600U	790U
E2 0-1	20061222	600U	600U	240UJ	240U	300U	240U	300U	400U
E2 1-3	20061222	600U	600U	240U	240U	300U	240U	300U	400U
E21 0-1	20061221	1200U	1200U	490U	490U	620UJ	490U	620U	810U
E3 0-1	20070710	1200U	1200U	470U	470U	590U	470U	590U	780U
E3 1-3	20070710	1200U	1200U	470U	470U	590U	470U	590U	780U
E6 0-1	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
E6 1-2	20070711	1300U	1300U	510U	510U	640U	510U	640U	850U
F1 0-1	20061221	11000U	11000U	4400U	4400U	5500U	4400U	55000U	7300U
F1 1-3	20061221	16000U	16000U	6300U	6300U	7900U	6300U	7900U	10000U
F12 0-1	20061221	1700U	1700UJ	680U	680U	850U	680U	850U	1100U
F2 0-1	20061221	15000U	15000U	5800U	5800U	7300U	5800U	7300U	9600U
F2 1-3	20061221	14000U	14000U	5500U	5500U	6900U	5500U	6900U	9100U
F4 0-1	20070711	1700U	1700U	680U	680U	850U	680U	850U	1100U
F4 1-3	20070711	1700U	1700U	680U	680U	850U	680U	850U	1100U

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping VI

Sample ID	Sample Date	3-Nitro-aniline	4-Nitro-aniline	Nitro-benzene	N-Nitrosodi-n-propylamine	N-Nitrosodi-methylamine	N-Nitrosodi-phenylamine	Di-n-octyl phthalate	Phenol
F4 3-5	20070711	1600U	1600U	620U	620U	780U	620U	780U	1000U
F5 0-1	20070710	1200U	1200U	480U	480U	610U	480U	610U	800U
F5 1-3	20070710	1200U	1200U	480U	480U	600U	480U	600U	790U
F5 3-5	20070710	1800U	1800U	720U	720U	900U	720U	900U	1200U
F6 0-1	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
F6 1-3	20070711	1200U	1200U	470U	470U	590U	470U	590U	770U
G1 0-1	20061221	1200U	1200UJ	490U	490U	610U	490U	610U	800U
G11 0-1	20061220	9000U	9000U	3600U	3600U	4500U	3600U	4500U	5900U
G11 1-3	20061220	18000U	18000U	7100U	7100U	8900U	7100U	8900U	12000U
G11 3-5	20061220	1400U	1400UJ	550U	550U	690U	550U	690U	910U
G11 5-7	20061220	610U	610U	240UJ	240U	300U	240U	300U	400U
G12 0-1	20061221	19000U	19000U	7500U	7500U	9300U	7500U	9300U	12000U
G12 1-3	20061221	21000U	21000U	8500U	8500U	11000U	8500U	11000U	14000U
G13 0-1	20070711	43000U	43000U	17000U	17000U	21000U	17000U	21000U	28000U
G13 1-3	20070711	2000U	2000U	800U	800U	1000U	800U	1000U	1300U
G13 3-5	20070711	1200U	1200U	490U	490U	610U	490U	610U	810U
G3 0-1	20061221	2700U	2700U	1100U	1100U	1300U	1100U	1300U	1600J
H1 0-1	20061220	1300U	1300U	510U	510U	640U	510U	640U	850U
H11 0-1	20061220	700U	700U	280UJ	280U	350U	280U	350U	460U
H11 1-3	20061220	790U	790U	320UJ	320U	400U	320U	400U	520U
H11 3-5	20061220	920U	920U	370UJ	370U	460U	370U	460U	610U
H12 0-1	20061219	920U	920U	370U	370U	460U	3700U	460U	610U
H12 1-3	20061219	840U	840U	340U	340U	420U	340U	420U	560U
H12 3-5	20061219	890U	890U	360U	360U	450U	3600U	4500U	590U
H12 5-7	20061219	930U	930U	370U	370U	460U	370U	460U	610U
H12 7-9	20061219	820U	820U	330U	330U	410U	330U	410U	540U
H13 0-1	20061221	820U	820U	330UJ	330U	410U	330U	410U	570
H13 1-3	20061221	850U	850U	340U	340U	420U	340U	420U	950
H13 3-5	20061221	930U	930U	370UJ	370U	470U	370U	470U	1600
H13 5-7	20061221	2000U	2000U	800U	800U	1000U	800U	1000U	1400
H13 7-9	20061221	2100U	2100UJ	830U	830U	1000U	830U	1000U	1600
H3 0-1	20061220	1600UJ	1600U	640U	640UJ	800UJ	640U	800U	420

Individual SVOC Results for Trenton Channel Remedial Investigation Phases I/II (PPB)
Grouping VI

Sample ID	Sample Date	3-Nitro-aniline	4-Nitro-aniline	Nitro-benzene	N-Nitrosodi-n-propylamine	N-Nitrosodi-methylamine	N-Nitrosodi-phenylamine	Di-n-octyl phthalate	Phenol
H3 1-3	20061220	1200UJ	1200U	480U	480UJ	600UJ	480U	600U	820
H3 3-5	20061220	1200UJ	1200U	460U	460UJ	580UJ	460U	580U	760U
I1 0-1	20061219	660U	660U	260U	260U	330U	260U	330U	430U
I1 1-3	20061219	740U	740U	290U	290U	370U	290U	370U	490U
I1 3-5	20061219	620U	620U	250U	250U	310U	250U	310U	500
I12 0-1	20061219	680U	680U	270U	270U	340U	270U	340U	450U
I12 1-3	20061219	720U	720U	290U	290U	360U	290U	360U	640
I12 3-5	20061219	670U	670U	270U	270U	330U	270U	330U	1400
I2 0-1	20061220	1600U	1600U	650U	650U	810U	650U	810U	1100U
I2 1-3	20061220	1200U	1200U	470U	470U	580U	470U	580U	1200
I2 3-5	20061220	1200U	1200U	480U	480U	610U	480U	610U	800U
I3 0-1	20061220	1200U	1200U	490U	490U	620U	490U	620U	820U
I3 1-3	20061220	1200U	1200U	480U	480U	600U	480U	600U	790U
J1 0-1	20061219	740U	740U	290U	290U	370U	290U	370U	490U
J1 1-3	20061219	810U	810U	320U	320U	400U	320U	400U	530U
J1 3-5	20061219	730U	730U	290U	290U	360U	290U	360U	480U
K1 0-1	20061220	75000U	75000U	30000U	30000U	38000U	30000U	380000U	50000U
K1 1-3	20061220	19000U	19000U	7500U	7500U	9400U	7500U	94000U	2300J
K1 3-5	20061220	2200U	2200U	860U	860U	1100U	860U	1100U	4000
K1 5-7	20061220	20000U	20000U	8100U	8100U	10000U	8100U	10000U	4100J
K1 7-9	20061220	20000U	20000U	8000U	8000U	10000U	8000U	10000U	2200J
K1 9-11	20061220	1800UJ	1800U	730U	730UJ	910UJ	730U	910U	500J
S1 0-1	20070711	18000U	18000U	7100U	7100U	8900U	7100U	8900U	12000U
S1 1-3	20070711	19000U	19000U	7500U	7500U	9400U	7500U	9400U	12000U
S1 3-5	20070711	17000U	17000U	6800U	6800U	8500U	6800U	8500U	11000U
S1 5-7	20070711	18000U	18000U	730U	730U	920U	730U	920U	1200U
S1 7-9	20070711	1500U	1500U	610U	610U	760U	610U	760U	1000U
S1 9-11	20070711	1200U	1200U	480U	480U	600U	480U	600U	790U
S2 0-1	20070710	2000U	2000U	810U	810U	1000U	810U	1000UJ	1300U
S2 1-3	20070710	1900U	1900U	740U	740U	930U	740U	930UJ	1200U
S2 3-5	20070710	1600U	1600U	630U	630U	790U	630U	790U	1000U
S2 5-7	20070710	1200U	1200U	470U	470U	590U	470U	590U	780U

Individual and Total Aroclor Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total Aroclors
A1 0-1	20061222	2400U	2400U	2400U	2400U	2400	1100J	1400U	1400U	1400U	3500
A1 1-3	20061222	310U	310U	310U	310U	310U	310U	310U	310U	310U	310U
A1 3-5	20061222	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U
A11 0-1	20061222	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U
A11 1-3	20061222	280U	280U	280U	280U	280U	280U	280U	280U	280U	280U
A11 3-5	20061222	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
B1 0-1	20061222	260U	260U	260U	260U	260U	260U	260U	260U	260U	260U
B2 0-1	20061222	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
B3 0-1	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
B3 1-2	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
B4 0-1	20070711	250U	250U	250U	250U	200J	150J	250U	250U	250U	350
B4 1-3	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
C1 0-1	20061221	600U	600U	600U	600U	590	990U	1300	1300U	320U	1890
C1 1-3	20061221	2300U	2300U	2300U	2300U	2300	1000	540	550U	340U	3840
C1 3-5	20061221	2500U	2500U	2500U	2500U	2400	1200U	280J	310U	310U	2680
C11 0-1	20061221	970U	970U	970U	970U	970	1600U	2300	2300U	420U	3270
C11 1-3	20061221	2300U	2300U	2300U	2300U	2200	1400U	1400	1400U	420U	3600
C11 3-5	20061221	13000U	13000U	13000U	13000U	13000	3300U	1500	1500U	390U	14500
C11 5-7	20061221	11000U	11000U	11000U	11000U	11000	2800U	880	890U	350U	11880
C12 0-1	20061221	300U	300U	300U	300U	290	400	450	460U	270U	1140
C12 1-3	20061221	1800UJ	1800UJ	1800UJ	1800UJ	1600J	1100UJ	1200J	1200UJ	320UJ	2800
C12 3-5	20061221	15000U	15000U	15000U	15000U	15000	6600	3600U	3600U	3600U	21600
C3 0-1	20061221	370U	370U	370U	370U	370U	700U	370U	370U	370U	700U
C3 1-3	20061221	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U
C3 3-5	20061221	270U	270U	270U	270U	270U	270U	270U	270U	270U	270U
C4 0-1	20070711	550U	550U	550U	550U	550J	580J	250J	280U	280U	1380
C4 1-3	20070711	250U	250U	250U	250U	170J	110J	250U	250U	250U	280
C4 3-5	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
C5 0-1	20070710	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U
C5 1-3	20070710	260U	260U	260U	260U	260U	260U	260U	260U	260U	260U
C5 3-5	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
C6 0-1	20070711	12000U	12000U	12000U	12000U	12000	7200	2100J	3800U	3800U	21300
C6 1-3	20070711	11000U	11000U	11000U	11000U	11000J	5200J	1200J	3800U	3800U	17400

Individual and Total Aroclor Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total Aroclors
C6 3-5	20070711	530U	530U	530U	530U	520J	610J	320J	350U	350U	1450
C6 5-7	20070711	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U
C6 7-9	20070711	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U
C7 0-1	20070710	1800U	1800U	1800U	1800	1800U	870	700	710U	340U	3370
C7 1-3	20070710	460U	460U	460U	460U	450	370	280U	280U	280U	820
C8 0-1	20070711	1900U	1900U	1900U	1900U	1800	850	360	370U	340U	3010
C8 1-3	20070711	350U	350U	350U	350U	280J	350U	350U	350U	350U	280
C9 0-1	20070710	720U	720U	720U	720U	700	830	650	660U	340U	2180
D2 0-1	20061221	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
D3 0-1	20061221	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
D4 0-1	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
D4 1-2	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
D5 0-1	20070710	320U	320U	320U	320U	320U	440U	290U	290U	290U	440U
D5 1-3	20070710	260U	260U	260U	260U	260U	260U	260U	260U	260U	260U
D6 0-1	20070710	230U	230U	230U	230U	230U	230U	230U	230U	230U	230U
E1 0-1	20061221	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E1 1-3	20061221	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E2 0-1	20061222	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U
E2 1-3	20061222	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E21 0-1	20061221	250U	250U	250U	250U	120J	250U	250U	250U	250U	120
E3 0-1	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E3 1-3	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E6 0-1	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
E6 1-2	20070711	260U	260U	260U	260U	260U	260U	260U	260U	260U	260U
F1 0-1	20061221	440U	440U	440U	440U	370J	440U	270J	440U	440U	640
F1 1-3	20061221	320U	320U	320U	320U	280J	320U	300J	320U	320U	580
F12 0-1	20061221	430U	430U	430U	430U	420	530	260J	340U	340U	1210
F2 0-1	20061221	290U	290U	290U	290U	290U	140J	290U	290U	290U	140
F2 1-3	20061221	270U	270U	270U	270U	270U	270U	270U	270U	270U	270U
F4 0-1	20070711	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U
F4 1-3	20070711	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U
F4 3-5	20070711	310U	310U	310U	310U	310U	160J	310U	310U	310U	160
F5 0-1	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U

Individual and Total Aroclor Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total Aroclors
F5 1-3	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
F5 3-5	20070710	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U
F6 0-1	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
F6 1-3	20070711	230U	230U	230U	230U	230U	230U	230U	230U	230U	230U
G1 0-1	20061221	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
G11 0-1	20061220	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U
G11 1-3	20061220	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U
G11 3-5	20061220	280U	280U	280U	280U	280U	280U	280U	280U	280U	280U
G11 5-7	20061220	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
G12 0-1	20061221	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U
G12 1-3	20061221	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U
G13 0-1	20070711	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U
G13 1-3	20070711	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U
G13 3-5	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
G3 0-1	20061221	540U	540U	540U	540U	540U	280J	540U	540U	540U	280
H1 0-1	20061220	260U	260U	260U	260U	260U	210J	260U	260U	260U	210
H11 0-1	20061220	280U	280U	280U	280U	280U	260J	280U	280U	280U	260
H11 1-3	20061220	320U	320U	320U	320U	320U	320U	320U	320U	320U	320U
H11 3-5	20061220	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U
H12 0-1	20061219	180U	180U	180U	180U	180U	180U	180U	180U	180U	180U
H12 1-3	20061219	170U	170U	170U	170U	170U	170U	170U	170U	170U	170U
H12 3-5	20061219	180U	180U	180U	180U	180U	180U	180U	180U	180U	180U
H12 5-7	20061219	190U	190U	190U	190U	190U	190U	190U	190U	190U	190U
H12 7-9	20061219	160U	160U	160U	160U	160U	160U	160U	160U	160U	160U
H13 0-1	20061221	330U	330U	330U	330U	330U	330U	330U	330U	330U	330U
H13 1-3	20061221	340U	340U	340U	340U	340U	560U	340U	340U	340U	560U
H13 3-5	20061221	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U
H13 5-7	20061221	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U
H13 7-9	20061221	410U	410U	410U	410U	410U	2100U	410U	410U	410U	2100U
H3 0-1	20061220	160U	160U	160U	160U	160U	160U	160U	160U	160U	160U
H3 1-3	20061220	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
H3 3-5	20061220	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
I1 0-1	20061219	3800U	3800U	3800U	3800U	3800U	1300U	1300U	1300U	1300U	3800U

Individual and Total Aroclor Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total Aroclors
I1 1-3	20061219	6300U	6300U	6300U	6300U	6300U	2900U	2900U	2900U	2900U	6300U
I1 3-5	20061219	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
I12 0-1	20061219	140U	140U	140U	140U	92J	140	140U	140U	140U	232
I12 1-3	20061219	140U	140U	140U	140U	140U	140U	140U	140U	140U	140U
I12 3-5	20061219	130U	130U	130U	130U	130U	130U	130U	130U	130U	130U
I2 0-1	20061220	160U	160U	160U	160U	160U	200U	160U	160U	160U	200U
I2 1-3	20061220	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
I2 3-5	20061220	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
I3 0-1	20061220	120U	120U	120U	120U	120U	120U	120U	120U	120U	120U
I3 1-3	20061220	120U	120U	120U	120U	120U	190U	120U	120U	120U	190U
J1 0-1	20061219	660U	660U	660U	660U	650	510	270U	270U	150U	1160
J1 1-3	20061219	160U	160U	160U	160U	150J	220	160U	160U	160U	370
J1 3-5	20061219	38000U	38000U	38000U	38000U	38000U	45000U	38000U	38000U	15000U	45000U
K1 0-1	20061220	750000U	750000U	750000U	750000U	750000U	5000000U	250000	260000U	75000U	250000
K1 1-3	20061220	190000U	190000U	190000U	190000U	190000U	600000U	460000	470000U	190000U	460000
K1 3-5	20061220	43000U	43000U	43000U	43000U	43000U	240000U	130000	130000U	43000U	130000
K1 5-7	20061220	10000U	10000U	10000U	10000U	10000U	61000U	33000	34000U	10000U	33000
K1 7-9	20061220	2000U	2000U	2000U	2000U	2000U	9000U	3100	3200U	2000U	3100
K1 9-11	20061220	1200U	1200U	1200U	1200U	1200U	6700U	1500	1500U	910U	1500
S1 0-1	20070711	7800U	7800U	7800U	7800U	7600J	4600J	1400J	3600U	3600U	13600
S1 1-3	20070711	380U	380U	380U	380U	210J	170J	380U	380U	380U	380
S1 3-5	20070711	340U	340U	340U	340U	340U	130J	340U	340U	340U	130
S1 5-7	20070711	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U
S1 7-9	20070711	300U	300U	300U	300U	300U	300U	300U	300U	300U	300U
S1 9-11	20070711	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U
S2 0-1	20070710	12000U	12000U	12000U	12000	12000U	4200	4100U	4100U	4100U	16200
S2 1-3	20070710	3000U	3000U	3000U	2900	3000U	1300	1900U	1900U	1900U	4200
S2 3-5	20070710	320U	320U	320U	320U	320U	320U	320U	320U	320U	320U
S2 5-7	20070710	240U	240U	240U	240U	240U	240U	240U	240U	240U	240U

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping I

Congener	Sample ID	B4 1-3	C12 0-1	C12 1-3	C12 3-5	C4 0-1	C4 1-3	C4 3-5
	Sample Date	20070711	20061221	20061221	20061221	20070711	20070711	20070711
1		0.101	0.135U	3.6J	1.8J	0.458J	0.224	0.016
2		0.0273	0.135U	1.3J	1.2J	0.152J	0.0698J	0.0302U
3		0.0579J	0.135U	3.8J	3.4J	0.358J	0.172	0.0148
4		0.451	NA	NA	NA	2.24	1.11	0.0393
4+10		NA	0.4	5.1	8.5	NA	NA	NA
5		0.0313J	NA	NA	NA	0.138J	0.053J	0.0302U
5+8		NA	5.8	68J	160J	NA	NA	NA
6		0.428	0.78	8.5	17	2.05	1.34	0.0277
7		0.0799	NA	NA	NA	0.447J	0.213	0.0302U
7+9		NA	0.4	4.9	6.4	NA	NA	NA
8		1.82	NA	NA	NA	10.4	6.55	0.152
9		0.103	NA	NA	NA	0.695	0.348	0.0104
10		0.0465J	NA	NA	NA	0.226J	0.0695J	0.0302U
11		0.0424	0.135U	0.98	0.59	0.219J	0.0793J	0.0167
12+13		0.148	0.36	3.6	3.9	0.742	0.373	0.0118
14		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0296	0.0302U
15		0.664	2.3	24	46J	3.85	1.92	0.0474J
16		1.79	NA	NA	NA	9.65	4.02	0.157
16+32		NA	4.7	37J	75J	NA	NA	NA
17		2.06	3.2	27	53J	12.6	7.8	0.181
18		5.32	5.2	44J	93J	30.3	21.4	0.49
19		0.358	0.41	3.5	5.9	1.51	1.14	0.0306
20+21+33		NA	6.8	57J	130J	NA	NA	NA
20+28		5.13	NA	NA	NA	34.3	23.9	0.509
21+33		2.71	NA	NA	NA	19.3	14.4	0.3
22		1.76	4	32	70J	11.5	8	0.179
23		0.03015U	NA	NA	NA	0.2655U	0.0303J	0.0302U
23+34		NA	0.135U	0.81	0.95	NA	NA	NA
24		0.0607	NA	NA	NA	0.279J	0.115	0.00551
24+27		NA	0.54	4.3	8	NA	NA	NA
25		0.43	0.9	6.7	12	2.41	1.43	0.0416J
26		NA	2	15	32	NA	NA	NA
26+29		0.797	NA	NA	NA	5.05	3.44	0.0863
27		0.289	NA	NA	NA	1.47	1	0.0216
28		NA	10	78J	160J	NA	NA	NA
29		NA	0.135U	0.69	1	NA	NA	NA
30		0.0605U	0.135U	0.17U	0.175U	0.53U	0.0745U	0.0605U
31		4.79	11	93J	220J	31.8	23.6	0.503
32		1.51	NA	NA	NA	7.79	4.84	0.123
34		0.0535J	NA	NA	NA	0.336J	0.194	0.00526
35		0.0862	0.135U	1.4	1.8	0.362J	0.264	0.0302U
36		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
37		1.13	3.7	29	58J	7.79	5.13	0.125
38		0.03015U	0.135U	0.17U	0.84	0.2655U	0.0372U	0.0302U
39		0.0302J	0.135U	0.17U	0.175U	0.238J	0.179	0.0302U
40		NA	2.4	21	87J	NA	NA	NA
40+71		2.3	NA	NA	NA	16.3	18.1	0.296
41		0.306	NA	NA	NA	2.29	2.75	0.0496J

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping I

Congener	Sample ID	C6 0-1	C6 1-3	C6 3-5	C6 5-7	C6 7-9	C8 0-1	C8 1-3
	Sample Date	20070711	20070711	20070711	20070711	20070711	20070711	20070711
1		11.3	3.51J	0.344J	0.0777	0.343U	0.903	1.66U
2		2.97J	0.702J	0.223J	0.376U	0.343U	0.37J	1.66U
3		7.32	2.1J	0.261J	0.376U	0.343U	0.801	1.66U
4		54.5	39.1	0.799J	0.481J	0.685U	6.74	1.6J
4+10		NA	NA	NA	NA	NA	NA	NA
5		4.26	1.69J	0.3265U	0.376U	0.343U	0.308J	1.66U
5+8		NA	NA	NA	NA	NA	NA	NA
6		49	27.5	0.629J	0.351J	0.225J	6.16	1.16J
7		13.5	5.12	0.198J	0.128J	0.343U	0.939	1.66U
7+9		NA	NA	NA	NA	NA	NA	NA
8		226	144	3.49	1.41J	0.822J	33.2	8.74
9		16.7	8.39	0.296J	0.0892J	0.343U	1.46	1.66U
10		3.19J	2.06J	0.127J	0.376U	0.343U	0.309J	1.66U
11		1.58J	0.803J	0.21J	0.75U	0.685U	0.346J	0.624J
12+13		15.9	6.45	0.429J	0.167J	0.145J	1.97	1.66U
14		0.984J	0.24J	0.154J	0.376U	0.343U	0.0731J	1.66U
15		89.1J	44.5	1.29	0.442J	0.273J	11.9	2.49J
16		166	164	2.89	1.42	0.809	49.8	13.4
16+32		NA	NA	NA	NA	NA	NA	NA
17		221	207	4.42	2.41	0.797	66.4	15.7
18		538	576	9.82	5.54	2.66	192	51
19		32.7	32.2	0.475J	0.376U	0.343U	9.48	1.66U
20+21+33		NA	NA	NA	NA	NA	NA	NA
20+28		537	530	13.8	5.39	3.25	207	42.5
21+33		290	301	7.84	2.94	1.75	116	25.3
22		176	179	4.66	1.79	1.07	66.7	14.5
23		1.17J	0.722J	0.3265U	0.376U	0.343U	0.137J	1.66U
23+34		NA	NA	NA	NA	NA	NA	NA
24		7.6	4.37	0.3265U	0.376U	0.343U	1.48	1.66U
24+27		NA	NA	NA	NA	NA	NA	NA
25		36.3	28.6	0.876	0.269J	0.137J	11.1	1.88J
26		NA	NA	NA	NA	NA	NA	NA
26+29		79	71.4	1.97	0.634J	0.388J	27.8	5.39
27		26.7	24.8	0.619J	0.192J	0.343U	7.58	1.57J
28		NA	NA	NA	NA	NA	NA	NA
29		NA	NA	NA	NA	NA	NA	NA
30		4.035U	3.64U	0.655U	0.75U	0.685U	0.68U	3.325U
31		477	542	12.5	5.24	2.9	209	46.6
32		131	137	2.7	1.1	0.576J	47.8	10.2
34		3.86J	2.46J	0.3265U	0.376U	0.343U	1.39	1.66U
35		6.13	3.87	0.181J	0.0669J	0.343U	1.44	1.66U
36		2.02U	0.482J	0.3265U	0.376U	0.343U	0.341U	1.66U
37		122J	112	3.18	1.03	0.511J	36	8.57
38		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
39		4.72	4.8	0.3265U	0.376U	0.343U	1.83	1.66U
40		NA	NA	NA	NA	NA	NA	NA
40+71		237	328	6.45	3.13	1.53	129	28.8
41		56.5	66.3	2.14	0.672J	0.175J	25.9	5.66

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II
Grouping I

Congener	Sample ID	D2 0-1	G11 0-1	G11 1-3	G11 3-5	G11 5-7	G3 1-3
	Sample Date	20061221	20061220	20061220	20061220	20061220	20070711
1		0.012U	0.185U	0.19U	0.125U	0.12U	0.156J
2		0.012U	0.185U	0.19U	0.125U	0.12U	0.112J
3		0.012U	0.185U	0.19U	0.125U	0.12U	0.154J
4		NA	NA	NA	NA	NA	0.764
4+10		0.012U	0.185U	0.19UJ	0.125U	0.12U	NA
5		NA	NA	NA	NA	NA	0.192J
5+8		0.14	0.185U	0.19UJ	0.125U	0.12U	NA
6		0.012U	0.185U	0.19UJ	0.125U	0.12U	0.708
7		NA	NA	NA	NA	NA	0.197J
7+9		0.012U	0.185U	0.19UJ	0.125U	0.12U	NA
8		NA	NA	NA	NA	NA	3.53
9		NA	NA	NA	NA	NA	0.23
10		NA	NA	NA	NA	NA	0.144J
11		0.012U	0.185U	0.19UJ	0.125U	0.12U	0.148J
12+13		0.012U	0.185U	0.19UJ	0.125U	0.12U	0.344
14		0.012U	0.185U	0.19UJ	0.125U	0.12U	0.118J
15		0.077	0.185U	0.19UJ	0.125U	0.12U	1.34
16		NA	NA	NA	NA	NA	1.71
16+32		0.062	0.185U	0.19U	0.125U	0.12U	NA
17		0.03	0.185U	0.19U	0.125U	0.12U	2.07
18		0.012U	0.185U	0.19U	0.125U	0.12U	5.45
19		0.012U	0.185U	0.19U	0.125U	0.12U	0.466
20+21+33		0.081	0.185U	0.19U	0.125U	0.12U	NA
20+28		NA	NA	NA	NA	NA	6.3
21+33		NA	NA	NA	NA	NA	3.37
22		0.059	0.185U	0.19U	0.125U	0.12U	2.16
23		NA	NA	NA	NA	NA	0.1075U
23+34		0.012U	0.185U	0.19U	0.125U	0.12U	NA
24		NA	NA	NA	NA	NA	0.1075U
24+27		0.012U	0.185U	0.19U	0.125U	0.12U	NA
25		0.012U	0.185U	0.19U	0.125U	0.12U	0.51
26		0.027	0.185U	0.19U	0.125U	0.12U	NA
26+29		NA	NA	NA	NA	NA	0.852
27		NA	NA	NA	NA	NA	0.296
28		0.15	0.185U	0.19U	0.125U	0.12U	NA
29		0.012U	0.185U	0.19U	0.125U	0.12U	NA
30		0.012U	0.185U	0.19U	0.125U	0.12U	0.2145U
31		0.15	0.185U	0.19U	0.125U	0.12U	5.42
32		NA	NA	NA	NA	NA	1.32
34		NA	NA	NA	NA	NA	0.1075U
35		0.012U	0.185U	0.19U	0.125U	0.12U	0.0973J
36		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
37		0.012U	0.185U	0.19U	0.125U	0.12U	1.47
38		0.012U	0.185U	0.19U	0.125U	0.12U	0.0399J
39		0.012U	0.185U	0.19U	0.125U	0.12U	0.0583J
40		0.012U	0.185U	0.19U	0.125U	0.12U	NA
40+71		NA	NA	NA	NA	NA	2.4
41		NA	NA	NA	NA	NA	0.413

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping I

Congener	Sample ID	G3 0-1	H11 0-1	H11 1-3	H3 0-1	H3 1-3	H3 3-5
	Sample Date	20061221	20061220	20061220	20061220	20061220	20061220
1		0.17	0.155U	0.165U	0.041	0.039J	0.051J
2		0.16	0.155U	0.165U	0.078	0.013UJ	0.0115UJ
3		0.35	0.155U	0.165U	0.065	0.013UJ	0.0115UJ
4		NA	NA	NA	NA	NA	NA
4+10		0.029U	0.155U	0.165U	0.0165U	0.013UJ	0.0115UJ
5		NA	NA	NA	NA	NA	NA
5+8		0.55	2.2	0.165U	0.21	0.078J	0.082J
6		0.065	0.155U	0.165U	0.0165U	0.013UJ	0.0115UJ
7		NA	NA	NA	NA	NA	NA
7+9		0.029U	0.155U	0.165U	0.0165U	0.013UJ	0.0115UJ
8		NA	NA	NA	NA	NA	NA
9		NA	NA	NA	NA	NA	NA
10		NA	NA	NA	NA	NA	NA
11		0.098	0.155U	0.165U	0.0165U	0.013UJ	0.0115UJ
12+13		0.21	0.155U	0.165U	0.055	0.013UJ	0.0115UJ
14		0.029U	0.155U	0.165U	0.0165U	0.013UJ	0.0115UJ
15		0.25	0.82	0.165U	0.12	0.013UJ	0.0115UJ
16		NA	NA	NA	NA	NA	NA
16+32		0.25	3.5	0.165U	0.15	0.013U	0.0115U
17		0.12	1.8	0.165U	0.048	0.013U	0.0115U
18		0.33	4.6	0.38	0.12	0.013U	0.0115U
19		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
20+21+33		0.38	4.8	0.165U	0.17	0.029	0.0115U
20+28		NA	NA	NA	NA	NA	NA
21+33		NA	NA	NA	NA	NA	NA
22		0.23	2.9	0.165U	0.11	0.013U	0.0115U
23		NA	NA	NA	NA	NA	NA
23+34		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
24		NA	NA	NA	NA	NA	NA
24+27		0.029U	0.33	0.165U	0.0165U	0.013U	0.0115U
25		0.029U	0.31	0.165U	0.052	0.013U	0.0115U
26		0.096	1	0.165U	0.063	0.013U	0.0115U
26+29		NA	NA	NA	NA	NA	NA
27		NA	NA	NA	NA	NA	NA
28		0.64	7.4	0.53	0.3	0.046	0.0115U
29		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
30		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
31		0.83	9.4	0.65	0.28	0.046	0.0115U
32		NA	NA	NA	NA	NA	NA
34		NA	NA	NA	NA	NA	NA
35		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
36		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
37		0.21	2.5	0.165U	0.14	0.013U	0.0115U
38		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
39		0.14	0.155U	0.165U	0.0165U	0.013U	0.0115U
40		0.29	1.7	0.165U	0.055	0.013U	0.0115U
40+71		NA	NA	NA	NA	NA	NA
41		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping I

Congener		I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample ID	I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample Date	20061220	20061220	20061220	20061220	20061220	20061220
1		0.11J	0.14	1800J	350J	83J	220J
2		0.057J	0.012U	80UJ	20UJ	22UJ	10.5UJ
3		0.096J	0.056	1200J	310J	85J	150J
4		NA	NA	NA	NA	NA	NA
4+10		0.063	0.051	860J	230J	55J	28J
5		NA	NA	NA	NA	NA	NA
5+8		0.42	0.28	5400J	2400J	540J	210J
6		0.075	0.026	440J	170J	22UJ	10.5UJ
7		NA	NA	NA	NA	NA	NA
7+9		0.031	0.012U	350J	130J	22UJ	10.5UJ
8		NA	NA	NA	NA	NA	NA
9		NA	NA	NA	NA	NA	NA
10		NA	NA	NA	NA	NA	NA
11		0.035	0.012U	80UJ	20UJ	22UJ	10.5UJ
12+13		0.15	0.012U	80UJ	44J	22UJ	10.5UJ
14		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
15		0.17	0.056	2200J	900J	210J	79J
16		NA	NA	NA	NA	NA	NA
16+32		0.45	0.1	870J	360J	84J	30J
17		0.16	0.042	620J	250J	66J	10.5UJ
18		0.42	0.089	1500J	660J	160J	34J
19		0.088	0.012U	80UJ	20UJ	22UJ	10.5UJ
20+21+33		0.4	0.093	1000J	450J	120J	37J
20+28		NA	NA	NA	NA	NA	NA
21+33		NA	NA	NA	NA	NA	NA
22		0.27	0.065	520J	250J	61J	10.5UJ
23		NA	NA	NA	NA	NA	NA
23+34		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
24		NA	NA	NA	NA	NA	NA
24+27		0.068	0.012U	80UJ	20UJ	22UJ	10.5UJ
25		0.22	0.027	80UJ	20UJ	22UJ	10.5UJ
26		0.14	0.026	190J	69J	22UJ	10.5UJ
26+29		NA	NA	NA	NA	NA	NA
27		NA	NA	NA	NA	NA	NA
28		1	0.19	2200J	1000J	260J	75J
29		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
30		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
31		0.96	0.17	1500J	700J	160J	57J
32		NA	NA	NA	NA	NA	NA
34		NA	NA	NA	NA	NA	NA
35		0.038	0.012U	80UJ	20UJ	22UJ	10.5UJ
36		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
37		0.23	0.051	700J	220J	58J	10.5UJ
38		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
39		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
40		0.27	0.035	180J	64J	22UJ	10.5UJ
40+71		NA	NA	NA	NA	NA	NA
41		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping I

Congener	Sample ID	K1 7-9	K1 9-11	S2 0-1	S2-1-3	S2-3-5	S2-5-7
	Sample Date	20061220	20061220	20070710	20070710	20070710	20070710
1		6.4J	4.3J	24.2	5.22	0.158	0.0203
2		2.05UJ	1.8UJ	2.66J	1.12J	0.141	0.00977
3		6.6J	4.7J	14.8	2.6J	0.162	0.0101
4		NA	NA	247	55.9	1.64	0.152
4+10		2.05UJ	1.8UJ	NA	NA	NA	NA
5		NA	NA	19	2.83J	0.0979	0.00718
5+8		34J	16J	NA	NA	NA	NA
6		2.05UJ	1.8UJ	196	41.7	1.47	0.0758
7		NA	NA	50.7	7.66	0.195	0.0127
7+9		2.05UJ	1.8UJ	NA	NA	NA	NA
8		NA	NA	949	235	7.78	0.39
9		NA	NA	70.8	12.4	0.426	0.0289
10		NA	NA	16	3.05J	0.129	0.02995U
11		2.05UJ	1.8UJ	4.67J	0.988J	0.0357J	0.00782
12+13		2.05UJ	1.8UJ	55.6	8.76	0.413	0.0174
14		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
15		10J	6.2J	317	72.9	1.99	0.0988
16		NA	NA	509	210	3.76	0.352
16+32		6.3J	1.8UJ	NA	NA	NA	NA
17		4.6J	1.8UJ	655	256	6.75	0.404
18		7.7J	4.3J	1600	695	18.2	1.01
19		2.05UJ	1.8UJ	112	42.5	1.33	0.0822
20+21+33		7.6J	4.2J	NA	NA	NA	NA
20+28		NA	NA	1800	755	23.2	0.886
21+33		NA	NA	1040	444	13.9	0.554
22		4.1J	1.8UJ	595	259	8.52	0.317
23		NA	NA	3.43J	1.16J	0.0507J	0.02995U
23+34		2.05UJ	1.8UJ	NA	NA	NA	NA
24		NA	NA	25.9	7.59	0.143	0.016
24+27		2.05UJ	1.8UJ	NA	NA	NA	NA
25		2.05UJ	1.8UJ	122	43.7	1.52	0.0637
26		2.05UJ	1.8UJ	NA	NA	NA	NA
26+29		NA	NA	281	115	3.65	0.137
27		NA	NA	79.5	32.8	0.923	0.0399J
28		16J	8.2J	NA	NA	NA	NA
29		2.05UJ	1.8UJ	NA	NA	NA	NA
30		2.05UJ	1.8UJ	4.2U	3.955U	0.0865U	0.06U
31		11J	6.1J	1610	747	22.7	0.879
32		NA	NA	371	160	3.57	0.253
34		NA	NA	11.2	3.68J	0.0964	0.02995U
35		2.05UJ	1.8UJ	20	5.72	0.281	0.0102J
36		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
37		4.7J	1.8UJ	420	166	5.24	0.206
38		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
39		2.05UJ	1.8UJ	10.7	4.73	0.139	0.02995U
40		2.05UJ	1.8UJ	NA	NA	NA	NA
40+71		NA	NA	570	373	10.4	0.373
41		NA	NA	109	101	1.92	0.0956

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	B4 1-3	C12 0-1	C12 1-3	C12 3-5	C4 0-1	C4 1-3	C4 3-5
	Sample Date	20070711	20061221	20061221	20061221	20070711	20070711	20070711
41+64+68		NA	8.6	77J	350J	NA	NA	NA
42		1.36	NA	NA	NA	9.78	9.9	0.171
42+59		NA	4.3	39J	170J	NA	NA	NA
43+49		NA	11	100J	440J	NA	NA	NA
43+73		0.185	NA	NA	NA	1.55	1.87	0.0278J
44		NA	9.1	81J	360J	NA	NA	NA
44+47+65		4.71	NA	NA	NA	33.1	37.1	0.678
45		NA	2.1	20	83J	NA	NA	NA
45+51		1.33	NA	NA	NA	7.06	8.25	0.136
46		0.389	0.86	7.8	32	2.57	3.01	0.0515J
47+48+75		NA	4.5	40J	180J	NA	NA	NA
48		1.03	NA	NA	NA	8.16	9.81	0.155
49		3.17	NA	NA	NA	23	25.5	0.465
50		NA	0.135U	0.58	1.9	NA	NA	NA
50+53		0.882	NA	NA	NA	5.1	6.1	0.0906
51		NA	0.95	6.4	27	NA	NA	NA
52		4.96	NA	NA	NA	36.8	47	1
52+73		NA	13	110J	470J	NA	NA	NA
53		NA	2.2	19	84J	NA	NA	NA
54		0.0736	0.135U	0.17U	0.49	0.2655U	0.0706J	0.0302U
55		0.137	0.135U	1.3	9.6	0.519J	0.474	0.018J
56		2.06	NA	NA	NA	15.8	14.7	0.289
56+60		NA	9.4	85J	440J	NA	NA	NA
57		0.033J	0.135U	0.72	2.9	0.2655U	0.174	0.0302U
58		0.0894	0.135U	0.36	0.175U	0.654	0.789	0.0191J
59+62+75		0.473	NA	NA	NA	3.07	3.29	0.0573J
60		0.901	NA	NA	NA	5.45	5.53	0.138
61		0.0605U	NA	NA	NA	0.53U	0.0745U	0.0605U
61+74		NA	7.5	75J	350J	NA	NA	NA
62		NA	0.135U	0.17U	0.175U	NA	NA	NA
63		0.186	0.61	5.9	25	1.19	1.06	0.0251J
64		1.98	NA	NA	NA	15	16.1	0.295
65		NA	0.135U	0.17U	0.175U	NA	NA	NA
66		3.83	NA	NA	NA	30.6	28.7	0.586
66+76+80		NA	9.9	93J	390J	NA	NA	NA
67		0.159	0.4	3.9	17	0.998	0.933	0.0199J
68		0.0465J	NA	NA	NA	0.209J	0.111	0.0302U
69		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
70		NA	18	170J	770J	NA	NA	NA
70+74+76		6.94	NA	NA	NA	53.5	54.3	1.21
71		NA	3.1	27	120J	NA	NA	NA
72		0.0512J	0.135U	0.6	0.175U	0.482J	0.25	0.0302U
77		0.402	1.4	12	43J	2.64	2.04	0.0517J
78		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
79		0.0393J	0.135U	0.17U	0.175U	0.22J	0.184	0.00836J
80		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0115J
81		0.03015U	0.1UJ	0.6UJ	3.25UJ	0.112J	0.0733J	0.0302U
82		0.671	2.1	18	60J	5.09	3.47	0.18

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	C6 0-1	C6 1-3	C6 3-5	C6 5-7	C6 7-9	C8 0-1	C8 1-3
	Sample Date	20070711	20070711	20070711	20070711	20070711	20070711	20070711
41+64+68		NA	NA	NA	NA	NA	NA	NA
42		144	185	4.44	1.54	0.775	73.9	15.5
42+59		NA	NA	NA	NA	NA	NA	NA
43+49		NA	NA	NA	NA	NA	NA	NA
43+73		25.8	30.1	0.478J	0.246J	0.343U	12.5	2.62J
44		NA	NA	NA	NA	NA	NA	NA
44+47+65		479	635	16.4	6.58	3.33	274	59.1
45		NA	NA	NA	NA	NA	NA	NA
45+51		113	142	2.97	1.35	0.559J	62.9	10.3
46		40.6	51.7	1.12	0.494J	0.343U	22	2.92J
47+48+75		NA	NA	NA	NA	NA	NA	NA
48		144	178	3.98	1.79	0.906	73.1	15.8
49		344	437	11	4.28	2.36	186	39.8
50		NA	NA	NA	NA	NA	NA	NA
50+53		78.7	103	2.27	0.954	0.408J	46.3	8.39
51		NA	NA	NA	NA	NA	NA	NA
52		551	776	23.7	7.81	4.04	335	68.2
52+73		NA	NA	NA	NA	NA	NA	NA
53		NA	NA	NA	NA	NA	NA	NA
54		2.02U	1.82U	0.3265U	0.376U	0.343U	0.593J	1.66U
55		8.09	14.9	0.444J	0.376U	0.343U	4.02	1.66U
56		237	320	7.28	3.41	1.62	118	27.8
56+60		NA	NA	NA	NA	NA	NA	NA
57		3.32J	3.13J	0.3265U	0.376U	0.343U	1.28	1.66U
58		11.2	12.9	0.596J	0.376U	0.343U	6.17	0.899J
59+62+75		51.1	57.3	1.28	0.634J	0.254J	22.9	4.93
60		93.9	185	4.53	1.77	0.699	59.3	14
61		4.035U	3.64U	0.655U	0.75U	0.685U	0.68U	3.325U
61+74		NA	NA	NA	NA	NA	NA	NA
62		NA	NA	NA	NA	NA	NA	NA
63		24.3	26.8	0.731	0.245J	0.149J	10	1.91J
64		226	321	7.25	3.13	1.49	120	26.1
65		NA	NA	NA	NA	NA	NA	NA
66		471	610	15.3	6.12	3.3	237	54.9
66+76+80		NA	NA	NA	NA	NA	NA	NA
67		17.9	19.8	0.503J	0.376U	0.343U	6.81	1.6J
68		2.77J	1.44J	0.3265U	0.376U	0.343U	0.62J	1.66U
69		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
70		NA	NA	NA	NA	NA	NA	NA
70+74+76		850	1120	32.7	11.8	6	445	100
71		NA	NA	NA	NA	NA	NA	NA
72		4.53	4.1	0.3265U	0.376U	0.343U	1.47	1.66U
77		42.3	51.1	1.64	0.428J	0.199J	18.4	3.82
78		2.02U	1.82U	0.3265U	0.376U	0.343U	0.209J	1.66U
79		4.05	4.09	0.219J	0.376U	0.343U	2.18	1.66U
80		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
81		1.85J	2.96J	0.3265U	0.376U	0.343U	0.899	1.66U
82		77.7	106	4.42	0.91	0.722	29.9	8.62

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	D2 0-1	G11 0-1	G11 1-3	G11 3-5	G11 5-7	G3 1-3
	Sample Date	20061221	20061220	20061220	20061220	20061220	20070711
41+64+68		0.084	0.185U	0.19U	0.125U	0.12U	NA
42		NA	NA	NA	NA	NA	1.31
42+59		0.036	0.185U	0.19U	0.125U	0.12U	NA
43+49		0.098	0.185U	0.19U	0.125U	0.12U	NA
43+73		NA	NA	NA	NA	NA	0.24
44		0.078	0.185U	0.19U	0.125U	0.12U	NA
44+47+65		NA	NA	NA	NA	NA	5.46
45		0.012U	0.185U	0.19U	0.125U	0.12U	NA
45+51		NA	NA	NA	NA	NA	1.36
46		0.012U	0.185U	0.19U	0.125U	0.12U	0.327
47+48+75		0.045	0.185U	0.19U	0.125U	0.12U	NA
48		NA	NA	NA	NA	NA	1.14
49		NA	NA	NA	NA	NA	3.65
50		0.012U	0.185U	0.19U	0.125U	0.12U	NA
50+53		NA	NA	NA	NA	NA	0.954
51		0.012U	0.185U	0.19U	0.125U	0.12U	NA
52		NA	NA	NA	NA	NA	7.31
52+73		0.1	0.185U	0.19U	0.125U	0.12U	NA
53		0.012U	0.185U	0.19U	0.125U	0.12U	NA
54		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
55		0.012U	0.185U	0.19U	0.125U	0.12U	0.14J
56		NA	NA	NA	NA	NA	2.49
56+60		0.095	0.185U	0.19U	0.125U	0.12U	NA
57		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
58		0.012U	0.185U	0.19U	0.125U	0.12U	0.253
59+62+75		NA	NA	NA	NA	NA	0.511
60		NA	NA	NA	NA	NA	1.25
61		NA	NA	NA	NA	NA	0.2145U
61+74		0.067	0.185U	0.19U	0.125U	0.12U	NA
62		0.012U	0.185U	0.19U	0.125U	0.12U	NA
63		0.012U	0.185U	0.19U	0.125U	0.12U	0.203J
64		NA	NA	NA	NA	NA	2.51
65		0.012U	0.185U	0.19U	0.125U	0.12U	NA
66		NA	NA	NA	NA	NA	4.84
66+76+80		0.097	0.185U	0.19U	0.125U	0.12U	NA
67		0.012U	0.185U	0.19U	0.125U	0.12U	0.154J
68		NA	NA	NA	NA	NA	0.1075U
69		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
70		0.17	0.185U	0.19U	0.125U	0.12U	NA
70+74+76		NA	NA	NA	NA	NA	9.83
71		0.036	0.185U	0.19U	0.125U	0.12U	NA
72		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
77		0.02	0.0185U	0.019U	0.0125U	0.012U	0.49
78		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
79		0.012U	0.185U	0.19U	0.125U	0.12U	0.115J
80		NA	NA	NA	NA	NA	0.1075U
81		0.0012U	0.0185U	0.019U	0.041	0.012U	0.0452J
82		0.012U	0.185U	0.19U	0.125U	0.12U	1.47

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	G3 0-1	H11 0-1	H11 1-3	H3 0-1	H3 1-3	H3 3-5
	Sample Date	20061221	20061220	20061220	20061220	20061220	20061220
41+64+68		1.3J	5.3	0.65	0.17	0.013U	0.0115U
42		NA	NA	NA	NA	NA	NA
42+59		0.37	2.5	0.165U	0.082	0.013U	0.0115U
43+49		2.7	6.1	0.81	0.24	0.013U	0.0115U
43+73		NA	NA	NA	NA	NA	NA
44		3	5.9	0.77	0.18	0.013U	0.0115U
44+47+65		NA	NA	NA	NA	NA	NA
45		0.16	1.5	0.165U	0.049	0.013U	0.0115U
45+51		NA	NA	NA	NA	NA	NA
46		0.067	0.6	0.165U	0.0165U	0.013U	0.0115U
47+48+75		0.54	2.1	0.165U	0.094	0.013U	0.0115U
48		NA	NA	NA	NA	NA	NA
49		NA	NA	NA	NA	NA	NA
50		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
50+53		NA	NA	NA	NA	NA	NA
51		0.063	0.44	0.165U	0.035	0.013U	0.0115U
52		NA	NA	NA	NA	NA	NA
52+73		7.4J	7.8	1.2	0.28	0.013U	0.0115U
53		0.27	1.5	0.165U	0.067	0.013U	0.0115U
54		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
55		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
56		NA	NA	NA	NA	NA	NA
56+60		1.8	5.9	0.71	0.21	0.013U	0.0115U
57		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
58		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
59+62+75		NA	NA	NA	NA	NA	NA
60		NA	NA	NA	NA	NA	NA
61		NA	NA	NA	NA	NA	NA
61+74		2.3	3.9	0.53	0.14	0.013U	0.0115U
62		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
63		0.1	0.155U	0.165U	0.0165U	0.013U	0.0115U
64		NA	NA	NA	NA	NA	NA
65		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
66		NA	NA	NA	NA	NA	NA
66+76+80		2.3	5.3	0.71	0.22	0.013U	0.0115U
67		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
68		NA	NA	NA	NA	NA	NA
69		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
70		8.4J	9.8	1.4	0.33	0.033	0.0115U
70+74+76		NA	NA	NA	NA	NA	NA
71		0.4	2.2	0.165U	0.073	0.013U	0.0115U
72		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
77		0.23	0.355UJ	0.06UJ	0.044	0.0031	0.00115U
78		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
79		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
80		NA	NA	NA	NA	NA	NA
81		0.075UJ	0.05UJ	0.0165U	0.00165U	0.0013U	0.00115U
82		2	1.1	0.165U	0.051	0.013U	0.0115U

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample Date	20061220	20061220	20061220	20061220	20061220	20061220
41+64+68		0.79	0.098	1100J	350J	91J	31J
42		NA	NA	NA	NA	NA	NA
42+59		0.4	0.052	340J	120J	22UJ	10.5UJ
43+49		1.3	0.12	1700J	450J	120J	36J
43+73		NA	NA	NA	NA	NA	NA
44		1	0.11	1900J	550J	150J	41J
44+47+65		NA	NA	NA	NA	NA	NA
45		0.28	0.03	210J	69J	22UJ	10.5UJ
45+51		NA	NA	NA	NA	NA	NA
46		0.14	0.012U	80UJ	20UJ	22UJ	10.5UJ
47+48+75		0.37	0.046	700J	230J	61J	10.5UJ
48		NA	NA	NA	NA	NA	NA
49		NA	NA	NA	NA	NA	NA
50		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
50+53		NA	NA	NA	NA	NA	NA
51		0.12	0.012U	80UJ	20UJ	22UJ	10.5UJ
52		NA	NA	NA	NA	NA	NA
52+73		1.7	0.16	4600J	1100J	290J	80J
53		0.37	0.035	250J	76J	22UJ	10.5UJ
54		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
55		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
56		NA	NA	NA	NA	NA	NA
56+60		0.75	0.11	1100J	370J	100J	33J
57		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
58		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
59+62+75		NA	NA	NA	NA	NA	NA
60		NA	NA	NA	NA	NA	NA
61		NA	NA	NA	NA	NA	NA
61+74		0.54	0.067	1300J	430J	120J	37J
62		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
63		0.052	0.012U	80UJ	20UJ	22UJ	10.5UJ
64		NA	NA	NA	NA	NA	NA
65		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
66		NA	NA	NA	NA	NA	NA
66+76+80		0.93	0.12	1300J	470J	130J	41J
67		0.029	0.012U	80UJ	20UJ	22UJ	10.5UJ
68		NA	NA	NA	NA	NA	NA
69		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
70		1.5	0.18	2200J	700J	180J	77J
70+74+76		NA	NA	NA	NA	NA	NA
71		0.38	0.049	300J	120J	22UJ	10.5UJ
72		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
77		0.11	0.01	75UJ	19UJ	6UJ	2.4J
78		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
79		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
80		NA	NA	NA	NA	NA	NA
81		0.0085UJ	0.00125U	27.5UJ	7.5UJ	2.2UJ	1.05UJ
82		0.29	0.041	350J	82J	22UJ	10.5UJ

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping II

Congener	Sample ID	K1 7-9	K1 9-11	S2 0-1	S2-1-3	S2-3-5	S2-5-7
	Sample Date	20061220	20061220	20070710	20070710	20070710	20070710
41+64+68		5.7J	1.8UJ	NA	NA	NA	NA
42		NA	NA	432	223	6.02	0.232
42+59		2.05UJ	1.8UJ	NA	NA	NA	NA
43+49		7J	3.9J	NA	NA	NA	NA
43+73		NA	NA	80.8	39.7	1.26	0.0352J
44		6.2J	3.8J	NA	NA	NA	NA
44+47+65		NA	NA	1450	763	21.9	0.748
45		2.05UJ	1.8UJ	NA	NA	NA	NA
45+51		NA	NA	353	177	6.03	0.201
46		2.05UJ	1.8UJ	121	64.8	2.13	0.051J
47+48+75		2.05UJ	1.8UJ	NA	NA	NA	NA
48		NA	NA	442	224	6.71	0.21
49		NA	NA	1020	509	14.7	0.525
50		2.05UJ	1.8UJ	NA	NA	NA	NA
50+53		NA	NA	239	121	4.22	0.136
51		2.05UJ	1.8UJ	NA	NA	NA	NA
52		NA	NA	1690	889	27.9	0.868
52+73		11J	7J	NA	NA	NA	NA
53		2.05UJ	1.8UJ	NA	NA	NA	NA
54		2.05UJ	1.8UJ	4.21	1.98U	0.04335U	0.02995U
55		2.05UJ	1.8UJ	37.2	21.3	0.101	0.0319J
56		NA	NA	680	360	8.25	0.322
56+60		6J	1.8UJ	NA	NA	NA	NA
57		2.05UJ	1.8UJ	9.59	4.61	0.151	0.02995U
58		2.05UJ	1.8UJ	29.3	13.9	0.325	0.02995U
59+62+75		NA	NA	153	69.5	2.01	0.0679
60		NA	NA	359	228	4.57	0.217
61		NA	NA	4.2U	3.955U	0.0865U	0.06U
61+74		6.2J	1.8UJ	NA	NA	NA	NA
62		2.05UJ	1.8UJ	NA	NA	NA	NA
63		2.05UJ	1.8UJ	65	32.3	0.639	0.032J
64		NA	NA	593	351	9.31	0.362
65		2.05UJ	1.8UJ	NA	NA	NA	NA
66		NA	NA	1380	696	16.2	0.63
66+76+80		7J	4.1J	NA	NA	NA	NA
67		2.05UJ	1.8UJ	54.4	26.4	0.609	0.0203J
68		NA	NA	7.11	1.86J	0.04335U	0.02995U
69		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
70		11J	6.5J	NA	NA	NA	NA
70+74+76		NA	NA	2500	1300	29.7	1.2
71		2.05UJ	1.8UJ	NA	NA	NA	NA
72		2.05UJ	1.8UJ	10.3	4.22	0.121	0.02995U
77		0.47J	0.18UJ	124	64.7	1.56	0.061
78		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
79		2.05UJ	1.8UJ	10.2	4.32	0.116	0.02995U
80		NA	NA	2.1U	1.98U	0.04335U	0.02995U
81		0.205UJ	0.18UJ	5.7	2.61J	0.079J	0.02995U
82		2.05UJ	1.8UJ	204	110	2.29	0.113

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	B4 1-3	C12 0-1	C12 1-3	C12 3-5	C4 0-1	C4 1-3	C4 3-5
	Sample Date	20070711	20061221	20061221	20061221	20070711	20070711	20070711
83+108		NA	0.81	6.2	20	NA	NA	NA
83+99		2.22	NA	NA	NA	19.7	11.6	0.658
84		1.24	4.6	32	100J	9.98	7.67	0.355
85+116+117		0.702	NA	NA	NA	5.37	4.06	0.208
85+120		NA	2.5	19	66J	NA	NA	NA
86+87+97+109+119+125		2.45	NA	NA	NA	19.3	13.5	0.775
86+87+97+111+117+125		NA	13	84J	300J	NA	NA	NA
88		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
88+121		NA	0.135U	0.17U	1.3	NA	NA	NA
89		0.0935	NA	NA	NA	0.693	0.477	0.0302U
89+90+101		NA	19	86J	210J	NA	NA	NA
90+101+113		3.87	NA	NA	NA	30.8	19.8	1.05
91		0.732	2.6	17	61J	4.99	3.43	0.156
92		0.897	4.8	25	59J	8.07	3.82	0.238
93		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
93+95		NA	22	94J	250J	NA	NA	NA
94		0.0934	0.135U	0.83	2.9	0.336J	0.16	0.0302U
95+100		3.32	NA	NA	NA	24.4	18.9	0.863
96		0.0731	0.135U	1.4	5	0.402J	0.326	0.0302U
98+102		0.223	0.52	3.9	14	1.67	1.26	0.0529J
99		NA	6.4	45J	150J	NA	NA	NA
100		NA	0.135U	0.38	1	NA	NA	NA
103		0.0863	0.31	1.4	2.1	0.726	0.245	0.0302U
104		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
105		0.938	4.7	29	110J	7.31	8.04	0.325
106		0.03015U	10	58J	130J	0.2655U	0.0372U	0.0302U
107		0.216	NA	NA	NA	1.89	1.68	0.0766
107+109		NA	1.1	8	21	NA	NA	NA
108+124		0.0906	NA	NA	NA	0.633	0.764	0.0415J
110		NA	20	110J	320J	NA	NA	NA
110+115		4.17	NA	NA	NA	35.1	21.5	1.33
111		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
112		0.03015U	0.135U	4.2	0.83	0.2655U	0.0372U	0.0302U
113		NA	0.135U	0.17U	0.175U	NA	NA	NA
114		0.0675	0.24	1.7	12	0.5J	0.622	0.0219J
115		NA	0.135U	0.17U	0.175U	NA	NA	NA
118		2.36	10	58J	130J	20.1	20	0.9
119		NA	0.59	4.1	6.7	NA	NA	NA
120		0.03015U	NA	NA	NA	0.289J	0.0582J	0.0302U
121		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
122		0.0492J	0.135U	1	4.1	0.333J	0.251	0.0157J
123		0.0637	0.455UJ	1.6UJ	4.5UJ	0.326J	0.368	0.00847J
124		NA	0.51	3.6	12	NA	NA	NA
126		0.0283J	0.056	0.36	1.2	0.19J	0.125	0.0302U
127		0.03015U	4.7	29	110J	0.2655U	0.0425J	0.0302U
128		0.47	2.8	15	44J	3.32	3.03	0.171
129		NA	1.1	5.4	18	NA	NA	NA
129+138+160+163		3.77	NA	NA	NA	27.8	18.3	0.987

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	C6 0-1	C6 1-3	C6 3-5	C6 5-7	C6 7-9	C8 0-1	C8 1-3
	Sample Date	20070711	20070711	20070711	20070711	20070711	20070711	20070711
83+108		NA	NA	NA	NA	NA	NA	NA
83+99		250	319	19	3.17	1.53	93.6	27.9
84		130	183	7.61	1.63	0.804	54.4	13.4
85+116+117		88.7	122	6.09	0.962	0.357J	33.9	7.54
85+120		NA	NA	NA	NA	NA	NA	NA
86+87+97+109+119+125		280	383	22.2	3.8	1.98	108	30.1
86+87+97+111+117+125		NA	NA	NA	NA	NA	NA	NA
88		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
88+121		NA	NA	NA	NA	NA	NA	NA
89		11.1	15.2	0.3265U	0.376U	0.343U	4.69	1.63J
89+90+101		NA	NA	NA	NA	NA	NA	NA
90+101+113		362	447	32.1	5.06	2.38	138	36.3
91		62.8	88.7	3.59	0.656J	0.383J	26.3	6.36
92		75.5	87.6	5.81	0.867	0.435J	27.8	4.98
93		2.02U	10.7	0.3265U	0.376U	0.343U	1.55	1.66U
93+95		NA	NA	NA	NA	NA	NA	NA
94		2.02U	4.45	0.3265U	0.376U	0.343U	1.69	1.66U
95+100		292	373	24.5	4.12	2.1	121	33.2
96		6.11	9.51	0.3265U	0.376U	0.343U	2.96	1.66U
98+102		27.2	30.8	1.35	0.376U	0.343U	8.65	1.97J
99		NA	NA	NA	NA	NA	NA	NA
100		NA	NA	NA	NA	NA	NA	NA
103		4.48	3.18J	0.3265U	0.376U	0.343U	1.33	1.66U
104		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
105		102J	179	10.2J	1.65	1.01	58.6	12
106		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
107		22.4	26.7	1.92	0.217J	0.149J	10.8	1.63J
107+109		NA	NA	NA	NA	NA	NA	NA
108+124		9.85	15	1.06J	0.14J	0.343U	5.59	0.817J
110		NA	NA	NA	NA	NA	NA	NA
110+115		415	535	36.5	5.93	2.86	161	51.2
111		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
112		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
113		NA	NA	NA	NA	NA	NA	NA
114		7.1	14.6	0.666	0.376U	0.343U	4.02	0.788J
115		NA	NA	NA	NA	NA	NA	NA
118		256J	362	25.2	4.11	2.28	125	27.9
119		NA	NA	NA	NA	NA	NA	NA
120		1.67J	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
121		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
122		4.34	7.55	0.454J	0.376U	0.343U	2.22	1.66U
123		5.94	8.14	0.464J	0.376U	0.07J	3.03	1.66U
124		NA	NA	NA	NA	NA	NA	NA
126		3.24J	2.78J	0.214J	0.376U	0.343U	0.773	1.66U
127		2.02U	1.82U	0.3265U	0.376U	0.343U	0.13J	1.66U
128		41.5	50.2	4.75	0.641J	0.0899J	2.48	1.66U
129		NA	NA	NA	NA	NA	NA	NA
129+138+160+163		253	275	31.7	3.91	2.07	130	21.5

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	D2 0-1	G11 0-1	G11 1-3	G11 3-5	G11 5-7	G3 1-3
	Sample Date	20061221	20061220	20061220	20061220	20061220	20070711
83+108		0.012U	0.185U	0.19U	0.125U	0.12U	NA
83+99		NA	NA	NA	NA	NA	5.39
84		0.036	0.185U	0.19U	0.125U	0.12U	2.27
85+116+117		NA	NA	NA	NA	NA	1.85
85+120		0.012U	0.185U	0.19U	0.125U	0.12U	NA
86+87+97+109+119+125		NA	NA	NA	NA	NA	5.94
86+87+97+111+117+125		0.088	0.185U	0.19U	0.125U	0.12U	NA
88		NA	NA	NA	NA	NA	0.1075U
88+121		0.012U	0.185U	0.19U	0.56	0.12U	NA
89		NA	NA	NA	NA	NA	0.1075U
89+90+101		0.098	0.185U	0.19U	0.125U	0.12U	NA
90+101+113		NA	NA	NA	NA	NA	8.15
91		0.025	0.185U	0.19U	0.125U	0.12U	1.1
92		0.026	0.185U	0.19U	0.125U	0.12U	1.45
93		NA	NA	NA	NA	NA	0.1075U
93+95		0.13	0.185U	0.19U	0.125U	0.12U	NA
94		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
95+100		NA	NA	NA	NA	NA	6.38
96		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
98+102		0.012U	0.185U	0.19U	0.125U	0.12U	0.25
99		0.045	0.185U	0.19U	0.125U	0.12U	NA
100		0.012U	0.185U	0.19U	0.125U	0.12U	NA
103		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
104		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
105		0.04	0.11	0.042	0.14	0.012UJ	2.73
106		0.077	0.185U	0.19U	0.125U	0.12U	0.1075U
107		NA	NA	NA	NA	NA	0.497
107+109		0.012U	0.185U	0.19U	0.125U	0.12U	NA
108+124		NA	NA	NA	NA	NA	0.222
110		0.15	0.185U	0.19U	0.125U	0.12U	NA
110+115		NA	NA	NA	NA	NA	9.57
111		NA	NA	NA	NA	NA	0.1075U
112		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
113		0.012U	0.185U	0.19U	0.125U	0.12U	NA
114		0.0012U	0.0185U	0.019U	0.0125U	0.012U	0.207J
115		0.012U	0.185U	0.19U	0.125U	0.12U	NA
118		0.077	0.24	0.071J	0.06	0.012UJ	6.91
119		0.012U	0.185U	0.19U	0.125U	0.12U	NA
120		NA	NA	NA	NA	NA	0.1075U
121		NA	NA	NA	NA	NA	0.1075U
122		0.012U	0.185U	0.19U	0.125U	0.12U	0.165J
123		0.0018UJ	0.0185U	0.019U	0.015UJ	0.012U	0.161J
124		0.012U	0.185U	0.19U	0.125U	0.12U	NA
126		0.0012U	0.0185U	0.019U	0.0125U	0.012U	0.0959J
127		0.04	0.185U	0.19U	0.125U	0.12U	0.0615J
128		0.012U	0.185U	0.19U	0.125U	0.12U	1.53
129		0.012U	0.185U	0.19U	0.125U	0.12U	NA
129+138+160+163		NA	NA	NA	NA	NA	8.12

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	G3 0-1	H11 0-1	H11 1-3	H3 0-1	H3 1-3	H3 3-5
	Sample Date	20061221	20061220	20061220	20061220	20061220	20061220
83+108		0.72	0.34	0.165U	0.0165U	0.013U	0.0115U
83+99		NA	NA	NA	NA	NA	NA
84		4.4	2.2	0.49	0.11	0.013U	0.0115U
85+116+117		NA	NA	NA	NA	NA	NA
85+120		2.4	1.2	0.165U	0.051	0.013U	0.0115U
86+87+97+109+119+125		NA	NA	NA	NA	NA	NA
86+87+97+111+117+125		14J	5.3	1.5	0.22	0.013U	0.0115U
88		NA	NA	NA	NA	NA	NA
88+121		0.061	0.155U	0.165U	0.0165U	0.013U	0.0115U
89		NA	NA	NA	NA	NA	NA
89+90+101		13J	4.7	1.4	0.23	0.013U	0.0115U
90+101+113		NA	NA	NA	NA	NA	NA
91		2.1	1	0.165U	0.072	0.013U	0.0115U
92		3	1.1	0.165U	0.066	0.013U	0.0115U
93		NA	NA	NA	NA	NA	NA
93+95		14J	5.6	1.5	0.36	0.013U	0.0115U
94		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
95+100		NA	NA	NA	NA	NA	NA
96		0.076	0.155U	0.165U	0.0165U	0.013U	0.0115U
98+102		0.22	0.155U	0.165U	0.0165U	0.013U	0.0115U
99		6.3J	2.5	0.69	0.12	0.013U	0.0115U
100		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
103		0.068	0.155U	0.165U	0.0165U	0.013U	0.0115U
104		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
105		5.5	2.4	0.75	0.084	0.0074	0.00115U
106		12J	4.3	1.4	0.15	0.013U	0.0115U
107		NA	NA	NA	NA	NA	NA
107+109		1.1	0.33	0.165U	0.0165U	0.013U	0.0115U
108+124		NA	NA	NA	NA	NA	NA
110		14J	7	2	0.36	0.027	0.0115U
110+115		NA	NA	NA	NA	NA	NA
111		NA	NA	NA	NA	NA	NA
112		0.25	0.155U	0.165U	0.0165U	0.013U	0.0115U
113		18J	0.155U	0.165U	0.0165U	0.013U	0.0115U
114		0.26	0.12	0.041	0.0036	0.0013U	0.00115U
115		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
118		12J	4.3	1.4	0.15	0.014	0.0034
119		0.24	0.155U	0.165U	0.0165U	0.013U	0.0115U
120		NA	NA	NA	NA	NA	NA
121		NA	NA	NA	NA	NA	NA
122		0.15	0.155U	0.165U	0.0165U	0.013U	0.0115U
123		0.15UJ	0.07UJ	0.0315UJ	0.00465U	0.0013U	0.00115U
124		0.66	0.155U	0.165U	0.0165U	0.013U	0.0115U
126		0.042	0.0155U	0.0165U	0.00165U	0.0013U	0.00115U
127		5.5	2.4	0.75	0.084	0.013U	0.0115U
128		2.9	0.65	0.165U	0.037	0.013U	0.0115U
129		0.91	0.155U	0.165U	0.0165U	0.013U	0.0115U
129+138+160+163		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample Date	20061220	20061220	20061220	20061220	20061220	20061220
83+108		0.12	0.012U	80UJ	20UJ	22UJ	10.5UJ
83+99		NA	NA	NA	NA	NA	NA
84		0.77	0.079	980J	230J	68J	27J
85+116+117		NA	NA	NA	NA	NA	NA
85+120		0.29	0.039	550J	150J	22UJ	10.5UJ
86+87+97+109+119+125		NA	NA	NA	NA	NA	NA
86+87+97+111+117+125		1.3	0.17	2500J	810J	220J	82J
88		NA	NA	NA	NA	NA	NA
88+121		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
89		NA	NA	NA	NA	NA	NA
89+90+101		1.3	0.16	5400J	2400J	650J	160J
90+101+113		NA	NA	NA	NA	NA	NA
91		0.37	0.041	520J	120J	22UJ	10.5UJ
92		0.43	0.047	810J	240J	69J	24J
93		NA	NA	NA	NA	NA	NA
93+95		2.3	0.25	6100J	2200J	610J	180J
94		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
95+100		NA	NA	NA	NA	NA	NA
96		0.028	0.012U	80UJ	20UJ	22UJ	10.5UJ
98+102		0.083	0.012U	80UJ	20UJ	22UJ	10.5UJ
99		0.67	0.082	1800J	480J	130J	38J
100		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
103		0.026	0.012U	80UJ	20UJ	22UJ	10.5UJ
104		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
105		0.32	0.053	1400J	490J	130J	38J
106		0.72	0.11	2900J	1000J	270J	85J
107		NA	NA	NA	NA	NA	NA
107+109		0.081	0.012U	80UJ	48J	22UJ	10.5UJ
108+124		NA	NA	NA	NA	NA	NA
110		2.1	0.28	3200J	1300J	350J	130J
110+115		NA	NA	NA	NA	NA	NA
111		NA	NA	NA	NA	NA	NA
112		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
113		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
114		0.012	0.0012U	120J	28J	7.6J	1.05UJ
115		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
118		0.72	0.11	2900J	1000J	270J	85J
119		0.054	0.012U	80UJ	20UJ	22UJ	10.5UJ
120		NA	NA	NA	NA	NA	NA
121		NA	NA	NA	NA	NA	NA
122		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
123		0.022UJ	0.0032UJ	255UJ	160UJ	39UJ	7.5UJ
124		0.037	0.012U	80UJ	65J	22UJ	10.5UJ
126		0.0033	0.0012U	44J	25J	5.9J	1.05UJ
127		0.32	0.053	1400J	490J	130J	38J
128		0.17	0.029	800J	290J	73J	10.5UJ
129		0.058	0.012U	390J	210J	60J	10.5UJ
129+138+160+163		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping III

Congener	Sample ID	K1 7-9	K1 9-11	S2 0-1	S2-1-3	S2-3-5	S2-5-7
	Sample Date	20061220	20061220	20070710	20070710	20070710	20070710
83+108		2.05UJ	1.8UJ	NA	NA	NA	NA
83+99		NA	NA	722	318	6.16	0.284
84		2.05UJ	1.8UJ	362	180	3.91	0.179
85+116+117		NA	NA	234	119	2.4	0.112
85+120		2.05UJ	1.8UJ	NA	NA	NA	NA
86+87+97+109+119+125		NA	NA	802	393	7.59	0.34
86+87+97+111+117+125		13J	5J	NA	NA	NA	NA
88		NA	NA	2.1U	1.98U	0.04335U	0.02995U
88+121		2.05UJ	1.8UJ	NA	NA	NA	NA
89		NA	NA	31.9	16.4	0.306	0.02995U
89+90+101		23J	11J	NA	NA	NA	NA
90+101+113		NA	NA	1110	467	9.66	0.44
91		2.05UJ	1.8UJ	177	80.8	1.83	0.0968
92		2.05UJ	1.8UJ	223	92.1	1.87	0.0803
93		NA	NA	20.7	10.1	0.04335U	0.02995U
93+95		27J	14J	NA	NA	NA	NA
94		2.05UJ	1.8UJ	9.72	5.17	0.04335U	0.02995U
95+100		NA	NA	870	396	8.86	0.36
96		2.05UJ	1.8UJ	16	8.06	0.203	0.02995U
98+102		2.05UJ	1.8UJ	59.2	30.1	0.61	0.0338J
99		6.9J	4.3J	NA	NA	NA	NA
100		2.05UJ	1.8UJ	NA	NA	NA	NA
103		2.05UJ	1.8UJ	11.1	3.26J	0.04335U	0.02995U
104		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
105		6.5J	3.8J	359	188	5.04	0.179
106		13J	8.3J	2.1U	1.98U	0.04335U	0.02995U
107		NA	NA	82.2	32.1	0.926	0.0286J
107+109		2.05UJ	1.8UJ	NA	NA	NA	NA
108+124		NA	NA	38.3	17.5	0.545	0.0188J
110		19J	12J	NA	NA	NA	NA
110+115		NA	NA	1190	537	10.8	0.504
111		NA	NA	2.1U	1.98U	0.04335U	0.02995U
112		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
113		2.05UJ	1.8UJ	NA	NA	NA	NA
114		0.205UJ	0.18UJ	28.8	16.7	0.41	0.0108J
115		2.05UJ	1.8UJ	NA	NA	NA	NA
118		13J	8.3J	922	407	11.2	0.358
119		2.05UJ	1.8UJ	NA	NA	NA	NA
120		NA	NA	2.08J	0.954J	0.04335U	0.02995U
121		NA	NA	2.1U	1.98U	0.04335U	0.02995U
122		2.05UJ	1.8UJ	16.6	9.35	0.191	0.02995U
123		1.35UJ	0.495UJ	15.9	11.1	0.0544J	0.0076J
124		2.05UJ	1.8UJ	NA	NA	NA	NA
126		0.205UJ	0.18UJ	5.61	2.79J	0.13	0.02995U
127		6.5J	3.8J	1.35J	1.98U	0.04335U	0.02995U
128		2.05UJ	1.8UJ	161	70.6	1.93	0.0599
129		2.05UJ	1.8UJ	NA	NA	NA	NA
129+138+160+163		NA	NA	1040	393	9.32	0.33

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping VI

Congener	Sample ID	B4 1-3	C12 0-1	C12 1-3	C12 3-5	C4 0-1	C4 1-3	C4 3-5
	Sample Date	20070711	20061221	20061221	20061221	20070711	20070711	20070711
130		0.254	1.9	10	21	2.4	1.21	0.0609
131		0.0496J	NA	NA	NA	0.297J	0.345	0.0302U
131+142+165		NA	0.3	32	5.3	NA	NA	NA
132		1.37	NA	NA	NA	10.7	6.77	0.345
132+168		NA	11	38J	79J	NA	NA	NA
133		0.127	0.63	2.9	3.8	1.07	0.596	0.0816
134		NA	2	8.2	19	NA	NA	NA
134+143		0.217	NA	NA	NA	2.12	1.29	0.0608
135+144		NA	10	36J	52J	NA	NA	NA
135+151+154		1.59	NA	NA	NA	13.6	5.61	0.375
136		0.583	8.2	28	41J	3.99	2.28	0.128
137		0.111	0.44	3.2	13	0.841	0.871	0.054J
138+163+164		NA	36J	130J	270J	NA	NA	NA
139+140		0.0648	NA	NA	NA	0.732	0.356	0.0155J
139+149		NA	47J	160J	230J	NA	NA	NA
140		NA	0.135U	0.92	1.7	NA	NA	NA
141		0.818	11	37J	57J	5.1	3.72	0.17
142		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
143		NA	0.135U	0.17U	0.71	NA	NA	NA
144		0.171	NA	NA	NA	1.2	1.65	0.0476J
145		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
146		0.826	6.9	29	38J	7.41	3.06	0.2
147		NA	0.38	1.7	6.3	NA	NA	NA
147+149		3.51	NA	NA	NA	28.2	15.2	0.729
148		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.127	0.0375J
150		0.03015U	0.135U	0.17U	0.36	0.2655U	0.0372U	0.0302U
151		NA	17	56J	60J	NA	NA	NA
152		0.03015U	0.135U	0.17U	0.42	0.2655U	0.0372U	0.0302U
153		NA	36J	130J	190J	NA	NA	NA
153+168		3.24	NA	NA	NA	24	13.6	0.687
154		NA	0.34	1.7	2.3	NA	NA	NA
155		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
156		NA	2.2	9.5	26	NA	NA	NA
156+157		0.312	NA	NA	NA	2.19	1.98	0.11
157		NA	0.26	1.6	6.1	NA	NA	NA
158		0.342	NA	NA	NA	2.26	1.89	0.0992
158+160		NA	3.8	15	36J	NA	NA	NA
159		0.0337J	0.62	1.9	1.5	0.214J	0.109	0.0302U
161		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
162		0.03015U	0.3	1.2	1.9	0.2655U	0.043J	0.0302U
164		0.302	NA	NA	NA	2.01	1.21	0.0732
165		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
166		0.0366J	0.135U	0.17U	1.3	0.276J	0.188	0.0097J
167		0.102	0.83	3.6	9.8	0.76	0.658	0.0326J
169		0.03015U	0.0135U	0.017U	0.0175U	0.2655U	0.049J	0.0302U
170		0.993	15	45J	50J	5.59	3.37	0.158
171		NA	4.3	13	14	NA	NA	NA
171+173		0.331	NA	NA	NA	2.37	1.2	0.0577J

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping VI

Congener	Sample ID	C6 0-1	C6 1-3	C6 3-5	C6 5-7	C6 7-9	C8 0-1	C8 1-3
	Sample Date	20070711	20070711	20070711	20070711	20070711	20070711	20070711
130		18.4	18.3	1.71	0.168J	0.166J	8.44	1.33J
131		1.18J	4.84	0.401J	0.376U	0.343U	2.19	1.66U
131+142+165		NA	NA	NA	NA	NA	NA	NA
132		95.1	102	10.6	1.4	0.647J	48.4	6.85
132+168		NA	NA	NA	NA	NA	NA	NA
133		3.47J	4.01	0.445J	0.376U	0.343U	2.17	1.66U
134		NA	NA	NA	NA	NA	NA	NA
134+143		16.2	18.8	1.99	0.376U	0.343U	9.19	1.66U
135+144		NA	NA	NA	NA	NA	NA	NA
135+151+154		93.3	95.3	10.6	0.93	0.662J	33.1	5.93
136		38.7	40.2	4.28	0.303J	0.292J	15.4	2.66J
137		11	14.1	1.36	0.164J	0.343U	6.55	1.66U
138+163+164		NA	NA	NA	NA	NA	NA	NA
139+140		4.98	4.72	0.522J	0.376U	0.343U	3.02	1.66U
139+149		NA	NA	NA	NA	NA	NA	NA
140		NA	NA	NA	NA	NA	NA	NA
141		54.3	57.3	6.85	0.768	0.478J	27.2	3.51
142		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
143		NA	NA	NA	NA	NA	NA	NA
144		13.1	15.9	1.44	0.376U	0.343U	6.18	1.66U
145		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
146		39.5	35.6	4.84	0.362J	0.281J	17.6	2.49J
147		NA	NA	NA	NA	NA	NA	NA
147+149		203	203	22.5	2.8	1.4	110	17.2
148		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
150		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
151		NA	NA	NA	NA	NA	NA	NA
152		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
153		NA	NA	NA	NA	NA	NA	NA
153+168		206	202	24.9	2.94	1.5	97.4	15.3
154		NA	NA	NA	NA	NA	NA	NA
155		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
156		NA	NA	NA	NA	NA	NA	NA
156+157		27	32.5	3.82	0.433J	0.195J	13.4	1.91J
157		NA	NA	NA	NA	NA	NA	NA
158		24.8	30.4	3.44	0.452J	0.227J	13.8	2.4J
158+160		NA	NA	NA	NA	NA	NA	NA
159		3.66J	2.97J	0.192J	0.376U	0.343U	1.56	1.66U
161		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
162		1.46J	1.42J	0.3265U	0.376U	0.343U	0.524J	1.66U
164		18.7	20.2	2.24	0.22J	0.343U	9.31	1.2J
165		2.02U	1.82U	0.3265U	0.376U	0.343U	0.566J	1.66U
166		2.18J	2.45J	0.269J	0.376U	0.343U	0.341U	1.66U
167		8.67	9.24	1.25	0.376U	0.343U	4.06	0.623J
169		2.02U	1.82U	0.3265U	0.376U	0.343U	0.331J	1.66U
170		61.3	56.5	7.33	0.658J	0.343J	26.2	3.77
171		NA	NA	NA	NA	NA	NA	NA
171+173		20.5	18.3	2.6	0.295J	0.343U	7.38	1.11J

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping VI

Congener	Sample ID	D2 0-1	G11 0-1	G11 1-3	G11 3-5	G11 5-7	G3 1-3
	Sample Date	20061221	20061220	20061220	20061220	20061220	20070711
130		0.012U	0.185U	0.19U	0.125U	0.12U	0.586
131		NA	NA	NA	NA	NA	0.283
131+142+165		0.029	0.185U	0.19U	0.125U	0.12U	NA
132		NA	NA	NA	NA	NA	2.79
132+168		0.04	0.185U	0.19U	0.125U	0.12U	NA
133		0.012U	0.185U	0.19U	0.125U	0.12U	0.166J
134		0.012U	0.185U	0.19U	0.125U	0.12U	NA
134+143		NA	NA	NA	NA	NA	1.02
135+144		0.031	0.185U	0.19U	0.125U	0.12U	NA
135+151+154		NA	NA	NA	NA	NA	1.99
136		0.026	0.185U	0.19U	0.125U	0.12U	0.838
137		0.012U	0.185U	0.19U	0.125U	0.12U	0.633
138+163+164		0.13	0.185U	0.19U	0.125U	0.12U	NA
139+140		NA	NA	NA	NA	NA	0.224
139+149		0.17	0.185U	0.19U	0.125U	0.12U	NA
140		0.012U	0.185U	0.19U	0.125U	0.12U	NA
141		0.032	0.185U	0.19U	0.125U	0.12U	1.35
142		NA	NA	NA	NA	NA	0.1075U
143		0.012U	0.185U	0.19U	0.125U	0.12U	NA
144		NA	NA	NA	NA	NA	0.626
145		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
146		0.026	0.185U	0.19U	0.125U	0.12U	0.873
147		0.012U	0.185U	0.19U	0.125U	0.12U	NA
147+149		NA	NA	NA	NA	NA	5.35
148		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
150		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
151		0.059	0.185U	0.19U	0.125U	0.12U	NA
152		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
153		0.12	0.185U	0.19U	0.125U	0.12U	NA
153+168		NA	NA	NA	NA	NA	5.62
154		0.012U	0.185U	0.19U	0.125U	0.12U	NA
155		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
156		0.0082	0.0185U	0.019U	0.0125U	0.012U	NA
156+157		NA	NA	NA	NA	NA	1.12
157		0.0012U	0.0185U	0.019U	0.044	0.012U	NA
158		NA	NA	NA	NA	NA	1.03
158+160		0.012U	0.185U	0.19U	0.125U	0.12U	NA
159		0.012U	0.185U	0.19U	0.125U	0.12U	0.139J
161		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
162		0.012U	0.185U	0.19U	0.125U	0.12U	0.0701J
164		NA	NA	NA	NA	NA	0.554
165		NA	NA	NA	NA	NA	0.1075U
166		0.012U	0.185U	0.19U	0.125U	0.12U	0.185J
167		0.0033	0.0185U	0.019U	0.0125U	0.012U	0.376
169		0.0012U	0.0185U	0.019U	0.0125U	0.012U	0.213J
170		0.049	0.0185U	0.019U	0.033	0.012U	1.13
171		0.012U	0.185U	0.19U	0.125U	0.12U	NA
171+173		NA	NA	NA	NA	NA	0.399

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping VI

Congener	Sample ID	G3 0-1	H11 0-1	H11 1-3	H3 0-1	H3 1-3	H3 3-5
	Sample Date	20061221	20061220	20061220	20061220	20061220	20061220
130		1.1	0.155U	0.165U	0.0165U	0.013U	0.0115U
131		NA	NA	NA	NA	NA	NA
131+142+165		0.25	0.155U	0.165U	0.0165U	0.013U	0.0115U
132		NA	NA	NA	NA	NA	NA
132+168		0.029U	1.3	0.51	0.12	0.013U	0.0115U
133		0.2	0.155U	0.165U	0.0165U	0.013U	0.0115U
134		0.88	0.155U	0.165U	0.0165U	0.013U	0.0115U
134+143		NA	NA	NA	NA	NA	NA
135+144		2.6	0.66	0.165U	0.088	0.013U	0.0115U
135+151+154		NA	NA	NA	NA	NA	NA
136		2.1	0.55	0.165U	0.075	0.013U	0.0115U
137		0.7	0.155U	0.165U	0.0165U	0.013U	0.0115U
138+163+164		14J	3.7	1.6	0.32	0.032	0.0115U
139+140		NA	NA	NA	NA	NA	NA
139+149		12J	3.2	1.4	0.44	0.055	0.0115U
140		0.059	0.155U	0.165U	0.0165U	0.013U	0.0115U
141		2.9	0.8	0.34	0.088	0.013U	0.0115U
142		NA	NA	NA	NA	NA	NA
143		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
144		NA	NA	NA	NA	NA	NA
145		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
146		2	0.51	0.165U	0.07	0.013U	0.0115U
147		0.31	0.155U	0.165U	0.0165U	0.013U	0.0115U
147+149		NA	NA	NA	NA	NA	NA
148		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
150		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
151		3.1	0.82	0.34	0.16	0.013U	0.0115U
152		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
153		13J	2.5	1.2	0.3	0.043	0.0115U
153+168		NA	NA	NA	NA	NA	NA
154		0.11	0.155U	0.165U	0.0165U	0.013U	0.0115U
155		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
156		1.6	0.38	0.18	0.018	0.0013U	0.00115U
156+157		NA	NA	NA	NA	NA	NA
157		0.34	0.081	0.045	0.004	0.0013U	0.00115U
158		NA	NA	NA	NA	NA	NA
158+160		1.8	0.53	0.165U	0.04	0.013U	0.0115U
159		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
161		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
162		0.093	0.155U	0.165U	0.0165U	0.013U	0.0115U
164		NA	NA	NA	NA	NA	NA
165		NA	NA	NA	NA	NA	NA
166		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
167		0.55	0.13	0.063	0.0087	0.0013U	0.00115U
169		0.0115UJ	0.0155U	0.0165U	0.00165U	0.0013U	0.00115U
170		2.9	0.77	0.37	0.11	0.02	0.0054
171		0.89	0.155U	0.165U	0.0165U	0.013U	0.0115U
171+173		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping VI

Congener	Sample ID	I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample Date	20061220	20061220	20061220	20061220	20061220	20061220
130		0.11	0.012U	380J	150J	22UJ	10.5UJ
131		NA	NA	NA	NA	NA	NA
131+142+165		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
132		NA	NA	NA	NA	NA	NA
132+168		0.52	0.082	2500J	1400J	360J	100J
133		0.025	0.012U	80UJ	46J	22UJ	10.5UJ
134		0.094	0.012U	370J	200J	52J	10.5UJ
134+143		NA	NA	NA	NA	NA	NA
135+144		0.36	0.052	3000J	2000J	570J	150J
135+151+154		NA	NA	NA	NA	NA	NA
136		0.32	0.047	2700J	1900J	550J	130J
137		0.032	0.012U	80UJ	41J	22UJ	10.5UJ
138+163+164		1.2	0.19	12000J	6700J	1800J	450J
139+140		NA	NA	NA	NA	NA	NA
139+149		1.7	0.25	16000J	12000J	3300J	850J
140		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
141		0.27	0.042	4000J	2800J	760J	190J
142		NA	NA	NA	NA	NA	NA
143		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
144		NA	NA	NA	NA	NA	NA
145		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
146		0.26	0.04	1900J	1000J	280J	65J
147		0.031	0.012U	80UJ	20UJ	22UJ	10.5UJ
147+149		NA	NA	NA	NA	NA	NA
148		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
150		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
151		0.57	0.088	8000J	6200J	1700J	410J
152		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
153		1	0.16	20000J	13000J	3500J	790J
153+168		NA	NA	NA	NA	NA	NA
154		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
155		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
156		0.059	0.012	950J	210J	55J	18J
156+157		NA	NA	NA	NA	NA	NA
157		0.014	0.0027	160J	63J	17J	5.5J
158		NA	NA	NA	NA	NA	NA
158+160		0.13	0.012U	1300J	550J	150J	42J
159		0.0125U	0.012U	970J	660J	190J	40J
161		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
162		0.0125U	0.012U	390J	230J	66J	10.5UJ
164		NA	NA	NA	NA	NA	NA
165		NA	NA	NA	NA	NA	NA
166		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
167		0.027	0.0051	250J	60J	15J	6.7J
169		0.00125U	0.0012U	8UJ	2UJ	2.2UJ	1.05UJ
170		0.3	0.055	11000J	5300J	1300J	420J
171		0.088	0.012U	3300J	1900J	500J	120J
171+173		NA	NA	NA	NA	NA	NA

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II
Grouping VI

Congener	Sample ID	K1 7-9	K1 9-11	S2 0-1	S2-1-3	S2-3-5	S2-5-7
	Sample Date	20061220	20061220	20070710	20070710	20070710	20070710
130		2.05UJ	1.8UJ	70.8	26.4	0.636	0.0201J
131		NA	NA	17.3	7.6	0.167	0.02995U
131+142+165		10J	3.7J	NA	NA	NA	NA
132		NA	NA	380	146	3.31	0.131
132+168		12J	6.1J	NA	NA	NA	NA
133		2.05UJ	1.8UJ	15	5.39	0.149	0.02995U
134		2.05UJ	1.8UJ	NA	NA	NA	NA
134+143		NA	NA	67.7	27.2	0.73	0.0191J
135+144		21J	7.3J	NA	NA	NA	NA
135+151+154		NA	NA	393	118	2.35	0.113
136		17J	6.3J	150	50.5	1.04	0.0404J
137		2.05UJ	1.8UJ	47.3	16.8	0.55	0.0198J
138+163+164		65J	25J	NA	NA	NA	NA
139+140		NA	NA	20.9	8.69	0.201	0.02995U
139+149		110J	39J	NA	NA	NA	NA
140		2.05UJ	1.8UJ	NA	NA	NA	NA
141		27J	8.5J	230	93.6	1.93	0.0676
142		NA	NA	2.1U	1.98U	0.04335U	0.02995U
143		2.05UJ	1.8UJ	NA	NA	NA	NA
144		NA	NA	64.2	21.9	0.697	0.02995U
145		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
146		9J	1.8UJ	160	50.2	0.966	0.0453J
147		2.05UJ	1.8UJ	NA	NA	NA	NA
147+149		NA	NA	838	298	6.35	0.231
148		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
150		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
151		58J	18J	NA	NA	NA	NA
152		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
153		120J	40J	NA	NA	NA	NA
153+168		NA	NA	853	293	6.56	0.254
154		2.05UJ	1.8UJ	NA	NA	NA	NA
155		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
156		2.8J	1.5J	NA	NA	NA	NA
156+157		NA	NA	107	43.8	1.27	0.0314J
157		0.72J	0.18UJ	NA	NA	NA	NA
158		NA	NA	103	42.8	1.11	0.0403J
158+160		5.8J	1.8UJ	NA	NA	NA	NA
159		6.3J	1.8UJ	10.7	2.63J	0.04335U	0.02995U
161		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
162		2.05UJ	1.8UJ	2.77J	1.51J	0.04335U	0.02995U
164		NA	NA	74.8	28	0.684	0.0185J
165		NA	NA	2.1U	1.98U	0.04335U	0.02995U
166		2.05UJ	1.8UJ	9.23	4.12	0.065J	0.02995U
167		0.98J	0.5J	32.4	13.4	0.334	0.02995U
169		0.205UJ	0.18UJ	3.2J	0.864J	0.04335U	0.02995U
170		60J	19J	249	84.4	1.65	0.0718
171		17J	5.1J	NA	NA	NA	NA
171+173		NA	NA	80.5	27.5	0.569	0.02995U

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping V

Congener	Sample ID	B4 1-3	C12 0-1	C12 1-3	C12 3-5	C4 0-1	C4 1-3	C4 3-5
	Sample Date	20070711	20061221	20061221	20061221	20070711	20070711	20070711
172		0.179	NA	NA	NA	1.05	0.65	0.0245J
172+192		NA	2.5	8.6	9.2	NA	NA	NA
173		NA	0.36	1.1	1.3	NA	NA	NA
174		1.17	19	64J	59J	6.78	3.84	0.178
175		0.0661	0.69	2.7	2.2	0.294J	0.16	0.0302U
176		0.165	2.2	8	7.3	1	0.513	0.0182J
177		0.716	10	34J	32	4.81	2.29	0.111
178		0.295	3.3	12	11	2.14	1.55	0.168
179		0.583	7.6	27	22	3.95	1.94	0.117
180		NA	32J	100J	98J	NA	NA	NA
180+193		2.07	NA	NA	NA	12	8.09	0.365
181		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
182		0.03015U	NA	NA	NA	0.2655U	0.044J	0.0302U
182+187		NA	13	47J	41J	NA	NA	NA
183		0.679	9.9	33	32	3.89	2.17	0.0819
184		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
185		0.14	2.3	7.2	6.8	0.836	0.394	0.0254J
186		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
187		1.54	NA	NA	NA	10.7	6.05	0.385
188		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0392J	0.011J
189		0.0418J	0.52	1.9	2.3	0.26J	0.127	0.0302U
190		0.215	15	45J	50J	0.907	0.842	0.0295J
191		0.0497J	0.64	2.1	2.2	0.293J	0.17	0.0302U
192		0.03015U	NA	NA	NA	0.2655U	0.0372U	0.0302U
193		NA	1.9	5.9	5.2	NA	NA	NA
194		0.52	7.2	29	27	3.24	2.22	0.151
195		0.272	2.4	9.3	7.9	1.7	0.802	0.048J
196		0.238	NA	NA	NA	1.31	1.24	0.0584J
196+203		NA	9	35J	33	NA	NA	NA
197		0.0328J	0.32	1.2	1.1	0.146J	0.081	0.0302U
198		NA	0.43	1.6	1.4	NA	NA	NA
198+199		0.521	NA	NA	NA	3.02	3.05	0.222
199		NA	1.1	34	4	NA	NA	NA
200		0.104	1.1	4.2	3.7	0.409J	0.319	0.0125J
201		0.0737	7.2	4.3	34	0.437J	0.366	0.0334J
202		0.114	1.6	5.9	6.2	0.597	0.774	0.0826
203		0.291	NA	NA	NA	1.52	1.52	0.133
204		0.03015U	0.135U	0.17U	0.175U	0.2655U	0.0372U	0.0302U
205		0.0508J	0.35	1.4	1.2	0.2655U	0.0964	0.0302U
206		0.165	1.8	7.5	12	0.843	1.9	0.187
207		0.03015U	0.135U	1.2	1.8	0.2655U	0.235	0.0232J
208		0.0434J	0.45	1.8	3	0.235J	0.803	0.065
209		0.0907	0.4	2	2.6	0.2655U	2.9	0.13

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping V

Congener	Sample ID	C6 0-1	C6 1-3	C6 3-5	C6 5-7	C6 7-9	C8 0-1	C8 1-3
	Sample Date	20070711	20070711	20070711	20070711	20070711	20070711	20070711
172		11.8	11.4	1.5	0.376U	0.343U	4.48	1.66U
172+192		NA	NA	NA	NA	NA	NA	NA
173		NA	NA	NA	NA	NA	NA	NA
174		69.9	62.5	8.41	0.865	0.434J	27.1	3.5
175		4.85	3.64	0.385J	0.376U	0.343U	1.11	1.66U
176		8.5	8.35	1.14	0.376U	0.343U	4.18	1.66U
177		41.5	35.1	4.95	0.513J	0.2J	14.6	1.77J
178		15.5	11.9	1.91	0.376U	0.343U	6.09	1.02J
179		32.5	27.3	3.31	0.46J	0.224J	13.3	1.95J
180		NA	NA	NA	NA	NA	NA	NA
180+193		134	123	18.3	2.16	1	51.1	8.93
181		2.02U	1.82U	0.3265U	0.376U	0.343U	0.598J	1.66U
182		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
182+187		NA	NA	NA	NA	NA	NA	NA
183		39.8	38.5	5.35	0.524J	0.342J	15.3	2.52J
184		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
185		8.44	8.87	1.01	0.376U	0.343U	3.44	1.66U
186		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
187		82.8	74.8	11	1.17	0.732	32.7	5.12
188		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
189		1.67J	1.77J	0.292J	0.376U	0.343U	0.733	1.66U
190		12.5	10.3	1.42	0.376U	0.343U	4.67	0.654J
191		1.75J	2.94J	0.423J	0.376U	0.343U	1.31	1.66U
192		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
193		NA	NA	NA	NA	NA	NA	NA
194		32.6	33.7	5.9	0.533J	0.247J	14.2	2.54J
195		13.5	12.7	1.83	0.376U	0.343U	6.37	1.66U
196		14.1	15.4	3.22	0.308J	0.343U	6.38	0.682J
196+203		NA	NA	NA	NA	NA	NA	NA
197		1.28J	1.2J	0.3265U	0.376U	0.343U	0.443J	1.66U
198		NA	NA	NA	NA	NA	NA	NA
198+199		33	34.3	9.94	0.645J	0.276J	13.1	2.99J
199		NA	NA	NA	NA	NA	NA	NA
200		4.46	3.8	0.729	0.376U	0.343U	1.79	1.66U
201		4.63	4.43	0.739	0.376U	0.343U	1.56	1.66U
202		7.47	6.05	2.63	0.376U	0.343U	2.97	1.66U
203		19.1	19.4	5.27	0.426J	0.218J	7.24	1.33J
204		2.02U	1.82U	0.3265U	0.376U	0.343U	0.341U	1.66U
205		1.69J	1.07J	0.261J	0.376U	0.343U	1.02	1.66U
206		10.7	11.4	14.8	0.816	0.228J	5.17	3.01J
207		1.89J	1.82U	1.11J	0.376U	0.343U	0.659J	1.66U
208		2.64J	1.59J	5.53	0.215J	0.343U	1.24	0.646J
209		1.75J	2.87J	15.2J	0.438J	0.131J	1.32	1.99J

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping V

Congener	Sample ID	D2 0-1	G11 0-1	G11 1-3	G11 3-5	G11 5-7	G3 1-3
	Sample Date	20061221	20061220	20061220	20061220	20061220	20070711
172		NA	NA	NA	NA	NA	0.307
172+192		0.012U	0.185U	0.19U	0.125U	0.12U	NA
173		0.012U	0.185U	0.19U	0.125U	0.12U	NA
174		0.064	0.185U	0.19U	0.125U	0.12U	1.42
175		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
176		0.012U	0.185U	0.19U	0.125U	0.12U	0.24
177		0.032	0.185U	0.19U	0.125U	0.12U	0.857
178		0.012U	0.185U	0.19U	0.125U	0.12U	0.395
179		0.027	0.185U	0.19U	0.125U	0.12U	0.708
180		0.12	0.14	0.083	0.11	0.077	NA
180+193		NA	NA	NA	NA	NA	3.12
181		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
182		NA	NA	NA	NA	NA	0.1075U
182+187		0.046	0.185U	0.19U	0.125U	0.12U	NA
183		0.032	0.185U	0.19U	0.125U	0.12U	1.05
184		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
185		0.012U	0.185U	0.19U	0.125U	0.12U	0.164J
186		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
187		NA	NA	NA	NA	NA	2.37
188		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
189		0.0012U	0.0185U	0.019U	0.0125U	0.012U	0.136J
190		0.049	0.185U	0.19U	0.125U	0.12U	0.386
191		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
192		NA	NA	NA	NA	NA	0.1075U
193		0.012U	0.185U	0.19U	0.125U	0.12U	NA
194		0.032	0.185U	0.19U	0.125U	0.12U	1.52
195		0.012U	0.185U	0.19U	0.125U	0.12U	0.37
196		NA	NA	NA	NA	NA	0.861
196+203		0.044	0.185U	0.19U	0.125U	0.12U	NA
197		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
198		0.012U	0.185U	0.19U	0.125U	0.12U	NA
198+199		NA	NA	NA	NA	NA	3.13
199		0.012U	0.185U	0.19U	0.125U	0.12U	NA
200		0.012U	0.185U	0.19U	0.125U	0.12U	0.15J
201		0.027	0.185U	0.19U	0.125U	0.12U	0.365
202		0.012U	0.185U	0.19U	0.125U	0.12U	1.1
203		NA	NA	NA	NA	NA	1.75
204		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
205		0.012U	0.185U	0.19U	0.125U	0.12U	0.1075U
206		0.012U	0.43	0.19U	0.125U	0.12U	7.81
207		0.012U	0.185U	0.19U	0.125U	0.12U	0.592
208		0.012U	0.185U	0.19U	0.125U	0.12U	3.47
209		0.012U	0.47	0.19U	0.125U	0.12U	9.97

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II Grouping V

Congener	Sample ID	G3 0-1	H11 0-1	H11 1-3	H3 0-1	H3 1-3	H3 3-5
	Sample Date	20061221	20061220	20061220	20061220	20061220	20061220
172		NA	NA	NA	NA	NA	NA
172+192		0.41	0.155U	0.165U	0.0165U	0.013U	0.0115U
173		0.085	0.155U	0.165U	0.0165U	0.013U	0.0115U
174		3.7	0.83	0.39	0.14	0.034	0.0115U
175		0.15	0.155U	0.165U	0.0165U	0.013U	0.0115U
176		0.41	0.155U	0.165U	0.0165U	0.013U	0.0115U
177		1.9	0.43	0.165U	0.073	0.013U	0.0115U
178		0.57	0.155U	0.165U	0.034	0.013U	0.0115U
179		1.4	0.39	0.165U	0.086	0.013U	0.0115U
180		6.8J	1.6	0.77	0.28	0.081	0.0115U
180+193		NA	NA	NA	NA	NA	NA
181		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
182		NA	NA	NA	NA	NA	NA
182+187		1.5J	0.84	0.42	0.11	0.038	0.0115U
183		2.3	0.46	0.165U	0.087	0.013U	0.0115U
184		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
185		0.41	0.155U	0.165U	0.0165U	0.013U	0.0115U
186		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
187		NA	NA	NA	NA	NA	NA
188		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
189		0.13	0.0155U	0.012	0.0042	0.0013U	0.00115U
190		2.9	0.77	0.37	0.11	0.013U	0.0115U
191		0.16	0.155U	0.165U	0.0165U	0.013U	0.0115U
192		NA	NA	NA	NA	NA	NA
193		0.3	0.155U	0.165U	0.0165U	0.013U	0.0115U
194		2.2	0.38	0.165U	0.11	0.042	0.0115U
195		0.54	0.155U	0.165U	0.0165U	0.013U	0.0115U
196		NA	NA	NA	NA	NA	NA
196+203		3.1	0.51	0.165U	0.19	0.075	0.0115U
197		0.13	0.155U	0.165U	0.0165U	0.013U	0.0115U
198		0.13	0.155U	0.165U	0.0165U	0.013U	0.0115U
198+199		NA	NA	NA	NA	NA	NA
199		3.3	0.5	0.165U	0.12	0.047	0.0115U
200		0.3	0.155U	0.165U	0.0165U	0.013U	0.0115U
201		0.58	0.155U	0.165U	0.0165U	0.013U	0.0115U
202		1.2	0.155U	0.165U	0.0165U	0.013U	0.0115U
203		NA	NA	NA	NA	NA	NA
204		0.029U	0.155U	0.165U	0.0165U	0.013U	0.0115U
205		0.077	0.155U	0.165U	0.0165U	0.013U	0.0115U
206		4.4	0.155U	0.165U	0.075	0.033	0.0115U
207		0.62	0.155U	0.165U	0.0165U	0.013U	0.0115U
208		2.1	0.155U	0.165U	0.0165U	0.013U	0.0115U
209		14J	0.155U	0.165U	0.0165U	0.013U	0.0115U

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II
Grouping V

Congener	Sample ID	I3 0-1	I3 1-3	K1 0-1	K1 1-3	K1 3-5	K1 5-7
	Sample Date	20061220	20061220	20061220	20061220	20061220	20061220
172		NA	NA	NA	NA	NA	NA
172+192		0.047	0.012U	1800J	1100J	280J	77J
173		0.0125U	0.012U	200J	120J	22UJ	10.5UJ
174		0.4	0.079	15000J	12000J	3200J	830J
175		0.0125U	0.012U	530J	350J	96J	25J
176		0.063	0.012U	2200J	1800J	480J	110J
177		0.22	0.041	7100J	5200J	1400J	340J
178		0.093	0.012U	3500J	2700J	760J	180J
179		0.24	0.053	9100J	7400J	2100J	480J
180		0.74	0.15	42000J	24000J	6400J	1900J
180+193		NA	NA	NA	NA	NA	NA
181		0.39	0.012U	80UJ	20UJ	22UJ	10.5UJ
182		NA	NA	NA	NA	NA	NA
182+187		0.35	0.075	25000J	18000J	4900J	1000J
183		0.24	0.05	14000J	8700J	2400J	540J
184		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
185		0.058	0.012U	3500J	2600J	710J	160J
186		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
187		NA	NA	NA	NA	NA	NA
188		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
189		0.0095	0.0012U	350J	73J	18J	5.4J
190		0.3	0.055	11000J	5300J	1300J	420J
191		0.0125U	0.012U	600J	250J	69J	10.5UJ
192		NA	NA	NA	NA	NA	NA
193		0.038	0.012U	1900J	1100J	330J	74J
194		0.2	0.054	40000J	15000J	3800J	950J
195		0.057	0.012U	7500J	3300J	860J	220J
196		NA	NA	NA	NA	NA	NA
196+203		0.35	0.087	50000J	25000J	6600J	1500J
197		0.0125U	0.012U	940J	590J	160J	37J
198		0.0125U	0.012U	1700J	860J	230J	52J
198+199		NA	NA	NA	NA	NA	NA
199		0.25	0.062	42000J	23000J	6000J	1500J
200		0.038	0.012U	4300J	2700J	730J	160J
201		0.042	0.012U	4100J	2700J	730J	170J
202		0.071	0.012U	6400J	4100J	1200J	340J
203		NA	NA	NA	NA	NA	NA
204		0.0125U	0.012U	80UJ	20UJ	22UJ	10.5UJ
205		0.0125U	0.012U	1800J	590J	150J	36J
206		0.13	0.036	33000J	12000J	2900J	870J
207		0.0125U	0.012U	4000J	1700J	420J	120J
208		0.036	0.012U	5900J	2600J	650J	200J
209		0.037	0.012U	4200J	980J	230J	58J

Individual Congener Results for Trenton Channel Remedial Investigation Phases I/II
Grouping V

Congener	Sample ID	K1 7-9	K1 9-11	S2 0-1	S2-1-3	S2-3-5	S2-5-7
	Sample Date	20061220	20061220	20070710	20070710	20070710	20070710
172		NA	NA	48.6	14	0.395	0.02995U
172+192		11J	1.8UJ	NA	NA	NA	NA
173		2.05UJ	1.8UJ	NA	NA	NA	NA
174		110J	33J	295	91.4	1.88	0.065
175		2.05UJ	1.8UJ	10.8	3.61J	0.128	0.02995U
176		15J	4.5J	39.4	11.4	0.278	0.02995U
177		48J	14J	167	50.7	0.973	0.0332J
178		25J	7.3J	61.1	17.6	0.429	0.02995U
179		65J	20J	137	42.4	0.85	0.0306J
180		280J	85J	NA	NA	NA	NA
180+193		NA	NA	552	176	3.95	0.135
181		2.05UJ	1.8UJ	2.92J	1.98U	0.04335U	0.02995U
182		NA	NA	2.1U	1.98U	0.04335U	0.02995U
182+187		140J	41J	NA	NA	NA	NA
183		83J	25J	170	54.9	1.08	0.0344J
184		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
185		23J	6.4J	36.9	11.9	0.231	0.02995U
186		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
187		NA	NA	355	103	2.38	0.0789
188		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
189		0.83J	0.18UJ	7.89	3.24J	0.0936	0.02995U
190		60J	19J	48.4	15.5	0.426	0.02995U
191		2.05UJ	1.8UJ	11.8	4.81	0.119	0.02995U
192		NA	NA	2.1U	1.98U	0.04335U	0.02995U
193		11J	1.8UJ	NA	NA	NA	NA
194		140J	43J	153	48.8	1.41	0.0378J
195		33J	9.8J	60.5	20.4	0.443	0.02995U
196		NA	NA	70.6	21.5	0.656	0.02995U
196+203		230J	70J	NA	NA	NA	NA
197		5.9J	1.8UJ	7.03	1.95J	0.04335U	0.02995U
198		7.6J	1.8UJ	NA	NA	NA	NA
198+199		NA	NA	163	52.1	2.17	0.0287J
199		200J	61J	NA	NA	NA	NA
200		24J	7J	23.3	6.2	0.194	0.02995U
201		26J	7.2J	18.1	6.15	0.249	0.02995U
202		52J	15J	28.9	9.38	0.532	0.02995U
203		NA	NA	90.3	32.1	1.13	0.02995U
204		2.05UJ	1.8UJ	2.1U	1.98U	0.04335U	0.02995U
205		6J	1.8UJ	7.93	3.45J	0.04335U	0.02995U
206		120J	39J	37.6	16.9	1.98	0.0221
207		17J	5.3J	4.65	2.5J	0.182	0.02995U
208		26J	8.3J	8.02	3.77J	0.842	0.02995U
209		9.1J	7.4J	6.56	4.21	2.38	0.0216J

Individual Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPM)

Sample ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
A1 0-1	20061222	9.3	110	4.5	75	89	120	0.98	0.8	0.87	310
A1 1-3	20061222	8	92	5.8	49	140	120	0.96	0.45	1	310
A1 3-5	20061222	9.4	130	6.8	82	180	160	1.6	0.47	1.8	410
A11 0-1	20061222	8.7	110	8.5	63	260	220	2.2	0.63	1.6	710
A11 1-3	20061222	4	37	0.67	10	46	55	0.53	0.2U	0.25	120
A11 3-5	20061222	6.1	62	0.23	13	18	9.4	0.05U	0.21	0.1U	45
B1 0-1	20061222	7.4	48	0.2U	15	18	8	0.05U	0.29	0.1U	48
B2 0-1	20061222	6.7	51	0.26	14	17	7.5	0.05U	0.28	0.1U	52
B3 0-1	20070710	6.5	56	0.24	14	19	9.2	0.05U	0.24	0.1U	49
B3 1-2	20070710	6.5	52	0.22	14	18	8.2	0.05U	0.32	0.1U	46
B4 0-1	20070711	6.7	48	0.38J	20	22	16J	0.06J	0.33	0.13	81
B4 1-3	20070711	6.8	69	0.3	17	19	9	0.05U	0.32	0.1U	67
C1 0-1	20061221	6.3	140	4.1	170	78	130	0.52	0.64	1.9	280
C1 1-3	20061221	6.4	160	5.1	170	86	150	0.54	0.67	2.4	310
C1 3-5	20061221	5.5	120	2.1	75	44	100	0.32	0.44	1.4	200
C11 0-1	20061221	8.5	190	14	250	140	250	0.98	0.91	6.3	560
C11 1-3	20061221	10	300	17	470	200	330	1.2	1	7.7	750
C11 3-5	20061221	10	260	14	290	150	310	1.3	0.95	5.8	620
C11 5-7	20061221	8.7	230	8.8	230	120	220	1	0.74	3.8	440
C12 0-1	20061221	6.2	110	3.6	140	46	150	0.17	0.42	1.2	300
C12 1-3	20061221	11	230	12	600	220	390	0.68	1.1	5.7	910
C12 3-5	20061221	10	180	10	350	220	280	1.5	1.1	4.6	1000
C3 0-1	20061221	8.5	140	21	93	140	170	1.5	0.76	1.7	460
C3 1-3	20061221	7.4	130	7.5	54	170	160	1.5	0.5	1.7	370
C3 3-5	20061221	6.4	92	2.8	27	73	75	0.64	0.32	0.76	230
C4 0-1	20070711	6.5	77	1.8	51	60	92	0.32	0.5	0.73	280
C4 1-3	20070711	6.9	82	1.8	53	36	33	0.45	0.52	0.52	120
C4 3-5	20070711	7.1	69	0.25	16	21	9.9	0.05U	0.28	0.1U	70
C5 0-1	20070710	10	150	11	73	150	490	1.9	0.92	2.5	470
C5 1-3	20070710	6.5	62	1.1	19	33	65	0.75	0.36	0.32	91
C5 3-5	20070710	5.7	55	0.21	13	17	8.6	0.05U	0.29	0.1U	49
C6 0-1	20070711	11	260	13	380	180	330	1.7	1.2	6.1	750
C6 1-3	20070711	10	210	8.4	240	160J	220	0.98	1.2	3.2	540
C6 3-5	20070711	12	160	13	190	230	300	0.96	1.1	3.2J	610
C6 5-7	20070711	10	170	8.4	82	170	220	2.4	0.75	3.8	750
C6 7-9	20070711	9.8	180J	8.3	54	220	360	3.3	1	7.4	1200
C7 0-1	20070710	9.3	160	5.2	180	87	190	0.8	1.4	1.9	370
C7 1-3	20070710	8.2	97	1.2	31	30	520	0.39	0.9	0.29	210
C8 0-1	20070711	8.7	120	3.3	100	70	110	0.45	0.97	1.4	290
C8 1-3	20070711	11	210	9.3	83	130	290	1.5	1	1.9	590
C9 0-1	20070710	7.8	93	6.7	87J	83	150	0.77	0.91	1.7J	360J
D2 0-1	20061221	6.5	57	0.27	14	17	8.1	0.05U	0.2U	0.1U	53
D3 0-1	20061221	6.2	58	0.28	14	17	17	0.05U	0.27	0.1U	55
D4 0-1	20070711	6.9	50	0.32	17	23	16	0.1	0.35	0.1	68
D4 1-2	20070711	6.8	68	0.2U	16	21	11	0.05U	0.25	0.1U	54
D5 0-1	20070710	6.7	80	1.2	34	39	140	0.47	0.66	0.43	190
D5 1-3	20070710	7.4	91	0.78	25	36	88	0.2	0.59	0.23	120
D6 0-1	20070710	6.2	62	0.22	16	17	18	0.05U	0.37	0.1U	46
E1 0-1	20061221	6.9	60	1.1	15	24	590	0.12	0.21	0.16	61
E1 1-3	20061221	6.6	53	0.38	15	25	20	0.1	0.2U	0.1	59
E2 0-1	20061222	6.7	52	0.26	14	17	9.7	0.05U	0.24	0.1U	46
E2 1-3	20061222	6.4	50	0.26	14	17	8.3	0.05U	0.2U	0.1U	49
E21 0-1	20061221	7.1	58	0.37	19	25	15	0.18	0.31	0.13	72

Individual Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPM)

Sample ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
E3 0-1	20070710	6.4	65	0.35	15	17	9.3	0.05U	0.33	0.1U	79
E3 1-3	20070710	10	55	0.27	14	18	9.2	0.05U	0.52	0.1U	58
E6 0-1	20070711	7.3	67	0.21	16	21	18	0.05U	0.26	0.1U	59
E6 1-2	20070711	5.1	83	0.2U	16	18	50	0.09	0.39	0.1U	76
F1 0-1	20061221	7.5	84	2.2	49	52	73	0.33	0.69	1.3	280
F1 1-3	20061221	7.9	120	3.4	57	81	210	0.99	0.59	1.5	300
F12 0-1	20061221	6.5	110	4.6	71	120	150	0.42	0.67	1	470
F2 0-1	20061221	7.4	180	3.1	29	74	560	0.55	0.45	0.51	270
F2 1-3	20061221	9.9	74	1.7	20	63	83	0.58	0.2U	0.37	120
F4 0-1	20070711	16	230	32	210	250	340	1.1	1.2	2.8	890
F4 1-3	20070711	15	210	22	160	210	310	1.6	1.1	2.5	770
F4 3-5	20070711	12	230	14	120	170	330	1.4	0.9	1.8	620
F5 0-1	20070710	6.9	52	0.47	14	19	18	0.11	0.41	0.12	61
F5 1-3	20070710	6	61	0.3	15	19	14	0.05U	0.26	0.1U	52
F5 3-5	20070710	6.6	59	0.24	14	20	10	0.05U	0.34	0.1U	46
F6 0-1	20070711	6.3	98	0.26	16	19	10	0.05U	0.3	0.1U	68
F6 1-3	20070711	22	94	0.24	14	20	13	0.05U	0.38	0.1U	52
G1 0-1	20061221	7.2	42	0.34	13	19J	13	0.05U	0.32	0.1U	51J
G11 0-1	20061220	9.6	140	4.6	38	230J	280	2.3	0.61	1.9	590J
G11 1-3	20061220	12	140	1.4	24	160J	180	1.7	0.51	1.5	390J
G11 3-5	20061220	5.7	77	0.89	13	48J	190	0.33	0.27	0.38	180J
G11 5-7	20061220	5.4	89	0.24	13	20J	14	0.05U	0.24	0.11	45J
G12 0-1	20061221	14	160	24	140	190J	200	2.5	0.79	1.9	470J
G12 1-3	20061221	19	130	24	140	200J	180	1.7	1.1	2.1	480J
G13 0-1	20070711	13	180	31	160	250	290	1.8	1	2.2	730
G13 1-3	20070711	11	180	19	150	210	210J	2.6	0.57	2.2	580
G13 3-5	20070711	7.1	89	0.34	17	25	21	0.05U	0.29	0.1	64
G3 0-1	20061221	9.3	49	3.4	60	48J	55	0.25	0.69	0.73	120J
H1 0-1	20061220	9.4	42	0.47	22	22	88	0.3	0.61	0.21	72
H11 0-1	20061220	7.4	160	0.34	15	22	28	0.46J	0.2U	0.2	45
H11 1-3	20061220	7.3	270	0.32	7	12	12	1.1J	0.2U	0.11	36
H11 3-5	20061220	4	810	0.45	5.4	14	21	0.85J	0.27	0.12	39
H12 0-1	20061219	8.3	83	2.1	42	76	58	1.2	0.75U	0.58	140
H12 1-3	20061219	4.3	65	0.88	16	29	33	0.83	0.56U	0.21	84
H12 3-5	20061219	1.9	33	0.21	6.2	26	17	0.44	0.57U	0.12	49
H12 5-7	20061219	2.2	52	0.2U	6.8	23	16	0.52	0.42U	0.13	36
H12 7-9	20061219	2.5	64	0.2U	7.2	22	18	0.49	0.4U	0.13	45
H13 0-1	20061221	5.9	49	0.35	11	47	28	0.68	0.25	0.13	44
H13 1-3	20061221	1.7	22	0.2U	4.4	16	8.1	0.26	0.2U	0.1U	24
H13 3-5	20061221	3.2	34	0.2U	5.1	18	22	0.57	0.2U	0.1U	38
H13 5-7	20061221	4.4	56	0.2U	8.2	20	18	0.81	0.28	0.13	50
H13 7-9	20061221	3.7	56	0.2U	8	20	15	0.26	0.2U	0.13	32
H3 0-1	20061220	10	61	0.27	8.4	28	22	1.2	0.71U	0.35	65
H3 1-3	20061220	6.5	66	0.2U	12	18	7.9	0.05U	0.5U	0.1U	44
H3 3-5	20061220	12	41	0.67	9.5	23	9.9	0.05U	1.1	0.11	76
I1 0-1	20061219	9.7	110	0.68	20	20	57	15	0.75U	0.15	140
I1 1-3	20061219	10	150	2	75	79	200	85	0.86	0.61	120
I1 3-5	20061219	10	65	0.61	20	28	37	16	0.64U	0.17	65
I12 0-1	20061219	7.4	81	0.67	27	62	68	2.1	0.57U	0.38	150
I12 1-3	20061219	6.2	72	0.42	12	67	63	0.96	0.74U	0.38	130
I12 3-5	20061219	6.3	58	0.38	16	44	42	0.2	0.63U	0.27	110
I2 0-1	20061220	5.7	93	0.32	9.9	30	24	0.37	0.6U	0.15	61
I2 1-3	20061220	5.9	62	0.2U	14	19	8.4	0.05U	0.5U	0.1U	43

Individual Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPM)

Sample ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
I2 3-5	20061220	6.2	59	0.24	14	18	8.6	0.54	0.41U	0.1U	46
I3 0-1	20061220	7.1	76	0.3	14	18	16	0.29	0.63U	0.1U	59
I3 1-3	20061220	6.7	58	0.33	13	17	15	0.05U	0.5U	0.1U	49
J1 0-1	20061219	11	130J	5.4	130	92	190	9.5	0.97	1.5	340J
J1 1-3	20061219	9.1	75J	4.7	93	83	92	3.7	0.86	1.3	210J
J1 3-5	20061219	8.6	89J	6	48	63	100	1	0.92	0.7	180J
K1 0-1	20061220	7.7	150J	2.1	28	250	270	67	0.75U	0.34	150J
K1 1-3	20061220	9.7	500J	5.2	64	420	520	12	1	0.9	250J
K1 3-5	20061220	6.8	140J	1.1	16	170	110	2.5	0.69U	0.47	180J
K1 5-7	20061220	7	83J	0.76	14	110	95	1.6	0.93	0.51	200J
K1 7-9	20061220	4.8	65J	0.47	10	69	66	0.78	0.76U	0.43	160J
K1 9-11	20061220	6.7	61J	0.46	11	68	65	0.78	0.73U	0.35	140J
S1 0-1	20070711	9.8	160	6.6	180	140	240	1.1	0.81	2.5	610
S1 1-3	20070711	20	180	18J	320J	210J	230	0.97	1.4	4.6J	600J
S1 3-5	20070711	12	160	16	140	210	230	1.7	0.61	2.2	590
S1 5-7	20070711	13	180	25J	150J	210J	220	1.2	0.8	2.1J	640
S1 7-9	20070711	2.2	57	0.52	19	27	14	0.08	0.66	0.15	57
S1 9-11	20070711	7	78	0.21	16	20	8.9	0.05U	0.23	0.1U	52
S2 0-1	20070710	11	330	17	490	220	440	2	1.5	8.1	910
S2 1-3	20070710	12	210	14	330	180	320	1.8	1.4	5	770
S2 3-5	20070710	7.5	91	5.5	53	100	120	1.1	0.6	1.1	310
S2 5-7	20070710	5.9	60	0.29	15	19	9	0.05U	0.39	0.1	51

Individual TCLP Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Silver - TCLP	Arsenic - TCLP	Barium - TCLP	Cadmium - TCLP	Chromium - TCLP	Copper - TCLP	Mercury - TCLP	Lead - TCLP	Selenium - TCLP	Zinc - TCLP
A1 0-1	20061222	5U	10U	860	14	50U	20U	0.4U	100U	10U	1100
A1 1-3	20061222	5U	24	1500	35	50U	23	0.4U	100U	10U	970
A1 3-5	20061222	5U	26	1100	10U	50U	20U	0.4U	100U	10U	310
A11 0-1	20061222	5U	26	1400	60	50U	22	0.4U	140	10U	4100
A11 1-3	20061222	5U	10U	580	10U	50U	20U	0.4U	100U	10U	500
A11 3-5	20061222	5U	10U	1700	10U	50U	20U	0.4U	100U	10U	210
B1 0-1	20061222	5U	10U	640	10U	50U	20U	0.4U	630	10U	340
B2 0-1	20061222	5U	10U	1600	10U	50U	20U	0.4U	100U	10U	220
C1 0-1	20061221	5U	16	900	10U	50U	20U	0.4U	100U	10U	1000
C1 1-3	20061221	5U	10U	1000	10U	50U	20U	0.4U	100U	10U	1300
C1 3-5	20061221	5U	10U	990	10U	50U	20U	0.4U	100U	10U	700
C11 0-1	20061221	5U	32	950	10U	50U	20U	0.4U	100U	10U	3800
C11 1-3	20061221	5U	51	1000	10U	50U	20U	0.4U	100U	10U	3600
C11 3-5	20061221	5U	42	870	10U	50U	20U	0.4U	100U	10U	1400
C11 5-7	20061221	5U	28	790	44	50U	20U	0.4U	100U	10U	5500
C12 0-1	20061221	5U	12	800	10U	50U	26	0.4U	100U	10U	1400
C12 1-3	20061221	5U	53	820	81	61	20U	0.4U	100U	10U	8200
C12 3-5	20061221	5U	32	550	120	50U	20U	0.4U	130	10U	11000
C3 0-1	20061221	5U	31	830	49	50U	20U	0.4U	100U	10U	1800
C3 1-3	20061221	5U	31	1100	20	50U	20U	0.4U	100U	10U	1400
C3 3-5	20061221	5U	13	1500	21	50U	30	0.4U	100U	10U	1500
D2 0-1	20061221	5U	10U	1800	10U	50U	20U	0.4U	100U	10U	290
D3 0-1	20061221	5U	10U	1700	10U	50U	20U	0.4U	100U	10U	240
E1 0-1	20061221	5U	10U	1800	10U	50U	20U	0.4U	100U	10U	330
E1 1-3	20061221	5U	10U	1600	10U	50U	20U	0.4U	100U	10U	340
E2 0-1	20061222	5U	10U	1600	10U	50U	20U	0.4U	100U	10U	190
E2 1-3	20061222	5U	10U	1600	10U	50U	20U	0.4U	100U	10U	190
E21 0-1	20061221	5U	10U	1400	10U	50U	20U	0.4U	100U	10U	380
F1 0-1	20061221	5U	14	930	10U	50U	20U	0.4U	100U	10U	2100

Individual TCLP Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Silver - TCLP	Arsenic - TCLP	Barium - TCLP	Cadmium - TCLP	Chromium - TCLP	Copper - TCLP	Mercury - TCLP	Lead - TCLP	Selenium - TCLP	Zinc - TCLP
F1 1-3	20061221	5U	17	980	31	50U	26	0.4U	100U	10U	4700
F12 0-1	20061221	5U	10U	1200	20U	50U	20U	0.4U	100U	10U	470
F2 0-1	20061221	5U	10U	1200	10U	50U	20U	0.4U	100U	10U	600
F2 1-3	20061221	5U	16	1500	20	50U	20U	0.4U	180	10U	1100
G1 0-1	20061221	5U	17	1400	10U	50U	22	0.4U	100U	10U	360
G11 0-1	20061220	5U	28	1000	11	50U	20U	0.4U	100U	10U	3400
G11 1-3	20061220	5U	39	1000	10U	50U	20U	0.4U	100U	10U	2600
G11 3-5	20061220	5U	14	1100	10U	50U	20U	0.4U	100U	10U	830
G11 5-7	20061220	5U	10U	1500	10U	50U	20U	0.4U	100U	10U	250
G12 0-1	20061221	5U	38	880	10U	50U	20U	0.4U	100U	10U	3200
G12 1-3	20061221	5U	42	1000	20	50U	20U	0.4U	100U	10U	2800
G3 0-1	20061221	5U	10U	470	10U	50U	20U	0.4U	100U	10U	62
H1 0-1	20061220	5U	10U	542	10U	50U	20U	0.4U	100U	10U	230
H11 0-1	20061220	5U	10U	1100	10U	50U	20U	0.4U	100U	10U	180
H11 1-3	20061220	5U	10U	880	10U	50U	20U	0.4U	100U	10U	270
H11 3-5	20061220	5U	10U	1700	10U	50U	20U	0.4U	100U	10U	220
H12 0-1	20061219	5U	10U	300	10U	50U	24	0.4U	100U	10U	290
H12 1-3	20061219	5U	10U	510	10U	50U	20U	0.4U	100U	10U	270
H12 3-5	20061219	5U	10U	280	10U	50U	24	0.4U	100U	10U	250
H12 5-7	20061219	5U	10U	280	10U	50U	20U	0.4U	100U	10U	210
H12 7-9	20061219	5U	10U	270	10U	50U	20U	0.4U	100U	10U	190
H13 0-1	20061221	5U	14	680	10U	50U	20U	0.4U	100U	10U	270
H13 1-3	20061221	5U	10U	440	10U	50U	40	0.4U	100U	10U	280
H13 3-5	20061221	5U	10U	460	10U	50U	31	0.4U	100U	10U	230
H13 5-7	20061221	5U	10U	470	10U	50U	29	0.4U	100U	10U	170
H13 7-9	20061221	5U	10U	320	10U	50U	30	0.4U	100U	10U	160
H3 0-1	20061220	5U	10U	390	10U	50U	22	0.4U	100U	10U	250
H3 1-3	20061220	5U	10U	1100	10U	50U	20U	0.4U	100U	10U	210
H3 3-5	20061220	5U	10U	1200	10U	50U	20U	0.4U	100U	10U	220

Individual TCLP Metals Results for Trenton Channel Remedial Investigation Phases I/II (PPB)

Sample ID	Sample Date	Silver - TCLP	Arsenic - TCLP	Barium - TCLP	Cadmium - TCLP	Chromium - TCLP	Copper - TCLP	Mercury - TCLP	Lead - TCLP	Selenium - TCLP	Zinc - TCLP
I1 0-1	20061219	5U	10U	720	10U	50U	20U	0.4U	100U	10U	230
I1 1-3	20061219	5U	10U	630	10U	50U	20U	0.4U	100U	10U	360
I1 3-5	20061219	5U	10U	1200	10U	50U	20U	0.4U	100U	10U	320
I12 0-1	20061219	5U	10U	560	10U	50U	20U	0.4U	100U	10U	140
I12 1-3	20061219	5U	10U	730	10U	50U	23	0.4U	100U	10U	450
I12 3-5	20061219	5U	10U	670	10U	50U	20U	0.4U	100U	10U	210
I2 0-1	20061220	5U	10U	870	10U	50U	22	0.4U	100U	10U	280
I2 1-3	20061220	5U	10U	1200	10U	50U	20U	0.4U	100U	10U	350
I2 3-5	20061220	5U	10U	1500	10U	50U	20U	0.4U	100U	10U	320
I3 0-1	20061220	5U	10U	1400	10U	50U	20U	0.4U	100U	10U	270
I3 1-3	20061220	5U	10U	1600	10U	50U	20U	0.4U	100U	10U	260
J1 0-1	20061219	5U	27	510	17	50U	20U	0.4U	100U	10U	1400
J1 1-3	20061219	5U	20	810	10U	50U	20U	0.4U	100U	10U	540
J1 3-5	20061219	5U	17	690	32	50U	20U	0.4U	100U	10U	980
K1 0-1	20061220	5U	10U	960	20U	50U	20U	0.4	100U	10U	240
K1 1-3	20061220	5U	10U	1100	20	50U	20U	0.4U	100U	10U	770
K1 3-5	20061220	5U	10U	1000	10U	50U	20U	0.4U	100U	10U	420
K1 5-7	20061220	5U	10U	1000	20U	50U	20U	0.4U	100U	10U	590
K1 7-9	20061220	5U	10U	940	10U	50U	20U	0.4U	100U	10U	490
K1 9-11	20061220	5U	10U	980	10U	50U	20U	0.4U	100U	10U	550

Individual AVS/SEM Results for Trenton Channel Remedial Investigation Phases I/II

Sample ID	Sample Date	SEM/AVSRatio	AcidVolatileSulfide (UMG)	Cadmium (UMG)	Copper (UMG)	Lead (UMG)	Mercury (UMG)	Nickel (UMG)	Zinc (UMG)
C12 0-1	20061221	0.548567J	4.9J	0.0078J	0.37	0.28J	0.00018UJ	0.33	1.7J
C12 1-3	20061221	0.82UJ	0.82UJ	0.06	2.1	1.1J	0.0002UJ	2	7.9J
C12 3-5	20061221	12.52323J	1.3J	0.08	2.5	1.3J	0.00021UJ	2.2	10.2J
D2 0-1	20061221	0.58UJ	0.58UJ	0.0013U	0.11J	0.027J	0.00014UJ	0.12J	0.4J
G11 0-1	20061220	0.86UJ	0.86UJ	0.028J	7.1J	1.4J	0.00021UJ	0.33J	9J
G11 1-3	20061220	0.89UJ	0.89UJ	0.0079J	2.4J	0.81J	0.00022UJ	0.23J	6.3J
G11 3-5	20061220	0.61UJ	0.61UJ	0.0025J	0.33J	0.42J	0.00015UJ	0.082J	1.2J
G11 5-7	20061220	0.57UJ	0.57UJ	0.0012UJ	0.079J	0.037J	0.00014UJ	0.099J	0.28J
G3 0-1	20061221	0.328895J	12.4J	0.028J	0.87J	0.3J	0.00031UJ	0.48J	2.4J
H11 0-1	20061220	0.65UJ	0.65UJ	0.0014UJ	0.21J	0.11J	0.00016UJ	0.17J	0.4J
H11 1-3	20061220	0.86UJ	0.86UJ	0.0029J	0.2J	0.081J	0.00021UJ	0.14J	0.95J
H3 0-1	20061220	0.380865J	3.8J	0.0021U	0.32J	0.085	0.00019UJ	0.14J	0.9J
H3 1-3	20061220	0.168865J	2.6J	0.0019U	0.08U	0.02U	0.00015UJ	0.097U	0.24J
H3 3-5	20061220	0.55UJ	0.55UJ	0.0029U	0.05UJ	0.017U	0.00014UJ	0.085U	0.35J
I3 0-1	20061220	1.061824J	0.74J	0.0036U	0.13U	0.042	0.00015UJ	0.17J	0.44J
I3 1-3	20061220	0.55UJ	0.55UJ	0.0015U	0.1U	0.026U	0.00014UJ	0.15J	0.31J
K1 0-1	20061220	0.89UJ	0.89UJ	0.016U	5.2J	0.92	0.012J	0.36	1.9J
K1 1-3	20061220	0.9UJ	0.9UJ	0.038	5.8J	2.1	0.001J	0.52	4.3J
K1 3-5	20061220	0.99UJ	0.99UJ	0.0098U	2.3J	0.49	0.00025UJ	0.2J	3.1J
K1 5-7	20061220	0.95UJ	0.95UJ	0.0073U	1.6J	0.47	0.00024UJ	0.16J	3.1J
K1 7-9	20061220	0.95UJ	0.95UJ	0.0023J	1.1J	0.33J	0.00024UJ	0.12J	2.4J
K1 9-11	20061220	0.8UJ	0.8UJ	0.0032U	0.73J	0.26	0.0002UJ	0.12J	1.6J

Additional Analyte Results for Trenton Channel Remedial Investigation Phases I/II

Sample ID	Sample Date	Total Organic Carbon (TOC) (PCT)	Percent Solids (PCT)	Moisture Content (PCT)	Diesel Range Organics (PPB)	Oil Range Organics (PPB)	Specific Gravity
A1 0-1	20061222	11.1	71.9	36.5	940000	2900000	2.508
A1 1-3	20061222	5.5	64.1	58.8	1600000	5200000	2.619
A1 3-5	20061222	6.3	53.5	74.5	2500000	7400000	2.645
A11 0-1	20061222	8.9	50.7	77.8	2500000	8400000	2.579
A11 1-3	20061222	3	71.2	35.8	700000	1900000	2.668
A11 3-5	20061222	1.1	83.2	19.5	110000	150000	2.729
B1 0-1	20061222	1.5	77.7	21.1	120000	130000	2.725
B2 0-1	20061222	1.1	83.3	18.9	100000	91000	2.701
B3 0-1	20070710	1.6	85	19.7	100000	140000	2.751
B3 1-2	20070710	0.5	84	19.2	97000	130000	2.752
B4 0-1	20070711	1.9J	80.5	23.5	170000	570000	2.685
B4 1-3	20070711	1.8	83.5	20.9	110000	150000	2.705
C1 0-1	20061221	7.7	61.9	73.3	1700000	5200000	2.568
C1 1-3	20061221	7.4	59.7	64.7	2500000	7400000	2.537
C1 3-5	20061221	4.4	64.8	55.3	1100000	3300000	2.617
C11 0-1	20061221	9	47.3	101.1	5700000	19000000	2.568
C11 1-3	20061221	10.1	47.8	116.5	9500000	25000000	2.525
C11 3-5	20061221	9.8	51.3	92.6	7200000	19000000	2.525
C11 5-7	20061221	8.5	57.1	91.7	3500000	12000000	2.583
C12 0-1	20061221	4	74	22.8	670000	1900000	2.65
C12 1-3	20061221	8.8	62.5	62.8	4700000	13000000	2.573
C12 3-5	20061221	8.8	56.2	73.1	4200000	14000000	2.556
C3 0-1	20061221	8.6	54.2	89	2400000	9900000	2.553
C3 1-3	20061221	8.7	56.3	79.3	2000000	7600000	2.193
C3 3-5	20061221	2.4	74.2	31.5	990000	2500000	2.685
C4 0-1	20070711	9.7	72.2	33.5	220000	790000	2.506
C4 1-3	20070711	3	78.9	34.4	220000	770000	2.638
C4 3-5	20070711	0.9	83.8	18.6	90000	230000	2.723
C5 0-1	20070710	7.9	55.4	78.1	640000	3700000	2.573
C5 1-3	20070710	6.3	78.1	51.2	230000	650000	2.479
C5 3-5	20070710	2.4	83.6	20.2	89000	120000	2.728
C6 0-1	20070711	10.3	52.3	99.4	4400000	14000000	2.58

Additional Analyte Results for Trenton Channel Remedial Investigation Phases I/II

Sample ID	Sample Date	Total Organic Carbon (TOC) (PCT)	Percent Solids (PCT)	Moisture Content (PCT)	Diesel Range Organics (PPB)	Oil Range Organics (PPB)	Specific Gravity
C6 1-3	20070711	9.8	52.8	84.7	2500000	8900000	2.553
C6 3-5	20070711	9.3	56.7	80.4	2200000	8700000	2.618
C6 5-7	20070711	7.3	52.3	89.6	1800000	6900000	2.624
C6 7-9	20070711	8	57.8	77.3	2600000	9500000	2.545
C7 0-1	20070710	7.1	59.5	43.2	3300000	11000000	2.579
C7 1-3	20070710	3.4	70.2	42.7	280000	1500000	2.64
C8 0-1	20070711	4.6	58.9	53.5	1000000	4500000	2.668
C8 1-3	20070711	17.1	57.3	66.9	1300000	5700000	2.631
C9 0-1	20070710	5.9	58.7	64.4	730000	3300000	2.647
D2 0-1	20061221	1.3	83.6	21.3	54000	52000	2.712
D3 0-1	20061221	1.9	82.9	21.2	45000	54000	2.719
D4 0-1	20070711	0.5	83.6	21.5	210000	550000	2.734
D4 1-2	20070711	0.5	83.8	20.3	110000	160000	2.74
D5 0-1	20070710	7.7	68.7	41.5	320000	1500000	2.563
D5 1-3	20070710	2.7	77.3	31.4	93000	620000	2.728
D6 0-1	20070710	1.4	85.4	17.7	84000	120000	2.715
E1 0-1	20061221	1.5	82.7	23.2	160000	320000	2.71
E1 1-3	20061221	1.4	83.9	18.4	110000	160000	2.719
E2 0-1	20061222	1.4	82.8	20.7	100000	98000	2.715
E2 1-3	20061222	1.1	83.4	20.3	98000	88000	2.327
E21 0-1	20061221	1.3	81.2	23.3	180000	480000	2.705
E3 0-1	20070710	0.4	84.7	18.4	110000	150000	2.746
E3 1-3	20070710	0.5	85	17.8	95000	130000	2.74
E6 0-1	20070711	3	83.9	19.6	90000	160000	2.742
E6 1-2	20070711	2.4	78	25.8	48000	170000	2.719
F1 0-1	20061221	7.2	45.3	118.6	1200000	4200000	2.625
F1 1-3	20061221	5.2	63.3	53.5	730000	2200000	2.634
F12 0-1	20061221	10.4	58.8	66.9	1300000	5300000	2.545
F2 0-1	20061221	7.1	68.7	50.3	970000	4100000	2.634
F2 1-3	20061221	3.1	72.8	39.2	760000	1900000	2.708
F4 0-1	20070711	10.8	59	70.1	2900000	16000000	2.58
F4 1-3	20070711	7.9	58.7	67.7	2600000	14000000	2.587

Additional Analyte Results for Trenton Channel Remedial Investigation Phases I/II

Sample ID	Sample Date	Total Organic Carbon (TOC) (PCT)	Percent Solids (PCT)	Moisture Content (PCT)	Diesel Range Organics (PPB)	Oil Range Organics (PPB)	Specific Gravity
F4 3-5	20070711	20	64.4	44.4	1800000	10000000	2.577
F5 0-1	20070710	1.6	82.6	21.7	120000	250000	2.701
F5 1-3	20070710	1.1	83.1	20.5	98000	140000	2.739
F5 3-5	20070710	1.1	55.5	20.6	150000	200000	2.746
F6 0-1	20070711	1.4	83.5	20.9	100000	160000	2.742
F6 1-3	20070711	1	85.2	18.7	120000	160000	2.734
G1 0-1	20061221	1.7	82.2	19.3	100000	150000	2.711
G11 0-1	20061220	5.1	55.6	81.2	2700000	8900000	2.641
G11 1-3	20061220	8.4	56.1	77.6	2300000	7200000	2.634
G11 3-5	20061220	2	72.6	27.3	300000	750000	2.726
G11 5-7	20061220	0.9	82.3	18.6	98000	110000	2.75
G12 0-1	20061221	15.5	53.5	62.3	2200000	8400000	2.519
G12 1-3	20061221	9.3	47.3	84.8	2600000	9600000	2.591
G13 0-1	20070711	8.4	46.7	99.6	2400000	12000000	2.533
G13 1-3	20070711	7.7	49.7	90.9	1700000	8400000	2.579
G13 3-5	20070711	2	81.7	23.9	120000	240000	2.732
G3 0-1	20061221	2	37.3	160.5	1300000	3100000	2.525
H1 0-1	20061220	9.8	77.7	19.1	110000	240000	2.345
H11 0-1	20061220	5.4	71.7	45.4	44000	220000	2.612
H11 1-3	20061220	3.6	63.1	68	40000	150000	2.657
H11 3-5	20061220	4.1	54.4	89.2	160000	760000	2.66
H12 0-1	20061219	12.9	54.1	91.9	910000	3300000	2.63
H12 1-3	20061219	3.8	59.2	86.7	330000	1000000	2.674
H12 3-5	20061219	5	56.1	90.8	310000	880000	2.69
H12 5-7	20061219	5.1	54	95.2	220000	610000	2.568
H12 7-9	20061219	5.6	60.8	58.1	140000	480000	2.718
H13 0-1	20061221	3.2	61.2	50.8	130000	460000	2.679
H13 1-3	20061221	3	59	63.9	180000	540000	2.678
H13 3-5	20061221	3.7	53.6	74.8	190000	730000	2.696
H13 5-7	20061221	8.7	50	88.3	300000	1100000	2.649
H13 7-9	20061221	11.8	48.4	85.6	280000	1300000	2.575
H3 0-1	20061220	6.1	62.8	105.7	71000	390000	2.671

Additional Analyte Results for Trenton Channel Remedial Investigation Phases I/II

Sample ID	Sample Date	Total Organic Carbon (TOC) (PCT)	Percent Solids (PCT)	Moisture Content (PCT)	Diesel Range Organics (PPB)	Oil Range Organics (PPB)	Specific Gravity
H3 1-3	20061220	2.5	82.7	42.2	59000	74000	2.704
H3 3-5	20061220	1.5	86.5	15.2	130000	120000	2.696
I1 0-1	20061219	4.5	76.1	27.7	130000	620000	2.622
I1 1-3	20061219	6.9	68	48.4	830000	2600000	2.55
I1 3-5	20061219	1.7	80.2	19.6	120000	170000	2.712
I12 0-1	20061219	6.1	73.1	33.6	310000	1300000	2.65
I12 1-3	20061219	5.2	69	45.2	660000	2100000	2.136
I12 3-5	20061219	1.4	74.8	23.8	650000	2100000	2.726
I2 0-1	20061220	2.1	61.4	66.3	160000	560000	2.638
I2 1-3	20061220	1.1	85.8	19.3	81000	110000	2.719
I2 3-5	20061220	1.4	82.6	21.2	69000	77000	2.726
I3 0-1	20061220	3.9	80.9	22.2	76000	87000	2.712
I3 1-3	20061220	0.9	83.4	20.4	79000	90000	2.732
J1 0-1	20061219	5.1	67.9	47.4	890000	2800000	2.605
J1 1-3	20061219	6.9	61.8	64.7	1400000	4500000	2.57
J1 3-5	20061219	6.4	68.5	44.2	1600000	2300000	2.603
K1 0-1	20061220	3	66.3	101.7	26000000	23000000	2.445
K1 1-3	20061220	11.3	53.3	89.6	14000000	11000000	2.537
K1 3-5	20061220	6.4	46.3	117.6	3200000	2400000	2.609
K1 5-7	20061220	6	49.5	96.9	4200000	3900000	2.609
K1 7-9	20061220	5	49.9	101.3	1500000	3000000	2.625
K1 9-11	20061220	2.8	54.9	74.3	1000000	1900000	2.651
S1 0-1	20070711	3.8	56.3	81.3	2100000	8200000	2.623
S1 1-3	20070711	5.6J	53.2	100.6	4300000	17000000	2.595
S1 3-5	20070711	8.3	58.8	75.5	2700000	12000000	2.617
S1 5-7	20070711	12.2	54.5	132.6	2000000	9200000	2.516
S1 7-9	20070711	3.7	66.1	51.5	27000	140000	2.645
S1 9-11	20070711	0.8	83.5	20.8	95000	170000	2.735
S2 0-1	20070710	8.6	49.2	100.2	390000	1300000	2.623
S2 1-3	20070710	6.8	53.7	87.8	2200000	8400000	2.633
S2 3-5	20070710	4.6	63.2	62.1	850000	3500000	2.692
S2 5-7	20070710	1	84.6	19.1	1200000	1800000	2.75

APPENDIX I – RESULTS OF *HYALELLA AZTECA* AND *CHIRONOMUS TENTANS* TOXICITY TESTS FROM PHASE I AND PHASE II SEDIMENT SAMPLES

Phase I Sediment Samples – December 21, 2006

Phase II Sediment Samples – July 11, 2007

ASci Corporation
Environmental Testing Laboratory
Submitted to TN&A – 2/07
ASci-ETL Study ID #5010-246

Results of
Hyalella azteca and *Chironomus tentans* Toxicity Tests with TN&A Whole Sediment Samples Received December 21, 2006

Prepared by

ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712

Submitted to

TN & Associates, Inc.
704 S. Illinois Ave., Suite C-104
Oak Ridge, TN 37830

Submitted February 2007

T N & Associates, Inc.
Engineering and Science

February 26, 2007

To: Raghu Nagam

Cc: Richard Baldino, Naren Babu

From: Arthur Stewart

Subject: Interpretation of results of sediment toxicity tests conducted by ASci, Inc.

I went through the ASci reports on the results of the *Chironomus* and *Hyallela* sediment toxicity tests for the four Riverview sediment samples and offer the following comments.

1. Overall, the reports are well organized and properly reported. This outcome suggests an appropriate level of QA/QC for the biological data.
2. I was unable to judge the quality of the chemical data presented because the report did not contain methods statements for these analyses. However, the values that were reported for conductivity, temperature, dissolved oxygen, pH and ammonia appeared reasonable, and the day-to-day variations in these data generally were similar in magnitude to those I've encountered in other sediment toxicity tests.
3. As the report's author notes, the North Poker Creek reference sample was problematic. But this does not invalidate the results for the four Riverview samples, or the comparison of the samples to the West Bearskin sediment, or the comparison of the results of the four samples to the EPA minimum criteria for test acceptability.
4. Based on BPJ (best professional judgment) developed from many years of toxicity testing and reporting of toxicity test results, I suggest that the statistically significant effects on *Hyalella azteca* growth reductions for the C11 0-1 and K-1 0-1 samples is not too much to worry about: the values for both of these test samples are still above the EP minimum criterion, and survival values for *H. azteca* in these two samples is not dramatically low.
5. Using BPJ again, the *Chironomus tentans* survival endpoint does suggest some problems: the survival values are <48% across the board for the four test samples, and this is well below their survival in the reference sample (West Bearskin) or the EPA minimum criterion. However, *Chironomus* weight and AFDW endpoints are not extremely low, so animals that survived were able to grow.
6. The number of samples tested is too small to draw definitive conclusions about anything – but some of the chemistry data and ancillary information that was provide may offer some clues. For example, a large odonate larva (baby dragonflies for the non-biologists) was found in one replicate of a sample from

K1. Thus, it seems likely that other dragonfly larvae might be found at K1 the sampling site. These organisms take several years to mature and are predatory – so either it was one unusually hardy critter, or sediments at the K1 site are extremely toxic. The original lab notes from ASci also state that "…all four test sediments (contained) tubificidae worms…commonly found in polluted sediments." This is true: tubificid worms favor highly enriched sediments and are not notably sensitive to many pollutants. So, the four test sediments probably are organically enriched, but not highly contaminanted.

7. The method for measuring ammonia is not specified, but the concentrations reported are high for all four test sediments – especially for C3 and C11. The presence of moderately high levels of ammonia suggest serious organic enrichment and potential toxicity. The C3 and C11 test sediments also are the two most "toxic" sediments, based on results of the *Chironomus tentans* tests, so for N=2, there is some correspondence between elevated ammonia and *Chironomus* mortality. .
8. Investigators conducting the tests noted that all organisms burrowed into all sediments, even though somewhere in the report I read that some of the test samples (C and G, as I recollect) had an odor of hydrocarbons and/or naphthalenes. No sediment-avoidance behavior was reported – and most organisms will try to avoid sediments that are strongly contaminated with hydrocarbons. Human noses in general are good at detecting even low levels of many types of hydrocarbons. Thus, the reported odor and the willingness of the organisms to burrow into the sediments support the idea that although the sediments probably contained hydrocarbons, their concentrations did not seem high enough to be acutely toxic.
9. With only four samples tested, there is not enough information to reliably assess site-to-site differences in biological quality of sediments within the study area.

Respectfully,
Arthur J. Stewart, PhD
Senior Ecotoxicologist

T N & Associates, Inc.
Engineering and Science

September 21, 2007

To: Raghu Nagam

Cc: Richard Baldino, Naren Babu

From: Arthur Stewart, Senior Ecotoxicologist

Subject: Interpretation of results of sediment toxicity tests conducted by ASci, Inc.

I reviewed the ASci Corporation reports on the results of the *Chironomus* and *Hyallela* sediment toxicity tests for four Riverview sediment samples (B3 0-1, E3 0-1, F5 0-1 and S2 0-1), submitted August 2007, offer the following comments.

1. Overall, the reports are well organized and properly reported. This outcome suggests an appropriate level of QA/QC for the biological data

2. The report authors note on page 11 that "Assessment of the effects of ammonia toxicity are contained in the Discussion." This seems to me to be an important point, because (a) ammonia levels were conspicuously elevated for sample S2 0-1 (see Tables 14, 15), and (b) this sample also was lethal to both test species (pages 31, 35) Unfortunately, the authors of the report apparently forgot to discuss the possibility of ammonia as a toxicant in the Discussion section. I will ask the ASci Corporation Environmental Testing Laboratory director to comment on this point. Parameters such as dissolved oxygen, pH, conductivity, alkalinity and hardness all were biologically suitable for the tested species and these parameters did not provide clues as to the nature of the toxicant(s).

3 The authors correctly note that the secondary laboratory control sediment was not suitable as a test medium for either species. This situation, though, does not affect the test's interpretation: sediment samples F5 01- and S2 0-1 would be considered to be toxic even relative to samples E3 01- and B3 0-1. Since ammonia levels in F5 0-1 were NOT elevated, factors other than ammonia must account for the toxicity of F5 0-1

4 In an attempt to identify substances that might account for the toxicity of samples F5 0-1 and S2 0-1, I reviewed data on the concentrations of organic and metallic pollutants in the four sediment samples Neither *Hyalella* nor *Chironomus* seemed to enjoy sediment samples B3 0-1 or E3 0-1 much, compared to the West Bearskin control sediment, but both species at least did better in B3 0-1 and E3 0-1 sediment than they did in F5 0-1 and S2 0-1 sediment Thus, a comparison of

chemicals in the four sediment samples was deemed worthwhile. Table 1, below, summarizes the results of this comparison. Values for measured constituents that "stood out" for the F5 0-1 and S2 0-1 samples, relative to the B3 0-1 and E3 0-1 samples, are identified in bold font in Table 1. These materials may contribute to the toxicity of F5 0-1 and S2 0-1. However, constituents not measured may cause or contribute to the toxicity of F5 0-1 and S2 0-1, as well. It is important to remember that, with four samples only, it is not possible to more rigorously assess possible site-to-site differences in the biological quality of sediments at the Riverview/Trenton Channel.

Table 1. Comparison of measured constituents in the four sediment samples (units are µg/Kg dry weight for the organic compounds and mg/kg dry weight for the metals). Values indicated in bold font are those that seem conspicuously elevated, and which might contribute to toxicity. ND refers to "not detected."

Constituent	F5 0-1	S2 0-1	E3 0-1	B3 0-1
Anthracene	160	**680**	ND	ND
Benzo(a)anthracene	180	**880**	ND	ND
Benzo(a)pyrene	130	ND	ND	ND
Benzo(b)fluoranthene	150	ND	ND	ND
Chrysene	200	**1300**	ND	ND
Fluoranthene	390	**1700**	ND	ND
Fluorene	100	**540**	ND	ND
Phenanthrene	390	**2700**	100	110
Pyrene	**4120**	**2400**	ND	ND
Arochlor 1242	ND	**12000**	ND	ND
Arochlor 1254	ND	**4200**	ND	ND
Mercury	0.11	**2.0**	ND	ND
Barium	52	**330**	65	56
Cadmium	0.47	**17**	0.35	0.24
Chromium	14	**490**	15	14
Copper	19	**220**	17	19
Lead	18	**440**	9.3	9.2
Silver	0.12	**8.1**	ND	ND
Zinc	61	**910**	79	49

ASci Corporation

Environmental Testing Laboratory

September 21, 2007

Art Stewart
Senior Ecotoxicologist
TN & Associates, Inc.
704 S. Illinois Ave., Suite C-104
Oak Ridge, TN 37830

Addendum to *Hyalella azteca* and *Chironomus tentans*
Toxicity Report from Samples Received July 11, 2007

The measured ammonia levels in the overlaying water recorded throughout each test sediment would not have been acutely toxic to the test organisms. The highest ammonia amount measured was recorded on the initial test day of the overlaying water in sediment S2 (7.55 mg/L). This level of ammonia most likely would not have caused significant mortality to *Chironomus* or *Hyalella*. Also, the ammonia levels measured in S2 dropped significantly by test day 1 and continued to drop throughout the test period.

Clayton Allen Digitally signed by Clayton Allen
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ASci Corporation
Environmental Testing Laboratory
Submitted to TN&A – 2/07
ASci-ETL Study ID #5010-246

REPORT APPROVAL

Name (signed): ______________ Date: 2/15/07

Name (typed): Kurt Anderson

Title: Operations Manager

* * * * *

Name (signed): ______________ Date: 2/15/07

Name (typed): Clayton Allen

Title: Senior Biologist

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INTRODUCTION

At the request of TN&A Associates, ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected by TN&A personnel on December 19-20, 2006. The toxicity tests were performed to measure the toxicity of selected sediment samples to *Hyalella azteca* (amphipod) and larval *Chironomus tentans* (midge). The *Hyalella* test endpoints were 28-day survival, length, and weight. The *Chironomus* endpoints were 20-day survival and growth (dried and ash-free dried weight (AFDW)). Test dates were January 4-February 1, 2007.

STUDY SUMMARY

The table below summarizes survival and growth for each TN&A sediment and the West Bearskin and North Poker Creek controls. The secondary control, North Poker Creek (NPC), had poor survival due to a high number of indigenous, predaceous *Chironomid* larvae[1]. As such, no comparisons were made using NPC as a statistical reference.

Endpoint	EPA 2000 minimum criteria	West Bearskin	North Poker Creek[2]	C3 0-1	C11 0-1	G11 0-1	K-1 0-1
H. azteca Survival (%)	≥80	90.0	50.0	76.3	78.8	60.0	60.0
H. azteca Growth (mg/organisms)	≥0.15	0.405	0.421	0.346	0.248	0.351	0.313
H. azteca Growth (mean length)	≥3.2	4.3	4.2	3.8	3.4	3.7	3.6
C. tentans Survival (%)	≥70	77.4	22.9	30.2	13.5	0	48.8
C. tentans Dried Weight (mg/org)	≥0.60	1.35	2.04	1.21	0.80	NA	1.10
C. tentans AFDW (mg/org)	≥0.48	1.14	1.81	1.00	0.62	NA	0.87

Significantly different than West Bearskin control results

1 *Tanyopodinae* chironomid (piercers and engulfers).
2 Secondary control.

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from TN&A were performed following abbreviated United States Environmental Protection chronic methods (USEPA 2000). Twenty-eight and twenty-day tests exposing *Hyalella* and *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth, with tests terminated before emergence and egg production (*C. tentans*) and water-only reproductive measurements (*H. azteca*). Effect was determined by comparison to organism performance following exposure to the selected reference control sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

Test Organism Culturing, Holding, and Acclimation

Hyalella and *Chironomus* were obtained from Environmental Consulting and Testing (ECT), Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Hyalella* were cultured in a static-renewal system with overlying water renewed twice per week, and the *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The batches of test organisms were hand delivered to ASci-ETL. Upon arrival at ASci-ETL, the batches of organisms were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3°C per day during holding. The holding tanks were lightly aerated during the pre-test period. At test initiation the *Hyalella* were 7 to 8 days old. The *Chironomus* were 4-24 hours old.

Overlying Water Characteristics

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds.

Exposure System

Sediment from each site tested included eight replicates for each species. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. The replicate test chambers (eight for each species) were held in a single all glass 12-L aquariums constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each holding aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperature (23° ± 1°C) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Performance

Sediment samples were collected by TN&A personnel from December 19-20, 2006. The samples were delivered to ASci-ETL by express courier on December 21, 2006. The samples were labeled as C3 0-1, C11 0-1, G11 0-1, and K1 0-1. The Chain of Custody forms were completed upon sample arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at 1-4°C until use. Appendix A contains a copy of the Chain of Custody forms.

The primary laboratory control sediment was collected on May 17, 2006, from West Bearskin Lake, located in Cook County, Minnesota. The sediment sample (5-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms. A secondary control, North Poker Creek sediment was collected January 2, 2007, from a remote stream in St. Louis County, Minnesota.

The toxicity exposures with both test species were originally performed simultaneously. Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water, and the *Chironomus* replicate exposures were fed 1.5 mL Tetrafin slurry. The toxicity tests were initiated approximately 24 hours later, after the sediments were allowed to settle. The organisms were introduced into the test system on January 4, 2007.

To start the tests, ten *Hyalella* (7 to 8 days old), and twelve *Chironomus* (4-24 hours old) were impartially distributed to random test replicates for each treatment. *Chironomus* replicates were allowed to settle four hours before re-introduction into the test chambers.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of ± 10% from target flow were adjusted. Measurements of overlying water pH, conductivity, and dissolved oxygen were measured three times per week. Temperature was measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough. Hardness and alkalinity were measured at test initiation and termination. Per the Statement of Work language, ammonia measurements were made for five replicates/treatment on test day 1, 6, and 13.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). The *Hyalella* were fed a mixture of yeast, Cerophyl®, and fermented trout chow (YCT) prepared to contain 1,800 mg/L total solids. *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 20 days of exposure (*C. tentans*) and 28-days (*Hyalella*). Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at 89°C for 24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus weight of ashed larvae.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled dry weight of the replicate by the number of organisms exposed less the number of pupae recovered.

At test termination the *Hyalella* were pooled, rinsed, and preserved in 10% formalin. Length was determined under a dissecting microscope via a calibrated eyepiece micrometer. *Hyalella* were then placed in pre-weighed pans and dried at 86°C for 22 hours to determine mean dried weight.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the selected reference site sediment exposure to measure effect. The survival data were analyzed using Toxcalc Version 5.0.23, Tidepool Scientific Software. The survival data were arc-sine transformed before analysis, and then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect (p=0.05) as compared to the reference site results.

The growth data was not transformed before analysis. Mean dry weights and/or lengths were checked for normality and equality of variance. The growth data were then analyzed for significant effect (p=0.05) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the reference site result to determine effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overall mean flow rate for each of the holding tanks during the test period was 5.5 ml/minute. The mean flow rate shows overlying water was renewed at a rate that averaged 2.0 tank volumes per day.

Tables 2 and 3 summarize the overlying water temperature values measured daily from the *Hyalella* and *Chironomus* exposure chambers. The range of individual temperature values was from 22.4°C to 22.8°C. All the individual values were within the proposed range of 23°C ± 1°C. Mean test temperatures were maintained at 22.4-22.5°C.

Overlying water dissolved oxygen (DO) concentrations in the *Hyalella* and *Chironomus* test chambers are in Tables 4 and 5. DO values ranged from 2.9 to 8.2 mg/L during the *Hyalella* exposures. DO values ranged from 3.8 to 7.8 mg/L during the *Chironomus* exposures. At no time was feeding suspended for either exposure.

Overlying water pHs for the *Hyalella* and *Chironomus* test chambers are in Tables 6 and 7. The pH of overlying water in the *Hyalella* and *Chironomus* exposures ranged from 6.51-7.48. None of the pH values were outside of the organisms' physiologically tolerable range.

Tables 8 and 9 contain the overlying water conductivity values for the *Hyalella* and *Chironomus* exposures. The overall range of conductivity values for both exposures was from 128 to 424 µmhos/cm. None of the values indicated that a biologically significant amount of ionized material was released from the test sediments.

Tables 10 and 11 contain overlying water alkalinity values for the *Hyalella* and *Chironomus* exposures, respectively. Concentrations ranged from 36-114 mg/L as $CaCO_3$.

Tables 12 and 13 contain the overlying total hardness values for the exposures. Concentrations ranged from 42-100 mg/L as $CaCO_3$.

Tables 14 and 15 contain the results of total ammonia measurements for the exposures. Ammonia concentrations for the control sediments and G11 0-1 and K1 0-1ranged were slightly elevated, ranging from 0.13-4.10. Ammonia values for C3 0-1 and C11 0-1 were recorded at moderately high levels, ranging from 1.13-12.20 mg/L, with averages of 4.63 and 7.07, respectively

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity for both test species. Assessment of the effects of ammonia toxicity are contained in the Discussion.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. At test termination, the secondary control, North Poker Creek, was found to contain large numbers of *Tanyopodinae* chironomids, which are classified as predaceous larvae (piercers and engulfers). The resulting survival data for North Poker Creek was both low (50% for *Hyalella* and 29.3% for *Chironomus*) and sporadic. Growth data indicated surviving organisms were healthy and larger than EPA minimum control growth criteria.

Replicate F for the West Bearskin Chironomus exposure had a large *Ephemeroptera* (mayfly) larvae present at test termination, and data from replicate F were excluded from statistical analysis. Replicate H for the K1 0-1 *Chironomus* exposure had a large *Odonata* (dragonfly) larvae present at test termination, and data from replicate F were excluded from statistical analysis.

For the *Hyalella* exposure, several replicates for West Bearskin had young present, and adult pairing was noted in most West Bearskin and some North Poker Creek replicates. Replicate F from K1 0-1 had large amounts of microbiological growth present in the sieved sediment. Since no other replicates in K1 0-1 had high levels of microbiological growth, it was assumed that the growth was due to a clump of organic material unrelated to actual sediment characteristics, and the data from replicate F in K1 0-1 was excluded from data analysis.

Petroleum- and naphthalene-like odors were present in all test sediments, but not the West Bearskin or North Poker Creek controls. The naphthalene-like odor was strongest in test sediments C11 0-1 and G11 0-1. Surface films were also present in all four test sediments throughout the tests, and screens were cleaned regularly to prevent build-up.

***Hyalella azteca* Survival -**

Appendix B summarizes the *Hyalella* survival results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean survival of 90%. The secondary control, North Poker Creek, had survival of 50%. The test sediments had survival rates from 60-78.8%. Statistical analysis showed the data were normal, with equal variances, and unequal replicate size (due to K1 0-1 replicate exclusion). Results of the Bonferroni t-test showed G11 0-1 and K1 0-1 survival results were significantly lower than the West Bearskin control results. C3 0-1 and C11 0-1 survival rates were not significantly lower than the West Bearskin control results.

***Hyalella azteca* Mean Dried Weight -**

Appendix B also summarizes the *Hyalella* mean dried weight results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean organism weights of 0.405 mg/organism. The secondary control, North Poker Creek, had a mean organism weight of

0.421 mg/organism. The test sediments had mean dry weights from 0.248-0.351 mg/organism. Statistical analysis showed the data were normal, with equal variances, and unequal replicate size (due to K1 0-1 replicate exclusion). Results of the Bonferroni t-test showed C11 0-1 and K1 0-1 dry weight results were significantly lower than the West Bearskin control results. C3 0-1 and G11 0-1 weights were not significantly lower than the West Bearskin control results.

***Hyalella azteca* Length -**

Appendix B also summarizes the *Hyalella* length results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean length rate of 4.3 millimeter per organism. The secondary control, North Poker Creek, had mean length rate of 4.2 millimeter per organism. The test sediments had mean length rates of 3.4-3.8 millimeter per organism. Statistical analysis showed the data were normal, with equal variances, and unequal replicate size (due to K1 0-1 replicate exclusion). Results of the Bonferroni t-test showed all test sediment organism lengths were significantly lower than the West Bearskin control results.

***Chironomus tentans* Survival and Growth Results -**

Appendix C summarizes the *Chironomus* survival results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean survival of 77%. The secondary control, North Poker Creek, had survival of 23%. The test sediments had survival rates from 0-49%. Statistical analysis showed the data were normal, with unequal variances, and unequal replicate size (due to West Bearskin and K1 0-1 replicate exclusion). Results of the Wilcoxin Rank Sum Test indicate all test sediment survival results were significantly lower than the West Bearskin control results.

Appendix C also summarizes the *Chironomus* mean dried weight results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported an acceptable 20-day mean organism dried weight of 1.36 mg/organism. The secondary control, North Poker Creek, had a mean organism weight of 2.05 mg/organism. The test sediments had mean dry weights from 0.80-1.21 mg/organism. Statistical analysis showed the data were non-normal, with equal variances, and unequal replicate size (due to West Bearskin and K1 0-1 replicate exclusion). Results of the Wilcoxin Rank Sum

Test indicate none of the sediments had significantly lower dried weights than the West Bearskin control results.

Appendix C also summarizes the *Chironomus* mean ash-free dried weight results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported an acceptable 20-day mean organism ash-free dried weight of 1.14 mg/organism. The secondary control, North Poker Creek, had a mean ash-free dried weight of 1.81 mg/organism. The test sediments had mean ash-free dry weights from 0.62-0.99 mg/organism. Statistical analysis showed the data were non-normal, with equal variances, and unequal replicate size (due to West Bearskin and K1 0-1 replicate exclusion). Results of the Wilcoxin Rank Sum Test indicate none of the sediments had significantly lower ash-free dried weights than the West Bearskin control results.

The following conclusions can be drawn from the study results.

- The primary laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for both test species.
- The secondary laboratory control sediment used for this study, North Poker Creek, did not support acceptable organism survival due to the presence of predaceous *Chironomid* larvae. North Poker Creek did support acceptable growth for both test species.
- Sediment C3 0-1 caused significant mortality to *Chironomus* and significantly affected *Hyalella* length when compared to the primary laboratory control, West Bearskin.
- Sediment C11 0-1 caused significant mortality to *Chironomus* and significantly affected *Hyalella* length and weight when compared to the primary laboratory control, West Bearskin.
- Sediment G11 0-1 caused significant mortality to *Chironomus* and significantly affected *Hyalella* length when compared to the primary laboratory control, West Bearskin.
- Sediment K1 0-1 caused significant mortality to *Chironomus* and significantly affected *Hyalella* length and weight when compared to the primary laboratory control, West Bearskin.

DISCUSSION

The four sediment samples collected by TN&A showed significant effect to *Chironomus tentans* survival, but only moderately affected *Hyalella azteca* growth (weight and/or length) and did not significantly affect *Hyalella azteca* survival. The measured ammonia levels throughout each exposure may have contributed to *Hyalella* growth impairment, but did probably not cause *C. tentans* lethality at the corresponding measured pH levels. The ammonia levels recorded throughout the test would not have been acutely toxic to most invertebrate species unless pH levels were >7.5 S.U.: the highest recorded pH level for C3 0-1 and C11 0-1 was 7.3. Ammonia levels in the test sediments were generally higher in the *Hyalella* exposures, which may have been caused by YCT food addition, or the smaller diameter screen necessary for Hyalella exposures. Unlike *C. tentans, Hyalella* move freely throughout the water column, especially during low light periods. The smaller diameter screen effectively restrains 7-8 day *Hyalella*, keeping the organisms inside the test beakers, but may not facilitate water exchange as readily as the larger diameter *C. tentans* screens when surface films develop. The development of surface films was noted for all test sediments throughout the exposures.

Without supporting analytical data it is impossible to ascertain the reason for the discrepancy in organism response, but a possible cause of response differences are the relative ages of the two test species. *Chironomus tentans* are more sensitive to both organic and inorganic toxicants in first instar life stage. *C. tentans* that survived into subsequent life-stages (i.e. until test terminations) may have been relatively unaffected by the same levels of toxicant(s) that were toxic at first instar stages.

The low organism survival in the secondary control did not affect the validity of the test. Low survival rates were due to indigenous larvae, and the relatively small test sample size (n=4) and relatively similar sediment characteristics (silt/clay) meant that a West Bearskin-only comparison is an accurate and fair statistical and quality-control reference for the test sediments.

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TOXCALC Version 5.0.23, Tidepool Scientific Software

Table 1. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to TN&A Sediments During 20-day *Chironomus tentans* and 28-day *Hyalella azteca* Exposures

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean	low	high
Head Flow Rate	340	348	340	342	346	342	342	346	342	342	342	350	346	342	350	350	346	346	342	350	342	345	340	350
Test Chamber Flow Rate	5.5	5.6	5.5	5.5	5.6	5.5	5.5	5.6	5.5	5.5	5.5	5.6	5.6	5.5	5.6	5.6	5.6	5.6	5.5	5.6	5.5	5.5	5.5	5.6
Volume Exchanges	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mean	low	high
Head Flow Rate	340	348	340	342	346	342	342	346	342	342	342	350	346	342	350	350	346	346	342	350	342	342	340	342	342	348	342	350	350	345	340	350
Test Chamber Flow Rate	5.5	5.6	5.5	5.5	5.6	5.5	5.5	5.6	5.5	5.5	5.5	5.6	5.6	5.5	5.6	5.6	5.6	5.6	5.5	5.6	5.5	5.5	5.5	5.5	5.5	5.6	5.5	5.6	5.6	5.5	5.5	5.6
Volume Exchanges	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Table 2. Overlaying Water Temperature Values for TN&A Associate *Hyalella* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3 0-1	C11 0-1	G11 0-1	K1 0-1
1/4/2007	0	22.7	22.8	22.7	22.8	22.9	22.8
1/5/2007	1	22.5	22.7	22.6	22.8	22.6	22.7
1/6/2007	2	22.6	22.5	22.5	22.8	22.7	22.7
1/7/2007	3	22.6	22.4	22.5	22.7	22.5	22.6
1/8/2007	4	22.8	22.7	22.8	22.7	22.8	22.7
1/9/2007	5	22.6	22.7	22.7	22.6	22.5	22.4
1/10/2007	6	22.5	22.4	22.5	22.5	22.5	22.5
1/11/2007	7	22.4	22.5	22.5	22.6	22.7	22.5
1/12/2007	8	22.4	22.4	22.3	22.2	22.4	22.6
1/13/2007	9	22.8	22.6	22.3	22.4	22.4	22.5
1/14/2007	10	22.5	22.5	22.6	22.7	22.6	22.5
1/15/2007	11	22.6	22.5	22.6	22.8	22.7	22.6
1/16/2007	12	22.3	22.2	22.1	22.3	22.1	22.3
1/17/2007	13	22.4	22.3	22.4	22.3	22.3	22.3
1/18/2007	14	22.2	22.2	22.3	22.3	22.3	22.4
1/19/2007	15	22.5	22.5	22.3	22.4	22.4	22.5
1/20/2007	16	22.2	22.1	22.1	22.2	22.3	22.3
1/21/2007	17	22.3	22.1	22.2	22.3	22.5	22.5
1/22/2007	18	22.4	22.3	22.3	22.4	22.4	22.4
1/23/2007	19	22.5	22.4	22.4	22.3	22.6	22.5
1/24/2007	20	22.3	22.3	22.3	22.5	22.5	22.6
1/25/2007	21	22.5	22.3	22.3	22.5	22.6	22.6
1/26/2007	22	22.5	22.5	22.5	22.6	22.5	22.7
1/27/2007	23	22.3	22.1	22.1	22.2	22.4	22.4
1/28/2007	24	22.4	22.1	22.0	22.4	22.5	22.5
1/29/2007	25	22.3	22.5	22.4	22.5	22.5	22.4
1/30/2007	26	22.8	22.5	22.6	22.5	22.6	22.6
1/31/2007	27	22.4	22.3	22.4	22.4	22.4	22.3
2/1/2007	28	22.4	22.3	22.3	22.5	22.5	22.4
	Maximum	22.8	22.8	22.8	22.8	22.9	22.8
	Minimum	22.2	22.1	22.0	22.2	22.1	22.3
	Mean	22.5	22.4	22.4	22.5	22.5	22.5

Table 3. Overlaying Water Temperature Values for TN&A Associate *Chironomus* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3 0-1	C11 0-1	G11 0-1	K1 0-1
1/4/2007	0	22.6	22.7	22.6	22.7	22.0	22.6
1/5/2007	1	22.5	22.6	22.6	22.7	22.8	22.6
1/6/2007	2	22.5	22.6	22.7	22.7	22.7	22.8
1/7/2007	3	22.5	22.6	22.5	22.5	22.7	22.7
1/8/2007	4	22.8	22.7	22.8	22.8	22.7	22.8
1/9/2007	5	22.8	22.7	22.5	22.7	22.6	22.6
1/10/2007	6	22.6	22.5	22.4	22.5	22.4	22.5
1/11/2007	7	22.7	22.6	22.5	22.4	22.4	22.5
1/12/2007	8	22.6	22.6	22.6	22.5	22.4	22.6
1/13/2007	9	22.6	22.7	22.5	22.3	22.4	22.7
1/14/2007	10	22.6	22.7	22.2	22.4	22.5	22.6
1/15/2007	11	22.7	22.7	22.6	22.5	22.6	22.5
1/16/2007	12	22.3	22.2	22.3	22.2	22.3	22.1
1/17/2007	13	22.4	22.3	22.4	22.3	22.3	22.3
1/18/2007	14	22.3	22.4	22.3	22.2	22.3	22.3
1/19/2007	15	22.1	22.4	22.2	22.3	22.5	22.5
1/20/2007	16	22.1	22.1	22.0	22.1	22.4	22.3
1/21/2007	17	22.1	22.2	22.0	22.2	22.4	22.4
1/22/2007	18	22.4	22.3	22.3	22.1	22.3	22.4
1/23/2007	19	22.5	22.4	22.4	22.3	22.1	22.3
1/24/2007	20	22.2	22.2	22.2	22.3	22.6	22.6
	Maximum	22.8	22.7	22.8	22.8	22.8	22.8
	Minimum	22.1	22.1	22.0	22.1	22.0	22.1
	Mean	22.5	22.5	22.4	22.4	22.4	22.5

Table 4. Overlaying Water DO Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	7.8	7.4	7.1	7.2	7.4	7.0
1/5/2007	1	8.2	8.0	8.0	6.4	7.0	7.3
1/8/2007	4	6.2	3.1	3.9	2.9	4.1	5.7
1/10/2007	6	6.4	5.4	5.8	5.1	5.2	5.0
1/12/2007	8	6.6	4.6	5.0	5.1	5.6	5.7
1/15/2007	15	5.5	5.5	4.8	4.5	4.1	4.1
1/17/2007	13	6.4	6.0	5.2	5.1	5.0	5.2
1/19/2007	15	7.4	6.0	5.3	4.2	4.5	5.0
1/22/2007	18	6.6	5.3	4.7	4.4	4.2	5.0
1/24/2007	20	6.0	4.8	4.5	4.5	4.8	4.9
1/26/2007	22	6.3	4.3	4.4	4.8	4.9	4.9
1/29/2007	25	6.5	5.1	5.1	4.8	4.2	5.2
1/31/2007	27	5.7	5.5	5.1	5.3	4.5	5.4
2/1/2007	28	6.6	6.3	5.5	5.2	4.9	5.1
	Maximum	8.2	8.0	8.0	7.2	7.4	7.3
	Minimum	5.5	3.1	3.9	2.9	4.1	4.1
	Mean	6.6	5.5	5.3	5.0	5.0	5.4

Table 5. Overlaying Water DO Values for *C. tentans* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	7.65	7.21	7.40	7.50	7.10	7.80
1/5/2007	1	7.84	7.00	7.51	6.95	6.09	5.62
1/8/2007	4	6.10	5.00	4.40	4.80	4.70	3.80
1/10/2007	6	6.4	5.7	5.0	5.4	5.3	5.1
1/12/2007	8	5.3	5.1	5.7	5.0	6.0	4.9
1/15/2007	11	5.8	4.8	4.7	4.7	4.3	4.3
1/17/2007	13	4.6	4.8	5.2	5.4	5.4	5.5
1/19/2007	15	5.2	6.2	6.6	6.9	6.8	6.8
1/22/2007	18	4.8	4.1	4.0	5.5	5.9	4.6
1/24/2007	20	6.0	6.3	5.6	5.9	5.9	5.4
	Maximum	7.8	7.2	7.5	7.5	7.1	7.8
	Minimum	4.6	4.1	4.0	4.7	4.3	3.8
	Mean	6.0	5.6	5.6	5.8	5.7	5.4

Table 6. Overlaying Water pH Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	7.28	7.18	7.29	7.23	7.31	7.08
1/5/2007	1	7.30	7.04	7.20	7.13	7.27	7.03
1/8/2007	4	7.48	7.40	7.29	7.19	7.18	7.21
1/10/2007	6	6.84	6.72	7.07	6.89	7.23	6.90
1/12/2007	8	6.85	6.65	7.24	7.02	7.19	6.98
1/15/2007	15	6.93	6.71	6.91	7.01	7.23	6.95
1/17/2007	13	6.89	6.65	6.80	6.80	6.95	6.79
1/19/2007	15	7.03	6.90	6.98	7.12	7.12	7.09
1/22/2007	18	7.05	6.92	7.05	7.10	7.20	7.10
1/24/2007	20	6.82	6.72	6.83	7.06	7.07	7.00
1/26/2007	22	6.72	6.60	6.74	6.75	6.89	6.82
1/29/2007	25	6.97	6.95	7.09	7.14	7.25	7.23
1/31/2007	27	6.84	6.70	7.06	6.96	7.15	7.06
2/1/2007	28	6.67	6.51	6.85	6.85	7.00	6.92
	Maximum	7.48	7.40	7.29	7.23	7.31	7.23
	Minimum	6.67	6.51	6.74	6.75	6.89	6.79
	Mean	6.98	6.83	7.03	7.02	7.15	7.01

Table 7. Overlaying Water pH Values for *C. tentans* Sediment Test

Date	Test Day	West Station	Poker Creek	C3	C11	G11	K1
1/4/2007	0	7.36	7.10	7.12	7.15	7.23	7.10
1/5/2007	1	7.42	7.02	7.06	7.06	7.16	7.04
1/8/2007	4	7.18	7.20	7.04	7.02	7.13	7.06
1/10/2007	6	6.80	6.74	6.90	6.84	7.12	6.91
1/12/2007	8	6.78	6.80	6.93	6.89	7.15	6.92
1/15/2007	11	6.71	6.89	6.94	6.81	7.13	6.95
1/17/2007	13	6.61	6.68	6.78	6.82	7.02	7.04
1/19/2007	15	6.83	6.84	6.94	6.99	7.11	7.03
1/22/2007	18	6.91	6.96	7.10	7.12	7.20	7.10
1/24/2007	20	6.96	6.85	7.09	7.11	7.18	7.10
	Maximum	7.42	7.20	7.12	7.15	7.23	7.10
	Minimum	6.61	6.68	6.78	6.81	7.02	6.91
	Mean	6.96	6.91	6.99	6.98	7.14	7.03

Table 8. Overlaying Water Conductivity Values for C. *tentans* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	130	240	302	204	424	199
1/10/2007	6	140	167	187	162	230	180
1/17/2007	13	160	153	182	189	231	216
1/24/2007	20	128	155	161	153	130	173
	Maximum	160	240	302	204	424	216
	Minimum	128	153	161	153	130	173
	Mean	140	179	208	177	254	192

Table 9. Overlaying Water Conductivity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	135	217	254	272	383	200
1/10/2007	6	135	182	219	247	332	240
1/17/2007	13	130	155	212	282	289	203
1/24/2007	20	156	140	201	250	316	214
2/1/2007	28	143	135	193	200	210	187
	Maximum	156	217	254	282	383	240
	Minimum	130	135	193	200	210	187
	Mean	140	166	216	250	306	209

Table 10. Overlaying Water Alkalinity Values for C. *tentans* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	66.0	112.0	114.2	96.0	86.0	93.6
1/24/2007	20	37.0	58.0	40.0	57.0	61.0	63.6
	Maximum	66.0	112.0	114.2	96.0	86.0	93.6
	Minimum	37.0	58.0	40.0	57.0	61.0	63.6
	Mean	51.5	85.0	77.1	76.5	73.5	78.6

Table 11. Overlaying Water Alkalinity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	66.0	112.0	114.2	96.0	86.0	93.6
2/1/2007	28	36.0	45.0	74.4	80.0	84.2	64.0
	Maximum	66.0	112.0	114.2	96.0	86.0	93.6
	Minimum	36.0	45.0	74.4	80.0	84.2	64.0
	Mean	51.0	78.5	94.3	88.0	85.1	78.8

Table 12. Overlaying Water Hardness Values for C. *tentans* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	50.0	100.0	96.0	79.8	88.0	84.0
1/24/2007	20	42.0	53.0	59.8	50.0	55.0	59.8
	Maximum	50.0	100.0	96.0	79.8	88.0	84.0
	Minimum	42.0	53.0	59.8	50.0	55.0	59.8
	Mean	46.0	76.5	77.9	64.9	71.5	71.9

Table 13. Overlaying Water Hardness Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	50.0	100.0	96.0	79.8	88.0	84.0
2/1/2007	28	74.2	50.0	75.0	73.8	81.8	72.0
	Maximum	74.2	100.0	96.0	79.8	88.0	84.0
	Minimum	50.0	50.0	75.0	73.8	81.8	72.0
	Mean	62.1	75.0	85.5	76.8	84.9	78.0

Table 14. Overlaying Water Ammonia Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	1.14	2.64	6.76	9.88	2.73	2.49
		1.41	2.32	7.29	9.12	2.12	2.55
		1.40	3.14	7.09	12.20	3.10	2.27
		1.20	3.17	8.49	9.30	3.29	2.62
		1.31	2.75	8.06	8.16	2.28	2.56
1/10/2007	6	0.450	1.19	7.29	5.83	2.40	3.24
		0.725	0.976	4.04	6.08	2.36	2.03
		0.449	0.688	6.21	5.67	2.33	3.66
		0.642	0.809	4.65	4.44	1.95	1.47
		0.500	1.43	4.44	7.82	2.15	3.26
1/17/2007	13	1.48	0.515	2.52	4.77	0.15	2.60
		2.02	0.546	1.80	6.34	0.30	4.10
		1.91	0.745	1.55	6.80	0.41	1.13
		0.22	0.682	1.47	5.89	0.57	0.931
		0.27	0.727	1.30	7.83	1.19	2.28
2/12007	28	0.129	0.174	1.13	2.96	0.14	1.47
	Maximum	2.02	3.17	8.49	12.20	3.29	4.10
	Minimum	0.13	0.17	1.13	2.96	0.14	0.93
	Mean	0.95	1.41	4.63	7.07	1.72	2.42

Table 15. Overlaying Water Ammonia Values for *C. tentans* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1
1/4/2007	0	0.745	2.38	8.29	3.58	2.44	1.69
		0.658	2.47	9.72	3.99	2.55	1.57
		0.460	2.88	8.12	4.50	2.78	2.20
		0.581	2.23	10.90	3.71	2.49	1.76
		0.569	2.59	8.35	4.55	2.30	2.26
1/10/2007	6	0.453	0.445	2.44	2.85	1.26	2.01
		0.459	0.437	3.80	2.10	1.22	2.55
		0.353	0.457	2.67	4.10	1.20	2.55
		0.345	0.498	2.49	4.18	1.20	2.62
		0.358	0.590	2.21	4.04	1.50	2.80
1/17/2007	13	0.730	0.754	1.01	1.72	0.714	1.97
		1.68	0.649	1.10	1.04	0.625	1.78
		1.66	1.220	1.23	1.51	0.537	1.98
		1.02	1.010	0.921	1.11	0.727	2.020
		1.21	0.976	0.727	1.54	0.803	2.20
	Maximum	1.68	2.88	10.90	4.55	2.78	2.80
	Minimum	0.35	0.44	0.73	1.04	0.54	1.57
	Mean	0.75	1.31	4.27	2.97	1.49	2.13

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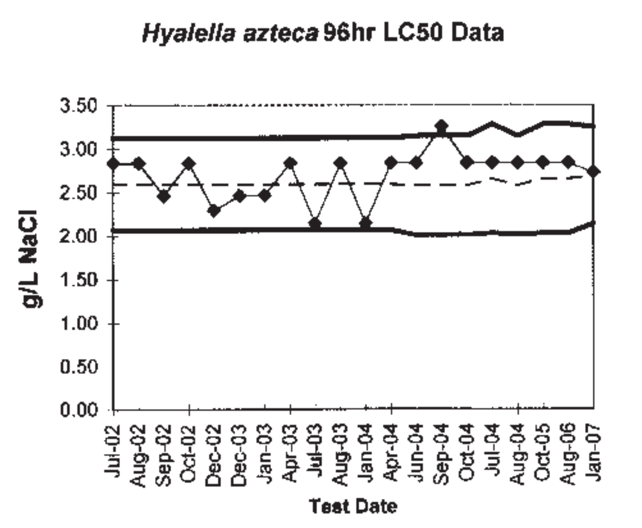
Date	LC50	+2SD	-2SD	MEAN
Jul-02	2.83	3.13	2.07	2.60
Aug-02	2.83	3.13	2.07	2.60
Sep-02	2.46	3.13	2.07	2.60
Oct-02	2.83	3.13	2.07	2.60
Dec-02	2.29	3.13	2.07	2.60
Dec-03	2.46	3.13	2.07	2.60
Jan-03	2.46	3.13	2.07	2.60
Apr-03	2.83	3.13	2.07	2.60
Jul-03	2.14	3.13	2.07	2.60
Aug-03	2.83	3.13	2.07	2.60
Jan-04	2.14	3.13	2.07	2.60
Apr-04	2.83	3.13	2.07	2.60
Jun-04	2.83	3.15	2.01	2.58
Sep-04	3.25	3.15	2.01	2.58
Oct-04	2.83	3.15	2.01	2.58
Jul-04	2.83	3.28	2.03	2.66
Aug-04	2.83	3.15	2.01	2.58
Oct-05	2.83	3.28	2.03	2.66
Aug-06	2.83	3.28	2.03	2.66
Jan-07	2.72	3.25	2.14	2.69

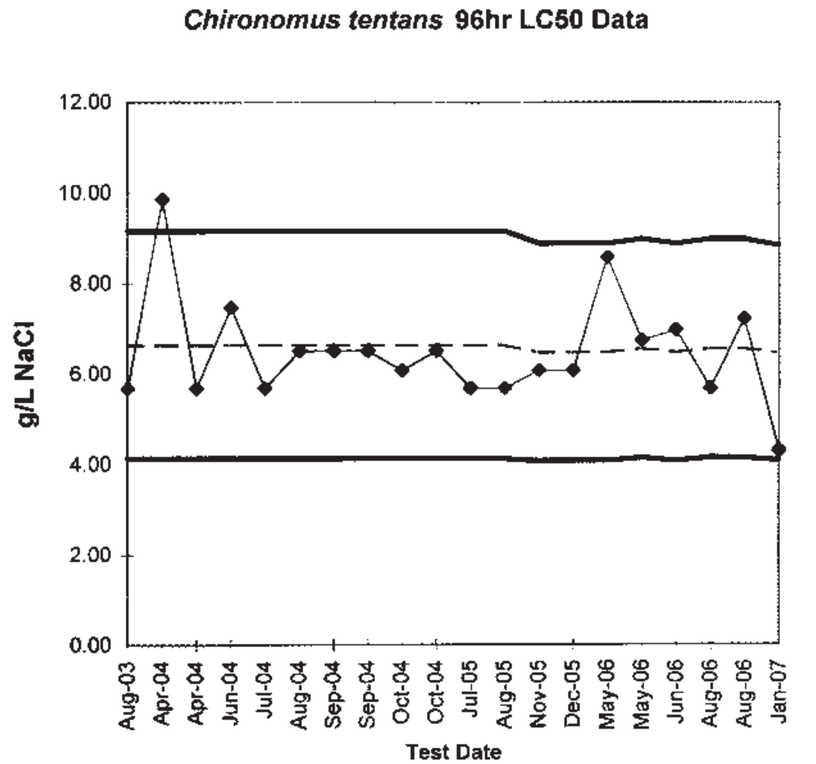
sd 0.28
cv 10%

sd 0.28
cv 10%



ASci Corporation Environmental Testing Laboratory
Precision of Chironomus tentans NaCl Reference Toxicant Testing

Date	LC50	+2SD	-2SD	MEAN
Aug-03	5.66	9.15	4.12	6.64
Apr-04	9.85	9.15	4.12	6.64
Apr-04	5.66	9.15	4.12	6.64
Jun-04	7.46	9.15	4.12	6.64
Jul-04	5.66	9.15	4.12	6.64
Aug-04	6.50	9.15	4.12	6.64
Sep-04	6.50	9.15	4.12	6.64
Sep-04	6.50	9.15	4.12	6.64
Oct-04	6.06	9.15	4.12	6.64
Oct-04	6.50	9.15	4.12	6.64
Jul-05	5.66	9.15	4.12	6.64
Aug-05	5.66	9.15	4.12	6.64
Nov-05	6.06	8.87	4.07	6.47
Dec-05	6.06	8.87	4.07	6.47
May-06	8.57	8.87	4.07	6.47
May-06	6.73	8.98	4.14	6.56
Jun-06	6.96	8.87	4.07	6.47
Aug-06	5.66	8.98	4.14	6.56
Aug-06	7.21	8.98	4.14	6.56
Jan-07	4.29	8.84	4.08	6.46
sd	1.19			
cv	18%			



APPENDIX A

Chain of Custody Form

EPA

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case L
Client No:
SDG No:

Date Shipped:	12/20/2006
Carrier Name:	FedEx
Airbill:	859930212490
Shipped to:	ASCI-ETL 4444 AIRPARK BLVD DULUTH MI 55811 (218) 722-4040

Chain of Custody Record

Sampler Signature:

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	Karen Campbell	12/20/06 1700	Kathe Brown	12/21/06 0910
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	FOR LAB USE ONLY Sample Condition On Receipt
C11 0-1	Sediment/ Nadia Silvestri	L/G	Hyalella a (21)	203 (1)	C11 0-1	S: 12/20/2006 15:28	
C3 0-1	Sediment/ Nadia Silvestri	L/G	Hyalella a (21)	204 (1)	C3 0-1	S: 12/20/2006 14:55	

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s): [signature]	Cooler Temperature Upon Receipt: 5.8	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? Y Shipment Iced? Y

Hyalella a = Hyalella azteca, Chironomus

TR Number: 5-071926195-122006-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

F2V5.1.043 Page 1 of 1

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case:
Client No:

R

Region:	5
Project Code:	
Account Code:	
CERCLIS ID:	
Spill ID:	
Site Name/State:	Riverview Trenton Channel/MI
Project Leader:	Karen Campbell
Action:	
Sampling Co:	STN

Date Shipped:	12/19/2006
Carrier Name:	FedEx
Airbill:	851995341429
Shipped to:	ASCI-ETL 4444 AIRPARK BLVD DULUTH MI 55811 (218) 722-4040

Chain of Custody Record — **Sampler Signature:**

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[illegible]		12/20/06 0900
2			
3			
4			

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
G11 0-1	Sediment/ Karen Campbell	L/G	Hyalella a (21)	108 (1)	G11 0-1	S: 12/19/2006 15:12	--
K1 0-1	Sediment/ Karen Campbell	L/G	Hyalella a (21)	107 (1)	K1 0-1	S: 12/19/2006 9:19	–

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? Y

Hyalella a = Hyalella azteca, Chironomus

TR Number: 5-071926195-121906-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

REGION CO

F2V5.1.043 Page 1 of 1

APPENDIX B

Hyalella azteca Results and Statistical Analysis

Hyalella Growth and Survival Test-28 Day Survival

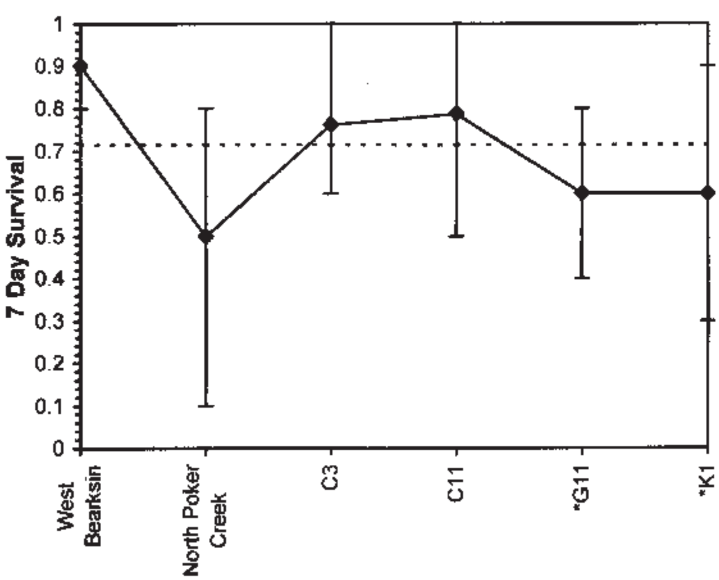
Start Date:	1/4/2007	Test ID:	TN&A	Sample ID:	FIRST SET
End Date:	2/1/2007	Lab ID:	5010	Sample Type:	SEDIMENTS
Sample Date:		Protocol:	EPA 2000	Test Species:	H. azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
West Bearksin	1.0000	0.9000	0.8000	0.9000	0.9000	0.8000	0.9000	1.0000
h Poker Creek	0.8000	0.4000	0.1000	0.8000	0.6000	0.5000	0.5000	0.3000
C3	1.0000	0.7000	0.8000	0.6000	0.9000	0.6000	0.7000	0.8000
C11	0.6000	0.6000	1.0000	1.0000	0.6000	1.0000	1.0000	0.5000
G11	0.7000	0.8000	0.5000	0.4000	0.5000	0.5000	0.8000	0.6000
K1	0.9000	0.6000	0.7000	0.4000	0.3000	0.6000	0.7000	

			Transform: Arcsin Square Root						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
West Bearksin	0.9000	1.8000	1.2543	1.1071	1.4120	9.198	8	*		
h Poker Creek	0.5000	1.0000	0.7822	0.3218	1.1071	33.637	8			
C3	0.7625	1.5250	1.0787	0.8861	1.4120	16.850	8	1.726	2.345	0.2385
C11	0.7875	1.5750	1.1365	0.7854	1.4120	26.082	8	1.159	2.345	0.2385
*G11	0.6000	1.2000	0.8916	0.6847	1.1071	17.961	8	3.567	2.345	0.2385
*K1	0.6000	1.2000	0.8954	0.5796	1.2490	24.454	7	3.409	2.345	0.2469

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9561		0.917		0.13592	-0.944
Bartlett's Test indicates equal variances (p = 0.18)	6.33097		13.2767			
The control means are significantly different (p = 3.76E-04)	4.64862		2.14479			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates significant differences	0.18831	0.20851	0.19185	0.04137	0.00427	4, 34
Treatments vs West Bearksin						

Dose-Response Plot



Hyalella azteca Growth

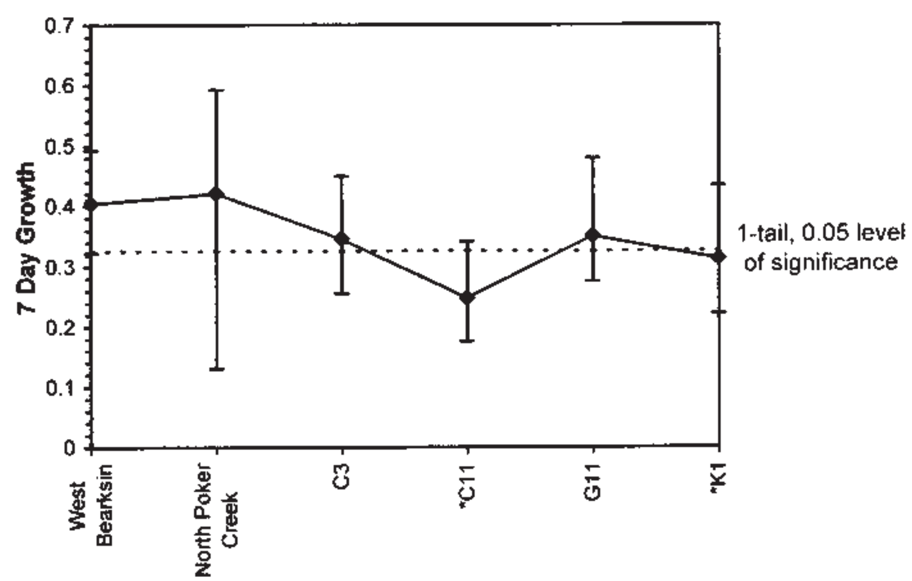
Start Date:	1/4/2007	Test ID:	TN&A	Sample ID:	FIRST SET
End Date:	2/1/2007	Lab ID:	5010	Sample Type:	SEDIMENTS
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:					

Conc-	1	2	3	4	5	6	7	8
West Bearksin	0.3740	0.3878	0.4075	0.4933	0.3233	0.4137	0.3811	0.4590
h Poker Creek	0.3825	0.5925	0.1300	0.1475	0.5867	0.5200	0.5380	0.4700
C3	0.2560	0.3071	0.3525	0.4500	0.3056	0.4083	0.3843	0.3050
C11	0.2583	0.1767	0.1780	0.1970	0.3417	0.3320	0.1950	0.3080
G11	0.2957	0.3350	0.3760	0.2750	0.3420	0.3360	0.4800	0.3650
K1	0.2644	0.2217	0.2486	0.3625	0.3100	0.4333	0.3486	

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
West Bearksin	0.4050	0.9622	0.4050	0.3233	0.4933	12.966	8	*		
h Poker Creek	0.4209	1.0000	0.4209	0.1300	0.5925	44.332	8			
C3	0.3461	0.8223	0.3461	0.2560	0.4500	18.641	8	1.814	2.345	0.0761
*C11	0.2483	0.5900	0.2483	0.1767	0.3417	28.447	8	4.826	2.345	0.0761
G11	0.3506	0.8330	0.3506	0.2750	0.4800	17.667	8	1.676	2.345	0.0761
*K1	0.3127	0.7430	0.3127	0.2217	0.4333	23.734	7	2.746	2.345	0.0788

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94792		0.917		0.44694	-0.7389
Bartlett's Test indicates equal variances (p = 0.93)	0.87066		13.2767			
The control means are not significantly different (p = 0.82)	0.2323		2.14479			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates significant differences	0.07879	0.19455	0.02638	0.00421	6.9E-04	4, 34
Treatments vs West Bearksin						

Dose-Response Plot



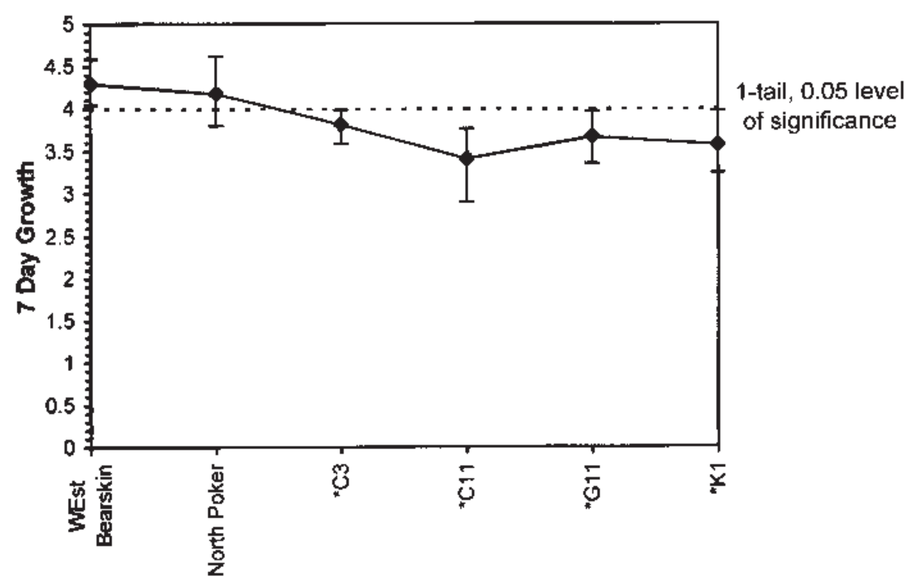
Hyalella azteca 28-day length					
Start Date:	1/4/2007	Test ID:	TN&A	Sample ID:	5010-246
End Date:	2/1/2007	Lab ID:	5010-246	Sample Type:	Sediments
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	H. azteca
Comments:					

Conc-%	1	2	3	4	5	6	7	8
WEst Bearskin	4.0800	4.0444	4.0625	4.5889	4.3556	4.5857	4.3222	4.3700
North Poker	3.8750	4.6250	3.8000	4.3750	4.3667	4.0400	4.0800	4.2667
C3	3.5900	3.9857	3.9000	3.9333	3.7556	3.6667	3.9429	3.7375
C11	3.6167	3.2333	2.8900	3.4300	3.6500	3.5400	3.1300	3.7600
G11	3.7286	3.6250	3.9600	3.6250	3.4400	3.7400	3.8625	3.3500
K1	3.2400	3.2833	3.5429	3.4250	3.9667	3.9333	3.5857	

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WEst Bearskin	4.3012	1.0000	4.3012	4.0444	4.5889	5.152	8			
North Poker	4.1785	0.9715	4.1785	3.8000	4.6250	6.680	8	1.003	2.421	0.2958
*C3	3.8140	0.8867	3.8140	3.5900	3.9857	3.824	8	3.987	2.421	0.2958
*C11	3.4063	0.7919	3.4063	2.8900	3.7600	8.737	8	7.323	2.421	0.2958
*G11	3.6664	0.8524	3.6664	3.3500	3.9600	5.539	8	5.194	2.421	0.2958
*K1	3.5681	0.8296	3.5681	3.2400	3.9667	8.110	7	5.795	2.421	0.3062

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97576		0.928		-0.063	-0.7393
Bartlett's Test indicates equal variances (p = 0.51)	4.30432		15.0863			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates significant differences Treatments vs WEst Bearskin	0.30621	0.07119	0.97607	0.05973	7.5E-09	5, 41

Dose-Response Plot



Hyalella azteca 28-day Growth Data

Site ID # NPC — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	4.0	4.5	3.8	4.3	4.6	3.7	4.4	4.9
2	3.9	4.5		4.5	4.1	3.8	3.9	4.3
3	3.9	4.5		4.8	5.1	3.9	3.2	3.6
4	3.4	5.0		4.4	5.2	4.6	4.4	
5	4.0			3.8	3.5	4.2	4.5	
6	3.8			4.5	3.7			
7	4.1			4.3				
8	3.9			4.4				
9								
10								
Means	3.9	4.6	3.8	4.4	4.4	4.0	4.1	4.3
Average of Means	4.2							

Site ID # C3 — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	2.7	3.7	4.4	3.9	3.9	4.4	3.6	3.1
2	4.2	4.4	4.2	3.5	3.5	3.7	4.0	3.3
3	3.7	3.9	4.6	4.6	3.9	2.4	4.6	3.9
4	3.4	4.3	4.2	4.1	3.7	3.0	4.3	4.9
5	3.6	2.9	3.0	4.0	5.1	4.5	3.9	4.1
6	3.8	4.3	3.8	3.5	2.6	4.0	3.8	4.1
7	4.3	4.4	3.9		3.9		3.4	3.2
8	3.6		3.1		3.4			3.3
9	4.0				3.8			
10	2.6							
Means	3.6	4.0	3.9	3.9	3.8	3.7	3.9	3.7
Average of Means	3.8							

Site ID # West Bearskin — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	4.4	3.4	4.1	5.3	5.5	4.5	5.5	3.5
2	3.5	4.5	3.3	5.2	4.4	4.4	4.8	4.5
3	4.2	3.6	5.0	4.7	3.0	4.3	4.4	3.4
4	4.0	4.1	4.1	4.3	3.9	5.5	3.9	4.6
5	4.1	4.6	4.2	4.6	5.0	4.9	3.9	3.6
6	3.6	4.1	4.3	4.6	4.4	4.6	4.6	4.4
7	4.3	2.6	3.6	4.2	4.3	3.9	4.9	4.5
8	4.2	4.5	3.9	4.4	4.3		3.7	4.5
9	4.4	5.0		4.0	4.4		3.2	5.5
10	4.1							5.2
Means	4.1	4.0	4.1	4.6	4.4	4.6	4.3	4.4
Average of Means	4.3							

Site ID # C11 — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	3.8	3.4	2.8	4.0	2.8	3.6	3.9	4.4
2	4.1	3.0	2.5	3.5	2.3	3.6	3.4	3.8
3	3.4	3.0	3.6	3.6	4.3	3.5	3.2	3.4
4	3.1	3.6	3.4	2.3	4.2	3.7	3.3	3.4
5	4.3	3.0	3.8	2.9	4.6	4.3	3.3	3.8
6	3.0	3.4	2.9	3.8	3.7	3.3	3.3	
7			3.5	3.4		4.3	2.4	
8			1.9	2.4		3.9	3.3	
9			2.5	2.5		2.9	2.7	
10			2.0	2.9		2.3	2.5	
Means	3.6	3.2	2.9	3.1	3.7	3.5	3.1	3.8
Average of Means	3.4							

Site ID # K1 — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	3.4	3.4	3.8	3.3	3.2		4.0	3.3
2	3.3	3.9	3.2	3.8	3.5		4.0	3.4
3	3.0	3.9	3.0	4.1	5.2		4.3	3.7
4	2.0	2.7	3.7	2.5			3.7	2.9
5	2.9	2.8	3.8				4.1	3.9
6	3.4	3.0	3.6				3.5	3.9
7	3.5		3.7					4.0
8	4.0							
9	3.5							
10	3.4							
Means	3.2	3.3	3.5	3.4	4.0		3.9	3.6
Average of Means	3.6							

Site ID # G11 — Length (mm)

Organism#	Rep.A	Rep. B	Rep. C	Rep D.	Rep. E	Rep. F	Rep. G	Rep. H
1	3.8	3.4	4.8	4.0	4.0	4.0	3.5	4.1
2	3.2	4.1	4.0	3.6	3.0	4.1	3.7	4.0
3	4.6	2.7	3.3	3.9	3.4	3.0	4.4	2.9
4	3.5	4.2	3.3	3.0	3.4	3.6	4.3	3.1
5	3.6	3.4	4.4		3.4	4.0	4.0	2.7
6	3.6	3.4					4.1	3.3
7	3.8	3.8					4.4	
8		4.0					2.5	
9								
10								
Means	3.7	3.6	4.0	3.6	3.4	3.7	3.9	3.4
Average of Means	3.7							

APPENDIX C

Chironomus tentans Results and Statistical Analysis

C. tentans 20-day Survival

Start Date:	1/4/2007	Test ID:	TN&Actafdw	Sample ID:	FIRST SET
End Date:	1/24/2007	Lab ID:	5010	Sample Type:	SEDIMENTS
Sample Date:		Protocol:	EPA 2000	Test Species:	C. tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
West Bearksin	0.7500	0.9167	0.5833	0.9167	0.5833	1.0000	0.6667	
h Poker Creek	0.0000	0.4167	0.5833	0.1667	0.0000	0.5000	0.0833	0.0833
C3	0.5000	0.4167	0.3333	0.0833	0.0000	0.3333	0.2500	0.5000
C11	0.0000	0.0833	0.0000	0.2500	0.0000	0.1667	0.1667	0.4167
G11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K1	0.5833	0.7500	0.3333	0.4167	0.3333	0.5000	0.5000	

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
West Bearksin	0.7738	3.3766	1.1032	0.8691	1.4260	20.263	7	*	
h Poker Creek	0.2292	1.0000	0.4565	0.1448	0.8691	63.469	8		
*C3	0.3021	1.3182	0.5581	0.1448	0.7854	41.354	8	36.00	45.00
*C11	0.1354	0.5909	0.3492	0.1448	0.7017	58.615	8	36.00	45.00
G11	0.0000	0.0000	0.1448	0.1448	0.1448	0.000	8		
*K1	0.4881	2.1299	0.7742	0.6155	1.0472	19.689	7	32.50	35.00

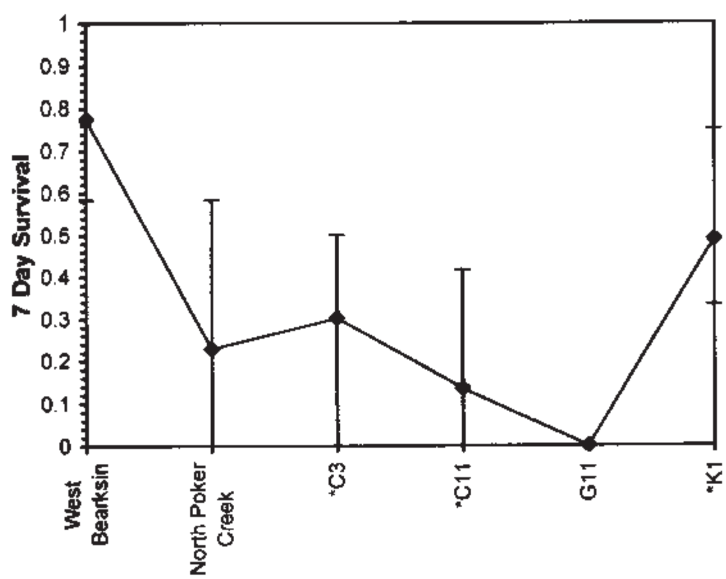
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97162	0.9	-0.0517	-0.7772
Equality of variance cannot be confirmed				
The control means are significantly different (p = 3.58E-04)	4.78246	2.16037		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates significant differences

Treatments vs West Bearksin

Dose-Response Plot



C. tenatns Dried Weights

Start Date:	1/4/2007	Test ID:	TN&Actafdw	Sample ID:	TN&A
End Date:	1/24/2007	Lab ID:	5010	Sample Type:	SEDIMENTS
Sample Date:		Protocol:	EPA 2000	Test Species:	C. tentans
Comments:					

Conc-	1	2	3	4	5	6	7
West Bearksin	1.5422	1.4782	1.1000	1.1745	1.5257	1.0808	1.6050
h Poker Creek	2.1500	1.8700	1.3650	1.5150	3.3100	2.0800	
C3	1.4300	0.8920	0.7650	1.4500	0.8675	2.3267	0.7667
C11	2.0800	0.7167	0.1200	0.6450	0.4480		
K1	1.2343	1.1067	1.2550	0.8640	0.7725	1.5650	0.8800

			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
West Bearksin	1.3581	0.6630	1.3581	1.0808	1.6050	16.860	7	*	
h Poker Creek	2.0483	1.0000	2.0483	1.3650	3.3100	33.727	6		
C3	1.2140	0.5927	1.2140	0.7650	2.3267	47.151	7	41.00	35.00
C11	0.8019	0.3915	0.8019	0.1200	2.0800	93.641	5	22.00	19.00
K1	1.0968	0.5354	1.0968	0.7725	1.5650	25.508	7	42.00	35.00

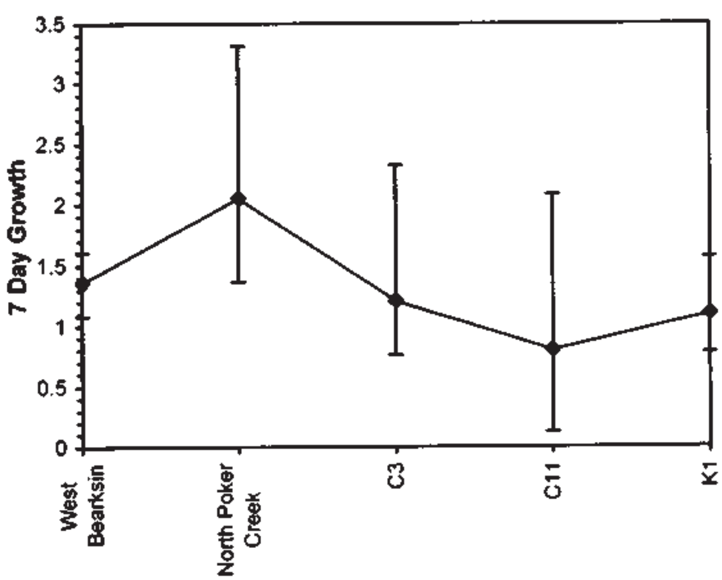
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.87275	0.891	1.40404	2.47472
Bartlett's Test indicates equal variances (p = 0.03)	8.70996	11.3449		
The control means are significantly different (p = 0.03)	2.50386	2.20099		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates no significant differences

Treatments vs West Bearksin

Dose-Response Plot



C. tentans 20-day AFDW					
Start Date:	1/4/2007	Test ID:	5010-246	Sample ID:	TN&A
End Date:	1/24/2007	Lab ID:	5010	Sample Type:	SEDIMENTS
Sample Date:		Protocol:	EPA 2000	Test Species:	C. tentans
Comments:					

Conc-	1	2	3	4	5	6	7
West Bearksin	1.2733	1.2336	0.9600	0.9836	1.2586	0.8975	1.3700
h Poker Creek	1.9580	1.6214	1.2500	1.3350	2.8900	1.8000	
C3	1.1867	0.7260	0.6225	1.1500	0.7350	1.9500	0.6183
C11	1.6300	0.5933	0.0450	0.4500	0.3740		
K1	0.9843	0.8522	1.0350	0.7200	0.5775	1.2300	0.7117

			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
West Bearksin	1.1395	0.6299	1.1395	0.8975	1.3700	16.385	7	*	
h Poker Creek	1.8091	1.0000	1.8091	1.2500	2.8900	32.825	6		
C3	0.9984	0.5519	0.9984	0.6183	1.9500	48.268	7	41.00	35.00
C11	0.6185	0.3419	0.6185	0.0450	1.6300	97.042	5	22.00	19.00
K1	0.8730	0.4825	0.8730	0.5775	1.2300	25.754	7	37.00	35.00

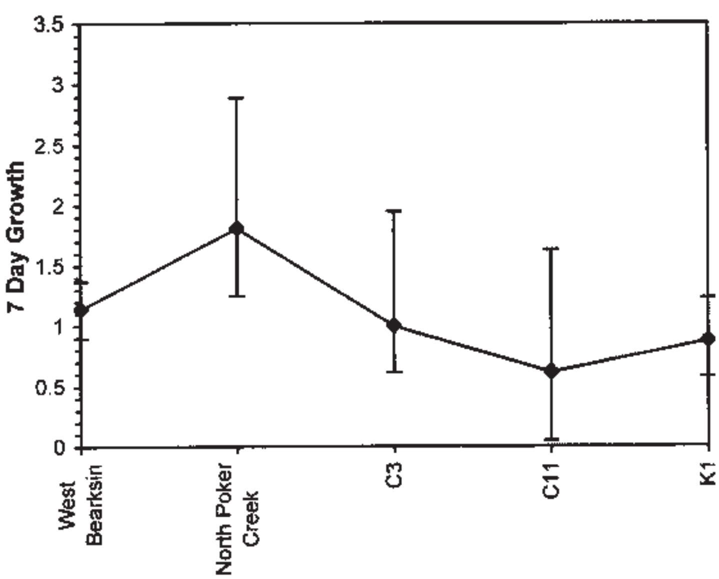
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.87252	0.891	1.38338	2.47099
Bartlett's Test indicates equal variances (p = 0.03)	8.77724	11.3449		
The control means are significantly different (p = 0.02)	2.8421	2.20099		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates no significant differences

Treatments vs West Bearksin

Dose-Response Plot



APPENDIX D

Raw Data

ASci Corporation

TEST__TN&A Associates Sediment Toxicity Test__

DATE__1/4/07__

STUDY DIRECTOR__Clayton Allen__

TECHNICIAN(S)_Brown, Wormer, Ehlers, Nordmeyer_

BIOLOGICAL TESTING INFORMATION FORM

TEST INFORMATION

Date: **1/4/07**
Sediment(s): G11 0-1, K1 0-1, C11 0-1, C3 0-1
Template #: Standard Randomization
Test Type: **28-day Hyaella (survival and Growth) and 20-day C. tentans**
Test Dates: **January 4-February 2, 2007**
Renewal Frequency: **Two renewals of overlaying water/day**
Dilution Water: **Post-carbon treated tap water**
Test Site: **Bio VII**
Temperature: **23°C ± 1°C**

TEST ORGANISM INFORMATION

Organism	*Hyalella azteca*	*C. tentans*
Age	**7-8 days old**	**< 24hours**
Food	**1.0 ml YCT/day**	**1.5 ml Tetrafin Slurry/day**
Culture Medium	**ECT Culture Water**	**ECT Culture Water**
Test Chamber	**300 mL glass Berzelius Beakers**	**300 mL glass Berzelius Beakers**
Source	**Environmental Consulting and Testing**	**Environmental Consulting and Testing**

HYALELLA AZTECA DAILY OBSERVATION AND FEEDING FORM

Test Day	Flow Rate	Exposure Fed (Y/N)	Observations/Activities
-1	346	Y	
0	340	Y	
1	348	Y	Test conditions appear normal - KB
2	340	Y	
3	342	Y	
4	346	Y	
5	342	Y	
6	342	Y	
7	346	Y	
8	342	Y	
9	342	Y	
10	342	Y	
11	350	Y	Film present on many replicates for all sites except West Bearskin. CT + HA present and visible in WBS, NPC
12	346	Y	
13	346	Y	
14	350	Y	
15	350	Y	All screens cleaned - KB
16	346	Y	
17	346	Y	
18	342	Y	
19	350	Y	
20	342	Y	C. tentans test terminated
21	342	Y	
22	340	Y	
23	342	Y	
24	342	Y	
25	348	Y	
26	342	Y	
27	350	Y	
28	350	N	Hyalella Test taken down.
29			

C. tentans DAILY OBSERVATION AND FEEDING FORM

Test Day	Flow Rate	Exposure Fed (Y/N)	Observations/Activities
-1	346	Y	loaded 100 ml homogenized sed/replicate
0	340	Y	loaded 12 C. tentans, <24 hrs old, to each replicate
1	348	Y	Test conditions appear normal
2	340	Y	
3	342	Y	
4	346	Y	look normal; growth visible on [illegible]
5	342	Y	
6	342	Y	
7	346	Y	
8	342	Y	
9	342	Y	
10	342	Y	
11	350	Y	Film present on most reps except WAS
12	346	Y	
13	342	Y	
14	350	Y	
15	350	Y	All screens cleaned - RS
16	346	Y	
17	346	Y	
18	342	Y	
19	350	Y	
20	342	N	Test taken down. C. tentans placed in oven @ 60°C for 20 hours, then ashed @ 550°C for 2 hrs
21			

Overlaying Water Temperature Values for TN&A Associates *Hyalella* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3 0-1	C-11 0-1	G11 0-1	K1 0-1
1/4/2007	0	22.7	22.8	22.7	22.8	22.9	22.8
1/5/2007	1	22.5	22.7	22.6	22.8	22.6	22.7
1/6/2007	2	22.6	22.5	22.5	22.8	22.7	22.7
1/7/2007	3	22.6	22.4	22.5	22.7	22.5	22.6
1/8/2007	4	22.8	22.7	22.8	22.7	22.8	22.7
1/9/2007	5	22.6	22.7	22.7	22.6	22.5	22.4
1/10/2007	6	22.5	22.4	22.5	22.5	22.5	22.5
1/11/2007	7	22.4	22.5	22.5	22.6	22.7	22.5
1/12/2007	8	22.4	22.4	22.3	22.2	22.4	22.6
1/13/2007	9	22.8	22.6	22.3	22.4	22.4	22.5
1/14/2007	10	22.5	22.5	22.6	22.7	22.6	22.5
1/15/2007	11	22.6	22.5	22.6	22.8	22.7	22.6
1/16/2007	12	22.3	22.2	22.1	22.3	22.1	22.3
1/17/2007	13	22.4	22.3	22.4	22.3	22.3	22.3
1/18/2007	14	22.2	22.2	22.3	22.3	22.3	22.4
1/19/2007	15	22.5	22.6	22.3	22.4	22.4	22.5
1/20/2007	16	22.2	22.1	22.1	22.2	22.3	22.3
1/21/2007	17	22.3	22.1	22.2	22.3	22.6	22.5
1/22/2007	18	22.4	22.3	22.3	22.4	22.4	22.4
1/23/2007	19	22.5	22.4	22.4	22.3	22.6	22.5
1/24/2007	20	22.3	22.3	22.3	22.5	22.5	22.6
1/25/2007	21	22.5	22.3	22.3	22.5	22.6	22.6
1/26/2007	22	22.5	22.6	22.5	22.6	22.5	22.7
1/27/2007	23	22.3	22.1	22.1	22.2	22.4	22.4
1/28/2007	24	22.4	22.1	22.0	22.4	22.6	22.5
1/29/2007	25	22.3	22.5	22.4	22.5	22.5	22.4
1/30/2007	26	22.8	22.5	22.6	22.5	22.6	22.6
1/31/2007	27	22.4	22.3	22.4	22.4	22.4	22.3
2/1/2007	28	22.4	22.3	22.3	22.5	22.5	22.4

Overlaying Water Temperature Values for TN&A Associates *Chironomus* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3 0-1	C-11 0-1	G11 0-1	K1 0-1
1/4/2007	0	22.6	22.7	22.6	22.7	22.0	22.6
1/5/2007	1	22.5	22.6	22.6	22.7	22.8	22.6
1/6/2007	2	22.5	22.6	22.7	22.7	22.7	22.8
1/7/2007	3	22.5	22.6	22.5	22.5	22.7	22.7
1/8/2007	4	22.8	22.7	22.8	22.8	22.7	22.8
1/9/2007	5	22.8	22.7	22.5	22.7	22.6	22.6
1/10/2007	6	22.6	22.5	22.4	22.5	22.4	22.5
1/11/2007	7	22.7	22.6	22.5	22.4	22.4	22.5
1/12/2007	8	22.6	22.6	22.6	22.5	22.4	22.6
1/13/2007	9	22.6	22.7	22.5	22.3	22.4	22.7
1/14/2007	10	22.6	22.7	22.2	22.4	22.5	22.6
1/15/2007	11	22.7	22.7	22.6	22.5	22.6	22.5
1/16/2007	12	22.3	22.2	22.3	22.2	22.3	22.1
1/17/2007	13	22.4	22.3	22.4	22.3	22.3	22.3
1/18/2007	14	22.3	22.4	22.3	22.2	22.3	22.3
1/19/2007	15	22.1	22.4	22.2	22.3	22.5	22.5
1/20/2007	16	22.1	22.1	22.0	22.1	22.4	22.3
1/21/2007	17 de 1/21/07	~~22.4~~ 22.1	22.2	22.0	22.2	22.4	22.4
1/22/2007	18	22.4	22.3	22.3	22.1	22.3	22.4
1/23/2007	19	22.5	22.4	22.4	22.3	22.1	22.3
1/24/2007	20	22.2	22.2	22.2	22.3	22.6	22.6
1/25/2007	21						
1/26/2007	22						
1/27/2007	23						
1/28/2007	24						
1/29/2007	25						
1/30/2007	26						
1/31/2007	27						
2/1/2007	28						

Overlaying Water DO Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	7.8	7.4	7.1	7.2	7.4	7.0	[illegible]
1/5/2007	1	8.16	7.98	8.03	6.36	6.99	7.26	KB
1/8/2007	4	6.2	3.1	3.9	2.9	4.1	5.7	CA
1/10/2007	6	6.4	5.4	5.8	5.1	5.2	5.0	KB
1/12/2007	8	6.6	4.6	5.0	5.1	5.6	5.7	CA
1/15/2007	11	5.5	5.5	4.8	4.5	4.1	4.1	CA
1/17/2006	13	6.4	6.0	5.2	5.1	5.0	5.2	CA
1/19/2007	15	7.4	6.0	5.3	4.2	4.5	5.0	KB
1/22/2007	18	6.6	5.3	4.7	4.4	4.2	5.0	CA
1/24/2007	20	6.0	4.8	4.5	4.5	4.8	4.9	KB
1/26/2007	22	6.3	4.3	4.4	4.8	4.9	4.9	KB
1/29/2007	25	6.5	5.1	5.1	4.8	4.2	5.2	CA
1/31/2007	27	5.7	5.5	5.1	5.3	4.5	5.4	KB
2/1/2007	28	6.6	6.3	5.5	5.2	4.9	5.1	KB

Overlaying Water pH Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	7.28	7.18	7.29	7.23	7.31	7.08	[illegible]
1/5/2007	1	7.30	7.04	7.20	7.13	7.27	7.03	KB
1/8/2007	4	7.48	7.40	7.29	7.19	7.18	7.21	CA
1/10/2007	6	6.84	6.72	7.07	6.89	7.23	6.90	KB
1/12/2007	8	6.85	6.65	7.24	7.02	7.19	6.98	CA
1/15/2007	11	6.93	6.71	6.91	7.01	7.23	6.95	CA
1/17/2006	13	6.89	6.56	6.80	6.80	6.95	6.79	CA
1/19/2007	15	7.03	6.90	6.98	7.12	7.12	7.09	KB
1/22/2007	18	7.05	6.92	7.05	7.10	7.20	7.10	CA
1/24/2007	20	6.82	6.72	6.83	7.06	7.07	7.00	KB
1/26/2007	22	6.72	6.60	6.74	6.75	6.89	6.82	KB
1/29/2007	25	6.97	6.95	7.09	7.14	7.25	7.23	CA
1/31/2007	27	6.84	6.70	7.06	6.96	7.15	7.06	KB
2/1/2007	28	6.67	6.51	6.85	6.85	7.00	6.92	KB

Overlaying Water Conductivity Values for C. tentans Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	130.0	240	302	204	424	199	KB
1/10/2007	6	140	167	187	162	230	180	KB
1/17/2007	13	160	153	182	189	213	216	CS
1/24/2007	20	128	155	161	153	130	173	KB
2/1/2007	28	~~143~~	~~192~~ 135	~~193~~	~~200~~	~~210~~	~~187~~	~~KB~~

Re KB 2/1/07

Re KB 2/1/07

Overlaying Water Alkalinity Values for C. tentans Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	66.0	112.0	114.2	96.0	86.0	93.6	KB
1/24/2007	20	37.0	58.0	40.0	57.0	61.0	63.6	KB

Overlaying Water Hardness Values for C. tentans Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	50.0	100.0	96.0	79.8	88.0	84.0	KB
1/24/2007	20	42.0	53.0	59.8	50.0	55.0	59.8	KB

Overlaying Water Conductivity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	134.5	217	254	272	383	200	KS
1/10/2007	6	135	182	219	247	332	240	KS
1/17/2007	13	130	155	212	282	289	203	[illegible]
1/24/2007	20	156	140	201	250	316	214	KS
2/1/2007	28	143	135	193	200	210	187	KS

Overlaying Water Alkalinity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	66.0	112.0	114.2	96.0	86.0	93.6	KS
2/1/2007	28	36.0	45.0	74.4	80.0	84.2	64.0	KS

Overlaying Water Hardness Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	50.0	100	96.0	79.8	88.0	84.0	KS
2/1/2007	28	74.2	50.0	75.0	73.8	81.8	72.0	KS

Overlaying Water DO Values for C. tentans Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	7.65	7.21	7.4	7.5	7.1	7.0	ku
1/5/2007	1	7.84	7.00	7.51	6.95	6.09	5.62	KBS
1/8/2007	4	6.1	5.0	4.4	4.8	4.7	3.8	ku
1/10/2007	6	6.4	5.7	5.0	5.4	5.3	5.1	KBS
1/12/2007	8	5.3	5.1	5.7	5.0	6.0	4.9	CA
1/15/2007	11	5.8	4.8	4.7	4.7	4.3	4.3	ku
1/17/2006	13	4.6	4.8	5.2	5.4	5.4	5.5	CA
1/19/2007	15	5.2	6.2	6.6	6.9	6.8	6.8	KBS
1/22/2007	18	4.8	4.1	4.0	5.5	5.9	4.6	CA
1/24/2007	20	6.0	6.3	5.6	5.9	5.9	5.4	KBS

Overlaying Water pH Values for C. tentans Sediment Test

Date	Test Day	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	7.36	7.10	7.12	7.15	7.23	7.10	ku
1/5/2007	1	7.42	7.02	7.06	7.06	7.16	7.04	KBS
1/8/2007	4	7.18	7.20	7.04	7.02	7.13	7.06	ku
1/10/2007	6	6.80	6.74	6.90	6.84	7.12	6.91	KBS
1/12/2007	8	6.78	6.80	6.93	6.89	7.15	6.92	CA
1/15/2007	11	6.71	6.89	6.94	6.81	7.13	6.95	ku
1/17/2006	13	6.61	6.68	6.78	6.82	7.02	7.04	CA
1/19/2007	15	6.83	6.84	6.94	6.99	7.11	7.03	KBS
1/22/2007	18	6.91	6.96	7.10	7.12	7.20	7.10	CA
1/24/2007	20	6.96	6.85	7.09	7.11	7.18	7.10	KBS

Overlaying Water Ammonia Values for *H. azteca* Sediment Test

Date	Test Day	Replicate	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0		E- 1.41	C- 2.64	A-6.76	G-9.88	C- 2.73	G- 2.49	[illegible]
		X	C- 1.41	D- 2.32	G-7.29	H-9.12	E-2.12	B-2.55	[illegible]
			F- 1.40	E- 3.14	E-7.09	A- 12.2	B-3.10	C-2.27	[illegible]
			A- 1.20	H- 3.17	C- 8.49	D- 9.30	G-3.29	A- 2.62	[illegible]
			B- 1.31	G- 2.75	F-8.06	F- 8.16	D-2.28	H- 2.56	[illegible]
1/10/2006	6		A-0.450	H- 1.19	C- 7.29	H5.83	E-2.40	A -3.24	[illegible]
		X	F-0.725	E-0.976	A- 4.04	G- 6.08	H- 2.36	C- 2.03	[illegible]
			E- 0.449	F-0.688	D-6.21	C-5.67	F- 2.33	E -3.66	[illegible]
			C-0.642	D-0.809	F-4.65	B- 4.44	G- 1.95	F -1.47	[illegible]
			B-0.500	G-1.43	E-4.44	D-7.82	C- 2.15	B-3.26	[illegible]
1/17/2007	13		C - 1.48	H-0.515	F-2.52	A- 4.77	D-0.152	B- 2.66	ca
		X	B- 2.02	A- 0.546	G- 1.80	F- 6.34	C- 0.304	H - 4.10	ca
			H - 1.91	B- 0.745	E - 1.55	C- 6.80	E - 0.414	C - 1.13	ca
			E - 0.216	E- 0.652	A- 1.47	G- 5.89	F- 0.572	F - 0.931	ca
			G - 0.266	F- 0.727	H - 1.30	H- 7.83	H - 1.19	E - 2.28	ca
2/1/2007	28		0.129	0.174	1.13	2.96	0.144	1.47	[illegible]
		X							

Overlaying Water Ammonia Values for *C. tentans* Sediment Test

Date	Test Day	Replicate	West Bearskin	Poker Creek	C3	C11	G11	K1	Initials
1/4/2007	0	D	0.745	D-2.38	A-8.29	I-3.58	B-2.44	H-1.69	CA
		G	0.658	H-2.47	F-9.72	A-3.99	I-2.55	C-1.57	↓
		E	0.460	G-2.38	D-8.12	B-4.50	G-2.78	D-2.20	
		C	0.581	C-2.23	G-10.9	E-3.71	C-2.49	E-1.76	
		H	0.569	A-2.59	H-8.35	D-4.55	A-2.30	B-2.26	
1/10/2006	6	C	A-0.453	H-0.445	B-2.44	A-2.85	D-1.26	G-2.01	KB
		A	D-0.459	E-0.437	E-3.80	G-2.10	A-1.22	B-2.55	KB
		G	G-0.353	D-0.457	A-2.67	B-4.10	C-1.20	C-2.55	KB
		F	B-0.345	F-0.498	F-2.49	F-4.18	E-1.20	D-2.62	KB
		E	H-0.358	A-0.590	D-2.21	C-4.04	F-1.50	A-2.85	KB
1/17/2007	13	B	E-0.730	E-0.754	B-1.01	B-1.72	G-0.714	D-1.97	CA
		A	A-1.68	A-0.649	E-1.10	A-1.40	E-0.625	A-1.78	CA
		C	D-1.66	D-1.22	G-1.23	E-1.51	A-0.537	B-1.98	CA
			H-1.02	H-1.01	C-0.921	D-1.11	C-0.727	G-2.02	CA
			B-1.21	G-0.976	F-0.727	C-1.54	F-0.803	C-2.20	CA
1/24/2007	20		0.537	1.51	0.696	0.803	0.570	1.18	CA

Chironomus tentans 20-day Survival and Growth Data

Site ID # WBS

Pan #	Rep	# Organisms Alive	Dead	Weighed	Ashed Pan Wt. ~~(g)~~ mg	Pan + Dried Org. Wt. ~~(g)~~ mg	Pan + Ashed Org. Wt. ~~(g)~~ mg
A	A	9	3	9	1272.36	1286.24	1274.78
B	B	11	1	11	1274.76	1291.02	1277.45
C	C	7	5	7	~~1271.70~~ *1271.61	1279.31	1272.59
D	D	11	1	11	1266.57	1279.49	1268.67
E	E	7	5	7	1268.77	1279.45	1270.64
F	F	0*	12*	0*	1267.58	--	--
G	G	12	12	12	1269.77	1282.74	1271.97
H	H	8	8	8	1261.16	1274.00	1263.04

* Ephemeroptera larvae present

*Re KB 1/24/07

Site ID # NPC **

Pan #	Rep	# Organisms Alive	Dead	Weighed	Ashed Pan Wt. ~~(g)~~ mg	Pan + Dried Org. Wt. ~~(g)~~ mg	Pan + Ashed Org. Wt. ~~(g)~~ mg
A	~~0~~ A	0	12	0	1270.97		
B	~~5~~ B	5	7	5	1274.11	1284.86	1275.07
C	~~7~~ C	7	5	7	1265.94	1279.03	1267.68
D	~~2~~ D	2	9	2	1266.00	1268.73	1266.23
E	~~0~~ E	0	12	0	1266.31		
F	~~6~~ F	6	6	6	1265.88	1274.97	1266.96
G	~~1~~ G	1	11	1	1276.01	1279.32	1276.43
H	~~1~~ H	1	11	1	1272.54	1274.62	1272.82

** Large number of indigenous chironomids present (Subfamily Tanypodinae, Tribe pentaneurini) which are predacious (engulfers + piercers)

Chironomus tentans 20-day Survival and Growth Data

Site ID # C3

Pan #	Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Ashed Pan Wt. (~~g~~) mg	Pan + Dried Org. Wt. (~~g~~) mg	Pan + Ashed Org. Wt. (g)
A	6	6	6	6	1277.82	1286.40	1279.28
B	5	5	7	5	1274.48	1278.94	1275.31
C	4	4	8	4	1272.51	1275.57	1273.08
D	1	1	11	1	1263.73	1265.18	1264.03
E	0	0	12	0	1265.35		
F	4	4	8	4	1272.59	1276.06	1273.12
G	3	3	9	3	1269.67	1270.65	1270.80
H	6	6*	6	5	1260.60	1271.20	1267.49

* 1 smallish pupae present

Site ID # C11

Pan #	Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Ashed Pan Wt. (~~g~~) mg	Pan + Dried Org. Wt. (~~g~~) mg	Pan + Ashed Org. Wt. (g)
A	0 A	0	12	0	1270.34		
B	1 B	1	11	1	1268.94	~~1271.06~~ RE dz 11/25/07 1271.02	1269.39
C	0 C	0	12	0	1281.72		
D	3 D	3	9	3	1276.50	1278.65	1276.87
E	0 E	0	12	0	1274.92		
F	2 F	2	10	2	1266.23	1266.47	1266.38
G	2 G	2	10	2	1266.67	1267.96	1267.06
H	5 H	5*	7	4	1262.33	1264.57	1262.70

* pupae present

Site ID # G11

Pan #	Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Ashed Pan Wt. (~~g~~ mg)	Pan + Dried Org. Wt. (g)	Pan + Ashed Org. Wt. (g)
A	A	0	12	6	1272.4		
B	B	0	12	0	1272.0		
C	C	0	12	0	1270.7		
D	D	0	12	0	1282.8		
E	E	0	12	0	1275.9		
F	F	0	12	0	1274.2		
G	G	0	12	0	1275.1		
H	H	0	12	6	1274.8		

Site ID # K1

Pan #	Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Ashed Pan Wt. (~~g~~ mg)	Pan + Dried Org. Wt. (~~g~~ mg)	Pan + Ashed Org. Wt. (~~g~~ mg)
A	A	7**	5	6	1282.51	1291.15	1284.26
B	B	9	3	9	1267.31	1277.27	1269.60
C	C	4	8	4	1265.87	1270.89	1266.75
D	D	5	7	4	1266.61	1270.93 RE [illegible] 1/26/07 ~~1283.83~~	1267.33
E	E	4	8	2	1280.81	1283.90	1281.59
F	F	6	6	6	1285.64	1295.03	1287.65
G	G	6	6	6	1280.04	1285.32	1281.05
H	H	0*	12	0	1270.53	*1270.53 ~~1270.52~~	1270.55

*Large Odonata larvae present

* RE [illegible] 1/25/07

** pupae present

General observation: All four test sediments tubificidae worms (Limnodrilus genus), commonly found in polluted sediments.

Hyalella azteca 28-day Survival and Growth Data

Site ID # NPC

Rep	# Organisms				Pan
	Alive	Dead	Weighed	Pan Wt. (mg)	Dried Org. Wt. (mg)
A	8	2	8	1264.34	1272.40
B	4 *	6	4	1262.17	1264.54
C	1 *	9	1	1268.61	1268.74
D	8	2	8	1275.31	1279.49
E	6	4	6	1274.09	1277.61
F	5 *	5	5	1273.85	1276.45
G	5 *	5	5	1267.05	1269.74
H	3 *	7	3	1265.61	1267.02

* Chironomid larvae present

Length

Organism #	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Rep. F	Rep. G	Rep. H
1	4.0	4.5	3.8	4.3	4.6	3.7	4.4	4.9
2	3.9	4.5	–	4.5	4.1	3.8	3.9	4.3
3	3.9	4.5	–	4.8	5.1	3.9	3.2	3.6
4	3.4	5.0	–	4.4	5.2	4.6	4.4	–
5	4.0	–	–	3.8	3.5	4.2	4.5	–
6	3.8	–	–	4.5	3.7	–	–	–
7	4.1	–	–	4.3	–	–	–	–
8	3.9	–	–	4.4	–	–	–	–
9	–	–	–	–	–	–	–	–
10	–	–	–	–	–	–	–	–

Hyalella azteca 28-day Survival and Growth Data

Site ID # C3

Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Pan Wt. (mg)	Pan Dried Org. Wt. (mg)
A	10	0	10	1261.28	1263.84
B	7	3	7	1264.96	1267.11
C	8	2	8	1274.71	1277.53
D	6	4	6	1274.81	1277.51
E	9	1	9	1266.27	1269.02
F	6	4	6	1268.47	1270.42
G	7	3	7	1267.48	1270.17
H	8	2	8	1282.00	1284.44

Length

Organism #	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Rep. F	Rep. G	Rep. H
1	2.7	3.7	4.4	39	3.9	4.4	3.6	3.1
2	4.2	4.4	4.2	3.5	3.5	3.7	40	3.3
3	3.7	39	4.6	4.6	39	2.4	4.6	3.9
4	3.4	4.3	4.2	4.1	3.7	3.0	4.3	4.9
5	3.6	2.9	3.0	4.0	5.1	4.5	3.9	4.1
6	3.8	4.3	3.8	3.5	2.6	4.0	3.8	4.1
7	4.3	44	3.9	–	39	–	3.4	3.2
8	3.6	–	3.1	–	3.4	–	–	3.3
9	4.0	–	–	–	3.8	–	–	–
10	2.6	–	–	–	–	–	–	–

Hyalella azteca 28-day Survival and Growth Data

Site ID # West Bearskin

Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Pan Wt. ~~(g)~~ mg	Pan Dried Org. Wt. ~~(g)~~ mg
A	10	0	10	1260.69	1264.43
B	9	1	9	1269.32	1272.81
C	8	2	8	1260.74	1264.00
D	9	1	9	1268.72	1273.16
E	9	1	9	1266.24	1269.20
F	8*	2	7**	1264.15	1267.46
G	9*	1	9	1270.33	1273.76
H	10	0	10	1261.72	1266.31

* young present

Length (mm)

Organism #	Rep A	Rep. B	Rep. C	Rep D	Rep. ~~E~~ F	Rep ~~F~~ E	Rep. G	Rep. H
1	4.4	3.4	4.1	5.3	4.5	5.5	5.5	3.5
2	3.5	4.5	3.3	5.2	4.4	4.4	4.8	4.5
3	4.2	3.6	5.0	4.7	4.3	3.0	4.4	3.4
4	4.0	4.1	4.1	4.3	5.5	3.9	3.9	4.6
5	4.1	4.6	4.2	4.6	4.9	5.0	3.9	3.6
6	3.6	4.1	4.3	4.6	4.6	4.4	4.6	4.4
7	4.3	2.6	3.6	~~9.2~~ 4.2 [illegible] 2/3/07	3.9	4.3	4.9	4.5
8	4.2	4.5	3.9	4.4	[illegible] ~~4~~ -	4.3	3.7	4.5
9	4.4	5.0	-	4.0	-	4.4	3.2	5.5
10	4.1	—	—	—	-	—	—	5.2

** 2/3/07 - only 7 found in cup - [illegible]

Hyalella azteca 28-day Survival and Growth Data

Site ID # C11

Rep	# Organisms Alive	Dead	Weighed	Pan Wt. (mg)	Pan Dried Org. Wt. (mg)
A	6	4	6	1272.96	1274.51
B	6	4	6	1261.26	1262.32
C	10	0	10	1264.68	1266.46
D	10	0	10	1272.39	1274.36
E	6	4	6	1270.48	1272.53
F	10	0	10	1260.53	1263.85
G	10	0	10	1267.01	1268.96
H	5	5	5	1266.95	1268.49

Length

Organism #	Rep A	Rep B	Rep C	Rep D	Rep E	Rep F	Rep G	Rep H
1	3.8	3.4	2.8	4.0	2.8	3.6	3.9	4.4
2	4.1	3.0	2.5	3.5	2.3	3.6	3.4	3.8
3	3.4	3.0	3.6	3.6	4.3	3.5	3.2	3.4
4	3.1	3.6	3.4	2.3	4.2	3.7	3.3	3.4
5	4.3	3.0	3.8	2.9	4.6	4.3	3.3	3.8
6	3.6	3.4	2.9	3.8	3.7	3.3	3.3	–
7	–	–	3.5	3.4	–	4.3	2.4	–
8	–	–	1.9	2.4	–	3.9	3.3	–
9	–	–	2.5	2.5	–	2.9	2.7	–
10	–	–	2.0	2.9	–	2.3	2.5	–

Hyalella azteca 28-day Survival and Growth Data

Site ID # K1

Rep	# Organisms Alive	Dead	Weighed	Pan Wt (mg)	Pan Dried Org. Wt (mg)
A	10	0	10	1257.75	1260.13
B	6	4	6	1261.11	1262.44
C	7	3	7	1256.35	1258.09
D	4	6	4	1257.03	1258.48
E	3	7	3	1264.39	1265.32
F	0*	10	0	1257.53	—
G	6	4	6	1264.41	1267.01
H	7	3	7	1258.28	1260.72

* large amount of microbial growth

Length

Organism #	Rep A	Rep B	Rep C	Rep D	Rep E	Rep F	Rep G	Rep H
1	3.4	3.4	3.8	3.3	3.2	-	4.0	3.3
2	3.3	3.9	3.2	3.8	3.[illegible]	-	4.0	3.4
3	3.0	3.9	3.0	4.1	5.2	-	4.3	3.7
4	2.0	2.7	3.7	2.5	-	-	3.7	2.9
5	2.9	2.8	3.8	-	-	-	4.1	3.9
6	3.4	3.0	3.6	-	-	-	3.5	3.9
7	3.5	-	3.7	-	-	-	-	4.0
8	4.0	-	-	-	-	-	-	-
9	3.5	-	-	-	-	-	-	-
10	3.4	-	-	-	-	-	-	-

Hyalella azteca 28-day Survival and Growth Data

Site ID # G11

Rep	# Organisms Alive	# Organisms Dead	# Organisms Weighed	Pan Wt. (mg)	Pan Dried Org. Wt. (mg)
A	7	3	7	1264.70	1266.77
B	8	2	8	1263.22	1265.90
C	5	5	5	1269.92	1271.80
D	4	6	4	1272.24	1273.34
E	5	5	5	1264.69	1266.40
F	5	5	5	1272.06	1273.74
* G	8	2	8	1258.60	1262.44
H	6	4	6	1253.09	1255.28

* Strong naph. odor

Length

Organism #	Rep A	Rep B	Rep C	Rep D	Rep E	Rep F	Rep G	Rep H
1	3.8	3.4	4.8	4.0	4.0	4.0	3.5	4.1
2	3.2	4.1	4.0	3.6	3.0	4.1	3.7	4.0
3	4.6	2.7	3.3	3.9	3.4	3.0	4.4	2.9
4	3.5	4.2	3.3	3.0	3.4	3.6	4.3	3.1
5	3.6	3.4	4.4	–	3.4	4.0	4.0	2.7
6	3.6	3.4	–	–	–	–	4.1	3.3
7	3.8	3.8	–	–	–	–	4.4	–
8	–	4.0	–	–	–	–	2.5	–
9	–	–	–	–	–	–	–	–
10	–	–	–	–	–	–	–	–

Results of *Hyalella azteca* and *Chironomus tentans* Toxicity Tests with TN&A Whole Sediment Samples Received July 11, 2007

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Submitted August 2007

REPORT APPROVAL

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INTRODUCTION

At the request of TN & Associates, ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected by TN&A personnel on July 10, 2007. The toxicity tests were performed to measure the toxicity of selected sediment samples to *Hyalella azteca* (amphipod) and larval *Chironomus tentans* (midge). The *Hyalella* test endpoints were 28-day survival, length, and weight. The *Chironomus* endpoints were 20-day survival and growth (dried and ash-free dried weight (AFDW)). Test dates were July 13 to August 10, 2007.

STUDY SUMMARY

The table below summarizes survival and growth for each TN & A sediment and the West Bearskin (WBS) and artificial sediment controls. CaribSea Live Aragonite Substrate (Ref 2), the secondary control, was chosen for its contrast to the silt/clay characteristics of the WBS control. It did not meet acceptable survival criteria for *Hyalella* or *Chironomus* and in future studies should not be used as a control sediment.

Endpoint	EPA 2000 minimum criteria	West Bearskin	Reference 2	B3 0-1	E3 0-1	F5 0-1	S2 0-1
H. azteca Survival (%)	≥80	96.3	72.5	85.0	85.0	51.3	0.04
H. azteca Growth (mg/organisms)	≥0.15	0.424	0.214	0.225	0.202	0.125	0.005
H. azteca Growth (mean length)	≥3.2	4.2	3.5	3.8	3.7	3.8	0.6
C. tentans Survival (%)	≥70	80.0	25.0	28.8	45.0	0	0
C. tentans Dried Weight (mg/org)	≥0.60	2.10	1.64	1.84	1.79	NA	NA
C. tentans AFDW (mg/org)	≥0.48	1.80	1.32	1.31	1.30	NA	NA

Significantly different than West Bearskin control results

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from TN&A were performed following abbreviated United States Environmental Protection chronic methods (USEPA 2000). Twenty-eight and twenty-day tests exposing *Hyalella azteca* and *Chironomus tentans* were conducted in a manner to determine the effect of each test sediment on organism survival and growth, with tests terminated before emergence and egg production (*C. tentans*) and water-only reproductive measurements (*H. azteca*). Effect was determined by comparison to organism performance following exposure to the selected reference control sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

Test Organism Culturing, Holding, and Acclimation

Hyalella azteca and *Chironomus tentans* (also known as *C. dilutus*) were obtained from Environmental Consulting and Testing (ECT), Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Hyalella* were cultured in a static-renewal system with overlying water renewed twice per week, and the *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23ºC.

The batches of test organisms were hand delivered to ASci-ETL. Upon arrival at ASci-ETL, the batches of organisms were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3ºC per day during holding. The holding tanks were lightly aerated during the pre-test period. At test initiation the *Hyalella* were 7 to 8 days old. The *Chironomus* were 4-24 hours old.

Overlying Water Characteristics

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds.

Exposure System

Sediment from each site tested included eight replicates for each species. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. The replicate test chambers (eight for each species) were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each holding aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperature (23º ± 1 º C) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Performance

Sediment samples were collected by TN&A personnel on July 10, 2007. The samples were delivered to ASci-ETL by express courier on July 11, 2007. The samples were labeled as

B3 0-1, E3 0-1, F5 0-1, and S2 0-1. The Chain of Custody forms were completed upon sample arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at 1-4ºC until use. Appendix A contains a copy of the Chain of Custody forms.

The primary laboratory control sediment was collected on June 23, 2007, from West Bearskin Lake, located in Cook County, Minnesota. The sediment sample (5-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4ºC) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms. A secondary control, CaribSea Live Aragonite Substrate (Ref 2), was rinsed before use.

The toxicity exposures with both test species were originally performed simultaneously. Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water, and the *Chironomus* replicate exposures were fed 1.5 mL Tetrafin slurry. The toxicity tests were initiated approximately 24 hours later, after the sediments were allowed to settle. The organisms were introduced into the test system on July 13, 2007.

To start the tests, ten *Hyalella* (7 to 8 days old), and ten *Chironomus* (4-24 hours old) were impartially distributed to random test replicates for each treatment. *Chironomus* replicates were allowed to settle four hours before re-introduction into the test chambers.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of ± 10% from target flow were adjusted. Measurements of overlying water pH, conductivity, and dissolved oxygen were measured three times per week. Temperature was measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough. Hardness and alkalinity were measured at test initiation and termination. Per the

Statement of Work language, ammonia measurements were made for five replicates/treatment on test days 1, 6, and 13.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic BioSystems). The *Hyalella* were fed a mixture of yeast, Cerophyl®, and fermented trout chow (YCT) prepared to contain 1,800 mg/L total solids. *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 20 days of exposure (*C. tentans*) and 28-days (*Hyalella*). Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at 60°C for 24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus weight of ashed larvae.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled dry weight of the replicate by the number of organisms exposed less the number of pupae recovered.

At test termination the *Hyalella* were pooled, rinsed, and preserved in 10% formalin. Length was determined under a dissecting microscope via a calibrated eyepiece micrometer. *Hyalella* were then placed in pre-weighed pans and dried at 60°C for 22 hours to determine mean dried weight.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the selected reference site sediment exposure to measure effect. The survival data were analyzed using ToxCalc Version 5.0.23, Tidepool Scientific Software. The survival data were arc-sine transformed before analysis, and then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect (p=0.05) as compared to the reference site results.

The growth data was not transformed before analysis. Mean dry weights and/or lengths were checked for normality and equality of variance. The growth data were then analyzed for significant effect (p=0.05) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the reference site result to determine effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overall mean flow rate for each of the holding tanks during the test period was 5.2 ml/minute. The mean flow rate shows overlying water was renewed at a rate that averaged 2.0 tank volumes per day.

Tables 2 and 3 summarize the overlying water temperature values measured daily from the *Hyalella* and *Chironomus* exposure chambers. The range of individual temperature values was from 23.1ºC to 23.6ºC. All the individual values were within the proposed range of 23º C ± 1ºC. Mean test temperatures were maintained at 23.4ºC.

Overlying water dissolved oxygen (DO) concentrations in the *Hyalella* and *Chironomus* test chambers are in Tables 4 and 5. DO values ranged from 4.1 to 8.3 mg/L during the

Hyalella exposures. DO values ranged from 3.9 to 8.3 mg/L during the *Chironomus* exposures. At no time was feeding suspended for either exposure.

Overlying water pHs for the *Hyalella* and *Chironomus* test chambers are in Tables 6 and 7. The pH of overlying water in the *Hyalella* and *Chironomus* exposures ranged from 6.51-8.04. None of the pH values were outside of the organisms' physiologically tolerable range.

Tables 8 and 9 contain the overlying water conductivity values for the *Hyalella* and *Chironomus* exposures. The overall range of conductivity values for both exposures was from 122 to 239 μmhos/cm. None of the values indicated that a biologically significant amount of ionized material was released from the test sediments.

Tables 10 and 11 contain overlying water alkalinity values for the *Hyalella* and *Chironomus* exposures, respectively. Concentrations ranged from 37-99 mg/L as $CaCO_3$.

Tables 12 and 13 contain the overlying total hardness values for the exposures. Concentrations ranged from 38-90 mg/L as $CaCO_3$.

Tables 14 and 15 contain the results of total ammonia measurements for the exposures. Ammonia concentrations for the S2 0-1 were slightly elevated, ranging from 0.17-7.55. Ammonia values for B3 0-1, E3 0-1, and F5 0-1 were recorded at low levels with averages all below 1 mg/L.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity for both test species. Assessment of the effects of ammonia toxicity are contained in the Discussion.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. CaribSea® Live Aragonite Substrate (Ref 2), the secondary control, was chosen for its similar grain size to the test sediments. Growth data indicated surviving organisms were healthy and larger than EPA minimum control growth criteria. The resulting survival data for Reference 2 was both low (73% for *Hyalella* and 25% for *Chironomus*) and sporadic, indicating that this substrate may not be an acceptable choice for an artificial sediment.

The weighing pan for replicate H of the Reference 2 *Chironomus* exposure was lost due to a technician error. The data from replicate H were excluded from growth statistical analysis.

***Hyalella azteca* Survival -**

Appendix B summarizes the *Hyalella* survival results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean survival of 96%. The secondary control, Reference 2, had survival of 73%. The test sediments had survival rates from 3.8 to 85.0%. Statistical analysis showed the data were normal with equal variances. Results of the Dunnett's Test showed F5 0-1 and S2 0-1 survival results were significantly lower than the West Bearskin control results. B3 0-1 and E3 0-1 survival rates were not significantly lower than the West Bearskin control results.

***Hyalella azteca* Mean Dried Weight -**

Appendix B also summarizes the *Hyalella* mean dried weight results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean organism weights of 0.424 mg/organism. The secondary control, Reference 2, had a mean organism weight of 0.214 mg/organism. The test sediments had mean dry weights from 0.005-0.225 mg/organism. Statistical analysis showed the data were non-normal with unequal variances. Results of the Steel's Many-One Rank Test showed all test sediment dry weight results were significantly lower than the West Bearskin control results.

***Hyalella azteca* Length -**

Appendix B also summarizes the *Hyalella* length results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean length rate of 4.2 millimeter per organism. The secondary control, Reference 2, had mean length rate of 3.5 millimeter per organism. The test sediments had mean length rates of 0.6-3.8 millimeter per organism. Statistical analysis showed the data were non-normal, with unequal variances. Results of the Steel's Many-One Rank Test showed all test sediment organism lengths were significantly lower than the West Bearskin control results.

***Chironomus tentans* Survival and Growth Results -**

Appendix C summarizes the *Chironomus* survival results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean survival of 80%. The secondary control, Reference 2, had survival of 25%. The test sediments had survival rates from 0-45%. Statistical analysis showed the data were normal, with unequal variances. Results of the Steel's Many-One Rank Test indicate all test sediment survival results were significantly lower than the West Bearskin control results.

Appendix C also summarizes the *Chironomus* mean dried weight results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported an acceptable 20-day mean organism dried weight of 2.10 mg/organism. The secondary control, Reference 2, had a mean organism weight of 1.64 mg/organism. The test sediments with surviving *Chironomus* had mean dry weights from 1.79-1.84 mg/organism. Statistical analysis showed the data were normal, with equal variances. Results of the Bonferroni t Test indicate none of the sediments with surviving *Chironomus* had significantly lower dried weights than the West Bearskin control results.

Appendix C also summarizes the *Chironomus* mean ash-free dried weight results for the 20-day exposures. The laboratory control sediment (West Bearskin) supported an acceptable 20-day mean organism ash-free dried weight of 1.80 mg/organism. The secondary control, Reference 2, had a mean ash-free dried weight of 1.32 mg/organism. The test sediments with surviving *Chironomus* had mean ash-free dry weights from 1.30-1.31 mg/organism. Statistical analysis showed the data were non-normal, with equal variances. Results of the Bonferroni t Test indicate that all of the sediments had significantly lower ash-free dried weights than the West Bearskin control results.

DISCUSSION

The four sediment samples collected by TN&A showed significant effect to *Chironomus tentans* survival and growth. B3 0-1 and E3 0-1 did not significantly affect *Hyalella azteca* survival, but did affect *Hyalella* growth (weight/length). The *Hyalella* exposed to F5 0-1 and S2 0-1 sediments were significantly affected in survival and growth.

The following conclusions can be drawn from the study results.

- The primary laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for both test species.
- The secondary laboratory control sediment used for this study, Reference 2, did not support acceptable organism survival. Reference 2 did support acceptable growth for both test species.
- Sediment B3 0-1 caused significant mortality and significantly affected growth (AFDW) to *Chironomus.* B3 0-1 also significantly affected *Hyalella* growth, in weight and length, when compared to the primary laboratory control, West Bearskin.
- Sediment E3 0-1 caused significant mortality and significantly affected growth (AFDW) to *Chironomus.* E3 0-1 also significantly affected *Hyalella* growth, in weight and length, when compared to the primary laboratory control, West Bearskin.
- Sediment F5 0-1 caused complete mortality to *Chironomus* and caused significant mortality to *Hyalella*. F5 0-1 significantly affected *Hyalella* growth, in weight and length, when compared to the primary laboratory control, West Bearskin.
- Sediment S2 0-1 caused complete mortality to *Chironomus* and caused significant mortality to *Hyalella*. S2 0-1 significantly affected *Hyalella* growth, in weight and length, when compared to the primary laboratory control, West Bearskin.

The low organism survival in the secondary control did not affect the validity of the test. The Ref 2 artificial substrate consisted of a large grain size, which was not similar to the test sediments. The relatively similar sediment characteristics of the West Bearskin control to the test sediments, meant that a West Bearskin-only comparison is an accurate and fair statistical and quality-control reference for the test sediments.

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TOXCALC, Version 5.0.23, Tidepool Scientific Software, McKinleyville, CA.

Table 1. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to TN&A Sediments During 20-day *Chironomus tentans* and 28-day *Hyalella azteca* Exposures

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean	Low	High
Head Flow Rate	320	320	320	320	324	320	326	324	324	324	320	320	320	322	320	320	320	326	320	320	322	322	320	326
Test Chamber Flow Rate	5.2	5.2	5.2	5.2	5.2	5.2	5.3	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.3	5.2	5.2	5.2	5.2	5.2	5.3
Volume Exchanges	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mean	Low	High
Head Flow Rate	320	320	320	320	324	320	326	324	324	324	320	320	320	322	320	320	320	326	320	320	322	320	320	320	322	320	322	322	324	321	320	326
Test Chamber Flow Rate	5.2	5.2	5.2	5.2	5.2	5.2	5.3	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.3	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.3
Volume Exchanges	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Table 2. Overlaying Water Temperature Values for TN & Associate *Hyalella* Sediment Test

Date	Test Day	Mean Temperature
7/13/2007	0	23.1
7/14/2007	1	23.1
7/15/2007	2	23.6
7/16/2007	3	23.5
7/17/2007	4	23.4
7/18/2007	5	23.4
7/19/2007	6	23.4
7/20/2007	7	23.4
7/21/2007	8	23.4
7/22/2007	9	23.4
7/23/2007	10	23.4
7/24/2007	11	23.3
7/25/2007	12	23.3
7/26/2007	13	23.3
7/27/2007	14	23.3
7/28/2007	15	23.3
7/29/2007	16	23.3
7/30/2007	17	23.3
7/31/2007	18	23.4
8/1/2007	19	23.4
8/2/2007	20	23.5
8/3/2007	21	23.4
8/4/2007	22	23.4
8/5/2007	23	23.3
8/6/2007	24	23.4
8/7/2007	25	23.2
8/8/2007	26	23.3
8/9/2007	27	23.6
8/10/2007	28	23.3
	Maximum	23.6
	Minimum	23.1
	Mean	23.4

Table 3. Overlaying Water Temperature Values for TN & Associate *Chironomus* Sediment Test

Date	Test Day	Mean Temperature
7/13/2007	0	23.1
7/14/2007	1	23.1
7/15/2007	2	23.6
7/16/2007	3	23.5
7/17/2007	4	23.4
7/18/2007	5	23.4
7/19/2007	6	23.4
7/20/2007	7	23.4
7/21/2007	8	23.4
7/22/2007	9	23.4
7/23/2007	10	23.4
7/24/2007	11	23.3
7/25/2007	12	23.3
7/26/2007	13	23.3
7/27/2007	14	23.3
7/28/2007	15	23.3
7/29/2007	16	23.3
7/30/2007	17	23.3
7/31/2007	18	23.4
8/1/2007	19	23.4
8/2/2007	20	23.5
	Maximum	23.6
	Minimum	23.1
	Mean	23.4

Table 4. Overlaying Water DO Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	8.3	8.3	8.3	8.3	8.3	8.3
7/14/2007	1	7.2	7.6	7.2	6.5	6.3	6.1
7/17/2007	4	5.9	5.6	5.5	5.5	5.1	4.9
7/19/2007	6	5.4	5.3	5.7	5.9	5.9	5.4
7/21/2007	8	6.1	6.5	6.5	6.0	5.4	5.4
7/24/2007	15	5.2	5.4	5.2	5.2	5.4	5.4
7/26/2007	13	6.1	6.2	5.4	5.0	5.4	4.9
7/28/2007	15	5.1	5.2	5.7	5.6	5.2	5.4
7/31/2007	18	5.3	4.8	5.2	5.1	5.4	5.4
8/2/2007	20	5.2	4.7	5.1	5.0	5.3	5.3
8/4/2007	22	5.8	5.3	5.2	5.4	5.3	5.4
8/7/2007	25	7.0	7.2	6.6	7.2	6.2	6.4
8/9/2007	27	4.8	5.4	5.3	4.5	4.1	4.2
8/10/2007	28	5.2	6.4	6.8	6.4	5.7	5.6
	Maximum	8.3	8.3	8.3	8.3	8.3	8.3
	Minimum	4.8	4.7	5.1	4.5	4.1	4.2
	Mean	5.9	6.0	6.0	5.8	5.6	5.6

Table 5. Overlaying Water DO Values for *C. tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	8.3	8.3	8.3	8.3	8.3	8.3
7/14/2007	1	6.8	7.2	7.3	6.5	6.4	6.7
7/17/2007	4	7.2	6.9	6.8	6.2	5.9	5.5
7/19/2007	6	4.9	4.9	5.3	5.6	5.8	5.8
7/21/2007	8	6.1	6.3	6.3	5.2	5.3	5.2
7/24/2007	11	6.0	5.9	5.9	5.8	5.8	5.8
7/26/2007	13	4.5	4.9	5.3	5.4	5.1	4.3
7/28/2007	15	4.8	5.1	5.9	5.0	4.8	4.8
7/31/2007	18	4.1	4.8	4.8	4.6	4.3	4.6
8/2/2007	20	3.9	4.8	4.8	4.6	4.3	4.5
	Maximum	8.3	8.3	8.3	8.3	8.3	8.3
	Minimum	3.9	4.8	4.8	4.6	4.3	4.3
	Mean	5.7	5.9	6.1	5.7	5.6	5.6

Table 6. Overlaying Water pH Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	6.51	7.42	7.40	7.34	7.55	7.31
7/14/2007	1	6.65	7.56	7.27	7.25	7.39	7.12
7/17/2007	4	6.91	7.53	7.07	7.03	7.12	7.10
7/19/2007	6	6.82	7.37	7.34	7.12	7.40	7.12
7/21/2007	8	6.79	7.27	7.16	7.11	7.24	6.97
7/24/2007	15	6.97	7.36	7.25	7.28	7.34	7.10
7/26/2007	13	6.97	7.23	7.23	7.25	7.28	7.03
7/28/2007	15	6.79	7.10	7.08	7.11	7.17	6.92
7/31/2007	18	7.16	7.35	7.35	7.37	7.39	7.35
8/2/2007	20	7.69	8.04	8.01	7.92	7.88	7.45
8/4/2007	22	7.60	7.81	7.83	7.79	7.65	7.69
8/7/2007	25	7.33	7.53	7.48	7.48	7.50	7.43
8/9/2007	27	7.12	7.38	7.26	7.26	7.27	7.12
8/10/2007	28	7.35	7.48	7.44	7.47	7.50	7.30
	Maximum	7.69	8.04	8.01	7.92	7.88	7.69
	Minimum	6.51	7.10	7.07	7.03	7.12	6.92
	Mean	7.05	7.46	7.37	7.34	7.41	7.22

Table 7. Overlaying Water pH Values for *C. tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	6.51	7.42	7.40	7.34	7.55	7.31
7/14/2007	1	6.73	7.48	7.23	7.15	7.36	7.05
7/17/2007	4	6.82	7.11	7.19	7.12	7.25	7.14
7/19/2007	6	6.93	7.15	6.97	6.93	7.02	6.96
7/21/2007	8	6.81	7.11	7.04	7.14	7.06	6.93
7/24/2007	11	6.80	7.08	7.13	7.17	7.12	7.10
7/26/2007	13	6.95	7.22	7.23	7.13	7.11	7.02
7/28/2007	15	6.60	7.19	6.95	6.97	6.92	6.93
7/31/2007	18	6.86	7.36	7.27	7.24	7.25	7.26
8/2/2007	20	7.28	7.55	7.56	7.54	7.55	7.50
	Maximum	7.28	7.55	7.56	7.54	7.55	7.50
	Minimum	6.51	7.08	6.95	6.93	6.92	6.93
	Mean	6.83	7.27	7.20	7.17	7.22	7.12

Table 8. Overlaying Water Conductivity Values for C. *tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	122	234	172	146	183	239
7/19/2007	6	148	177	163	158	166	165
7/26/2007	13	147	174	161	187	206	166
8/2/2007	20	153	157	173	179	165	151
	Maximum	153	234	173	187	206	239
	Minimum	122	157	161	146	165	151
	Mean	143	186	167	168	180	180

Table 9. Overlaying Water Conductivity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	122	234	171	146	183	239
7/19/2007	6	133	191	195	170	226	170
7/26/2007	13	140	179	178	190	177	166
8/2/2007	20	160	157	144	161	159	151
8/10/2007	28	140	168	222	193	216	170
	Maximum	160	234	222	193	226	239
	Minimum	122	157	144	146	159	151
	Mean	139	186	182	172	192	179

Table 10. Overlaying Water Alkalinity Values for C. *tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	36.8	55.8	70.0	78.0	74.2	99.0
8/10/2007	20	78.0	56.0	58.0	66.0	42.0	58.0
	Maximum	78.0	56.0	70.0	78.0	74.2	99.0
	Minimum	36.8	55.8	58.0	66.0	42.0	58.0
	Mean	57.4	55.9	64.0	72.0	58.1	78.5

Table 11. Overlaying Water Alkalinity Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	36.8	55.8	70.0	78.0	74.2	99.0
8/10/2007	28	44.0	70.0	76.0	82.0	58.0	84.0
	Maximum	44.0	70.0	76.0	82.0	74.2	99.0
	Minimum	36.8	55.8	70.0	78.0	58.0	84.0
	Mean	40.4	62.9	73.0	80.0	66.1	91.5

Table 12. Overlaying Water Hardness Values for C*. tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	38.0	55.8	82.0	78.4	74.2	72.2
8/2/2007	20	52.0	58.2	71.0	74.0	58.0	52.2
	Maximum	52.0	58.2	82.0	78.4	74.2	72.2
	Minimum	38.0	55.8	71.0	74.0	58.0	52.2
	Mean	45.0	57.0	76.5	76.2	66.1	62.2

Table 13. Overlaying Water Hardness Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	38.0	55.8	82.0	78.4	74.2	72.2
8/10/2007	28	46.0	90.0	73.0	76.0	56.0	82.0
	Maximum	46.0	90.0	82.0	78.4	74.2	82.0
	Minimum	38.0	55.8	73.0	76.0	56.0	72.2
	Mean	42.0	72.9	77.5	77.2	65.1	77.1

Table 14. Overlaying Water Ammonia Values for *H. azteca* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	0.557	0.000	0.000	0.000	0.498	7.550
7/14/2007	1	0.187	0.000	0.009	0.000	0.000	3.410
		0.346	0.000	0.000	0.000	0.069	4.080
		0.175	0.000	0.032	0.000	0.056	5.140
		0.164	0.000	0.381	0.000	0.036	3.530
		0.169	0.000	0.010	0.000	0.010	3.860
7/19/2007	6	0.000	0.000	0.000	0.000	0.083	1.230
		0.000	0.000	0.000	0.000	0.000	1.620
		0.000	0.000	0.000	0.000	0.000	1.530
		0.000	0.000	0.000	0.000	0.000	1.620
		0.000	0.000	0.000	0.000	0.000	1.480
7/26/2007	13	0.116	0.000	0.000	0.000	0.000	0.184
		0.085	0.000	0.000	0.000	0.000	0.305
		0.003	0.000	0.000	0.000	0.000	0.289
		0.000	0.000	0.000	0.000	0.000	0.169
		0.000	0.000	0.000	0.000	0.000	0.227
8/10/2007	28	0.160	0.037	0.106	0.044	0.226	0.289
	Maximum	0.56	0.04	0.38	0.04	0.50	7.55
	Minimum	0.00	0.00	0.00	0.00	0.00	0.17
	Mean	0.12	0.00	0.03	0.00	0.06	2.15

Table 15. Overlaying Water Ammonia Values for *C. tentans* Sediment Test

Date	Test Day	West Bearskin	Ref 2	B3	E3	F5	S2
7/13/2007	0	0.557	0.000	0.000	0.000	0.498	7.55
7/14/2007	1	0.300	0.000	0.000	0.000	0.000	2.91
		0.080	0.000	0.038	0.000	0.000	3.12
		0.030	0.000	0.000	0.000	0.000	3.49
		0.000	0.000	0.026	0.000	0.000	3.21
		0.000	0.000	0.000	0.000	0.000	3.14
7/19/2007	6	0.384	0.050	0.449	0.434	0.158	1.97
		0.267	0.135	0.769	0.296	0.189	1.97
		0.274	0.064	0.466	0.424	0.181	2.03
		0.259	0.078	0.682	0.143	0.178	2.11
		0.200	0.061	0.512	0.125	0.176	1.77
7/16/2007	13	0.516	0.116	0.032	0.012	0.206	0.288
		0.617	0.021	0.074	0.018	0.482	0.774
		0.547	0.075	0.015	0.010	0.000	0.567
		0.556	0.059	0.013	0.169	0.339	0.644
		0.676	0.073	0.044	0.147	0.054	0.547
8/2/2007	28	2.23	0.041	0.103	0.256	0.046	0.182
	Maximum	2.23	0.14	0.77	0.43	0.50	7.55
	Minimum	0.00	0.00	0.00	0.00	0.00	0.18
	Mean	0.44	0.05	0.19	0.12	0.15	2.13

APPENDIX A

Chain of Custody Form

EPA

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case L
Client No:
SDG No:

Date Shipped:	7/10/2007
Carrier Name:	FedEx
Airbill:	851995341360
Shipped to:	ASCI-ETL 4444 AIRPARK BLVD DULUTH MI 55811 (218) 722-4040

Chain of Custody Record

Sampler Signature: Naren Babu

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1	[signature]	7/10/07 1600	[signature]	7/11/07 0915
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	FOR LAB USE ONLY Sample Condition On Receipt
B3 0-1	Sediment/ Naren Babu	M/G	Hyallella/ (21)	474 (1)	B3 0-1	S: 7/10/2007 12:35	
E3 0-1	Sediment/ Naren Babu	M/G	Hyallella/ (21)	471 (1)	E3 0-1	S: 7/10/2007 11:48	
F5 0-1	Sediment/ Naren Babu	M/G	Hyallella/ (21)	467 (1)	F5 0-1	S: 7/10/2007 10:45	
S2 0-1	Sediment/ Naren Babu	M/G	Hyallella/ (21)	477 (1)	S2 0-1	S: 7/10/2007 13:19	

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___ Shipment Iced? ___

Hyallella/ = Hyalella azteca/Chironomus dilutus

TR Number: 5-071926195-071007-0001

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

F2V5.1.043 Page 1 of 1

APPENDIX B

Hyalella azteca Results and Statistical Analysis

Hyalella Survival Test-28 Day Survival

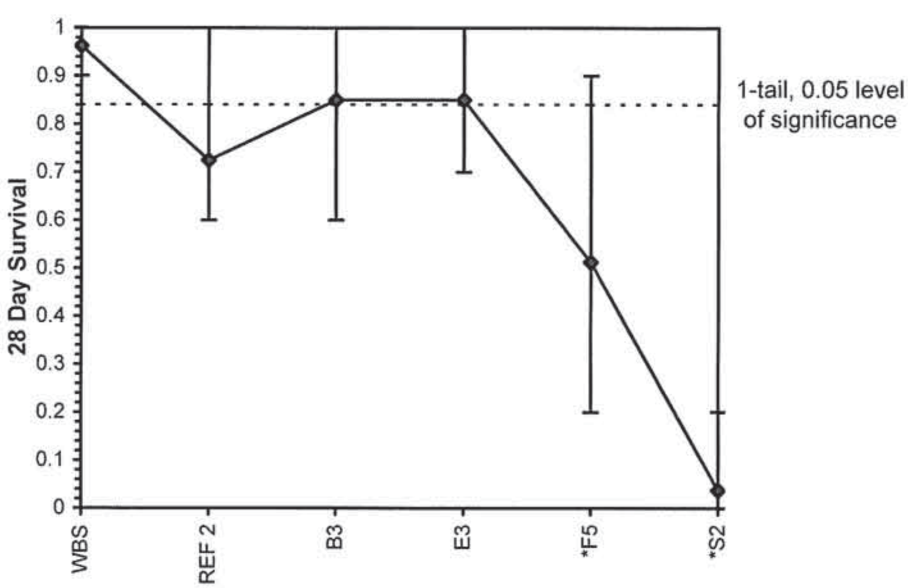
Start Date:	7/13/2007	Test ID:	TN & A	Sample ID:	Riverview - Trenton
End Date:	8/10/2007	Lab ID:	5010-246	Sample Type:	Sediment
Sample Date:		Protocol:	-EPA 2000	Test Species:	HA-Hyalella azteca
Comments:					

Conc-%	1	2	3	4	5	6	7	8
WBS	1.0000	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	0.9000
REF 2	0.7000	0.6000	0.6000	0.6000	0.8000	1.0000	0.7000	0.8000
B3	1.0000	0.8000	0.9000	0.9000	0.6000	0.8000	0.9000	0.9000
E3	1.0000	1.0000	0.7000	0.7000	0.9000	0.8000	0.9000	0.8000
F5	0.4000	0.9000	0.7000	0.3000	0.6000	0.3000	0.7000	0.2000
S2	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	0.9625	1.3276	1.3509	1.2490	1.4120	6.244	8	*		
REF 2	0.7250	1.0000	1.0334	0.8861	1.4120	17.269	8			
B3	0.8500	1.1724	1.1886	0.8861	1.4120	13.085	8	1.906	2.239	0.1906
E3	0.8500	1.1724	1.1898	0.9912	1.4120	14.148	8	1.891	2.239	0.1906
*F5	0.5125	0.7069	0.8031	0.4636	1.2490	33.463	8	6.433	2.239	0.1906
*S2	0.0375	0.0517	0.2173	0.1588	0.4636	52.809	8	13.313	2.239	0.1906

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96393		0.919		0.2641	0.45927
Bartlett's Test indicates equal variances (p = 0.04)	9.85395		13.2767			
The control means are significantly different (p = 4.53E-04)	4.55041		2.14479			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates significant differences	0.11169	0.11727	1.66728	0.02901	6.7E-15	4, 35
Treatments vs WBS						

Dose-Response Plot



Hyalella Survival Test-Dry Wgt

Start Date:	5/4/2007	Test ID:	b07b5 Men	Sample ID:	Riverview - Trenton
End Date:	5/8/2007	Lab ID:	5010	Sample Type:	Sediment
Sample Date:		Protocol:	EPAA 91-EPA/600/4-90/027F	Test Species:	HA-Hyalella azteca
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8
WBS	0.3660	0.6340	0.7060	0.4060	0.3060	0.4080	0.2680	0.2950
REF 2	0.1910	0.1280	0.1410	0.2370	0.1600	0.5290	0.1580	0.1670
B3	0.3050	0.2290	0.2220	0.3400	0.0930	0.1840	0.2270	0.1980
E3	0.2380	0.2770	0.2090	0.0760	0.1580	0.1770	0.1820	0.3000
F5	0.1030	0.1240	0.1660	0.1040	0.1710	0.0680	0.1950	0.0650
S2	0.0410	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010

			Transform: Untransformed					Rank	1-Tailed
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	0.4236	1.9807	0.4236	0.2680	0.7060	38.112	8	*	
REF 2	0.2139	1.0000	0.2139	0.1280	0.5290	61.541	8		
*B3	0.2247	1.0508	0.2247	0.0930	0.3400	33.418	8	41.00	47.00
*E3	0.2021	0.9451	0.2021	0.0760	0.3000	35.188	8	39.00	47.00
*F5	0.1245	0.5821	0.1245	0.0650	0.1950	38.961	8	36.00	47.00
*S2	0.0052	0.0245	0.0052	0.0000	0.0410	275.227	8	36.00	47.00

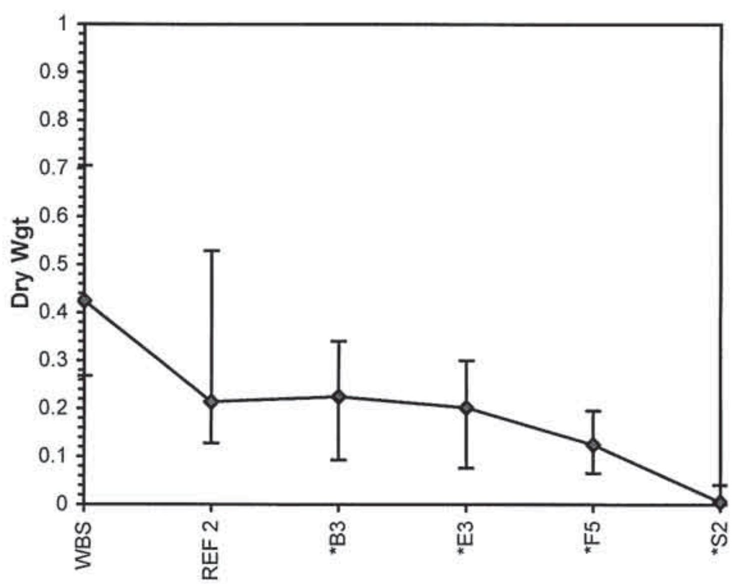
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.90521	0.919	1.05674	2.96174
Bartlett's Test indicates unequal variances (p = 7.08E-06)	29.2113	13.2767		
The control means are significantly different (p = 0.01)	2.84805	2.14479		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences

Treatments vs WBS

Dose-Response Plot



Hyalella Survival Test-Length

Start Date:	5/4/2007	Test ID:	b07b5 Men	Sample ID:	Riverview - Trenton
End Date:	5/8/2007	Lab ID:	5010	Sample Type:	Sediment
Sample Date:		Protocol:	EPAA 91-EPA/600/4-90/027F	Test Species:	HA-Hyalella azteca
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8
WBS	4.1700	3.9700	4.3100	4.3900	4.0700	4.4200	4.2000	3.9900
REF 2	3.7000	3.5800	3.6700	3.6000	3.2500	3.3900	3.5400	3.4300
B3	3.8700	4.0400	3.5800	3.8900	3.5700	3.7900	3.8900	3.8000
E3	3.8500	3.8600	3.8400	3.2300	3.6400	3.7400	3.7200	4.0000
F5	3.5500	3.4000	3.6100	3.7300	3.6300	3.8700	4.0000	4.5500
S2	3.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.6000

			Transform: Untransformed					Rank	1-Tailed
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	4.1900	1.1903	4.1900	3.9700	4.4200	4.140	8	*	
REF 2	3.5200	1.0000	3.5200	3.2500	3.7000	4.338	8		
*B3	3.8038	1.0806	3.8038	3.5700	4.0400	4.216	8	38.00	47.00
*E3	3.7350	1.0611	3.7350	3.2300	4.0000	6.192	8	38.00	47.00
*F5	3.7925	1.0774	3.7925	3.4000	4.5500	9.451	8	46.00	47.00
*S2	0.6125	0.1740	0.6125	0.0000	3.3000	199.470	8	36.00	47.00

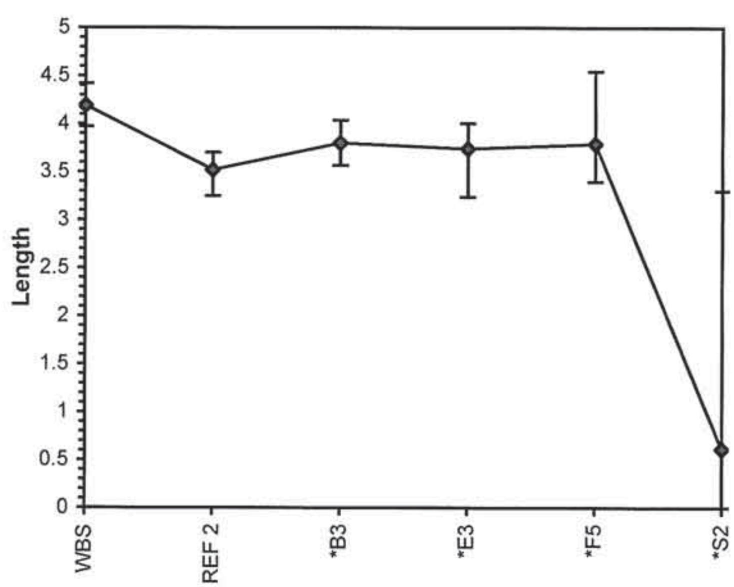
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.72287	0.919	3.00003	13.6239
Bartlett's Test indicates unequal variances (p = 1.23E-08)	42.6362	13.2767		
The control means are significantly different (p = 1.03E-06)	8.20067	2.14479		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences

Treatments vs WBS

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by: July 2010

APPENDIX C

Chironomus tentans Results and Statistical Analysis

Chirononmus Survival and Growth-20 Day Survival

Start Date:	7/13/2007	Test ID:	TNA	Sample ID:	Riverview-Trenton Channel
End Date:	8/8/2007	Lab ID:	5010-246	Sample Type:	SEDIMENT
Sample Date:		Protocol:	-EPA 2000	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
West Bearskin	0.8000	0.6000	0.9000	0.9000	1.0000	0.5000	0.7000	1.0000
REF2	0.4000	0.2000	0.0000	0.6000	0.1000	0.2000	0.3000	0.2000
B3 (0-1)	0.2000	0.5000	0.2000	0.5000	0.2000	0.6000	0.1000	0.0000
E3 (0-1)	0.0000	0.4000	0.4000	0.2000	0.5000	0.5000	1.0000	0.6000
F5 (0-1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S2 (0-1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

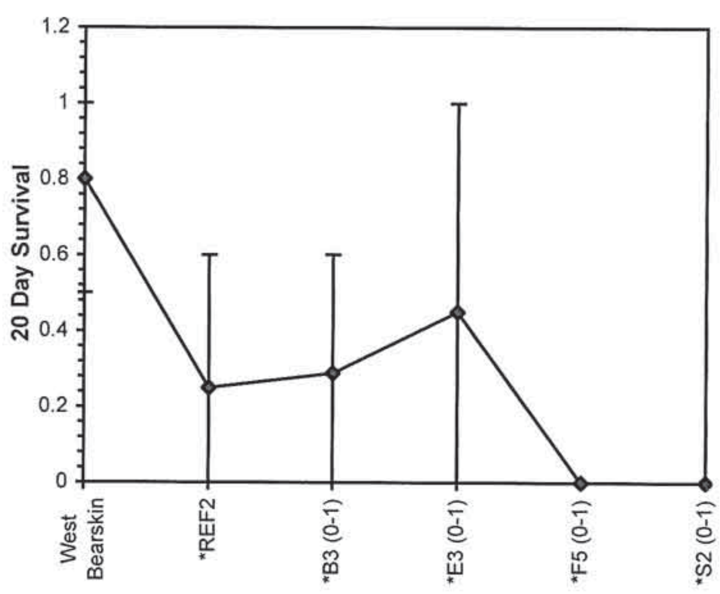
			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
West Bearskin	0.8000	1.0000	0.8000	0.5000	1.0000	23.146	8		
*REF2	0.2500	0.3125	0.2500	0.0000	0.6000	74.066	8	37.50	46.00
*B3 (0-1)	0.2875	0.3594	0.2875	0.0000	0.6000	75.378	8	38.50	46.00
*E3 (0-1)	0.4500	0.5625	0.4500	0.0000	1.0000	65.060	8	45.50	46.00
*F5 (0-1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	46.00
*S2 (0-1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	46.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9424	0.929	0.38225	1.96396
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences
Treatments vs West Bearskin

Dose-Response Plot



 ToxCalc v5.0.23 Reviewed by: July 2010

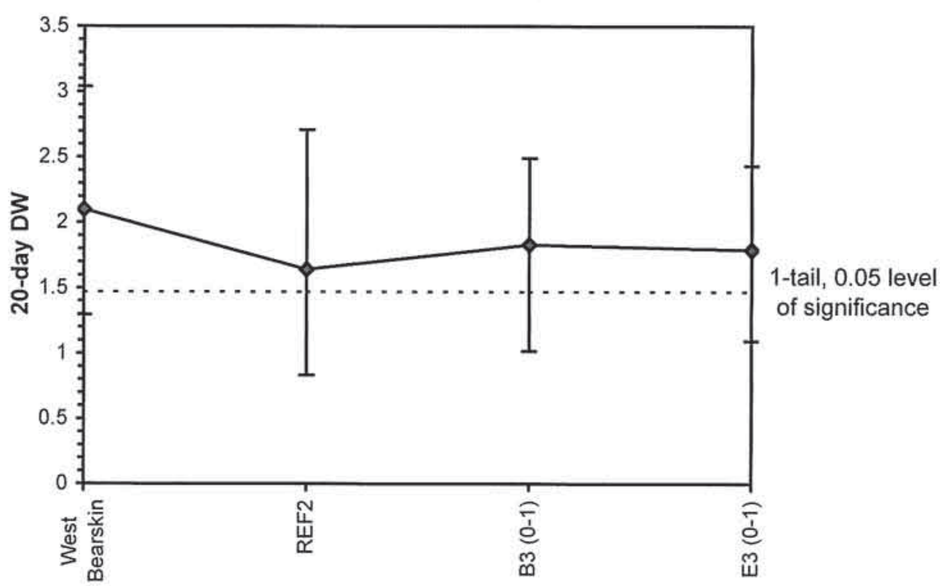
Chirononmus Survival and Growth-20-day DW								
Start Date:	7/13/2007	Test ID:	TNA		Sample ID:	Riverview-Trenton Channel		
End Date:	8/8/2007	Lab ID:	5010-246		Sample Type:	SEDIMENT		
Sample Date:		Protocol:	-EPA 2000		Test Species:	CT-Chironomus tentans		
Comments:								

Conc-	1	2	3	4	5	6	7	8
West Bearskin	1.9388	2.4167	1.7911	2.0222	1.8960	3.0380	2.3957	1.2940
REF2	1.5125	1.5000	0.8317	2.7100	2.2550	1.0767	1.5850	
B3 (0-1)	2.4950	1.9460	2.3100	1.5340	2.0700	1.4600	1.0200	
E3 (0-1)	1.5625	1.9075	2.4300	1.6980	1.6460	1.0910	2.1633	

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
West Bearskin	2.0991	1.0000	2.0991	1.2940	3.0380	24.730	8			
REF2	1.6387	0.7807	1.6387	0.8317	2.7100	39.648	7	1.660	2.252	0.6245
B3 (0-1)	1.8336	0.8735	1.8336	1.0200	2.4950	28.376	7	0.957	2.252	0.6245
E3 (0-1)	1.7855	0.8506	1.7855	1.0910	2.4300	24.329	7	1.131	2.252	0.6245

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96384		0.898		0.25028	-0.4165
Bartlett's Test indicates equal variances (p = 0.82)	0.93212		11.3449			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates no significant differences	0.62449	0.29751	0.27991	0.28702	0.4201	3, 25
Treatments vs West Bearskin						

Dose-Response Plot



Chironomus Survival and Growth-20-day AFDW

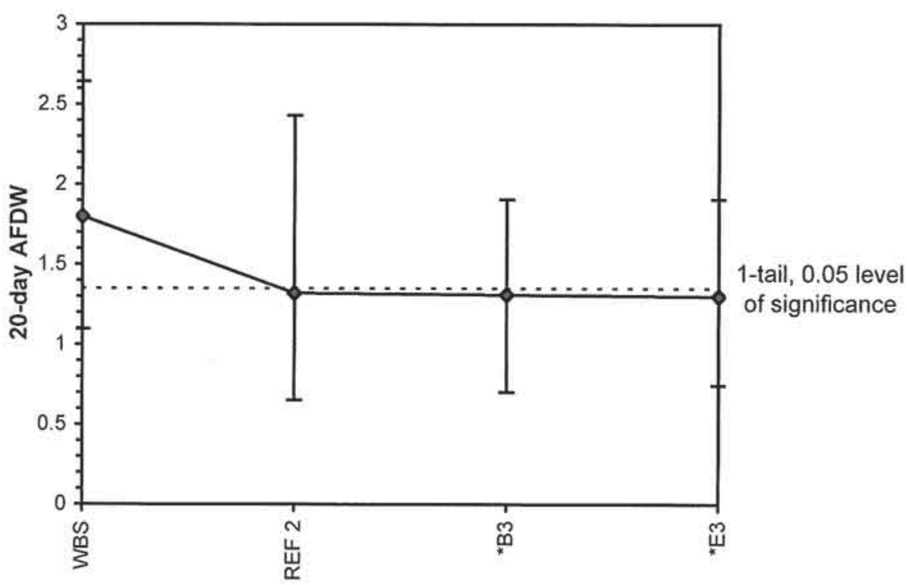
Start Date:	7/13/2007	Test ID:	TNA	Sample ID:	RIVERVIEW
End Date:	8/8/2007	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	-EPA 2000	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
WBS	1.6538	2.1533	1.5467	1.7156	1.5800	2.6480	2.0400	1.1020
REF 2	1.2125	1.1750	0.6583	2.4300	1.5000	0.9733		
B3	1.9050	1.3540	1.6450	0.9660	1.4750	1.1200	0.7000	
E3	1.1050	1.3400	1.9100	1.3380	1.1060	0.7450	1.5633	

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	1.8049	1.3623	1.8049	1.1020	2.6480	25.900	8		*	
REF 2	1.3249	1.0000	1.3249	0.6583	2.4300	45.973	6			
*B3	1.3093	0.9882	1.3093	0.7000	1.9050	31.521	7	2.271	2.093	0.4569
*E3	1.3010	0.9820	1.3010	0.7450	1.9100	28.556	7	2.308	2.093	0.4569

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97678		0.878		0.25315	-0.2799
Bartlett's Test indicates equal variances (p = 0.85)	0.31961		9.21035			
The control means are not significantly different (p = 0.12)	1.67372		2.17881			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Bonferroni t Test indicates significant differences	0.45687	0.25313	0.63584	0.17788	0.04812	2, 19
Treatments vs WBS						

Dose-Response Plot



ToxCalc v5.0.23
Reviewed by July 2010

APPENDIX D

Raw Data

ASci Corporation

SEDIMENT TOXICITY TEST

TEST SPONSOR TN & ASSOCIATES, INC.

ASci STUDY ID# 5010-246

PROJECT NAME Riverview – Trenton Channel Site

TEST DATES 7/13/2007-8/10/2007

ASci STUDY DIRECTOR Clayton Allen

ASci TECHNICIANS K. Brown, K. LaFortune, K. Wormer, M. Warner

WHOLE-SEDIMENT TOXICITY TESTING INFORMATION

TEST INFORMATION

Project: Sediment Toxicity Assessments for the Riverview – Trenton Channel Site in Riverview, Michigan
Client: TN and Associates
Test Dates: July 13 to August 10, 2007
Sample No.: West Bearskin (WBS), Reference Sed. 2 (REF 2), B3 (0-1), E3 (0-1), F5 (0-1), and S2 (0-1)
Test Type: 28-day *Hyalella azteca* (Survival and Growth) and 20-day Chironomus dilutes (Survival and Growth)
Renewal Frequency: Two renewals of overlaying water daily
Overlaying Water: PC
Template #: Standard Randomization
Test Site: Bio VII
Light Intensity: 50-100 Foot Candles Photo Period: 16 Hour Light/8 Hour Dark
Temperature: 23°C ± 1°C

TEST ORGANISM INFORMATION

Organism	*Hyalella azteca*	*Chironomus dilutus*
Source	ECT (Superior, WI)	ECT (Superior, WI)
Age	7 day	4-24 hour
ASci Log No.	071307-I	071307-II
Food	1.0 mL YCT/Day	1.5 mL Tetrafin Slurry/day
Test Chamber	300 mL glass Berzelius Beakers	300 mL glass Berzelius Beakers
Sediment Volume	100 mL	100 mL
Number of Replicates	8	8
Organisms Per Chamber	10 ~~12~~ FE KL 8/30/07	10

PC = Post-Carbon (City of Duluth Carbon Treated Tap water)

Exposure System Observations/Activities Sheet for Sediments (PAGE 1 of 2)

Date	Day of Test	HA Fed 1.0 mL YCT?	CT Fed 1.5 mL Slurry?	Head Flow (ml/min):	Observations
7/12/2007	-1	NA	NA	320	SEDIMENTS LOADED. NO INDIGENOUS ORGANISMS NOTICED.
7/13/2007	0	Y	Y	320	ALL SEDIMENTS LEVEL. OVERLAYING WATER CLEARING. ORGANISM LOADED @ 1400 (HA) AND 1430 (CD)
7/14/2007	1	Y	Y	320	Test conditions appear normal.
7/15/2007	2	Y	Y	320	CONDITIONS appear normal
7/16/2007	3	Y	Y	320	F5-F ⇒ one HA dead also reps B,G had one dead each (HA) All other samples appear normal
7/17/2007	4	Y	Y	324	Test appears normal
7/18/2007	5	Y	Y	320	Test appears normal
7/19/2007	6	Y	Y	326	One Chironomidae pupae found in E3-F (Hyalella) beaker + E3-D Film on water surface found on ⇒ E3-B + F5-A
7/20/2007	7	Y	Y	324	conditions appear normal → KB
7/21/2007	8	Y	Y	324	conditions appear normal - KB
7/22/2007	9	Y	Y	324	conditions appear normal - KB
7/23/2007	10	Y	Y	320	conditions appear normal
7/24/2007	11	Y	Y	320	conditions appear normal
7/25/2007	12	Y	Y	320	conditions appear normal - KB
7/26/2007	13	Y	Y	322	Conditions appear normal
7/27/2007	14	y	y	320	Also Except E3-HA-A → one chironomidae pupae removed Conditions appear normal in all beakers except E3-CT-A → one chironomidae pupae found swimming around, but couldn't remove
7/28/2007	15	Y	Y	320	conditions appear normal - KB
7/29/2007	16	Y	Y	320	Screens cleaned. conditions appear normal - KB
7/30/2007	17	Y	Y	326	conditions appear normal
7/31/2007	18	Y	Y	320	conditions appear normal
8/1/2007	19	Y	Y	320	conditions appear normal
8/2/2007	20	Y	Y	322	conditions appear normal

Exposure System Observations/Activities Sheet for Sediments (PAGE 2 of 2)

Date	Day of Test	HA Fed 1.0 mL YCT?	CT Fed 1.5 mL Slurry?	Head Flow (ml/min):	Observations
8/3/2007	21	Y	-	320	conditions appear normal - KB
8/4/2007	22	Y	-	320	conditions appear normal - KB
8/5/2007	23	Y	-	320	conditions appear normal - KB
8/6/2007	24	Y	-	322	conditions appear normal
8/7/2007	25	Y	-	320	conditions appear normal
8/8/2007	26	Y	-	322	conditions appear normal
8/9/2007	27	Y	-	322	conditions appear normal
8/10/2007	28	Y	-	324	conditions appear normal Sediments sieved + Hyallela removed

Overlaying Water DO Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	8.3	8.3	8.3	8.3	8.3	8.3	MLW
7/14/2007	1	7.2	7.6	7.2	6.5	6.3	6.1	KS
7/17/2007	4	5.9	5.6	5.5	5.5	5.1	4.9	KW
7/19/2007	6	5.4	5.3	5.7	5.9	5.9	5.4	KW
7/21/2007	8	6.1	6.5	6.5	6.0	5.4	5.4	KS
7/24/2007	11	5.2	5.4	5.2	5.2	5.4	5.4	KW
7/26/2007	13	6.1	6.2	5.4	5.0	5.4	4.9	KW
7/28/2007	15	5.1	5.2	5.7	5.6	5.2	5.4	KS
7/31/2007	18	5.3	4.8	5.2	5.1	5.4	5.4	KW
8/2/2007	20	5.2	4.7	5.1	5.0	5.3	5.3	MLW
8/4/2007	22	5.8	5.3	5.2	5.4	5.3	5.4	KS
8/7/2007	25	7.0	7.2	6.6	7.2	6.2	6.4	KW
8/9/2007	27	4.8	5.4	5.3	4.5	4.1	4.2	KW
8/10/2007	28	RE KW 8/10 ~~6.8~~ 5.2	RE KW 8/10 ~~7.2~~ 6.4	RE KW 8/10 ~~7.1~~ 6.8	6.4	5.7	5.6	KW

Overlaying Water pH Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	6.51	7.42	7.40	7.34	7.55	7.31	MLW
7/14/2007	1	6.65	7.56	7.27	7.25	7.39	7.12	KS
7/17/2007	4	6.91	7.53	7.07	7.03	7.12	7.10	KW
7/19/2007	6	6.82	7.37	7.34	7.12	7.40	7.12	KW
7/21/2007	8	6.79	7.27	7.16	7.11	7.24	6.97	KS
7/24/2007	11	6.97	7.36	7.25	7.28	7.34	7.10	KW
7/26/2007	13	6.97	7.23	7.23	7.25	7.28	7.03	KW
7/28/2007	15	6.79	7.10	7.08	7.11	7.17	6.92	KS
7/31/2007	18	7.16	7.35	7.35	7.37	7.39	7.35	KW
8/2/2007	20	7.69	8.04	8.01	7.92	7.83	7.45	MLW
8/4/2007	22	7.60	7.81	7.83	7.79	7.65	7.69	KS
8/7/2007	25	7.33	7.53	7.48	7.48	7.50	7.43	KW
8/9/2007	27	7.12	7.38	7.26	7.26	7.27	7.12	KW
8/10/2007	28	7.35	7.48	7.44	7.47	7.50	7.30	KW

Overlaying Water DO Values for *C. dilutus* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	8.3	8.3	8.3	8.3	8.3	8.3	MLW
7/14/2007	1	6.8	7.2	7.3	6.5	6.4	6.7	KBS
7/17/2007	4	7.2	6.9	6.8	6.2	5.9	5.5	KW
7/19/2007	6	4.9	4.9	5.3	5.6	5.8	5.8	KW
7/21/2007	8	6.1	6.3	6.3	5.2	5.3	5.2	KBS
7/24/2007	11	6.0	5.9	5.9	5.8	5.8	5.8	KW
7/26/2007	13	4.5	4.9	5.3	5.4	5.1	4.3	KW
7/28/2007	15	4.8	5.1	5.9	5.0	4.8	4.8	KBS
7/31/2007	18	4.1	4.8	4.8	4.6	4.3	4.6	KW
8/2/2007	20	3.9	4.8	4.8	4.6	4.3	4.5	MLW

C. dilutus

Overlaying Water pH Values for ~~*H. azteca*~~ Sediment Test

FE

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	6.51	7.42	7.40	7.34	7.55	7.31	MLW
7/14/2007	1	6.73	7.48	7.23	7.15	7.36	7.05	KBS
7/17/2007	4	6.82	7.11	7.19	7.12	7.25	7.14	KW
7/19/2007	6	6.93	7.15	6.97	6.93	7.02	6.96	KW
7/21/2007	8	6.81	7.11	7.04	7.14	7.06	6.93	KBS
7/24/2007	11	6.80	7.08	7.13	7.17	7.12	7.10	KW
7/26/2007	13	6.95	7.22	7.23	7.13	7.11	7.02	KBS
7/28/2007	15	6.60	7.19	6.95	6.97	6.92	6.93	KBS
7/31/2007	18	6.86	7.36	7.27	7.24	7.25	7.26	KW
8/2/2007	20	7.28	7.55	7.56	7.54	7.55	7.50	MLW

Overlaying Water Conductivity Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	122.0	234.1	171.1	146.4	183.2	239.0	MLW
7/19/2007	6	132.6	190.6	195.0	169.5	226.0	170.0	KW
7/26/2007	13	140.4	179.1	177.6	189.9	177.1	166.2	KW
8/2/2007	20	159.8	157.2	144.1	160.5	158.8	150.7	MLW
8/10/2007	28	140.1	168.0	222.0	193.2	216.0	169.5	KW

Overlaying Water Alkalinity Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	36.8	55.8	70.0	78.0	74.2	99.0	MLW
8/10/2007	28	44.0	70.0	76.0	82.0	58.0	84.0	KW

Overlaying Water Hardness Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	38.0	55.8	82.0	78.4	74.2	72.2	MLW
8/10/2007	28	~~[illegible]~~ 46.0	90.0	73.0	76.0	56.0	82.0	KW

Overlaying Water Conductivity Values for *C. dilutus* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	122.1	234.1	171.5	146.3	183.3	239.0	MLW
7/19/2007	6	147.5	174.6	162.5	158.2	165.5	165.5	KW
7/26/2007	13	147.2	173.7	160.9	186.7	206.0	166.0	KW
8/2/2007	20	153.4	157.4	172.8	179.0	164.5	151.0	MLW

Overlaying Water Alkalinity Values for *C. dilutus* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	36.8	55.8	70.0	78.0	74.2	99.0	MLW
8/2/2007	20	78.0	56.0	58.0	66.0	42.0	58.0	MLW

Overlaying Water Hardness Values for *C. dilutus* Sediment Test

DATE	TEST DAY	WBS CONTROL	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	38.0	55.8	82.0	78.4	74.2	72.2	MLW
8/2/2007	20	52.0	58.2	71.0	74.0	58.0	52.2	MLW

Overlaying Water Ammonia Values for *H. azteca* Sediment Test

DATE	TEST DAY	WBS	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	0.557	<0.2	<0.2	<0.2	0.498	7.55	MLW
7/14/2007	1	A-0.187	0.000	0.0085	0.000	0.000	3.41	KS
		0.346	0.000	0.000	0.000	0.0687	4.08	↓
		0.175	0.000	0.0315	0.000	0.0556	5.14	
		0.164	0.000	0.381	0.000	0.0358	3.53	
		0.169	0.000	0.0098	0.000	0.0103	3.86	
7/19/2007	6	0.0000	0.0000	0.000	0.0000	0.0825	1.23	KW
		0.0000	0.0000	0.0000	0.0000	0.0000	1.62	↓
		0.0000	0.0000	0.0000	0.0000	0.0000	1.53	
		0.0000	0.0000	0.0000	0.0000	0.0000	1.62	
		0.0000	0.0000	0.0000	0.0000	0.0000	1.48	
7/26/2007	13	0.1160	0.0000	0.0000	0.0000	0.0000	0.1840	KW
		0.0854	0.0000	0.0000	0.0000	0.0000	0.3050	↓
		0.0033	0.0000	0.0000	0.0000	0.0000	0.2890	
		0.0000	0.0000	0.0000	0.0000	0.0000	0.1690	
		0.0000	0.0000	0.0000	0.0000	0.0000	0.2770	
		0.1580	0.0000	0.0000	0.0000	0.0000	0.2560	
8/10/2007	28	0.1600	0.0372	0.1060	0.6440	0.2260	0.2890	KW

Overlaying Water Ammonia Values for *C. dilutus* Sediment Test

DATE	TEST DAY	WBS	REF 2	B3 (0-1)	E3 (0-1)	F5 (0-1)	S2 (0-1)	INITIALS
7/13/2007	0	0.557	<0.2	<0.2	<0.2	0.498	7.55	MLW
7/14/2007	1	0.300	0.000	0.000	0.000	0.000	2.91	KS
		0.080	0.000	0.038	0.000	0.000	3.12	↓
		0.030	0.000	0.000	0.000	0.000	3.49	↓
		0.000	0.000	0.026	0.000	0.000	3.21	↓
		0.000	0.000	0.000	0.000	0.000	3.14	↓
7/19/2007	6	0.384	0.0503	0.449	0.434	0.158	1.97	KW
		0.267	0.1350	0.769	0.296	0.189	1.97	↓
		0.274	0.0639	0.466	0.424	0.181	2.03	↓
		0.259	0.0772	0.682	0.143	0.178	2.11	↓
		~~0.~~ 0.200	0.0609	0.512	0.125	0.176	1.77	↓
7/26/2007	13	0.5160	0.1160	0.0318	0.0210	0.2060	0.2880	KW
		0.6170	0.0207	0.0736	0.01840	0.482	0.7740	↓
		0.5470	0.0752	0.0150	0.0106	0.0000	0.5670	↓
		0.5560	0.0593	0.0129	0.1690	0.3390	0.6440	↓
		0.6760	0.0731	0.0440	0.1470	0.0537	0.5470	↓
		0.6220	0.0590	0.0280	0.1200	0.0101	0.6760	↓
8/2/2007	20	2.23	0.0413	0.103	0.256	0.0463	0.182	MLW

Chironomus tentans 20-day Survival and Growth Data

Site ID # West Bearskin

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	8	2	8	1255.37	1270.88	1257.65
B	6	4	6	1264.95	1279.45	1266.53
C	9	1	9	1263.75	1279.87	1265.95
D	9	1	9	1251.97	1270.17	1254.73
E	10	0	10	1260.27	1279.23	1263.43
F	5	5	5	1256.86	1272.05	1258.81
G	7	3	7	1266.59	1283.36	1269.08
H	10	0	10	1273.88	1286.82	1275.80

Site ID # REF 2

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	4	6	4	1265.18	1271.23	1266.38
B	2	8	2	1262.91	1265.91	1263.56
C	0	10	0	1262.98	—	—
D	6	4	6	1269.79	1274.78	1270.83
E	1	9	1	1267.79	1270.50	1268.07
F	2	8	2	1265.15	1269.66	1266.66
G	3	7	3	1257.54	1260.77	1257.85
H	2	8	2	1261.27	1264.44	*

*TECH ERROR - PAN LOST KL 8/5/07

Chironomus tentans 20-day Survival and Growth Data

Site ID # B3 (0-1)

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	2	8	2	1261.78	1266.77	1262.96
B	5	5	5	~~1258.19~~ 1265.80 RE MLW 8/1/07	1275.53	1268.76
C *	~~2~~ 3 8/2/07	~~8~~ 7 8/2/07	2	1261.92	1266.54	1263.25
D	5	5	~~6~~ 5	1258.14	1265.81	1260.98
E	2	8	2	1259.57	1263.71	1260.76
F	6	4	6	1269.86	1278.62	1271.90
G	1	9	1	1263.09	~~1263~~ 1264.11 RE KL 8/9/07	1263.41
H	0	10	0	1265.85	—	—

* CHIRONOMID PUPA NOTED

Site ID # E3 (0-1)

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1257.00	—	—
B	4	6	4	1259.69	1265.94	1261.52
C	4	6	4	1254.47	1262.10	1256.74
D	2	8	2	1260.31	1265.17	1261.35
E	5	5	5	1256.55	1265.04	1258.35
F	5	5	5	1252.36	1268.59	1255.06
G	10	0	10	1254.64	1265.55	1258.10
H	6	4	6	1257.85	1270.83	1261.45

Chironomus tentans 20-day Survival and Growth Data

Site ID # F5 (0-1)

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1276.83	—	—
B	0	10		1254.60	—	—
C	0	10		1264.13	—	—
D	0	10		1265.98	—	—
E	0	10		1265.28	—	—
F*	0	10		1262.24	—	—
G	0	10	0	1262.71	—	—
H	0	10	↓	1265.81	—	—

~~*SURVIVING CHIROS: PALE IN COLOR NO HEMOGLOBIN~~ PE KL 8/9/07

Site ID # S2 (0-1)

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1263.66	—	—
B	0	10		1257.46	—	—
C	0	10	0	1255.82	—	—
D	0	10		1259.23	—	—
E	0	10		1258.75	—	—
F	0	10		1259.72	—	—
G	0	10		1259.10	—	—
H	0	10	↓	1254.64	—	—

H. azteca 28-day Survival and Growth

Site I.D.: WBS

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	10	0	10	1276.76	1280.42
2	10	0	10	1270.46	1276.80
3	10	0	10	1276.46	1283.52
4	10	0	10	1275.32	1279.38
5	10	0	10	1271.34	1274.40
6	9	1	9	1269.63	1273.71
7	9	1	9	1275.06	1277.74
8	9	1	9	1271.44	1274.39

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 N/A	REP 10 N/A
1	4.2	3.4	4.3	4.4	4.4	4.1	4.3	3.6		
2	4.2	4.1	4.6	4.6	4.7	4.6	4.1	3.6		
3	4.0	4.2	4.0	4.3	4.2	4.6	5.0	4.4		
4	3.7	4.6	4.2	4.6	3.8	4.1	4.4	4.2		
5	4.2	3.8	4.3	4.4	3.9	6.0	3.9	4.6		
6	4.4	4.2	4.4	4.6	4.3	4.6	4.1	4.4		
7	4.4	3.9	4.7	4.3	3.7	3.8	4.1	4.2		
8	4.5	4.1	4.2	4.5	3.9	4.3	4.0	4.4		
9	4.1	3.5	4.1	4.2	3.8	4.7	4.0	2.5		
10	4.0	3.9	4.3	4.0	4.0	—	—	—		

Site I.D.: REF 2

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	7	3	7	1270.10	1272.01
2	6	4	6	1277.88	1279.16
3	6	4	6	1269.28	1270.69
4	6	4	6	1272.48	1274.85
5	8	2	8	1278.34	1279.94
6	10	0	10	1276.50	1281.79
7	7	3	7	1278.28	1279.86
8	8	2	8	1279.37	1281.04

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 N/A	REP 10 N/A
1	4.2	3.8	4.0	3.6	3.7	3.8	3.9	3.4		
2	3.9	3.7	3.1	4.0	3.5	3.8	4.2	3.6		
3	3.6	4.0	3.3	3.0	3.5	3.1	3.6	3.4		
4	4.1	3.7	3.6	3.4	3.5	4.0	3.2	3.5		
5	3.8	3.6	4.1	3.5	3.2	3.8	3.1	3.3		
6	4.2	2.7	3.9	4.1	3.3	3.2	3.6	3.6		
7	2.4	—	—	—	3.0	3.0	3.2	3.4		
8	—	—	—	—	2.3	3.5	—	3.2		
9	—	—	—	—	—	2.8	—	—		
10	—	—	—	—	—	2.9	—	—		

H. azteca 28-day Survival and Growth

Site I.D.: B3 (0-1)

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	10	0	10	1277.94	1280.99
2	8	2	8	1272.16	1274.45
3	9	1	9	1280.84	1283.06
4	9	1	9	1278.53	1281.93
5	6	4	6	1276.14	1277.07
6	8	2	8	1275.24	1277.08
7	9	1	9	1267.27	1269.54
8	9	1	9	1275.64	1277.62

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 (N/A)	REP 10 (N/A)
1	4.3	4.2	3.9	4.6	3.1	4.2	4.0	3.6		
2	4.1	3.9	3.1	4.3	3.9	3.8	4.3	3.5		
3	3.3	3.3	3.6	4.6	3.1	3.9	3.6	4.2		
4	3.7	4.4	3.8	3.1	3.6	4.5	4.3	4.2		
5	3.9	4.5	3.7	4.2	3.9	4.9	3.6	3.6		
6	4.2	3.8	3.2	3.4	3.8	4.0	4.3	3.9		
7	4.7	4.3	3.5	3.2	—	3.2	4.0	4.3		
8	2.8	3.9	3.6	4.1	—	1.8	3.5	3.8		
9	4.1	—	3.8	3.6	—	—	3.4	3.1		
10	3.6	—	—	—	—	—	—	—		

Site I.D.: E3 (0-1)

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	10	0	10	1274.35	1276.73
2	10	0	10	1274.06	1276.83
3	7	3	7	1260.82	1262.91
4	7	3	7	1273.86	1274.62
5	9	1	9	1279.67	1281.25
6	8	2	8	1266.22	1267.99
7	9	1	9	1266.50	1268.32
8	8	2	8	1268.17	1271.17

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 (N/A)	REP 10 (N/A)
1	4.0	3.4	3.8	3.1	3.6	3.7	4.1	4.0		
2	3.7	4.1	4.2	3.4	3.1	3.8	4.0	4.0		
3	4.2	3.9	2.9	2.8	3.7	4.4	4.2	3.8		
4	3.8	4.6	4.2	3.4	3.5	4.2	3.6	3.6		
5	3.8	3.7	4.4	4.1	4.0	2.7	4.2	4.1		
6	3.6	3.8	3.6	3.2	3.7	4.2	4.0	4.2		
7	4.0	3.5	3.8	2.6	3.8	3.3	3.0	4.4		
8	4.0	4.2	—	—	4.0	3.6	3.5	3.9		
9	4.2	3.8	—	—	3.4	—	2.9	—		
10	3.2	3.6	—	—	—	—	—	—		

H. azteca 28-day Survival and Growth

Site I.D.: F5 (0-1)

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	4	6	4	1264.36	1265.39
2	9	1	9	1271.40	1272.64
3	7	3	7	1269.20	1270.86
4	3	7	3	1269.84	1270.88
5	6	4	6	1273.96	1275.67
6	3	7	3	1268.31	1268.99
7	7	3	7	1267.92	1269.77
8	2	8	2	1268.22	1268.87

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 N/A	REP 10 N/A
1	3.9	3.9	4.4	4.5	4.2	3.6	4.6	5.5		
2	4.4	3.8	3.1	4.2	3.3	3.9	5.0	3.6		
3	3.1	3.6	3.8	2.5	3.7	4.1	4.0	—		
4	2.8	4.1	3.8	—	4.6	—	3.6	—		
5	—	2.1	4.2	—	2.6	—	4.5	—		
6	—	3.3	3.3	—	3.4	—	3.3	—		
7	—	2.8	2.7	—	—	—	3.0	—		
8	—	—	—	—	—	—	—	—		
9	—	—	—	—	—	—	—	—		
10	—	—	—	—	—	—	—	—		

Site I.D.: S2 (0-1)

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	2	8	2	1276.69	1277.10
2	0	10	0	—	—
3	↓	↓	↓	—	—
4	↓	↓	↓	—	—
5	↓	↓	↓	—	—
6	↓	↓	↓	—	—
7	↓	↓	↓	—	—
8	1	9	1	1262.83	1262.84

Length (mm)

ORGANISM NUMBER	A REP 1	B REP 2	C REP 3	D REP 4	E REP 5	F REP 6	G REP 7	H REP8	REP 9 N/A	REP 10 N/A
1	3.5	D	D	Dead	Dead	D	D	1.6		
2	3.1	↓	↓	↓	↓	↓	↓	—		
3	—	↓	↓	↓	↓	↓	↓	—		
4	—	↓	↓	↓	↓	↓	↓	—		
5	—	↓	↓	↓	↓	↓	↓	—		
6	—	↓	↓	↓	↓	↓	↓	—		
7	—	↓	↓	↓	↓	↓	↓	—		
8	—	↓	↓	↓	↓	↓	↓	—		
9	—	↓	↓	↓	↓	↓	↓	—		
10	—	↓	↓	↓	↓	↓	↓	—		

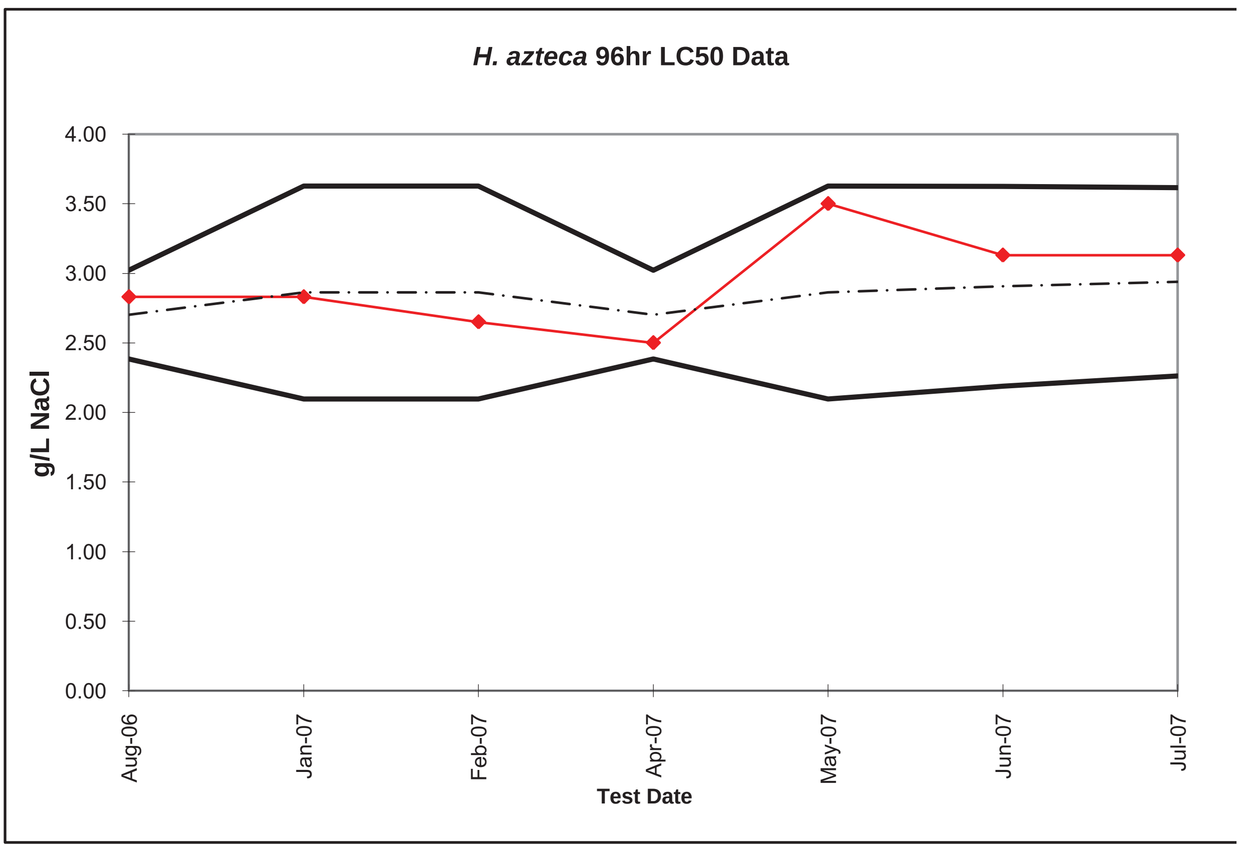
APPENDIX E

Precision of NaCl Reference Toxicant Testing

ASci Corporation Environmental Testing Laboratory
Precision of *Hyalella azteca* 96-Hour NaCl Reference Toxicant Testing

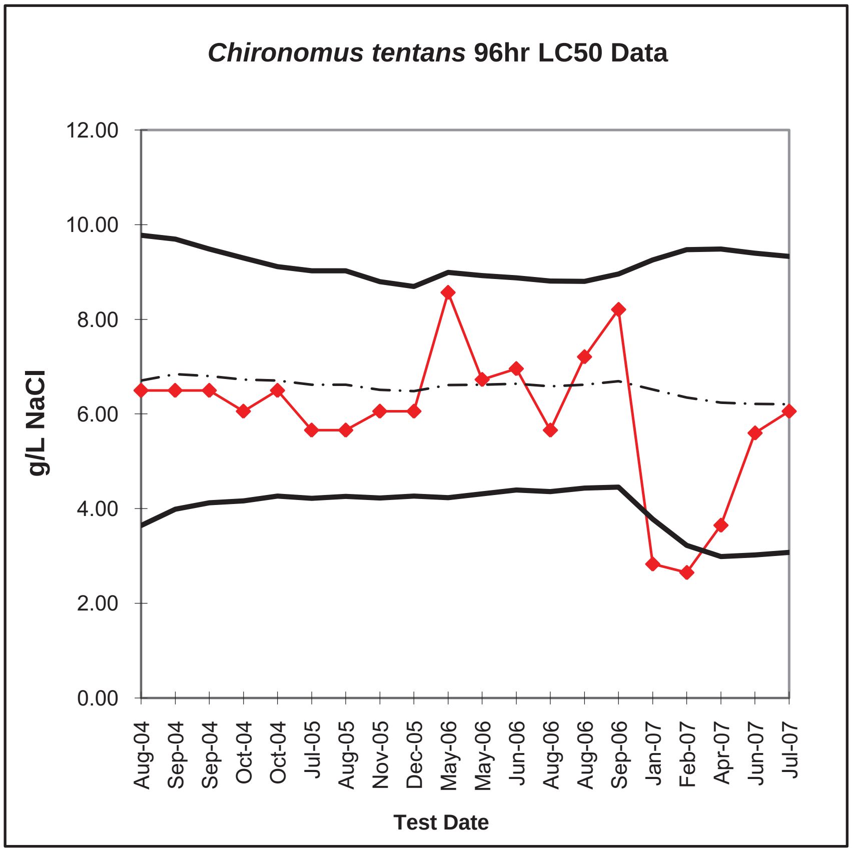
Date	LC50	+2SD	-2SD	MEAN
Aug-06	2.83	3.02	2.38	2.70
Jan-07	2.83	3.63	2.10	2.86
Feb-07	2.65	3.63	2.10	2.86
Apr-07	2.50	3.02	2.38	2.70
May-07	3.50	3.63	2.10	2.86
Jun-07	3.13	3.62	2.19	2.91
Jul-07	3.13	3.62	2.26	2.94

sd 0.34
cv 12%



ASci Corporation Environmental Testing Laboratory
Precision of *Chironomus tentans* NaCl Reference Toxicant Testing

Date	LC50	+2SD	-2SD	MEAN
Jul-03	7.46	9.15	4.31	6.71
Aug-03	5.66	9.15	3.64	6.71
Apr-04	9.85	9.06	4.22	6.62
Apr-04	5.66	10.22	4.75	7.16
Jun-04	7.46	9.64	3.51	6.96
Jul-04	5.66	10.30	3.62	6.96
Aug-04	6.50	9.78	3.64	6.71
Sep-04	6.50	9.70	3.99	6.84
Sep-04	6.50	9.48	4.13	6.81
Oct-04	6.06	9.30	4.16	6.73
Oct-04	6.50	9.11	4.27	6.71
Jul-05	5.66	9.03	4.22	6.62
Aug-05	5.66	9.03	4.26	6.62
Nov-05	6.06	8.80	4.23	6.51
Dec-05	6.06	8.70	4.27	6.48
May-06	8.57	8.99	4.23	6.61
May-06	6.73	8.93	4.31	6.62
Jun-06	6.96	8.88	4.40	6.64
Aug-06	5.66	8.81	4.36	6.59
Aug-06	7.21	8.80	4.44	6.62
Sep-06	8.21	8.96	4.46	6.69
Jan-07	2.83	9.26	3.78	6.52
Feb-07	2.65	9.47	3.23	6.35
Apr-07	3.65	9.49	2.99	6.24
Jun-07	5.60	9.40	3.02	6.21
Jul-07	6.06	9.33	3.08	6.21



sd 1.56
cv 25%