Environment

Town of Greenwich Department of Public Works

Screening-level Ecological Risk Assessment Addendum: Downstream Area

Greenwich High School

Greenwich, Connecticut

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List of Acronyms and Abbreviations

AUF	Area Use Factor
BAF	Bioaccumulation Factor
BSAF	Biota-Sediment Accumulation Factor
BERA	Baseline Ecological Risk Assessment
COPEC	Constituent of Potential Ecological Concern
CSM	Conceptual Site Model
CTDEEP	Connecticut Department of Environmental Protection
DDx	Total sum of DDD + DDE + DDT
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
GHS	Greenwich High School
HHRA	Human Health Risk Assessment
HMW	High Molecular Weight
HQ	Hazard Quotient
LOAEL	Lowest Observed Adverse Effect Level
LMW	Low Molecular Weight
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observable Adverse Effect Level
NWI	National Wetland Inventory
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated Biphenyls
PEC	Probable Effect Concentration
PEL	Probable Effect Level
SLERA	Screening Level Ecological Risk Assessment
SMDP	Scientific Management Decision Point
SQuiRT	Screening Quick Reference Tables
SVOC	Semi Volatile Organic Compound
TAL	Target Analyte List
TEC	Threshold Effect Concentration

TEL	Threshold Effect Level
T&E	Threatened and Endangered
TRV	Toxicity Reference Value
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound

1. Introduction

On behalf of the Town of Greenwich (Town), AECOM Technical Services, Inc. (AECOM) presents this aquatic screening level ecological risk assessment (SLERA) for Upper and Middle Milbrook Ponds along Greenwich Creek. These ponds, referred to herein as "the Downstream Area," are located off-site and downstream of the Greenwich High School (GHS) site ("Site") located at 10 Hillside Road in Greenwich, Fairfield County, Connecticut (**Figure 1-1**). A SLERA for the aquatic habitat at the Site was previously completed (AECOM, 2013). This evaluation of potential risk to the environment posed by sediment and surface water in the off-site Downstream Area is intended to supplement the evaluation presented in the 2013 SLERA, which addressed environmental impacts in West Brothers Brook, and is presented as a SLERA Addendum. For consistency, methods and approaches in this Addendum are the same as those presented in the 2013 SLERA. The data used in this Addendum are based on sampling of eenvironmental media (i.e., surface water and sediment) in West Brothers Brook and Greenwich Creek performed in 2013 and 2014, respectively. The 2013 SLERA and this Addendum supplement the Remedial Investigation (RI) (AECOM 2012a) and Human Health Risk Assessment (HHRA) (AECOM 2012b) for the Site. These investigations and data analysis tasks in total are being conducted to support the development of the final Remedial Action Plan for the Site.

The SLERA Addendum presented herein was specifically conducted to address potential ecological impacts related to exposure to Site-related constituents that may have migrated downstream and off-site to the surface water and sediment of Upper and Middle Milbrook Ponds. In addition to the Upper and Middle Milbrook Ponds, sediment and surface water samples were collected from North Pond, which is located upstream of the confluence of West Brothers Brook and Greenwich Creek (**Figure 1-1**), and from locations further upstream on West Brothers Brook. North Pond and the upstream West Brothers Brook samples serve as background/reference conditions ("Background") for the Milbrook Ponds in the Downstream Area.

The 2013 SLERA evaluated the potentially complete exposure pathways for upland (terrestrial) ecological habitat and determined that the pathways are limited or absent at the Site, which is an operating high school. Since the pathway for migration of Site constituents to the Downstream Area is within the aquatic system, potential exposure to upland soil is not a potentially significant exposure pathway and is therefore not addressed.

1.1 ERA Process

The Connecticut Department of Energy and Environmental Protection (CTDEEP) currently does not have state guidance for conducting ecological risk assessments (ERA) but relies on United States Environmental Protection Agency (USEPA) guidance. Therefore, ERA activities will be conducted in accordance with relevant federal guidance, including the following:

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997);
- Guidelines for Ecological Risk Assessment (USEPA, 1998); and
- Intermittent "ECO Update" Bulletins of USEPA (2001).

A SLERA is considered the first tier of the ERA process and is designed to serve as Steps 1 and 2 of USEPA's eight-step ERA process (USEPA, 1997) (**Figure 1-2**). Each successive tier of ERA requires more detailed and quantitative data analysis and interpretation. Conducting assessments in a tiered, step-wise manner allows the risk assessor and risk manager to maximize the use of available information and sampling data, while providing the opportunity to reduce uncertainties inherent in the ERA process through the use of focused supplemental data collection to fill key data gaps identified in the previous tier of the assessment, as necessary.

The purpose of the SLERA is to provide a general indication of the potential, or lack thereof, of ecological risk (USEPA, 2001), and as such, conservative assumptions are used in the SLERA to estimate the potential for risks to ecological receptors in order to determine the need for additional site-specific risk assessment through a Baseline Ecological Risk Assessment (BERA). The outcome of the SLERA is to identify the constituents of potential ecological concern (COPECs) and pathways that warrant further evaluation based on comparisons to conservative

screening levels. As indicated by the USEPA (2001), "SLERAs are not designed nor intended to provide definitive estimates of actual risk, generate cleanup goals and, in general, are not based upon site-specific assumptions."

Consistent with the 2013 SLERA, following the Step 2 screening, an additional step (i.e., Step 3A) will be conducted to refine the list of COPECs based on site specific significance. Step 3A honors the iterative ERA process outlined in ERAGS (USEPA 1997) and Guidelines (USEPA 1998) and implements more recent USEPA guidance (USEPA 2001) that focuses on the refinement of COPECs outside the context of a BERA (USEPA Step 3).

In accordance with USEPA guidance and process documents, the principal components of the SLERA Addendum include the following:

- Problem Formulation: In this phase, the objectives of the ERA are defined, and a plan for characterizing and analyzing risks is determined. Available information regarding stressors and specific sites is integrated. Products generated through problem formulation include assessment endpoints and the conceptual site model (CSM).
- Risk Analysis: During the risk analysis phase of work, data are evaluated to characterize potential ecological exposures and effects.
- Risk Characterization: During risk characterization, exposure and stressor response profiles are integrated through risk estimation. Risk characterization also includes a summary of uncertainties, strengths, and weaknesses associated with the risk assessment.

The outcome of Step 3A of this SLERA Addendum is the identification of COPECs that are responsible for the majority or all of reported risk (i.e., risk drivers) for associated media and ecological receptors of the off-site downstream area of the Site. At the end of Step 3A, a scientific management decision point (SMDP) is reached to inform risk management decisions regarding how to proceed and is based on a determination that either (1) the available data indicate the potential for ecological risk and further investigation is warranted, (2) the available data indicate either no or low potential for ecological risk and no further work is warranted, or (3) there are data gaps that must be addressed before the presence or absence of risk can be concluded (e.g., additional sampling or analysis).

1.2 SLERA Organization

The following sections are included in this SLERA Addendum:

- **Section 2, Site Conditions**, provides a summary of current conditions and available data of the off-site downstream areas of Greenwich Creek
- **Section 3, Problem Formulation**, summarizes and identifies key ecological communities, receptors, appropriate Step 2 (and Step 3A) assessment and measurement endpoints, and the process for determining Site COPECs.
- **Section 4, Exposure and Toxicity Assessment**, presents sources, procedures, and assumptions for exposure and toxicity parameters applied in Steps 2 and 3A.
- **Section 5.0, Risk Characterization**, presents the methods and process to describe risk estimates assuming Steps 2 and 3A toxicity and exposure assumptions.
- **Section 6.0, Uncertainty Analysis**, presents a summary of the sources of uncertainty inherent to ERAs.
- **Section 7.0, Risk Conclusions**, presents a summary of the risk results and conclusions based on consideration of the Step 3A refinement of COPECs risk characterization and uncertainty analyses.
- **Section 8.0, References**, provides the sources of information used in the SLERA Addendum.

2. Site Conditions

The Site is located at 10 Hillside Road in Greenwich, Fairfield County, Connecticut, at approximately 73.61 degrees west longitude and 41.04 degrees north latitude. Information obtained from the Town of Greenwich Tax Assessor's office indicates that the Site is owned by the Town and occupies 54.75 acres. The focus of the 2013 SLERA was West Brothers Brook, which passes through the Site and discharges to Greenwich Creek immediately south of U.S. Highway 1, approximately 200 feet downstream of North Pond and approximately 900 feet upstream of Upper Milbrook Pond. The Downstream Area is located immediately south of the Site along Greenwich Creek (Figure 2-1). Upper and Middle Milbrook Ponds were part of the study area and were sampled; Lower Milbrook Pond was not sampled. Greenwich Creek discharges to Long Island Sound via Indian Harbor downstream of Lower Milbrook Pond.

2.1 Current and Future Land Use

The three Downstream Area ponds are located along Greenwich Creek south of East Putnam Avenue in between Woodside Drive to the east and West Brother Drive to the west. The ponds are surrounded by residential properties. A private golf course (Milbrook Club) borders Middle Milbrook Pond and the southern end of Upper Milbrook Pond to the east. The reasonably anticipated future land use at and surrounding the Downstream Area is expected to remain unchanged from current use.

2.2 Previous Investigations

The following summary was provided in the 2013 SLERA and outlines the investigations performed at the Site to date. The reports and supporting information presented below have previously been made available to federal and state regulators and released to the public and are available at the Greenwich Public Schools Environmental Testing webpage (GPS, 2017). Please refer to the RI for full detail regarding these investigations.

- Diversified Technology Consultants (DTC) site wide surface soil sampling (July and August 2011) – focused investigation on the grass-covered athletic fields, grass-covered areas surrounding the athletic fields, and grass and soil covered areas on the southern portion of the Site.
- DTC Phase I ESA for the Site (August 2011) – summarized site historical information and identified nine areas of concern (AOCs). The Phase I ESA recommended that additional site investigation activities be performed;
- Interim Remedial Measures (IRMs) (September 2011) –- IRMs were performed to allow for safe access to the athletic fields.
- AECOM soil investigation (October and November 2011) – conducted in support of the MISA construction activities. Several reports were generated based on this investigation:
    - MISA Investigation Report, AECOM, January 23, 2012.
    - Soil Remedial Action Report, AECOM, January 23, 2012.
    - Soil Remedial Action Report Addendum, AECOM, April 20, 2012.
    - Town of Greenwich Response to the EPA, Town of Greenwich, August 16, 2012.

- AECOM site wide investigation (December 2011) – investigation activities included collection of surface and subsurface soil samples, installation of groundwater monitoring wells, groundwater sampling, and sampling of surface water and sediments from the West Brothers Brook and Cider Mill Pond.
- AECOM drinking water supply and well surveys (March 2012) – conducted for all properties abutting the GHS Site and within a quarter-mile of the property boundary.
- AECOM supplemental site wide investigations (February and April 2012) – Investigation activities included collection of surface and subsurface soil samples, installation of additional groundwater monitoring wells, and collection of groundwater samples from new and existing wells.
- AECOM supplemental site wide investigation in June and July 2012 – Investigation activities included collection of surface and subsurface soil samples, installation of additional groundwater monitoring wells, collection of groundwater samples from new and existing wells, collection of sediment and surface water samples from West Brothers Brook and Cider Mill Pond, collection of ambient air samples site-wide, and collection of soil vapor samples from beneath and near the high school buildings.

2.3 Ecological Characteristics

The focus of this SLERA Addendum is on the aquatic habitats of Upper and Middle Milbrook Ponds, where Site-related constituents could have migrated and been deposited. Upland (terrestrial) habitat adjacent to the ponds is limited in extent by developed residential areas, as impervious cover and maintained areas make up the majority of the upland habitat , which includes buildings, paved parking areas, manicured/landscaped lawns and golf course, all with minimal ecological habitat. Ecological habitat in these areas is either entirely absent or consists of limited areas of suburban landscape and in narrow and discontinuous wooded corridors. Animal life is limited to occasional foraging by urbanized birds and mammals. In addition, migration of Site-related constituents from Greenwich Creek to upland habitat is not considered a complete pathway. Therefore, terrestrial areas are not evaluated in this SLERA Addendum. Ecological habitat is limited to the aquatic habitat associated with the two Milbrook Ponds in the Downstream Area. Photographs taken during the 2014 sampling event are presented in Appendix A.

2.3.1 Site Exposure Areas and Habitat

The Downstream Area is composed of three ponds (Upper Milbrook, Middle Milbrook and Lower Milbrook) connected by Greenwich Creek downstream of the confluence with West Brothers Brook. Greenwich Creek flows from the north passing under East Putnam Ave and into North Pond upstream of the confluence with West Brothers Brook. From North Pond, Greenwich Creek continues south, combining with West Brothers Brook (which flows through urban residential areas upstream of the Site and the Site itself) and flowing through a concrete-lined reach into Upper Milbrook pond. Upper Milbrook Pond extends approximately 1,700 feet south to a weir, which is the outlet to Middle Milbrook Pond, an approximately 375-foot long pond between Upper and Lower Milbrook Ponds. Lower Milbrook Pond extends over a half mile further south to the outlet under Davis Avenue toward Indian Harbor, which in turn discharges to Captain Harbor of Long Island Sound.

Upper Milbrook Pond

Upper Milbrook Pond is approximately 500 meters in length, varies in width between 80 and 100 meters, narrowing to approximately 20 meters near the southern and northern ends. The shoreline is bordered by residential properties with maintained/landscaped lawns, although some tree cover along the edge of water exists. The pond, although long, is relatively shallow with large amounts of leafy debris covering the bottom. The pond contains macrophytes and algae populations. Pesticide application signs were observed on properties bordering the pond.

Middle Milbrook Pond

Middle Milbrook is located below the outlet of Upper Milbrook Pond and flows along the western edge of a small park until it passes under West Brother Drive. The Milbrook Club is located to the east of the pond. The pond is narrow

and comparatively deeper with a concrete ledge along the western side. Pond sediment is dominated by silt. Large amounts of leafy debris and algae exist throughout the pond. Two freshwater mussels, Eastern Floaters (Pyganodon cataracta), were recovered during sampling in October 2014.

Background

Sediment and surface water samples were collected upstream to define background reference conditions for the Upper and Middle Milbrook Ponds. One sample was collected in North Pond, a small pond (0.41 acres according to the National Wetland Inventory [NWI]) on a residential property south of East Putnam Ave. Water from Greenwich Creek flows from the north under East Putnam Ave into the pond and exits the pond over a small weir to the west. North Pond is approximately 200 feet upstream of the confluence of West Brothers Brook and Greenwich Creek. Due to the flow pattern, the pond bottom nearest the southern edge is largely scoured and armored with gravel, whereas leaf litter, milfoil and algae are found in the pond center. Sediments collected from the central western portion of the pond were observed as fine to coarse sand with trace amounts of silt. The edge of the pond is delineated by artificially placed stones.

Four additional sediment and surface water samples were collected from West Brothers Brook upstream of the Site **(Figure 2-1).** These data were collected to supplement the understanding of background conditions for West Brothers Brook on the Site.

2.4 Sensitive Species and Habitats

Based on consultation with the U. S. Fish and Wildlife Service (USFWS) and the CTDEEP (for state-listed species), and site-specific assessment of potential habitat, no state and federally listed species were identified as a potential species expected to occur at or in association with the Site or its environs (AECOM, 2013). **Appendix B** provides a listing of threatened and endangered (T&E) species provided by CTDEEP and USFWS known to occur in Fairfield County and the assessment to determine potential Site T&E presence. Given the proximity of the Downstream Area to the GHS Site, it is not expected that sensitive species or habitats are present.

The presence of wetlands at or near the Site was also reviewed, via a desktop analysis, based on examination of data available from the USFWS National Wetland Inventory (NWI). **Appendix B** provides a NWI map showing the two Milbrook Ponds and other nearby water bodies. Upper and Middle Milbrook Ponds are classified as lacustrine limnetic systems that are permanently flooded and diked or impounded. No areas of emergent wetlands (or other environmentally sensitive areas) are known to be present in the area (at or within one-half mile of the Site). In the Background Area, North Pond is designated as a palustrine unconsolidated bottom, permanently flooded and excavated water body.

The focus on the NWI is to make available to the public inventoried wetland area maps and/or digital database resources that apply the USFWS wetland classification system, which describes key wetland attributes. The NWI also provides projections and reporting on national wetland trends. Review of the NWI is a preliminary step in establishing a need to conduct a “ground truth” survey and/or a detailed wetland delineation study (i.e., should emergent wetland areas be identified) per state and/or federal (i.e., United States Army Corps of Engineers) guidelines.

3. Problem Formulation

3.1 Objective

The primary objective of the SLERA Addendum is to evaluate the available data to determine whether or not the potential is present for risks posed to ecological receptors by Site-related constituents that may have migrated downstream. Problem formulation is the initial step of the SLERA process in which the Downstream Area conditions are characterized by assessing the potential for ecological habitat and ecological receptors and identifying Site-related constituents. The information collected during problem formulation is used to develop a CSM describing the potential exposure pathways and ecological receptors to be considered in the SLERA. The following parameters will be addressed in the problem formulation:

- Ecological fate and transport pathways and media of concern;
- Key habitats and receptors;
- Assessment and measurement endpoints;
- Conceptual Site Model; and
- Determination of site COPECs

3.1.1 Ecological Fate and Transport Pathways and Media of Concern

The potential migration pathways by which ecological receptors may be exposed to Site-related chemicals in the Downstream Area includes overland surface flow/erosion following precipitation events, particularly during the filling of the wetlands and construction of the athletic fields at GHS, and potentially includes leaching of contaminants from Site soil to groundwater and subsequent groundwater discharge to surface water of West Brothers Brook. Site-related contaminants present in surface water and sediment from West Brothers Brook have the potential to flow downstream to the Milbrook Ponds. The following media and pathways are considered potentially complete and significant for ecological exposure:

- **Surface water, direct contact/indirect contact –** This pathway is potentially complete for aquatic/semi-aquatic wildlife receptors and assumes exposure via direct contact with surface water in the Downstream Area and indirect exposure via ingestion of biota (e.g., (non-rooted) aquatic plants and invertebrates).
- **Sediment, direct contact/indirect contact –** This pathway is potentially complete for benthic (sediment-dwelling) and aquatic/semi-aquatic receptors and assumes exposure via direct contact with sediment in the Downstream Area and indirect exposure via ingestion of sediment-dwelling biota (e.g., rooted aquatic plants and benthic invertebrates).

Potentially complete and significant pathways are put into the context of applicable assessment and measurement endpoints as discussed below.

3.1.2 Key Habitats and Receptors

The key habitat identified in the vicinity of the Downstream Area is limited to aquatic habitat. As such, the following representative ecological receptors will be evaluated in the SLERA:

- Aquatic receptors:
  - Aquatic Community (plants, invertebrates, and fish);
  - Amphibian Community (larvae);
  - Pelagic fish through ingestion and direct contact with surface water,
  - Benthic Community (invertebrates);
  - Great Blue Heron (piscivorous bird);
  - Mallard (omnivorous bird); and

  - Muskrat (herbivorous mammal).
- Semi-Aquatic receptors (evaluated for aquatic exposure):
  - Mink (carnivorous/piscivorous mammal); and
  - Raccoon (omnivorous mammals).

Rationale for selection of each of these receptors is provided in **Table 3-1**.

3.1.3 Assessment and Measurement Endpoints

Ecologically-based assessment endpoints and measures of effects are designed to evaluate potential ecotoxicological effects associates with exposure to identified COPECs. Assessment endpoints describe the characteristics of an ecosystem that have an intrinsic environmental value to be protected (i.e., protection of a fish community; no potential risk to endangered species). Because assessment endpoints often cannot be measured directly, a set of surrogate measurement endpoints are generally selected for ecological risk assessment that relate to the assessment endpoints but have measurable attributes (e.g., comparison of media concentrations to screening levels) (USEPA 1997, 1998). These measurement endpoints provide a quantitative metric for evaluating potential effects of constituents on the ecosystem components potentially at risk. The following assessment and measurement endpoints have been identified for the SLERA Addendum:

- Assessment Endpoint 1 – Protection and maintenance of aquatic invertebrate, aquatic plant (rooted and free-floating), amphibian and fish communities typical of comparable Connecticut aquatic habitats with similar morphology and hydrology.
  - Measure of Effect 1 – Comparison of surface water concentrations to surface water screening values. Concentrations above the screening values are considered indicative of a potential for ecological risks.
- Assessment Endpoint 2 – Protection and maintenance of benthic invertebrate and fish communities typical of comparable Connecticut wetland habitats.
  - Measure of Effect 2 – Comparison of sediment concentrations to sediment screening values. Concentrations above the screening values are considered indicative of a potential for ecological risks.
- Assessment Endpoint 3 – Protection and maintenance of birds and mammals within the study area typical of comparable Connecticut urban aquatic habitats.
  - Measure of Effect 3 – Comparison of modeled dietary intakes for birds and mammals using sediment and surface water COPEC concentrations and modeled tissue COPEC concentrations with literature-based ingestion screening values.

3.1.4 Conceptual Site Model

The CSM presented in **Figure 3-1** describes the origin, fate, and transport of contamination from the Site, and exposure pathways and receptors of concern within the Downstream Area. **Figure 3-2** provides a food web model that further defines the CSM. As depicted in these figures, the potentially complete exposure pathways for ecological receptors are associated with sediment and surface water in the Downstream Area and were determined to exist for:

- Aquatic invertebrates and amphibian larvae through direct contact with surface water,
- Aquatic plants through root uptake of surface water,
- Benthic fish through ingestion and direct contact with sediment and ingestion of surface water,
- Benthic invertebrates through direct contact with sediment, and,
- Bioaccumulation and ingestion of contaminated food items by birds and mammals.

3.2 Determination of COPECs

The target analyte list (TAL) for the Downstream Area was defined based on the TAL determined for the 2013 SLERA. Site history and background information is detailed in the RI (AECOM 2012a). The TAL includes metals,

semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and pesticides.

3.2.1 Dataset

The surface water and sediment dataset used in this SLERA Addendum were collected from the Downstream Area in October 2014 and from the upstream locations in West Brothers Brook in July 2013. Five co-located surface water and surface sediment samples were collected from Upper Milbrook Pond and Middle Milbrook Pond (**Figure 2-1**). In the Background Area, one location in North Pond was sampled, and four locations were sampled in West Brothers Brook. Sediment samples were collected from the upper 6 inches after removing leaf litter and other surficial debris. Surface water samples were collected from mid-depth of the water column and were field-filtered for metals analysis. The dataset has been validated and the analytical data have been determined to be adequate for risk assessment purposes. The analytical data used in the SLERA Addendum are presented in **Table 3-2**, and a summary of the investigation activities and results are provided in **Appendix C**.

3.2.2 COPEC Screening Process

The COPEC screening process is implicit in the overall ERA process, which serves to focus on only those COPECs that are likely to result in exposures producing the potential for unacceptable risk. Inherent in the COPEC screening process is defining the initial set of COPECs by comparison of maximum detected site concentrations to conservative screening concentrations protective of ecological receptors. **Figure 3-3** presents the site-specific COPEC selection process, consistent with USEPA guidance. All COPECs identified in this process were carried forward for development of Step 2 risk estimates. Non-detected analytes with the maximum reporting limit (MRL) in excess of applicable screening levels are addressed in the uncertainty analysis.

3.2.2.1 Calculated Totals

To accommodate those classes of analytes for which screening levels and/or toxicity data are available on a total basis, analytical results for individual constituents (e.g., isomers, congeners, or homologues) were summed. Only detected constituent concentrations were included in the total calculation; non-detected constituents were treated as zeros for the calculation of the sum. In cases where no individual constituents were detected, the total concentration is treated as a "non-detect" and represented by the highest reporting limit for individual constituents. Based on the constituents detected in sediment in the Downstream Area, the following chemical constituents were summed:

Parameter	**Constituent Parameters**
Polycyclic Aromatic Hydrocarbons	
Total High Molecular Weight (HMW) PAHs	benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3,-c,d)pyrene, and pyrene
Total Low Molecular Weight (LMW) PAHs	acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene; and 1- and 2-methylnaphthalene
Total PAHs	acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3,-c,d)pyrene, naphthalene, phenanthrene, pyrene; and 1- and 2-methylnaphthalene
Pesticides	
Total DDx	4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT), 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE),and 4,4'dichlorodiphenyldichloroethane (4,4'-DDD)

3.2.2.2 Ecological Screening Levels

The sources and hierarchy for selection of screening levels for application in the COPEC screening process are presented in **Table 3-3** for all target analytes. The primary sources include:

- For sediment, screening levels are derived from the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRT) tables (Buchman 2008); and
- For surface water, screening levels are derived from Connecticut Water Quality Standards (CTDEEP 2011) and National Ambient Water Quality Criteria (USEPA 2010).

Additional sources and hierarchy of selection are detailed in **Table 3-3**.

3.2.2.3 COPEC Screening Results

The complete COPEC evaluation conducted by medium for all detected and non-detected analytes is presented in **Appendix D**. Detected COPECs were retained for quantitative evaluation in the Step 2 SLERA and include the following in the Upper and Middle Milbrook Ponds:

- Surface water -
  - Two metals (barium and copper)
- Sediment :
  - Ten metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, vanadium, and zinc); and PAHs (as total HMW PAHs, total LMW PAHs, and total PAHs).

4. Exposure and Toxicity Assessment

The risk analysis phase of the SLERA is based on the CSM developed in problem formulation. Risk analysis includes the characterization of potential ecological exposure and corresponding effects. The ecological exposure assessment involves the identification of potential exposure pathways and an evaluation of the magnitude of exposure or identified ecological receptors. The ecological effects evaluation describes the potential adverse effects to ecological receptors from exposure to COPECs in environmental media. Benthic invertebrates are evaluated on a community-level basis and are exposed to potentially affected media on a continuous basis, whereas wildlife are evaluated on an individual basis and are generally more mobile and, thus, exposed to potentially affected media on an intermittent basis. The following sections describe the sources and methods for quantifying exposure and toxicity.

4.1 Ecological Exposure Assessment

The exposure assessment presents the assumptions and parameters used to develop estimates of exposure. Per USEPA (1997) guidance, the SLERA is an evaluation based on conservative assumptions and is intended to eliminate COPECs with no potential to cause risk. To this end, the Step 2 initial COPEC screening serves to identify indicators of potential risk. A more-detailed Step 3A refinement of COPECs evaluation (USEPA 2001, 1997) allows for the identification and characterization of current and future risk using site-specific assumptions, and ultimately serves to define the scope for additional ERA tiers (e.g., baseline ERA) or as the basis for risk-based decisions.

Table 4-1 defines the specific differences in exposure assumptions used for the Step 2 screening and Step 3A refinement of COPECs and indicates where the site-specific and receptor-specific values are implemented in the SLERA process. Each exposure parameter is described in more detail in the following subsections.

4.1.1 Community-based Receptor Exposure

Community-based receptors are assumed to be exposed to contaminants on a continuous basis. For example, aquatic plant communities experience direct uptake via roots and/or foliage. Assessing contaminant exposure in ecological communities is, therefore, based upon the integration of all exposures into a single criterion for the media of exposure (i.e., the screening benchmark).

4.1.2 Wildlife Receptor Exposure

Ingested doses to wildlife receptors are modeled using exposure point concentrations (EPCs) along with exposure parameters for a given representative receptor. The following generalized equation was used to evaluate the total daily dose (TDD) for each wildlife receptor from all sources (i.e., prey items, drinking water, and incidental ingestion) for each COPC:

$$TDD = \Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w]) \times ED \times AUF,$$

Body Weight

where:

TDD = Total daily dose ($mg/kg_{body\ weight}/day$)

IR_f = Ingestion rate of food (kg_{ww}/day),

IR_s = Incidental ingestion rate of sediment (kg_{dw}/day),

IR_w = Ingestion rate of water (L/day),

C_f = Concentration of COPC in prey (mg_{ww}/kg),

C_s= Concentration of COPC in sediment (mg_{dw}/kg),

C_w = Concentration of COPC in water (mg/L),

ED = Exposure duration (fraction of time receptor spends within exposure area), and

AUF = Area use factor (ratio of the receptor's home range, etc., relative to the size of exposure area).

4.1.3 Bioaccumulation Factors

Bioaccumulation factors (BAFs) are used to estimate prey tissue concentrations in the absence of empirical, site-specific data. This estimate is based on the product of the BAF and media concentration. BAFs were developed for each of the following biota: aquatic plants, sediment invertebrates, and fish. The BAFs for site-specific COPECs are presented in **Table 4-2** and are consistent with the BAFs used in the 2013 SLERA. The BAFs and hierarchy of sources for quantitatively evaluated media are summarized below.

- **Soil/Sediment to Plant BAF**. For metals and inorganics, the BAFs developed by Bechtel-Jacobs (1998a) are used as the primary source. Organic BAFs are modeled per the uptake relationship based upon the octanol water partitioning coefficient (Kow) developed by USEPA (2005) where applicable. Estimated plant uptake values (constants) are computed using the following relationship for analytes having a log Kow between 3 and 8:
- Log $BAF_{soil/sediment\ to\ plant}$ = 1.781 – 0.4057 * log K_{ow} (USEPA 2005)
- For those analytes with log Kow outside of this range, the relationship presented is used, as cited in EPA (1999).
- **Sediment to Benthic Invertebrate BAF**. Uptake factors for sediment to benthic invertebrates for inorganics are based on values obtained from Bechtel-Jacobs (1998b). Organic BAFs (or rather biota-sediment accumulation factors [BSAFs] for invertebrates) are derived from EPA's Biota-Sediment Accumulation Factor Data Set (EPA 2012) or EPA's 2nd Edition of the National Sediment Quality Survey (EPA 2004) where available. For other organics lacking applicable values, a default value of 1 is used.
- **Surface Water to Fish BAF**. Uptake factors for surface water to fish are based on values obtained from EPA 2002 (National Recommended Water Quality Criteria), California Office of Environmental Health Assessment (OEHHA 2012), and USEPA's EPI Suite database (EPA 2011a).
- **Sediment to Fish BSAF**. Uptake factors for sediment to fish (BSAFs) are based on values obtained from USEPA's EPI Suite database (USEPA 2011a) or USEPA's 2nd Edition of the National Sediment Quality Survey (USEPA 2004).
-

4.1.4 Life History Parameters

Life history parameters and exposure factors for wildlife receptors were derived from USEPA (2005, 1993) or calculated using the relationships cited therein. The life history parameters for wildlife receptors quantitatively evaluated in the SLERA Addendum are presented in **Table 1** of **Appendix E** and are consistent with those used in the 2013 SLERA.

Other pertinent parameters in assessing exposure are area use factors (AUF) and absorption factors (or bioavailability). The AUF is the site-specific ratio of the defined exposure area to the total area of foraging or home range of the receptor. Foraging areas obtained from EPA (1993) and other literature sources were applied to the site-defined exposure area(s). To return conservative estimates of risk, 100 percent bioavailability (i.e., AUF=1) of site COPECs is assumed for the Step 2 evaluation. For Step 3A, an AUF of less than 1 is calculated if the home or foraging range exceeds the approximate area of the Downstream Area. Bioavailability issues are discussed qualitatively, as necessary, in the risk characterization and uncertainty analysis.

4.1.5 Exposure Point Concentrations

EPCs were estimated for sediment (0 to 6 inches deep) and surface water for each COPEC to evaluate the selected ecological exposure pathways and receptors. These EPCs represent the range of media concentrations that ecological receptors may encounter. Consistent with the 2013 SLERA, the Step 2 EPC is the maximum detected

concentration. In Step 3A, a central tendency estimate is typically used to represent the EPC. However due to the small sample size of sediment and surface water in the Downstream Area (n = 6), the maximum EPC is used in this step as well. The EPCs for sediment and surface water are presented in **Table 4-3**.

4.2 Ecological Effects Assessment

The purpose of the effects assessment phase is to identify screening ecotoxicity benchmarks to be used to evaluate media of concern. For the purposes of the SLERA, the benchmarks represent media-specific levels below which there is minimal risk to receptors. These ecological screening values are based on conservative endpoints and sensitive ecological effects data. They represent a preliminary screening of contaminant levels to determine if there is a need to conduct further analyses or investigations.

4.2.1 Surface Water Benchmark Screening

Fish may potentially be exposed to COPECs from direct contact with surface water. Potential risks to these receptors from COPEC exposure in surface water will be evaluated through comparisons of surface water data with literature-derived toxicity thresholds.

Table 3-3 presents the surface water screening levels, which are based on the same hierarchy of sources that were used in the 2013 SLERA at the GHS Site (AECOM, 2013), the primary sources being Connecticut Water Quality Standards (CTDEEP 2011) and National Ambient Water Quality Criteria (USEPA 2010).

4.2.2 Sediment Benchmark Screening

Benthic invertebrates may potentially be exposed to COPECs from direct contact with sediment. Potential risks to these receptors from COPEC exposure in sediment will be evaluated through comparison of sediment data with literature derived toxicity thresholds.

Table 3-3 presents the sediment screening levels, which are those used in the 2013 SLERA at the GHS Site (AECOM, 2013) The primary source for Step 2 thresholds is the effect (low) levels (e.g., threshold effect concentration [TEC]) from the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRT) tables (Buchman 2008). The Step 3A evaluation compares media concentrations to the sediment probable effect benchmark (e.g., probable effect concentration [PEC] or probable effect level [PEL]) instead of the threshold sediment levels. The probable effect concentration screening benchmark is the concentration above which some adverse effects may be expected in more than 50 percent of benthic communities. The probable effect sediment benchmarks were derived from a combination of sources (defined subsequently).

4.2.3 Wildlife Receptors

For wildlife receptors, two toxicity reference values (TRVs) were developed based upon ingested dose and appropriate toxicological effect endpoint(s) (i.e., reproduction and growth):

- A No Observed Adverse Effect Level (NOAEL)-based TRV applied in the Step 2 screening and Step 3A refinement of COPECs; and
- A Lowest Observed Adverse Effect Level (LOAEL)-based TRV applied in the Step 3A refinement of COPECs.

All TRVs were derived from recognized literature sources including (in order of preference) USEPA (2005), Sample et al. (1996), USEPA (1999), and others as available. The TRVs used for this evaluation are presented in **Appendix E**. The TRVs used in the SLERA Addendum are consistent with those from the 2013 SLERA.

All toxicity study-based doses were adjusted for study duration and toxicological endpoint to chronic NOAEL and chronic LOAEL TRVs by application of uncertainty factors (UF) as applicable per USEPA (1997). All UFs are presented in **Tables 3** and **4** of **Appendix E**. Refinement of the laboratory/study-based TRVs to the relevant ecological receptor using intertaxon extrapolation was not done due to the associated uncertainties. Ecological TRVs were developed separately for birds and mammals, and no extrapolation across taxonomic classes was

applied (i.e., mammalian toxicity data was not extrapolated to birds or vice-versa). COPECs without available toxicity data are discussed in the uncertainty analysis.

The TRV available for total PAHs for birds was developed from a study conducted by Patton and Dieter (1980) based on a PAH mixture, as there is a paucity of reliable individual PAH toxicity values for avian species. For mammals, a hazard quotient (HQ) was developed for LMW PAHs and HMW PAHs, as adequate toxicity data are available to make this distinction for mammals. A Hazard Index (HI) for PAHs, which approximates a total PAH risk level, is equal to the sum of the HQs for the LMW and HMW PAHs and is provided for comparative purposes for the evaluation of PAH risk to birds and mammals. This approach is consistent with the 2013 SLERA and allows for equal comparison of mammals (TRVs available for LMW and HMW PAHs) and birds (TRV available for total PAHs).

5. Risk Characterization

The results of the risk analysis are analyzed and interpreted to determine the likelihood of adverse environmental effects and to determine whether a conclusion of no significant risk can be reached for each assessment endpoint evaluated. The ecological risk characterization summarizes the results of the risk analysis phase of work and provides interpretation of the ecologically significant findings, which form the basis to support the SMDP.

Potential risks to ecological receptors are evaluated by calculating screening HQs. Screening HQs are calculated for each constituent by comparing the maximum EPCs in each media in each study area to the appropriate screening level using the following formula:

Hazard Quotient (HQ) = EPC/Ecological Screening Level

For higher trophic level wildlife receptors, the risk estimate is also based on the HQ, defined as the dietary intake (or dose) of a COPEC divided by the species-specific TRV:

HQ = Dietary Intake/TRV

When the HQ is less than 1 (i.e., the concentration was less than the screening level), the constituent exposure is assumed to fall below the range considered to be associated with adverse effects for growth, reproduction, or survival of individual receptors, and no population level risks are assumed to be present, and thus, the exposure pathway can be eliminated from further BERA investigations. For HQ values greater than 1, the constituent is identified as a COPEC, and further evaluation of potential risk may be warranted to evaluate the potential for risk to ecological receptors.

The HQ is not a predictor of risk but rather is an index used to rule out potential risk. A HQ ≤ 1 suggests that a given COPEC/receptor combination may be excluded from further consideration (i.e., potential risk is not likely). If the HQ is >1 then the potential for risk cannot be ruled out for the given assessment endpoint. Note also that the magnitude of the HQ is not comparable across assessment endpoints (i.e., a HQ of 10 for one receptor does not necessarily indicate worse effects than a HQ of 5 for another), as the underlying dose-response relationship is not linear nor comparable between species.

Except for PAHs, for which toxic effects are generally considered additive based on a general narcosis model of toxicity (Di Toro and McGrath 2000; Di Toro et al. 2000), a cumulative HI is not calculated (USEPA 1997). For mammals, the HI for PAHs is equal to the sum of the HQ for LMW PAHs and HMW PAHs. For birds, a HI is not necessary as a total PAH TRV is used to derive a HQ.

Risk estimates developed in Step 2 are not intended to serve as a basis for a SMDP but rather as a means to identify COPECs to be carried forward into the Step 3A refinement of COPECs analysis. For Step 3A, a risk estimate was computed based on site-specific exposure assumptions that consider the full distribution of exposure and effect (e.g., in Step 3A, wildlife risks are bounded by toxicity study duration endpoints based on a NOAEL-based and a LOAEL-based HQ). This provides a range of potential risks. Both Step 2 and Step 3A risk estimates are tabulated and presented in the SLERA.

The outcome of the Step 3A refinement of COPECs represents a SMDP that provides the basis for risk management decisions for the Site. The Step 3A refinement of COPECs risk characterization criteria for key assessment endpoints are summarized below:

- Potential risk to wildlife species exposed to sediment, prey, and surface water are based on the Step 3A HQs (or the HI for PAHs for mammals). Exceedance of a HQ=1 (or mammalian HI=1 for PAHs) suggests that risk cannot be ruled out. Potential for risk that cannot be excluded based on the HQ is discussed further in the uncertainty analysis, in which additional factors are considered in qualifying the estimated risk, if applicable. Such factors include but are not limited to the contribution of local or regional background concentrations to the reported risk and bioavailability of COPECs based on dietary consumption.

Risk reported in the Step 3A risk characterization is carried forward for further consideration in the uncertainty analysis (Section 6.0). The uncertainty analysis provides a means to discuss the uncertainties related to interpretation of risk characterization results.

5.1 Step 2 Screening Level Ecological Risk Characterization

This section summarizes the risk characterization results for the selected assessment endpoints under the screening level exposure and toxicity scenarios.

5.1.1 Surface Water Evaluation (Assessment Endpoints 1 and 2: Aquatic Community and Amphibians)

Table 5-1 shows a summary evaluation of surface water data against aquatic life and amphibian screening levels. Surface water was analyzed for metals, pesticides, and PAHs. In the Downstream Area, there were two chemicals (barium and copper) detected in the downstream surface water:

- Barium was detected in all five samples with a maximum detected concentration of 135 ug/L, which exceeded the aquatic life screening level of 3.9 ug/L. There was no amphibian screening level available for comparison to barium.
- Copper was detected in three of the five samples with a maximum detected concentration of 7.6 ug/L, which exceeded the aquatic life screening criteria of 4.8 ug/L. The maximum concentration of copper did not exceed the amphibian screening level of 15 ug/L.

The potential for unacceptable risk cannot be excluded from these COPECs, and as such, these COPECs are considered in Step 3A.

5.1.2 Sediment Evaluation (Assessment Endpoint 3: Benthic Invertebrate Community)

Table 5-2 shows the summary evaluation of sediment data against Step 2 and Step 3A screening levels protective of the benthic invertebrate community assessment endpoint. Only Step 2 evaluation is discussed in this section. Step 3A evaluation is discussed in Section 5.2. For the Step 2 screening level evaluation the appropriate screening level is the threshold effect level (TEL). Downstream surface sediment was sampled for metals, pesticides, PCBs (Aroclors), and PAHs. There were no PCBs detected in sediment.

Ten metals were detected in the downstream surface sediment and all exceeded the Step 2 TELs. The ten metals included (with maximum concentrations in parentheses): arsenic (14.2 mg/kg), barium (823 mg/kg), cadmium (2.83 mg/kg), chromium (95.5 mg/kg), copper (416 mg/kg), lead (305 mg/kg), mercury (0.577 mg/kg), nickel (57.2 mg/kg), vanadium (101 mg/kg), and zinc (508 mg/kg). The TELs for two metals (barium and vanadium) are the background sediment concentrations, and therefore potential toxicity cannot be predicted based on background exceedances (as described further in Section 5.2.2). The potential for unacceptable risk cannot be excluded from the ten aforementioned metals. These COPECs are considered in Step 3A.

Twelve individual PAHs were detected in downstream surface sediment. PAHs were evaluated on a total basis (i.e., total HMW PAHs, total LMW PAHs, and total PAHs were calculated). All total calculated PAHs exceeded the step 2 screening levels:

- The maximum calculated Total HMW PAHs (104 mg/kg) exceeds the Step 2 TEL of 0.193 mg/kg.
- The maximum calculated LMW PAHs (11.5 mg/kg) exceeds the Step 2 TEL of 0.0764 mg/kg.
- The maximum calculated total PAHs (116 mg/kg) exceeds the Step 2 TEL of 1.6 mg/kg.

The potential for unacceptable risk cannot be excluded for these COPECs. These COPECs are considered in Step 3A.

5.1.3 Sediment Evaluation (Assessment Endpoints 4, 5, 6, 7, and 8: Aquatic-feeding Mammals and Birds)

Table 5-3 presents the summary results of the Step 2 Downstream Area food web model with supporting calculations presented in **Appendix E**. The EPCs used in the Step 2 food web model evaluation are the maximum detected concentrations, because the limited dataset in the Downstream Area precluded meaningful calculation of central tendency values for sediment and surface water. In addition, 100 percent bioavailability (i.e., AUF=1) of site COPECs is assumed for the Step 2 evaluation. The Step 2 screening-level food web evaluation is based on highly conservative assumptions: continual (lifelong and year-round) exposure to the maximum concentration in the exposure area, NOAEL-based TRVs, and preferential feeding on the most contaminated food item.

For wildlife receptors, the following are the results of the food web calculations for the Downstream Area:

- Great blue heron
  - NOAEL-based HQ for total PAHs exceeds 1.
- Mallard
  - NOAEL-based HQs for copper, lead, vanadium, and zinc exceed 1.
- Mink
  - NOAEL-based HQ for copper, total HMW PAHs, and total PAHs exceeds 1.
- Raccoon
  - NOAEL-based HQ for copper exceeds 1.
  - NOAEL-based HQs for nickel, total HMW PAHs and total PAHs slightly exceed 1.
- Muskrat
  - NOAEL-based HQ for total HMW PAHs and total PAHs slightly exceeds 1.

These results indicate minimal risks to wildlife receptors in the Downstream Area, and risks cannot be eliminated for PAHs (heron, mink, raccoon, and muskrat), copper (mallard, mink and raccoon), lead (mallard), vanadium (mallard) and zinc (mallard). These results do consider site-specific area use factors for receptors or background or upstream conditions for these COPECs.

5.2 Step 3A Refinement of COPEC

In the refinement of COPEC step, exceedances of Step 2 screening criteria are further evaluated based on modifying factors. These include:

- Consideration of background where available. Regional literature-based background concentrations are considered as applicable.
- The comparison against probable effect sediment levels.

The consideration of an area average EPCs for sediment and surface water was not appropriate due to the low detection frequency and total number of samples available. Therefore, the calculation of a central tendency value (i.e., 95% upper confidence limit [UCL]) was not completed and the EPCs used in the Step 3A evaluation are the maximum detected concentrations. Similarly, the food web model evaluation defaults to the maximum detected concentrations and is carried out with conservative exposure parameters. The Step 3A food web model presents evaluations based on LOAEL-based TRVs, and the Maximum Allowable Toxicant Concentration (MATC)-based TRVs.

5.2.1 Surface Water Evaluation (Assessment Endpoint 1: Aquatic Community)

Two metals (barium and copper) were carried through to the Step 3A assessment in the Downstream Area. There are no alternative screening levels to apply to surface water screening in Step 3A. The calculation of central tendency values was not appropriate due to the small number samples detected and total available dataset. Therefore, the maximum detected concentration was used for comparison. **Table 5-1** presents the results of the Step 3A evaluation for surface water.

Barium was detected in all five of the surface water samples in the Downstream Area at concentrations ranging from 119 to 135 ug/L, all of which exceed the aquatic life screening level (3.9 ug/L). There is no amphibian screening level available for barium. Copper was detected in three of the five surface water samples collected in Upper Milbrook Pond (two of the four samples) and one sample from Middle Milbrook Pond, ranging from 5 to 7.6 ug/L. All three of the detected concentrations slightly exceeded the aquatic life screening level (4.8 ug/L); however none of the concentrations exceeded the amphibian screening levels (15 ug/L).

Surface water samples collected upstream in North Pond and in Greenwich Creek upstream of the Site are considered qualitatively to represent background/reference conditions. Concentrations of barium detected in all six background/reference samples ranged from 85.8 to 122 ug/L, all of which exceed the aquatic life screening level. Concentrations of barium in the Downstream Area are not significantly above the range of background concentrations and is consistent concentrations detected immediately upstream of the Site. Therefore, concentrations of barium may represent local background (uniform enrichment noted in soil and sediment [Section 5.2.2]). The potential for unacceptable risk is not expected, but cannot be dismissed based on current data.

Background/reference concentrations of copper ranged from 5.8 to 8.6 ug/L, which also exceed the aquatic life screening levels. The range of downstream Site concentrations is consistent with upstream background conditions. In addition, due to the low frequency of detection and inconsistency of detected sample origination, the potential for unacceptable risk is not expected.

5.2.2 Sediment Evaluation (Assessment Endpoint 3: Benthic Invertebrate Community)

Several metals and PAHs exceeded applicable Step 2 threshold (low) sediment levels. The calculation of central tendency values was not appropriate due to the small number of detections and total available dataset. Therefore, Step 3A evaluation compares maximum detected concentrations of COPECs identified in Step 2 against the probable (high) effect levels. **Table 5-2** presents the results of the Step 3A evaluation for sediment, including the probable effect screening levels.

In the Downstream Area, six out of ten metals (barium, copper, lead, nickel, vanadium, and zinc) have HQs above 1 when the maximum detected concentration is compared to probable effect screening levels. There are no threshold (low) and probable (high) levels available for barium or vanadium, so the screening levels for these two chemicals are based on background levels. The threshold level for barium is based on the background value per Buchman (2008), which was used for the initial screening. Connecticut soil is enriched in barium, with an average concentration of 400 mg/kg (USEPA 2005). Eastern U.S. barium levels range from 10 to 1500 mg/kg (average 420 mg/kg). The observed concentrations of barium are likely attributable to background conditions. Similarly, vanadium is compared to background value per Buchman (2008). Connecticut soil background for vanadium has an average concentration of 60 mg/kg (USEPA 2005) and eastern U.S. soil concentrations range from 7 to 300 mg/kg (average 66 mg/kg). Background concentrations of barium and vanadium detected in sediment samples collected upstream ranged from 40 to 111 mg/kg (barium) and 20.1 to 38.7 mg/kg (vanadium). Downstream Area sediment concentrations of barium and vanadium are elevated compared to upstream concentrations, but not compared to the published background levels for these metals. Therefore, the potential for unacceptable risk is not expected from barium and vanadium.

The range of concentrations for the remainder of the metals (copper, lead, nickel, and zinc) is at levels consistent with the range of sediment concentrations in West Brothers Brook and Cider Mill Pond but higher than background sediment concentrations measured in North Pond and upstream on Greenwich Creek. Therefore, consistent with the findings of the 2013 SLERA, the potential for unacceptable risk cannot be dismissed based on current data; however based on the conservative nature of the assessment, actual risks are not expected from metals in sediment.

When compared to probable effect levels, calculated total HMW PAHs, total LMW PAHs, and total PAHs results in HQs above 1.

- Total HMW PAHs slightly exceeds the probable effect level of 6.5 mg/kg with a maximum concentration of 104 mg/kg.

- Total LMW PAHs exceeds the probable effect level of 5.3 mg/kg with a maximum concentration of 11.5 mg/kg.
- Total PAHs exceeds the probable effect level of 22.8 mg/kg with a maximum concentration of 116 mg/kg.

Several individual HMW PAHs were detected at levels that exceed the relative screening criteria. Only one individual LMW PAH (phenanthrene) was detected at all locations, and the remaining LMW PAH compounds were not detected or detected at just one location in Upper and Middle Milbrook Ponds. The concentrations of total LMW PAHs in the Milbrook Ponds are consistent with those measured upstream in West Brothers Brook and Cider Mill Pond. However, concentrations of total HMW PAHs and total PAHs are an order of magnitude higher in the Milbrook Ponds of the Downstream Area than the range of concentrations measured upstream on Site and are elevated compared to upstream background sediment concentrations. Background concentrations of total HMW and total PAHs exceeded the probable effect levels with concentration ranging from 0.28 to 26.4 mg/kg and 0.1 to 31.2 mg/kg respectively. North Pond and Mill Brook may receive roadway runoff containing PAHs which may be contributing to the concentration in the Millbrook Ponds of the Downstream Area. Therefore, the potential for unacceptable risk from total HMW PAHs, total LMW PAHs, and total PAHs cannot be dismissed based on current data.

5.2.3 Sediment Evaluation (Assessment Endpoints 4, 5, 6, 7, and 8: Aquatic-feeding Mammals and Birds)

Table 5-4 presents the summary results of the Step 3A food web model with supporting calculations presented in **Appendix E**. The Step 3A evaluation includes wildlife receptors for which potential risks were identified in the Step 2 evaluation. The majority of assumptions in the Step 3A food web are the same as for the Step 2 food web. The EPCs used in the Step 3A food web model evaluation are the maximum detected concentrations (same as Step 2), because the calculation of central tendency values for sediment and surface water was not appropriate due to the small number of detections and limited total available dataset for the Downstream Area. The TRVs used in the Step 3A are LOAEL-based TRVs and MATC- based TRVs (MATC-based TRVs are the geometric mean of NOAEL- and LOAEL-based TRVs).

Site-specific AUFs less than 1 were calculated for those receptors for which home or foraging ranges exceed the approximate aquatic habitat area of the ponds in the Downstream Area.

While the Step 3A food web model calculations include two levels of TRV, the results are based on the MATC-based TRVs.

For wildlife receptors, the following are the results of the Step 3A food web calculations for the Downstream Area:

- Great blue heron –
    - All HQs are less than 1.
- Mallard –
    - All HQs are less than 1.
- Mink –
    - MATC-based HQ for total HMW PAHs slightly exceeds 1.
    - MATC-based HI for total PAHs slightly exceeds 1.
- Raccoon –
    - All HQs and total PAH HI are less than 1.
- Muskrat –

- All HQs and total PAH HI are less than 1.

Based on the Step 3A food web calculations for the Downstream Area, all MATC-HQs are less than 1 for the great blue heron, mallard, raccoon, and muskrat. The MATC-HQ for total HMW PAHs and MATC-HI for total PAHs calculated for mink slightly exceeds 1 (HQ = 1.3; HI = 1.3), but the LOAEL-HQ and LOAEL-HI are less than 1. These results indicate that the potential for unacceptable risks to wildlife receptors in the Downstream Area is not expected.

6. Uncertainty Analysis

The objective of the uncertainty evaluation is to discuss the assumptions of the SLERA process that may influence the risk assessment results and conclusions. Because a SLERA is designed to be overly protective in nature, there is a considerable amount of uncertainty associated with results from a SLERA. The uncertainty analysis provides a description of the nature of the uncertainties encountered in developing risk estimates and is an integral part of the ERA process as defined by USEPA guidance (1997a). Uncertainties built into the estimation of exposures and ultimately risks may act either to increase or decrease the identified risks, depending on the source of uncertainty.

Common sources of uncertainty include those related to the development of the CSM, the factors used to develop the risk estimate (e.g., exposure assumptions and toxicity assumptions), and uncertainty in the parameters used to evaluate risk (e.g., data gaps, EPC estimates). The common uncertainties associated with ERA are typically related to the following general categories:

- Data quality;
- Selection of COPECs;
- Exposure assessment;
- Development and Application of EPCs;
- Toxicity assessment; and
- Risk characterization.

Uncertainties associated with these ERA components account for the majority of potential limitations in risk assessment methodology and are described in sections below.

6.1 Uncertainties Associated with Data Quality

6.1.1 Accuracy of Analytical Measurements

Laboratory analysis of environmental samples is subject to a number of technical difficulties, and values reported by the laboratory may not always be accurate. The magnitude of analytical error is usually small compared to other sources of uncertainty, although the relative uncertainty increases for results that are near the detection limit. Constituents detected below the sample reporting limit but above the method detection limit (i.e., J-flagged data) lack sufficient precision in the reported concentration and are thus estimated concentrations. However, to minimize underestimation of site concentrations, J-flagged data were included, where applicable. Inclusion of these data in development of EPCs generally returns conservative exposure concentration and resulting risk estimates. Inclusion of these data in the SLERA is generally conservative and likely overestimates risk that is based in part or solely on these data. There was one rejected analysis for chlordane in an upstream sediment sample, but this does not affect the findings of the risk assessment, as upstream concentrations of this analyte are adequately represented by the other three samples.

Sediment data collection in the Downstream Area was conducted in the two ponds, all of which are depositional areas with areas of accumulated fine-grained sediments where contaminants are expected to reside. Because the data collection was focused on the two ponds, these data sets are expected to represent the worst-case scenarios for sediment quality in the Downstream Area, relative to the short, faster-flowing portions of Greenwich Creek that connect the ponds. Data sets containing these worst-case samples, particularly given that conclusions are based on the maximum detected concentration, will result in overestimation of risk.

6.1.2 Potential Data Gaps

Six samples collected upstream in North Pond and in Greenwich Creek upstream of the Site were considered qualitatively to represent upstream (off-site) conditions in West Brothers Brook surface water (i.e., as it enters the Site). In addition, literature-based regional background values for inorganic compounds in other media (soil) were considered, but may not be fully representative. It should be acknowledged that the soil background data applied for barium (and vanadium) in sediment were based on regional levels (per USEPA 2005) expected in Connecticut soil and were not specific to sediment. Use of these regional data to qualify risk may over- or under-estimate risk.

The actual contribution of background to risk estimates is unknown. Risk estimates are based on total exposure and are independent of background and, therefore, are unaffected by uncertainties in background. Therefore, risk conclusions based on a qualitative evaluation of the contribution of background to total risk may result in over- or under-estimate of risk.

6.2 Uncertainties Associated with Selection of COPEC

6.2.1 Detected Analytes with no Screening Levels or Other Numeric Assumptions

For some COPECs, partial toxicity information may exist for some receptor classes, but not others. As it is inappropriate to extrapolate TRVs between taxonomic classes, this was not done. Data gaps in toxicity information were partially addressed by using surrogate values derived from similar compounds. The use of surrogates introduces an unknown level of uncertainty in the risk estimates, especially for less similar compounds. **Appendix D** presents the determination of COPECs and identifies detected COPECs that lack applicable screening levels on a medium-specific basis. For community-level receptors, the absence of sediment screening threshold values may result in underestimation of risk to benthic organisms. It is important to note that the sediment screening concentrations for barium and vanadium are not toxicity-based but based on sediment background concentrations per Buchman (2008). Therefore, in the absence of applicable toxicity data, the potential for unacceptable risk cannot be fully assessed for these compounds.

A TRV is absent for total PAHs for mammals. However, applicable toxicity data are available for LMW and HMW PAHs, and the HQs for these were summed to create a total PAH HI. Therefore, the absence of a total PAH TRV for mammals does not result in risk uncertainty.

A number of analytes were retained as COPECs based solely on their status as bioaccumulative chemical compounds (BCCs) (see the COPEC selection summary tables in **Appendix D**). The process for COPEC selection was based on comparison to protective screening criteria. To remain conservative, detected compounds with the potential to bioaccumulate, but with detected concentrations below screening levels, were retained as COPECs. Inclusion of these constituents as COPECs may overestimate the potential risk.

Note that evaluation of potential risk to aquatic and benthic community receptors were based on overall effects and do not specifically consider uptake/accumulation. Therefore, some uncertainty surrounds conclusions drawn about potential risk from BCCs for these communities.

6.2.2 Uncertainties related to Non-Detected Analytes

Some of the analytes never detected in a given medium had MRLs in exceedance of the applicable screening level (**Appendix D**). Analytes that were never detected in any media were not retained as COPECs. This elimination may result in an underestimate of risk by an unknown amount. The presence of censored data (i.e., data reported as non-detected above a specific reporting limit) in a data set has the potential to affect risk estimates (i.e., censored data introduces uncertainty, because the true concentration is within the interval between the reporting limit and zero). The underestimation would be moderate, because if the non-detected constituent were actually site-related and were present at levels of significant concern, it likely would have been noted at levels above the detection limit at least once.

Analytes that were not detected in the listed media, but where the MRL exceeds the applicable screening level, are indicated in **Appendix D** and include the following:

- Surface water – Six metals (beryllium, cadmium, lead, mercury, selenium, silver); three pesticides (4,4'-DDT, toxaphene, chlordane); three individual PAHs (benzo(a)anthracene, benzo(a)pyrene, pyrene).
- Sediment – Three metals (antimony, selenium, silver); several pesticides (alpha-BHC, beta-BHC, gamma-BHC, heptachlor, aldrin, chlordane, dieldrin, endosulfan I, endrin, endosulfan II, endosulfan sulfate, heptachlor epoxide, 4,4'-DDE, 4,4'-DDD, methoxychlor, toxaphene); Aroclor-1254; two individual PAHs (naphthalene, 2-methylnaphthalene)

Although the MRL was exceeded for the above analytes, not all RLs were in excess of the screening level. Also, uuncertainty regarding individual PAHs and PCBs are negligible, because these chemical classes were evaluated on a total basis, and therefore exceedance of the MRL by individual PAHs or PCBs does not affect evaluation of these classes.

6.3 Uncertainties Associated with Exposure Assessment

6.3.1 Exposure Pathways

The actual presence, Site use, and year-round abundance of the representative receptors included in the SLERA Addendum are uncertain. Exposure pathways selected for quantitative evaluation in this SLERA Addendum do not include all potential exposure pathways for all ecological receptors. Exposure pathways that were not evaluated because they tend to minimally influence the risk outcome include:

- Ingestion of sediments and prey items by benthic invertebrates – not easily quantifiable, as rates of ingestion by invertebrates are not established. Exposure to invertebrates is addressed based on literature-derived toxicity bioassays and resulting sediment benchmarks which includes direct contact and ingestion (where applicable for the organism);
- Dermal exposures of wildlife to soil, sediment, and surface water – not easily quantifiable; considered to be insignificant due to the protection that wildlife coat/feathers offer, which limits direct dermal contact; and
- Inhalation of dust particles by wildlife – considered minor/negligible due to assumption of purely aquatic exposure. Potential exposure via this pathway is negligible.

The surface water ingestion pathway for wildlife is quantifiable (EPA 1993) and was included in the food web evaluation (**Appendix E**). However, the contribution to the overall risk estimate from water ingestion is trivial relative to the ingested dose via incidental ingestion of sediment and diet and contributes little to overall risk. For example, based on maximum surface water concentrations, the dose from ingestion of metals and SVOCs in water contributes less than 1 percent of the combined total dose from other exposure pathways. This negligible contribution from water to overall dose is typical for these chemical classes and leads to a risk estimate unaffected by the water pathway. In addition, many drinking water sources not related to the ponds of the Downstream Area are also available and used by wide-ranging wildlife. Therefore, estimating risk based on an assumed reliance of mobile animals on only one or a few impacted and Site-related locations for water resources is likely to overestimate risk, albeit by a small amount.

6.3.2 Exposure Point Concentrations

The ideal input for exposure calculations is the true mean concentration (or the 95% UCL of the sample average, to be conservative) of a compound within a given medium over the area where exposure may occur. However, in some instances, calculating an estimated mean concentration is not possible due to small datasets. Therefore, the use of the MDC in these instances is a conservative approach and is likely to overestimate exposure to site media, as average concentrations are likely more indicative of actual exposures.

Tissue samples were not collected from ecological receptors in the Downstream Area because of the low potential for adverse impacts to organisms and the uncertainty associated with interpretation of tissue concentrations,

especially for mobile receptors. Modeling the exposure dose to aquatic wildlife is a conservative method for estimating the potential for adverse impacts and in general considered to minimize underestimation of potential risk.

6.3.3 Exposure Analysis

Knowledge about site-specific dietary composition, exposure pathways, and spatial and temporal constraints on exposure for the selected receptors may be incomplete. Moreover, the actual dietary composition of an organism will vary daily and seasonally. The intake (ingestion) rates for food, soil, and sediment used to estimate exposure of wildlife at the Site were derived from literature reports of typical intake rates, body weights, dietary compositions, consumption rates, and metabolic rates in receptors at other locations or from measurements of laboratory-raised organisms. These values are not necessarily representative for site-specific intake rates of receptors.

Use of a single surrogate species to represent several species may introduce uncertainty because of interspecies variability in exposure or sensitivity to a COPEC. Risks to wildlife were assessed for a small subset of the species likely to be present in the Downstream Area. Although wildlife receptors selected represent a range of taxonomic groups and life history types, these species may not represent the full range of exposures and sensitivities present. The species selected may be either more or less exposed or sensitive to constituents than typical species located within the area. However, the species selected for evaluation are considered typical and representative for ecological risk evaluation in this region.

It is unlikely any receptor would be exposed concurrently to the average concentrations of all constituents in each area or in all media. For this analysis, it was assumed that wildlife exposures were continuous and that receptor home ranges were located entirely or at least in part within the boundary of the Downstream Area (i.e., the entire dietary intake was assumed to be from the Upper or Middle Milbrook Ponds). In the case of resident small-home-range receptors (e.g., muskrat), these assumptions are likely to be fairly realistic. However, these assumptions tend to overestimate exposures in receptors that have a large home range, may migrate, and that may not be exposed within the Downstream Area most of the time (e.g., heron, mallard, mink, and raccoon).

The following summarizes uncertainties and their effect on risk conclusions related to specific exposure assumptions used in the SLERA Addendum:

Uptake factors. Literature-derived uptake factors are for a variety of organisms and conditions and typically do not consider that only a finite mass of each chemical is available for the receptors. Lack of data specific to local diets may overestimate exposure and risk.

- **Bioaccumulation factors**. BAFs are estimates of the potential uptake from media to food items (e.g., sediment to invertebrates). Often, the BAF is derived by determining the geometric mean of values reported in studies. Part of the difficulty and, hence, the uncertainty is the selection and appropriateness of data to include in the BAF calculation. Therefore, the selection of a particular BAF value to model potential uptake to food items may result in under- or over-estimation of risk.
- **Home/Foraging Ranges.** The foraging ranges applied in the SLERA Addendum were derived based on available literature. In the Step 2 evaluation, the most conservative estimates of the home range were applied. This approach returns an exposure estimate that likely overestimates exposure and ultimately risk for a given receptor. In the Step 3A evaluation, where applicable, an average range was applied to reduce this overestimate. However, given variability in regional and habitat-specific home ranges for a given species and the extent of other attractive habitat nearby, the selected home range may over- or under-estimate potential exposure and risk. Existence of more attractive habitat nearby is likely to result in less Site presence for mobile receptors, with a consequent overestimation of risk.
- **Bioavailability**. The toxicity of an ingested compound depends on how much is absorbed from the gastrointestinal tract into the body. However, the actual extent of absorption from ingested media (e.g., soil, sediment, and food) is usually not known. The hazard from an ingested dose is estimated by comparing the dose to an ingested dose that is believed to be safe, based on tests in a laboratory setting. Thus, if the absorption is the same in the laboratory test and exposure at the Site, then the prediction of hazard will be

accurate. However, if the absorption of a compound from a given medium is different (usually lower) than occurred in the laboratory study, then the hazard estimate will be incorrect (usually biased high). In this SLERA Addendum, estimates of wildlife exposure assumed a relative bioavailability of 100 percent for all compounds in all media. Assuming bioavailability of 100 percent will overestimate the potential exposure to receptors.

- **Ecological effects of compounds**. Extrapolation between toxicological endpoints (e.g., NOAEL and LOAEL) and/or study duration endpoints (e.g., chronic, subchronic) adds uncertainty that may overestimate or underestimate resulting risk estimates. For example, extrapolation of subchronic duration endpoints (e.g., subchronic LOAEL) to chronic duration endpoints (e.g., chronic NOAEL) for laboratory test species introduces uncertainty into the determination of potential impacts, as the distribution of exposure and effect within these bounds is not known. There is higher confidence in toxicological values derived from studies where the full distribution of exposure and effect are bounded (i.e., chronic NOAEL bounded by a chronic LOAEL) as defined in the study design. Uncertainty also remains with respect to interspecies extrapolation. Laboratory or test species and wildlife species differ with respect to absorption, metabolism, distribution, and excretion of constituents. These variables are addressed by applying additional factors to the chronic or subchronic duration and/or toxicity endpoint to account for uncertainty due to species-to-species extrapolation and other treatment of toxicity data. In the absence of sufficient data to support the use of a species-to-species extrapolation factor, no factor was applied for this evaluation. The use of such modifying uncertainty factors may result in an over- or under-estimation of risk.

6.3.4 Uncertainties Associated with Toxicity Assessment and Risk Characterization

Adverse effects to individuals do not necessarily imply adverse effects at the population or community level. In general, the goal of ERA is to protect communities and populations and not each individual in that population (except in the case of threatened and endangered species). A common endpoint, which unfortunately is very difficult to operationally define, is a population level EC-20 (i.e., the concentration or dose that results in an adverse effect to 20 percent of the population). However, almost all toxicity reference values for dose-based evaluations (e.g., NOAELs and LOAELs) are based on individual-level adverse effects. Risk estimates based on individual risk (as represented by Step 2 HQ and the Step 3A upper bound risk estimates) overstate risk at the population level.

Most toxicity benchmark values are derived from high dosing regimen lab studies of the adverse effects of a single constituent. However, exposures to ecological receptors usually involve multiple constituents, where additive, synergistic, or antagonistic interactions could occur. Data generally are not adequate to permit any quantitative adjustment in toxicity values or risk calculations based on inter-chemical interactions. In accordance with EPA ecological risk guidance, effects from different compounds are not considered additive. This may result in overestimated or underestimated risks if additive or antagonistic effects are actually present for the mixture of COPECs.

In field-collected samples, PAHs typically occur as complex mixtures of co-varying compounds and thus adverse effects result from cumulative effects of multiple PAHs (Schwartz 1999). Application of the total PAH probable (high) sediment screen, per MacDonald et al. (2000), provides a means to account for PAH mixtures and more accurately provides an assessment of actual or expected toxicity.

Assessment endpoints for the receptors in the Downstream Area are based on the sustainability of exposed populations, and adverse effects on individuals in a population may occur even when the population is healthy and stable. However, even if it is possible to accurately characterize the distribution of risks or effects across the members of the exposed population, estimating the impact of those effects on the population generally is difficult and uncertain. The relationship between adverse effects on individuals and effects on the population is complex, depending on the demographic and life history characteristics of the receptor being considered, as well as the nature, magnitude, and frequency of the chemical stresses and associated adverse effects. Thus, the actual risks that will lead to population-level adverse effects will vary from receptor to receptor and risk conclusions based on individual-level toxicity data may under- or overestimate risk.

7. Risk Conclusions

The results of the SLERA Addendum were considered along with associated uncertainties to draw conclusions for all receptors and ecological habitats identified with residual Step 3A risk at the Downstream Area. The exposure area of the Downstream Area is defined as the aquatic habitats of Upper and Middle Milbrook Ponds. These ponds are man-made impoundments on Greenwich Creek and evidence of maintenance of the surrounding shoreline area and the ponds themselves (e.g., mowing, pesticide application signs) were observed during sampling. As such, the aquatic habitats of the ponds are of low to moderate quality. In addition, the presence of the weirs at each outlet may prevent the upstream or downstream movement of aquatic biota such as fish. Therefore, the aquatic-feeding wildlife evaluated in this SLERA Addendum are likely present in the Downstream Area, but their presence is likely limited due to the poor quality of ecological resources available, and it is not likely that the ponds provide sufficient resources for full-time presence of larger wildlife such as mink or great blue heron. As such, the conclusions of this SLERA Addendum have a higher relevance for assumed resident wildlife (e.g., muskrat) and limited mobility sediment invertebrate communities.

Eight assessment endpoints were evaluated in this SLERA Addendum, which addressed exposures to sediment and surface water of Upper and Middle Milbrook Ponds and food ingestion of prey items from the Upper and Middle Milbrook Ponds. Risk conclusions are summarized below:

Assessment Endpoint	**Risk Driver**	**Comments**
Aquatic Life (surface water exposure)	Metals: barium and copper	Although both metals exceed the applicable screening criteria, both metals were detected in the Upstream Area at comparable levels, which suggests potential off-site sources
Sediment Biota (sediment exposure)	Metals: copper, lead, nickel, and zinc PAHs: Total HMW PAHs, total LMW PAHs, and total PAHs	Metals were detected at levels below the screening criteria in North Pond and at increasing levels from north to south in Upper and Middle Milbrook Ponds. Similar levels of metals were detected upstream in West Brothers Brook and Cider Mill Pond. These results suggest that levels of metals on Site and in the Downstream Area may be attributable to background sources and may not be toxic to aquatic biota in the ponds. Similar individual PAHs were detected in all three ponds with highest concentrations detected in Upper Milbrook Pond (Sed-Downstream-04) and were predominantly HMW PAHs, which were detected at concentrations an order of magnitude higher than those measured upstream in West Brothers Brook and Cider Mill Pond. These results indicate a potential for adverse effects, but the PAHs are not likely to be attributable to Site activities.
Larval amphibians	None	--
Herbivorous Birds (mallard)	None	--
Piscivorous Birds (great blue heron)	None	--
Herbivorous Mammals (muskrat)	None	--
Omnivorous Mammals (raccoon)	None	--
Piscivorous Mammals (mink)	None	HMW PAH HQ and total PAH HI exceed 1 (1.3) but this is based on conservative estimate of exposure (maximum detected concentration). The PAHs detected were predominantly HMW PAHs, which were detected at concentrations an order of magnitude higher than those measured upstream in West Brothers Brook and Cider Mill Pond. Thus, any potential for adverse effects due to PAHs are

Assessment Endpoint	Risk Driver	Comments
		not likely to be attributable to Site activities.

The conclusions of this SLERA Addendum indicate that the Downstream Area surface water is likely influenced by upstream sources of inorganic and organic compounds based on similar levels of barium and copper measured on Site and in the Upstream Area. For sediment-dwelling biota, there is a potential for impacts due to metals and PAHs. However, because none of these COPECs are identified as ecological risk-drivers for the Site, these constituents may have off-site origins, and their presence in the Downstream Area is not believed to be related to Site activities. Therefore, the SMDP for this SLERA Addendum is the available data indicate either no or low potential for ecological risk in the Downstream Area and no further work is warranted.

8. References

AECOM. 2012a. Remedial Investigation Report, Greenwich High School, Greenwich, CT.

Prepared by AECOM for Town of Greenwich, Department of Public Works. October 2012.

AECOM. 2012b. Human Health Risk Assessment Report, Greenwich High School, Greenwich, CT.

Prepared by AECOM for Town of Greenwich, Department of Public Works. October 2012.

AECOM, 2013. Screening Level Ecological Risk Assessment, Greenwich High School, Greenwich, CT. Prepared for: Town of Greenwich Department of Public Works, March 2013.

Bechtel-Jacobs Company LLC. 1998a. Empirical Models for the Uptake of Inorganic Chemicals by Plants. Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee. BJC/OR-133. Bechtel-Jacobs Company LLC.

Bechtel-Jacobs Company LLC. 1998b. Biota Sediment Accumulation Factors for Invertebrates: Review and Recommendations for the Oak Ridge Reservation. Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee.

BJC/OR-112

Buchman, M.F. 2008. NOAA Screening Quick Reference Tables (SQuiRTs). NOAA OR&R Report 08-1. Seattle WA. Office of Response and Restoration Division National Oceanic and Atmospheric Administration, 34 pages.

CTDEEP. 2011. Connecticut Department of Environmental Protection (CTDEEP) Proposed Revisions to Connecticut Water Quality Standards. January 2011. Available at: http://water.epa.gov/scitech/swguidance/standards/upload/ctwqs.pdf

Di Toro, D.M. and J.A. McGrath. 2000. “Technical Basis for Narcotic Chemicals and Polycyclic Aromatic Hydrocarbon Criteria. II. Mixtures and Sediments”. Environ Toxicol Chem 19 (2000): 1971-1982.

Di Toro, D.M., McGrath, J.A., and D.J. Hansen. 2000. “Technical Basis for Narcotic Chemicals and Polycyclic Aromatic Hydrocarbon Criteria. I. Water and Tissue”. Environ Toxicol Chem 19 (2000): 1951-1970.

GPS. 2017. GHS Fields Remediation Project. Greenwich Public Schools (GPS) website. Available at: https://www.greenwichschools.org/departments/facilities-rentals/building-grounds-projects/ghs-fields-remediation-project. Accessed on June 26, 2017.

MacDonald, D.D., C.G Ingersoll, and T.A. Berger. 2000. “Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems.” Archives of Environmental Contamination and Toxicology. Vol. 39. pp 20-31.

OEHHA. 2012. Technical Support Document for Exposure Assessment and Stochastic Analysis, FINAL. California Office of Environmental Health Assessment. August, 2012. Internet website: oehha.ca.gov/air/hot_spots/pdf/apenh.pdf.

Patton, J.F., and M.P. Dieter. 1980. “Effects of Petroleum Hydrocarbons on Hepatic Function in the Duck.” Comparative Biochemistry and Physiology C, Vol. 65C(1): 33-36.

Sample, B. E., D. M. Opresko, and G. W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. ES/ER/TM-86/R3. Office of Environmental Management, U.S. Department of Energy. Health Sciences Research Division, Oak Ridge National Laboratory Risk Assessment Program, Oak Ridge, TN. June.

Schwartz, R.C. 1999. “Sediment Quality Guidelines for Polycyclic Aromatic Hydrocarbon Mixtures.” Environmental Toxicology and Chemistry, Vol. 18, No. 4, pp. 780-787.

USEPA. 1993. Wildlife Exposure Factors Handbook. Office of Research and Development, U.S. Environmental Protection Agency (EPA), Washington, D.C. EPA/600/R-93/187a.

USEPA. 1997. Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments (Interim Final). U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Office of Emergency and Remedial Response. EPA 540/R-97/006. June 1997.

USEPA, 1998. Guidelines for Ecological Risk Assessment. Risk Assessment Forum. U.S. Environmental Protection Agency; Washington, D.C. EPA/630/R-95/002F. April 1998.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (Volume Three). EPA 530-D-99-001A. Washington D.C.: United States Environmental Protection Agency, Office of Solid Waste. August 1999.

USEPA. 2001. The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. ECO UPDATE. Interim Bulletin Number 12. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response.

USEPA. 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. National Sediment Quality Survey: Second Edition. Table C-1. Office of Science and Technology, Washington, D.C. EPA-823-R-04-007. November.

USEPA. 2005. Guidance for Developing Ecological Soil Screening Levels. Office of Emergency and Remedial Response. Washington D.C. November 2003, Revised February 2005. Includes 2007 and 2008 updates.

USEPA. 2010. National Recommended Water Quality Criteria: 2010. United States Environmental Protection Agency, Office of Water and Office of Science and Technology (4304T).

USEPA. 2011. Estimations Programs Interface for Windows (EPI Suite) v. 4.1. BCFBAF Interface. Developed by the EPA's Office of Pollution Prevention Toxics and Syracuse Research Corporation (SRC). January 2011. Available online at: http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm.

USEPA. 2012. Biota-Sediment Accumulation Factor Data Set (BSAF). Office of Research and Development with OSWER support. Available online at: http://www.epa.gov/med/prods_pubs.htm.

Figures

Map Location

SITE LOCUS MAP
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

0 500 1,000 2,000 3,000 4,000 5,000 6,000 Feet

0 100 200 400 600 800 1,000 1,200 1,400 1,600 Meters

Map Projection: State Plane, NAD 83, Feet.
Image Source: National Geographic Society Quadrangle: Stamford, CT.

Scale: 1:24,000

AECOM

Figure 1-1

Date: June 2017

Project #: 60225155.500

Path: P:\Jobs\Indl_Service\Project Files\Greenwich_High_School\GIS\Projects\Site_Locus_Map_SLERA.mxd

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS

Greenwich High School
Greenwich, Connecticut

ERAGS (EPA 1997) and REFINING CONTAMINANTS OF CONCERN (EPA 2001) PROCESS

Desktop Habitat Survey to Identify Key Habitats and Ecological Receptors

Qualitative Ecological Exposure Assessment

Are there actual or potential ecological receptors and potential exposure pathways to ecological receptors?

NO

YES

Step 1

Develop Problem Formulation and CSM for Ecological Receptors

Develop Toxicity and Exposure Data

STEP 1
Screening Level Problem Formulation (CSM, Risk Hypotheses, Potential Receptors, Assessment and Measurement Endpoints)

Step 2

Do site concentrations exceed a HQ based on conservative exposure and toxicity assumptions; or exceed accepted screening benchmarks?

NO

YES

STEP 2
Screening Level Assessment
(Exposure Estimate and Risk Calculation)

REFINEMENT OF COPEC
Develop Site-Specific Exposure and Toxicity Assumptions

STEP 3
STEP 3A Refining Contaminants of Concern
STEP 3B Baseline Problem Formulation

STEP 4
Study Design and Objectives

Step 3

Do site concentrations exceed a HQ or HI > 1 using site-specific assumptions?

NO

YES

STEP 5
Field Verification of Sampling Design

STEP 6
Site Investigation and Analysis

STEP 7
Risk Characterization

STEP 8
Risk Management

Risk Management Decision: Need for Corrective/Remedial Action?

YES*

NO

YES

Risk Adequately Characterized

Notes:

- Dark arrow represents points of correspondence between EPA guidance and tiered approach

- Scientific Management Decision Point

*Risk Management decision indicating additional data needs

Terms:
SLERA – Screening Level Ecological Risk Assessment
COPEC – Chemical of Potential Ecological Concern
CSM –Conceptual Site Model
ERAGS – Ecological Risk Assessment Guidance for Superfund
HQ – Hazard Quotient
ERA – Ecological Risk Assessment

Shaded boxes indicate EPA steps applied in the ERA

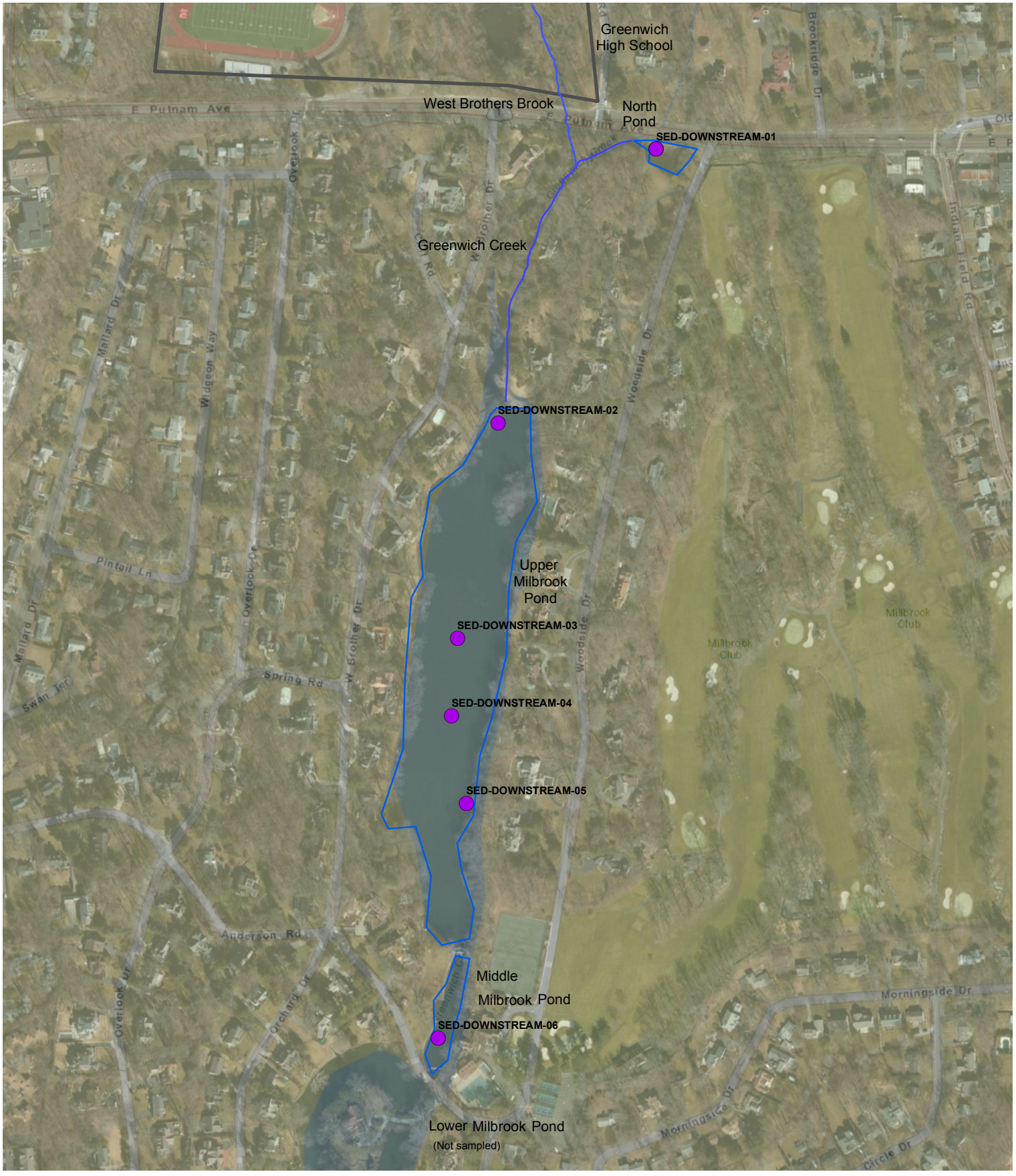
References:

EPA, 1997. Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments, Interim Final. Environmental Response Team, U.S. Environmental Protection Agency. Edison, NJ

EPA, 2001. The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. ECO Update. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency. EPA 540/F-01/014. June.

AECOM

Greenwich High School **10 Hillside Road** **Greenwich, Connecticut**	**Ecological Risk Assessment Process**
DATE: 02/22/13	**FIGURE 1-2**



Downstream Sediment Sample

N

0 125 250 500 Feet

Sediment Sampling Location

Downstream Sediment and
Surface Water Report
Greenwich, CT

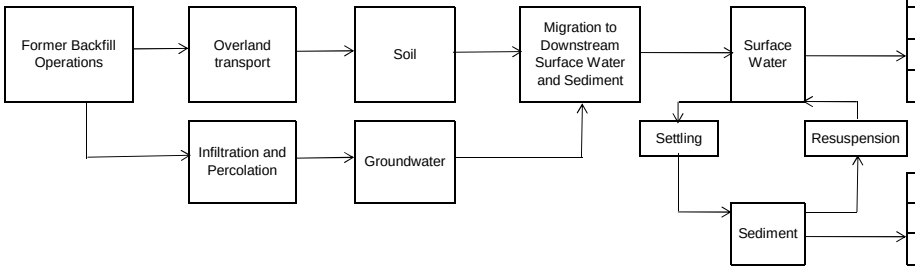
SCALE	DATE	PROJECT NO.
See Insets	12/14	60225155

AECOM

Figure Number

2-1

Figure 3-1
Conceptual Site Model
Greenwich High School
10 Hillside Raod
Greenwich, CT



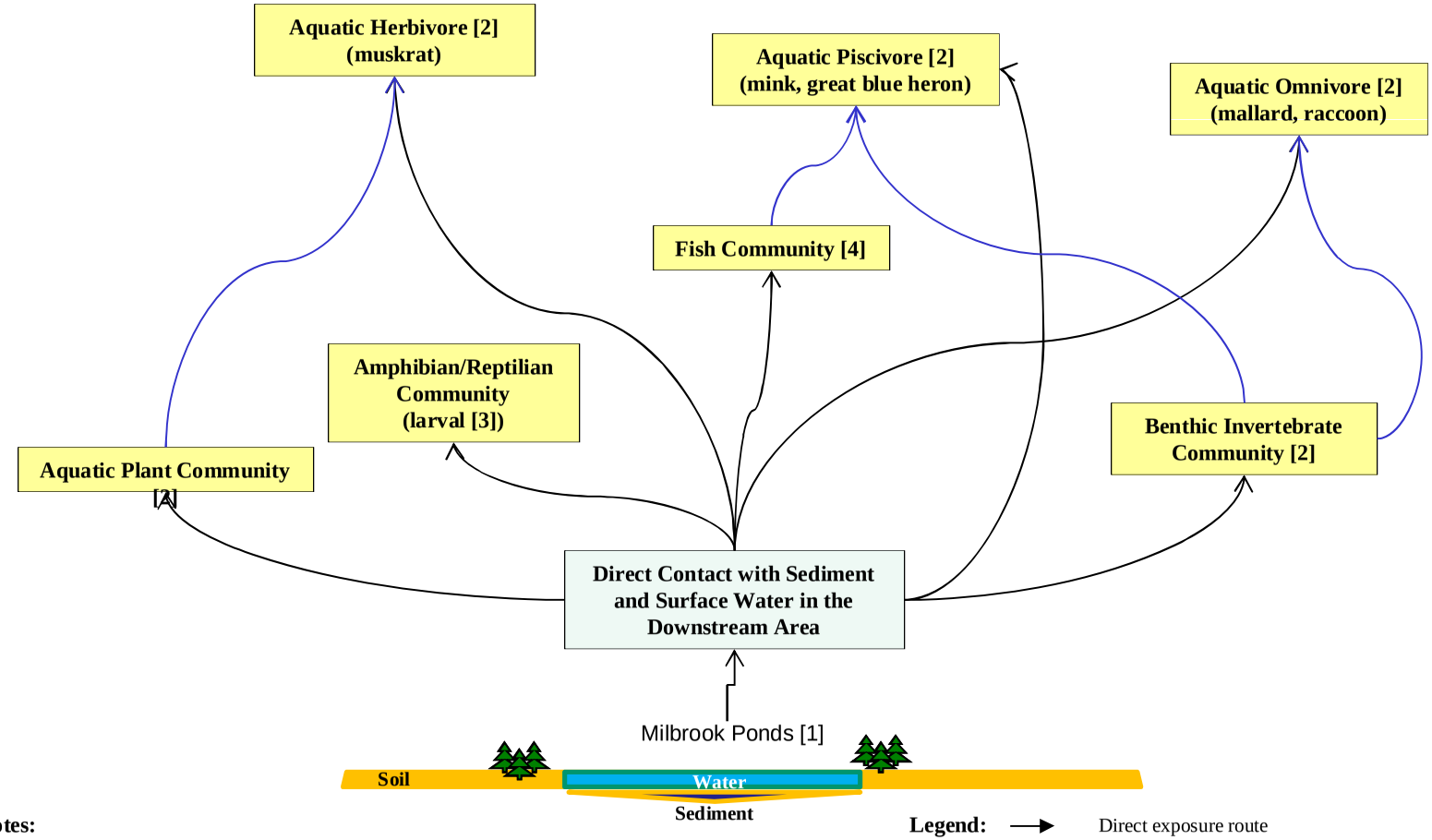
Potential Exposure Route	Aquatic Invertebrates	Plants (Macrophytes)	Amphibians (larvae)	Fish (Pelagic)	Fish (Benthic)	Benthic Invertebrates	Birds and Mammals [1]
Bioaccumulation [2]	i	i	i	i	i	i	I
Ingestion	i	i	i	I	I	i	I
Root Uptake	i	I	i	i	i	i	i
Direct Contact	I	i	I	I	i	i	i
Bioaccumulation [2]	i	i	i	i	i	i	I
Ingestion	i	i	i	i	I	i	I
Direct Contact	i	i	i	i	I	I	i

Key:

I Pathway potentially complete, further evaluation recommended.

i Pathway considered and found incomplete or insignificant.

(1) Aquatic and semi-aquatic birds and mammals will be evaluated.
(2) Bioaccumulation considers the ingestion of food items (e.g., plants, invertebrates, fish) impacted by bioaccumulative chemicals. Invertebrates, plants, and fish will be considered as food items in a food web model to evaluate risks to birds and mammals.



Notes:

[1] The Downstream Area includes Upper, and Middle Milbrook Ponds.

[2] The listed representative receptors are based on review of expected and/or observed wildlife species.

[3] The larval form for amphibians (e.g., frog tadpole) is considered to evaluate amphibian and aquatic reptiles (turtles).

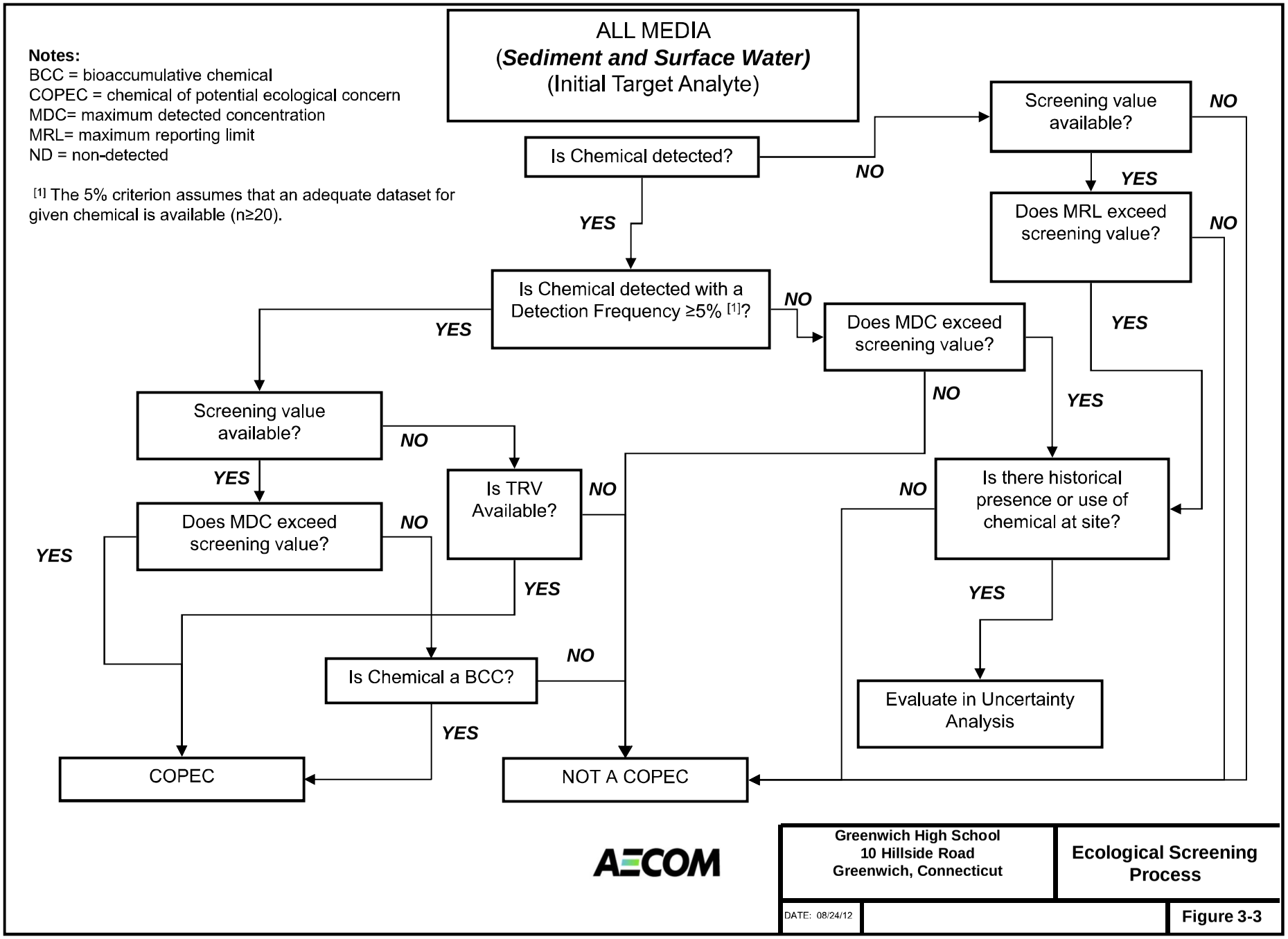
[4] The fish community are evaluated using a weight of evidence evaluation. Fish assumed to be exposed to surface water and sediment and biota in the ponds.

Legend:

- Direct exposure route
- Indirect exposure route
- Sediment — Medium Affected
- Carnivore — Complete and significant pathway/receptor - to be evaluated in ERA

AECOM

Greenwich High School 10 Hillside Road Greenwich, Connecticut	Food Web Model
DATE: 08/24/12	Figure 3-2


ALL MEDIA
(Sediment and Surface Water)
(Initial Target Analyte)
Notes:
BCC = bioaccumulative chemical
COPEC = chemical of potential ecological concern
MDC= maximum detected concentration
MRL= maximum reporting limit
ND = non-detected
[1] The 5% criterion assumes that an adequate dataset for given chemical is available (n≥20).
Is Chemical detected?
NO
YES
Screening value available?
NO
YES
Does MRL exceed screening value?
NO
YES
Is Chemical detected with a Detection Frequency ≥5% [1]?
NO
YES
Does MDC exceed screening value?
NO
YES
Screening value available?
NO
YES
Is TRV Available?
NO
YES
Does MDC exceed screening value?
NO
YES
Is there historical presence or use of chemical at site?
NO
YES
Is Chemical a BCC?
NO
YES
Evaluate in Uncertainty Analysis
COPEC
NOT A COPEC
AECOM
Greenwich High School
10 Hillside Road
Greenwich, Connecticut
Ecological Screening Process
DATE: 08/24/12
Figure 3-3

Tables

AECOM

Table 3-1
Representative Species and Exposure Pathways

Greenwich High School
10 Hillside Road
Greenwich, CT

Community or Receptor Guild [1]	Key Species Noted or Expected	Exposure Media	Pathway Evaluated? [2]	Rationale [3]	Representative Species
Aquatic Community	Aquatic zooplankton and macroinvertebrates (isopods, amphipods, cladocera), macrophytes, phytoplankton	Surface water	Pathway Evaluated	Vegetation (emergent, submerged, and phytoplankton) have been observed or may be present in Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. Zooplankton is assumed present, although not specifically observed.	Aquatic Community
Benthic Invertebrate Community	Benthic invertebrates (oligochaetes, insect larvae, mulloscs)	Sediment	Pathway Evaluated	A varied benthic community is expected in the substrate of Upper, Middle, and Lower Milbrook Ponds in the Downstream Area.	Benthic Invertebrates
Fish Community	Bass (*Micropterus* spp.), sunfish (*Centrarchidae* family), carp (*Cyprinus* spp.)	Sediment, Biota, Surface Water	Pathway Evaluated	A fish community may be present in Upper, Middle, and Lower Milbrook Ponds in the Downstream Area, although fish have not been specifically observed.	Carp, Bass, Sunfish
Aquatic Piscivorous Birds	Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*)	Sediment, Biota, Surface Water	Pathway Evaluated	Herons are common to the area and are expected to be present in Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. Other avian piscivores (e.g., kingfisher, green heron) may be expected to occur in the area. The great blue heron was selected as representative of the feeding guild.	Great Blue Heron
Aquatic Omnivorous Birds	Mallard (*Anas platyrhyncnos*), blue-winged teal (*Anas discors*) and wood duck (*Aix sponsa*).	Sediment, Biota, Surface Water	Pathway Evaluated	Various duck species are expected to occur in the area and are likely to use Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. Mallards, teals, and wood ducks are seasonal or year-round residents common in the area. The mallard is ubiquitous and selected as representative of the feeding guild.	Mallard
Aquatic Piscivorous Mammal	Mink (*Neovison vison*),	Sediment, Fish, Surface Water	Pathway Evaluated	Although not observed, mink are expected to occur in association with Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. The mink is selected as a representative aquatic-feeding mammalian receptor.	Mink
Aquatic Herbivorous Mammals	Muskrat (*Ondatra zibethicus*)	Sediment, Biota, Surface Water	Pathway Evaluated	Muskrat are common to the area and are likely to occur in association with Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. Muskrats were selected to represent the feeding guild.	Muskrat
Aquatic Omnivorous Mammals	Raccoon (*Procyon lotor*)	Sediment, Biota, Surface Water	Pathway Evaluated	Raccoons are ubiquitous inhabitants of a variety of habitats including but not limited to forest, marsh, riparian and disturbed/urban habits and are common to the area. The raccoon was selected to represent aquatic omnivorous mammals as this species is known to obtain resources from both terrestrial and aquatic habitats and ample life history data are available. The evaluation assumes that the raccoon obtains all food resources from aquatic sources.	Raccoon

Notes:

[1] Receptor guilds (or ecological guilds) are any group of species that exploit the same dietary resources. Guilds are limited to those identified by site observations or via desktop site survey.

[2] Refers to whether a given pathway is proposed for evaluation in the ERA.

[3] The SLERA is focused on aquatic resources associated with Upper, Middle, and Lower Milbrook Ponds in the Downstream Area. Three primary aquatic habitat types are associated with the West Brothers Brook: stream, pond and marsh, all of which supports aquatic and benthic communities, including fish.

AECOM

Table 3-2
Sample Summary Table - SLERA Addendum

Greenwich High School
10 Hillside Road
Greenwich, CT

AOC	Location Name	Sample Date	Depth Interval (ft)		Matrix[1]	Notes [2]
Downstream	SED-DOWNSTREAM-02	1-Oct-2014	0	0.5	SE	Located in Upper Milbrook Pond.
Downstream	SED-DOWNSTREAM-03	1-Oct-2014	0	0.5	SE	Located in Upper Milbrook Pond.
Downstream	SED-DOWNSTREAM-04	1-Oct-2014	0	0.5	SE	Located in Upper Milbrook Pond.
Downstream	SED-DOWNSTREAM-05	1-Oct-2014	0	0.5	SE	Located in the southeastern section of Upper Milbrook Pond.
Downstream	SED-DOWNSTREAM-06	2-Oct-2014	0	0.5	SE	Located in Middle Milbrook Pond.
Downstream	SW-DOWNSTREAM-02	1-Oct-2014	--	--	WS	Located in Upper Milbrook Pond.
Downstream	SW-DOWNSTREAM-03	1-Oct-2014	--	--	WS	Located in Upper Milbrook Pond.
Downstream	SW-DOWNSTREAM-04	1-Oct-2014	--	--	WS	Located in Upper Milbrook Pond.
Downstream	SW-DOWNSTREAM-05	1-Oct-2014	--	--	WS	Located in the southeastern section of Upper Milbrook Pond.
Downstream	SW-DOWNSTREAM-06	2-Oct-2014	--	--	WS	Located in Middle Milbrook Pond.
Background	SED-DOWNSTREAM-01	2-Oct-2014	0	0.5	SE	Located in the North Pond (Upstream)
Background	SED-BBUS-1	25-Jul-2013	0	0.5	SE	Located in Greenwich Creek upstream of Site
Background	SED-BBUS-2	25-Jul-2013	0	0.5	SE	Located in Greenwich Creek upstream of Site
Background	SED-BBUS-3	25-Jul-2013	0	0.5	SE	Located in Greenwich Creek upstream of Site
Background	SED-BBUS-4	25-Jul-2013	0	0.5	SE	Located in Greenwich Creek upstream of Site
Background	SW-DOWNSTREAM-01	2-Oct-2014	--	--	WS	Located in the North Pond (Upstream)
Background	SW-BBUS-1	25-Jul-2013	--	--	WS	Located in Greenwich Creek upstream of Site
Background	SW-BBUS-2	25-Jul-2013	--	--	WS	Located in Greenwich Creek upstream of Site
Background	SW-BBUS-3	25-Jul-2013	--	--	WS	Located in Greenwich Creek upstream of Site
Background	SW-BBUS-4	25-Jul-2013	--	--	WS	Located in Greenwich Creek upstream of Site

Notes:

[2] The sediment samples were collected from the upper 6 inches after removing surficial debris.

[1] The dataset includes co-located sediment and surface water samples collected downstream of the site.

AOC = area of concern

SE = sediment

WS = surface water

-- = Not Appicable.

Table 3-3
Screening Levels and Benchmarks

					Surface Water				Sediment	
Analyte	CAS Number	Class	Subclass	BCC	Aquatic Life Screening Level (ug/L)	Source	Amphibian Screening Level (ug/L)	Source	Sediment Threshold Screening Level (mg/kg)	Source
Antimony	7440-36-0	Inorganic			30	NAWQC	300	Schuytema et al. 1996	0.16	Buchman 2008, bkg
Arsenic	7440-38-2	Inorganic			150	CDEP 2011, CWQS	2900	Sparling et al., 2000	9.79	Buchman 2008, TEC
Barium	7440-39-3	Inorganic			3.9	EPA 1996, ET			0.7	Buchman 2008, bkg
Beryllium	7440-41-7	Inorganic			0.66	Suter and Tsao, 1996 Tier II SCV	690	Sparling et al., 2000		
Cadmium	7440-43-9	Inorganic			0.125	CDEP 2011, CWQS*	180	Sparling et al., 2000	0.99	Buchman 2008, TEC
Chromium	7440-47-3	Inorganic			11	CDEP 2011, CWQS	560	Sparling et al., 2000	43.4	Buchman 2008, TEC
Copper	7440-50-8	Inorganic			4.8	CDEP 2011, CWQS*	15	Sparling et al., 2000	31.6	Buchman 2008, TEC
Cyanide	57-12-5	Inorganic			5.2	CDEP 2011, CWQS			0.1	BTAG RIII 2006, SLV
Lead	7439-92-1	Inorganic			1.2	CDEP 2011, CWQS*	310	Sparling et al., 2000	35.8	Buchman 2008, TEC
Mercury	7439-97-6	Inorganic		x	0.77	CDEP 2011, CWQS	30	Sparling et al., 2000	0.18	Buchman 2008, TEC
Nickel	7440-02-0	Inorganic			28.9	CDEP 2011, CWQS*	9600	Sparling et al., 2000	22.7	Buchman 2008, TEC
Selenium	7782-49-2	Inorganic			5	CDEP 2011, CWQS	680	Sparling et al., 2000	2	BTAG RIII 2006, SLV
Silver	7440-22-4	Inorganic			0.36	Suter and Tsao, 1996 Tier II SCV	2.6	Sparling et al., 2000	1	BTAG RIII 2006, SLV
Thallium	7440-28-0	Inorganic			12	Suter and Tsao, 1996 Tier II SCV	72	Sparling et al., 2000		
Vanadium	7440-62-2	Inorganic			19	EPA 1996, ET			50	Buchman 2008, bkg
Zinc	7440-66-6	Inorganic			65	CDEP 2011, CWQS*	72	Sparling et al., 2000	121	Buchman 2008, TEC
1-Methylnaphthalene	90-12-0	PAH	LPAH		2.1	Buchman 2008, CCC				
2-Methylnaphthalene	91-57-6	PAH	LPAH		4.7	BTAG RIII 2006, SLV			0.202	BTAG RIII 2006, SLV
Acenaphthene	83-32-9	PAH	LPAH		23	EPA 1996, ET			0.0067	BTAG RIII 2006, SLV
Acenaphthylene	208-96-8	PAH	LPAH						0.0059	BTAG RIII 2006, SLV
Anthracene	120-12-7	PAH	LPAH		0.73	EPA 1996, ET	25	Schuytema et al. 1996	0.0572	Buchman 2008, TEC
Benzo(a)anthracene	56-55-3	PAH	HPAH	x	0.027	Suter and Tsao, 1996 Tier II SCV			0.108	Buchman 2008, TEC
Benzo(a)pyrene	50-32-8	PAH	HPAH	x	0.014	Suter and Tsao, 1996 Tier II SCV	12.5	Schuytema et al. 1996	0.15	Buchman 2008, TEC
Benzo(b)fluoranthene	205-99-2	PAH	HPAH	x	9.1	EPA 2003, R5 ESL			10.4	EPA 2003, R5 ESL
Benzo(g,h,i)perylene	191-24-2	PAH	HPAH	x					0.17	BTAG RIII 2006, SLV
Benzo(k)fluoranthene	207-08-9	PAH	HPAH	x					0.0272	Buchman 2008, TEL-H
Chrysene	218-01-9	PAH	HPAH	x					0.166	Buchman 2008, TEC
Dibenzo(a,h)anthracene	53-70-3	PAH	HPAH	x					0.033	Buchman 2008, TEC
Fluoranthene	206-44-0	PAH	LPAH		8.1	EPA 1996, ET	90	Schuytema et al. 1996	0.423	Buchman 2008, TEC
Fluorene	86-73-7	PAH	LPAH		3.9	EPA 1996, ET			0.0774	Buchman 2008, TEC
Indeno(1,2,3-cd)pyrene	193-39-5	PAH	HPAH	x	4.3	EPA 2003, R5 ESL			0.0173	Buchman 2008, TEL-H
Naphthalene	91-20-3	PAH	LPAH		24	EPA 1996, ET	2100	Schuytema et al. 1996	0.176	Buchman 2008, TEC
Phenanthrene	85-01-8	PAH	LPAH		6.3	EPA 1996, ET			0.204	Buchman 2008, TEC
Pyrene	129-00-0	PAH	HPAH	x	0.025	BTAG RIII 2006, SLV	140	Schuytema et al. 1996	0.195	Buchman 2008, TEC
Total High Molecular Weight PAHs	RACALC-HPAH	PAH	HPAH	x					0.193	Buchman 2008, TEL-H
Total Low Molecular Weight PAHs	RACALC-LPAH	PAH	LPAH						0.07642	Buchman 2008, TEL-H
Total PAHs	RACALC-PAH	PAH		x					1.6	Buchman 2008, TEC
Aroclor 1016	12674-11-2	PCB		x			6.2	Sparling et al., 2000		
Aroclor 1221	11104-28-2	PCB		x						
Aroclor 1232	11141-16-5	PCB		x						
Aroclor 1242	53469-21-9	PCB		x			2.1	Sparling et al., 2000		
Aroclor 1248	12672-29-6	PCB		x						
Aroclor 1254	11097-69-1	PCB		x			1	Sparling et al., 2000	0.06	Buchman 2008, TEL
Aroclor 1260	11096-82-5	PCB		x						
Aroclor 1262	37324-23-5	PCB		x						
Aroclor 1268	11100-14-4	PCB		x						
Total PCB Aroclors	RACALC-PCB	PCB		x	0.014	CDEP 2011, CWQS			0.0598	Buchman 2008, TEC
2,2-Dichloropropionic acid	75-99-0	Pesticide	Herbicide							
2,4,5-T	93-76-5	Pesticide	Herbicide		36	Buchman 2008, CCC			12.3	BTAG RIII 2006, SLV
2,4,5-TP (Silvex)	93-72-1	Pesticide	Herbicide		30	BTAG RIII 2006, SLV			0.675	BTAG RIII 2006, SLV
2,4-DB	94-82-6	Pesticide	Herbicide							
2-4 Dichlorophenoxyacetic acid (2,4	94-75-7	Pesticide	Herbicide		4	Buchman 2008, CCC			1.273	EPA 2003, R5 ESL
4,4-DDD (p,p)	72-54-8	Pesticide	Insecticide	x	0.011	Suter and Tsao, 1996 Tier II SCV			0.00488	Buchman 2008, TEC
4,4-DDE (p,p)	72-55-9	Pesticide	Insecticide	x	105	Buchman 2008, CCC			0.00316	Buchman 2008, TEC
4,4-DDT (p,p)	50-29-3	Pesticide	Insecticide	x	0.0005	Buchman 2008, CCC	150	Sparling et al., 2000	0.00416	Buchman 2008, TEC

					Surface Water				Sediment	
Analyte	**CAS Number**	**Class**	**Subclass**	**BCC**	**Aquatic Life Screening Level (ug/L)**	**Source**	**Amphibian Screening Level (ug/L)**	**Source**	**Sediment Threshold Screening Level (mg/kg)**	**Source**
Alachlor	15972-60-8	Pesticide	Herbicide							
Aldrin	309-00-2	Pesticide	Insecticide	x	3	BTAG RIII 2006, SLV	150	Sparling et al., 2000	0.002	BTAG RIII 2006, SLV
alpha-Chlordane	5103-71-9	Pesticide	Insecticide	x	0.0022	Buchman 2008, CCC	500	Schuytema et al. 1996		
Camphechlor	8001-35-2	Pesticide	Insecticide	x	0.0002	Buchman 2008, CCC	34	Schuytema et al. 1996	0.028	EPA 1996, ET
Chlordane	57-74-9	Pesticide	Insecticide	x	0.0043	CDEP 2011, CWQS			0.00324	Buchman 2008, TEC
delta-BHC	319-86-8	Pesticide	Insecticide	x	141	BTAG RIII 2006, SLV			6.4	BTAG RIII 2006, SLV
Dicamba	1918-00-9	Pesticide	Herbicide		10	Buchman 2008, CCC				
Dichloroprop	120-36-5	Pesticide	Herbicide							
Dieldrin	60-57-1	Pesticide	Insecticide	x	0.056	CDEP 2011, CWQS	100	Sparling et al., 2000	0.0019	Buchman 2008, TEC
Dinitrobutyl phenol	88-85-7	Pesticide	Herbicide		0.05	Buchman 2008, CCC			0.0145	EPA 2003, R5 ESL
Endosulfan I	959-98-8	Pesticide	Insecticide		0.056	CDEP 2011, CWQS	1.8	Schuytema et al. 1996	0.0029	EPA 1996, ET
Endosulfan II	33213-65-9	Pesticide	Insecticide		0.056	CDEP 2011, CWQS	1.8	Schuytema et al. 1996	0.014	EPA 1996, ET
Endosulfan sulfate	1031-07-8	Pesticide	Insecticide		2.22	Buchman 2008, CCC			0.0054	BTAG RIII 2006, SLV
Endrin	72-20-8	Pesticide	Insecticide		0.036	CDEP 2011, CWQS	10	Sparling et al., 2000	0.00222	Buchman 2008, TEC
Endrin aldehyde	7421-93-4	Pesticide	Insecticide							
Endrin ketone	53494-70-5	Pesticide	Insecticide							
gamma-Chlordane	5103-74-2	Pesticide	Insecticide	x						
Heptachlor	76-44-8	Pesticide	Insecticide		0.0038	CDEP 2011, CWQS	435	Schuytema et al. 1996	0.068	BTAG RIII 2006, SLV
Heptachlor epoxide	1024-57-3	Pesticide	Insecticide		0.0038	CDEP 2011, CWQS			0.00247	Buchman 2008, TEC
Hexachlorocyclohexane, alpha	319-84-6	Pesticide	Insecticide	x	2.2	Buchman 2008, CCC			0.006	BTAG RIII 2006, SLV
Hexachlorocyclohexane, beta	319-85-7	Pesticide	Insecticide	x	2.2	Buchman 2008, CCC			0.005	BTAG RIII 2006, SLV
Hexachlorocyclohexane, gamma (Li	58-89-9	Pesticide	Insecticide	x	0.08	Buchman 2008, CCC	2700	Sparling et al., 2000	0.00237	Buchman 2008, TEC
MCPA (2-Methyl-4-Chlorophenoxya	94-74-6	Pesticide	Herbicide		2.6	Buchman 2008, CCC				
MCPB	94-81-5	Pesticide	Herbicide							
MCPP	93-65-2	Pesticide	Herbicide							
Methoxychlor	72-43-5	Pesticide	Insecticide		0.03	Buchman 2008, CCC	80	Schuytema et al. 1996	0.019	EPA 1996, ET
Total DDx	RACALC-DDx	Pesticide	Insecticide	x	0.001	CDEP 2011, CWQS	150	Sparling et al., 2000	0.00528	Buchman 2008, TEC

Notes:

µg/L = micrograms per liter

mg/kg = milligrams per kilogram

NA = not available

* - indicates that given metal is hardness dependent. Data are screened with default hardness; subsequent analysis of surface incorporates site-specific hardness.

BCC = bioaccumulative compound; BCCs (except for PAHs) include any chemical that has the potential to cause adverse effects after release to surface waters due to bioaccumulation in aquatic organisms (the bioaccumulation factor must be greater than 1000, after considering metabolism ar
PAHs are as benzo(a)pyrene is included as a priority persistent bioacculmaulative and toxic chemical per EPA 2012 (http://www.epa.gov/pbt/index.htm).

References:

Surface Water

1. CT DEEP 2011. Numerical Water Quality Crieteria for Chemical Constituents. State of Connecticut Department of Environmental Protection. Bureau of Water Protection and Land Reuse Planning and Standards Division, 2011 Connecticut Water Quality Standards (CWQS). Continuous (4-da
2. Buchman, M.F, 2008. NOAA Screening Quick Reference (SQuiRT) Tables, NOAA OR&R Report 08-1, Seattle, WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages. Continuous chronic criteria (CCC) for fresh waters (National Ambie
3. Suter and Tsao. 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota, 1996 Revision Tier II Secondary Chronic Values (Tier II SCV)
4. EPA 1996. Ecotox Thresholds (ET). United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Vol 3(2). EPA540/F-95/038. January. Table 2 (Tier II values)
5. EPA 2006. Screening Level Values (SLVs) for Freshwater and Marine Sediment and Freshwater and Marine Water to be Used at Superfund Sites. Region III Biological Technical Assistance Group (BTAG). July/August 2006.
6. EPA 2003. RCRA Corrective Action Ecological Screening Levels (ESLs). EPA, Region 5. August 22, 2003. (Water ESL)
7. Schuytema et al. 1996. "Amphibian Toxicity Data for Water Quality Criteria Chemicals". *EPA/600/R-96/124. Corvallis, Oregon*
8. Sparling et al., 2000. Ecotoxicology of Amphibians and Reptiles. SETAC Press.

Sediment

1. Buchman, M.F. 2008. NOAA Screening Quick Reference (SQuiRT) Tables, NOAA OR&R Report 08-1, Seattle, WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.
Sediment - hierarchy of selection (in order of preference): A. Threshold Effect Concentration (TEC); B. Threshold Effect Level (TEL); C. ARCS Threshold Effect Level (*Hyalella azteca*) (TEL-H)
2. EPA 1996. Ecotox Thresholds. United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Vol 3(2). EPA540/F-95/038. January. Table 2 (SQB)
3. EPA 2006. Screening Level Values (SLV) for Freshwater and Marine Sediment and Freshwater and Marine Water to be Used at Superfund Sites. Region III Biological Technical Assistance Group (BTAG). July/August 2006.
4. EPA 2003. RCRA Corrective Action Ecological Screening Levels (ESLs). U.S EPA, Region 5. August 22, 2003. (Sediment ESL)

In the absence of toxicity-based values from the above sources, the sediment "background" value (bkg) presented in Bucman 2008 was applied.

Other

EPA 1995. Final Water Quality Guidance for the Great Lakes System. 60 Federal Register: 15365 (March 23, 1995). Table 6.

AECOM

Table 4-1
Ecological Risk Assessment Assumptions[1]

Greenwich High School
10 Hillside Road
Greewnich, CT

Parameter	Step 2 Screening Level Assessment	Step 3A Refinement of COPEC
Exposure		
Area Use Factors	100%	Species-specific, per site observations and estimates for future land use, as appropriate.
Bioavailability	100%	Assumed 100% in the absence of quantitative data. Specific site and COPEC bioavailability data is discussed qualitatively as applicable.
Life History	Per Receptor Exposure Parameters	Per Receptor Exposure Parameters
Dietary Composition	100% of diet consists of most dominant food item [2]	Species-specific typical dietary composition, as listed in Receptor Exposure Parameters
Dietary Uptake factors (BAFs)	Literature data, per Receptor Exposure Parameters. The 90th percentile (upper bound) value is used where available.	Literature data, the central tendency value is used.
Exposure Point Concentrations		
Media Concentration	Maximum Detected Concentration for exposure area.	Maximum Detected Concentration for exposure area.
Toxicity Values		
Toxicity Reference Value (TRV)	Chronic NOAEL	Chronic NOAEL[3] and Chronic LOAEL (surrogate for EC20 population level effect)

Notes:

[1] Assumptions presented are based on EPA guidance (EPA 2001; EPA 1997)

[2] Most dominant food item: the "preferred" diet item assumed to supply 100% of diet

[3] Step 3 (refinement of COPECs) provides a risk estimate bounded by toxicity study duration endpoints, providing an upper bound (NOAEL-based) and lower bound (LOAEL-based) risk estimate.

COPEC = chemical of potential ecological concern

EC20 = 20% effect concentration

LOAEL = lowest observable adverse effect level

NOAEL = no observable adverse effect level

BAF = bioaccumulation factor

References:

EPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final. Environmental Response Team, U.S. Environmental Protection Agency. Edison, NJ.

EPA. 2001. The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. ECO Update. Office of Solid Waste and Emergency Response,

AECOM

Table 4-2
Bioaccumulation Factors

Greenwich High School
10 Hillside Road
Greenwich, CT

			Soil/Sediment-to-Plant (mg/kg tissue dwt)/(mg/kg soil/sed dwt)			Sediment-to-Benthic Invertebrate (mg/kg tissue dwt)/(mg/kg sed dwt)			Water-to-Fish (mg/kg tissue wwt)/(mg/L water)			Sediment-to-Fish (mg/kg tissue dwt)/(mg/L water)		
COPEC	**CAS**	**Class**	**BAFplant [1]**	**90th Percentile [1] BAFplant**	**Comment/ Reference**	**BAFinv [1]/BSAF**	**90th Percentile [1] BAFinv**	**Comment/ Reference**	**BAF fish (mean)**	**BAF fish (max)**	**Comment/ Reference**	**BSAF fish**	**90th Percentile BAFfish**	**Comment/ Reference**
Volatile Organic Compounds (8260B)														
2-Butanone	78-93-3	VOC	26.3	NA	Travis and Arms (1988)	1.0	NA	Default	1.0	1.0	BCFwin, EPA (2011)	1	NA	Default (EPA 2004)
Acetone	67-64-1	VOC	53.3	NA	Travis and Arms (1988)	1.0	NA	Default	1.0	1.0	BCFwin, EPA (2011)	1	NA	Default (EPA 2004)
PAHs (8270C)														
Total High Molecular Weight PAHs	RACALC-HPAH	PAH	ln(Cp)=0.975*Ln(Cs)-2.0615	NA	BaP used as surrogate, EPA (2005)	0.14	0.18	Mean/90th percentile of hPAH BSAFs	3106	5846	Mean/Maximum of hPAH BAFs per BCFwin, EPA (2011)	0.26	NA	Mean of hPAH BSAFs per EPA (2012) [5]
Total Low Molecular Weight PAHs	RACALC-LPAH	PAH	ln(Cp)=0.7784*Ln(Cs)-0.9887	NA	Anthracene used as surrogate, EPA (2005)	0.14	0.18	Mean/90th percentile of lPAH BSAFs	614	691	Mean/Maximum of lPAH BAFs per BCFwin, EPA (2011)	2.8	NA	Mean of lPAH BSAFs per EPA (2012) [5]
Total PAHs [3]	RACALC-PAH	PAH	ln(Cp)=0.7912*Ln(Cs)-1.1442	NA	EPA (2005)	0.14	0.18	Mean/90th percentile of PAH BSAFs	1860	3268	Mean/Maximum of PAH BAFs per BCFwin, EPA (2011)	1.5	NA	Mean of PAH BSAFs per EPA (2012) [5]
Metals and Cyanide (6010B/6020, 7470A/7471A, 9010/9012A)														
Arsenic	7440-38-2	Metal	0.038	1.103	Bechtel-Jacobs (1998a)	0.14	0.69	Bechtel-Jacobs (1998b)	17	NA	OEHHA (2012)	NA	NA	[6]
Barium	7440-39-3	Metal	0.156	0.477	Bechtel-Jacobs (1998a)	0.091	0.16	Bechtel-Jacobs (1998b)	5.2	NA	WDOE (1996)	NA	NA	[6]
Beryllium	7440-41-7	Metal	ln(Cp)=0.7345*Ln(Cs)-0.5361	NA	Bechtel-Jacobs (1998a)	0.77	3.72	Bechtel-Jacobs (1998b)	40	NA	OEHHA (2012)	NA	NA	[6]
Cadmium	7440-43-9	Metal	ln(Cp)=0.546*Ln(Cs)-0.475	NA	Bechtel-Jacobs (1998a)	0.60	7.99	Bechtel-Jacobs (1998b)	40	NA	OEHHA (2012)	NA	NA	[6]
Chromium	7440-47-3	Metal	0.041	0.083	Bechtel-Jacobs (1998a)	0.10	0.47	Bechtel-Jacobs (1998b)	21	NA	OEHHA (2012)	NA	NA	[6]
Copper	7440-50-8	Metal	ln(Cp)=0.394*Ln(Cs)+0.668	NA	Bechtel-Jacobs (1998a)	1.57	5.25	Bechtel-Jacobs (1998b)	36	NA	NRWQC (HH), EPA (2002)	NA	NA	[6]
Lead	7439-92-1	Metal	ln(Cp)=0.561*Ln(Cs)-1.328	NA	Bechtel-Jacobs (1998a)	0.071	0.61	Bechtel-Jacobs (1998b)	12	NA	OEHHA (2012)	NA	NA	[6]
Nickel	7440-02-0	Metal	ln(Cp)=0.784*Ln(Cs)-2.223	NA	Bechtel-Jacobs (1998a)	0.49	2.32	Bechtel-Jacobs (1998b)	21	NA	OEHHA (2012)	NA	NA	[6]
Vanadium	7440-62-2	Metal	0.00485	0.010	Bechtel-Jacobs (1998a)	0.042	0.088	Soil invertebrate value used as surrogate	1	NA	Default	NA	NA	[6]
Zinc	7440-66-6	Metal	ln(Cp)=0.554*Ln(Cs)+1.575	NA	Bechtel-Jacobs (1998a)	1.94	7.53	Bechtel-Jacobs (1998b)	47	NA	NRWQC (HH), EPA (2002)	NA	NA	[6]
Mercury (7470A)	7439-97-6	Metal	ln(Cp)=0.544*Ln(Cs)-0.996	NA	Bechtel-Jacobs (1998a)	1.13	2.87	Bechtel-Jacobs (1998b)	84	NA	OEHHA (2012)	NA	NA	[6]
Pesticides (8081)														
Total DDx	RACALC-DDx	Pest	ln(Cp)=0.7524*Ln(Cs)-2.5119	NA	EPA (2005)	ln(Cp)=0.8561*Ln(Cs)+2.1287	NA	EPA (2005)	1,594,333	2,315,000	BCFwin (DDT), EPA (2011)	24.7	NA	Mean of 4,4-DDT, -DDE and DDD BSAFs per EPA (2012) [5]
Chlordane	57-74-9	Pest	0.18	NA	EPA (2005) [2]	4.1	NA	Mean of alpha- and gamma-chlordane BSAFs per EPA (2012) [5]	1,737,067	3,205,000	BCFwin, EPA (2011)	4.9	NA	Mean of alpha- and gamma-chlordane BSAFs per EPA (2012) [5]
Polychlorinated biphenyls (8082)														
Total PCBs	RECALC-PCBs	PCB	0.17	NA	EPA (2005)	10.7	NA	Aroclor 1260 surrogate, EPA (2012) [4]	1,249,467	2,100,000	BCFwin, EPA (2011)	112.8	NA	Aroclor 1260 surrogate, EPA (2012) [5]

Notes:

[1] The central tendency value is represented by the median, unless otherwise noted. The median value is used for the refined screening level evaluation, (RSLERA) and 90th percentile values, where available, are used for screening level evaluations (RSLERA).

[2] Estimated plant uptake values (constants) were computed using the following relationship for analytes having a log Kow between 3 and 8: Log BAFsoil to plant = 1.781 - 0.4057 * log Kow, per EPA (2005). For those analytes, with Log Kows outside of this range the relationship presented by Travis and Arms (1988) was used: Log BAF soil to plant =1.588-0.578 * Log Kow

[3] The total PAH value is the mean of the data presented for the 16 priority PAHs (also includes 1- and 2-methylnaphthalene)

[4] The fish BSAF is modified from the reported value that is given in organic carbon-lipid normalized units (kg-sediment-oc / kg-lipid-fish). The BSAF is modified using the following relationship: modified BSAF (kg-sediment / kg-fish tissue wwt) = BSAF (kg-sediment-oc / kg-lipid-fish) x Fish lipid content (unitless) / Sediment OC (unitless), where lipid content is conservatively assumed to be 7 percent and organic carbon assumed a total organic carbon of 1 percent (foc=0.01). The value is further modified to be presented in dry weight units assuming 75 percent moisture (i.e., modified BSAF / 0.25).

[5] The invertebrate BSAF is modified from the reported value that is given in organic carbon-lipid normalized units (kg-sediment-oc / kg-lipid-invertebrate). The BSAF is modified using the following relationship: modified BSAF (kg-sediment / kg-invertebrate tissue wwt) = BSAF (kg-sediment-oc / kg-lipid-invertebrate) x Invertebrate lipid content (unitless) / Sediment OC (unitless), where lipid content is conservatively assumed to be 1.3% (freshwater molluscs and worms per USCOE 2009) and a total organic carbon of 1 percent (foc=0.01). The value is further modified to be presented in dry weight units assuming 80 percent moisture (i.e., modified BSAF / 0.2).

[6] Use of BSAFs for inorganics is not appropriate; therefore, inorganics were not evaluated (ODEQ 2007; USCOE 2009)

NA = Value not available

dwt = dry weight basis

wwt = wet weight basis

NRAWQC = national recommended ambient water quality criteria

References:

Bechtel-Jacobs Company LLC. 1998a. *Empirical Models for the Uptake of Inorganic Chemicals by Plants.* Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee. BJC/OR-133. Bechtel-Jacobs Company LLC.

Bechtel-Jacobs Company LLC. 1998b. *Biota Sediment Accumulation Factors for Invertebrates: Review and Recommendations for the Oak Ridge Reservation. Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee. BJC/OR-112*

Travis, C.C. and Arms, A.D., 1988. "Bioconcentration of Organics in Beef, Milk and Vegetation," *Environmental Science and Technology* , 22:271-274.

EPA. 2002. National Recommended Water Quality Criteria: 2002 Human Health Criteria Calculation Matrix. United States Environmental Protection Agency, Office of Water (4304T), EPA-822-R-02-012, November 2002.

EPA. 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey: Second Edition. Office of Science and Technology, Washington, D.C. EPA-823-R-04-007. November. Table C-1.

EPA 2005. Ecological Soil Screening Level Guidance. Washington D.C.: Office of Emergency and Remedial Response. November 2003, Revised February 2005.

EPA. 2011. Estimations Programs Interface for Windows (EPI Suite) v. 4.1. BCFBAF Interface. Developed by the EPA's Office of Pollution Prevention Toxics and Syracuse Research Corporation (SRC). January 2011. Available online at: http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm

EPA. 2012. Biota-Sediment Accumulation Factor Data Set (BSAF). Office of Research and Development with OSWER support. Available online at: http://www.epa.gov/med/prods_pubs.htm. Accessed September 7, 2012.

WDOE. 1996. Washington State Department of Ecology, Toxics Cleanup Program.

OEHHA. 2012. Technical Support Document for Exposure Assessment and Stochastic Analysis, FINAL. California Office of Environmental Health Assessment. August, 2012. Available at: oehha.ca.gov/air/hot_spots/pdf/apenh.pdf

ODEQ. 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment, April 17 and April 19, 2007 Public Workshop. Oregon Department of Environmental Quality. Available online at: http://www.deq.state.or.us/lq/pubs/Bioaccumtraining07041

USCOE. 2009. BSAF Database. U.S. Army Corps of Engineers. Technical Point of Contact, Mr. Charlie Lutz. Accessed online January 21, 2009 at: http://el.erdc.usace.army.mil/bsaf/bsaf.html

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Table 4-3
Exposure Point Concentrations for
Surface Water and Sediment

Greenwich High School
10 Hillside Road
Greenwich, CT

			Sediment (mg/kg) [1,2]
COPEC	**CAS**	**Class**	**Maximum Detected Concentration**
Arsenic	7440-38-2	Inorganic	14.2
Barium	7440-39-3	Inorganic	823
Cadmium	7440-43-9	Inorganic	2.83
Chromium	7440-47-3	Inorganic	95.5
Copper	7440-50-8	Inorganic	416
Lead	7439-92-1	Inorganic	305
Mercury	7439-97-6	Inorganic	0.577
Nickel	7440-02-0	Inorganic	57.2
Vanadium	7440-62-2	Inorganic	101
Zinc	7440-66-6	Inorganic	580
Total High Molecular Weight PAHs	RACALC-HPAH	PAH	104
Total Low Molecular Weight PAHs	RACALC-LPAH	PAH	11.5
Total PAHs	RACALC-PAH	PAH	116

			Surface Water (ug/L) [1,2]
COPEC	**CAS**	**Class**	**Maximum Detected Concentration**
Barium	7440-39-3	Inorganic	135
Copper	7440-50-8	Inorganic	7.6

Notes:

[1] The COPEC presented as totals (i.e., low/high molecular weight PAHs and DDx) are the maximum of the sum of the individual constituent parameters.

[2] Detected chemicals are presented.

mg/kg = milligram per kilogram

ug/L = micrograms per liter

CAS = Chemical Abstracts Service.

COPEC = contaminant of potential ecological concern.

HMW = High molecular weight.

LMW = Low molecular weight.

PAH = polyaromatic hydrocarbons.

Pest = pesticide.

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Table 5-1
Surface Water Risk Characterization
Aquatic Biota Assessment Endpoint (detected COPEC)

Greenwich High School
10 Hillside Road
Greenwich, CT

COPEC	CAS Number	Class	Aquatic Life Screening Level	Amphibian Screening Level	Units	Maximum Detected Concentration	Step 2 Risk cannot be excluded. Carry through to Step 3	EPC	HQ (EPC/ALSL)
Downstream									
Barium	7440-39-3	Inorganic	3.9	NA	ug/L	135	YES	135	34.6
Copper	7440-50-8	Inorganic	4.8	15	ug/L	7.6	YES	8	1.6

Notes:
Aquatic life screening levels (AQSL) are presented in Table 3.2.
Shading = indicates exceedance of the aquatic life screening level.
EPC = exposure point concentration.
µg/L = micrograms per liter.
MDC = maximum detected concentration. Used as EPC where insufficient samples for statistical analysis exist, or where the calculation was not needed.
ME = magnitude of exceedance.
NA - Not available.
NC - Not calculated.
AQSL = Aquatic Life Screening Level.

Table 5-1
Surface Water Risk Characterization
Aquatic Biota Assessment Endpoint (detected COPEC)

Step 3A Risk Characterization. Is there potential ecological risk?	Comment
YES. Area EPC > SL. Total of 5 samples, average conc.124 µg/L. 5 of 5 samples detected, all 5 detected locations exceed.	Detected throughout downstream sampling locations. Concentrations may represent local background (uniform enrichment noted in soil and sediment). The potential for unacceptable risk not expected but cannot be dismissed based on current data.
YES. Area EPC > SL. Total of 5 samples, average conc.6.06 µg/L. 3 of 5 samples detected, all 3 detected locations exceed.	Concentrations may represent local background (uniform enrichment noted in soil and sediment). The potential for unacceptable risk not expected but cannot be dismissed based on current data.

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Table 5-2
Sediment Risk Characterization
Benthic Biota Assessment Endpoint

Greenwich High School
10 Hillside Road
Greenwich, CT

COPEC	CAS Number	Class	Step 2 Sediment Threshold (Low) Level [1] (mg/kg)	Step 3 Sediment Probable (High) Level [2] (mg/kg)	Sediment Probable (High) Level Source/Basis	Maximum Detected Concentration (mg/kg)	Step 2 Risk cannot be excluded. Carry through to Step 3	EPC (mg/kg)	ME (EPC/PEL)	Step 3A Risk Characterization. Is there potential ecological risk?	Comments
Downstream											
Arsenic	7440-38-2	Inorganic	9.79	33	Buchman 2008, PEC	14.2	YES	14.2	0.4	NO. EPC does not exceed (high) screening	
Barium	7440-39-3	Inorganic	0.7 "background"	NA	Buchman 2008	823	YES	823	1176	Unknown. EPC > "background" level. Potential toxicity cannot be predicted based on background exceedance.	Exceedance based on comparison to sediment "background" value per Buchman 2008, which was used for initial (threshold) screening; threshold (low) and probable (high) levels not available. However, Connecticut soil is enriched in barium, with an average concentration of 400 mg/kg (EPA 2005). Eastern U.S. barium levels range from 10 to 1500 mg/kg (average 420 mg/kg). The observed concentrations of barium are likely attributable to background conditions. The potential for unacceptable risk is not expected but cannot be dismissed based on current data.
Cadmium	7440-43-9	Inorganic	0.99	4.98	Buchman 2008, PEC	2.83	YES	2.83	0.6	NO. EPC does not exceed (high) screening	
Chromium	7440-47-3	Inorganic	43.4	111	Buchman 2008, PEC	95.5	YES	95.5	0.9	NO. EPC does not exceed (high) screening	
Copper	7440-50-8	Inorganic	31.6	149	Buchman 2008, PEC	416	YES	416	2.8	YES. Area EPC > (high) SL	
Lead	7439-92-1	Inorganic	35.8	128	Buchman 2008, PEC	305	YES	305	2.4	YES. Area EPC > (high) SL	
Mercury	7439-97-6	Inorganic	0.18	1.1	Buchman 2008, PEC	0.58	YES	0.58	0.5	NO. EPC does not exceed (high) screening	
Nickel	7440-02-0	Inorganic	22.7	48.6	Buchman 2008, PEC	57.2	YES	57.2	1.2	YES. Area EPC > (high) SL	
Vanadium	7440-62-2	Inorganic	50 "background"	NA	Buchman 2008	101	YES	101	2.0	Unknown. EPC > "background" level. Potential toxicity cannot be predicted based on background exceedance.	The EPC exceeds "background". Threshold (low) and probable (high) levels are not available. Connecticut soil background for vanadium has an average concentration of 60 mg/kg (EPA 2005) and eastern U.S. soil concentrations range from 7 to 300 mg/kg (average 66 mg/kg). The potential for unacceptable risk is not expected.
Zinc	7440-66-6	Inorganic	121	459	Buchman 2008, PEC	580	YES	580	1.3	YES. Area EPC > (high) SL	

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Table 5-2
Sediment Risk Characterization
Benthic Biota Assessment Endpoint

Greenwich High School
10 Hillside Road
Greenwich, CT

COPEC	CAS Number	Class	Step 2 Sediment Threshold (Low) Level [1] (mg/kg)	Step 3 Sediment Probable (High) Level [2] (mg/kg)	Sediment Probable (High) Level Source/Basis	Maximum Detected Concentration (mg/kg)	Step 2 Risk cannot be excluded. Carry through to Step 3	EPC (mg/kg)	ME (EPC/PEL)	Step 3A Risk Characterization. Is there potential ecological risk?	Comments
Total HMW PAHs	RACALC-HPAH	PAH	0.193	6.5	Buchman 2008, UET	104.4	YES	104.4	16.1	YES. Area EPC > (high) SL	
Total LMW PAHs	RACALC-LPAH	PAH	0.07642	5.3	Buchman 2008, UET	11.5	YES	11.5	2.2	YES. Area EPC > (high) SL	
Total PAHs	RACALC-PAH	PAH	1.6	22.8	Buchman 2008, PEC	116.4	YES	116.4	5.1	YES. Area EPC > (high) SL	

Notes:

mg/kg = milligram per kilogram

CAS = Chemical Abstracts Service.

COPEC = contaminant of potential ecological concern.

HMW = High molecular weight.

LMW = Low molecular weight.

MDC = maximum detected concentration. Used as EPC where insufficient samples for statistical analysis exist, or where the calculation was not needed.

NA - Not available.

PAH = polyaromatic hydrocarbons.

[1] The low screen represents the threshold, or "possible effect" level. Screening values are derived as follows (in order of preference, see also Table 3-5):

TEC = The consensus threshold effect concentration TEC listed in McDonald et al. (2000). This is the preferred screening levels, as they are derived for freshwater biota.

TEL = The TEL or the ARCS TEL listed in Buchman (2008).

LEL = Lowest effect level listed in Buchman (2008)

SQB = Sediment qualtiy benchmark for freshwater sediment per Jones et al (1997).

SLV = Screening Level Values (SLVs) for Freshwater Sediment as listed in EPA Region III Biological Technical Assisstance Group (EPA 2006).

ESL = Ecological screening levels for freshwater sediment as listed in EPA Region 5 Ecological Screening Levels (EPA 2003).

[2] The high screen represents the probable, or "probable effect" level. Screening levels are derived as follows (in order of preference):

PEC = Freshwater concensus probable effecet concentration (PEC) listed in McDonald et al. (2000) as cited by Buchman (2008). This is the preferred screening level.

PEL = Freshwater PEL listed in Buchman (2008).

SEL = secondary effect level listed in Buchman (2008)

UET = Freshwater Washington State Upper Effect Threshold values, as listed in Buchman (2008).

SLV = Screening Level Values (SLVs) for Freshwater Sediment as listed in EPA Region III Biological Technical Assisstance Group (EPA 2006).

ESL = Ecological screening levels for freshwater sediment as listed in EPA Region 5 Ecological Screening Levels (EPA 2003).

References:

Buchman, M.F. 2008. *National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRT)* . NOAA OR&R Report 08-1, Seattle, WA. Office of Response and Restoriation Division, National Oceanic and Atmoshperic Asministration (NOAA)., 34p

Jones, D.S., G.W. Suter II, and R.N. Hull. 1997. *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota* . Oak Ridge National Laboratory, Oak Ridge TN.

Shaklette and Boerngen, 1984. Element Concnetrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional paper 1270: An account of the concnetrations of 50 chemical elements in samples of soils and other regoliths. July 1984.

EPA. 1996. Ecotox Thresholds. In: ECO Update Intermittent Bulletin Volume 3, Number 2. U.S. EPA Office of Solid Waste Management and Emergency Response (OSWER). EPA 540/F-95/038. January

EPA. 2003. RCRA Corrective Action Ecological Screening Levels (ESLs). U.S EPA Region 5. August 22, 2003. (Sediment ESL)

EPA. 2005. Guidance for Developing Ecological Soil Screening Levels. Office of Emergency and Remedial Response. Washington D.C.November 2003, Revised February 2005.

EPA. 2006. EPA Region III Biological Technical Assisstance Group. Screening Level Values for Freshwater and Marine Sediment and Freshwater and Marine Water to be used at Superfund Sites.July/August 2006.

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Table 5-3
Step 2 Food Web Model -
Evaluation for Aquatic-Feeding Birds and Mammals

Greenwich High School
10 Hillside Road
Grenwich, CT

	Downstream						Downstream			
	Great Blue Heron		Mallard		Mink		Raccoon		Muskrat	
	Sediment, Food and Drinking Water		Sediment, Food and Drinking Water		Sediment, Food and Drinking Water		Sediment, Food and Drinking Water		Sediment, Food and Drinking Water	
COPEC	Potential Daily Dose (mg/kgbw/day)	NOAEL-based HQ	Potential Daily Dose (mg/kgbw/day)	NOAEL-based HQ	Potential Daily Dose (mg/kgbw/day)	NOAEL-based HQ	Potential Daily Dose (mg/kgbw/day)	NOAEL-based HQ	Potential Daily Dose (mg/kgbw/day)	NOAEL-based HQ
ARSENIC	3.9E-02	1.8E-02	3.9E-01	1.7E-01	1.4E-01	1.4E-01	1.9E-01	1.8E-01	3.9E-02	3.7E-02
BARIUM	2.0E+00	4.9E-02	7.4E+00	1.8E-01	5.4E+00	1.0E-01	5.4E+00	1.1E-01	9.2E+00	1.8E-01
CADMIUM	2.6E-02	1.8E-02	8.6E-01	5.9E-01	1.7E-01	2.3E-01	3.7E-01	4.8E-01	7.8E-02	1.0E-01
CHROMIUM, TOTAL	2.5E-01	9.3E-02	1.8E+00	6.9E-01	8.1E-01	3.4E-01	9.7E-01	4.1E-01	2.8E-01	1.2E-01
COPPER	2.9E+00	7.0E-01	8.2E+01	**2.0E+01**	1.8E+01	**3.1E+00**	3.5E+01	**6.2E+00**	1.5E+00	2.7E-01
LEAD	8.3E-01	5.1E-01	7.4E+00	**4.5E+00**	2.9E+00	6.1E-01	3.7E+00	7.9E-01	4.7E-01	1.0E-01
MERCURY	2.7E-03	6.0E-03	6.6E-02	1.5E-01	1.5E-02	1.5E-02	3.0E-02	3.0E-02	2.0E-02	1.9E-02
NICKEL	2.4E-01	3.6E-02	5.1E+00	7.5E-01	1.2E+00	7.2E-01	2.2E+00	**1.3E+00**	1.6E-01	9.4E-02
VANADIUM	2.3E-01	6.6E-01	4.4E-01	**1.3E+00**	5.8E-01	1.4E-01	3.9E-01	9.5E-02	3.6E-02	8.6E-03
ZINC	5.1E+00	7.7E-02	1.7E+02	**2.5E+00**	3.4E+01	4.5E-01	7.1E+01	9.4E-01	1.2E+01	1.6E-01
TOTAL LMW PAHs	6.9E+00	2.5E-01	1.2E-01	4.4E-03	7.5E+00	1.1E-01	2.2E-01	3.3E-03	1.8E-01	2.7E-03
TOTAL HMW PAHs	6.0E+00	2.2E-01	9.6E-01	3.5E-02	6.9E+00	**1.1E+01**	7.8E-01	**1.3E+00**	8.5E-01	**1.4E+00**
TOTAL PAHs	3.7E+01	**1.4E+00**	1.1E+00	3.9E-02	4.0E+01	**1.1E+01**	1.4E+00	**1.3E+00**	9.8E-01	**1.4E+00**

Notes:

Shaded cells indicate a HQ>1.

-- = Analyte was not identified with Step 2 HQ>1.

BW - Body Weight.

HMW - High Molecular Weight.

HQ = Hazard Quotient.

LOAEL - Lowest Observed Adverse Effects Level.

LMW - Low Molecular Weight.

mg/kg - Miligram per kilogram.

MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

NC - Not Calculated.

NOAEL - No Observed Adverse Effects Level.

PAHs - Polycyclic Aromatic Hydrocarbons.

[2] Refer to Appendix C for food web model calculations.

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Table 5-4
Step 3A Food Web Model -
Evaluation for Aquatic-Feeding Birds and Mammals

Greenwich High School
10 Hillside Road
Grenwich, CT

	Downstream														
	Great Blue Heron			Mallard			Mink			Raccoon			Muskrat		
	Sediment, Food and Drinking Water			Sediment, Food and Drinking Water			Sediment, Food and Drinking Water			Sediment, Food and Drinking Water			Sediment, Food and Drinking Water		
COPEC	Potential Daily Dose (mg/kgbw/day)	LOAEL-based HQ	MATC-based HQ	Potential Daily Dose (mg/kgbw/day)	LOAEL-based HQ	MATC-based HQ	Potential Daily Dose (mg/kgbw/day)	LOAEL-based HQ	MATC-based HQ	Potential Daily Dose (mg/kgbw/day)	LOAEL-based HQ	MATC-based HQ	Potential Daily Dose (mg/kgbw/day)	LOAEL-based HQ	MATC-based HQ
ARSENIC	3.2E-02	7.0E-03	9.9E-03	2.7E-03	6.0E-04	8.6E-04	3.6E-02	2.1E-02	2.7E-02	3.6E-03	2.1E-03	2.7E-03	3.9E-02	2.3E-02	2.9E-02
BARIUM	1.6E+00	7.8E-03	1.7E-02	5.2E-02	2.5E-04	5.6E-04	1.4E+00	1.2E-02	1.8E-02	1.0E-01	8.6E-04	1.3E-03	9.2E+00	7.7E-02	1.2E-01
CADMIUM	2.1E-02	3.3E-03	6.8E-03	6.1E-03	9.6E-04	2.0E-03	4.5E-02	6.3E-03	1.9E-02	6.9E-03	9.8E-04	3.0E-03	7.8E-02	1.1E-02	3.4E-02
CHROMIUM, TOTAL	2.0E-01	2.2E-02	4.1E-02	1.3E-02	1.4E-03	2.6E-03	2.1E-01	5.9E-03	2.2E-02	1.8E-02	5.2E-04	2.0E-03	2.8E-01	8.0E-03	3.1E-02
COPPER	2.3E+00	1.9E-01	3.3E-01	5.8E-01	4.8E-02	8.3E-02	4.5E+00	4.8E-01	6.2E-01	6.6E-01	7.1E-02	9.1E-02	1.5E+00	1.6E-01	2.1E-01
LEAD	6.6E-01	2.0E-01	2.8E-01	5.2E-02	1.6E-02	2.2E-02	7.3E-01	8.2E-02	1.1E-01	7.0E-02	7.9E-03	1.1E-02	4.7E-01	5.3E-02	7.3E-02
MERCURY	2.2E-03	2.4E-03	3.4E-03	4.6E-04	5.2E-04	7.3E-04	3.8E-03	7.5E-04	1.7E-03	5.6E-04	1.1E-04	2.5E-04	2.0E-02	3.9E-03	8.7E-03
NICKEL	1.9E-01	9.0E-03	1.6E-02	3.5E-02	1.7E-03	3.0E-03	3.1E-01	9.2E-02	1.3E-01	4.2E-02	1.2E-02	1.7E-02	1.6E-01	4.7E-02	6.7E-02
VANADIUM	1.8E-01	2.6E-01	3.7E-01	3.1E-03	4.5E-03	6.4E-03	1.5E-01	1.8E-02	2.5E-02	7.5E-03	9.0E-04	1.3E-03	3.6E-02	4.3E-03	6.1E-03
ZINC	4.1E+00	2.1E-02	3.6E-02	1.2E+00	6.2E-03	1.0E-02	8.6E+00	3.0E-02	5.8E-02	1.3E+00	4.6E-03	9.0E-03	1.2E+01	4.0E-02	7.9E-02
TOTAL LMW PAHs	5.5E+00	4.0E-02	9.0E-02	8.5E-04	6.2E-06	1.4E-05	1.9E+00	5.8E-03	1.3E-02	4.1E-03	1.2E-05	2.8E-05	1.8E-01	5.4E-04	1.2E-03
TOTAL HMW PAHs	4.8E+00	3.5E-02	7.9E-02	6.7E-03	4.9E-05	1.1E-04	1.8E+00	5.7E-01	**1.3E+00**	1.5E-02	4.8E-03	1.1E-02	8.5E-01	2.7E-01	6.1E-01
TOTAL PAHs	2.9E+01	2.2E-01	4.8E-01	7.5E-03	5.5E-05	1.2E-04	1.0E+01	5.8E-01	**1.3E+00**	2.7E-02	4.8E-03	1.1E-02	9.8E-01	2.7E-01	6.1E-01

Notes:

Shaded cells indicate a HQ>1.

-- = Analyte was not identified with Step 2 HQ>1.

BW - Body Weight.

HMW - High Molecular Weight.

HQ = Hazard Quotient.

LMW - Low Molecular Weight.

mg/kg - Miligram per kilogram.

MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

NC - Not Calculated.

PAHs - Polycyclic Aromatic Hydrocarbons.

[2] Refer to Appendix C for food web model calculations.

Appendix A

Photo Documentation of Downstream Area

PHOTOGRAPHIC LOG

Client Name:	**Site Location:** Background Area—North Pond	**Project No.**

Photo No. 1	**Date:** 10/1/2014

Direction Photo Taken:

Northwest

Description:

North Pond pictured looking toward outlet with East Putnam Ave (Route 1) in the background.

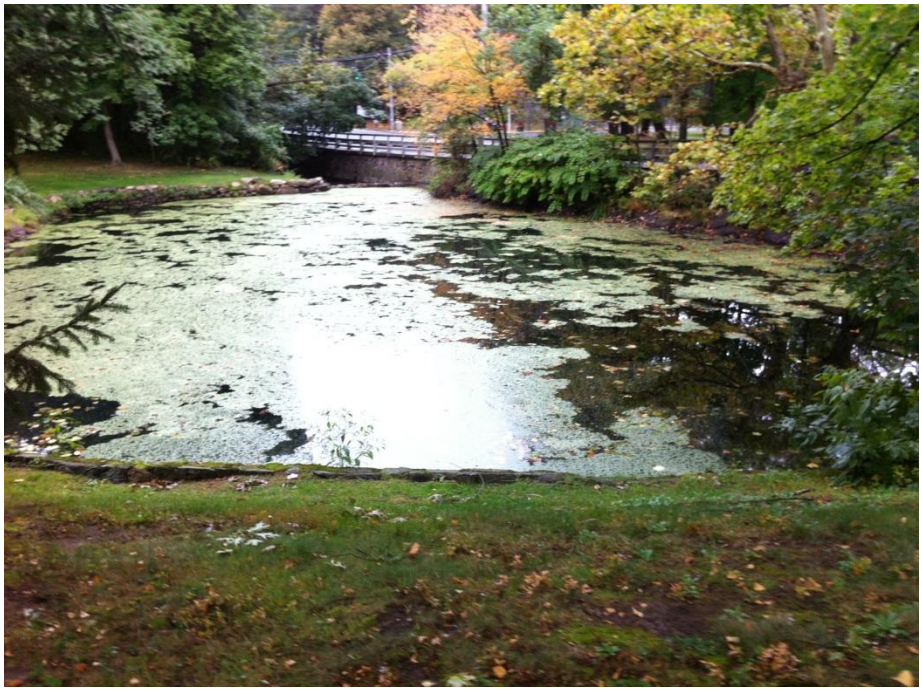


Photo No. 2	**Date:** 10/1/2014

Direction Photo Taken:

North

Description:

Inlet into North Pond conveying flow under East Putnam Ave (Route 1).

PHOTOGRAPHIC LOG

Client Name:	**Site Location:** Downstream Area—Upper Milbrook Pond	**Project No.**

Photo No. 3	**Date:** 10/2/2014

Direction Photo Taken:

South

Description:

Picture taken from north end of Upper Milbrook Pond looking south (downstream).

Photo No. 4	**Date:** 10/2/2014

Direction Photo Taken:

Southwest

Description:

Representative edge of Upper Milbrook Pond showing trees, residences and lawns. Inlet to Upper Milbrook Pond located to the right of picture.

PHOTOGRAPHIC LOG

Client Name:	**Site Location:** Downstream Area—Middle Milbrook Pond	**Project No.**

Photo No. 5	**Date:** 10/1/2014

Direction Photo Taken:

North

Description:

Middle Milbrook Pond pictured showing park along bank and in background inlet restricting flow from Upper Milbrook Pond.

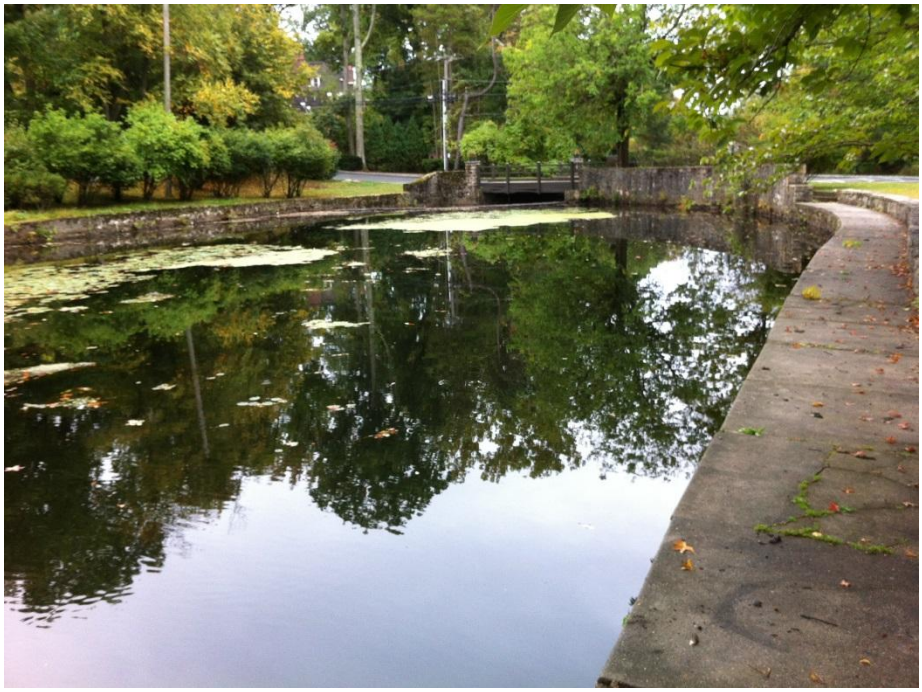
Photo No. 6	**Date:** 10/1/2014

Direction Photo Taken:

South

Description:

Middle Milbrook Pond pictured showing outlet under W Brother Drive in background where flow continues toward Long Island Sound.



PHOTOGRAPHIC LOG

Client Name:	**Site Location:** Downstream Area—Middle Milbrook Pond	**Project No.**

Photo No. 7	**Date:** 10/1/2014

Direction Photo Taken:

NA

Description:

Posted sign in park near Middle Milbrook Pond indicating recent copper sulfate pesticide treatment to unspecified “lake’.

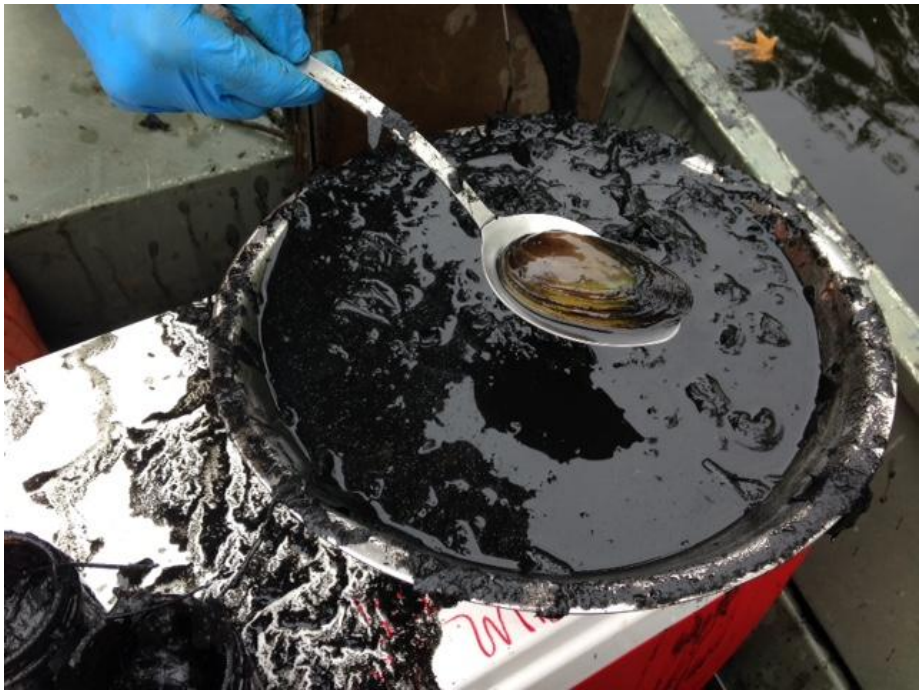
Photo No. 8	**Date:** 10/1/2014

Direction Photo Taken:

NA

Description:

Representative picture of sediment homogenization and freshwater mussel found in collected sediment.



Appendix B

Threatened and Endangered Species and National Wetland Inventory Documentation

AECOM

Table B-1 Summary of Threatened and Endangered Species[1] for Fairfield County, Connecticut

Greenwich High School
10 Hillside Road
Greenwich, CT

Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat	Source[2]	Potential Habitat Status
Species With State Concerns Identified by Connecticut Department of Environmental Protection							
Amphibian	Blue-spotted salamander	*Ambystoma laterale*	E/SC		Found in forested wetland, riparian, scrub-shrub wetland and temporary pool habitats. In New England and New Jersey, generally associated with lowland swamps and marshes and surrounding uplands with sandy or loamy soils. Adults usually found beneath objects or underground. Eggs are attached to submerged sticks or bottom of shallow forest ponds and pools.	[a]	Habitat suitable for breeding, nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.
Amphibian	Northern slimy salamander	*Plethodon glutinosus*	T		Occurs on wooded slopes, ravines, floodplains, shalebanks, and cave entrances; most often in hardwood forest, sometimes in pinelands. Generally under or in rotting logs, stumps, or leaf litter, or under rocks, during the day. Goes underground during dry or freezing weather. Eggs are laid in rotting logs, underground, or in rock crevices.	[a]	Primarily occurs in terrestrial habitat. Habitat suitable for breeding, nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.
Bird	Great egret	*Ardea alba*	T		Occurs in forested wetland, riparian, herbaceous wetland and scrub-shrub wetland; and herbaceous/grassland upland (terrestrial) habitats. Prefers marshes, swampy woods, tidal estuaries, lagoons, mangroves, streams, lakes, and ponds; also fields and meadows. Nests primarily in tall trees, usually with other colonial water birds; in woods or thickets near water.	[a]	Potential habitat may be present, although spatially limited, in association with the site. Significant site presence is not expected.
Bird	Upland sandpiper	*Bartramia longicauda*	E		Occur in bog/fen and upland habitats (cropland/hedgerow, grassland/herbaceous, old field). Prefer open tracts of short grassland habitat for breeding and nest in native prairie, dry meadows, pastures, domestic hayfields, short-grass savanna, plowed fields, along highway rights-of-way and on airfields.	[a]	Primarily occurs in terrestrial habitat. Habitat suitable for breeding, nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.
Bird	American bittern	*Botaurus lentiginosus*	E		Occur in herbaceous wetland and riparian habitat. Primarily large freshwater and (less frequently) brackish marshes, including lake and pond edges where cattails, sedges, or bulrushes are plentiful; and marshes where there are areas of open water and aquatic-bed vegetation. Also occurs in other areas with dense herbaceous cover, such as shrubby marshes, bogs, wet meadows, and occasionally hayfields. Readily uses wetlands created by impoundments: wetlands of 2.5 ha or more may support nesting; smaller wetlands may serve as alternate foraging sites.	[a]	Potential habitat may be present at or near the site, although suitable habitat at the site is limited. Significant site presence is not expected.
Bird	Snowy egret	*Egretta thula*	T		Occurs in marsh, lake, pond, lagoon, mangrove, and shallow coastal habitats. Nests in trees or shrubs or, in some areas, on ground or in marsh vegetation. Often nests with other colonial water birds. Nests typically built over water or on ground.	[a]	Potential habitat may be present at or near the site, although suitable habitat at the site is limited. Significant site presence is not expected.

AECOM

Table B-1 Summary of Threatened and Endangered Species[1] for Fairfield County, Connecticut

Greenwich High School
10 Hillside Road
Greenwich, CT

Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat	Source[2]	Potential Habitat Status
Bird	Common moorhen	*Gallinula chloropus*	E		Prefers habitat simlar to that of other rails: freshwater or braskish marshes with tall emergent vegetation; also found in ponds, canals and rice fields. Primarily a grainivore feeding on seeds of aquatic grasses and sedges. Also consume invertebrates (e.g., snails) gleaned from vegetation.	[b]	Potential habitat may be present, although spatially limited, in association with the site. Significant site presence is not expected.
Bird	Bald eagle	*Haliaeetus leucocephalus*	T		Found near water bodies, including rivers, reservoirs and lakes. Nest in large trees with open crowns, especially in cottonwood and white pine trees along riparian areas.	[a]	Potential habitat may be present nearby. However, on site nesting and foraging habitat is spatially limited. Significant site presence is not expected.
Bird	Least bittern	*Ixobrychus exilis*	T		Prefers freshwater or braskish marshes with tall emergent vegetation. Primarily a pisicivore feeding on small fish and also invertebrates. Constructs nest on ground amidst dense/tall vegetation.	[c]	Habitat suitable for nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.
Bird	Black rail	*Laterallus jamaicensis*	E		Prefers salt, brackish, and freshwater marshes, grassy swamps, pond borders and wet meadows breeding and non-breeding. Secretive, but may emerge from cover in early morning. Nests in or along edge of marsh, in area with saturated or shallowly flooded soils and dense vegetation, usually in nest site hidden by marsh grass or at base of *Salicornia* (in brackish/salt marshes); also nests on damp ground, on mat of previous year's dead grasses, or over very shallow water. Diet is omnivirous consisting of small invertebrates and seeds.	[a]	Habitat suitable for nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.
Bird	Pied-billed grebe	*Podilymbus podiceps*	E		Breeds in association with seasonal or permanent ponds with dense stands of emergent vegetation, bays and sloughs. Nests are typically built in shallow water surrounded by dense vegetation, especially cattail (*Typha spp*.) and bulrush (*Scirpus spp*.). Uses most types of wetlands during winter. Primarily feeds on fishes, crustaceans, insects; also amphibians, other invertebrates, and some plant material.	[a]	Potential habitat may be present nearby. However, on site nesting and foraging habitat is spatially limited. Significant site presence is not expected.
Bird	King rail	*Rallus elegans*	E		Prefers freshwater marshes, upland-wetland marsh edges, ricefields or similar flooded farmland, and shrub swamps; also found locally in brackish and coastal salt marshes. Constructs nests in shallow water as an elevated platform of grasses, sedges, or rushes placed in clump of grass just above water, oten with a canopy and ramp. Diet composed of crustaceans, especially crayfish, aquatic insects and small fish.	[a] [d]	Potential habitat may be present nearby. However, on site nesting and foraging habitat is spatially limited. Significant site presence is not expected.
Invertebrate	Northern metalmark	*Calephelis borealis*	E		Prefers habitats that are openings within (terrestrial) forested or wooded areas. Such openings may be natural outcrops,shale or limestone barrens, glades or powerline right of ways. Critical factors are presence of the primary larval foodplant (*Senecio obovatus*, ragwort) and nectar (e.g., orange milkweed, black eyed susan, daisy or fleabane flowers).	[a]	Terrestrial habitat suitable for foraging and reproduction is limited or absent at the Site. Significant site presence is not expected.

AECOM

Table B-1 Summary of Threatened and Endangered Species[1] for Fairfield County, Connecticut

Greenwich High School
10 Hillside Road
Greenwich, CT

Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat	Source[2]	Potential Habitat Status
Invertebrate	Tiger spiketail	*Cordulegaster erronea*	T		Data regarding preferred habitat is limited. In New Jersey, typically found along small forested streams. In Michigan, noted to occur in lotic depositional headwater streams. Larvae are found in spring seepages and less frequently encountered in larger streams or at low elevations. Specifically require sandy substrate, silt, detritus, slow gradient, rock and soft substrates.	[e] [f]	Potential habitat may be present at or near the Site. However, the riparian corridor is poorly developed and discontinous suggesting that suitable on site habitat is spatially limited. Significant site presence is not expected.
Invertebrate	Sleepy duskywing	*Erynnis brizo*	T		Found in dry usually scrubby oak barrens, woodlands or dry oak forest. Habitat varies regionally, for example in New England very strongly associated with scrub oak (*Quercus Ilicifolia)*, but uses several oaks in New Jersey and in the southeast.	[a]	Suitable terrestrial habitat suitable is absent at the Site. Significant site presence is not expected.
Invertebrate	Columbine duskywing	*Erynnis lucilius*	E		Occurs in hardwood and mixed savanna forests, and mixed/hardwood woodlands.Prefers wooded areas including glades, barrens, ridgetops as well as gullies and openings that occur in richer woods with an abundance of columbines. Habitat needs other than abundance of coulmbines are not fully defined.	[a]	Suitable terrestrial habitat suitable is absent at the Site. Significant site presence is not expected.
Plant	Appalachian blue	*Celastrina neglectamajor*	T		Usually occurs within a rich, moist forest community matrix, such as mixed mesophytic forest, mesic oak-hickory forest, or cove forest. Within these settings, plants generally occur in partially open to open sites generated naturally and/or by human disturbance. These sites include streambanks, floodplains, serpentine barrens, glades, clearings, forest edges, roadsides, old railroad grades, dirt roads, trailsides, old fields, pastures, lawns, and parks. In habitats that are kept open by mowing, there seems to be an optimal mowing frequency that promotes the species' persistence.	[a]	Habitat suitable is limited or absent associated with the site. Significant site presence is not expected.
Reptile	Bog turtle	*Glyptemys muhlenbergii*	T		Preferred habitat includesslow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, wet cow pastures, and shrub swamps; the habitat usually contains an abundance of sedges or mossy cover. The turtles depend on a mosaic of microhabitats for foraging, nesting, basking, hibernation, and shelter. Other wildlife (beaver, deer, and cattle) may be important in maintaining the essential open-canopy wetlands.	[a]	Habitat suitable for nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.

AECOM

Table B-1 Summary of Threatened and Endangered Species[1] for Fairfield County, Connecticut

Greenwich High School
10 Hillside Road
Greenwich, CT

Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat	Source[2]	Potential Habitat Status
Species With Federal Concerns Identified by USFWS							
Reptiles	Bog turtle	*Glyptemys muhlenbergii*		T	Preferred habitat includesslow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, wet cow pastures, and shrub swamps; the habitat usually contains an abundance of sedges or mossy cover. The turtles depend on a mosaic of microhabitats for foraging, nesting, basking, hibernation, and shelter. Other wildlife (beaver, deer, and cattle) may be important in maintaining the essential open-canopy wetlands.	[a]	Habitat suitable for nesting and foraging is not consistent with the habitat associated with the site. Significant site presence is not expected.

Notes:

[1] The table presents threatened and endangered aquatic and aquatic-feeding species identified by Connecticut DEP (http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323486) and United States Fish and Wildlife Service (USFWS). Terrestrial, marine and state-listed special conern species are not presented.

[2] Includes data obtained from Connecticut DEP interactive website (http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323486) and additional species-specific data per NatureServe (2009). All other data obtained from site-specific inqueries to United State Fish and Wildlife Service (USFWS) and other sources, as noted.

E = endangered

T = threatened

SC = special concern

References:

[a] NatureServe 2012. NatureServe Explorer. Interactive Database. Accessed August 27, 2012 at: http://www.natureserve.org/explorer/

[b] Bannor, B. K., and E. Kiviat. 2002. Common Moorhen (Gallinula chloropus). In The Birds of North America, No. 685 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. As cited at: http://www.allaboutbirds.org/guide/Common_Moorhen/lifehistory. Accessed on line October 2, 2012.

[c] Gibbs, J. P., F. A. Reid, and S. M. Melvin. Least Bittern (Ixobrychus exilis). In The Birds of North America, No. 17 (A. Poole, P. Stettenheim, and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union. As cited at: http://www.allaboutbirds.org/guide/Least_Bittern/lifehistory. Accessed on line October 2, 2012.

[d] Meanley, B. 1992. King Rail (Rallus elegans). In The Birds of North America, No. 3 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC.: The American Ornithologists Union. As cited at: http://www.allaboutbirds.org/guide/King_Rail/lifehistory. Accessed on line October 2, 2012.

[e] MNFI 2012. Michigan Natural Features Inventory. Michigan State university Extension. Accessed on line October 2, 2012 at:http://mnfi.anr.msu.edu/explorer/species.cfm?id=12063

[f] NJODES 2012. Tiger Spiketail (Cordulegaster erronea). New Jersey Odonates Enthusiasts. Accessed on line October 2, 2012 at: http://www.njodes.com/Speciesaccts/spiketails/spik-tige.asp

A County Report of
Connecticut's Endangered, Threatened and Special Concern

Fairfield County

Amphibians

Scientific Name	Common Name	Protection Status
Ambystoma jeffersonianum	Jefferson salamander "complex"	SC
Ambystoma laterale	Blue-spotted salamander	E/SC
Plethodon glutinosus	Northern slimy salamander	T

Birds

Scientific Name	Common Name	Protection Status
Accipiter striatus	Sharp-shinned hawk	E
Aegolius acadicus	Northern saw-whet owl	SC
Ammodramus caudacutus	Saltmarsh sharp-tailed sparrow	SC
Ammodramus henslowii	Henslow's sparrow	SC*
Ammodramus maritimus	Seaside sparrow	T
Ammodramus savannarum	Grasshopper sparrow	E
Ardea alba	Great egret	T
Asio flammeus	Short-eared owl	T
Asio otus	Long-eared owl	E
Bartramia longicauda	Upland sandpiper	E
Botaurus lentiginosus	American bittern	E
Buteo platypterus	Broad-winged hawk	SC
Charadrius melodus	Piping plover	T
Circus cyaneus	Northern harrier	E
Cistothorus platensis	Sedge wren	E
Dolichonyx oryzivorus	Bobolink	SC
Egretta caerulea	Little blue heron	SC
Egretta thula	Snowy egret	T

Fairfield County

Birds

Scientific Name	Common Name	Protection Status
Eremophila alpestris	Horned lark	E
Falco peregrinus	Peregrine falcon	T
Falco sparverius	American kestrel	T
Gallinula chloropus	Common moorhen	E
Gavia immer	Common loon	SC
Haematopus palliatus	American oystercatcher	T
Haliaeetus leucocephalus	Bald eagle	T
Icteria virens	Yellow-breasted chat	E
Ixobrychus exilis	Least bittern	T
Laterallus jamaicensis	Black rail	E
Melanerpes erythrocephalus	Red-headed woodpecker	E
Nyctanassa violacea	Yellow-crowned night-heron	SC
Passerculus sandwichensis	Savannah sparrow	SC
Passerculus sandwichensis ssp. princeps	Ipswich sparrow	SC
Plegadis falcinellus	Glossy ibis	SC
Podilymbus podiceps	Pied-billed grebe	E
Pooecetes gramineus	Vesper sparrow	E
Progne subis	Purple martin	T
Rallus elegans	King rail	E
Sterna dougallii	Roseate tern	E
Sterna hirundo	Common tern	SC
Sternula antillarum	Least tern	T
Toxostoma rufum	Brown thrasher	SC
Tyto alba	Barn owl	E

Fish

Scientific Name	Common Name	Protection Status
Acipenser oxyrinchus oxyrinchus	Atlantic sturgeon	T

Fairfield County

Fish

Scientific Name	Common Name	Protection Status
Alosa aestivalis	Blueback herring	SC

Invertebrates

Scientific Name	Common Name	Protection Status
Badister transversus	Ground beetle	SC
Bembidion lacunarium	Ground beetle	SC
Bembidion pseudocautum	Ground beetle	SC
Bembidion semicinctum	Ground beetle	SC
Calephelis borealis	Northern metalmark	E
Celastrina neglectamajor	Appalachian blue	T
Chlosyne harrisii	Harris' checkerspot	SC*
Cicindela formosa generosa	Pine barrens tiger beetle	SC
Cicindela marginata	Tiger beetle	SC
Cicindela tranquebarica	Dark bellied tiger beetle	SC
Citheronia regalis	Regal moth	SC*
Cordulegaster erronea	Tiger spiketail	T
Eacles imperialis imperialis	Imperial moth	SC*
Erynnis brizo	Sleepy duskywing	T
Erynnis lucilius	Columbine duskywing	E
Euphyes dion	Sedge skipper	SC
Fossaria rustica	Lymnaeid snail	SC
Lycaena hyllus	Bronze copper	SC
Margaritifera margaritifera	Eastern pearl shell	SC
Meropleon ambifuscum	Newman's brocade	SC
Procambarus acutus	Whiteriver crayfish	SC
Satyrodes eurydice	Eyed brown	SC
Stygobromus tenuis tenuis	Piedmont groundwater amphipod	SC
Valvata tricarinata	Turret snail	SC

Fairfield County

Mammals

Scientific Name	Common Name	Protection Status
Lasiurus borealis	Red bat	SC

Plants

Scientific Name	Common Name	Protection Status
Acalypha virginica	Virginia copperleaf	SC
Agastache nepetoides	Yellow giant hyssop	E
Agastache scrophulariifolia	Purple giant hyssop	E
Ageratina aromatica	Small white snakeroot	E
Andromeda polifolia var. glaucophylla	Bog rosemary	T
Anemone canadensis	Canada anemone	T
Angelica venenosa	Hairy angelica	SC*
Antennaria howellii ssp. petaloidea	Field pussytoes	SC*
Aplectrum hyemale	Puttyroot	SC*
Arethusa bulbosa	Arethusa	SC*
Aristida longespica	Needlegrass	SC
Aristida purpurascens	Arrowfeather	SC
Aristida tuberculosa	Beach needle grass	E
Aristolochia serpentaria	Virginia snakeroot	SC
Asclepias purpurascens	Purple milkweed	SC
Asplenium ruta-muraria	Wallrue spleenwort	T
Atriplex glabriuscula	Orache	SC
Betula pumila	Swamp birch	SC
Bidens beckii	Water-marigold	T
Bolboschoenus maritimus ssp. paludosus	Bayonet grass	SC
Bolboschoenus novae-angliae	Salt marsh bulrush	SC
Bouteloua curtipendula	Side-oats grama-grass	E
Cardamine douglassii	Purple cress	SC
Carex aestivalis	Summer sedge	SC

Fairfield County

Plants

Scientific Name	Common Name	Protection Status
Carex alata	Broadwing sedge	E
Carex alopecoidea	Foxtail sedge	T
Carex barrattii	Barratt's sedge	E
Carex bushii	Sedge	SC
Carex buxbaumii	Brown bog sedge	E
Carex davisii	Davis' sedge	T
Carex hitchcockiana	Hitchcock's sedge	SC
Carex prairea	Prairie sedge	SC
Carex squarrosa	Sedge	SC
Carex sterilis	Dioecious sedge	SC
Carex trichocarpa	Sedge	SC
Carex tuckermanii	Tuckerman's sedge	SC
Carex typhina	Sedge	SC
Castilleja coccinea	Indian paintbrush	T
Chamaelirium luteum	Devil's-bit	E
Chenopodium rubrum	Coast blite	SC*
Coeloglossum viride	Long-bracted green orchid	E
Corallorhiza trifida	Early coral root	SC
Cryptogramma stelleri	Slender cliff-brake	E
Cuphea viscosissima	Blue waxweed	SC*
Cuscuta coryli	Hazel dodder	SC*
Cynoglossum virginianum	Wild comfrey	SC*
Cypripedium parviflorum	Yellow lady's-slipper	SC
Desmodium glabellum	Dillenius' tick-trefoil	SC
Dichanthelium xanthophysum	Panic grass	SC*
Diplazium pycnocarpon	Narrow-leaved glade fern	E
Draba reptans	Whitlow-grass	SC
Dryopteris goldiana	Goldie's fern	SC

Fairfield County

Plants

Scientific Name	Common Name	Protection Status
Eleocharis quadrangulata var. crassior	Spike-rush	E
Elymus wiegandii	Wiegand's wild rye	SC
Equisetum pratense	Meadow horsetail	E
Eriocaulon parkeri	Parker's pipewort	E
Eurybia x herveyi	Hervey's aster	SC
Floerkea proserpinacoides	False mermaid-weed	E
Gaylussacia dumosa var. bigeloviana	Dwarf huckleberry	T
Gentianella quinquefolia	Stiff gentian	E
Hasteola suaveolens	Sweet-scented Indian-plantain	E
Heteranthera reniformis	Kidneyleaf mud-plantain	SC*
Honckenya peploides	Seabeach sandwort	SC
Hottonia inflata	Featherfoil	SC
Hudsonia tomentosa	False beach-heather	T
Hydrastis canadensis	Golden seal	E
Hydrophyllum virginianum	Virginia waterleaf	SC
Hypericum ascyron	Great St. John's-wort	SC
Isotria medeoloides	Small whorled pogonia	E
Juncus debilis	Weak rush	SC*
Krigia biflora	Two-flowered cynthia	SC
Leptochloa fusca ssp. fascicularis	Saltpond Grass	E
Lespedeza repens	Creeping bush-clover	SC
Liatris scariosa var. novae-angliae	Blazing-star	SC
Limosella australis	Mudwort	SC
Linum sulcatum	Yellow flax	E
Liquidambar styraciflua	Sweet gum	SC
Lyonia mariana	Stagger-bush	SC*
Malaxis unifolia	Green adder's-mouth	E

Fairfield County

Plants

Scientific Name	Common Name	Protection Status
Nuphar advena	Large yellow pond lily	SC*
Nuphar microphylla	Small yellow pond lily	SC
Oenothera fruticosa	Sundrops	SC*
Onosmodium virginianum	Gravel-weed	E
Opuntia humifusa	Eastern prickly pear	SC
Orontium aquaticum	Golden club	SC
Orthilia secunda	One-sided pyrola	SC*
Panax quinquefolius	American ginseng	SC
Panicum amarum	Panic grass	T
Paronychia fastigiata	Hairy forked chickweed	SC*
Phaseolus polystachios var. polystachios	Wild kidney bean	SC*
Pityopsis falcata	Sickle-leaved golden aster	E
Platanthera ciliaris	Yellow-fringed orchid	T
Platanthera flava var. herbiola	Pale green orchid	SC
Platanthera hookeri	Hooker's orchid	SC*
Podostemum ceratophyllum	Threadfoot	SC
Polygala cruciata	Field milkwort	E
Polygala senega	Seneca snakeroot	E
Potentilla arguta	Tall cinquefoil	SC
Prunus alleghaniensis	Alleghany plum	SC*
Ranunculus ambigens	Water-plantain spearwort	E
Ranunculus pensylvanicus	Bristly buttercup	SC*
Ribes rotundifolium	Wild currant	SC
Rotala ramosior	Toothcup	T
Sabatia stellaris	Marsh pink	E
Sagittaria subulata	Arrowleaf	SC
Salix pedicellaris	Bog willow	E
Salix petiolaris	Slender willow	SC

Fairfield County

Plants

Scientific Name	Common Name	Protection Status
Salix serissima	Autumn willow	SC
Saururus cernuus	Lizard's tail	E
Schoenoplectus acutus	Hard-stemmed bulrush	T
Scleria triglomerata	Nutrush	E
Senna hebecarpa	Wild senna	SC
Silene stellata	Starry champion	T
Sporobolus clandestinus	Rough dropseed	E
Sporobolus cryptandrus	Sand dropseed	T
Sporobolus neglectus	Small dropseed	E
Stellaria borealis	Northern stitchwort	SC
Symphyotrichum prenanthoides	Crooked-stem aster	SC*
Taenidia integerrima	Yellow pimpernel	E
Thuja occidentalis	Northern white cedar	T
Triosteum angustifolium	Narrow-leaved horse gentian	E
Verbena simplex	Narrow-leaved vervain	SC*
Viburnum nudum	Possum haw	SC*
Viburnum prunifolium	Smooth black-haw	SC
Viola brittoniana	Coast violet	E
Viola hirsutula	Southern wood violet	SC*
Viola nephrophylla	Northern bog violet	SC
Vitis x novae-angliae	New England grape	SC
Waldsteinia fragarioides	Barren strawberry	E
Xyris montana	Northern yellow-eyed grass	T
Zizia aptera	Golden Alexanders	E

Reptiles

Scientific Name	Common Name	Protection Status
Caretta caretta	Loggerhead	T

Fairfield County

Reptiles

Scientific Name	Common Name	Protection Status
Chelonia mydas	Atlantic green turtle	T
Crotalus horridus	Timber rattlesnake	E
Dermochelys coriacea	Leatherback	E
Glyptemys insculpta	Wood turtle	SC
Glyptemys muhlenbergii	Bog turtle	E
Heterodon platirhinos	Eastern hognose snake	SC
Lepidochelys kempii	Atlantic ridley	E
Liochlorophis vernalis	Smooth green snake	SC
Terrapene carolina carolina	Eastern box turtle	SC
Thamnophis sauritus	Eastern ribbon snake	SC

E = Endangered, T = Threatened, SC = Special Concern, * Believed Extirpated

State of Connecticut
Department of Energy and Environmental Protection
Bureau of Natural Resources, Wildlife Division
79 Elm St., Hartford, CT 06106

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Piping Plover (Charadrius	except Great Lakes watershed	Threatened	Office Of The Regional Director	Great Lakes & Northern Great	Final
Birds	Piping Plover (Charadrius	except Great Lakes watershed	Threatened	Office Of The Regional Director	Piping Plover Atlantic Coast	Final Revision 1
Reptiles	Hawksbill sea turtle		Endangered	North Florida Ecological	Recovery Plan for the Hawksbill	Final Revision 1
Reptiles	Hawksbill sea turtle		Endangered	North Florida Ecological	Recovery Plan for U.S. Pacific	Final Revision 1
Reptiles	Leatherback sea turtle		Endangered	North Florida Ecological	Recovery Plan for U.S. Pacific	Final Revision 1
Reptiles	Leatherback sea turtle		Endangered	North Florida Ecological	Recovery Plan for Leatherback	Final Revision 1
Reptiles	Green sea turtle (Chelonia	except where endangered	Threatened	North Florida Ecological	Recovery Plan for U.S. Pacific	Final Revision 1
Reptiles	Green sea turtle (Chelonia	except where endangered	Threatened	North Florida Ecological	Recovery Plan for U.S.	Final Revision 1
Reptiles	Bog (=Muhlenberg) turtle	northern	Threatened	Assistant Regional Director-	Recovery Plan for the Bog	Final

U.S. Fish and Wildlife Service
National Wetlands Inventory

Milbrook Ponds, Downstream of GHS

May 19, 2017

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix C

Off-site Sediment and Surface Water Sampling Results (On CD)

AECOM
500 Enterprise Drive
Suite 1A
Rocky Hill, CT 06067
www.aecom.com

860.263.5800 tel
860.263.5777 fax

October 16, 2017

Amy Siebert, Commissioner
Greenwich Department of Public Works
101 Field Point Road
Greenwich, CT 06830

RE: Off-site Sediment and Surface Water Results
Greenwich High School
10 Hillside Road
Greenwich, Connecticut

Dear Ms. Siebert:

AECOM Technical Services, Inc. (AECOM) is herein providing the results of the sediment sampling conducted associated with the Greenwich High School (the site) environmental investigation activities. Sampling activities were conducted in July 2013 and October 2014. The sampling results are being used to support a Screening Level Ecological Risk Assessment (SLERA) Addendum, which is being prepared for submission to the Connecticut Department of Energy and Environmental Protection (DEEP).

Introduction

AECOM conducted sediment and surface water sampling in West Brother Brook upstream of the site, North Pond, located south of the site and upstream of the confluence of West Brothers Brook and Greenwich Creek and the two ponds located downstream of the site, south of East Putnam Avenue (US Route 1). A site location map is provided as **Figure 1**. The upstream investigation was conducted in July 2013, and the downstream investigation was conducted in October 2014. Each sampling event included the collection of surficial sediment samples and co-located surface water samples.

Project Objective

The upstream investigation was conducted to determine if any of the constituents of concern (COCs) identified in site sediment may have migrated to the site from potential upstream sources.

The downstream investigation was conducted to investigate whether COCs from the site have been transported to the downstream water bodies from the site. The objectives of the investigative activities were to:

- Determine if COCs have migrated to downstream sediments;
- Investigate sediment type and general characteristics of the downstream area; and
- Characterize downstream surface water and sediment quality.

Project Description

The following activities were completed during the investigations:

- Upstream
  - Collection and analysis of four sediment samples and co-located surface water samples and associated QA/QC samples.
- Downstream
  - Collection and analysis of six sediment samples and co-located surface water samples and associated QA/QC samples.

Site Setting

West Brothers Brook flows southeast through residential neighborhoods located northwest of the site and enters the site near the northwestern corner of the athletic fields. On-site, West Brothers brook flows south through a culverted concrete channel along the western perimeter of the site, turning east, then north where it becomes a natural channel before bending south again and flowing to Cider Mill Pond. From Cider Mill Pond, West Brothers Brook exits the site near the southeastern corner of the property flowing through a culvert underneath Route 1. Immediately south of Route 1, West Brothers Brook discharges to Greenwich Creek.

The downstream area ponds are located along Greenwich Creek south of Route 1. North Pond is located approximately 200 feet upstream of the confluence of West Brothers Brook and Greenwich Creek and is approximately 0.5 acres in area. South of the confluence with West Brothers Brook, Greenwich Creek flows through a short natural channel and then a concrete-lined channel surrounded by residences before flowing into Upper Milbrook Pond. Upper Milbrook Pond is located approximately 900 feet south of Route 1 and is approximately 18 acres in area. Middle Milbrook Pond is approximately 1 acre in area and is separated from Upper Milbrook Pond by a constructed dam. To the east of the Milbrook Ponds is the Milbrook Country Club, and to the west, are residential neighborhoods.

The banks of the ponds are built up with stones and large cobble, with residential lawns and yards abutting the waterline.

Because North Pond is upstream of the confluence of West Brothers Brook and Greenwich Creek, it serves as a reference location for the downstream Milbrook Pond sampling stations.

Rationale for Scope of Work

The primary goals of the supplemental investigations activities were to:

- Support the SLERA Addendum;
- Evaluate potential migration of COCs onto the site from potential upstream sources;
- Evaluate potential migration of COCs to downstream water bodies;
- Further evaluate current downstream conditions and potential offsite contributors to contamination of the lower ponds.

Field Activities

Upstream Activities

Upstream sampling activities were coordinated through Town of Greenwich Department of Public Works personnel, who accompanied AECOM during the initial site visit to help identify sampling locations. Sampling locations were selected to minimize disturbance to nearby residences in areas where safe stream access was available. Upstream sampling locations are shown on **Figure 2**.

Surficial sediment and water samples were collected from four upstream locations in West Brothers Brook on July 25, 2013. Sampling was conducted from downstream to upstream to ensure that any disturbed sediments were not subsequently collected in downstream sediment or surface water samples. Water samples were collect before sediment samples at each location to prevent adding suspended solids to the water column. Water samples were collected in laboratory-supplied glassware from the mid-point of the water column. Sediment samples were collected using a stainless steel hand auger, which was decontaminated prior to each use to prevent cross-contamination during sampling.

Water samples were submitted for laboratory analysis of metals, polycyclic aromatic hydrocarbons (PAHs), and pesticides. Sediment samples were submitted for laboratory analysis of metals, PAHs, pesticides and PCBs. Two field duplicates were taken, one for water and one for sediment, and were included in the sample set for analysis. Laboratory analysis was performed by Spectrum Analytical Inc. of Agawam, Massachusetts (Spectrum).

Downstream Activities

Downstream sampling activities were conducted under an access agreement between the Town of Greenwich and Milbrook Owners Association, Inc (MOA). AECOM coordinated with Mr. Rick Sirvaitis of the MOA prior to commencing field activities.

Surficial sediment and water samples were collected from the downstream area ponds on October 1 and 2, 2014. During the sampling event surficial sediment samples were collected from 6 locations and 6 water samples were collected from the mid-point of the water column using a peristaltic pump and associated tubing. Collection of all samples occurred from a Jon Boat equipped with an electric trolling motor. Sediment and water sample locations are shown on **Figure 3**.

Predetermined sample locations were navigated to in the field using a GPS with sub-meter accuracy and aerial imagery. Select sampling locations were field-adjusted based on field conditions to collect samples from depositional environments where sediment transported from upstream would be likely to settle out of the water column. Sampling was conducted from downstream to upstream, to ensure that any disturbed sediments were not subsequently collected in subsequent sediment or surface water samples. Sample time, water depth, water sample depth, sediment type and any pertinent sample location notes were recorded in a project dedicated field logbook.

Once on station, water depth was recorded to determine the mid-point of the water column and water collection depth. Fresh tubing was connected to the peristaltic pump at each sample location. Water samples were collected from the mid-depth of the water column and placed in laboratory prepared,

clean glassware. Sediment samples were collected after the collection of water samples to avoid adding suspended solids to the water column. Sediment samples were collected using an Ekman Dredge; and material collected was placed into a decontaminated stainless steel mixing bowl and homogenized before being placed into lab cleaned glassware. Sediment sampling equipment was field decontaminated prior to the collection of each sample.

Water samples were submitted for laboratory analysis of metals, PAHs, and pesticides. Sediment samples were submitted for laboratory analysis of metals, PAHs, pesticides, and PCBs. Two field duplicates were taken, one for water and one for sediment, and were included in the sample set for analysis. Laboratory analysis was performed by Spectrum Analytical Inc. of Agawam, Massachusetts (Spectrum).

Upstream Sampling Results

Upstream sediment sampling results are summarized in **Table 1**. PCBs were not detected in any of the samples. PAHs were detected in only one of the samples (SED-BBUS-3). Pesticides were detected in two of the samples (SED-BBUS-1 and SED-BBUS-3). Arsenic, barium, chromium copper, lead, nickel, vanadium and zinc were detected in one or more of the samples.

Upstream surface water sampling results are summarized in **Table 2**. PAHs were detected in four of the samples (SW-BBUS-1, SW-BBUS-2, SW-BBUS-3, SW-BBUS-4). Metals (barium, cadmium, and zinc), and pesticides (dieldrin) were detected in one or more of the samples.

Downstream Area Sampling Results

Downstream area sediment sampling results are summarized in **Table 3**. PCBs were not detected in the downstream sediment samples. PAHs and metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, vanadium and zinc) were detected in one or more of the samples.

Downstream area surface water sampling results are summarized in **Table 4**. PAHs and pesticides were not detected in any of the samples. Barium was detected in all the samples. No other metals were detected.

The sediment sample collected from North Pond (SED-DOWNSTREAM-01) contained PAHs, metals (barium, chromium, copper, lead, nickel, vanadium and zinc) and pesticides (4,4-DDT). The surface water sample from this location contained barium.

Discussion

The results of the upstream and downstream sediment and surface water investigations are being incorporated into the SLERA addendum report and will be discussed further therein.

If you should have any questions regarding this summary report, please do not hesitate to contact the undersigned.

Regards,

Matthew Rood, LEP
Project Engineer

Patrick Haskell, LEP
Senior Technical Specialist

cc: Jane Warren, McCarter & English

Attachments:

Attachment I Data Summary Tables
Attachment II Figures
Attachment III Laboratory Reports

Attachment I Data Summary Tables

AECOM

Table 1
Upstream Sediment Sampling Results

Greenwich High School
10 Hillside Road
Greenwich, CT

Sample ID Depth (ft bgs) Sample Date	SED-BBUS-1 0-0.5 7/25/2013	SED-BBUS-2 0-0.5 7/25/2013	SED-BBUS-2 0-0.5 7/25/2013	SED-BBUS-3 0-0.5 7/25/2013	SED-BBUS-4 0-0.5 7/25/2013
SVOCs-SIM (ug/Kg)					
Benzo(b)fluoranthene	<76	<77	<78	**940**	<87
Fluoranthene	<76	<77	<78	**1100**	<87
Pyrene	<76	<77	<78	**1100**	<87
Total PAHs	<0	<0	<0	**3140**	<0
Metals (mg/Kg)					
Antimony	*<5.93*	*<5.69*	*<5.74*	*<5.54*	*<6.48*
Arsenic	**4.48**	<1.71	**1.89**	**2.09**	**3.37**
Barium	**66.6**	**94**	**93.8**	**40.1**	**111**
Chromium	**19.2**	**25.9**	**22.6**	**13.1**	**36.8**
Copper	**16.2**	**15.8**	**19.2**	**14.5**	**16.4**
Lead	**11.5**	**4.63**	**4.65**	**50.9**	**7.39**
Nickel	**15.1**	**14.6**	**14.8**	**14.4**	**21.2**
Silver	*<1.78*	*<1.71*	*<1.72*	*<1.66*	*<1.94*
Vanadium	**24.9**	**30.5**	**26.3**	**21**	**38.7**
Zinc	**33.4**	**41**	**35.2**	**33.9**	**60.3**
PCBs (ug/Kg)					
Total PCBs	<0	<0	<0	<0	<0
Pesticides (ug/Kg)					
4,4-DDD (p,p)	*<9.67*	*<10.5*	*<10.3*	**16**	*<10.7*
4,4-DDE (p,p)	**23.4**	*<6.56*	*<6.44*	**22.5**	*<6.71*
4,4-DDT (p,p)	**20.1**	*<10.5*	*<10.3*	**30.7**	*<10.7*
alpha-Chlordane	**17.3**	<6.56	<6.44	**5.83**	<6.71
Chlordane	**78.5**	*<26.2*	*<25.7*	**49.5**	*<26.9*
Total DDT	**43.5**	<0	<0	**69.2**	<0

Notes:

This is a summary table. Only detected chemicals are presented.

<0.010 = Not detected above given laboratory reporting limit.

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

SIM = Selective Ion Monitoring; a method performed for the PAH subgroup of SVOC analytes to obtain lower detection limits

SVOC = semivolatile organic compound

PCB = polychlorinated biphenyl

PAH = polycyclic aromatic hydrocarbon

AECOM

Table 2
Upstream Surface Water Sampling Results

Greenwich High School
10 Hillside Road
Greenwich, CT

Location ID Sample Date	SW-BBUS-1 7/25/2013	SW-BBUS-2 7/25/2013	SW-BBUS-2 7/25/2013	SW-BBUS-3 7/25/2013	SW-BBUS-4 7/25/2013
PAHs-SIM (ug/L)					
Benzo(a)anthracene	<0.050	<0.050	<0.050	**0.288**	<0.050
Benzo(a)pyrene	<0.050	<0.050	<0.050	**0.375**	**0.064**
Benzo(b)fluoranthene	<0.050	<0.050	<0.050	**0.379**	**0.068**
Benzo(g,h,i)perylene	<0.050	<0.050	<0.050	**0.272**	**0.05**
Benzo(k)fluoranthene	<0.050	<0.050	<0.050	**0.318**	**0.056**
Chrysene	<0.050	<0.050	<0.050	**0.373**	**0.054**
Fluoranthene	**0.084**	<0.050	**0.097**	**0.728**	**0.131**
Indeno(1,2,3-cd)pyrene	<0.050	<0.050	<0.050	**0.31**	**0.056**
Phenanthrene	**0.057**	<0.050	**0.077**	**0.341**	**0.096**
Pyrene	**0.064**	<0.050	**0.075**	**0.605**	**0.103**
Total PAHs	**0.205**	<0	**0.249**	**3.989**	**0.678**
Total Metals (mg/L)					
Barium	**0.0958**	**0.0858**	**0.122**	**0.105**	**0.0879**
Cadmium	*<0.0025*	*<0.0025*	*<0.0025*	*<0.0025*	*<0.0025*
Copper	**0.0072**	<0.0050	**0.0086**	**0.0058**	<0.0050
Lead	*<0.0075*	*<0.0075*	*<0.0075*	*<0.0075*	*<0.0075*
Silver	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Thallium	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Zinc	**0.02**	**0.0117**	**0.0265**	**0.0197**	**0.122**
Pesticides (ug/L)					
Dieldrin	**0.031**	**0.018**	**0.003**	**0.004**	**0.003**

Notes:

This is a summary table. Only detected chemicals are presented except when no analytes were detected for an analysis.

<0.010 = Not detected above given laboratory reporting limit.

mg/L = milligram per liter

ug/L = microgram per liter

PAH = polycyclic aromatic hydrocarbon

SIM = Selective Ion Monitoring; a method performed for the PAH subgroup of SVOC analytes to obtain lower detection limits

SVOC = semivolatile organic compound

Table 3
Downstream Area Sediment Sampling Results

Greenwich High School
10 Hillside Road
Greenwich, CT

Location ID	SED-DOWNSTREAM-01	SED-DOWNSTREAM-01	SED-DOWNSTREAM-02	SED-DOWNSTREAM-03	SED-DOWNSTREAM-04	SED-DOWNSTREAM-05	SED-DOWNSTREAM-06
Depth Interval (ft bgs)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Sample Date	10/2/2014	10/2/2014	10/1/2014	10/1/2014	10/1/2014	10/1/2014	10/1/2014
PAH-SIMS (ug/kg)							
Acenaphthene	**130**	< 110	< 170	< 410	< 390	< 460	< 1000
Acenaphthylene	**100**	< 110	< 170	< 410	< 390	< 460	< 1000
Anthracene	**670**	**360**	**310**	< 410	**1400**	**670**	< 1000
Benzo(a)anthracene	**2100**	**1700**	**910**	**810**	**9600**	**1900**	< 1000
Benzo(a)pyrene	**2100**	**1600**	**850**	**810**	**9100**	**2300**	< 1000
Benzo(b)fluoranthene	**3100**	**2500**	**1200**	**1400**	**13000**	**4100**	**2200**
Benzo(g,h,i)perylene	**1100**	**1100**	**620**	**610**	**6000**	**1900**	< 1000
Benzo(k)fluoranthene	**1300**	**1100**	**570**	**690**	**6500**	**1700**	< 1000
Chrysene	**2600**	**2000**	**970**	**1000**	**9300**	**3100**	**1900**
Dibenzo(a,h)anthracene	**280**	< 110	< 170	< 410	< 390	< 460	< 1000
Fluoranthene	**6800**	**5000**	**2500**	**2200**	**24000**	**6100**	**3500**
Fluorene	**260**	**160**	< 170	< 410	**610**	< 460	< 1000
Indeno(1,2,3-cd)pyrene	**2000**	**1400**	**740**	**830**	**7900**	**2300**	< 1000
Phenanthrene	**3700**	**2400**	**1400**	**670**	**9500**	**2200**	**1500**
Pyrene	**5000**	**3900**	**1800**	**1800**	**19000**	**4800**	**2600**
Total PAHs	**31240**	**23220**	**11870**	**10820**	**115910**	**31070**	**11700**
Metals (mg/kg)							
Arsenic	< 2.05	< 2.21	**6.45**	**13.6**	**10.0**	**14.2**	< 21.6
Barium	**70.8**	**71.7**	**229**	**719**	**502**	**823**	**815**
Cadmium	< 0.682	< 0.736	< 1.21	< 3.78	< 2.45	**2.83**	< 7.19
Chromium	**28.3**	**18.1**	**38.3**	**91.8**	**74.2**	**95.5**	**58.6**
Copper	**25.1**	**18.7**	**81.7**	**416**	**256**	**353**	**408**
Lead	**32.3**	**23.1**	**183**	**273**	**212**	**305**	**148**
Mercury	< 0.0399	< 0.0440	**0.155**	**0.575**	**0.409**	**0.564**	**0.577**
Nickel	**9.30**	**8.64**	**21.9**	**56.3**	**44.1**	**57.2**	**47.2**
Vanadium	**19.1**	**20.1**	**40.6**	**95.3**	**80.8**	**101**	**82.4**
Zinc	**52.5**	**50.0**	**208**	**580**	**432**	**543**	**497**
PCBs (ug/kg)							
Total PCB Aroclors	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)							
4,4-DDT (p,p)	**15.7**	< 13.0	< 20.2	< 63.3	< 45.9	< 50.5	< 118
Total DDx	**15.7**	ND	ND	ND	ND	ND	ND

Notes:
This is a summary table. Only detected chemicals are presented.
<0.010 = Not detected above given laboratory reporting limit.
Bold = Detected above reporting limit.
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
SIM = Selective Ion Monitoring; a method performed for the PAH subgroup of SVOC analytes to obtain lower detection limits
PCB = polychlorinated biphenyl
PAH = polycyclic aromatic hydrocarbon

Table 4
Downstream Area Surface Water Sampling Results

Greenwich High School
10 Hillside Road
Greenwich, CT

Location ID Sample Date	SW-DOWNSTREAM-01 10/2/2014	SW-DOWNSTREAM-01 10/2/2014	SW-DOWNSTREAM-02 10/1/2014	SW-DOWNSTREAM-03 10/1/2014	SW-DOWNSTREAM-04 10/1/2014	SW-DOWNSTREAM-05 10/1/2014	SW-DOWNSTREAM-06 10/1/2014
PAH-SIMS (ug/L)							
Total PAHs	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Metals (mg/L)							
Barium	**0.106**	**0.100**	**0.119**	**0.122**	**0.123**	**0.122**	**0.135**
Pesticides (ug/L)							
Pesticides	ND	ND	ND	ND	ND	ND	ND

Notes:
This is a summary table. Only detected chemicals are presented except when no analytes were detected for an analysis.
<0.010 = Not detected above given laboratory reporting limit.
mg/L = milligram per liter
ug/L = microgram per liter
PAH = polycyclic aromatic hydrocarbon
SIM = Selective Ion Monitoring; a method performed for the PAH subgroup of SVOC analytes to obtain lower detection limits

Attachment II Figures

0 0.125 0.25 Miles

Site Locus

Off-site Sediment and Surface Water Report Greenwich, CT

Scale:	Date:	Project Number:
1" = 1/4 mi	6/29/2017	60432356

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

Figure Number
1

Document Path: X:\60225155 Greenwich High School\7.0 Project Documents\Downstream Sediment Sampling\Reporting_2014\Figures\June 2017\Figure 1.mxd

0 150 300 Feet

N

Upstream Sediment and Surface Water Samples

Off-site Sediment and
Surface Water Report
Greenwich, CT

Scale:	Date:	Project Number:
1" = 300'	6/29/2017	60432356

AECOM
AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

Figure Number
2

Document Path: X:\60225155 Greenwich High School\7.0 Project Documents\Downstream Sediment Sampling\Reporting_2014\Figures\June 2017\Figure 2 Upstream.mxd

0 200 400 Feet

N

Downstream Sediment Samples

Off-site Sediment and
Surface Water Report
Greenwich, CT

Scale:	Date:	Project Number:
1" = 400'	6/29/2017	60432356

AECOM

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500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
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Figure Number
3

Document Path: X:\60225155 Greenwich High School\7.0 Project Documents\Downstream Sediment Sampling\Reporting_2014\Figures\June 2017\Figure 3 Downstream.mxd

Attachment III Laboratory Reports

Report Date:
02-Aug-13 16:16

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

AECOM Environment
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
Attn: Malcolm Beeler

Project: Greenwich HS - Greenwich, CT
Project #: 60225155

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SB73837-01	SED-BBUS-1-072513-1	Sediment	25-Jul-13 09:00	25-Jul-13 21:00
SB73837-02	SW-BBUS-1-072513-1	Surface Water	25-Jul-13 09:00	25-Jul-13 21:00
SB73837-03	SED-BBUS-2-072513-1	Sediment	25-Jul-13 10:00	25-Jul-13 21:00
SB73837-04	SW-BBUS-2-072513-1	Surface Water	25-Jul-13 10:00	25-Jul-13 21:00
SB73837-05	SED-BBUS-2-072513-2	Sediment	25-Jul-13 10:00	25-Jul-13 21:00
SB73837-06	SW-BBUS-2-072513-2	Surface Water	25-Jul-13 10:00	25-Jul-13 21:00
SB73837-07	SED-BBUS-3-072513-1	Sediment	25-Jul-13 10:30	25-Jul-13 21:00
SB73837-08	SW-BBUS-3-072513-1	Surface Water	25-Jul-13 10:30	25-Jul-13 21:00
SB73837-09	SED-BBUS-4-072513-1	Sediment	25-Jul-13 11:00	25-Jul-13 21:00
SB73837-10	SW-BBUS-4-072513-1	Surface Water	25-Jul-13 11:00	25-Jul-13 21:00
SB73837-11	Equipment Blank	Deionized Water	25-Jul-13 11:30	25-Jul-13 21:00

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New Jersey # MA011/MA012
New York # 11393/11840
Pennsylvania # 68-04426/68-02924
Rhode Island # 98
USDA # S-51435

Authorized by:

Nicole Leja
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 61 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, FL-E87936 and NJ-MA012).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Reasonable Confidence Protocols
Laboratory Analysis
QA/QC Certification Form

Laboratory Name: Spectrum Analytical, Inc.

Client: AECOM Environment - Rocky Hill, CT

Project Location: Greenwich HS - Greenwich, CT

Project Number: 60225155

Sampling Date(s):
7/25/2013

Laboratory Sample ID(s):
SB73837-01 through SB73837-11

RCP Methods Used:

EPA 245.1/7470A
SW846 6010C
SW846 7471B
SW846 8081B
SW846 8082A
SW846 8270D
SW846 8270D SIM

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	✓ Yes	No
1A	Were the method specified preservation and holding time requirements met?	✓ Yes	No
1B	***VPH and EPH methods only***: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	Yes	No
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	✓ Yes	No
3	Were samples received at an appropriate temperature?	✓ Yes	No
4	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved?	Yes	✓ No
5	a) Were reporting limits specified or referenced on the chain-of-custody? b) Were these reporting limits met?	Yes Yes	✓ No No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	✓ Yes	No
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	✓ Yes	No

Note: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence."

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for obtaining the information contained in this analytical report, such information is accurate and complete.

Nicole Leja
Laboratory Director
Date: 8/2/2013

CASE NARRATIVE:

The samples were received 4.5 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

Required site-specific Matrix Spike/Matrix Spike Duplicate (MS/MSD) must be requested by the client and sufficient sample must be submitted for the additional analyses. Samples submitted with insufficient volume/weight will not be analyzed for site specific MS/MSD, however a batch MS/MSD may be analyzed from a non-site specific sample.

CTDEP has published a list of analytical methods which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of decisions being made utilizing the Reasonable Confidence Protocol (RCP). "Reasonable Confidence" can be established only for those methods published by the CTDEP in the RCP guidelines. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

The CTDEP RCP requests that "all non-detects and all results below the reporting limit are reported as ND (Not Detected at the Specified Reporting Limit)". All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

If no reporting limits were specified or referenced on the chain-of-custody the laboratory's practical quantitation limits were applied.

Tetrachloro-m-xylene is recommended as a surrogate by the CTDEP RCP for the following SW846 Methods 8081, 8082 and 8151. Spectrum Analytical, Inc. uses Tetrachloro-m-xylene as the Internal Standard for these methods and Dibromooctaflourobiphenyl as the surrogate.

For this work order, the reporting limits have not been referenced or specified.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 6010C

Spikes:

1318009-MS1 *Source: SB73837-07*

The spike recovery exceeded the QC control limits for the MS and/or MSD. The batch was accepted based upon acceptable PS and /or LCS recovery.

Antimony
Lead

1318009-MSD1 *Source: SB73837-07*

The spike recovery exceeded the QC control limits for the MS and/or MSD. The batch was accepted based upon acceptable PS and /or LCS recovery.

Antimony
Lead

Duplicates:

1318009-DUP1 *Source: SB73837-07*

Analyses are not controlled on RPD values from sample concentrations that are less than 5 times the reporting level. The batch is accepted based upon the difference between the sample and duplicate is less than or equal to the reporting limit.

Arsenic

The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.

Lead

SW846 7471B

Duplicates:

1318010-DUP1 *Source: SB73837-07*

Analyses are not controlled on RPD values from sample concentrations that are less than 5 times the reporting level. The batch is accepted based upon the difference between the sample and duplicate is less than or equal to the reporting limit.

Mercury

SW846 8081B

Spikes:

1317981-MS1 *Source: SB73837-07*

The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

gamma-Chlordane

1317981-MSD1 *Source: SB73837-07*

The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

gamma-Chlordane

Samples:

SB73837-01 *SED-BBUS-1-072513-1*

Difference between the two GC columns is greater than 40%.

Chlordane [2C]
gamma-Chlordane [2C]

SB73837-04 *SW-BBUS-2-072513-1*

Difference between the two GC columns is greater than 40%.

Dieldrin [2C]

SB73837-07 *SED-BBUS-3-072513-1*

Difference between the two GC columns is greater than 40%.

alpha-Chlordane
gamma-Chlordane [2C]

SW846 8270D SIM

Spikes:

1317842-MS2 *Source: SB73837-08*

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Fluoranthene

1317842-MSD2 *Source: SB73837-08*

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Fluoranthene

M1295-04AMS *Source: SB73837-07*

SW846 8270D SIM

Spikes:

M1295-04AMS *Source: SB73837-07*

Spike recovery falls outside of the control limit

2-Methylnaphthalene
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Naphthalene
Phenanthrene
Pyrene

M1295-04AMSD *Source: SB73837-07*

Relative percent difference is outside of the control limit

Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Naphthalene
Phenanthrene
Pyrene

Spike recovery falls outside of the control limit

Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Fluoranthene
Indeno(1,2,3-cd)pyrene
Phenanthrene
Pyrene

Samples:

S309150-CCV1

SW846 8270D SIM

Samples:

S309150-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

Dibenzo (a,h) anthracene (23.3%)

This affected the following samples:

1317842-BLK2
1317842-BS2
1317842-BSD2
SW-BBUS-1-072513-1
SW-BBUS-2-072513-1

Sample Acceptance Check Form

Client:	AECOM Environment - Rocky Hill, CT
Project:	Greenwich HS - Greenwich, CT / 60225155
Work Order:	SB73837
Sample(s) received on:	7/25/2013
Received by:	Jessica Hoffman

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
1. Were custody seals present?	☐	☑	☐
2. Were custody seals intact?	☐	☐	☑
3. Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
4. Were samples cooled on ice upon transfer to laboratory representative?	☑	☐	☐
5. Were samples refrigerated upon transfer to laboratory representative?	☐	☑	☐
6. Were sample containers received intact?	☑	☐	☐
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
8. Were samples accompanied by a Chain of Custody document?	☑	☐	☐
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
10. Did sample container labels agree with Chain of Custody document?	☑	☐	☐
11. Were samples received within method-specific holding times?	☑	☐	☐

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-1-072513-1	60225155	Sediment	25-Jul-13 09:00	25-Jul-13
SB73837-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC	< 6.04		µg/kg dry	6.04	0.918	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317981	X
319-85-7	beta-BHC	< 6.04		µg/kg dry	6.04	1.02	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 6.04		µg/kg dry	6.04	1.03	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 3.63		µg/kg dry	3.63	0.979	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 6.04		µg/kg dry	6.04	0.906	1	"	"	"	"	"	X
309-00-2	Aldrin	< 6.04		µg/kg dry	6.04	0.967	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 6.04		µg/kg dry	6.04	1.06	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 6.04		µg/kg dry	6.04	1.06	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 6.04		µg/kg dry	6.04	1.00	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	**23.4**		µg/kg dry	6.04	1.03	1	"	"	"	"	"	X
72-20-8	Endrin	< 9.67		µg/kg dry	9.67	1.20	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 9.67		µg/kg dry	9.67	1.04	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 9.67		µg/kg dry	9.67	1.04	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 9.67		µg/kg dry	9.67	1.12	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	**20.1**		µg/kg dry	9.67	1.02	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 9.67		µg/kg dry	9.67	0.810	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 9.67		µg/kg dry	9.67	1.09	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 9.67		µg/kg dry	9.67	1.08	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	**17.3**		µg/kg dry	6.04	1.09	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 6.04	P	µg/kg dry	6.04	1.08	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 121		µg/kg dry	121	13.6	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	**78.5**	P	µg/kg dry	24.2	3.60	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 6.04		µg/kg dry	6.04	1.40	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*101*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*86*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*82*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*70*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 23.8		µg/kg dry	23.8	17.7	1	SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	X
11104-28-2	Aroclor-1221	< 23.8		µg/kg dry	23.8	21.4	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 23.8		µg/kg dry	23.8	15.3	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 23.8		µg/kg dry	23.8	14.3	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 23.8		µg/kg dry	23.8	12.4	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 23.8		µg/kg dry	23.8	19.8	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 23.8		µg/kg dry	23.8	14.7	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 23.8		µg/kg dry	23.8	22.1	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 23.8		µg/kg dry	23.8	9.80	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-1-072513-1 SB73837-01	60225155	Sediment	25-Jul-13 09:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*105*			*30-150 %*			SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	
2051-24-3	*Decachlorobiphenyl (Sr)*	*70*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*140*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 1.78		mg/kg dry	1.78	0.513	1	SW846 6010C	30-Jul-13	31-Jul-13	EDT	1318009	X
7440-38-2	Arsenic	**4.48**		mg/kg dry	1.78	0.776	1	"	"	"	"	"	X
7440-39-3	Barium	**66.6**		mg/kg dry	1.19	0.382	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.593		mg/kg dry	0.593	0.179	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.593		mg/kg dry	0.593	0.174	1	"	"	"	"	"	X
7440-47-3	Chromium	**19.2**		mg/kg dry	1.19	0.256	1	"	"	"	"	"	X
7440-50-8	Copper	**16.2**		mg/kg dry	1.19	0.457	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0329		mg/kg dry	0.0329	0.0017	1	SW846 7471B	"	31-Jul-13	JLM	1318010	X
7440-02-0	Nickel	**15.1**		mg/kg dry	1.19	0.344	1	SW846 6010C	"	31-Jul-13	EDT	1318009	X
7439-92-1	Lead	**11.5**		mg/kg dry	1.78	0.656	1	"	"	"	"	"	X
7440-36-0	Antimony	< 5.93		mg/kg dry	5.93	1.09	1	"	"	"	"	"	X
7782-49-2	Selenium	< 1.78		mg/kg dry	1.78	0.510	1	"	"	"	"	"	X
7440-28-0	Thallium	< 3.56		mg/kg dry	3.56	1.01	1	"	"	"	"	"	X
7440-62-2	Vanadium	**24.9**		mg/kg dry	1.78	0.551	1	"	"	"	"	"	X
7440-66-6	Zinc	**33.4**		mg/kg dry	1.19	0.521	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**81.5**		%			1	SM2540 G Mod.	26-Jul-13	26-Jul-13	DT	1317764	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**16**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		29-Jul-13	PH-01	R75557	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 76		ug/Kg	76	23	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
91-57-6	2-Methylnaphthalene	< 76		ug/Kg	76	23	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 76		ug/Kg	76	20	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 76		ug/Kg	76	21	1	"	"	"	"	"	
86-73-7	Fluorene	< 76		ug/Kg	76	20	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 76		ug/Kg	76	23	1	"	"	"	"	"	
120-12-7	Anthracene	< 76		ug/Kg	76	22	1	"	"	"	"	"	
206-44-0	Fluoranthene	< 76		ug/Kg	76	35	1	"	"	"	"	"	
129-00-0	Pyrene	< 76		ug/Kg	76	25	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	< 76		ug/Kg	76	30	1	"	"	"	"	"	
218-01-9	Chrysene	< 76		ug/Kg	76	51	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	< 76		ug/Kg	76	37	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 76		ug/Kg	76	30	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 76		ug/Kg	76	22	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 76		ug/Kg	76	25	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 76		ug/Kg	76	25	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-1-072513-1	60225155	Sediment	25-Jul-13 09:00	25-Jul-13
SB73837-01				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 76		ug/Kg	76	25	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
Surrogate recoveries:													
205440-82-0	*Benzo(e)pyrene-d12*	*106*			*32-153 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-1-072513-1	60225155	Surface Water	25-Jul-13 09:00	25-Jul-13
SB73837-02				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	02-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	**0.084**		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	**0.057**		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	**0.064**		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*85*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*85*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*94*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
60-57-1	Dieldrin	**0.031**		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-1-072513-1 SB73837-02	60225155	Surface Water	25-Jul-13 09:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.051		µg/l	0.051	0.047	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.006	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*77*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*70*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*44*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*33*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	**0.0958**		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0072**		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-66-6	Zinc	**0.0200**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-1	60225155	Sediment	25-Jul-13 10:00	25-Jul-13
SB73837-03				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC	< 6.56		µg/kg dry	6.56	0.997	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317981	X
319-85-7	beta-BHC	< 6.56		µg/kg dry	6.56	1.10	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 6.56		µg/kg dry	6.56	1.12	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 3.94		µg/kg dry	3.94	1.06	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 6.56		µg/kg dry	6.56	0.984	1	"	"	"	"	"	X
309-00-2	Aldrin	< 6.56		µg/kg dry	6.56	1.05	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 6.56		µg/kg dry	6.56	1.15	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 6.56		µg/kg dry	6.56	1.15	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 6.56		µg/kg dry	6.56	1.09	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 6.56		µg/kg dry	6.56	1.12	1	"	"	"	"	"	X
72-20-8	Endrin	< 10.5		µg/kg dry	10.5	1.30	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 10.5		µg/kg dry	10.5	1.13	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 10.5		µg/kg dry	10.5	1.13	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 10.5		µg/kg dry	10.5	1.22	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 10.5		µg/kg dry	10.5	1.10	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 10.5		µg/kg dry	10.5	0.879	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 10.5		µg/kg dry	10.5	1.18	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 10.5		µg/kg dry	10.5	1.17	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 6.56		µg/kg dry	6.56	1.18	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 6.56		µg/kg dry	6.56	1.10	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 131		µg/kg dry	131	14.8	1	"	"	"	"	"	X
57-74-9	Chlordane	< 26.2		µg/kg dry	26.2	3.73	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 6.56		µg/kg dry	6.56	1.52	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*109*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*80*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*69*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*58*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 24.9		µg/kg dry	24.9	18.6	1	SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	X
11104-28-2	Aroclor-1221	< 24.9		µg/kg dry	24.9	22.5	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 24.9		µg/kg dry	24.9	16.0	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 24.9		µg/kg dry	24.9	15.0	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 24.9		µg/kg dry	24.9	13.0	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 24.9		µg/kg dry	24.9	20.8	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 24.9		µg/kg dry	24.9	15.5	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 24.9		µg/kg dry	24.9	23.2	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 24.9		µg/kg dry	24.9	10.3	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-1 SB73837-03	60225155	Sediment	25-Jul-13 10:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*85*			*30-150 %*			SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*100*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 1.71		mg/kg dry	1.71	0.492	1	SW846 6010C	30-Jul-13	31-Jul-13	EDT	1318009	X
7440-38-2	Arsenic	< 1.71		mg/kg dry	1.71	0.744	1	"	"	"	"	"	X
7440-39-3	Barium	**94.0**		mg/kg dry	1.14	0.367	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.569		mg/kg dry	0.569	0.172	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.569		mg/kg dry	0.569	0.167	1	"	"	"	"	"	X
7440-47-3	Chromium	**25.9**		mg/kg dry	1.14	0.246	1	"	"	"	"	"	X
7440-50-8	Copper	**15.8**		mg/kg dry	1.14	0.438	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0356		mg/kg dry	0.0356	0.0018	1	SW846 7471B	"	31-Jul-13	JLM	1318010	X
7440-02-0	Nickel	**14.6**		mg/kg dry	1.14	0.330	1	SW846 6010C	"	31-Jul-13	EDT	1318009	X
7439-92-1	Lead	**4.63**		mg/kg dry	1.71	0.629	1	"	"	"	"	"	X
7440-36-0	Antimony	< 5.69		mg/kg dry	5.69	1.05	1	"	"	"	"	"	X
7782-49-2	Selenium	< 1.71		mg/kg dry	1.71	0.489	1	"	"	"	"	"	X
7440-28-0	Thallium	< 3.41		mg/kg dry	3.41	0.964	1	"	"	"	"	"	X
7440-62-2	Vanadium	**30.5**		mg/kg dry	1.71	0.528	1	"	"	"	"	"	X
7440-66-6	Zinc	**41.0**		mg/kg dry	1.14	0.500	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**75.4**		%			1	SM2540 G Mod.	26-Jul-13	26-Jul-13	DT	1317764	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**16**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		29-Jul-13	PH-01	R75557	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 77		ug/Kg	77	23	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
91-57-6	2-Methylnaphthalene	< 77		ug/Kg	77	23	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 77		ug/Kg	77	21	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 77		ug/Kg	77	21	1	"	"	"	"	"	
86-73-7	Fluorene	< 77		ug/Kg	77	20	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 77		ug/Kg	77	23	1	"	"	"	"	"	
120-12-7	Anthracene	< 77		ug/Kg	77	22	1	"	"	"	"	"	
206-44-0	Fluoranthene	< 77		ug/Kg	77	35	1	"	"	"	"	"	
129-00-0	Pyrene	< 77		ug/Kg	77	26	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	< 77		ug/Kg	77	30	1	"	"	"	"	"	
218-01-9	Chrysene	< 77		ug/Kg	77	52	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	< 77		ug/Kg	77	38	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 77		ug/Kg	77	30	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 77		ug/Kg	77	22	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 77		ug/Kg	77	26	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 77		ug/Kg	77	26	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-1	60225155	Sediment	25-Jul-13 10:00	25-Jul-13
SB73837-03				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 77		ug/Kg	77	26	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
Surrogate recoveries:													
205440-82-0	*Benzo(e)pyrene-d12*	*89.2*			*32-153 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-2-072513-1	60225155	Surface Water	25-Jul-13 10:00	25-Jul-13
SB73837-04				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	02-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*93*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*95*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*90*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	**0.018**	P	µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-2-072513-1 SB73837-04	60225155	Surface Water	25-Jul-13 10:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.058		µg/l	0.058	0.054	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.008		µg/l	0.008	0.007	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*88*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*81*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*51*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*38*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	**0.0858**		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-66-6	Zinc	**0.0117**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-2	60225155	Sediment	25-Jul-13 10:00	25-Jul-13
SB73837-05				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC	< 6.44		µg/kg dry	6.44	0.978	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317981	X
319-85-7	beta-BHC	< 6.44		µg/kg dry	6.44	1.08	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 6.44		µg/kg dry	6.44	1.09	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 3.86		µg/kg dry	3.86	1.04	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 6.44		µg/kg dry	6.44	0.965	1	"	"	"	"	"	X
309-00-2	Aldrin	< 6.44		µg/kg dry	6.44	1.03	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 6.44		µg/kg dry	6.44	1.13	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 6.44		µg/kg dry	6.44	1.13	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 6.44		µg/kg dry	6.44	1.07	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 6.44		µg/kg dry	6.44	1.09	1	"	"	"	"	"	X
72-20-8	Endrin	< 10.3		µg/kg dry	10.3	1.27	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 10.3		µg/kg dry	10.3	1.11	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 10.3		µg/kg dry	10.3	1.11	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 10.3		µg/kg dry	10.3	1.20	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 10.3		µg/kg dry	10.3	1.08	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 10.3		µg/kg dry	10.3	0.862	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 10.3		µg/kg dry	10.3	1.16	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 10.3		µg/kg dry	10.3	1.15	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 6.44		µg/kg dry	6.44	1.16	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 6.44		µg/kg dry	6.44	1.08	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 129		µg/kg dry	129	14.5	1	"	"	"	"	"	X
57-74-9	Chlordane	< 25.7		µg/kg dry	25.7	3.66	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 6.44		µg/kg dry	6.44	1.49	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*123*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*125*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*88*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*83*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 25.8		µg/kg dry	25.8	19.3	1	SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	X
11104-28-2	Aroclor-1221	< 25.8		µg/kg dry	25.8	23.3	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 25.8		µg/kg dry	25.8	16.6	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 25.8		µg/kg dry	25.8	15.5	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 25.8		µg/kg dry	25.8	13.4	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 25.8		µg/kg dry	25.8	21.5	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 25.8		µg/kg dry	25.8	16.0	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 25.8		µg/kg dry	25.8	24.1	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 25.8		µg/kg dry	25.8	10.7	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*95*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-2 SB73837-05	60225155	Sediment	25-Jul-13 10:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*95*			*30-150 %*			SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*95*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 1.72		mg/kg dry	1.72	0.496	1	SW846 6010C	30-Jul-13	31-Jul-13	EDT	1318009	X
7440-38-2	Arsenic	**1.89**		mg/kg dry	1.72	0.751	1	"	"	"	"	"	X
7440-39-3	Barium	**93.8**		mg/kg dry	1.15	0.370	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.574		mg/kg dry	0.574	0.173	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.574		mg/kg dry	0.574	0.169	1	"	"	"	"	"	X
7440-47-3	Chromium	**22.6**		mg/kg dry	1.15	0.248	1	"	"	"	"	"	X
7440-50-8	Copper	**19.2**		mg/kg dry	1.15	0.442	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0349		mg/kg dry	0.0349	0.0018	1	SW846 7471B	"	31-Jul-13	JLM	1318010	X
7440-02-0	Nickel	**14.8**		mg/kg dry	1.15	0.333	1	SW846 6010C	"	31-Jul-13	EDT	1318009	X
7439-92-1	Lead	**4.65**		mg/kg dry	1.72	0.635	1	"	"	"	"	"	X
7440-36-0	Antimony	< 5.74		mg/kg dry	5.74	1.06	1	"	"	"	"	"	X
7782-49-2	Selenium	< 1.72		mg/kg dry	1.72	0.494	1	"	"	"	"	"	X
7440-28-0	Thallium	< 3.45		mg/kg dry	3.45	0.973	1	"	"	"	"	"	X
7440-62-2	Vanadium	**26.3**		mg/kg dry	1.72	0.533	1	"	"	"	"	"	X
7440-66-6	Zinc	**35.2**		mg/kg dry	1.15	0.504	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**77.4**		%			1	SM2540 G Mod.	26-Jul-13	26-Jul-13	DT	1317764	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**16**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		29-Jul-13	PH-01	R75557	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 78		ug/Kg	78	24	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
91-57-6	2-Methylnaphthalene	< 78		ug/Kg	78	24	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 78		ug/Kg	78	21	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 78		ug/Kg	78	21	1	"	"	"	"	"	
86-73-7	Fluorene	< 78		ug/Kg	78	21	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 78		ug/Kg	78	23	1	"	"	"	"	"	
120-12-7	Anthracene	< 78		ug/Kg	78	23	1	"	"	"	"	"	
206-44-0	Fluoranthene	< 78		ug/Kg	78	36	1	"	"	"	"	"	
129-00-0	Pyrene	< 78		ug/Kg	78	26	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	< 78		ug/Kg	78	31	1	"	"	"	"	"	
218-01-9	Chrysene	< 78		ug/Kg	78	52	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	< 78		ug/Kg	78	38	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 78		ug/Kg	78	31	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 78		ug/Kg	78	23	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 78		ug/Kg	78	26	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 78		ug/Kg	78	26	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-2-072513-2	60225155	Sediment	25-Jul-13 10:00	25-Jul-13
SB73837-05				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 78		ug/Kg	78	26	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
Surrogate recoveries:													
205440-82-0	*Benzo(e)pyrene-d12*	*91.0*			*32-153 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-2-072513-2	60225155	Surface Water	25-Jul-13 10:00	25-Jul-13
SB73837-06				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	02-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	**0.097**		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	**0.077**		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	**0.075**		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*68*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*91*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*86*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	**0.003**		µg/l	0.002	0.001	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-2-072513-2 SB73837-06	60225155	Surface Water	25-Jul-13 10:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.052		µg/l	0.052	0.048	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.006	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*85*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*74*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*43*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*35*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	**0.122**		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0086**		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-66-6	Zinc	**0.0265**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC	< 5.50		µg/kg dry	5.50	0.837	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317981	X
319-85-7	beta-BHC	< 5.50		µg/kg dry	5.50	0.925	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 5.50		µg/kg dry	5.50	0.936	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 3.30		µg/kg dry	3.30	0.892	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 5.50		µg/kg dry	5.50	0.826	1	"	"	"	"	"	X
309-00-2	Aldrin	< 5.50		µg/kg dry	5.50	0.881	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 5.50		µg/kg dry	5.50	0.969	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 5.50		µg/kg dry	5.50	0.969	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 5.50		µg/kg dry	5.50	0.914	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	**22.5**		µg/kg dry	5.50	0.936	1	"	"	"	"	"	X
72-20-8	Endrin	< 8.81		µg/kg dry	8.81	1.09	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 8.81		µg/kg dry	8.81	0.947	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	**16.0**		µg/kg dry	8.81	0.947	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 8.81		µg/kg dry	8.81	1.02	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	**30.7**		µg/kg dry	8.81	0.925	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 8.81		µg/kg dry	8.81	0.738	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 8.81		µg/kg dry	8.81	0.991	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 8.81		µg/kg dry	8.81	0.980	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	**5.83**	P	µg/kg dry	5.50	0.991	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 5.50	P	µg/kg dry	5.50	0.980	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 110		µg/kg dry	110	12.4	1	"	"	"	"	"	X
57-74-9	Chlordane	**49.5**		µg/kg dry	22.0	3.13	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 5.50		µg/kg dry	5.50	1.28	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*97*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*92*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*65*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*60*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 20.3		µg/kg dry	20.3	15.2	1	SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	X
11104-28-2	Aroclor-1221	< 20.3		µg/kg dry	20.3	18.3	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 20.3		µg/kg dry	20.3	13.1	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 20.3		µg/kg dry	20.3	12.2	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 20.3		µg/kg dry	20.3	10.6	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 20.3		µg/kg dry	20.3	17.0	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 20.3		µg/kg dry	20.3	12.6	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 20.3		µg/kg dry	20.3	18.9	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 20.3		µg/kg dry	20.3	8.39	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-3-072513-1 SB73837-07	60225155	Sediment	25-Jul-13 10:30	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*135*			*30-150 %*			SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	
2051-24-3	*Decachlorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*95*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 1.66		mg/kg dry	1.66	0.478	1	SW846 6010C	30-Jul-13	31-Jul-13	EDT	1318009	X
7440-38-2	Arsenic	**2.09**		mg/kg dry	1.66	0.724	1	"	"	"	"	"	X
7440-39-3	Barium	**40.1**		mg/kg dry	1.11	0.357	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.554		mg/kg dry	0.554	0.167	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.554		mg/kg dry	0.554	0.163	1	"	"	"	"	"	X
7440-47-3	Chromium	**13.1**		mg/kg dry	1.11	0.239	1	"	"	"	"	"	X
7440-50-8	Copper	**14.5**		mg/kg dry	1.11	0.426	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0300		mg/kg dry	0.0300	0.0015	1	SW846 7471B	"	31-Jul-13	JLM	1318010	X
7440-02-0	Nickel	**14.4**		mg/kg dry	1.11	0.321	1	SW846 6010C	"	31-Jul-13	EDT	1318009	X
7439-92-1	Lead	**50.9**		mg/kg dry	1.66	0.612	1	"	"	"	"	"	X
7440-36-0	Antimony	< 5.54		mg/kg dry	5.54	1.02	1	"	"	"	"	"	X
7782-49-2	Selenium	< 1.66		mg/kg dry	1.66	0.476	1	"	"	"	"	"	X
7440-28-0	Thallium	< 3.32		mg/kg dry	3.32	0.938	1	"	"	"	"	"	X
7440-62-2	Vanadium	**21.0**		mg/kg dry	1.66	0.514	1	"	"	"	"	"	X
7440-66-6	Zinc	**33.9**		mg/kg dry	1.11	0.486	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**89.6**		%			1	SM2540 G Mod.	26-Jul-13	26-Jul-13	DT	1317764	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**15**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		29-Jul-13	PH-01	R75557	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 76		ug/Kg	76	23	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
91-57-6	2-Methylnaphthalene	< 76		ug/Kg	76	23	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 76		ug/Kg	76	20	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 76		ug/Kg	76	21	1	"	"	"	"	"	
86-73-7	Fluorene	< 76		ug/Kg	76	20	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 76		ug/Kg	76	23	1	"	"	"	"	"	
120-12-7	Anthracene	< 76		ug/Kg	76	22	1	"	"	"	"	"	
206-44-0	Fluoranthene	**1,100**		ug/Kg	76	35	1	"	"	"	"	"	
129-00-0	Pyrene	**1,100**		ug/Kg	76	25	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	< 76		ug/Kg	76	30	1	"	"	"	"	"	
218-01-9	Chrysene	< 76		ug/Kg	76	51	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**940**		ug/Kg	76	37	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 76		ug/Kg	76	30	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 76		ug/Kg	76	22	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 76		ug/Kg	76	25	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 76		ug/Kg	76	25	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-3-072513-1	60225155	Sediment	25-Jul-13 10:30	25-Jul-13
SB73837-07				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 76		ug/Kg	76	25	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
Surrogate recoveries:													
205440-82-0	*Benzo(e)pyrene-d12*	*110*			*32-153 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-3-072513-1	60225155	Surface Water	25-Jul-13 10:30	25-Jul-13
SB73837-08				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	01-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	**0.288**		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	**0.375**		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	**0.379**		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	**0.272**		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	**0.318**		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	**0.373**		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	**0.728**		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	**0.310**		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	**0.341**		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	**0.605**		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*57*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*76*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*80*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	**0.004**		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-3-072513-1 SB73837-08	60225155	Surface Water	25-Jul-13 10:30	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.057		µg/l	0.057	0.053	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.006	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*72*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*78*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*74*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*69*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	**0.105**		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0058**		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-66-6	Zinc	**0.0197**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-4-072513-1	60225155	Sediment	25-Jul-13 11:00	25-Jul-13
SB73837-09				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC	< 6.71		µg/kg dry	6.71	1.02	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317981	X
319-85-7	beta-BHC	< 6.71		µg/kg dry	6.71	1.13	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 6.71		µg/kg dry	6.71	1.14	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 4.03		µg/kg dry	4.03	1.09	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 6.71		µg/kg dry	6.71	1.01	1	"	"	"	"	"	X
309-00-2	Aldrin	< 6.71		µg/kg dry	6.71	1.07	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 6.71		µg/kg dry	6.71	1.18	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 6.71		µg/kg dry	6.71	1.18	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 6.71		µg/kg dry	6.71	1.11	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 6.71		µg/kg dry	6.71	1.14	1	"	"	"	"	"	X
72-20-8	Endrin	< 10.7		µg/kg dry	10.7	1.33	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 10.7		µg/kg dry	10.7	1.15	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 10.7		µg/kg dry	10.7	1.15	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 10.7		µg/kg dry	10.7	1.25	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 10.7		µg/kg dry	10.7	1.13	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 10.7		µg/kg dry	10.7	0.900	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 10.7		µg/kg dry	10.7	1.21	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 10.7		µg/kg dry	10.7	1.20	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 6.71		µg/kg dry	6.71	1.21	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 6.71		µg/kg dry	6.71	1.13	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 134		µg/kg dry	134	15.1	1	"	"	"	"	"	X
57-74-9	Chlordane	< 26.9		µg/kg dry	26.9	3.81	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 6.71		µg/kg dry	6.71	1.56	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*91*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*67*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*69*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*58*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 26.0		µg/kg dry	26.0	19.4	1	SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	X
11104-28-2	Aroclor-1221	< 26.0		µg/kg dry	26.0	23.4	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 26.0		µg/kg dry	26.0	16.7	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 26.0		µg/kg dry	26.0	15.6	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 26.0		µg/kg dry	26.0	13.5	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 26.0		µg/kg dry	26.0	21.7	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 26.0		µg/kg dry	26.0	16.1	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 26.0		µg/kg dry	26.0	24.2	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 26.0		µg/kg dry	26.0	10.7	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*70*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-4-072513-1 SB73837-09	60225155	Sediment	25-Jul-13 11:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			SW846 8082A	26-Jul-13	30-Jul-13	IMR	1317792	
2051-24-3	*Decachlorobiphenyl (Sr)*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*50*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 1.94		mg/kg dry	1.94	0.560	1	SW846 6010C	30-Jul-13	31-Jul-13	EDT	1318009	X
7440-38-2	Arsenic	**3.37**		mg/kg dry	1.94	0.847	1	"	"	"	"	"	X
7440-39-3	Barium	**111**		mg/kg dry	1.30	0.417	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.648		mg/kg dry	0.648	0.196	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.648		mg/kg dry	0.648	0.190	1	"	"	"	"	"	X
7440-47-3	Chromium	**36.8**		mg/kg dry	1.30	0.280	1	"	"	"	"	"	X
7440-50-8	Copper	**16.4**		mg/kg dry	1.30	0.499	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0392		mg/kg dry	0.0392	0.0020	1	SW846 7471B	"	31-Jul-13	JLM	1318010	X
7440-02-0	Nickel	**21.2**		mg/kg dry	1.30	0.376	1	SW846 6010C	"	31-Jul-13	EDT	1318009	X
7439-92-1	Lead	**7.39**		mg/kg dry	1.94	0.716	1	"	"	"	"	"	X
7440-36-0	Antimony	< 6.48		mg/kg dry	6.48	1.19	1	"	"	"	"	"	X
7782-49-2	Selenium	< 1.94		mg/kg dry	1.94	0.557	1	"	"	"	"	"	X
7440-28-0	Thallium	< 3.89		mg/kg dry	3.89	1.10	1	"	"	"	"	"	X
7440-62-2	Vanadium	**38.7**		mg/kg dry	1.94	0.601	1	"	"	"	"	"	X
7440-66-6	Zinc	**60.3**		mg/kg dry	1.30	0.569	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**74.1**		%			1	SM2540 G Mod.	26-Jul-13	26-Jul-13	DT	1317764	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**26**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		29-Jul-13	PH-01	R75557	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 87		ug/Kg	87	26	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
91-57-6	2-Methylnaphthalene	< 87		ug/Kg	87	26	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 87		ug/Kg	87	23	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 87		ug/Kg	87	24	1	"	"	"	"	"	
86-73-7	Fluorene	< 87		ug/Kg	87	23	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 87		ug/Kg	87	26	1	"	"	"	"	"	
120-12-7	Anthracene	< 87		ug/Kg	87	25	1	"	"	"	"	"	
206-44-0	Fluoranthene	< 87		ug/Kg	87	39	1	"	"	"	"	"	
129-00-0	Pyrene	< 87		ug/Kg	87	29	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	< 87		ug/Kg	87	34	1	"	"	"	"	"	
218-01-9	Chrysene	< 87		ug/Kg	87	58	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	< 87		ug/Kg	87	42	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 87		ug/Kg	87	34	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 87		ug/Kg	87	25	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 87		ug/Kg	87	29	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 87		ug/Kg	87	29	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-BBUS-4-072513-1	60225155	Sediment	25-Jul-13 11:00	25-Jul-13
SB73837-09				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 87		ug/Kg	87	29	1	SW846 8270D SIM	30-Jul-13	31-Jul-13	PH-01	72963	
Surrogate recoveries:													
205440-82-0	*Benzo(e)pyrene-d12*	*99.7*			*32-153 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-4-072513-1	60225155	Surface Water	25-Jul-13 11:00	25-Jul-13
SB73837-10				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	02-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	**0.064**		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	**0.068**		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	**0.050**		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	**0.056**		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	**0.054**		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	**0.131**		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	**0.056**		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	**0.096**		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	**0.103**		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*67*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*81*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*81*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	**0.003**		µg/l	0.002	0.001	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-BBUS-4-072513-1 SB73837-10	60225155	Surface Water	25-Jul-13 11:00	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.052		µg/l	0.052	0.048	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.006	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*74*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*80*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*52*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*47*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	**0.0879**		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-66-6	Zinc	**0.122**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Equipment Blank	60225155	Deionized Water	25-Jul-13 11:30	25-Jul-13
SB73837-11				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.007	1	SW846 8270D SIM	29-Jul-13	02-Aug-13	ML/	1317842	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.013	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.036	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.031	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.026	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.022	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.030	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.017	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.012	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.029	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.016	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.019	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.017	1	"	"	"	"	"	X
Surrogate recoveries:													
321-60-8	*2-Fluorobiphenyl*	*65*			*30-130 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-dl4*	*82*			*30-130 %*			"	"	"	"	"	
205440-82-0	*Benzo (e) pyrene-d12*	*74*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.001	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.001	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.005		µg/l	0.005	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.005		µg/l	0.005	0.003	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Equipment Blank SB73837-11	60225155	Deionized Water	25-Jul-13 11:30	25-Jul-13

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	30-Jul-13	31-Jul-13	TG	1317977	X
8001-35-2	Toxaphene	< 0.062		µg/l	0.062	0.057	1	"	"	"	"	"	X
57-74-9	Chlordane	< 0.008		µg/l	0.008	0.007	1	"	"	"	"	"	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*89*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*77*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*37*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*31*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.0247		µg/l	0.0247	0.00907	1	SW846 8082A	30-Jul-13	31-Jul-13	BLM	1317978	X
11104-28-2	Aroclor-1221	< 0.0247		µg/l	0.0247	0.0157	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.0247		µg/l	0.0247	0.0128	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.0247		µg/l	0.0247	0.0148	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.0247		µg/l	0.0247	0.0128	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.0247		µg/l	0.0247	0.0161	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.0247		µg/l	0.0247	0.0135	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.0247		µg/l	0.0247	0.0170	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.0247		µg/l	0.0247	0.0102	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*85*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*89*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*80*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			BEL	1317737	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0018	1	"	"	"	"	"	X
7440-39-3	Barium	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0002	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0008	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0011	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0007	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0020	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0014	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0030	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0029	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Equipment Blank SB73837-11	60225155	Deionized Water	25-Jul-13 11:30	25-Jul-13

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Total Metals by EPA 6000/7000 Series Methods													
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0009	1	SW846 6010C	30-Jul-13	31-Jul-13	TBC	1318007	X
7440-66-6	Zinc	**0.0910**		mg/l	0.0050	0.0020	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	30-Jul-13	31-Jul-13	JLM	1318008	X

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317842 - SW846 3510C										
Blank (1317842-BLK2)					Prepared: 29-Jul-13 Analyzed: 02-Aug-13					
Acenaphthene	< 0.050		µg/l	0.050						
Acenaphthylene	< 0.050		µg/l	0.050						
1-Methylnaphthalene	< 0.050		µg/l	0.050						
Anthracene	< 0.050		µg/l	0.050						
Benzo (a) anthracene	< 0.050		µg/l	0.050						
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Benzo (b) fluoranthene	< 0.050		µg/l	0.050						
Benzo (g,h,i) perylene	< 0.050		µg/l	0.050						
Benzo (k) fluoranthene	< 0.050		µg/l	0.050						
Chrysene	< 0.050		µg/l	0.050						
Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050						
Fluoranthene	< 0.050		µg/l	0.050						
Fluorene	< 0.050		µg/l	0.050						
Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050						
2-Methylnaphthalene	< 0.050		µg/l	0.050						
Naphthalene	< 0.050		µg/l	0.050						
Phenanthrene	< 0.050		µg/l	0.050						
Pyrene	< 0.050		µg/l	0.050						
Surrogate: 2-Fluorobiphenyl	*46.9*		µg/l		*50.0*		*94*	*30-130*		
Surrogate: Terphenyl-dl4	*42.6*		µg/l		*50.0*		*85*	*30-130*		
Surrogate: Benzo (e) pyrene-d12	*0.862*		µg/l		*1.00*		*86*	*30-130*		
LCS (1317842-BS2)					Prepared: 29-Jul-13 Analyzed: 02-Aug-13					
Acenaphthene	**0.830**		µg/l	0.050	1.00		83	40-140		
Acenaphthylene	**0.907**		µg/l	0.050	1.00		91	40-140		
1-Methylnaphthalene	**0.717**		µg/l	0.050	1.00		72	40-140		
Anthracene	**0.880**		µg/l	0.050	1.00		88	40-140		
Benzo (a) anthracene	**0.913**		µg/l	0.050	1.00		91	40-140		
Benzo (a) pyrene	**1.09**		µg/l	0.050	1.00		109	40-140		
Benzo (b) fluoranthene	**1.05**		µg/l	0.050	1.00		105	40-140		
Benzo (g,h,i) perylene	**1.13**		µg/l	0.050	1.00		113	40-140		
Benzo (k) fluoranthene	**1.11**		µg/l	0.050	1.00		111	40-140		
Chrysene	**0.840**		µg/l	0.050	1.00		84	40-140		
Dibenzo (a,h) anthracene	**1.25**		µg/l	0.050	1.00		125	40-140		
Fluoranthene	**0.934**		µg/l	0.050	1.00		93	40-140		
Fluorene	**0.948**		µg/l	0.050	1.00		95	40-140		
Indeno (1,2,3-cd) pyrene	**1.23**		µg/l	0.050	1.00		123	40-140		
2-Methylnaphthalene	**0.814**		µg/l	0.050	1.00		81	40-140		
Naphthalene	**0.744**		µg/l	0.050	1.00		74	40-140		
Phenanthrene	**0.814**		µg/l	0.050	1.00		81	40-140		
Pyrene	**0.964**		µg/l	0.050	1.00		96	40-140		
Surrogate: 2-Fluorobiphenyl	*40.1*		µg/l		*50.0*		*80*	*30-130*		
Surrogate: Terphenyl-dl4	*45.1*		µg/l		*50.0*		*90*	*30-130*		
Surrogate: Benzo (e) pyrene-d12	*0.943*		µg/l		*1.00*		*94*	*30-130*		
LCS Dup (1317842-BSD2)					Prepared: 29-Jul-13 Analyzed: 02-Aug-13					
Acenaphthene	**0.894**		µg/l	0.050	1.00		89	40-140	7	20
Acenaphthylene	**0.955**		µg/l	0.050	1.00		96	40-140	5	20
1-Methylnaphthalene	**0.810**		µg/l	0.050	1.00		81	40-140	12	20
Anthracene	**0.935**		µg/l	0.050	1.00		94	40-140	6	20
Benzo (a) anthracene	**0.974**		µg/l	0.050	1.00		97	40-140	6	20
Benzo (a) pyrene	**1.11**		µg/l	0.050	1.00		111	40-140	3	20
Benzo (b) fluoranthene	**1.14**		µg/l	0.050	1.00		114	40-140	9	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317842 - SW846 3510C										
LCS Dup (1317842-BSD2)					Prepared: 29-Jul-13 Analyzed: 02-Aug-13					
Benzo (g,h,i) perylene	**1.19**		µg/l	0.050	1.00		119	40-140	5	20
Benzo (k) fluoranthene	**1.16**		µg/l	0.050	1.00		116	40-140	4	20
Chrysene	**0.892**		µg/l	0.050	1.00		89	40-140	6	20
Dibenzo (a,h) anthracene	**1.26**		µg/l	0.050	1.00		126	40-140	0.5	20
Fluoranthene	**1.01**		µg/l	0.050	1.00		101	40-140	7	20
Fluorene	**0.990**		µg/l	0.050	1.00		99	40-140	4	20
Indeno (1,2,3-cd) pyrene	**1.29**		µg/l	0.050	1.00		129	40-140	5	20
2-Methylnaphthalene	**0.921**		µg/l	0.050	1.00		92	40-140	12	20
Naphthalene	**0.827**		µg/l	0.050	1.00		83	40-140	11	20
Phenanthrene	**0.887**		µg/l	0.050	1.00		89	40-140	8	20
Pyrene	**1.04**		µg/l	0.050	1.00		104	40-140	7	20
Surrogate: 2-Fluorobiphenyl	*37.1*		µg/l		*50.0*		*74*	*30-130*		
Surrogate: Terphenyl-dl4	*42.7*		µg/l		*50.0*		*85*	*30-130*		
Surrogate: Benzo (e) pyrene-d12	*0.967*		µg/l		*1.00*		*97*	*30-130*		
Matrix Spike (1317842-MS2)			**Source: SB73837-08**		Prepared: 29-Jul-13 Analyzed: 01-Aug-13					
Acenaphthene	**0.804**		µg/l	0.050	1.06	BRL	76	40-140		
Acenaphthylene	**0.843**		µg/l	0.050	1.06	BRL	79	40-140		
1-Methylnaphthalene	**0.657**		µg/l	0.050	1.06	BRL	62	40-140		
Anthracene	**0.782**		µg/l	0.050	1.06	0.0426	70	40-140		
Benzo (a) anthracene	**0.950**		µg/l	0.050	1.06	0.288	62	40-140		
Benzo (a) pyrene	**1.02**		µg/l	0.050	1.06	0.375	60	40-140		
Benzo (b) fluoranthene	**0.981**		µg/l	0.050	1.06	0.379	57	40-140		
Benzo (g,h,i) perylene	**0.848**		µg/l	0.050	1.06	0.272	54	40-140		
Benzo (k) fluoranthene	**1.00**		µg/l	0.050	1.06	0.318	64	40-140		
Chrysene	**0.929**		µg/l	0.050	1.06	0.373	52	40-140		
Dibenzo (a,h) anthracene	**0.817**		µg/l	0.050	1.06	0.0481	72	40-140		
Fluoranthene	**1.07**	QM7	µg/l	0.050	1.06	0.728	33	40-140		
Fluorene	**0.892**		µg/l	0.050	1.06	BRL	84	40-140		
Indeno (1,2,3-cd) pyrene	**0.983**		µg/l	0.050	1.06	0.310	63	40-140		
2-Methylnaphthalene	**0.733**		µg/l	0.050	1.06	BRL	69	40-140		
Naphthalene	**0.721**		µg/l	0.050	1.06	BRL	68	40-140		
Phenanthrene	**0.956**		µg/l	0.050	1.06	0.341	58	40-140		
Pyrene	**1.11**		µg/l	0.050	1.06	0.605	47	40-140		
Surrogate: 2-Fluorobiphenyl	*36.4*		µg/l		*53.2*		*68*	*30-130*		
Surrogate: Terphenyl-dl4	*40.4*		µg/l		*53.2*		*76*	*30-130*		
Surrogate: Benzo (e) pyrene-d12	*0.755*		µg/l		*1.06*		*71*	*30-130*		
Matrix Spike Dup (1317842-MSD2)			**Source: SB73837-08**		Prepared: 29-Jul-13 Analyzed: 01-Aug-13					
Acenaphthene	**0.856**		µg/l	0.050	1.12	BRL	76	40-140	0.8	20
Acenaphthylene	**0.910**		µg/l	0.050	1.12	BRL	81	40-140	2	20
1-Methylnaphthalene	**0.679**		µg/l	0.050	1.12	BRL	60	40-140	2	20
Anthracene	**0.883**		µg/l	0.050	1.12	0.0426	75	40-140	7	20
Benzo (a) anthracene	**1.06**		µg/l	0.050	1.12	0.288	69	40-140	10	20
Benzo (a) pyrene	**1.14**		µg/l	0.050	1.12	0.375	68	40-140	12	20
Benzo (b) fluoranthene	**1.11**		µg/l	0.050	1.12	0.379	65	40-140	14	20
Benzo (g,h,i) perylene	**0.996**		µg/l	0.050	1.12	0.272	64	40-140	17	20
Benzo (k) fluoranthene	**1.15**		µg/l	0.050	1.12	0.318	74	40-140	15	20
Chrysene	**1.03**		µg/l	0.050	1.12	0.373	58	40-140	11	20
Dibenzo (a,h) anthracene	**1.00**		µg/l	0.050	1.12	0.0481	85	40-140	16	20
Fluoranthene	**1.11**	QM7	µg/l	0.050	1.12	0.728	34	40-140	4	20
Fluorene	**0.989**		µg/l	0.050	1.12	BRL	88	40-140	5	20
Indeno (1,2,3-cd) pyrene	**1.17**		µg/l	0.050	1.12	0.310	76	40-140	19	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317842 - SW846 3510C										
Matrix Spike Dup (1317842-MSD2)			**Source: SB73837-08**		Prepared: 29-Jul-13 Analyzed: 01-Aug-13					
2-Methylnaphthalene	**0.764**		µg/l	0.050	1.12	BRL	68	40-140	1	20
Naphthalene	**0.696**		µg/l	0.050	1.12	BRL	62	40-140	9	20
Phenanthrene	**0.992**		µg/l	0.050	1.12	0.341	58	40-140	0.4	20
Pyrene	**1.15**		µg/l	0.050	1.12	0.605	48	40-140	2	20
Surrogate: 2-Fluorobiphenyl	*36.0*		µg/l		*56.2*		*64*	*30-130*		
Surrogate: Terphenyl-dl4	*44.6*		µg/l		*56.2*		*79*	*30-130*		
Surrogate: Benzo (e) pyrene-d12	*0.854*		µg/l		*1.12*		*76*	*30-130*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317792 - SW846 3540C										
Blank (1317792-BLK1)					Prepared: 26-Jul-13 Analyzed: 30-Jul-13					
Aroclor-1016	< 20.0		µg/kg wet	20.0						
Aroclor-1016 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1221	< 20.0		µg/kg wet	20.0						
Aroclor-1221 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1232	< 20.0		µg/kg wet	20.0						
Aroclor-1232 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1242	< 20.0		µg/kg wet	20.0						
Aroclor-1242 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1248	< 20.0		µg/kg wet	20.0						
Aroclor-1248 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1254	< 20.0		µg/kg wet	20.0						
Aroclor-1254 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1260	< 20.0		µg/kg wet	20.0						
Aroclor-1260 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1262	< 20.0		µg/kg wet	20.0						
Aroclor-1262 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1268	< 20.0		µg/kg wet	20.0						
Aroclor-1268 [2C]	< 20.0		µg/kg wet	20.0						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*21.0*		µg/kg wet		*20.0*		*105*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*23.0*		µg/kg wet		*20.0*		*115*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*15.0*		µg/kg wet		*20.0*		*75*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*20.0*		µg/kg wet		*20.0*		*100*	*30-150*		
LCS (1317792-BS1)					Prepared: 26-Jul-13 Analyzed: 30-Jul-13					
Aroclor-1016	**255**		µg/kg wet	20.0	250		102	40-140		
Aroclor-1016 [2C]	**295**		µg/kg wet	20.0	250		118	40-140		
Aroclor-1260	**208**		µg/kg wet	20.0	250		83	40-140		
Aroclor-1260 [2C]	**246**		µg/kg wet	20.0	250		98	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*18.0*		µg/kg wet		*20.0*		*90*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*19.0*		µg/kg wet		*20.0*		*95*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*14.0*		µg/kg wet		*20.0*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*16.0*		µg/kg wet		*20.0*		*80*	*30-150*		
LCS Dup (1317792-BSD1)					Prepared: 26-Jul-13 Analyzed: 30-Jul-13					
Aroclor-1016	**257**		µg/kg wet	20.0	250		103	40-140	0.8	30
Aroclor-1016 [2C]	**293**		µg/kg wet	20.0	250		117	40-140	0.7	30
Aroclor-1260	**197**		µg/kg wet	20.0	250		79	40-140	5	30
Aroclor-1260 [2C]	**245**		µg/kg wet	20.0	250		98	40-140	0.4	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*18.0*		µg/kg wet		*20.0*		*90*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*19.0*		µg/kg wet		*20.0*		*95*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*15.0*		µg/kg wet		*20.0*		*75*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*16.0*		µg/kg wet		*20.0*		*80*	*30-150*		
Matrix Spike (1317792-MS1)			**Source: SB73837-07**		Prepared: 26-Jul-13 Analyzed: 30-Jul-13					
Aroclor-1016	**289**		µg/kg dry	21.1	264	BRL	110	40-140		
Aroclor-1016 [2C]	**263**		µg/kg dry	21.1	264	BRL	100	40-140		
Aroclor-1260	**181**		µg/kg dry	21.1	264	BRL	68	40-140		
Aroclor-1260 [2C]	**231**		µg/kg dry	21.1	264	BRL	88	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*20.1*		µg/kg dry		*21.1*		*95*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*26.4*		µg/kg dry		*21.1*		*125*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*16.9*		µg/kg dry		*21.1*		*80*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*21.1*		µg/kg dry		*21.1*		*100*	*30-150*		
Matrix Spike Dup (1317792-MSD1)			**Source: SB73837-07**		Prepared: 26-Jul-13 Analyzed: 30-Jul-13					

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317792 - SW846 3540C										
Matrix Spike Dup (1317792-MSD1)			**Source: SB73837-07**		Prepared: 26-Jul-13 Analyzed: 30-Jul-13					
Aroclor-1016	**295**		µg/kg dry	22.1	276	BRL	107	40-140	3	30
Aroclor-1016 [2C]	**303**		µg/kg dry	22.1	276	BRL	110	40-140	10	30
Aroclor-1260	**175**		µg/kg dry	22.1	276	BRL	64	40-140	7	30
Aroclor-1260 [2C]	**209**		µg/kg dry	22.1	276	BRL	76	40-140	15	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*22.1*		µg/kg dry		*22.1*		*100*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*25.4*		µg/kg dry		*22.1*		*115*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*16.6*		µg/kg dry		*22.1*		*75*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*18.8*		µg/kg dry		*22.1*		*85*	*30-150*		
Batch 1317977 - SW846 3510C										
Blank (1317977-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	< 0.002		µg/l	0.002						
alpha-BHC [2C]	< 0.002		µg/l	0.002						
beta-BHC	< 0.002		µg/l	0.002						
beta-BHC [2C]	< 0.002		µg/l	0.002						
delta-BHC	< 0.002		µg/l	0.002						
delta-BHC [2C]	< 0.002		µg/l	0.002						
gamma-BHC (Lindane)	< 0.002		µg/l	0.002						
gamma-BHC (Lindane) [2C]	< 0.002		µg/l	0.002						
Heptachlor	< 0.002		µg/l	0.002						
Heptachlor [2C]	< 0.002		µg/l	0.002						
Aldrin	< 0.002		µg/l	0.002						
Aldrin [2C]	< 0.002		µg/l	0.002						
Heptachlor epoxide	< 0.002		µg/l	0.002						
Heptachlor epoxide [2C]	< 0.002		µg/l	0.002						
Endosulfan I	< 0.002		µg/l	0.002						
Endosulfan I [2C]	< 0.002		µg/l	0.002						
Dieldrin	< 0.002		µg/l	0.002						
Dieldrin [2C]	< 0.002		µg/l	0.002						
4,4'-DDE (p,p')	< 0.002		µg/l	0.002						
4,4'-DDE (p,p') [2C]	< 0.002		µg/l	0.002						
Endrin	< 0.004		µg/l	0.004						
Endrin [2C]	< 0.004		µg/l	0.004						
Endosulfan II	< 0.004		µg/l	0.004						
Endosulfan II [2C]	< 0.004		µg/l	0.004						
4,4'-DDD (p,p')	< 0.004		µg/l	0.004						
4,4'-DDD (p,p') [2C]	< 0.004		µg/l	0.004						
Endosulfan sulfate	< 0.004		µg/l	0.004						
Endosulfan sulfate [2C]	< 0.004		µg/l	0.004						
4,4'-DDT (p,p')	< 0.004		µg/l	0.004						
4,4'-DDT (p,p') [2C]	< 0.004		µg/l	0.004						
Methoxychlor	< 0.004		µg/l	0.004						
Methoxychlor [2C]	< 0.004		µg/l	0.004						
Endrin ketone	< 0.004		µg/l	0.004						
Endrin ketone [2C]	< 0.004		µg/l	0.004						
Endrin aldehyde	< 0.004		µg/l	0.004						
Endrin aldehyde [2C]	< 0.004		µg/l	0.004						
alpha-Chlordane	< 0.002		µg/l	0.002						
alpha-Chlordane [2C]	< 0.002		µg/l	0.002						
gamma-Chlordane	< 0.002		µg/l	0.002						
gamma-Chlordane [2C]	< 0.002		µg/l	0.002						
Toxaphene	< 0.050		µg/l	0.050						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317977 - SW846 3510C										
Blank (1317977-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Toxaphene [2C]	< 0.050		µg/l	0.050						
Chlordane	< 0.007		µg/l	0.007						
Chlordane [2C]	< 0.007		µg/l	0.007						
Alachlor	< 0.002		µg/l	0.002						
Alachlor [2C]	< 0.002		µg/l	0.002						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0165*		µg/l		*0.0200*		*82*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0201*		µg/l		*0.0200*		*101*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0164*		µg/l		*0.0200*		*82*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0163*		µg/l		*0.0200*		*81*	*30-150*		
LCS (1317977-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**0.033**		µg/l	0.002	0.0500		66	40-140		
alpha-BHC [2C]	**0.033**		µg/l	0.002	0.0500		66	40-140		
beta-BHC	**0.034**		µg/l	0.002	0.0500		67	40-140		
beta-BHC [2C]	**0.037**		µg/l	0.002	0.0500		74	40-140		
delta-BHC	**0.034**		µg/l	0.002	0.0500		68	40-140		
delta-BHC [2C]	**0.035**		µg/l	0.002	0.0500		69	40-140		
gamma-BHC (Lindane)	**0.033**		µg/l	0.002	0.0500		67	40-140		
gamma-BHC (Lindane) [2C]	**0.033**		µg/l	0.002	0.0500		66	40-140		
Heptachlor	**0.033**		µg/l	0.002	0.0500		66	40-140		
Heptachlor [2C]	**0.034**		µg/l	0.002	0.0500		68	40-140		
Aldrin	**0.034**		µg/l	0.002	0.0500		68	40-140		
Aldrin [2C]	**0.034**		µg/l	0.002	0.0500		69	40-140		
Heptachlor epoxide	**0.036**		µg/l	0.002	0.0500		72	40-140		
Heptachlor epoxide [2C]	**0.035**		µg/l	0.002	0.0500		70	40-140		
Endosulfan I	**0.036**		µg/l	0.002	0.0500		72	40-140		
Endosulfan I [2C]	**0.037**		µg/l	0.002	0.0500		74	40-140		
Dieldrin	**0.035**		µg/l	0.002	0.0500		70	40-140		
Dieldrin [2C]	**0.036**		µg/l	0.002	0.0500		72	40-140		
4,4'-DDE (p,p')	**0.036**		µg/l	0.002	0.0500		71	40-140		
4,4'-DDE (p,p') [2C]	**0.035**		µg/l	0.002	0.0500		70	40-140		
Endrin	**0.037**		µg/l	0.004	0.0500		74	40-140		
Endrin [2C]	**0.037**		µg/l	0.004	0.0500		74	40-140		
Endosulfan II	**0.034**		µg/l	0.004	0.0500		68	40-140		
Endosulfan II [2C]	**0.036**		µg/l	0.004	0.0500		71	40-140		
4,4'-DDD (p,p')	**0.037**		µg/l	0.004	0.0500		73	40-140		
4,4'-DDD (p,p') [2C]	**0.036**		µg/l	0.004	0.0500		73	40-140		
Endosulfan sulfate	**0.037**		µg/l	0.004	0.0500		75	40-140		
Endosulfan sulfate [2C]	**0.039**		µg/l	0.004	0.0500		79	40-140		
4,4'-DDT (p,p')	**0.033**		µg/l	0.004	0.0500		65	40-140		
4,4'-DDT (p,p') [2C]	**0.036**		µg/l	0.004	0.0500		73	40-140		
Methoxychlor	**0.034**		µg/l	0.004	0.0500		67	40-140		
Methoxychlor [2C]	**0.039**		µg/l	0.004	0.0500		77	40-140		
Endrin ketone	**0.036**		µg/l	0.004	0.0500		71	40-140		
Endrin ketone [2C]	**0.038**		µg/l	0.004	0.0500		76	40-140		
Endrin aldehyde	**0.040**		µg/l	0.004	0.0500		80	40-140		
Endrin aldehyde [2C]	**0.043**		µg/l	0.004	0.0500		85	40-140		
alpha-Chlordane	**0.034**		µg/l	0.002	0.0500		69	40-140		
alpha-Chlordane [2C]	**0.034**		µg/l	0.002	0.0500		69	40-140		
gamma-Chlordane	**0.035**		µg/l	0.002	0.0500		69	40-140		
gamma-Chlordane [2C]	**0.034**		µg/l	0.002	0.0500		68	40-140		
Alachlor	**0.034**		µg/l	0.002	0.0500		67	40-140		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317977 - SW846 3510C										
LCS (1317977-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Alachlor [2C]	**0.040**		µg/l	0.002	0.0500		80	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0187*		µg/l		*0.0200*		*94*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0204*		µg/l		*0.0200*		*102*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0156*		µg/l		*0.0200*		*78*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0193*		µg/l		*0.0200*		*97*	*30-150*		
LCS Dup (1317977-BSD1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**0.032**		µg/l	0.002	0.0500		64	40-140	2	20
alpha-BHC [2C]	**0.033**		µg/l	0.002	0.0500		66	40-140	0.02	20
beta-BHC	**0.036**		µg/l	0.002	0.0500		72	40-140	6	20
beta-BHC [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140	3	20
delta-BHC	**0.034**		µg/l	0.002	0.0500		69	40-140	0.6	20
delta-BHC [2C]	**0.035**		µg/l	0.002	0.0500		69	40-140	0.2	20
gamma-BHC (Lindane)	**0.034**		µg/l	0.002	0.0500		68	40-140	1	20
gamma-BHC (Lindane) [2C]	**0.034**		µg/l	0.002	0.0500		67	40-140	2	20
Heptachlor	**0.034**		µg/l	0.002	0.0500		67	40-140	1	20
Heptachlor [2C]	**0.034**		µg/l	0.002	0.0500		67	40-140	1	20
Aldrin	**0.034**		µg/l	0.002	0.0500		68	40-140	0.4	20
Aldrin [2C]	**0.034**		µg/l	0.002	0.0500		68	40-140	0.3	20
Heptachlor epoxide	**0.037**		µg/l	0.002	0.0500		73	40-140	2	20
Heptachlor epoxide [2C]	**0.035**		µg/l	0.002	0.0500		69	40-140	1	20
Endosulfan I	**0.036**		µg/l	0.002	0.0500		73	40-140	0.9	20
Endosulfan I [2C]	**0.036**		µg/l	0.002	0.0500		72	40-140	2	20
Dieldrin	**0.035**		µg/l	0.002	0.0500		71	40-140	0.6	20
Dieldrin [2C]	**0.035**		µg/l	0.002	0.0500		70	40-140	2	20
4,4'-DDE (p,p')	**0.036**		µg/l	0.002	0.0500		72	40-140	1	20
4,4'-DDE (p,p') [2C]	**0.034**		µg/l	0.002	0.0500		68	40-140	3	20
Endrin	**0.037**		µg/l	0.004	0.0500		75	40-140	2	20
Endrin [2C]	**0.036**		µg/l	0.004	0.0500		72	40-140	3	20
Endosulfan II	**0.036**		µg/l	0.004	0.0500		72	40-140	6	20
Endosulfan II [2C]	**0.035**		µg/l	0.004	0.0500		70	40-140	2	20
4,4'-DDD (p,p')	**0.037**		µg/l	0.004	0.0500		74	40-140	0.8	20
4,4'-DDD (p,p') [2C]	**0.036**		µg/l	0.004	0.0500		73	40-140	0.3	20
Endosulfan sulfate	**0.038**		µg/l	0.004	0.0500		76	40-140	2	20
Endosulfan sulfate [2C]	**0.038**		µg/l	0.004	0.0500		76	40-140	3	20
4,4'-DDT (p,p')	**0.035**		µg/l	0.004	0.0500		70	40-140	8	20
4,4'-DDT (p,p') [2C]	**0.034**		µg/l	0.004	0.0500		68	40-140	8	20
Methoxychlor	**0.037**		µg/l	0.004	0.0500		75	40-140	11	20
Methoxychlor [2C]	**0.036**		µg/l	0.004	0.0500		72	40-140	8	20
Endrin ketone	**0.038**		µg/l	0.004	0.0500		76	40-140	7	20
Endrin ketone [2C]	**0.039**		µg/l	0.004	0.0500		77	40-140	2	20
Endrin aldehyde	**0.041**		µg/l	0.004	0.0500		82	40-140	3	20
Endrin aldehyde [2C]	**0.040**		µg/l	0.004	0.0500		81	40-140	5	20
alpha-Chlordane	**0.035**		µg/l	0.002	0.0500		69	40-140	0.8	20
alpha-Chlordane [2C]	**0.034**		µg/l	0.002	0.0500		67	40-140	2	20
gamma-Chlordane	**0.037**		µg/l	0.002	0.0500		74	40-140	6	20
gamma-Chlordane [2C]	**0.033**		µg/l	0.002	0.0500		66	40-140	2	20
Alachlor	**0.033**		µg/l	0.002	0.0500		65	40-140	3	20
Alachlor [2C]	**0.041**		µg/l	0.002	0.0500		81	40-140	2	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0185*		µg/l		*0.0200*		*92*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0202*		µg/l		*0.0200*		*101*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0165*		µg/l		*0.0200*		*83*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317977 - SW846 3510C										
LCS Dup (1317977-BSD1)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0182*		µg/l		*0.0200*		*91*	*30-150*		
Matrix Spike (1317977-MS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
alpha-BHC	**0.031**		µg/l	0.002	0.0543	BRL	58	30-150		
alpha-BHC [2C]	**0.035**		µg/l	0.002	0.0543	BRL	64	30-150		
beta-BHC	**0.029**		µg/l	0.002	0.0543	BRL	54	30-150		
beta-BHC [2C]	**0.051**		µg/l	0.002	0.0543	BRL	93	30-150		
delta-BHC	**0.028**		µg/l	0.002	0.0543	BRL	52	30-150		
delta-BHC [2C]	**0.040**		µg/l	0.002	0.0543	BRL	73	30-150		
gamma-BHC (Lindane)	**0.042**		µg/l	0.002	0.0543	BRL	78	30-150		
gamma-BHC (Lindane) [2C]	**0.037**		µg/l	0.002	0.0543	BRL	68	30-150		
Heptachlor	**0.028**		µg/l	0.002	0.0543	BRL	51	30-150		
Heptachlor [2C]	**0.034**		µg/l	0.002	0.0543	BRL	63	30-150		
Aldrin	**0.029**		µg/l	0.002	0.0543	BRL	54	30-150		
Aldrin [2C]	**0.033**		µg/l	0.002	0.0543	BRL	60	30-150		
Heptachlor epoxide	**0.037**		µg/l	0.002	0.0543	BRL	68	30-150		
Heptachlor epoxide [2C]	**0.036**		µg/l	0.002	0.0543	BRL	66	30-150		
Endosulfan I	**0.039**		µg/l	0.002	0.0543	BRL	71	30-150		
Endosulfan I [2C]	**0.059**		µg/l	0.002	0.0543	BRL	109	30-150		
Dieldrin	**0.034**		µg/l	0.002	0.0543	0.004	55	30-150		
Dieldrin [2C]	**0.038**		µg/l	0.002	0.0543	0.004	62	30-150		
4,4'-DDE (p,p')	**0.032**		µg/l	0.002	0.0543	BRL	59	30-150		
4,4'-DDE (p,p') [2C]	**0.034**		µg/l	0.002	0.0543	BRL	63	30-150		
Endrin	**0.036**		µg/l	0.004	0.0543	BRL	66	30-150		
Endrin [2C]	**0.039**		µg/l	0.004	0.0543	BRL	71	30-150		
Endosulfan II	**0.039**		µg/l	0.004	0.0543	BRL	71	30-150		
Endosulfan II [2C]	**0.036**		µg/l	0.004	0.0543	BRL	66	30-150		
4,4'-DDD (p,p')	**0.036**		µg/l	0.004	0.0543	BRL	66	30-150		
4,4'-DDD (p,p') [2C]	**0.041**		µg/l	0.004	0.0543	BRL	75	30-150		
Endosulfan sulfate	**0.032**		µg/l	0.004	0.0543	BRL	59	30-150		
Endosulfan sulfate [2C]	**0.042**		µg/l	0.004	0.0543	BRL	77	30-150		
4,4'-DDT (p,p')	**0.032**		µg/l	0.004	0.0543	BRL	60	30-150		
4,4'-DDT (p,p') [2C]	**0.037**		µg/l	0.004	0.0543	BRL	68	30-150		
Methoxychlor	**0.032**		µg/l	0.004	0.0543	BRL	59	30-150		
Methoxychlor [2C]	**0.040**		µg/l	0.004	0.0543	BRL	74	30-150		
Endrin ketone	**0.035**		µg/l	0.004	0.0543	BRL	64	30-150		
Endrin ketone [2C]	**0.039**		µg/l	0.004	0.0543	BRL	71	30-150		
Endrin aldehyde	**0.041**		µg/l	0.004	0.0543	BRL	76	30-150		
Endrin aldehyde [2C]	**0.041**		µg/l	0.004	0.0543	BRL	76	30-150		
alpha-Chlordane	**0.034**		µg/l	0.002	0.0543	BRL	62	30-150		
alpha-Chlordane [2C]	**0.038**		µg/l	0.002	0.0543	BRL	69	30-150		
gamma-Chlordane	**0.032**		µg/l	0.002	0.0543	BRL	59	30-150		
gamma-Chlordane [2C]	**0.021**		µg/l	0.002	0.0543	BRL	39	30-150		
Alachlor	**0.045**		µg/l	0.002	0.0543	BRL	82	30-150		
Alachlor [2C]	**0.047**		µg/l	0.002	0.0543	BRL	87	30-150		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0177*		µg/l		*0.0217*		*81*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0226*		µg/l		*0.0217*		*104*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0137*		µg/l		*0.0217*		*63*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0168*		µg/l		*0.0217*		*77*	*30-150*		
Matrix Spike Dup (1317977-MSD1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
alpha-BHC	**0.036**		µg/l	0.002	0.0581	BRL	61	30-150	6	20
alpha-BHC [2C]	**0.037**		µg/l	0.002	0.0581	BRL	63	30-150	1	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317977 - SW846 3510C										
Matrix Spike Dup (1317977-MSD1)			**Source: SB73837-08**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
beta-BHC	**0.033**		µg/l	0.002	0.0581	BRL	57	30-150	5	20
beta-BHC [2C]	**0.054**		µg/l	0.002	0.0581	BRL	93	30-150	0.06	20
delta-BHC	**0.032**		µg/l	0.002	0.0581	BRL	55	30-150	4	20
delta-BHC [2C]	**0.044**		µg/l	0.002	0.0581	BRL	75	30-150	3	20
gamma-BHC (Lindane)	**0.049**		µg/l	0.002	0.0581	BRL	84	30-150	8	20
gamma-BHC (Lindane) [2C]	**0.038**		µg/l	0.002	0.0581	BRL	66	30-150	2	20
Heptachlor	**0.032**		µg/l	0.002	0.0581	BRL	54	30-150	6	20
Heptachlor [2C]	**0.036**		µg/l	0.002	0.0581	BRL	62	30-150	1	20
Aldrin	**0.035**		µg/l	0.002	0.0581	BRL	59	30-150	10	20
Aldrin [2C]	**0.034**		µg/l	0.002	0.0581	BRL	59	30-150	2	20
Heptachlor epoxide	**0.043**		µg/l	0.002	0.0581	BRL	74	30-150	9	20
Heptachlor epoxide [2C]	**0.040**		µg/l	0.002	0.0581	BRL	69	30-150	5	20
Endosulfan I	**0.044**		µg/l	0.002	0.0581	BRL	75	30-150	6	20
Endosulfan I [2C]	**0.058**		µg/l	0.002	0.0581	BRL	99	30-150	9	20
Dieldrin	**0.041**		µg/l	0.002	0.0581	0.004	63	30-150	13	20
Dieldrin [2C]	**0.039**		µg/l	0.002	0.0581	0.004	60	30-150	4	20
4,4'-DDE (p,p')	**0.039**		µg/l	0.002	0.0581	BRL	67	30-150	13	20
4,4'-DDE (p,p') [2C]	**0.037**		µg/l	0.002	0.0581	BRL	64	30-150	2	20
Endrin	**0.040**		µg/l	0.005	0.0581	BRL	69	30-150	5	20
Endrin [2C]	**0.043**		µg/l	0.005	0.0581	BRL	73	30-150	3	20
Endosulfan II	**0.044**		µg/l	0.005	0.0581	BRL	76	30-150	6	20
Endosulfan II [2C]	**0.039**		µg/l	0.005	0.0581	BRL	66	30-150	0.9	20
4,4'-DDD (p,p')	**0.044**		µg/l	0.005	0.0581	BRL	76	30-150	14	20
4,4'-DDD (p,p') [2C]	**0.044**		µg/l	0.005	0.0581	BRL	76	30-150	1	20
Endosulfan sulfate	**0.038**		µg/l	0.005	0.0581	BRL	65	30-150	10	20
Endosulfan sulfate [2C]	**0.044**		µg/l	0.005	0.0581	BRL	75	30-150	3	20
4,4'-DDT (p,p')	**0.036**		µg/l	0.005	0.0581	BRL	61	30-150	3	20
4,4'-DDT (p,p') [2C]	**0.036**		µg/l	0.005	0.0581	BRL	61	30-150	11	20
Methoxychlor	**0.033**		µg/l	0.005	0.0581	BRL	57	30-150	2	20
Methoxychlor [2C]	**0.041**		µg/l	0.005	0.0581	BRL	70	30-150	6	20
Endrin ketone	**0.041**		µg/l	0.005	0.0581	BRL	71	30-150	10	20
Endrin ketone [2C]	**0.040**		µg/l	0.005	0.0581	BRL	69	30-150	4	20
Endrin aldehyde	**0.048**		µg/l	0.005	0.0581	BRL	83	30-150	9	20
Endrin aldehyde [2C]	**0.043**		µg/l	0.005	0.0581	BRL	74	30-150	3	20
alpha-Chlordane	**0.041**		µg/l	0.002	0.0581	BRL	70	30-150	12	20
alpha-Chlordane [2C]	**0.039**		µg/l	0.002	0.0581	BRL	67	30-150	3	20
gamma-Chlordane	**0.038**		µg/l	0.002	0.0581	BRL	66	30-150	10	20
gamma-Chlordane [2C]	**0.022**		µg/l	0.002	0.0581	BRL	37	30-150	5	20
Alachlor	**0.051**		µg/l	0.002	0.0581	BRL	88	30-150	8	20
Alachlor [2C]	**0.050**		µg/l	0.002	0.0581	BRL	86	30-150	0.6	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0192*		µg/l		*0.0233*		*82*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0230*		µg/l		*0.0233*		*99*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0161*		µg/l		*0.0233*		*69*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0156*		µg/l		*0.0233*		*67*	*30-150*		
Batch 1317978 - SW846 3510C										
Blank (1317978-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Aroclor-1016	< 0.0200		µg/l	0.0200						
Aroclor-1016 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1221	< 0.0200		µg/l	0.0200						
Aroclor-1221 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1232	< 0.0200		µg/l	0.0200						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317978 - SW846 3510C										
Blank (1317978-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Aroclor-1232 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1242	< 0.0200		µg/l	0.0200						
Aroclor-1242 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1248	< 0.0200		µg/l	0.0200						
Aroclor-1248 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1254	< 0.0200		µg/l	0.0200						
Aroclor-1254 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1260	< 0.0200		µg/l	0.0200						
Aroclor-1260 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1262	< 0.0200		µg/l	0.0200						
Aroclor-1262 [2C]	< 0.0200		µg/l	0.0200						
Aroclor-1268	< 0.0200		µg/l	0.0200						
Aroclor-1268 [2C]	< 0.0200		µg/l	0.0200						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0240*		µg/l		*0.0200*		*120*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0230*		µg/l		*0.0200*		*115*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0240*		µg/l		*0.0200*		*120*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0250*		µg/l		*0.0200*		*125*	*30-150*		
LCS (1317978-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Aroclor-1016	**0.289**		µg/l	0.0200	0.250		116	40-140		
Aroclor-1016 [2C]	**0.264**		µg/l	0.0200	0.250		106	40-140		
Aroclor-1260	**0.269**		µg/l	0.0200	0.250		108	40-140		
Aroclor-1260 [2C]	**0.295**		µg/l	0.0200	0.250		118	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0120*		µg/l		*0.0200*		*60*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0210*		µg/l		*0.0200*		*105*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0270*		µg/l		*0.0200*		*135*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0270*		µg/l		*0.0200*		*135*	*30-150*		
LCS Dup (1317978-BSD1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Aroclor-1016	**0.288**		µg/l	0.0200	0.250		115	40-140	0.3	20
Aroclor-1016 [2C]	**0.263**		µg/l	0.0200	0.250		105	40-140	0.4	20
Aroclor-1260	**0.265**		µg/l	0.0200	0.250		106	40-140	1	20
Aroclor-1260 [2C]	**0.319**		µg/l	0.0200	0.250		128	40-140	8	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0120*		µg/l		*0.0200*		*60*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0210*		µg/l		*0.0200*		*105*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0270*		µg/l		*0.0200*		*135*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0280*		µg/l		*0.0200*		*140*	*30-150*		
Batch 1317981 - SW846 3545A										
Blank (1317981-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	< 3.33		µg/kg wet	3.33						
alpha-BHC [2C]	< 3.33		µg/kg wet	3.33						
beta-BHC	< 3.33		µg/kg wet	3.33						
beta-BHC [2C]	< 3.33		µg/kg wet	3.33						
delta-BHC	< 3.33		µg/kg wet	3.33						
delta-BHC [2C]	< 3.33		µg/kg wet	3.33						
gamma-BHC (Lindane)	< 2.00		µg/kg wet	2.00						
gamma-BHC (Lindane) [2C]	< 2.00		µg/kg wet	2.00						
Heptachlor	< 3.33		µg/kg wet	3.33						
Heptachlor [2C]	< 3.33		µg/kg wet	3.33						
Aldrin	< 3.33		µg/kg wet	3.33						
Aldrin [2C]	< 3.33		µg/kg wet	3.33						
Heptachlor epoxide	< 3.33		µg/kg wet	3.33						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317981 - SW846 3545A										
Blank (1317981-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Heptachlor epoxide [2C]	< 3.33		µg/kg wet	3.33						
Endosulfan I	< 3.33		µg/kg wet	3.33						
Endosulfan I [2C]	< 3.33		µg/kg wet	3.33						
Dieldrin	< 3.33		µg/kg wet	3.33						
Dieldrin [2C]	< 3.33		µg/kg wet	3.33						
4,4'-DDE (p,p')	< 3.33		µg/kg wet	3.33						
4,4'-DDE (p,p') [2C]	< 3.33		µg/kg wet	3.33						
Endrin	< 5.33		µg/kg wet	5.33						
Endrin [2C]	< 5.33		µg/kg wet	5.33						
Endosulfan II	< 5.33		µg/kg wet	5.33						
Endosulfan II [2C]	< 5.33		µg/kg wet	5.33						
4,4'-DDD (p,p')	< 5.33		µg/kg wet	5.33						
4,4'-DDD (p,p') [2C]	< 5.33		µg/kg wet	5.33						
Endosulfan sulfate	< 5.33		µg/kg wet	5.33						
Endosulfan sulfate [2C]	< 5.33		µg/kg wet	5.33						
4,4'-DDT (p,p')	< 5.33		µg/kg wet	5.33						
4,4'-DDT (p,p') [2C]	< 5.33		µg/kg wet	5.33						
Methoxychlor	< 5.33		µg/kg wet	5.33						
Methoxychlor [2C]	< 5.33		µg/kg wet	5.33						
Endrin ketone	< 5.33		µg/kg wet	5.33						
Endrin ketone [2C]	< 5.33		µg/kg wet	5.33						
Endrin aldehyde	< 5.33		µg/kg wet	5.33						
Endrin aldehyde [2C]	< 5.33		µg/kg wet	5.33						
alpha-Chlordane	< 3.33		µg/kg wet	3.33						
alpha-Chlordane [2C]	< 3.33		µg/kg wet	3.33						
gamma-Chlordane	< 3.33		µg/kg wet	3.33						
gamma-Chlordane [2C]	< 3.33		µg/kg wet	3.33						
Toxaphene	< 66.7		µg/kg wet	66.7						
Toxaphene [2C]	< 66.7		µg/kg wet	66.7						
Chlordane	< 13.3		µg/kg wet	13.3						
Chlordane [2C]	< 13.3		µg/kg wet	13.3						
Alachlor	< 3.33		µg/kg wet	3.33						
Alachlor [2C]	< 3.33		µg/kg wet	3.33						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*6.63*		µg/kg wet		*6.67*		*99*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*6.35*		µg/kg wet		*6.67*		*95*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*5.43*		µg/kg wet		*6.67*		*81*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*3.49*		µg/kg wet		*6.67*		*52*	*30-150*		
LCS (1317981-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**10.7**		µg/kg wet	3.33	16.7		64	40-140		
alpha-BHC [2C]	**11.0**		µg/kg wet	3.33	16.7		66	40-140		
beta-BHC	**12.3**		µg/kg wet	3.33	16.7		74	40-140		
beta-BHC [2C]	**12.5**		µg/kg wet	3.33	16.7		75	40-140		
delta-BHC	**12.4**		µg/kg wet	3.33	16.7		74	40-140		
delta-BHC [2C]	**11.6**		µg/kg wet	3.33	16.7		70	40-140		
gamma-BHC (Lindane)	**12.3**		µg/kg wet	2.00	16.7		74	40-140		
gamma-BHC (Lindane) [2C]	**10.7**		µg/kg wet	2.00	16.7		64	40-140		
Heptachlor	**12.2**		µg/kg wet	3.33	16.7		73	40-140		
Heptachlor [2C]	**11.2**		µg/kg wet	3.33	16.7		67	40-140		
Aldrin	**12.6**		µg/kg wet	3.33	16.7		75	40-140		
Aldrin [2C]	**11.4**		µg/kg wet	3.33	16.7		68	40-140		
Heptachlor epoxide	**12.9**		µg/kg wet	3.33	16.7		77	40-140		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317981 - SW846 3545A										
LCS (1317981-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Heptachlor epoxide [2C]	**10.8**		µg/kg wet	3.33	16.7		65	40-140		
Endosulfan I	**12.8**		µg/kg wet	3.33	16.7		77	40-140		
Endosulfan I [2C]	**11.6**		µg/kg wet	3.33	16.7		69	40-140		
Dieldrin	**13.5**		µg/kg wet	3.33	16.7		81	40-140		
Dieldrin [2C]	**12.0**		µg/kg wet	3.33	16.7		72	40-140		
4,4'-DDE (p,p')	**13.1**		µg/kg wet	3.33	16.7		79	40-140		
4,4'-DDE (p,p') [2C]	**11.3**		µg/kg wet	3.33	16.7		68	40-140		
Endrin	**13.9**		µg/kg wet	5.33	16.7		83	40-140		
Endrin [2C]	**12.3**		µg/kg wet	5.33	16.7		74	40-140		
Endosulfan II	**13.5**		µg/kg wet	5.33	16.7		81	40-140		
Endosulfan II [2C]	**12.0**		µg/kg wet	5.33	16.7		72	40-140		
4,4'-DDD (p,p')	**13.4**		µg/kg wet	5.33	16.7		81	40-140		
4,4'-DDD (p,p') [2C]	**12.0**		µg/kg wet	5.33	16.7		72	40-140		
Endosulfan sulfate	**14.1**		µg/kg wet	5.33	16.7		85	40-140		
Endosulfan sulfate [2C]	**13.2**		µg/kg wet	5.33	16.7		79	40-140		
4,4'-DDT (p,p')	**13.1**		µg/kg wet	5.33	16.7		79	40-140		
4,4'-DDT (p,p') [2C]	**11.9**		µg/kg wet	5.33	16.7		71	40-140		
Methoxychlor	**13.5**		µg/kg wet	5.33	16.7		81	40-140		
Methoxychlor [2C]	**13.5**		µg/kg wet	5.33	16.7		81	40-140		
Endrin ketone	**14.3**		µg/kg wet	5.33	16.7		86	40-140		
Endrin ketone [2C]	**13.2**		µg/kg wet	5.33	16.7		79	40-140		
Endrin aldehyde	**14.0**		µg/kg wet	5.33	16.7		84	40-140		
Endrin aldehyde [2C]	**11.8**		µg/kg wet	5.33	16.7		71	40-140		
alpha-Chlordane	**12.4**		µg/kg wet	3.33	16.7		75	40-140		
alpha-Chlordane [2C]	**11.1**		µg/kg wet	3.33	16.7		67	40-140		
gamma-Chlordane	**13.3**		µg/kg wet	3.33	16.7		80	40-140		
gamma-Chlordane [2C]	**10.9**		µg/kg wet	3.33	16.7		66	40-140		
Alachlor	**13.3**		µg/kg wet	3.33	16.7		80	40-140		
Alachlor [2C]	**14.5**		µg/kg wet	3.33	16.7		87	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*6.91*		µg/kg wet		*6.67*		*104*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*7.13*		µg/kg wet		*6.67*		*107*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*5.63*		µg/kg wet		*6.67*		*84*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*4.16*		µg/kg wet		*6.67*		*62*	*30-150*		
LCS Dup (1317981-BSD1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**10.5**		µg/kg wet	3.33	16.7		63	40-140	2	30
alpha-BHC [2C]	**11.5**		µg/kg wet	3.33	16.7		69	40-140	5	30
beta-BHC	**12.2**		µg/kg wet	3.33	16.7		73	40-140	0.8	30
beta-BHC [2C]	**13.7**		µg/kg wet	3.33	16.7		82	40-140	9	30
delta-BHC	**12.3**		µg/kg wet	3.33	16.7		74	40-140	0.9	30
delta-BHC [2C]	**12.2**		µg/kg wet	3.33	16.7		73	40-140	5	30
gamma-BHC (Lindane)	**12.1**		µg/kg wet	2.00	16.7		72	40-140	2	30
gamma-BHC (Lindane) [2C]	**11.2**		µg/kg wet	2.00	16.7		67	40-140	5	30
Heptachlor	**12.1**		µg/kg wet	3.33	16.7		73	40-140	1	30
Heptachlor [2C]	**11.8**		µg/kg wet	3.33	16.7		71	40-140	5	30
Aldrin	**12.4**		µg/kg wet	3.33	16.7		75	40-140	1	30
Aldrin [2C]	**12.1**		µg/kg wet	3.33	16.7		73	40-140	6	30
Heptachlor epoxide	**12.7**		µg/kg wet	3.33	16.7		76	40-140	1	30
Heptachlor epoxide [2C]	**11.2**		µg/kg wet	3.33	16.7		67	40-140	4	30
Endosulfan I	**12.8**		µg/kg wet	3.33	16.7		77	40-140	0.02	30
Endosulfan I [2C]	**12.1**		µg/kg wet	3.33	16.7		72	40-140	4	30
Dieldrin	**13.3**		µg/kg wet	3.33	16.7		80	40-140	2	30

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317981 - SW846 3545A										
LCS Dup (1317981-BSD1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Dieldrin [2C]	**12.3**		µg/kg wet	3.33	16.7		74	40-140	3	30
4,4'-DDE (p,p')	**12.9**		µg/kg wet	3.33	16.7		78	40-140	1	30
4,4'-DDE (p,p') [2C]	**11.7**		µg/kg wet	3.33	16.7		70	40-140	4	30
Endrin	**13.9**		µg/kg wet	5.33	16.7		83	40-140	0.2	30
Endrin [2C]	**12.8**		µg/kg wet	5.33	16.7		77	40-140	4	30
Endosulfan II	**13.4**		µg/kg wet	5.33	16.7		80	40-140	1	30
Endosulfan II [2C]	**12.5**		µg/kg wet	5.33	16.7		75	40-140	4	30
4,4'-DDD (p,p')	**13.4**		µg/kg wet	5.33	16.7		80	40-140	0.1	30
4,4'-DDD (p,p') [2C]	**12.6**		µg/kg wet	5.33	16.7		75	40-140	4	30
Endosulfan sulfate	**14.1**		µg/kg wet	5.33	16.7		85	40-140	0.007	30
Endosulfan sulfate [2C]	**13.3**		µg/kg wet	5.33	16.7		80	40-140	1	30
4,4'-DDT (p,p')	**13.2**		µg/kg wet	5.33	16.7		79	40-140	0.6	30
4,4'-DDT (p,p') [2C]	**12.4**		µg/kg wet	5.33	16.7		74	40-140	4	30
Methoxychlor	**13.6**		µg/kg wet	5.33	16.7		81	40-140	0.2	30
Methoxychlor [2C]	**13.3**		µg/kg wet	5.33	16.7		80	40-140	0.8	30
Endrin ketone	**14.3**		µg/kg wet	5.33	16.7		86	40-140	0.1	30
Endrin ketone [2C]	**13.8**		µg/kg wet	5.33	16.7		83	40-140	4	30
Endrin aldehyde	**14.0**		µg/kg wet	5.33	16.7		84	40-140	0.1	30
Endrin aldehyde [2C]	**12.3**		µg/kg wet	5.33	16.7		74	40-140	3	30
alpha-Chlordane	**12.4**		µg/kg wet	3.33	16.7		74	40-140	0.5	30
alpha-Chlordane [2C]	**11.6**		µg/kg wet	3.33	16.7		69	40-140	4	30
gamma-Chlordane	**13.3**		µg/kg wet	3.33	16.7		80	40-140	0.4	30
gamma-Chlordane [2C]	**11.4**		µg/kg wet	3.33	16.7		68	40-140	4	30
Alachlor	**12.8**		µg/kg wet	3.33	16.7		77	40-140	4	30
Alachlor [2C]	**15.0**		µg/kg wet	3.33	16.7		90	40-140	3	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*6.78*		µg/kg wet		*6.67*		*102*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*7.46*		µg/kg wet		*6.67*		*112*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*5.47*		µg/kg wet		*6.67*		*82*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*4.43*		µg/kg wet		*6.67*		*67*	*30-150*		
Matrix Spike (1317981-MS1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**18.2**		µg/kg dry	5.51	27.6	BRL	66	30-150		
alpha-BHC [2C]	**19.5**		µg/kg dry	5.51	27.6	BRL	71	30-150		
beta-BHC	**13.9**		µg/kg dry	5.51	27.6	BRL	51	30-150		
beta-BHC [2C]	**15.2**		µg/kg dry	5.51	27.6	BRL	55	30-150		
delta-BHC	**18.4**		µg/kg dry	5.51	27.6	BRL	67	30-150		
delta-BHC [2C]	**17.4**		µg/kg dry	5.51	27.6	BRL	63	30-150		
gamma-BHC (Lindane)	**19.6**		µg/kg dry	3.31	27.6	BRL	71	30-150		
gamma-BHC (Lindane) [2C]	**18.2**		µg/kg dry	3.31	27.6	BRL	66	30-150		
Heptachlor	**18.0**		µg/kg dry	5.51	27.6	BRL	65	30-150		
Heptachlor [2C]	**16.9**		µg/kg dry	5.51	27.6	BRL	61	30-150		
Aldrin	**18.5**		µg/kg dry	5.51	27.6	BRL	67	30-150		
Aldrin [2C]	**17.9**		µg/kg dry	5.51	27.6	BRL	65	30-150		
Heptachlor epoxide	**19.2**		µg/kg dry	5.51	27.6	BRL	70	30-150		
Heptachlor epoxide [2C]	**18.2**		µg/kg dry	5.51	27.6	BRL	66	30-150		
Endosulfan I	**18.3**		µg/kg dry	5.51	27.6	BRL	66	30-150		
Endosulfan I [2C]	**18.3**		µg/kg dry	5.51	27.6	BRL	66	30-150		
Dieldrin	**24.2**		µg/kg dry	5.51	27.6	3.85	74	30-150		
Dieldrin [2C]	**19.8**		µg/kg dry	5.51	27.6	2.70	62	30-150		
4,4'-DDE (p,p')	**36.8**		µg/kg dry	5.51	27.6	22.5	52	30-150		
4,4'-DDE (p,p') [2C]	**28.6**		µg/kg dry	5.51	27.6	19.1	34	30-150		
Endrin	**24.5**		µg/kg dry	8.82	27.6	BRL	89	30-150		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317981 - SW846 3545A										
Matrix Spike (1317981-MS1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Endrin [2C]	**22.4**		µg/kg dry	8.82	27.6	BRL	81	30-150		
Endosulfan II	**18.8**		µg/kg dry	8.82	27.6	BRL	68	30-150		
Endosulfan II [2C]	**22.2**		µg/kg dry	8.82	27.6	BRL	81	30-150		
4,4'-DDD (p,p')	**33.5**		µg/kg dry	8.82	27.6	16.0	64	30-150		
4,4'-DDD (p,p') [2C]	**33.7**		µg/kg dry	8.82	27.6	15.3	67	30-150		
Endosulfan sulfate	**20.7**		µg/kg dry	8.82	27.6	BRL	75	30-150		
Endosulfan sulfate [2C]	**18.1**		µg/kg dry	8.82	27.6	BRL	66	30-150		
4,4'-DDT (p,p')	**51.9**		µg/kg dry	8.82	27.6	30.7	77	30-150		
4,4'-DDT (p,p') [2C]	**51.2**		µg/kg dry	8.82	27.6	26.2	91	30-150		
Methoxychlor	**19.8**		µg/kg dry	8.82	27.6	BRL	72	30-150		
Methoxychlor [2C]	**22.0**		µg/kg dry	8.82	27.6	BRL	80	30-150		
Endrin ketone	**20.1**		µg/kg dry	8.82	27.6	BRL	73	30-150		
Endrin ketone [2C]	**21.5**		µg/kg dry	8.82	27.6	BRL	78	30-150		
Endrin aldehyde	**21.4**		µg/kg dry	8.82	27.6	BRL	78	30-150		
Endrin aldehyde [2C]	**20.3**		µg/kg dry	8.82	27.6	BRL	74	30-150		
alpha-Chlordane	**22.9**		µg/kg dry	5.51	27.6	5.83	62	30-150		
alpha-Chlordane [2C]	**21.2**		µg/kg dry	5.51	27.6	8.89	45	30-150		
gamma-Chlordane	**34.1**	QM1	µg/kg dry	5.51	27.6	44.6	-38	30-150		
gamma-Chlordane [2C]	**15.9**		µg/kg dry	5.51	27.6	1.99	50	30-150		
Alachlor	**24.1**		µg/kg dry	5.51	27.6	BRL	87	30-150		
Alachlor [2C]	**38.2**		µg/kg dry	5.51	27.6	BRL	139	30-150		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*11.7*		µg/kg dry		*11.0*		*107*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*14.1*		µg/kg dry		*11.0*		*128*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*9.13*		µg/kg dry		*11.0*		*83*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*8.77*		µg/kg dry		*11.0*		*80*	*30-150*		
Matrix Spike Dup (1317981-MSD1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
alpha-BHC	**18.3**		µg/kg dry	5.56	27.8	BRL	66	30-150	0.2	30
alpha-BHC [2C]	**19.5**		µg/kg dry	5.56	27.8	BRL	70	30-150	1	30
beta-BHC	**14.1**		µg/kg dry	5.56	27.8	BRL	51	30-150	0.2	30
beta-BHC [2C]	**14.1**		µg/kg dry	5.56	27.8	BRL	51	30-150	8	30
delta-BHC	**18.9**		µg/kg dry	5.56	27.8	BRL	68	30-150	2	30
delta-BHC [2C]	**17.6**		µg/kg dry	5.56	27.8	BRL	63	30-150	0.4	30
gamma-BHC (Lindane)	**20.5**		µg/kg dry	3.33	27.8	BRL	74	30-150	4	30
gamma-BHC (Lindane) [2C]	**18.3**		µg/kg dry	3.33	27.8	BRL	66	30-150	0.1	30
Heptachlor	**19.3**		µg/kg dry	5.56	27.8	BRL	69	30-150	6	30
Heptachlor [2C]	**16.9**		µg/kg dry	5.56	27.8	BRL	61	30-150	1	30
Aldrin	**18.4**		µg/kg dry	5.56	27.8	BRL	66	30-150	2	30
Aldrin [2C]	**18.4**		µg/kg dry	5.56	27.8	BRL	66	30-150	2	30
Heptachlor epoxide	**19.3**		µg/kg dry	5.56	27.8	BRL	69	30-150	0.5	30
Heptachlor epoxide [2C]	**18.4**		µg/kg dry	5.56	27.8	BRL	66	30-150	0.2	30
Endosulfan I	**18.3**		µg/kg dry	5.56	27.8	BRL	66	30-150	0.8	30
Endosulfan I [2C]	**18.2**		µg/kg dry	5.56	27.8	BRL	66	30-150	1	30
Dieldrin	**23.6**		µg/kg dry	5.56	27.8	3.85	71	30-150	4	30
Dieldrin [2C]	**20.5**		µg/kg dry	5.56	27.8	2.70	64	30-150	3	30
4,4'-DDE (p,p')	**36.3**		µg/kg dry	5.56	27.8	22.5	50	30-150	4	30
4,4'-DDE (p,p') [2C]	**29.0**		µg/kg dry	5.56	27.8	19.1	36	30-150	3	30
Endrin	**24.0**		µg/kg dry	8.89	27.8	BRL	86	30-150	3	30
Endrin [2C]	**19.4**		µg/kg dry	8.89	27.8	BRL	70	30-150	15	30
Endosulfan II	**18.4**		µg/kg dry	8.89	27.8	BRL	66	30-150	3	30
Endosulfan II [2C]	**19.0**		µg/kg dry	8.89	27.8	BRL	68	30-150	17	30
4,4'-DDD (p,p')	**32.9**		µg/kg dry	8.89	27.8	16.0	61	30-150	4	30

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317981 - SW846 3545A										
Matrix Spike Dup (1317981-MSD1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
4,4'-DDD (p,p') [2C]	**33.3**		µg/kg dry	8.89	27.8	15.3	65	30-150	3	30
Endosulfan sulfate	**20.4**		µg/kg dry	8.89	27.8	BRL	73	30-150	3	30
Endosulfan sulfate [2C]	**18.2**		µg/kg dry	8.89	27.8	BRL	66	30-150	0.2	30
4,4'-DDT (p,p')	**52.0**		µg/kg dry	8.89	27.8	30.7	77	30-150	0.5	30
4,4'-DDT (p,p') [2C]	**46.3**		µg/kg dry	8.89	27.8	26.2	72	30-150	22	30
Methoxychlor	**20.2**		µg/kg dry	8.89	27.8	BRL	73	30-150	1	30
Methoxychlor [2C]	**18.2**		µg/kg dry	8.89	27.8	BRL	65	30-150	20	30
Endrin ketone	**19.9**		µg/kg dry	8.89	27.8	BRL	72	30-150	2	30
Endrin ketone [2C]	**19.6**		µg/kg dry	8.89	27.8	BRL	70	30-150	10	30
Endrin aldehyde	**19.6**		µg/kg dry	8.89	27.8	BRL	70	30-150	10	30
Endrin aldehyde [2C]	**20.6**		µg/kg dry	8.89	27.8	BRL	74	30-150	0.6	30
alpha-Chlordane	**22.5**		µg/kg dry	5.56	27.8	5.83	60	30-150	4	30
alpha-Chlordane [2C]	**21.3**		µg/kg dry	5.56	27.8	8.89	45	30-150	0.2	30
gamma-Chlordane	**36.2**	QM1	µg/kg dry	5.56	27.8	44.6	-30	30-150	NR	30
gamma-Chlordane [2C]	**16.3**		µg/kg dry	5.56	27.8	1.99	52	30-150	2	30
Chlordane	**131**		µg/kg dry	22.2		49.5		30-150		30
Chlordane [2C]	**86.7**		µg/kg dry	22.2		34.7		30-150		30
Alachlor	**25.0**		µg/kg dry	5.56	27.8	BRL	90	30-150	3	30
Alachlor [2C]	**38.6**		µg/kg dry	5.56	27.8	BRL	139	30-150	0.2	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*11.7*		µg/kg dry		*11.1*		*105*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*11.3*		µg/kg dry		*11.1*		*101*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*9.53*		µg/kg dry		*11.1*		*86*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*8.28*		µg/kg dry		*11.1*		*74*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318007 - SW846 3005A										
Blank (1318007-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Silver	< 0.0050		mg/l	0.0050						
Lead	< 0.0075		mg/l	0.0075						
Nickel	< 0.0050		mg/l	0.0050						
Copper	< 0.0050		mg/l	0.0050						
Chromium	< 0.0050		mg/l	0.0050						
Beryllium	< 0.0020		mg/l	0.0020						
Arsenic	< 0.0040		mg/l	0.0040						
Cadmium	< 0.0025		mg/l	0.0025						
Zinc	< 0.0050		mg/l	0.0050						
Vanadium	< 0.0050		mg/l	0.0050						
Thallium	< 0.0050		mg/l	0.0050						
Selenium	< 0.0150		mg/l	0.0150						
Barium	< 0.0050		mg/l	0.0050						
Antimony	< 0.0060		mg/l	0.0060						
LCS (1318007-BS1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Thallium	**1.31**		mg/l	0.0050	1.25		104	85-115		
Arsenic	**1.28**		mg/l	0.0040	1.25		102	85-115		
Silver	**1.30**		mg/l	0.0050	1.25		104	85-115		
Beryllium	**1.25**		mg/l	0.0020	1.25		100	85-115		
Cadmium	**1.34**		mg/l	0.0025	1.25		107	85-115		
Lead	**1.30**		mg/l	0.0075	1.25		104	85-115		
Vanadium	**1.23**		mg/l	0.0050	1.25		98	85-115		
Selenium	**1.29**		mg/l	0.0150	1.25		103	85-115		
Barium	**1.24**		mg/l	0.0050	1.25		99	85-115		
Chromium	**1.27**		mg/l	0.0050	1.25		101	85-115		
Antimony	**1.24**		mg/l	0.0060	1.25		99	85-115		
Nickel	**1.21**		mg/l	0.0050	1.25		97	85-115		
Copper	**1.32**		mg/l	0.0050	1.25		106	85-115		
Zinc	**1.28**		mg/l	0.0050	1.25		102	85-115		
LCS Dup (1318007-BSD1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Beryllium	**1.24**		mg/l	0.0020	1.25		99	85-115	0.5	20
Chromium	**1.27**		mg/l	0.0050	1.25		102	85-115	0.5	20
Copper	**1.33**		mg/l	0.0050	1.25		107	85-115	0.9	20
Nickel	**1.22**		mg/l	0.0050	1.25		97	85-115	0.3	20
Barium	**1.24**		mg/l	0.0050	1.25		100	85-115	0.4	20
Zinc	**1.28**		mg/l	0.0050	1.25		102	85-115	0.04	20
Selenium	**1.29**		mg/l	0.0150	1.25		103	85-115	0.08	20
Vanadium	**1.23**		mg/l	0.0050	1.25		99	85-115	0.6	20
Lead	**1.30**		mg/l	0.0075	1.25		104	85-115	0.3	20
Thallium	**1.31**		mg/l	0.0050	1.25		105	85-115	0.2	20
Antimony	**1.25**		mg/l	0.0060	1.25		100	85-115	0.4	20
Silver	**1.30**		mg/l	0.0050	1.25		104	85-115	0.8	20
Cadmium	**1.34**		mg/l	0.0025	1.25		107	85-115	0.2	20
Arsenic	**1.28**		mg/l	0.0040	1.25		102	85-115	0.2	20
Duplicate (1318007-DUP1)			**Source: SB73837-06**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Vanadium	**0.0028**	J	mg/l	0.0050		0.0030			7	20
Zinc	**0.0248**		mg/l	0.0050		0.0265			6	20
Thallium	< 0.0050		mg/l	0.0050		BRL				20
Selenium	< 0.0150		mg/l	0.0150		BRL				20
Antimony	**0.0015**	J	mg/l	0.0060		BRL				20
Lead	**0.0061**	J	mg/l	0.0075		0.0060			0.8	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318007 - SW846 3005A										
Duplicate (1318007-DUP1)			**Source: SB73837-06**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Nickel	**0.0038**	J	mg/l	0.0050		0.0038			1	20
Copper	**0.0078**		mg/l	0.0050		0.0086			10	20
Chromium	**0.0022**	J	mg/l	0.0050		0.0021			2	20
Beryllium	**0.0002**	J	mg/l	0.0020		BRL				20
Barium	**0.116**		mg/l	0.0050		0.122			5	20
Arsenic	< 0.0040		mg/l	0.0040		0.0018				20
Silver	< 0.0050		mg/l	0.0050		BRL				20
Cadmium	< 0.0025		mg/l	0.0025		BRL				20
Matrix Spike (1318007-MS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Vanadium	**1.23**		mg/l	0.0050	1.25	0.0026	98	70-130		
Copper	**1.33**		mg/l	0.0050	1.25	0.0058	106	75-125		
Chromium	**1.25**		mg/l	0.0050	1.25	0.0022	100	75-125		
Cadmium	**1.34**		mg/l	0.0025	1.25	BRL	107	75-125		
Beryllium	**1.20**		mg/l	0.0020	1.25	0.0002	96	75-125		
Barium	**1.31**		mg/l	0.0050	1.25	0.105	97	75-125		
Arsenic	**1.29**		mg/l	0.0040	1.25	0.0022	103	75-125		
Silver	**1.31**		mg/l	0.0050	1.25	BRL	105	75-125		
Antimony	**1.25**		mg/l	0.0060	1.25	0.0022	100	75-125		
Thallium	**1.30**		mg/l	0.0050	1.25	BRL	104	75-125		
Zinc	**1.27**		mg/l	0.0050	1.25	0.0197	100	75-125		
Nickel	**1.18**		mg/l	0.0050	1.25	0.0028	94	75-125		
Lead	**1.27**		mg/l	0.0075	1.25	0.0052	101	75-125		
Selenium	**1.29**		mg/l	0.0150	1.25	BRL	103	75-125		
Matrix Spike Dup (1318007-MSD1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Copper	**1.39**		mg/l	0.0050	1.25	0.0058	110	75-125	4	20
Selenium	**1.32**		mg/l	0.0150	1.25	BRL	106	75-125	2	20
Beryllium	**1.26**		mg/l	0.0020	1.25	0.0002	101	75-125	4	20
Thallium	**1.33**		mg/l	0.0050	1.25	BRL	106	75-125	2	20
Barium	**1.36**		mg/l	0.0050	1.25	0.105	101	75-125	4	20
Cadmium	**1.37**		mg/l	0.0025	1.25	BRL	110	75-125	2	20
Chromium	**1.30**		mg/l	0.0050	1.25	0.0022	103	75-125	4	20
Antimony	**1.28**		mg/l	0.0060	1.25	0.0022	102	75-125	2	20
Lead	**1.30**		mg/l	0.0075	1.25	0.0052	104	75-125	2	20
Nickel	**1.21**		mg/l	0.0050	1.25	0.0028	97	75-125	3	20
Zinc	**1.29**		mg/l	0.0050	1.25	0.0197	102	75-125	2	20
Vanadium	**1.27**		mg/l	0.0050	1.25	0.0026	101	70-130	3	20
Silver	**1.34**		mg/l	0.0050	1.25	BRL	107	75-125	2	20
Arsenic	**1.33**		mg/l	0.0040	1.25	0.0022	106	75-125	3	20
Post Spike (1318007-PS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Cadmium	**1.35**		mg/l	0.0025	1.25	BRL	108	80-120		
Beryllium	**1.22**		mg/l	0.0020	1.25	0.0002	98	80-120		
Chromium	**1.26**		mg/l	0.0050	1.25	0.0022	100	80-120		
Barium	**1.32**		mg/l	0.0050	1.25	0.105	97	80-120		
Lead	**1.28**		mg/l	0.0075	1.25	0.0052	102	80-120		
Copper	**1.34**		mg/l	0.0050	1.25	0.0058	107	80-120		
Silver	**1.32**		mg/l	0.0050	1.25	BRL	105	80-120		
Antimony	**1.26**		mg/l	0.0060	1.25	0.0022	100	80-120		
Selenium	**1.30**		mg/l	0.0150	1.25	BRL	104	80-120		
Thallium	**1.30**		mg/l	0.0050	1.25	BRL	104	80-120		
Vanadium	**1.23**		mg/l	0.0050	1.25	0.0026	98	80-120		
Zinc	**1.29**		mg/l	0.0050	1.25	0.0197	102	80-120		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318007 - SW846 3005A										
Post Spike (1318007-PS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Nickel	**1.18**		mg/l	0.0050	1.25	0.0028	94	80-120		
Arsenic	**1.30**		mg/l	0.0040	1.25	0.0022	104	80-120		
Batch 1318009 - SW846 3050B										
Blank (1318009-BLK1)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Silver	< 1.45		mg/kg wet	1.45						
Nickel	< 0.966		mg/kg wet	0.966						
Arsenic	< 1.45		mg/kg wet	1.45						
Beryllium	< 0.483		mg/kg wet	0.483						
Cadmium	< 0.483		mg/kg wet	0.483						
Copper	< 0.966		mg/kg wet	0.966						
Lead	< 1.45		mg/kg wet	1.45						
Antimony	< 4.83		mg/kg wet	4.83						
Selenium	< 1.45		mg/kg wet	1.45						
Thallium	< 2.90		mg/kg wet	2.90						
Vanadium	< 1.45		mg/kg wet	1.45						
Zinc	< 0.966		mg/kg wet	0.966						
Chromium	< 0.966		mg/kg wet	0.966						
Barium	< 0.966		mg/kg wet	0.966						
Duplicate (1318009-DUP1)			**Source: SB73837-07**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Selenium	< 1.47		mg/kg dry	1.47		BRL				20
Zinc	**34.1**		mg/kg dry	0.979		33.9			0.4	20
Vanadium	**17.8**		mg/kg dry	1.47		21.0			16	20
Thallium	< 2.94		mg/kg dry	2.94		BRL				20
Antimony	< 4.89		mg/kg dry	4.89		BRL				20
Lead	**10.6**	QR6	mg/kg dry	1.47		50.9			131	20
Silver	< 1.47		mg/kg dry	1.47		BRL				20
Arsenic	**1.53**	QR8	mg/kg dry	1.47		2.09			31	20
Copper	**12.9**		mg/kg dry	0.979		14.5			12	20
Chromium	**11.2**		mg/kg dry	0.979		13.1			15	20
Cadmium	< 0.489		mg/kg dry	0.489		BRL				20
Beryllium	**0.277**	J	mg/kg dry	0.489		0.246			12	20
Nickel	**14.9**		mg/kg dry	0.979		14.4			4	20
Barium	**39.0**		mg/kg dry	0.979		40.1			3	20
Matrix Spike (1318009-MS1)			**Source: SB73837-07**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Chromium	**133**		mg/kg dry	1.07	133	13.1	90	75-125		
Zinc	**141**		mg/kg dry	1.07	133	33.9	81	75-125		
Antimony	**94.4**	QM8	mg/kg dry	5.33	133	BRL	71	75-125		
Lead	**122**	QM8	mg/kg dry	1.60	133	50.9	53	75-125		
Copper	**140**		mg/kg dry	1.07	133	14.5	94	75-125		
Nickel	**121**		mg/kg dry	1.07	133	14.4	80	75-125		
Vanadium	**141**		mg/kg dry	1.60	133	21.0	90	75-125		
Selenium	**120**		mg/kg dry	1.60	133	BRL	90	75-125		
Silver	**121**		mg/kg dry	1.60	133	BRL	91	75-125		
Arsenic	**123**		mg/kg dry	1.60	133	2.09	91	75-125		
Cadmium	**116**		mg/kg dry	0.533	133	BRL	87	75-125		
Thallium	**131**		mg/kg dry	3.20	133	BRL	98	75-125		
Beryllium	**120**		mg/kg dry	0.533	133	0.246	90	75-125		
Barium	**176**		mg/kg dry	1.07	133	40.1	102	75-125		
Matrix Spike Dup (1318009-MSD1)			**Source: SB73837-07**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Silver	**115**		mg/kg dry	1.58	132	BRL	87	75-125	5	20
Beryllium	**113**		mg/kg dry	0.528	132	0.246	86	75-125	6	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318009 - SW846 3050B										
Matrix Spike Dup (1318009-MSD1)			**Source: SB73837-07**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Selenium	**112**		mg/kg dry	1.58	132	BRL	85	75-125	6	20
Chromium	**128**		mg/kg dry	1.06	132	13.1	87	75-125	4	20
Nickel	**119**		mg/kg dry	1.06	132	14.4	79	75-125	2	20
Antimony	**87.2**	QM8	mg/kg dry	5.28	132	BRL	66	75-125	8	20
Thallium	**131**		mg/kg dry	3.17	132	BRL	99	75-125	0.05	20
Vanadium	**134**		mg/kg dry	1.58	132	21.0	86	75-125	5	20
Cadmium	**111**		mg/kg dry	0.528	132	BRL	84	75-125	4	20
Copper	**135**		mg/kg dry	1.06	132	14.5	92	75-125	3	20
Arsenic	**116**		mg/kg dry	1.58	132	2.09	86	75-125	6	20
Zinc	**138**		mg/kg dry	1.06	132	33.9	79	75-125	2	20
Lead	**118**	QM8	mg/kg dry	1.58	132	50.9	51	75-125	3	20
Barium	**168**		mg/kg dry	1.06	132	40.1	97	75-125	5	20
Post Spike (1318009-PS1)			**Source: SB73837-07**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Thallium	**140**		mg/kg dry	3.32	138	BRL	101	80-120		
Chromium	**142**		mg/kg dry	1.11	138	13.1	93	80-120		
Cadmium	**129**		mg/kg dry	0.554	138	BRL	93	80-120		
Beryllium	**122**		mg/kg dry	0.554	138	0.246	88	80-120		
Zinc	**154**		mg/kg dry	1.11	138	33.9	87	80-120		
Selenium	**128**		mg/kg dry	1.66	138	BRL	92	80-120		
Antimony	**127**		mg/kg dry	5.54	138	BRL	91	80-120		
Lead	**170**		mg/kg dry	1.66	138	50.9	86	80-120		
Copper	**150**		mg/kg dry	1.11	138	14.5	98	80-120		
Arsenic	**131**		mg/kg dry	1.66	138	2.09	93	80-120		
Nickel	**133**		mg/kg dry	1.11	138	14.4	86	80-120		
Silver	**113**		mg/kg dry	1.66	138	BRL	81	80-120		
Vanadium	**147**		mg/kg dry	1.66	138	21.0	91	80-120		
Barium	**166**		mg/kg dry	1.11	138	40.1	91	80-120		
Reference (1318009-SRM1)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Nickel	**57.6**		mg/kg wet	1.00	64.2		90	84.38-115.62		
Zinc	**93.4**		mg/kg wet	1.00	102		91	81.86-117.65		
Vanadium	**50.4**		mg/kg wet	1.50	52.2		97	75.48-124.03		
Thallium	**72.0**		mg/kg wet	3.00	72.2		100	81.25-118.75		
Selenium	**39.5**		mg/kg wet	1.50	43.1		92	79.98-119.91		
Lead	**61.4**		mg/kg wet	1.50	68.2		90	83.82-116.91		
Copper	**40.1**		mg/kg wet	1.00	40.2		100	83.77-116.1		
Chromium	**60.0**		mg/kg wet	1.00	62.7		96	81.6-117.6		
Cadmium	**28.6**		mg/kg wet	0.500	30.3		94	83.11-116.88		
Beryllium	**45.3**		mg/kg wet	0.500	49.3		92	83.93-115.97		
Arsenic	**84.5**		mg/kg wet	1.50	91.3		93	82.97-117.58		
Silver	**27.9**		mg/kg wet	1.50	30.7		91	66.23-133.77		
Antimony	**21.3**		mg/kg wet	5.00	53.2		40	25-218.86		
Barium	**69.4**		mg/kg wet	1.00	71.7		97	83.21-117.48		
Reference (1318009-SRM2)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318009 - SW846 3050B										
Reference (1318009-SRM2)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Arsenic	**88.3**		mg/kg wet	1.50	91.7		96	82.97-117.58		
Lead	**63.4**		mg/kg wet	1.50	68.5		93	83.82-116.91		
Silver	**28.4**		mg/kg wet	1.50	30.9		92	66.23-133.77		
Beryllium	**47.4**		mg/kg wet	0.500	49.5		96	83.93-115.97		
Cadmium	**29.2**		mg/kg wet	0.500	30.4		96	83.11-116.88		
Chromium	**62.0**		mg/kg wet	1.00	63.0		98	81.6-117.6		
Nickel	**59.4**		mg/kg wet	1.00	64.5		92	84.38-115.62		
Antimony	**23.1**		mg/kg wet	5.00	53.4		43	25-218.86		
Selenium	**41.4**		mg/kg wet	1.50	43.3		96	79.98-119.91		
Thallium	**75.2**		mg/kg wet	3.00	72.5		104	81.25-118.75		
Vanadium	**52.5**		mg/kg wet	1.50	52.4		100	75.48-124.03		
Zinc	**97.8**		mg/kg wet	1.00	103		95	81.86-117.65		
Copper	**40.8**		mg/kg wet	1.00	40.3		101	83.77-116.1		
Barium	**71.0**		mg/kg wet	1.00	72.0		99	83.21-117.48		
Batch 1318010 - EPA200/SW7000 Series										
Blank (1318010-BLK1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	< 0.0285		mg/kg wet	0.0285						
Duplicate (1318010-DUP1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	**0.0016**	J,QR8	mg/kg dry	0.0296		0.0048			101	20
Matrix Spike (1318010-MS1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	**0.254**		mg/kg dry	0.0302	0.210	0.0048	119	75-125		
Matrix Spike Dup (1318010-MSD1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	**0.266**		mg/kg dry	0.0310	0.215	0.0048	121	75-125	5	20
Post Spike (1318010-PS1)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	**0.233**		mg/kg dry	0.0300	0.208	0.0048	109	80-120		
Reference (1318010-SRM1)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Mercury	**3.05**	D	mg/kg wet	0.600	3.15		97	71.67-128.65		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1318008 - EPA200/SW7000 Series										
Blank (1318008-BLK1)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	< 0.00020		mg/l	0.00020						
LCS (1318008-BS1)						Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	**0.00492**		mg/l	0.00020	0.00500		98	85-115		
Duplicate (1318008-DUP1)			**Source: SB73837-10**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	< 0.00020		mg/l	0.00020		BRL				20
Matrix Spike (1318008-MS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	**0.00505**		mg/l	0.00020	0.00500	BRL	101	80-120		
Matrix Spike Dup (1318008-MSD1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	**0.00483**		mg/l	0.00020	0.00500	BRL	97	80-120	4	20
Post Spike (1318008-PS1)			**Source: SB73837-08**			Prepared: 30-Jul-13 Analyzed: 31-Jul-13				
Mercury	**0.00495**		mg/l	0.00020	0.00500	BRL	99	85-115		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1317764 - General Preparation										
Duplicate (1317764-DUP1)			**Source: SB73837-07**		Prepared & Analyzed: 26-Jul-13					
% Solids	**76.1**		%			89.6			16	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 72963 - SW3545A										
LCS (LCS-72963)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Naphthalene	**141.0**		ug/Kg	66	166.7		84.6	19-102		
2-Methylnaphthalene	**140.9**		ug/Kg	66	166.7		84.6	19-112		
Acenaphthylene	**145.2**		ug/Kg	66	166.7		87.1	23-134		
Acenaphthene	**125.8**		ug/Kg	66	166.7		75.5	33-113		
Fluorene	**126.8**		ug/Kg	66	166.7		76.1	32-122		
Phenanthrene	**141.2**		ug/Kg	66	166.7		84.7	38-108		
Anthracene	**127.3**		ug/Kg	66	166.7		76.4	35-114		
Fluoranthene	**151.3**		ug/Kg	66	166.7		90.8	41-117		
Pyrene	**140.7**		ug/Kg	66	166.7		84.4	39-119		
Benzo(a)anthracene	**149.1**		ug/Kg	66	166.7		89.5	39-111		
Chrysene	**147.7**		ug/Kg	66	166.7		88.6	36-112		
Benzo(b)fluoranthene	**130.5**		ug/Kg	66	166.7		78.3	39-128		
Benzo(k)fluoranthene	**159.2**		ug/Kg	66	166.7		95.5	30-133		
Benzo(a)pyrene	**143.0**		ug/Kg	66	166.7		85.8	43-119		
Indeno(1,2,3-cd)pyrene	**176.9**		ug/Kg	66	166.7		106	48-119		
Dibenzo(a,h)anthracene	**149.4**		ug/Kg	66	166.7		89.6	48-121		
Benzo(g,h,i)perylene	**158.5**		ug/Kg	66	166.7		95.1	45-116		
Surrogate: Benzo(e)pyrene-d12	*159.2*		ug/Kg		*166.7*		*95.5*	*32-153*		
Matrix Spike (M1295-04AMS)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Naphthalene	**414.3**	S	ug/Kg	76	193.1		215	19-102		
2-Methylnaphthalene	**240.2**	S	ug/Kg	76	193.1		124	19-112		
Acenaphthylene	**868.2**	S	ug/Kg	76	193.1		450	23-134		
Acenaphthene	**235.5**	S	ug/Kg	76	193.1		122	33-113		
Fluorene	**304.1**	S	ug/Kg	76	193.1		157	32-122		
Phenanthrene	**1868**	S	ug/Kg	76	193.1		968	38-108		
Anthracene	**879.9**	S	ug/Kg	76	193.1		456	35-114		
Fluoranthene	**3560**	S	ug/Kg	76	193.1		1270	41-117		
Pyrene	**3464**	S	ug/Kg	76	193.1		1230	39-119		
Benzo(a)anthracene	**2842**	S	ug/Kg	76	193.1		1470	39-111		
Chrysene	**2861**	S	ug/Kg	76	193.1		1480	36-112		
Benzo(b)fluoranthene	**4076**	S	ug/Kg	76	193.1		1620	39-128		
Benzo(k)fluoranthene	**1743**	S	ug/Kg	76	193.1		903	30-133		
Benzo(a)pyrene	**3392**	S	ug/Kg	76	193.1		1760	43-119		
Indeno(1,2,3-cd)pyrene	**2219**	S	ug/Kg	76	193.1		1150	48-119		
Dibenzo(a,h)anthracene	**627.7**	S	ug/Kg	76	193.1		325	48-121		
Benzo(g,h,i)perylene	**2023**	S	ug/Kg	76	193.1		1050	45-116		
Surrogate: Benzo(e)pyrene-d12	*223.2*		ug/Kg		*193.1*		*116*	*32-153*		
Matrix Spike Dup (M1295-04AMSD)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Naphthalene	**176.3**	R	ug/Kg	75	190.6		92.5	19-102	80.6	40.0
2-Methylnaphthalene	**174.2**		ug/Kg	75	190.6		91.4	19-112	31.9	40.0
Acenaphthylene	**231.7**	R	ug/Kg	75	190.6		122	23-134	116	40.0
Acenaphthene	**195.8**		ug/Kg	75	190.6		103	33-113	18.4	40.0
Fluorene	**200.9**	R	ug/Kg	75	190.6		105	32-122	40.9	40.0
Phenanthrene	**464.9**	S, R	ug/Kg	75	190.6		244	38-108	120	40.0
Anthracene	**261.3**	S, R	ug/Kg	75	190.6		137	35-114	108	40.0
Fluoranthene	**555.7**	S, R	ug/Kg	75	190.6		0	41-117	146	40.0
Pyrene	**585.5**	S, R	ug/Kg	75	190.6		0	39-119	142	40.0
Benzo(a)anthracene	**370.0**	S, R	ug/Kg	75	190.6		194	39-111	154	40.0
Chrysene	**351.7**	S, R	ug/Kg	75	190.6		184	36-112	156	40.0
Benzo(b)fluoranthene	**397.4**	S, R	ug/Kg	75	190.6		0	39-128	164	40.0
Benzo(k)fluoranthene	**270.3**	S, R	ug/Kg	75	190.6		142	30-133	146	40.0

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 72963 - SW3545A										
Matrix Spike Dup (M1295-04AMSD)			**Source: SB73837-07**		Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Benzo(a)pyrene	**355.0**	S, R	ug/Kg	75	190.6		186	43-119	162	40.0
Indeno(1,2,3-cd)pyrene	**334.9**	S, R	ug/Kg	75	190.6		176	48-119	148	40.0
Dibenzo(a,h)anthracene	**219.8**	R	ug/Kg	75	190.6		115	48-121	96.3	40.0
Benzo(g,h,i)perylene	**272.7**	S, R	ug/Kg	75	190.6		143	45-116	152	40.0
Surrogate: Benzo(e)pyrene-d12	*214.5*		ug/Kg		*190.6*		*113*	*32-153*		
Blank (MB-72963)					Prepared: 30-Jul-13 Analyzed: 31-Jul-13					
Naphthalene	< 66	U	ug/Kg	66				-		
2-Methylnaphthalene	< 66	U	ug/Kg	66				-		
Acenaphthylene	< 66	U	ug/Kg	66				-		
Acenaphthene	< 66	U	ug/Kg	66				-		
Fluorene	< 66	U	ug/Kg	66				-		
Phenanthrene	< 66	U	ug/Kg	66				-		
Anthracene	< 66	U	ug/Kg	66				-		
Fluoranthene	< 66	U	ug/Kg	66				-		
Pyrene	< 66	U	ug/Kg	66				-		
Benzo(a)anthracene	< 66	U	ug/Kg	66				-		
Chrysene	< 66	U	ug/Kg	66				-		
Benzo(b)fluoranthene	< 66	U	ug/Kg	66				-		
Benzo(k)fluoranthene	< 66	U	ug/Kg	66				-		
Benzo(a)pyrene	< 66	U	ug/Kg	66				-		
Indeno(1,2,3-cd)pyrene	< 66	U	ug/Kg	66				-		
Dibenzo(a,h)anthracene	< 66	U	ug/Kg	66				-		
Benzo(g,h,i)perylene	< 66	U	ug/Kg	66				-		
Surrogate: Benzo(e)pyrene-d12	*172.0*		ug/Kg		*166.7*		*103*	*32-153*		

Analyte(s)	Column	% Breakdown	Limit
Batch S309014			
Performance Mix (S309014-PEM1)			
4,4'-DDT (p,p')	1	4.7	15.0
Endrin	1	9.0	15.0
4,4'-DDT (p,p')	2	4.2	15.0
Endrin	2	9.6	15.0
Performance Mix (S309014-PEM2)			
4,4'-DDT (p,p')	1	2.6	15.0
Endrin	1	4.4	15.0
4,4'-DDT (p,p')	2	2.7	15.0
Endrin	2	5.3	15.0
Batch S309027			
Performance Mix (S309027-PEM1)			
4,4'-DDT (p,p')	1	2.6	15.0
Endrin	1	4.4	15.0
4,4'-DDT (p,p')	2	2.7	15.0
Endrin	2	5.3	15.0
Performance Mix (S309027-PEM2)			
4,4'-DDT (p,p')	1	3.4	15.0
Endrin	1	1.9	15.0
4,4'-DDT (p,p')	2	2.9	15.0
Endrin	2	3.8	15.0

Notes and Definitions

D	Data reported from a dilution
P	Difference between the two GC columns is greater than 40%.
QM1	The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.
QM7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM8	The spike recovery exceeded the QC control limits for the MS and/or MSD. The batch was accepted based upon acceptable PS and /or LCS recovery.
QR6	The RPD exceeded the QC control limits; however precision is demonstrated with acceptable RPD values for MS/MSD.
QR8	Analyses are not controlled on RPD values from sample concentrations that are less than 5 times the reporting level. The batch is accepted based upon the difference between the sample and duplicate is less than or equal to the reporting limit.
R	Relative percent difference is outside of the control limit
S	Spike recovery falls outside of the control limit
U	Compound not detected below method detection limit at or above the MRL.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:
Nicole Leja

GB73837

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 2

Special Handling: S JB
- [x] Standard TAT - ~~7 to 10~~ business days
- [ ] Rush TAT - Date Needed: _____
- All TATs subject to laboratory approval.
- Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: AECOM
500 Enterprise Drive
Rocky Hill CT

Telephone #: 8600 258 0300
Project Mgr. Malcolm Bixler

Invoice To: Same

P.O. No.: _____ RQN: _____

Project No.: 60225155
Site Name: Greenwich High School
Location: Greenwich State: CT
Sampler(s): M. Rood & S. Bartlett

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=_____ 12=_____

List preservative code below: 4

QA/QC Reporting Notes:
* additional charges may apply

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW=Surface Water SO=Soil SL=Sludge A=Air
X1= Sediment X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: PAHs - SIM	Pesticides	RSR metals	PCBs - Soxhlet	QA/QC Reporting Notes
73837-01	SED-BBUS-1-072513-1	7/23/13	0900	G	X1		4			X	X	X	X	
02	SW-BBUS-1-072513-1	7/25/13	0900	G	SW		2		1	X	X	X		
03	SED-BBUS-2-072513-1	7/23/13	1000	G	X1		4			X	X	X	X	
04	SW-BBUS-2-072513-1	7/23/13	1000	G	SW		2		1	X	X	X		
05	SED-BBUS-2-072513-2	7/25/13	1000	G	X1		4			X	X	X	X	
06	SW-BBUS-2-072513-2	7/23/13	1000	G	SW		2		1	X	X	X		
07	SED-BBUS-3-072513-1	7/23/13	1030	G	X1		12			X	X	X	X	MS/MSD
08	SW-BBUS-3-072513-1	7/25/13	1030	G	SW		6		3	X	X	X		MS/MSD
09	SED-BBUS-4-072513-1	7/25/13	1100	G	X1		4			X	X	X	X	
10	SW-BBUS-4-072513-1	7/25/13	1100	G	SW		2		1	X	X	X		

Relinquished by:	Received by:	Date:	Time:	Temp °C
[signature]	[signature]	7/25/13	1:35pm	
[signature]	[signature]	7/25/13	2100	

- [x] EDD Format equis
- [x] E-mail to malcolm.bixler@aecom.com
  william.scott@aecom.com

Condition upon receipt:
- [ ] Ambient
- [x] Iced
- [ ] Refrigerated
- [ ] DI VOA Frozen
- [ ] Soil Jar Frozen

4.5/0/4.5 IR 04

SB73837 JB

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 2 of 2

Special Handling: 5
- ☒ Standard TAT - ~~7 to 10~~ business days
- ☐ Rush TAT - Date Needed: _____
- All TATs subject to laboratory approval.
- Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: AECOM
500 Enterprise Dr
Rocky Hill CT

Telephone #: 860 263 5800
Project Mgr. Malcolm Beeler

Invoice To: Same

P.O. No.: _____ RQN: _____

Project No.: 60225155
Site Name: Greenwich High School
Location: Greenwich State: CT
Sampler(s): M. Read & S. Bartlett

1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9= Deionized Water 10= H_3PO_4 11= _____ 12= _____

List preservative code below:

7/9				4			

QA/QC Reporting Notes:
* additional charges may apply

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1= DI water X2= _____ X3= _____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: VOCs	MTBE	Pesticides	PCBs	RCRA Metals				QA/QC Reporting Notes
73837-11	Equipment Blank	7/25/13	1130	G	X1		3		1		X	X	X	X				
↓ ~~X12~~	Trip Blank					2				X								HOLD

MA DEP MCP CAM Report: Yes ☐ No ☒
CT DPH RCP Report: Yes ☒ No ☐

QA/QC Reporting Level
☒ Standard ☐ No QC ☐ DQA*
☐ NY ASP A* ☐ NY ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ TIER II* ☐ TIER IV*
☐ Other _____

State-specific reporting standards:

Relinquished by:	Received by:	Date:	Time:	Temp°C
Jet	Jet	7/25/13	1:35p	
	YJ	7/25/13	2:40	

☒ EDD Format EQuIS
☒ E-mail to malcolm.beeler@aecom.com
collen.scott@aecom.com

Condition upon receipt:
☐ Ambient ☒ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

45/0/45 IR 02

SB73837 JB

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 2 of 2

Special Handling: 5
☒ Standard TAT - ~~7 to 10~~ business days
☐ Rush TAT - Date Needed: _____
· All TATs subject to laboratory approval.
· Min. 24-hour notification needed for rushes.
· Samples disposed of after 60 days unless otherwise instructed.

Report To: AECom
500 Enterprise Dr
Rocky Hill CT

Telephone #: 860 263 5800
Project Mgr. Malcolm Beeler

Invoice To: Same

P.O. No.: _____ RQN: _____

Project No.: 60225155
Site Name: Greenwich High School
Location: Greenwich State: CT
Sampler(s): M. Rood & S. Bartlett

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9= Deionized Water 10= H_3PO_4 11= _____ 12= _____

List preservative code below:

7/9				4			

QA/QC Reporting Notes:
* additional charges may apply

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1= DI water X2= _____ X3= _____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses: VOCs	PAHs	Pesticides	PCBs	RSK Methods				
73837-11	Equipment Blank	7/25/13	1130	G	X1		3		1		X	X	X	X				
↓ set 12	Trip Blank					2				X								

MA DEP MCP CAM Report: Yes ☐ No ☒
CT DPH RCP Report: Yes ☒ No ☐

QA/QC Reporting Level
☒ Standard ☐ No QC ☐ DQA*
☐ NY ASP A* ☐ NY ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ TIER II* ☐ TIER IV*
☐ Other _____

State-specific reporting standards:

HOLD / Do not run Trip Blanks per Client request 7/26/13 5:07

Relinquished by:	Received by:	Date:	Time:	Temp°C
Jet	Jet	7/25/13	1:35p	
		7.25.13	2:40	

☒ EDD Format equis
☒ E-mail to malcolm.beeler@aecom.com
colleen.stotler@aecom.com

Condition upon receipt:
☐ Ambient ☒ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

45/0/45 IR 02

Report Date:
15-Oct-14 16:52

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

AECOM Environment
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
Attn: Malcolm Beeler

Project: Greenwich HS - Greenwich, CT
Project #: 60225155

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SB97408-01	SW-DOWNSTREAM-01-10-02-14	Surface Water	02-Oct-14 10:26	02-Oct-14 18:30
SB97408-02	SW-DOWNSTREAM-02-10-01-14	Surface Water	01-Oct-14 17:25	02-Oct-14 18:30
SB97408-03	SW-DOWNSTREAM-03-10-01-14	Surface Water	01-Oct-14 16:45	02-Oct-14 18:30
SB97408-04	SW-DOWNSTREAM-04-10-01-14	Surface Water	01-Oct-14 15:52	02-Oct-14 18:30
SB97408-05	SW-DOWNSTREAM-05-10-01-14	Surface Water	01-Oct-14 14:55	02-Oct-14 18:30
SB97408-06	SW-DOWNSTREAM-06-10-01-14	Surface Water	01-Oct-14 11:56	02-Oct-14 18:30
SB97408-07	SW-DOWNSTREAM-01-10-02-14 -FD	Surface Water	02-Oct-14 10:26	02-Oct-14 18:30
SB97408-08	SW-DOWNSTREAM-01-10-02-14 -EB	Surface Water	02-Oct-14 12:10	02-Oct-14 18:30

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New Jersey # MA011/MA012
New York # 11393/11840
Pennsylvania # 68-04426/68-02924
Rhode Island # 98
USDA # S-51435

Authorized by:

Nicole Leja
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 32 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, NJ-MA012, PA-68-04426 and FL-E87936).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Reasonable Confidence Protocols
Laboratory Analysis
QA/QC Certification Form

Laboratory Name: Spectrum Analytical, Inc.

Client: AECOM Environment - Rocky Hill, CT

Project Location: Greenwich HS - Greenwich, CT

Project Number: 60225155

Sampling Date(s):
10/1/2014 through 10/2/2014

Laboratory Sample ID(s):
SB97408-01 through SB97408-08

RCP Methods Used:

EPA 245.1/7470A

SW846 6010C

SW846 8081B

SW846 8270D SIM

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	✓ Yes	No
1A	Were the method specified preservation and holding time requirements met?	✓ Yes	No
1B	***VPH and EPH methods only***: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	Yes	No
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	✓ Yes	No
3	Were samples received at an appropriate temperature?	✓ Yes	No
4	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved?	Yes	✓ No
5	a) Were reporting limits specified or referenced on the chain-of-custody? b) Were these reporting limits met?	Yes Yes	✓ No No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	✓ Yes	No
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	Yes	✓ No

Note: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence."

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for obtaining the information contained in this analytical report, such information is accurate and complete.

Nicole Leja
Laboratory Director
Date: 10/15/2014

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

The samples were received 0.5 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

Required site-specific Matrix Spike/Matrix Spike Duplicate (MS/MSD) must be requested by the client and sufficient sample must be submitted for the additional analyses. Samples submitted with insufficient volume/weight will not be analyzed for site specific MS/MSD, however a batch MS/MSD may be analyzed from a non-site specific sample.

CTDEP has published a list of analytical methods which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of decisions being made utilizing the Reasonable Confidence Protocol (RCP). "Reasonable Confidence" can be established only for those methods published by the CTDEP in the RCP guidelines. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

The CTDEP RCP requests that "all non-detects and all results below the reporting limit are reported as ND (Not Detected at the Specified Reporting Limit)". All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

If no reporting limits were specified or referenced on the chain-of-custody the laboratory's practical quantitation limits were applied.

Tetrachloro-m-xylene is recommended as a surrogate by the CTDEP RCP for the following SW846 Methods 8081, 8082 and 8151. Spectrum Analytical, Inc. uses Tetrachloro-m-xylene as the Internal Standard for these methods and Dibromooctaflourobiphenyl as the surrogate.

For this work order, the reporting limits have not been referenced or specified.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 6010C

Samples:

SB97408-01 *SW-DOWNSTREAM-01-10-02-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-02 *SW-DOWNSTREAM-02-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-03 *SW-DOWNSTREAM-03-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-04 *SW-DOWNSTREAM-04-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-05 *SW-DOWNSTREAM-05-10-01-14*

SW846 6010C

Samples:

SB97408-05 *SW-DOWNSTREAM-05-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-06 *SW-DOWNSTREAM-06-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-07 *SW-DOWNSTREAM-01-10-02-14-FD*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97408-08 *SW-DOWNSTREAM-01-10-02-14-EB*

MRL raised to correlate to batch QC reporting limits.

Zinc

SW846 8081B

Samples:

SB97408-02 *SW-DOWNSTREAM-02-10-01-14*

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

Decachlorobiphenyl (Sr)

SW846 8270D SIM

Laboratory Control Samples:

1423547 BS

Naphthalene percent recovery 37 (40-140) is outside individual acceptance criteria, but within overall method allowances. All reported results of the following samples are considered to have a potentially low bias:

SW-DOWNSTREAM-01-10-02-14
SW-DOWNSTREAM-01-10-02-14-EB
SW-DOWNSTREAM-01-10-02-14-FD
SW-DOWNSTREAM-02-10-01-14
SW-DOWNSTREAM-03-10-01-14
SW-DOWNSTREAM-04-10-01-14
SW-DOWNSTREAM-05-10-01-14
SW-DOWNSTREAM-06-10-01-14

Samples:

S411556-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

Indeno (1,2,3-cd) pyrene (-25.4%)

SW846 8270D SIM

Samples:

S411556-CCV1

This affected the following samples:

1423547-BLK2
1423547-BS2
1423547-BSD2
SW-DOWNSTREAM-01-10-02-14-FD
SW-DOWNSTREAM-02-10-01-14
SW-DOWNSTREAM-03-10-01-14
SW-DOWNSTREAM-04-10-01-14
SW-DOWNSTREAM-05-10-01-14
SW-DOWNSTREAM-06-10-01-14

S411593-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

Fluorene (21.9%)

This affected the following samples:

SW-DOWNSTREAM-01-10-02-14
SW-DOWNSTREAM-01-10-02-14-EB

Sample Acceptance Check Form

Client:	AECOM Environment - Rocky Hill, CT
Project:	Greenwich HS - Greenwich, CT / 60225155
Work Order:	SB97408
Sample(s) received on:	10/2/2014

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
1. Were custody seals present?	☐	☑	☐
2. Were custody seals intact?	☐	☐	☑
3. Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
4. Were samples cooled on ice upon transfer to laboratory representative?	☑	☐	☐
5. Were samples refrigerated upon transfer to laboratory representative?	☐	☑	☐
6. Were sample containers received intact?	☑	☐	☐
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
8. Were samples accompanied by a Chain of Custody document?	☑	☐	☐
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
10. Did sample container labels agree with Chain of Custody document?	☑	☐	☐
11. Were samples received within method-specific holding times?	☑	☐	☐

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14	60225155	Surface Water	02-Oct-14 10:26	02-Oct-14
SB97408-01				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*72*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.053		µg/l	0.053	0.048	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14 SB97408-01	60225155	Surface Water	02-Oct-14 10:26	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*37*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*34*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	BJW	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	"	"	"	X
7440-39-3	Barium	**0.106**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-02-10-01-14	60225155	Surface Water	01-Oct-14 17:25	02-Oct-14
SB97408-02				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	09-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*77*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.053		µg/l	0.053	0.047	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-02-10-01-14 SB97408-02	60225155	Surface Water	01-Oct-14 17:25	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*62*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*20*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*38*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	BJW	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	"	"	"	X
7440-39-3	Barium	**0.119**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-03-10-01-14	60225155	Surface Water	01-Oct-14 16:45	02-Oct-14
SB97408-03				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*79*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.054		µg/l	0.054	0.048	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-03-10-01-14 SB97408-03	60225155	Surface Water	01-Oct-14 16:45	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*51*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*66*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*36*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*39*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	BJW	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	"	"	"	X
7440-39-3	Barium	**0.122**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0056**		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-04-10-01-14	60225155	Surface Water	01-Oct-14 15:52	02-Oct-14
SB97408-04				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*74*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.053		µg/l	0.053	0.048	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-04-10-01-14 SB97408-04	60225155	Surface Water	01-Oct-14 15:52	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*49*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*58*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*36*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*39*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	BJW	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	"	"	"	X
7440-39-3	Barium	**0.123**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-05-10-01-14	60225155	Surface Water	01-Oct-14 14:55	02-Oct-14
SB97408-05				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM													
Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*84*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.053		µg/l	0.053	0.047	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-05-10-01-14 SB97408-05	60225155	Surface Water	01-Oct-14 14:55	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*56*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*86*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*33*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*51*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	15-Oct-14	"	"	X
7440-39-3	Barium	**0.122**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0050**		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-06-10-01-14	60225155	Surface Water	01-Oct-14 11:56	02-Oct-14
SB97408-06				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*82*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.053		µg/l	0.053	0.048	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-06-10-01-14 SB97408-06	60225155	Surface Water	01-Oct-14 11:56	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*57*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*30*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*43*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	15-Oct-14	"	"	X
7440-39-3	Barium	**0.135**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	**0.0076**		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14-FD	60225155	Surface Water	02-Oct-14 10:26	02-Oct-14
SB97408-07				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*85*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.054		µg/l	0.054	0.048	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14-FD SB97408-07	60225155	Surface Water	02-Oct-14 10:26	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*47*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*46*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*33*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*33*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	15-Oct-14	"	"	X
7440-39-3	Barium	**0.100**		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14-EB	60225155	Surface Water	02-Oct-14 12:10	02-Oct-14
SB97408-08				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
83-32-9	Acenaphthene	< 0.050		µg/l	0.050	0.008	1	SW846 8270D SIM	06-Oct-14	10-Oct-14	ML/	1423547	X
208-96-8	Acenaphthylene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
90-12-0	1-Methylnaphthalene	< 0.050		µg/l	0.050	0.014	1	"	"	"	"	"	
120-12-7	Anthracene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
56-55-3	Benzo (a) anthracene	< 0.050		µg/l	0.050	0.021	1	"	"	"	"	"	X
50-32-8	Benzo (a) pyrene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
205-99-2	Benzo (b) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
191-24-2	Benzo (g,h,i) perylene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
207-08-9	Benzo (k) fluoranthene	< 0.050		µg/l	0.050	0.007	1	"	"	"	"	"	X
218-01-9	Chrysene	< 0.050		µg/l	0.050	0.008	1	"	"	"	"	"	X
53-70-3	Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050	0.025	1	"	"	"	"	"	X
206-44-0	Fluoranthene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	X
86-73-7	Fluorene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
91-57-6	2-Methylnaphthalene	< 0.050		µg/l	0.050	0.010	1	"	"	"	"	"	
91-20-3	Naphthalene	< 0.050		µg/l	0.050	0.011	1	"	"	"	"	"	X
85-01-8	Phenanthrene	< 0.050		µg/l	0.050	0.027	1	"	"	"	"	"	X
129-00-0	Pyrene	< 0.050		µg/l	0.050	0.009	1	"	"	"	"	"	X
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*80*			*30-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
319-84-6	alpha-BHC	< 0.002		µg/l	0.002	0.002	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
319-85-7	beta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
319-86-8	delta-BHC	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane)	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
76-44-8	Heptachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
309-00-2	Aldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
959-98-8	Endosulfan I	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
60-57-1	Dieldrin	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p')	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
72-20-8	Endrin	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
33213-65-9	Endosulfan II	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p')	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
72-43-5	Methoxychlor	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
53494-70-5	Endrin ketone	< 0.004		µg/l	0.004	0.003	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde	< 0.004		µg/l	0.004	0.002	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	X
8001-35-2	Toxaphene	< 0.056		µg/l	0.056	0.050	1	"	"	"	"	"	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SW-DOWNSTREAM-01-10-02-14-EB SB97408-08	60225155	Surface Water	02-Oct-14 12:10	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides Prepared by method SW846 3510C													
57-74-9	Chlordane	< 0.007		µg/l	0.007	0.007	1	SW846 8081B	07-Oct-14	11-Oct-14	TG	1423604	X
15972-60-8	Alachlor	< 0.002		µg/l	0.002	0.002	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*42*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*50*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*31*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*36*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 200/6000 Series Methods													
	Preservation	**Field Preserved**		N/A			1	EPA 200/6000 methods			YR	1423472	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0011	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423834	X
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0019	1	"	"	15-Oct-14	"	"	X
7440-39-3	Barium	< 0.0050		mg/l	0.0050	0.0008	1	"	"	15-Oct-14	"	"	X
7440-41-7	Beryllium	< 0.0020		mg/l	0.0020	0.0004	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0012	1	"	"	"	"	"	X
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0022	1	"	"	"	"	"	X
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0014	1	"	"	"	"	"	X
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0032	1	"	"	"	"	"	X
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0022	1	"	"	"	"	"	X
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0067	1	"	"	"	"	"	X
7440-28-0	Thallium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-62-2	Vanadium	< 0.0050		mg/l	0.0050	0.0018	1	"	"	"	"	"	X
7440-66-6	Zinc	< 0.0450	R06	mg/l	0.0450	0.0024	1	"	"	"	"	"	X
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00008	1	EPA 245.1/7470A	09-Oct-14	10-Oct-14	SMR	1423835	X

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423547 - SW846 3510C										
Blank (1423547-BLK2)					Prepared: 06-Oct-14 Analyzed: 09-Oct-14					
Acenaphthene	< 0.050		µg/l	0.050						
Acenaphthylene	< 0.050		µg/l	0.050						
1-Methylnaphthalene	< 0.050		µg/l	0.050						
Anthracene	< 0.050		µg/l	0.050						
Benzo (a) anthracene	< 0.050		µg/l	0.050						
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Benzo (b) fluoranthene	< 0.050		µg/l	0.050						
Benzo (g,h,i) perylene	< 0.050		µg/l	0.050						
Benzo (k) fluoranthene	< 0.050		µg/l	0.050						
Chrysene	< 0.050		µg/l	0.050						
Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050						
Fluoranthene	< 0.050		µg/l	0.050						
Fluorene	< 0.050		µg/l	0.050						
Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050						
2-Methylnaphthalene	< 0.050		µg/l	0.050						
Naphthalene	< 0.050		µg/l	0.050						
Phenanthrene	< 0.050		µg/l	0.050						
Pyrene	< 0.050		µg/l	0.050						
Surrogate: Benzo (e) pyrene-d12	*0.950*		µg/l		*1.00*		*95*	*30-130*		
LCS (1423547-BS2)					Prepared: 06-Oct-14 Analyzed: 09-Oct-14					
Acenaphthene	**0.534**		µg/l	0.050	1.00		53	40-140		
Acenaphthylene	**0.542**		µg/l	0.050	1.00		54	40-140		
1-Methylnaphthalene	**0.478**		µg/l	0.050	1.00		48	40-140		
Anthracene	**0.516**		µg/l	0.050	1.00		52	40-140		
Benzo (a) anthracene	**0.677**		µg/l	0.050	1.00		68	40-140		
Benzo (a) pyrene	**0.642**		µg/l	0.050	1.00		64	40-140		
Benzo (b) fluoranthene	**0.591**		µg/l	0.050	1.00		59	40-140		
Benzo (g,h,i) perylene	**0.612**		µg/l	0.050	1.00		61	40-140		
Benzo (k) fluoranthene	**0.769**		µg/l	0.050	1.00		77	40-140		
Chrysene	**0.763**		µg/l	0.050	1.00		76	40-140		
Dibenzo (a,h) anthracene	**0.710**		µg/l	0.050	1.00		71	40-140		
Fluoranthene	**0.664**		µg/l	0.050	1.00		66	40-140		
Fluorene	**0.666**		µg/l	0.050	1.00		67	40-140		
Indeno (1,2,3-cd) pyrene	**0.584**		µg/l	0.050	1.00		58	40-140		
2-Methylnaphthalene	**0.456**		µg/l	0.050	1.00		46	40-140		
Naphthalene	**0.366**	QC2	µg/l	0.050	1.00		37	40-140		
Phenanthrene	**0.564**		µg/l	0.050	1.00		56	40-140		
Pyrene	**0.674**		µg/l	0.050	1.00		67	40-140		
Surrogate: Benzo (e) pyrene-d12	*0.700*		µg/l		*1.00*		*70*	*30-130*		
LCS Dup (1423547-BSD2)					Prepared: 06-Oct-14 Analyzed: 09-Oct-14					
Acenaphthene	**0.477**		µg/l	0.050	1.00		48	40-140	11	20
Acenaphthylene	**0.507**		µg/l	0.050	1.00		51	40-140	7	20
1-Methylnaphthalene	**0.411**		µg/l	0.050	1.00		41	40-140	15	20
Anthracene	**0.499**		µg/l	0.050	1.00		50	40-140	3	20
Benzo (a) anthracene	**0.680**		µg/l	0.050	1.00		68	40-140	0.4	20
Benzo (a) pyrene	**0.648**		µg/l	0.050	1.00		65	40-140	0.9	20
Benzo (b) fluoranthene	**0.580**		µg/l	0.050	1.00		58	40-140	2	20
Benzo (g,h,i) perylene	**0.623**		µg/l	0.050	1.00		62	40-140	2	20
Benzo (k) fluoranthene	**0.743**		µg/l	0.050	1.00		74	40-140	3	20
Chrysene	**0.743**		µg/l	0.050	1.00		74	40-140	3	20
Dibenzo (a,h) anthracene	**0.697**		µg/l	0.050	1.00		70	40-140	2	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423547 - SW846 3510C										
LCS Dup (1423547-BSD2)					Prepared: 06-Oct-14 Analyzed: 09-Oct-14					
Fluoranthene	**0.640**		µg/l	0.050	1.00		64	40-140	4	20
Fluorene	**0.572**		µg/l	0.050	1.00		57	40-140	15	20
Indeno (1,2,3-cd) pyrene	**0.572**		µg/l	0.050	1.00		57	40-140	2	20
2-Methylnaphthalene	**0.415**		µg/l	0.050	1.00		42	40-140	9	20
Pyrene	**0.641**		µg/l	0.050	1.00		64	40-140	5	20
Surrogate: Benzo (e) pyrene-d12	*0.730*		µg/l		*1.00*		*73*	*30-130*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423604 - SW846 3510C										
Blank (1423604-BLK1)					Prepared & Analyzed: 07-Oct-14					
alpha-BHC	< 0.002		µg/l	0.002						
alpha-BHC [2C]	< 0.002		µg/l	0.002						
beta-BHC	< 0.002		µg/l	0.002						
beta-BHC [2C]	< 0.002		µg/l	0.002						
delta-BHC	< 0.002		µg/l	0.002						
delta-BHC [2C]	< 0.002		µg/l	0.002						
gamma-BHC (Lindane)	< 0.002		µg/l	0.002						
gamma-BHC (Lindane) [2C]	< 0.002		µg/l	0.002						
Heptachlor	< 0.002		µg/l	0.002						
Heptachlor [2C]	< 0.002		µg/l	0.002						
Aldrin	< 0.002		µg/l	0.002						
Aldrin [2C]	< 0.002		µg/l	0.002						
Heptachlor epoxide	< 0.002		µg/l	0.002						
Heptachlor epoxide [2C]	< 0.002		µg/l	0.002						
Endosulfan I	< 0.002		µg/l	0.002						
Endosulfan I [2C]	< 0.002		µg/l	0.002						
Dieldrin	< 0.002		µg/l	0.002						
Dieldrin [2C]	< 0.002		µg/l	0.002						
4,4'-DDE (p,p')	< 0.002		µg/l	0.002						
4,4'-DDE (p,p') [2C]	< 0.002		µg/l	0.002						
Endrin	< 0.004		µg/l	0.004						
Endrin [2C]	< 0.004		µg/l	0.004						
Endosulfan II	< 0.004		µg/l	0.004						
Endosulfan II [2C]	< 0.004		µg/l	0.004						
4,4'-DDD (p,p')	< 0.004		µg/l	0.004						
4,4'-DDD (p,p') [2C]	< 0.004		µg/l	0.004						
Endosulfan sulfate	< 0.004		µg/l	0.004						
Endosulfan sulfate [2C]	< 0.004		µg/l	0.004						
4,4'-DDT (p,p')	< 0.004		µg/l	0.004						
4,4'-DDT (p,p') [2C]	< 0.004		µg/l	0.004						
Methoxychlor	< 0.004		µg/l	0.004						
Methoxychlor [2C]	< 0.004		µg/l	0.004						
Endrin ketone	< 0.004		µg/l	0.004						
Endrin ketone [2C]	< 0.004		µg/l	0.004						
Endrin aldehyde	< 0.004		µg/l	0.004						
Endrin aldehyde [2C]	< 0.004		µg/l	0.004						
alpha-Chlordane	< 0.002		µg/l	0.002						
alpha-Chlordane [2C]	< 0.002		µg/l	0.002						
gamma-Chlordane	< 0.002		µg/l	0.002						
gamma-Chlordane [2C]	< 0.002		µg/l	0.002						
Toxaphene	< 0.050		µg/l	0.050						
Toxaphene [2C]	< 0.050		µg/l	0.050						
Chlordane	< 0.007		µg/l	0.007						
Chlordane [2C]	< 0.007		µg/l	0.007						
Alachlor	< 0.002		µg/l	0.002						
Alachlor [2C]	< 0.002		µg/l	0.002						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0210*		µg/l		*0.0200*		*105*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0200*		µg/l		*0.0200*		*100*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0172*		µg/l		*0.0200*		*86*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0161*		µg/l		*0.0200*		*81*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423604 - SW846 3510C										
Blank (1423604-BLK2)					Prepared: 07-Oct-14 Analyzed: 13-Oct-14					
alpha-BHC	< 0.020		µg/l	0.020						
alpha-BHC [2C]	< 0.020		µg/l	0.020						
beta-BHC	< 0.020		µg/l	0.020						
beta-BHC [2C]	< 0.020		µg/l	0.020						
delta-BHC	< 0.020		µg/l	0.020						
delta-BHC [2C]	< 0.020		µg/l	0.020						
gamma-BHC (Lindane)	< 0.020		µg/l	0.020						
gamma-BHC (Lindane) [2C]	< 0.020		µg/l	0.020						
Heptachlor	< 0.020		µg/l	0.020						
Heptachlor [2C]	< 0.020		µg/l	0.020						
Aldrin	< 0.020		µg/l	0.020						
Aldrin [2C]	< 0.020		µg/l	0.020						
Heptachlor epoxide	< 0.020		µg/l	0.020						
Heptachlor epoxide [2C]	< 0.020		µg/l	0.020						
Endosulfan I	< 0.020		µg/l	0.020						
Endosulfan I [2C]	< 0.020		µg/l	0.020						
Dieldrin	< 0.020		µg/l	0.020						
Dieldrin [2C]	< 0.020		µg/l	0.020						
4,4'-DDE (p,p')	< 0.020		µg/l	0.020						
4,4'-DDE (p,p') [2C]	< 0.020		µg/l	0.020						
Endrin	< 0.040		µg/l	0.040						
Endrin [2C]	< 0.040		µg/l	0.040						
Endosulfan II	< 0.040		µg/l	0.040						
Endosulfan II [2C]	< 0.040		µg/l	0.040						
4,4'-DDD (p,p')	< 0.040		µg/l	0.040						
4,4'-DDD (p,p') [2C]	< 0.040		µg/l	0.040						
Endosulfan sulfate	< 0.040		µg/l	0.040						
Endosulfan sulfate [2C]	< 0.040		µg/l	0.040						
4,4'-DDT (p,p')	< 0.040		µg/l	0.040						
4,4'-DDT (p,p') [2C]	< 0.040		µg/l	0.040						
Methoxychlor	< 0.040		µg/l	0.040						
Methoxychlor [2C]	< 0.040		µg/l	0.040						
Endrin ketone	< 0.040		µg/l	0.040						
Endrin ketone [2C]	< 0.040		µg/l	0.040						
Endrin aldehyde	< 0.040		µg/l	0.040						
Endrin aldehyde [2C]	< 0.040		µg/l	0.040						
alpha-Chlordane	< 0.020		µg/l	0.020						
alpha-Chlordane [2C]	< 0.020		µg/l	0.020						
gamma-Chlordane	< 0.020		µg/l	0.020						
gamma-Chlordane [2C]	< 0.020		µg/l	0.020						
Toxaphene	< 0.500		µg/l	0.500						
Toxaphene [2C]	< 0.500		µg/l	0.500						
Chlordane	< 0.065		µg/l	0.065						
Chlordane [2C]	< 0.065		µg/l	0.065						
Alachlor	< 0.020		µg/l	0.020						
Alachlor [2C]	< 0.020		µg/l	0.020						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.166*		µg/l		*0.200*		*83*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.162*		µg/l		*0.200*		*81*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.117*		µg/l		*0.200*		*58*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.115*		µg/l		*0.200*		*58*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423604 - SW846 3510C										
LCS (1423604-BS1)					Prepared & Analyzed: 07-Oct-14					
alpha-BHC	**0.040**		µg/l	0.002	0.0500		80	40-140		
alpha-BHC [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140		
beta-BHC	**0.049**		µg/l	0.002	0.0500		98	40-140		
beta-BHC [2C]	**0.052**		µg/l	0.002	0.0500		103	40-140		
delta-BHC	**0.051**		µg/l	0.002	0.0500		102	40-140		
delta-BHC [2C]	**0.053**		µg/l	0.002	0.0500		106	40-140		
gamma-BHC (Lindane)	**0.040**		µg/l	0.002	0.0500		79	40-140		
gamma-BHC (Lindane) [2C]	**0.040**		µg/l	0.002	0.0500		80	40-140		
Heptachlor	**0.037**		µg/l	0.002	0.0500		74	40-140		
Heptachlor [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140		
Aldrin	**0.037**		µg/l	0.002	0.0500		73	40-140		
Aldrin [2C]	**0.039**		µg/l	0.002	0.0500		77	40-140		
Heptachlor epoxide	**0.036**		µg/l	0.002	0.0500		71	40-140		
Heptachlor epoxide [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140		
Endosulfan I	**0.036**		µg/l	0.002	0.0500		71	40-140		
Endosulfan I [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140		
Dieldrin	**0.034**		µg/l	0.002	0.0500		69	40-140		
Dieldrin [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140		
4,4'-DDE (p,p')	**0.034**		µg/l	0.002	0.0500		68	40-140		
4,4'-DDE (p,p') [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140		
Endrin	**0.036**		µg/l	0.004	0.0500		72	40-140		
Endrin [2C]	**0.040**		µg/l	0.004	0.0500		81	40-140		
Endosulfan II	**0.037**		µg/l	0.004	0.0500		74	40-140		
Endosulfan II [2C]	**0.042**		µg/l	0.004	0.0500		83	40-140		
4,4'-DDD (p,p')	**0.035**		µg/l	0.004	0.0500		70	40-140		
4,4'-DDD (p,p') [2C]	**0.042**		µg/l	0.004	0.0500		83	40-140		
Endosulfan sulfate	**0.041**		µg/l	0.004	0.0500		81	40-140		
Endosulfan sulfate [2C]	**0.049**		µg/l	0.004	0.0500		97	40-140		
4,4'-DDT (p,p')	**0.031**		µg/l	0.004	0.0500		62	40-140		
4,4'-DDT (p,p') [2C]	**0.036**		µg/l	0.004	0.0500		72	40-140		
Methoxychlor	**0.035**		µg/l	0.004	0.0500		71	40-140		
Methoxychlor [2C]	**0.040**		µg/l	0.004	0.0500		81	40-140		
Endrin ketone	**0.036**		µg/l	0.004	0.0500		72	40-140		
Endrin ketone [2C]	**0.041**		µg/l	0.004	0.0500		82	40-140		
Endrin aldehyde	**0.036**		µg/l	0.004	0.0500		72	40-140		
Endrin aldehyde [2C]	**0.043**		µg/l	0.004	0.0500		86	40-140		
alpha-Chlordane	**0.035**		µg/l	0.002	0.0500		69	40-140		
alpha-Chlordane [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140		
gamma-Chlordane	**0.036**		µg/l	0.002	0.0500		71	40-140		
gamma-Chlordane [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140		
Alachlor	**0.043**		µg/l	0.002	0.0500		87	40-140		
Alachlor [2C]	**0.045**		µg/l	0.002	0.0500		91	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0165*		µg/l		*0.0200*		*83*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0163*		µg/l		*0.0200*		*82*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0157*		µg/l		*0.0200*		*79*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0157*		µg/l		*0.0200*		*79*	*30-150*		
LCS Dup (1423604-BSD1)					Prepared & Analyzed: 07-Oct-14					
alpha-BHC	**0.041**		µg/l	0.002	0.0500		82	40-140	2	20
alpha-BHC [2C]	**0.039**		µg/l	0.002	0.0500		77	40-140	0.4	20
beta-BHC	**0.050**		µg/l	0.002	0.0500		99	40-140	1	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423604 - SW846 3510C										
LCS Dup (1423604-BSD1)					Prepared & Analyzed: 07-Oct-14					
beta-BHC [2C]	**0.052**		µg/l	0.002	0.0500		104	40-140	1	20
delta-BHC	**0.051**		µg/l	0.002	0.0500		103	40-140	1	20
delta-BHC [2C]	**0.053**		µg/l	0.002	0.0500		107	40-140	1	20
gamma-BHC (Lindane)	**0.041**		µg/l	0.002	0.0500		82	40-140	3	20
gamma-BHC (Lindane) [2C]	**0.040**		µg/l	0.002	0.0500		80	40-140	0.03	20
Heptachlor	**0.038**		µg/l	0.002	0.0500		77	40-140	3	20
Heptachlor [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140	0.4	20
Aldrin	**0.039**		µg/l	0.002	0.0500		77	40-140	5	20
Aldrin [2C]	**0.039**		µg/l	0.002	0.0500		77	40-140	0.3	20
Heptachlor epoxide	**0.038**		µg/l	0.002	0.0500		76	40-140	7	20
Heptachlor epoxide [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140	0.1	20
Endosulfan I	**0.038**		µg/l	0.002	0.0500		77	40-140	7	20
Endosulfan I [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140	0.2	20
Dieldrin	**0.037**		µg/l	0.002	0.0500		74	40-140	8	20
Dieldrin [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140	0.3	20
4,4'-DDE (p,p')	**0.037**		µg/l	0.002	0.0500		74	40-140	8	20
4,4'-DDE (p,p') [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140	0.2	20
Endrin	**0.040**		µg/l	0.004	0.0500		79	40-140	10	20
Endrin [2C]	**0.041**		µg/l	0.004	0.0500		81	40-140	0.8	20
Endosulfan II	**0.041**		µg/l	0.004	0.0500		83	40-140	11	20
Endosulfan II [2C]	**0.042**		µg/l	0.004	0.0500		84	40-140	0.6	20
4,4'-DDD (p,p')	**0.039**		µg/l	0.004	0.0500		78	40-140	11	20
4,4'-DDD (p,p') [2C]	**0.042**		µg/l	0.004	0.0500		85	40-140	1	20
Endosulfan sulfate	**0.044**		µg/l	0.004	0.0500		88	40-140	8	20
Endosulfan sulfate [2C]	**0.049**		µg/l	0.004	0.0500		97	40-140	0.1	20
4,4'-DDT (p,p')	**0.035**		µg/l	0.004	0.0500		69	40-140	11	20
4,4'-DDT (p,p') [2C]	**0.037**		µg/l	0.004	0.0500		74	40-140	3	20
Methoxychlor	**0.040**		µg/l	0.004	0.0500		79	40-140	12	20
Methoxychlor [2C]	**0.041**		µg/l	0.004	0.0500		82	40-140	2	20
Endrin ketone	**0.040**		µg/l	0.004	0.0500		79	40-140	10	20
Endrin ketone [2C]	**0.041**		µg/l	0.004	0.0500		81	40-140	0.6	20
Endrin aldehyde	**0.039**		µg/l	0.004	0.0500		78	40-140	8	20
Endrin aldehyde [2C]	**0.042**		µg/l	0.004	0.0500		84	40-140	2	20
alpha-Chlordane	**0.037**		µg/l	0.002	0.0500		75	40-140	7	20
alpha-Chlordane [2C]	**0.038**		µg/l	0.002	0.0500		76	40-140	0.1	20
gamma-Chlordane	**0.038**		µg/l	0.002	0.0500		76	40-140	7	20
gamma-Chlordane [2C]	**0.039**		µg/l	0.002	0.0500		78	40-140	0.1	20
Alachlor	**0.046**		µg/l	0.002	0.0500		93	40-140	7	20
Alachlor [2C]	**0.044**		µg/l	0.002	0.0500		89	40-140	2	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.0169*		µg/l		*0.0200*		*84*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.0162*		µg/l		*0.0200*		*81*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.0168*		µg/l		*0.0200*		*84*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.0162*		µg/l		*0.0200*		*81*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423834 - SW846 3005A										
Blank (1423834-BLK1)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Antimony	< 0.0060		mg/l	0.0060						
Barium	< 0.0050		mg/l	0.0050						
Silver	< 0.0050		mg/l	0.0050						
Zinc	< 0.0450		mg/l	0.0450						
Vanadium	< 0.0050		mg/l	0.0050						
Thallium	< 0.0050		mg/l	0.0050						
Selenium	< 0.0150		mg/l	0.0150						
Arsenic	< 0.0040		mg/l	0.0040						
Nickel	< 0.0050		mg/l	0.0050						
Copper	< 0.0050		mg/l	0.0050						
Chromium	< 0.0050		mg/l	0.0050						
Beryllium	< 0.0020		mg/l	0.0020						
Cadmium	< 0.0025		mg/l	0.0025						
Lead	< 0.0075		mg/l	0.0075						
LCS (1423834-BS1)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Thallium	**1.33**		mg/l	0.0050	1.25		106	85-115		
Arsenic	**1.26**		mg/l	0.0040	1.25		100	85-115		
Silver	**1.21**		mg/l	0.0050	1.25		97	85-115		
Vanadium	**1.19**		mg/l	0.0050	1.25		95	85-115		
Selenium	**1.20**		mg/l	0.0150	1.25		96	85-115		
Antimony	**1.21**		mg/l	0.0060	1.25		97	85-115		
Lead	**1.24**		mg/l	0.0075	1.25		99	85-115		
Copper	**1.21**		mg/l	0.0050	1.25		97	85-115		
Chromium	**1.28**		mg/l	0.0050	1.25		102	85-115		
Cadmium	**1.23**		mg/l	0.0025	1.25		99	85-115		
Beryllium	**1.32**		mg/l	0.0020	1.25		105	85-115		
Barium	**1.24**		mg/l	0.0050	1.25		99	85-115		
Nickel	**1.23**		mg/l	0.0050	1.25		98	85-115		
Zinc	**1.26**		mg/l	0.0450	1.25		101	85-115		
LCS Dup (1423834-BSD1)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Beryllium	**1.35**		mg/l	0.0020	1.25		108	85-115	2	20
Silver	**1.20**		mg/l	0.0050	1.25		96	85-115	0.5	20
Zinc	**1.32**		mg/l	0.0450	1.25		106	85-115	5	20
Vanadium	**1.24**		mg/l	0.0050	1.25		99	85-115	5	20
Thallium	**1.38**		mg/l	0.0050	1.25		111	85-115	4	20
Selenium	**1.28**		mg/l	0.0150	1.25		102	85-115	6	20
Antimony	**1.26**		mg/l	0.0060	1.25		101	85-115	4	20
Lead	**1.30**		mg/l	0.0075	1.25		104	85-115	5	20
Nickel	**1.29**		mg/l	0.0050	1.25		103	85-115	5	20
Copper	**1.27**		mg/l	0.0050	1.25		102	85-115	5	20
Cadmium	**1.30**		mg/l	0.0025	1.25		104	85-115	5	20
Barium	**1.30**		mg/l	0.0050	1.25		104	85-115	5	20
Arsenic	**1.25**		mg/l	0.0040	1.25		100	85-115	0.1	20
Chromium	**1.31**		mg/l	0.0050	1.25		105	85-115	3	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423835 - EPA200/SW7000 Series										
Blank (1423835-BLK1)						Prepared: 09-Oct-14 Analyzed: 10-Oct-14				
Mercury	< 0.00020		mg/l	0.00020						
LCS (1423835-BS1)						Prepared: 09-Oct-14 Analyzed: 10-Oct-14				
Mercury	**0.00429**		mg/l	0.00020	0.00500		86	85-115		

Analyte(s)	Column	% Breakdown	Limit
Batch S411406			
Performance Mix (S411406-PEM1)			
4,4'-DDT (p,p')	1	2.8	15.0
Endrin	1	3.2	15.0
4,4'-DDT (p,p')	2	2.6	15.0
Endrin	2	3.4	15.0
Performance Mix (S411406-PEM2)			
4,4'-DDT (p,p')	1	2.8	15.0
Endrin	1	3.4	15.0
4,4'-DDT (p,p')	2	2.8	15.0
Endrin	2	2.8	15.0
Batch S411615			
Performance Mix (S411615-PEM1)			
4,4'-DDT (p,p')	1	1.9	15.0
Endrin	1	2.6	15.0
4,4'-DDT (p,p')	2	1.9	15.0
Endrin	2	1.8	15.0
Performance Mix (S411615-PEM2)			
4,4'-DDT (p,p')	1	1.8	15.0
Endrin	1	2.2	15.0
4,4'-DDT (p,p')	2	1.2	15.0
Endrin	2	1.6	15.0
Batch S411630			
Performance Mix (S411630-PEM1)			
4,4'-DDT (p,p')	1	2.6	15.0
Endrin	1	4.3	15.0
4,4'-DDT (p,p')	2	1.9	15.0
Endrin	2	2.5	15.0
Performance Mix (S411630-PEM2)			
4,4'-DDT (p,p')	1	2.6	15.0
Endrin	1	3.9	15.0
4,4'-DDT (p,p')	2	2.0	15.0
Endrin	2	2.4	15.0

Notes and Definitions

QC2	Analyte out of acceptance range in QC spike but no reportable concentration present in sample.
R06	MRL raised to correlate to batch QC reporting limits.
SGC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:
Kimberly Anderson
Nicole Leja

SB97408 By

SPECTRUM ANALYTICAL, INC.
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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- [x] Standard TAT - 7 to 10 business days
- [ ] Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: AECOM
500 Enterprise Dr
Rocky Hill, CT 06067
Telephone #: 860-283-5800
Project Mgr: Malcom Beeler

Invoice To: SAME
Attn: Kris van Naerssen
P.O No.: _____ RQN _____

Project No: 60225155
Site Name: Greenwich High school
Location: Greenwich State CT
Sampler(s): Kris Van Naerssen/Clare Murphy-Hagan

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9= Deionized Water 10=H_3PO_4 11= _____ 12= _____

DW=Dinking Water GW= Groundwater WW= Waste Water
O= Oil SW= surface Water SO=Soil SL= Sludge A= Air
X1= _____ X2= _____ X3= _____

G= Grab C=Compsite

Lab ID	Sample ID	Date	Time	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: Metals (Method 6000/7000 series)	PAHs (Method 8270 SIM)	Pesticides (Method 8081)
97408-01	SW-DOWNSTREAM-01-10-02-14	10/02/2014	10:26	G	SW		2		2	x	x	x
02	SW-DOWNSTREAM-02-10-01-14	10/01/2014	17:25	G	SW		2		2	x	x	x
03	SW-DOWNSTREAM-03-10-01-14	10/01/2014	16:45	G	SW		2		2	x	x	x
04	SW-DOWNSTREAM-04-10-01-14	10/01/2014	15:52	G	SW		2		2	x	x	x
05	SW-DOWNSTREAM-05-10-01-14	10/01/2014	14:55	G	SW		2		2	x	x	x
06	SW-DOWNSTREAM-06-10-01-14	10/01/2014	11:56	G	SW		2		2	x	x	x
07	SW-DOWNSTREAM-01-10-02-14-FD	10/02/2014	10:26	G	SW		2		2	x	x	x
08	SW-DOWNSTREAM-01-10-02-14-EB	10/02/2014	12:10	G	SW		2		2	x	x	x

List Preservative Code below:

QA/QC Reporting Notes:
*additional charges may appply

MA DEP MCP CAM Report ☐ yes ☐ no
CT DPH RCP Report ☐ yes ☐ no
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

05/06/15 IR 01

Relinquished by:	Received by:	Date	Time	Temp °C
		10/2/14	14:00	
	mary	10214	1830	05

☑ EDD format: 10214 EQUIS mary
☑ E-mail to: kris.vannaerssen@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☑ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

SB97408 By

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
☑ Standard TAT - 7 to 10 business days
☐ Rush TAT - Date Needed: _____
All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: AECOM
500 Enterprise Dr
Rocky Hill, CT 06067
Telephone #: 860-283-5800
Project Mgr: Malcom Beeler

Invoice To: SAME
Attn: Kris van Naerssen
P.O No.: _____ RQN _____

Project No: 60225155
Site Name: Greenwich High school
Location: Greenwich State CT
Sampler(s): Kris Van Naerssen/Clare Murphy-Hagan

1=Na_2S2O_3 **2**=HCl **3**=H_2SO_4 **4**=HNO_3 **5**=NaOH **6**=Ascorbic Acid **7**=CH_3OH
8= $NaHSO_4$ **9**= Deionized Water **10**=H_3PO_4 **11**= _____ **12**= _____

DW=Dinking Water **GW**= Groundwater **WW**= Waste Water
O= Oil **SW**= surface Water **SO**=Soil **SL**= Sludge **A**= Air
X1= _____ **X2**= _____ **X3**= _____

G= Grab **C**=Compsite

Lab ID	Sample ID	Date	Time	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Metals (Method 6000/7000 series) *	PAHs (Method 8270 SIM)	Pesticides (Method 8081)						
97408-01	SW-DOWNSTREAM-01-10-02-14	10/02/2014	10:26	G	SW		2		2	x	x	x						
02	SW-DOWNSTREAM-02-10-01-14	10/01/2014	17:25	G	SW		2		2	x	x	x						
03	SW-DOWNSTREAM-03-10-01-14	10/01/2014	16:45	G	SW		2		2	x	x	x						
04	SW-DOWNSTREAM-04-10-01-14	10/01/2014	15:52	G	SW		2		2	x	x	x						
05	SW-DOWNSTREAM-05-10-01-14	10/01/2014	14:55	G	SW		2		2	x	x	x						
06	SW-DOWNSTREAM-06-10-01-14	10/01/2014	11:56	G	SW		2		2	x	x	x						
07	SW-DOWNSTREAM-01-10-02-14-FD	10/02/2014	10:26	G	SW		2		2	x	x	x						
08	SW-DOWNSTREAM-01-10-02-14-EB	10/02/2014	12:10	G	SW		2		2	x	x	x						

List Preservative Code below:

QA/QC Reporting Notes:
*additional charges may appply

MA DEP MCP CAM Report ☐ yes ☐ no
CT DPH RCP Report ☒ yes ☐ no
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

* RSR 15 Metals per client request By 10/6
CTRCP per project History

05/05IR01
10214 mary

Relinquished by:	Received by:	Date	Time	Temp °C
		10/2/14	14:00	
	mary	10214	1830	05

☑ EDD format: EQUIS
☑ E-mail to: kris.vannaerssen@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☑ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Report Date:
15-Oct-14 17:13

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

Laboratory Report

AECOM Environment
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
Attn: Malcolm Beeler

Project: Greenwich HS - Greenwich, CT
Project #: 60225155

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SB97409-01	SED-DOWNSTREAM-01-10-02-14	Soil	02-Oct-14 11:20	02-Oct-14 18:25
SB97409-02	SED-DOWNSTREAM-02-10-01-14	Soil	01-Oct-14 18:12	02-Oct-14 18:25
SB97409-03	SED-DOWNSTREAM-03-10-01-14	Soil	01-Oct-14 17:02	02-Oct-14 18:25
SB97409-04	SED-DOWNSTREAM-04-10-01-14	Soil	01-Oct-14 16:10	02-Oct-14 18:25
SB97409-05	SED-DOWNSTREAM-05-10-01-14	Soil	01-Oct-14 15:15	02-Oct-14 18:25
SB97409-06	SED-DOWNSTREAM-06-10-01-14	Soil	01-Oct-14 12:30	02-Oct-14 18:25
SB97409-07	SED-DOWNSTREAM-01-10-02-14-FD	Soil	02-Oct-14 11:20	02-Oct-14 18:25

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New Jersey # MA011/MA012
New York # 11393/11840
Pennsylvania # 68-04426/68-02924
Rhode Island # 98
USDA # S-51435

Authorized by:

Nicole Leja
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 39 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, NJ-MA012, PA-68-04426 and FL-E87936).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

The samples were received 0.5 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 6010C

Samples:

SB97409-01 *SED-DOWNSTREAM-01-10-02-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-02 *SED-DOWNSTREAM-02-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-03 *SED-DOWNSTREAM-03-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-04 *SED-DOWNSTREAM-04-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-05 *SED-DOWNSTREAM-05-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-06 *SED-DOWNSTREAM-06-10-01-14*

MRL raised to correlate to batch QC reporting limits.

Zinc

SB97409-07 *SED-DOWNSTREAM-01-10-02-14-FD*

MRL raised to correlate to batch QC reporting limits.

Zinc

SW846 8081B

Calibration:

SB97409-01

Internal standard area count (884700000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (2213%).

SB97409-02

SW846 8081B

Calibration:

SB97409-02

Internal standard area count (2287900000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (5724%).

SB97409-03

Internal standard area count (6665700000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (16676%).

SB97409-04

Internal standard area count (1705000000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (4265%).

SB97409-05

Internal standard area count (174300000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (436%).

SB97409-06

Internal standard area count (3168800000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (7928%).

SB97409-07

Internal standard area count (980700000) is outside criteria of the associated CCAL (39972080) for 2,4,5,6-TC-M-Xylene (IS) (2453%).

Samples:

SB97409-01 *SED-DOWNSTREAM-01-10-02-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-02 *SED-DOWNSTREAM-02-10-01-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-03 *SED-DOWNSTREAM-03-10-01-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

SW846 8081B

Samples:

SB97409-03 *SED-DOWNSTREAM-03-10-01-14*

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-04 *SED-DOWNSTREAM-04-10-01-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-05 *SED-DOWNSTREAM-05-10-01-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-06 *SED-DOWNSTREAM-06-10-01-14*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SB97409-07 *SED-DOWNSTREAM-01-10-02-14-FD*

Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.

2,4,5,6-TC-M-Xylene (IS)

Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

4,4-DB-Octafluorobiphenyl (Sr)
Decachlorobiphenyl (Sr)

SW846 8270D SIM

Laboratory Control Samples:

79383 BSD

2-Fluorobiphenyl RPD 11.8% (0%) is outside individual acceptance criteria.

Nitrobenzene-d5 RPD 40.5% (0%) is outside individual acceptance criteria.

Terphenyl-d14 RPD 2.48% (0%) is outside individual acceptance criteria.

SW846 8270D SIM

Samples:

SB97409-04 *SED-DOWNSTREAM-04-10-01-14*

Spike recovery falls outside of the control limit

Nitrobenzene-d5

SB97409-06 *SED-DOWNSTREAM-06-10-01-14*

Spike recovery falls outside of the control limit

Nitrobenzene-d5

SB97409-07 *SED-DOWNSTREAM-01-10-02-14-FD*

Spike recovery falls outside of the control limit

Nitrobenzene-d5

Sample Acceptance Check Form

Client:	AECOM Environment - Rocky Hill, CT
Project:	Greenwich HS - Greenwich, CT / 60225155
Work Order:	SB97409
Sample(s) received on:	10/2/2014

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
1. Were custody seals present?	☐	☑	☐
2. Were custody seals intact?	☐	☐	☑
3. Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
4. Were samples cooled on ice upon transfer to laboratory representative?	☑	☐	☐
5. Were samples refrigerated upon transfer to laboratory representative?	☐	☑	☐
6. Were sample containers received intact?	☑	☐	☐
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
8. Were samples accompanied by a Chain of Custody document?	☑	☐	☐
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
10. Did sample container labels agree with Chain of Custody document?	☑	☐	☐
11. Were samples received within method-specific holding times?	☑	☐	☐

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14 SB97409-01	60225155	Soil	02-Oct-14 11:20	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 7.71		µg/kg dry	7.71	0.817	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 7.71		µg/kg dry	7.71	0.959	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 7.71		µg/kg dry	7.71	0.871	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 4.62		µg/kg dry	4.62	0.811	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 7.71		µg/kg dry	7.71	0.895	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 7.71		µg/kg dry	7.71	0.861	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 7.71		µg/kg dry	7.71	0.894	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 7.71		µg/kg dry	7.71	0.874	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 7.71		µg/kg dry	7.71	1.10	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 7.71		µg/kg dry	7.71	0.797	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 12.3		µg/kg dry	12.3	0.985	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 12.3		µg/kg dry	12.3	0.861	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 12.3		µg/kg dry	12.3	0.801	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 12.3		µg/kg dry	12.3	0.875	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	**15.7**		µg/kg dry	12.3	0.767	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 12.3		µg/kg dry	12.3	0.996	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 12.3		µg/kg dry	12.3	0.832	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 12.3		µg/kg dry	12.3	1.41	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 7.71		µg/kg dry	7.71	0.885	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 7.71		µg/kg dry	7.71	0.991	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 154		µg/kg dry	154	63.0	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 30.8		µg/kg dry	30.8	26.0	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 7.71		µg/kg dry	7.71	1.20	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*3*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*63*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*2*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*48*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 30.7		µg/kg dry	30.7	28.7	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 30.7		µg/kg dry	30.7	26.1	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 30.7		µg/kg dry	30.7	27.6	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 30.7		µg/kg dry	30.7	13.6	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 30.7		µg/kg dry	30.7	16.7	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 30.7		µg/kg dry	30.7	19.4	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 30.7		µg/kg dry	30.7	22.0	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 30.7		µg/kg dry	30.7	16.6	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 30.7		µg/kg dry	30.7	30.2	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*110*			*30-150 %*			"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14 SB97409-01	60225155	Soil	02-Oct-14 11:20	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*140*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*140*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*80*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 2.05		mg/kg dry	2.05	0.195	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	< 2.05		mg/kg dry	2.05	0.724	1	"	"	"	"	"	X
7440-39-3	Barium	**70.8**		mg/kg dry	1.36	0.248	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.682		mg/kg dry	0.682	0.0474	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.682		mg/kg dry	0.682	0.0913	1	"	"	"	"	"	X
7440-47-3	Chromium	**28.3**		mg/kg dry	1.36	0.247	1	"	"	"	"	"	X
7440-50-8	Copper	**25.1**		mg/kg dry	1.36	0.187	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0399		mg/kg dry	0.0399	0.0039	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**9.30**		mg/kg dry	1.36	0.190	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**32.3**		mg/kg dry	2.05	0.949	1	"	"	"	"	"	X
7440-36-0	Antimony	< 6.82		mg/kg dry	6.82	1.05	1	"	"	"	"	"	X
7782-49-2	Selenium	< 2.05		mg/kg dry	2.05	0.964	1	"	"	"	"	"	X
7440-28-0	Thallium	< 4.09		mg/kg dry	4.09	1.44	1	"	"	"	"	"	X
7440-62-2	Vanadium	**19.1**		mg/kg dry	2.05	0.305	1	"	"	"	"	"	X
7440-66-6	Zinc	**52.5**	R06	mg/kg dry	4.91	0.341	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**64.4**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423384	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**28**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 90	U	ug/Kg	90	27	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 90	U	ug/Kg	90	27	1	"	"	"	"	"	
208-96-8	Acenaphthylene	**100**		ug/Kg	90	24	1	"	"	"	"	"	
83-32-9	Acenaphthene	**130**		ug/Kg	90	25	1	"	"	"	"	"	
86-73-7	Fluorene	**260**		ug/Kg	90	24	1	"	"	"	"	"	
85-01-8	Phenanthrene	**3,700**		ug/Kg	90	27	1	"	"	"	"	"	
120-12-7	Anthracene	**670**		ug/Kg	90	26	1	"	"	"	"	"	
206-44-0	Fluoranthene	**6,800**		ug/Kg	90	41	1	"	"	"	"	"	
129-00-0	Pyrene	**5,000**		ug/Kg	90	30	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**2,100**		ug/Kg	90	36	1	"	"	"	"	"	
218-01-9	Chrysene	**2,600**		ug/Kg	90	60	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**3,100**		ug/Kg	90	44	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**1,300**		ug/Kg	90	36	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**2,100**		ug/Kg	90	26	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**2,000**		ug/Kg	90	30	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	**280**		ug/Kg	90	30	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14	60225155	Soil	02-Oct-14 11:20	02-Oct-14
SB97409-01				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**1,100**		ug/Kg	90	30	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 90	U	ug/Kg	90	27	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*62.4*			*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*52.0*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*65.8*			*45-135 %*			"	"	"	"	"	

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 12.6		µg/kg dry	12.6	1.34	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 12.6		µg/kg dry	12.6	1.57	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 12.6		µg/kg dry	12.6	1.43	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 7.57		µg/kg dry	7.57	1.33	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 12.6		µg/kg dry	12.6	1.47	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 12.6		µg/kg dry	12.6	1.41	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 12.6		µg/kg dry	12.6	1.46	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 12.6		µg/kg dry	12.6	1.43	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 12.6		µg/kg dry	12.6	1.80	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 12.6		µg/kg dry	12.6	1.30	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 20.2		µg/kg dry	20.2	1.61	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 20.2		µg/kg dry	20.2	1.41	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 20.2		µg/kg dry	20.2	1.31	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 20.2		µg/kg dry	20.2	1.43	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 20.2		µg/kg dry	20.2	1.26	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 20.2		µg/kg dry	20.2	1.63	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 20.2		µg/kg dry	20.2	1.36	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 20.2		µg/kg dry	20.2	2.31	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 12.6		µg/kg dry	12.6	1.45	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 12.6		µg/kg dry	12.6	1.62	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 252		µg/kg dry	252	103	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 50.5		µg/kg dry	50.5	42.7	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 12.6		µg/kg dry	12.6	1.96	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*0.5*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*63*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*0.4*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*38*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 48.1		µg/kg dry	48.1	44.9	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 48.1		µg/kg dry	48.1	40.9	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 48.1		µg/kg dry	48.1	43.2	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 48.1		µg/kg dry	48.1	21.4	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 48.1		µg/kg dry	48.1	26.1	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 48.1		µg/kg dry	48.1	30.4	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 48.1		µg/kg dry	48.1	34.4	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 48.1		µg/kg dry	48.1	26.1	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 48.1		µg/kg dry	48.1	47.3	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-02-10-01-14 SB97409-02	60225155	Soil	01-Oct-14 18:12	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*110*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*55*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 3.63		mg/kg dry	3.63	0.346	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	**6.45**		mg/kg dry	3.63	1.28	1	"	"	"	"	"	X
7440-39-3	Barium	**229**		mg/kg dry	2.42	0.440	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 1.21		mg/kg dry	1.21	0.0842	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 1.21		mg/kg dry	1.21	0.162	1	"	"	"	"	"	X
7440-47-3	Chromium	**38.3**		mg/kg dry	2.42	0.438	1	"	"	"	"	"	X
7440-50-8	Copper	**81.7**		mg/kg dry	2.42	0.332	1	"	"	"	"	"	X
7439-97-6	Mercury	**0.155**		mg/kg dry	0.0659	0.0065	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**21.9**		mg/kg dry	2.42	0.336	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**183**		mg/kg dry	3.63	1.68	1	"	"	"	"	"	X
7440-36-0	Antimony	< 12.1		mg/kg dry	12.1	1.86	1	"	"	"	"	"	X
7782-49-2	Selenium	< 3.63		mg/kg dry	3.63	1.71	1	"	"	"	"	"	X
7440-28-0	Thallium	< 7.26		mg/kg dry	7.26	2.55	1	"	"	"	"	"	X
7440-62-2	Vanadium	**40.6**		mg/kg dry	3.63	0.542	1	"	"	"	"	"	X
7440-66-6	Zinc	**208**	R06	mg/kg dry	8.71	0.605	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**39.4**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423384	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**62**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 170	U	ug/Kg	170	52	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 170	U	ug/Kg	170	52	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 170	U	ug/Kg	170	46	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 170	U	ug/Kg	170	47	1	"	"	"	"	"	
86-73-7	Fluorene	< 170	U	ug/Kg	170	45	1	"	"	"	"	"	
85-01-8	Phenanthrene	**1,400**		ug/Kg	170	51	1	"	"	"	"	"	
120-12-7	Anthracene	**310**		ug/Kg	170	50	1	"	"	"	"	"	
206-44-0	Fluoranthene	**2,500**		ug/Kg	170	78	1	"	"	"	"	"	
129-00-0	Pyrene	**1,800**		ug/Kg	170	57	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**910**		ug/Kg	170	68	1	"	"	"	"	"	
218-01-9	Chrysene	**970**		ug/Kg	170	110	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**1,200**		ug/Kg	170	83	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**570**		ug/Kg	170	68	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**850**		ug/Kg	170	50	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**740**		ug/Kg	170	57	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 170	U	ug/Kg	170	57	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-02-10-01-14 SB97409-02	60225155	Soil	01-Oct-14 18:12	02-Oct-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**620**		ug/Kg	170	57	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 170	U	ug/Kg	170	51	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*62.8*			*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*62.3*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*61.8*			*45-135 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-03-10-01-14	60225155	Soil	01-Oct-14 17:02	02-Oct-14
SB97409-03				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 39.5		µg/kg dry	39.5	4.19	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 39.5		µg/kg dry	39.5	4.92	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 39.5		µg/kg dry	39.5	4.47	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 23.7		µg/kg dry	23.7	4.16	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 39.5		µg/kg dry	39.5	4.59	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 39.5		µg/kg dry	39.5	4.42	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 39.5		µg/kg dry	39.5	4.59	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 39.5		µg/kg dry	39.5	4.48	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 39.5		µg/kg dry	39.5	5.64	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 39.5		µg/kg dry	39.5	4.09	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 63.3		µg/kg dry	63.3	5.05	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 63.3		µg/kg dry	63.3	4.42	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 63.3		µg/kg dry	63.3	4.11	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 63.3		µg/kg dry	63.3	4.49	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 63.3		µg/kg dry	63.3	3.94	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 63.3		µg/kg dry	63.3	5.11	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 63.3		µg/kg dry	63.3	4.27	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 63.3		µg/kg dry	63.3	7.25	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 39.5		µg/kg dry	39.5	4.54	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 39.5		µg/kg dry	39.5	5.08	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 791		µg/kg dry	791	323	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 158		µg/kg dry	158	134	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 39.5		µg/kg dry	39.5	6.15	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*0.6*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*98*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*0.09*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*32*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 154		µg/kg dry	154	143	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 154		µg/kg dry	154	131	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 154		µg/kg dry	154	138	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 154		µg/kg dry	154	68.2	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 154		µg/kg dry	154	83.4	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 154		µg/kg dry	154	96.9	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 154		µg/kg dry	154	110	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 154		µg/kg dry	154	83.2	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 154		µg/kg dry	154	151	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*130*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-03-10-01-14 SB97409-03	60225155	Soil	01-Oct-14 17:02	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*135*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*125*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*90*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 11.3		mg/kg dry	11.3	1.08	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	**13.6**		mg/kg dry	11.3	4.01	1	"	"	"	"	"	X
7440-39-3	Barium	**719**		mg/kg dry	7.56	1.38	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 3.78		mg/kg dry	3.78	0.263	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 3.78		mg/kg dry	3.78	0.506	1	"	"	"	"	"	X
7440-47-3	Chromium	**91.8**		mg/kg dry	7.56	1.37	1	"	"	"	"	"	X
7440-50-8	Copper	**416**		mg/kg dry	7.56	1.04	1	"	"	"	"	"	X
7439-97-6	Mercury	**0.575**		mg/kg dry	0.219	0.0216	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**56.3**		mg/kg dry	7.56	1.05	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**273**		mg/kg dry	11.3	5.26	1	"	"	"	"	"	X
7440-36-0	Antimony	< 37.8		mg/kg dry	37.8	5.80	1	"	"	"	"	"	X
7782-49-2	Selenium	< 11.3		mg/kg dry	11.3	5.34	1	"	"	"	"	"	X
7440-28-0	Thallium	< 22.7		mg/kg dry	22.7	7.97	1	"	"	"	"	"	X
7440-62-2	Vanadium	**95.3**		mg/kg dry	11.3	1.69	1	"	"	"	"	"	X
7440-66-6	Zinc	**580**	R06	mg/kg dry	27.2	1.89	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**12.6**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423384	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**85**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 410	U	ug/Kg	410	130	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 410	U	ug/Kg	410	130	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 410	U	ug/Kg	410	110	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 410	U	ug/Kg	410	110	1	"	"	"	"	"	
86-73-7	Fluorene	< 410	U	ug/Kg	410	110	1	"	"	"	"	"	
85-01-8	Phenanthrene	**670**		ug/Kg	410	120	1	"	"	"	"	"	
120-12-7	Anthracene	< 410	U	ug/Kg	410	120	1	"	"	"	"	"	
206-44-0	Fluoranthene	**2,200**		ug/Kg	410	190	1	"	"	"	"	"	
129-00-0	Pyrene	**1,800**		ug/Kg	410	140	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**810**		ug/Kg	410	160	1	"	"	"	"	"	
218-01-9	Chrysene	**1,000**		ug/Kg	410	280	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**1,400**		ug/Kg	410	200	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**690**		ug/Kg	410	160	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**810**		ug/Kg	410	120	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**830**		ug/Kg	410	140	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 410	U	ug/Kg	410	140	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-03-10-01-14 SB97409-03	60225155	Soil	01-Oct-14 17:02	02-Oct-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**610**		ug/Kg	410	140	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 410	U	ug/Kg	410	120	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*53.2*			*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*51.6*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*59.8*			*45-135 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-04-10-01-14	60225155	Soil	01-Oct-14 16:10	02-Oct-14
SB97409-04				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 28.7		µg/kg dry	28.7	3.04	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 28.7		µg/kg dry	28.7	3.57	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 28.7		µg/kg dry	28.7	3.24	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 17.2		µg/kg dry	17.2	3.02	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 28.7		µg/kg dry	28.7	3.33	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 28.7		µg/kg dry	28.7	3.21	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 28.7		µg/kg dry	28.7	3.33	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 28.7		µg/kg dry	28.7	3.25	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 28.7		µg/kg dry	28.7	4.09	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 28.7		µg/kg dry	28.7	2.96	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 45.9		µg/kg dry	45.9	3.66	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 45.9		µg/kg dry	45.9	3.21	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 45.9		µg/kg dry	45.9	2.98	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 45.9		µg/kg dry	45.9	3.26	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 45.9		µg/kg dry	45.9	2.86	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 45.9		µg/kg dry	45.9	3.70	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 45.9		µg/kg dry	45.9	3.10	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 45.9		µg/kg dry	45.9	5.26	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 28.7		µg/kg dry	28.7	3.29	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 28.7		µg/kg dry	28.7	3.69	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 573		µg/kg dry	573	234	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 115		µg/kg dry	115	96.9	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 28.7		µg/kg dry	28.7	4.46	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*1*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*99*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*0.4*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*34*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 114		µg/kg dry	114	107	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 114		µg/kg dry	114	97.2	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 114		µg/kg dry	114	103	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 114		µg/kg dry	114	50.8	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 114		µg/kg dry	114	62.1	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 114		µg/kg dry	114	72.1	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 114		µg/kg dry	114	81.7	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 114		µg/kg dry	114	61.9	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 114		µg/kg dry	114	112	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*85*			*30-150 %*			"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-04-10-01-14 SB97409-04	60225155	Soil	01-Oct-14 16:10	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*120*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*75*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 7.35		mg/kg dry	7.35	0.701	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	**10.0**		mg/kg dry	7.35	2.60	1	"	"	"	"	"	X
7440-39-3	Barium	**502**		mg/kg dry	4.90	0.892	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 2.45		mg/kg dry	2.45	0.171	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 2.45		mg/kg dry	2.45	0.328	1	"	"	"	"	"	X
7440-47-3	Chromium	**74.2**		mg/kg dry	4.90	0.887	1	"	"	"	"	"	X
7440-50-8	Copper	**256**		mg/kg dry	4.90	0.672	1	"	"	"	"	"	X
7439-97-6	Mercury	**0.409**		mg/kg dry	0.167	0.0165	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**44.1**		mg/kg dry	4.90	0.681	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**212**		mg/kg dry	7.35	3.41	1	"	"	"	"	"	X
7440-36-0	Antimony	< 24.5		mg/kg dry	24.5	3.77	1	"	"	"	"	"	X
7782-49-2	Selenium	< 7.35		mg/kg dry	7.35	3.47	1	"	"	"	"	"	X
7440-28-0	Thallium	< 14.7		mg/kg dry	14.7	5.17	1	"	"	"	"	"	X
7440-62-2	Vanadium	**80.8**		mg/kg dry	7.35	1.10	1	"	"	"	"	"	X
7440-66-6	Zinc	**432**	R06	mg/kg dry	17.6	1.23	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**17.3**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423385	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**84**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 390	U	ug/Kg	390	120	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 390	U	ug/Kg	390	120	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 390	U	ug/Kg	390	110	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 390	U	ug/Kg	390	110	1	"	"	"	"	"	
86-73-7	Fluorene	**610**		ug/Kg	390	100	1	"	"	"	"	"	
85-01-8	Phenanthrene	**9,500**		ug/Kg	390	120	1	"	"	"	"	"	
120-12-7	Anthracene	**1,400**		ug/Kg	390	110	1	"	"	"	"	"	
206-44-0	Fluoranthene	**24,000**		ug/Kg	390	180	1	"	"	"	"	"	
129-00-0	Pyrene	**19,000**		ug/Kg	390	130	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**9,600**		ug/Kg	390	160	1	"	"	"	"	"	
218-01-9	Chrysene	**9,300**		ug/Kg	390	260	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**13,000**		ug/Kg	390	190	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**6,500**		ug/Kg	390	160	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**9,100**		ug/Kg	390	110	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**7,900**		ug/Kg	390	130	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 390	U	ug/Kg	390	130	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-04-10-01-14	60225155	Soil	01-Oct-14 16:10	02-Oct-14
SB97409-04				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**6,000**		ug/Kg	390	130	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 390	U	ug/Kg	390	120	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*160*	S		*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*131*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*97.5*			*45-135 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-05-10-01-14	60225155	Soil	01-Oct-14 15:15	02-Oct-14
SB97409-05				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 31.6		µg/kg dry	31.6	3.35	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 31.6		µg/kg dry	31.6	3.93	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 31.6		µg/kg dry	31.6	3.57	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 18.9		µg/kg dry	18.9	3.32	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 31.6		µg/kg dry	31.6	3.67	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 31.6		µg/kg dry	31.6	3.53	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 31.6		µg/kg dry	31.6	3.66	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 31.6		µg/kg dry	31.6	3.58	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 31.6		µg/kg dry	31.6	4.50	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 31.6		µg/kg dry	31.6	3.26	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 50.5		µg/kg dry	50.5	4.04	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 50.5		µg/kg dry	50.5	3.53	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 50.5		µg/kg dry	50.5	3.28	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 50.5		µg/kg dry	50.5	3.59	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 50.5		µg/kg dry	50.5	3.14	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 50.5		µg/kg dry	50.5	4.08	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 50.5		µg/kg dry	50.5	3.41	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 50.5		µg/kg dry	50.5	5.79	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 31.6		µg/kg dry	31.6	3.62	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 31.6		µg/kg dry	31.6	4.06	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 632		µg/kg dry	632	258	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 126		µg/kg dry	126	107	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 31.6		µg/kg dry	31.6	4.91	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*13*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*84*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*8*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*49*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 125		µg/kg dry	125	116	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 125		µg/kg dry	125	106	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 125		µg/kg dry	125	112	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 125		µg/kg dry	125	55.4	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 125		µg/kg dry	125	67.7	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 125		µg/kg dry	125	78.7	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 125		µg/kg dry	125	89.2	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 125		µg/kg dry	125	67.6	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 125		µg/kg dry	125	123	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*85*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-05-10-01-14 SB97409-05	60225155	Soil	01-Oct-14 15:15	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*105*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*90*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*85*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 8.11		mg/kg dry	8.11	0.773	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	**14.2**		mg/kg dry	8.11	2.87	1	"	"	"	"	"	X
7440-39-3	Barium	**823**		mg/kg dry	5.41	0.984	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 2.70		mg/kg dry	2.70	0.188	1	"	"	"	"	"	X
7440-43-9	Cadmium	**2.83**		mg/kg dry	2.70	0.362	1	"	"	"	"	"	X
7440-47-3	Chromium	**95.5**		mg/kg dry	5.41	0.979	1	"	"	"	"	"	X
7440-50-8	Copper	**353**		mg/kg dry	5.41	0.741	1	"	"	"	"	"	X
7439-97-6	Mercury	**0.564**		mg/kg dry	0.165	0.0162	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**57.2**		mg/kg dry	5.41	0.752	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**305**		mg/kg dry	8.11	3.76	1	"	"	"	"	"	X
7440-36-0	Antimony	< 27.0		mg/kg dry	27.0	4.15	1	"	"	"	"	"	X
7782-49-2	Selenium	< 8.11		mg/kg dry	8.11	3.82	1	"	"	"	"	"	X
7440-28-0	Thallium	< 16.2		mg/kg dry	16.2	5.70	1	"	"	"	"	"	X
7440-62-2	Vanadium	**101**		mg/kg dry	8.11	1.21	1	"	"	"	"	"	X
7440-66-6	Zinc	**543**	R06	mg/kg dry	19.5	1.35	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**15.8**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423385	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**86**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 460	U	ug/Kg	460	140	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 460	U	ug/Kg	460	140	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 460	U	ug/Kg	460	120	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 460	U	ug/Kg	460	120	1	"	"	"	"	"	
86-73-7	Fluorene	< 460	U	ug/Kg	460	120	1	"	"	"	"	"	
85-01-8	Phenanthrene	**2,200**		ug/Kg	460	140	1	"	"	"	"	"	
120-12-7	Anthracene	**670**		ug/Kg	460	130	1	"	"	"	"	"	
206-44-0	Fluoranthene	**6,100**		ug/Kg	460	210	1	"	"	"	"	"	
129-00-0	Pyrene	**4,800**		ug/Kg	460	150	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**1,900**		ug/Kg	460	180	1	"	"	"	"	"	
218-01-9	Chrysene	**3,100**		ug/Kg	460	310	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**4,100**		ug/Kg	460	220	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**1,700**		ug/Kg	460	180	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**2,300**		ug/Kg	460	130	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**2,300**		ug/Kg	460	150	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 460	U	ug/Kg	460	150	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-05-10-01-14 SB97409-05	60225155	Soil	01-Oct-14 15:15	02-Oct-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**1,900**		ug/Kg	460	150	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 460	U	ug/Kg	460	140	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*63.0*			*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*81.7*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*82.6*			*45-135 %*			"	"	"	"	"	

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 73.9		µg/kg dry	73.9	7.83	1	SW846 8081B	08-Oct-14	13-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 73.9		µg/kg dry	73.9	9.19	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 73.9		µg/kg dry	73.9	8.35	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 44.3		µg/kg dry	44.3	7.77	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 73.9		µg/kg dry	73.9	8.59	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 73.9		µg/kg dry	73.9	8.26	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 73.9		µg/kg dry	73.9	8.57	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 73.9		µg/kg dry	73.9	8.38	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 73.9		µg/kg dry	73.9	10.5	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 73.9		µg/kg dry	73.9	7.64	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 118		µg/kg dry	118	9.44	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 118		µg/kg dry	118	8.26	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 118		µg/kg dry	118	7.68	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 118		µg/kg dry	118	8.39	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 118		µg/kg dry	118	7.36	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 118		µg/kg dry	118	9.55	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 118		µg/kg dry	118	7.98	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 118		µg/kg dry	118	13.5	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 73.9		µg/kg dry	73.9	8.48	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 73.9		µg/kg dry	73.9	9.50	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 1480		µg/kg dry	1480	604	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 296		µg/kg dry	296	250	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 73.9		µg/kg dry	73.9	11.5	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*2*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*44*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*0.2*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*32*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 294		µg/kg dry	294	275	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 294		µg/kg dry	294	250	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 294		µg/kg dry	294	264	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 294		µg/kg dry	294	131	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 294		µg/kg dry	294	160	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 294		µg/kg dry	294	186	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 294		µg/kg dry	294	210	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 294		µg/kg dry	294	159	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 294		µg/kg dry	294	289	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*85*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-06-10-01-14 SB97409-06	60225155	Soil	01-Oct-14 12:30	02-Oct-14

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*120*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*80*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 21.6		mg/kg dry	21.6	2.06	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	< 21.6		mg/kg dry	21.6	7.64	1	"	"	"	"	"	X
7440-39-3	Barium	**815**		mg/kg dry	14.4	2.62	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 7.19		mg/kg dry	7.19	0.501	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 7.19		mg/kg dry	7.19	0.964	1	"	"	"	"	"	X
7440-47-3	Chromium	**58.6**		mg/kg dry	14.4	2.60	1	"	"	"	"	"	X
7440-50-8	Copper	**408**		mg/kg dry	14.4	1.97	1	"	"	"	"	"	X
7439-97-6	Mercury	**0.577**		mg/kg dry	0.441	0.0434	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**47.2**		mg/kg dry	14.4	2.00	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**148**		mg/kg dry	21.6	10.0	1	"	"	"	"	"	X
7440-36-0	Antimony	< 71.9		mg/kg dry	71.9	11.0	1	"	"	"	"	"	X
7782-49-2	Selenium	< 21.6		mg/kg dry	21.6	10.2	1	"	"	"	"	"	X
7440-28-0	Thallium	< 43.2		mg/kg dry	43.2	15.2	1	"	"	"	"	"	X
7440-62-2	Vanadium	**82.4**		mg/kg dry	21.6	3.22	1	"	"	"	"	"	X
7440-66-6	Zinc	**497**	R06	mg/kg dry	51.8	3.60	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**6.7**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423385	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**94**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 1000	U	ug/Kg	1000	310	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 1000	U	ug/Kg	1000	310	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 1000	U	ug/Kg	1000	280	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 1000	U	ug/Kg	1000	280	1	"	"	"	"	"	
86-73-7	Fluorene	< 1000	U	ug/Kg	1000	270	1	"	"	"	"	"	
85-01-8	Phenanthrene	**1,500**		ug/Kg	1000	310	1	"	"	"	"	"	
120-12-7	Anthracene	< 1000	U	ug/Kg	1000	300	1	"	"	"	"	"	
206-44-0	Fluoranthene	**3,500**		ug/Kg	1000	470	1	"	"	"	"	"	
129-00-0	Pyrene	**2,600**		ug/Kg	1000	340	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**980**	J	ug/Kg	1000	410	1	"	"	"	"	"	
218-01-9	Chrysene	**1,900**		ug/Kg	1000	690	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**2,200**		ug/Kg	1000	500	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	< 1000	U	ug/Kg	1000	410	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	< 1000	U	ug/Kg	1000	300	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	< 1000	U	ug/Kg	1000	340	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 1000	U	ug/Kg	1000	340	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-06-10-01-14 SB97409-06	60225155	Soil	01-Oct-14 12:30	02-Oct-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	< 1000	U	ug/Kg	1000	340	1	SW846 8270D SIM	07-Oct-14	09-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 1000	U	ug/Kg	1000	310	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*10.9*	S		*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*97.7*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*79.2*			*45-135 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14-FD	60225155	Soil	02-Oct-14 11:20	02-Oct-14
SB97409-07				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Organochlorine Pesticides													
Prepared by method SW846 3545A													
319-84-6	alpha-BHC [2C]	< 8.10		µg/kg dry	8.10	0.858	1	SW846 8081B	08-Oct-14	14-Oct-14	TG	1423741	X
319-85-7	beta-BHC [2C]	< 8.10		µg/kg dry	8.10	1.01	1	"	"	"	"	"	X
319-86-8	delta-BHC [2C]	< 8.10		µg/kg dry	8.10	0.915	1	"	"	"	"	"	X
58-89-9	gamma-BHC (Lindane) [2C]	< 4.86		µg/kg dry	4.86	0.852	1	"	"	"	"	"	X
76-44-8	Heptachlor [2C]	< 8.10		µg/kg dry	8.10	0.941	1	"	"	"	"	"	X
309-00-2	Aldrin [2C]	< 8.10		µg/kg dry	8.10	0.905	1	"	"	"	"	"	X
1024-57-3	Heptachlor epoxide [2C]	< 8.10		µg/kg dry	8.10	0.939	1	"	"	"	"	"	X
959-98-8	Endosulfan I [2C]	< 8.10		µg/kg dry	8.10	0.918	1	"	"	"	"	"	X
60-57-1	Dieldrin [2C]	< 8.10		µg/kg dry	8.10	1.15	1	"	"	"	"	"	X
72-55-9	4,4'-DDE (p,p') [2C]	< 8.10		µg/kg dry	8.10	0.837	1	"	"	"	"	"	X
72-20-8	Endrin [2C]	< 13.0		µg/kg dry	13.0	1.03	1	"	"	"	"	"	X
33213-65-9	Endosulfan II [2C]	< 13.0		µg/kg dry	13.0	0.905	1	"	"	"	"	"	X
72-54-8	4,4'-DDD (p,p') [2C]	< 13.0		µg/kg dry	13.0	0.842	1	"	"	"	"	"	X
1031-07-8	Endosulfan sulfate [2C]	< 13.0		µg/kg dry	13.0	0.920	1	"	"	"	"	"	X
50-29-3	4,4'-DDT (p,p') [2C]	< 13.0		µg/kg dry	13.0	0.807	1	"	"	"	"	"	X
72-43-5	Methoxychlor [2C]	< 13.0		µg/kg dry	13.0	1.05	1	"	"	"	"	"	X
53494-70-5	Endrin ketone [2C]	< 13.0		µg/kg dry	13.0	0.875	1	"	"	"	"	"	X
7421-93-4	Endrin aldehyde [2C]	< 13.0		µg/kg dry	13.0	1.49	1	"	"	"	"	"	X
5103-71-9	alpha-Chlordane [2C]	< 8.10		µg/kg dry	8.10	0.930	1	"	"	"	"	"	X
5566-34-7	gamma-Chlordane [2C]	< 8.10		µg/kg dry	8.10	1.04	1	"	"	"	"	"	X
8001-35-2	Toxaphene [2C]	< 162		µg/kg dry	162	66.2	1	"	"	"	"	"	X
57-74-9	Chlordane [2C]	< 32.4		µg/kg dry	32.4	27.4	1	"	"	"	"	"	X
15972-60-8	Alachlor [2C]	< 8.10		µg/kg dry	8.10	1.26	1	"	"	"	"	"	
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*2*	SGC		*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*69*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*9*	SGC		*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*47*			*30-150 %*			"	"	"	"	"	
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
12674-11-2	Aroclor-1016	< 31.1		µg/kg dry	31.1	29.1	1	SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	X
11104-28-2	Aroclor-1221	< 31.1		µg/kg dry	31.1	26.5	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 31.1		µg/kg dry	31.1	28.0	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 31.1		µg/kg dry	31.1	13.8	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 31.1		µg/kg dry	31.1	16.9	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 31.1		µg/kg dry	31.1	19.7	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 31.1		µg/kg dry	31.1	22.3	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 31.1		µg/kg dry	31.1	16.9	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 31.1		µg/kg dry	31.1	30.6	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*115*			*30-150 %*			"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14-FD	60225155	Soil	02-Oct-14 11:20	02-Oct-14
SB97409-07				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls													
Prepared by method SW846 3540C													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*135*			*30-150 %*			SW846 8082A	03-Oct-14	09-Oct-14	IMR	1423473	
2051-24-3	*Decachlorobiphenyl (Sr)*	*120*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*75*			*30-150 %*			"	"	"	"	"	
Total Metals by EPA 6000/7000 Series Methods													
7440-22-4	Silver	< 2.21		mg/kg dry	2.21	0.210	1	SW846 6010C	09-Oct-14	15-Oct-14	SMR	1423837	X
7440-38-2	Arsenic	< 2.21		mg/kg dry	2.21	0.781	1	"	"	"	"	"	X
7440-39-3	Barium	**71.7**		mg/kg dry	1.47	0.268	1	"	"	"	"	"	X
7440-41-7	Beryllium	< 0.736		mg/kg dry	0.736	0.0512	1	"	"	"	"	"	X
7440-43-9	Cadmium	< 0.736		mg/kg dry	0.736	0.0986	1	"	"	"	"	"	X
7440-47-3	Chromium	**18.1**		mg/kg dry	1.47	0.266	1	"	"	"	"	"	X
7440-50-8	Copper	**18.7**		mg/kg dry	1.47	0.202	1	"	"	"	"	"	X
7439-97-6	Mercury	< 0.0440		mg/kg dry	0.0440	0.0043	1	SW846 7471B	"	15-Oct-14	LR	1423838	X
7440-02-0	Nickel	**8.64**		mg/kg dry	1.47	0.205	1	SW846 6010C	"	15-Oct-14	SMR	1423837	X
7439-92-1	Lead	**23.1**		mg/kg dry	2.21	1.02	1	"	"	"	"	"	X
7440-36-0	Antimony	< 7.36		mg/kg dry	7.36	1.13	1	"	"	"	"	"	X
7782-49-2	Selenium	< 2.21		mg/kg dry	2.21	1.04	1	"	"	"	"	"	X
7440-28-0	Thallium	< 4.42		mg/kg dry	4.42	1.55	1	"	"	"	"	"	X
7440-62-2	Vanadium	**20.1**		mg/kg dry	2.21	0.330	1	"	"	"	"	"	X
7440-66-6	Zinc	**50.0**	R06	mg/kg dry	5.30	0.368	1	"	"	"	"	"	X
General Chemistry Parameters													
	% Solids	**61.4**		%			1	SM2540 G Mod.	03-Oct-14	03-Oct-14	DT	1423385	
Subcontracted Analyses													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
	Percent Moisture	**39**		PCT	10	0.050	1	ASTM D2216 -- PMOIST		07-Oct-14	KP	R84870	
Subcontracted Analyses													
Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
91-20-3	Naphthalene	< 110	U	ug/Kg	110	33	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
91-57-6	2-Methylnaphthalene	< 110	U	ug/Kg	110	33	1	"	"	"	"	"	
208-96-8	Acenaphthylene	< 110	U	ug/Kg	110	29	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 110	U	ug/Kg	110	29	1	"	"	"	"	"	
86-73-7	Fluorene	**160**		ug/Kg	110	28	1	"	"	"	"	"	
85-01-8	Phenanthrene	**2,400**		ug/Kg	110	32	1	"	"	"	"	"	
120-12-7	Anthracene	**360**		ug/Kg	110	31	1	"	"	"	"	"	
206-44-0	Fluoranthene	**5,000**		ug/Kg	110	49	1	"	"	"	"	"	
129-00-0	Pyrene	**3,900**		ug/Kg	110	36	1	"	"	"	"	"	
56-55-3	Benzo(a)anthracene	**1,700**		ug/Kg	110	42	1	"	"	"	"	"	
218-01-9	Chrysene	**2,000**		ug/Kg	110	72	1	"	"	"	"	"	
205-99-2	Benzo(b)fluoranthene	**2,500**		ug/Kg	110	52	1	"	"	"	"	"	
207-08-9	Benzo(k)fluoranthene	**1,100**		ug/Kg	110	42	1	"	"	"	"	"	
50-32-8	Benzo(a)pyrene	**1,600**		ug/Kg	110	31	1	"	"	"	"	"	
193-39-5	Indeno(1,2,3-cd)pyrene	**1,400**		ug/Kg	110	36	1	"	"	"	"	"	
53-70-3	Dibenzo(a,h)anthracene	< 110	U	ug/Kg	110	36	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
SED-DOWNSTREAM-01-10-02-14-FD SB97409-07	60225155	Soil	02-Oct-14 11:20	02-Oct-14

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW3545A													
Analysis performed by Spectrum Analytical, Inc. - North Kingstown, RI													
191-24-2	Benzo(g,h,i)perylene	**1,100**		ug/Kg	110	36	1	SW846 8270D SIM	07-Oct-14	08-Oct-14	TM	79383	
90-12-0	1-Methylnaphthalene	< 110	U	ug/Kg	110	32	1	"	"	"	"	"	
Surrogate recoveries:													
4165-60-0	*Nitrobenzene-d5*	*35.3*	S		*45-135 %*			"	"	"	"	"	
321-60-8	*2-Fluorobiphenyl*	*46.5*			*45-135 %*			"	"	"	"	"	
1718-51-0	*Terphenyl-d14*	*46.6*			*45-135 %*			"	"	"	"	"	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423473 - SW846 3540C										
Blank (1423473-BLK1)					Prepared: 03-Oct-14 Analyzed: 04-Oct-14					
Aroclor-1016	< 19.9		µg/kg wet	19.9						
Aroclor-1016 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1221	< 19.9		µg/kg wet	19.9						
Aroclor-1221 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1232	< 19.9		µg/kg wet	19.9						
Aroclor-1232 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1242	< 19.9		µg/kg wet	19.9						
Aroclor-1242 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1248	< 19.9		µg/kg wet	19.9						
Aroclor-1248 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1254	< 19.9		µg/kg wet	19.9						
Aroclor-1254 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1260	< 19.9		µg/kg wet	19.9						
Aroclor-1260 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1262	< 19.9		µg/kg wet	19.9						
Aroclor-1262 [2C]	< 19.9		µg/kg wet	19.9						
Aroclor-1268	< 19.9		µg/kg wet	19.9						
Aroclor-1268 [2C]	< 19.9		µg/kg wet	19.9						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*16.9*		µg/kg wet		*19.9*		*85*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*16.9*		µg/kg wet		*19.9*		*85*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*16.9*		µg/kg wet		*19.9*		*85*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*13.9*		µg/kg wet		*19.9*		*70*	*30-150*		
LCS (1423473-BS1)					Prepared: 03-Oct-14 Analyzed: 04-Oct-14					
Aroclor-1016	**220**		µg/kg wet	19.4	243		91	40-140		
Aroclor-1016 [2C]	**208**		µg/kg wet	19.4	243		86	40-140		
Aroclor-1260	**201**		µg/kg wet	19.4	243		83	40-140		
Aroclor-1260 [2C]	**181**		µg/kg wet	19.4	243		74	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*16.5*		µg/kg wet		*19.4*		*85*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*16.5*		µg/kg wet		*19.4*		*85*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*17.5*		µg/kg wet		*19.4*		*90*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*15.5*		µg/kg wet		*19.4*		*80*	*30-150*		
LCS Dup (1423473-BSD1)					Prepared: 03-Oct-14 Analyzed: 04-Oct-14					
Aroclor-1016	**261**		µg/kg wet	19.6	245		107	40-140	16	30
Aroclor-1016 [2C]	**205**		µg/kg wet	19.6	245		84	40-140	2	30
Aroclor-1260	**229**		µg/kg wet	19.6	245		94	40-140	12	30
Aroclor-1260 [2C]	**167**		µg/kg wet	19.6	245		68	40-140	8	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*19.6*		µg/kg wet		*19.6*		*100*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*16.6*		µg/kg wet		*19.6*		*85*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*21.5*		µg/kg wet		*19.6*		*110*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*14.7*		µg/kg wet		*19.6*		*75*	*30-150*		
Batch 1423741 - SW846 3545A										
Blank (1423741-BLK1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
alpha-BHC	< 4.97		µg/kg wet	4.97						
alpha-BHC [2C]	< 4.97		µg/kg wet	4.97						
beta-BHC	< 4.97		µg/kg wet	4.97						
beta-BHC [2C]	< 4.97		µg/kg wet	4.97						
delta-BHC	< 4.97		µg/kg wet	4.97						
delta-BHC [2C]	< 4.97		µg/kg wet	4.97						
gamma-BHC (Lindane)	< 2.98		µg/kg wet	2.98						
gamma-BHC (Lindane) [2C]	< 2.98		µg/kg wet	2.98						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423741 - SW846 3545A										
Blank (1423741-BLK1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
Heptachlor	< 4.97		µg/kg wet	4.97						
Heptachlor [2C]	< 4.97		µg/kg wet	4.97						
Aldrin	< 4.97		µg/kg wet	4.97						
Aldrin [2C]	< 4.97		µg/kg wet	4.97						
Heptachlor epoxide	< 4.97		µg/kg wet	4.97						
Heptachlor epoxide [2C]	< 4.97		µg/kg wet	4.97						
Endosulfan I	< 4.97		µg/kg wet	4.97						
Endosulfan I [2C]	< 4.97		µg/kg wet	4.97						
Dieldrin	< 4.97		µg/kg wet	4.97						
Dieldrin [2C]	< 4.97		µg/kg wet	4.97						
4,4'-DDE (p,p')	< 4.97		µg/kg wet	4.97						
4,4'-DDE (p,p') [2C]	< 4.97		µg/kg wet	4.97						
Endrin	< 7.96		µg/kg wet	7.96						
Endrin [2C]	< 7.96		µg/kg wet	7.96						
Endosulfan II	< 7.96		µg/kg wet	7.96						
Endosulfan II [2C]	< 7.96		µg/kg wet	7.96						
4,4'-DDD (p,p')	< 7.96		µg/kg wet	7.96						
4,4'-DDD (p,p') [2C]	< 7.96		µg/kg wet	7.96						
Endosulfan sulfate	< 7.96		µg/kg wet	7.96						
Endosulfan sulfate [2C]	< 7.96		µg/kg wet	7.96						
4,4'-DDT (p,p')	< 7.96		µg/kg wet	7.96						
4,4'-DDT (p,p') [2C]	< 7.96		µg/kg wet	7.96						
Methoxychlor	< 7.96		µg/kg wet	7.96						
Methoxychlor [2C]	< 7.96		µg/kg wet	7.96						
Endrin ketone	< 7.96		µg/kg wet	7.96						
Endrin ketone [2C]	< 7.96		µg/kg wet	7.96						
Endrin aldehyde	< 7.96		µg/kg wet	7.96						
Endrin aldehyde [2C]	< 7.96		µg/kg wet	7.96						
alpha-Chlordane	< 4.97		µg/kg wet	4.97						
alpha-Chlordane [2C]	< 4.97		µg/kg wet	4.97						
gamma-Chlordane	< 4.97		µg/kg wet	4.97						
gamma-Chlordane [2C]	< 4.97		µg/kg wet	4.97						
Toxaphene	< 99.5		µg/kg wet	99.5						
Toxaphene [2C]	< 99.5		µg/kg wet	99.5						
Chlordane	< 19.9		µg/kg wet	19.9						
Chlordane [2C]	< 19.9		µg/kg wet	19.9						
Alachlor	< 4.97		µg/kg wet	4.97						
Alachlor [2C]	< 4.97		µg/kg wet	4.97						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*10.7*		µg/kg wet		*9.95*		*108*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*9.88*		µg/kg wet		*9.95*		*99*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*8.70*		µg/kg wet		*9.95*		*87*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*7.65*		µg/kg wet		*9.95*		*77*	*30-150*		
LCS (1423741-BS1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
alpha-BHC	**20.6**		µg/kg wet	4.97	24.9		83	40-140		
alpha-BHC [2C]	**19.3**		µg/kg wet	4.97	24.9		78	40-140		
beta-BHC	**26.0**		µg/kg wet	4.97	24.9		105	40-140		
beta-BHC [2C]	**26.1**		µg/kg wet	4.97	24.9		105	40-140		
delta-BHC	**28.0**		µg/kg wet	4.97	24.9		112	40-140		
delta-BHC [2C]	**27.3**		µg/kg wet	4.97	24.9		110	40-140		
gamma-BHC (Lindane)	**20.8**		µg/kg wet	2.98	24.9		84	40-140		
gamma-BHC (Lindane) [2C]	**20.0**		µg/kg wet	2.98	24.9		80	40-140		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423741 - SW846 3545A										
LCS (1423741-BS1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
Heptachlor	**20.0**		µg/kg wet	4.97	24.9		80	40-140		
Heptachlor [2C]	**19.3**		µg/kg wet	4.97	24.9		78	40-140		
Aldrin	**19.7**		µg/kg wet	4.97	24.9		79	40-140		
Aldrin [2C]	**19.2**		µg/kg wet	4.97	24.9		77	40-140		
Heptachlor epoxide	**19.4**		µg/kg wet	4.97	24.9		78	40-140		
Heptachlor epoxide [2C]	**19.6**		µg/kg wet	4.97	24.9		79	40-140		
Endosulfan I	**19.5**		µg/kg wet	4.97	24.9		78	40-140		
Endosulfan I [2C]	**19.4**		µg/kg wet	4.97	24.9		78	40-140		
Dieldrin	**19.0**		µg/kg wet	4.97	24.9		76	40-140		
Dieldrin [2C]	**19.1**		µg/kg wet	4.97	24.9		77	40-140		
4,4'-DDE (p,p')	**18.7**		µg/kg wet	4.97	24.9		75	40-140		
4,4'-DDE (p,p') [2C]	**19.1**		µg/kg wet	4.97	24.9		77	40-140		
Endrin	**17.7**		µg/kg wet	7.96	24.9		71	40-140		
Endrin [2C]	**18.6**		µg/kg wet	7.96	24.9		75	40-140		
Endosulfan II	**20.7**		µg/kg wet	7.96	24.9		83	40-140		
Endosulfan II [2C]	**20.9**		µg/kg wet	7.96	24.9		84	40-140		
4,4'-DDD (p,p')	**19.7**		µg/kg wet	7.96	24.9		79	40-140		
4,4'-DDD (p,p') [2C]	**21.0**		µg/kg wet	7.96	24.9		85	40-140		
Endosulfan sulfate	**23.2**		µg/kg wet	7.96	24.9		93	40-140		
Endosulfan sulfate [2C]	**24.5**		µg/kg wet	7.96	24.9		99	40-140		
4,4'-DDT (p,p')	**16.7**		µg/kg wet	7.96	24.9		67	40-140		
4,4'-DDT (p,p') [2C]	**17.5**		µg/kg wet	7.96	24.9		70	40-140		
Methoxychlor	**18.9**		µg/kg wet	7.96	24.9		76	40-140		
Methoxychlor [2C]	**19.4**		µg/kg wet	7.96	24.9		78	40-140		
Endrin ketone	**20.6**		µg/kg wet	7.96	24.9		83	40-140		
Endrin ketone [2C]	**20.7**		µg/kg wet	7.96	24.9		83	40-140		
Endrin aldehyde	**21.2**		µg/kg wet	7.96	24.9		85	40-140		
Endrin aldehyde [2C]	**22.1**		µg/kg wet	7.96	24.9		89	40-140		
alpha-Chlordane	**18.9**		µg/kg wet	4.97	24.9		76	40-140		
alpha-Chlordane [2C]	**18.8**		µg/kg wet	4.97	24.9		76	40-140		
gamma-Chlordane	**19.6**		µg/kg wet	4.97	24.9		79	40-140		
gamma-Chlordane [2C]	**19.5**		µg/kg wet	4.97	24.9		78	40-140		
Alachlor	**23.7**		µg/kg wet	4.97	24.9		95	40-140		
Alachlor [2C]	**22.5**		µg/kg wet	4.97	24.9		90	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*8.44*		µg/kg wet		*9.95*		*85*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*7.95*		µg/kg wet		*9.95*		*80*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*7.82*		µg/kg wet		*9.95*		*79*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*7.06*		µg/kg wet		*9.95*		*71*	*30-150*		
LCS Dup (1423741-BSD1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
alpha-BHC	**20.5**		µg/kg wet	4.95	24.8		83	40-140	0.01	30
alpha-BHC [2C]	**19.4**		µg/kg wet	4.95	24.8		78	40-140	0.8	30
beta-BHC	**26.2**		µg/kg wet	4.95	24.8		106	40-140	1	30
beta-BHC [2C]	**26.2**		µg/kg wet	4.95	24.8		106	40-140	0.7	30
delta-BHC	**28.2**		µg/kg wet	4.95	24.8		114	40-140	1	30
delta-BHC [2C]	**27.3**		µg/kg wet	4.95	24.8		110	40-140	0.5	30
gamma-BHC (Lindane)	**20.9**		µg/kg wet	2.97	24.8		84	40-140	0.7	30
gamma-BHC (Lindane) [2C]	**20.1**		µg/kg wet	2.97	24.8		81	40-140	0.8	30
Heptachlor	**20.1**		µg/kg wet	4.95	24.8		81	40-140	1	30
Heptachlor [2C]	**19.4**		µg/kg wet	4.95	24.8		79	40-140	1	30
Aldrin	**19.8**		µg/kg wet	4.95	24.8		80	40-140	0.7	30
Aldrin [2C]	**19.3**		µg/kg wet	4.95	24.8		78	40-140	1	30

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423741 - SW846 3545A										
LCS Dup (1423741-BSD1)					Prepared: 08-Oct-14 Analyzed: 09-Oct-14					
Heptachlor epoxide	**19.9**		µg/kg wet	4.95	24.8		80	40-140	3	30
Heptachlor epoxide [2C]	**19.7**		µg/kg wet	4.95	24.8		79	40-140	1	30
Endosulfan I	**20.0**		µg/kg wet	4.95	24.8		81	40-140	3	30
Endosulfan I [2C]	**19.5**		µg/kg wet	4.95	24.8		79	40-140	0.9	30
Dieldrin	**19.5**		µg/kg wet	4.95	24.8		79	40-140	3	30
Dieldrin [2C]	**19.2**		µg/kg wet	4.95	24.8		78	40-140	1	30
4,4'-DDE (p,p')	**19.3**		µg/kg wet	4.95	24.8		78	40-140	4	30
4,4'-DDE (p,p') [2C]	**19.2**		µg/kg wet	4.95	24.8		78	40-140	0.7	30
Endrin	**18.6**		µg/kg wet	7.92	24.8		75	40-140	5	30
Endrin [2C]	**18.8**		µg/kg wet	7.92	24.8		76	40-140	2	30
Endosulfan II	**21.7**		µg/kg wet	7.92	24.8		88	40-140	5	30
Endosulfan II [2C]	**21.1**		µg/kg wet	7.92	24.8		85	40-140	1	30
4,4'-DDD (p,p')	**20.8**		µg/kg wet	7.92	24.8		84	40-140	6	30
4,4'-DDD (p,p') [2C]	**21.2**		µg/kg wet	7.92	24.8		86	40-140	1	30
Endosulfan sulfate	**24.4**		µg/kg wet	7.92	24.8		99	40-140	6	30
Endosulfan sulfate [2C]	**24.4**		µg/kg wet	7.92	24.8		99	40-140	0.04	30
4,4'-DDT (p,p')	**18.0**		µg/kg wet	7.92	24.8		73	40-140	8	30
4,4'-DDT (p,p') [2C]	**17.8**		µg/kg wet	7.92	24.8		72	40-140	2	30
Methoxychlor	**20.5**		µg/kg wet	7.92	24.8		83	40-140	9	30
Methoxychlor [2C]	**19.4**		µg/kg wet	7.92	24.8		78	40-140	0.5	30
Endrin ketone	**21.5**		µg/kg wet	7.92	24.8		87	40-140	4	30
Endrin ketone [2C]	**20.7**		µg/kg wet	7.92	24.8		84	40-140	0.3	30
Endrin aldehyde	**22.0**		µg/kg wet	7.92	24.8		89	40-140	4	30
Endrin aldehyde [2C]	**22.0**		µg/kg wet	7.92	24.8		89	40-140	0.03	30
alpha-Chlordane	**19.4**		µg/kg wet	4.95	24.8		78	40-140	3	30
alpha-Chlordane [2C]	**18.9**		µg/kg wet	4.95	24.8		76	40-140	0.8	30
gamma-Chlordane	**20.1**		µg/kg wet	4.95	24.8		81	40-140	3	30
gamma-Chlordane [2C]	**19.5**		µg/kg wet	4.95	24.8		79	40-140	0.7	30
Alachlor	**24.3**		µg/kg wet	4.95	24.8		98	40-140	3	30
Alachlor [2C]	**22.4**		µg/kg wet	4.95	24.8		91	40-140	0.3	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*8.38*		µg/kg wet		*9.90*		*85*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*8.03*		µg/kg wet		*9.90*		*81*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*8.22*		µg/kg wet		*9.90*		*83*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*7.52*		µg/kg wet		*9.90*		*76*	*30-150*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423837 - SW846 3050B										
Blank (1423837-BLK1)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Thallium	< 2.90		mg/kg wet	2.90						
Beryllium	< 0.484		mg/kg wet	0.484						
Selenium	< 1.45		mg/kg wet	1.45						
Antimony	< 4.84		mg/kg wet	4.84						
Cadmium	< 0.484		mg/kg wet	0.484						
Copper	< 0.968		mg/kg wet	0.968						
Zinc	< 3.49		mg/kg wet	3.49						
Nickel	< 0.968		mg/kg wet	0.968						
Vanadium	< 1.45		mg/kg wet	1.45						
Arsenic	< 1.45		mg/kg wet	1.45						
Chromium	< 0.968		mg/kg wet	0.968						
Silver	< 1.45		mg/kg wet	1.45						
Lead	< 1.45		mg/kg wet	1.45						
Barium	< 0.968		mg/kg wet	0.968						
Reference (1423837-SRM1)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Silver	**19.1**		mg/kg wet	1.50	20.7		92	74.87-125.37		
Beryllium	**50.6**		mg/kg wet	0.500	49.6		102	82.83-117.58		
Cadmium	**47.0**		mg/kg wet	0.500	49.5		95	81.66-117.71		
Copper	**87.6**		mg/kg wet	1.00	86.7		101	81.54-118.45		
Nickel	**61.2**		mg/kg wet	1.00	63.5		96	82.11-118.69		
Lead	**66.0**		mg/kg wet	1.50	68.6		96	81.95-118.79		
Antimony	**20.8**		mg/kg wet	5.00	45.8		45	25-209.45		
Selenium	**87.4**		mg/kg wet	1.50	91.3		96	77.4-122.59		
Thallium	**79.6**		mg/kg wet	3.00	71.2		112	78.26-121.73		
Vanadium	**56.2**		mg/kg wet	1.50	55.2		102	76.63-123.36		
Zinc	**94.6**		mg/kg wet	3.60	97.5		97	81.48-118.52		
Chromium	**71.3**		mg/kg wet	1.00	70.2		102	78.67-120.58		
Arsenic	**71.8**		mg/kg wet	1.50	71.7		100	78.41-121.58		
Barium	**111**		mg/kg wet	1.00	105		106	82.75-117.73		
Reference (1423837-SRM2)					Prepared: 09-Oct-14 Analyzed: 15-Oct-14					
Lead	**63.0**		mg/kg wet	1.50	67.1		94	81.95-118.79		
Zinc	**95.1**		mg/kg wet	3.60	95.4		100	81.48-118.52		
Vanadium	**55.6**		mg/kg wet	1.50	54.0		103	76.63-123.36		
Thallium	**76.7**		mg/kg wet	3.00	69.6		110	78.26-121.73		
Antimony	**19.2**		mg/kg wet	5.00	44.8		43	25-209.45		
Nickel	**61.0**		mg/kg wet	1.00	62.1		98	82.11-118.69		
Copper	**85.2**		mg/kg wet	1.00	84.8		101	81.54-118.45		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423837 - SW846 3050B										
Reference (1423837-SRM2)						Prepared: 09-Oct-14 Analyzed: 15-Oct-14				
Chromium	**69.3**		mg/kg wet	1.00	68.6		101	78.67-120.58		
Cadmium	**46.7**		mg/kg wet	0.500	48.4		96	81.66-117.71		
Beryllium	**50.8**		mg/kg wet	0.500	48.5		105	82.83-117.58		
Arsenic	**69.2**		mg/kg wet	1.50	70.1		99	78.41-121.58		
Silver	**19.6**		mg/kg wet	1.50	20.3		97	74.87-125.37		
Selenium	**87.3**		mg/kg wet	1.50	89.3		98	77.4-122.59		
Barium	**109**		mg/kg wet	1.00	102		107	82.75-117.73		
Batch 1423838 - EPA200/SW7000 Series										
Blank (1423838-BLK1)						Prepared: 09-Oct-14 Analyzed: 15-Oct-14				
Mercury	< 0.0273		mg/kg wet	0.0273						
Reference (1423838-SRM1)						Prepared: 09-Oct-14 Analyzed: 15-Oct-14				
Mercury	**4.93**	D	mg/kg wet	0.600	4.34		114	72.86-127.13		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1423385 - General Preparation										
Duplicate (1423385-DUP1)			**Source: SB97409-04**			Prepared & Analyzed: 03-Oct-14				
% Solids	**17.1**		%			17.3			1	5
Duplicate (1423385-DUP2)			**Source: SB97409-05**			Prepared & Analyzed: 03-Oct-14				
% Solids	**15.4**		%			15.8			3	5

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 79383 - SW3545A										
LCS (LCS-79383)					Prepared: 07-Oct-14 Analyzed: 08-Oct-14					
Naphthalene	**106.6**		ug/Kg	66	166.7		63.9	19-102		
2-Methylnaphthalene	**130.8**		ug/Kg	66	166.7		78.5	19-112		
Acenaphthylene	**97.13**		ug/Kg	66	166.7		58.3	23-134		
Acenaphthene	**91.26**		ug/Kg	66	166.7		54.8	33-113		
Fluorene	**108.1**		ug/Kg	66	166.7		64.9	32-122		
Phenanthrene	**116.8**		ug/Kg	66	166.7		70.1	38-108		
Anthracene	**93.05**		ug/Kg	66	166.7		55.8	35-114		
Fluoranthene	**104.1**		ug/Kg	66	166.7		62.5	41-117		
Pyrene	**117.8**		ug/Kg	66	166.7		70.7	39-119		
Benzo(a)anthracene	**122.0**		ug/Kg	66	166.7		73.2	39-111		
Chrysene	**141.4**		ug/Kg	66	166.7		84.8	36-112		
Benzo(b)fluoranthene	**106.8**		ug/Kg	66	166.7		64.1	39-128		
Benzo(k)fluoranthene	**121.9**		ug/Kg	66	166.7		73.1	30-133		
Benzo(a)pyrene	**112.1**		ug/Kg	66	166.7		67.3	43-119		
Indeno(1,2,3-cd)pyrene	**139.9**		ug/Kg	66	166.7		83.9	48-119		
Dibenzo(a,h)anthracene	**92.27**		ug/Kg	66	166.7		55.4	48-121		
Benzo(g,h,i)perylene	**88.10**		ug/Kg	66	166.7		52.9	45-116		
1-Methylnaphthalene	**94.45**		ug/Kg	66	166.7		56.7	50-150		
Surrogate: Nitrobenzene-d5	*123.8*		ug/Kg		*166.7*		*74.3*	*45-135*		
Surrogate: 2-Fluorobiphenyl	*112.2*		ug/Kg		*166.7*		*67.3*	*45-135*		
Surrogate: Terphenyl-d14	*106.5*		ug/Kg		*166.7*		*63.9*	*45-135*		
LCS Dup (LCSD-79383)					Prepared: 07-Oct-14 Analyzed: 08-Oct-14					
Naphthalene	**99.41**		ug/Kg	66	166.7		59.6	19-102	6.94	40.0
2-Methylnaphthalene	**105.5**		ug/Kg	66	166.7		63.3	19-112	21.4	40.0
Acenaphthylene	**88.76**		ug/Kg	66	166.7		53.3	23-134	9.01	40.0
Acenaphthene	**101.2**		ug/Kg	66	166.7		60.7	33-113	10.4	40.0
Fluorene	**120.9**		ug/Kg	66	166.7		72.5	32-122	11.1	40.0
Phenanthrene	**125.4**		ug/Kg	66	166.7		75.3	38-108	7.09	40.0
Anthracene	**79.16**		ug/Kg	66	166.7		47.5	35-114	16.1	40.0
Fluoranthene	**106.9**		ug/Kg	66	166.7		64.2	41-117	2.67	40.0
Pyrene	**90.51**		ug/Kg	66	166.7		54.3	39-119	26.2	40.0
Benzo(a)anthracene	**112.6**		ug/Kg	66	166.7		67.5	39-111	8.00	40.0
Chrysene	**113.3**		ug/Kg	66	166.7		68.0	36-112	22.1	40.0
Benzo(b)fluoranthene	**136.9**		ug/Kg	66	166.7		82.2	39-128	24.7	40.0
Benzo(k)fluoranthene	**101.3**		ug/Kg	66	166.7		60.8	30-133	18.4	40.0
Benzo(a)pyrene	**106.9**		ug/Kg	66	166.7		64.1	43-119	4.78	40.0
Indeno(1,2,3-cd)pyrene	**112.2**		ug/Kg	66	166.7		67.3	48-119	22.0	40.0
Dibenzo(a,h)anthracene	**89.77**		ug/Kg	66	166.7		53.9	48-121	2.75	40.0
Benzo(g,h,i)perylene	**87.17**		ug/Kg	66	166.7		52.3	45-116	1.06	40.0
1-Methylnaphthalene	**106.8**		ug/Kg	66	166.7		64.1	50-150	12.3	40.0
Surrogate: Nitrobenzene-d5	*82.14*		ug/Kg		*166.7*		*49.3*	*45-135*		
Surrogate: 2-Fluorobiphenyl	*126.3*		ug/Kg		*166.7*		*75.8*	*45-135*		
Surrogate: Terphenyl-d14	*109.2*		ug/Kg		*166.7*		*65.5*	*45-135*		
Blank (MB-79383)					Prepared: 07-Oct-14 Analyzed: 08-Oct-14					
Naphthalene	< 66	U	ug/Kg	66				-		
2-Methylnaphthalene	< 66	U	ug/Kg	66				-		
Acenaphthylene	< 66	U	ug/Kg	66				-		
Acenaphthene	< 66	U	ug/Kg	66				-		
Fluorene	< 66	U	ug/Kg	66				-		
Phenanthrene	< 66	U	ug/Kg	66				-		
Anthracene	< 66	U	ug/Kg	66				-		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 79383 - SW3545A										
Blank (MB-79383)					Prepared: 07-Oct-14 Analyzed: 08-Oct-14					
Fluoranthene	< 66	U	ug/Kg	66				-		
Pyrene	< 66	U	ug/Kg	66				-		
Benzo(a)anthracene	< 66	U	ug/Kg	66				-		
Chrysene	< 66	U	ug/Kg	66				-		
Benzo(b)fluoranthene	< 66	U	ug/Kg	66				-		
Benzo(k)fluoranthene	< 66	U	ug/Kg	66				-		
Benzo(a)pyrene	< 66	U	ug/Kg	66				-		
Indeno(1,2,3-cd)pyrene	< 66	U	ug/Kg	66				-		
Dibenzo(a,h)anthracene	< 66	U	ug/Kg	66				-		
Benzo(g,h,i)perylene	< 66	U	ug/Kg	66				-		
1-Methylnaphthalene	< 66	U	ug/Kg	66				-		
Surrogate: Nitrobenzene-d5	*84.25*		ug/Kg		*166.7*		*50.6*	*45-135*		
Surrogate: 2-Fluorobiphenyl	*114.1*		ug/Kg		*166.7*		*68.5*	*45-135*		
Surrogate: Terphenyl-d14	*118.9*		ug/Kg		*166.7*		*71.4*	*45-135*		

Analyte(s)	Column	% Breakdown	Limit
Batch S411466			
Performance Mix (S411466-PEM1)			
4,4'-DDT (p,p')	1	3.9	15.0
Endrin	1	10.8	15.0
4,4'-DDT (p,p')	2	2.9	15.0
Endrin	2	8.6	15.0
Performance Mix (S411466-PEM2)			
4,4'-DDT (p,p')	1	3.5	15.0
Endrin	1	12.5	15.0
4,4'-DDT (p,p')	2	2.9	15.0
Endrin	2	9.0	15.0
Batch S411635			
Performance Mix (S411635-PEM1)			
4,4'-DDT (p,p')	1	3.3	15.0
Endrin	1	4.2	15.0
4,4'-DDT (p,p')	2	2.2	15.0
Endrin	2	3.4	15.0
Performance Mix (S411635-PEM2)			
4,4'-DDT (p,p')	1	7.3	15.0
Endrin	1	4.8	15.0
4,4'-DDT (p,p')	2	4.1	15.0
Endrin	2	1.9	15.0

Notes and Definitions

D	Data reported from a dilution
DC9	Matrix interference affected the internal standard recovery on the primary column. The results from the confirmation column were used.
J	Reading was less than the PQL but greater than the MDL or Estimated concentration for Tentatively Identified Compound
R06	MRL raised to correlate to batch QC reporting limits.
S	Spike recovery falls outside of the control limit
SGC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
U	Compound not detected below method detection limit at or above the MRL.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:
June O'Connor
Nicole Leja
Rebecca Merz

SB97409 By

SPECTRUM ANALYTICAL, INC.
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HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
☑ Standard TAT - 7 to 10 business days
☐ Rush TAT - Date Needed: _____
All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: AECOM
500 Enterprise Dr
Rocky Hill, CT 06067
Telephone #: 860-283-5800
Project Mgr: Malcom Beeler

Invoice To: SAME
Attn: Kris van Naerssen
P.O No.: _____ RQN _____

Project No: 60225155
Site Name: Greenwich High School
Location: Greenwich State CT
Sampler(s): Kris Van Naerssen/Clare Murphy-Hagan

1=Na_2S2O_3 **2**=HCl **3**=H_2SO_4 **4**=HNO_3 **5**=NaOH **6**=Ascorbic Acid **7**=CH_3OH
8= $NaHSO_4$ **9**= Deionized Water **10**=H_3PO_4 **11**= _____ **12**= _____

List Preservative Code below:

QA/QC Reporting Notes:
*additional charges may appply

DW=Dinking Water **GW**= Groundwater **WW**= Waste Water
O= Oil **SW**= surface Water **SO**=Soil **SL**= Sludge **A**= Air
X1= _____ X2= _____ X3= _____

G= Grab **C**=Compsite

Lab ID	Sample ID	Date	Time	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Metals (Method 6000/7000 series)	PAHs (Method 8270 SIM)	Pesticides (Method 8081)	PCBs (Methods 3540 and 8082)	
97409-01	SED-DOWNSTREAM-01-10-02-14	10/02/2014	11:20	G	SO		2			x	x	x	x	
02	SED-DOWNSTREAM-02-10-01-14	10/01/2014	18:12	G	SO		2			x	x	x	x	
03	SED-DOWNSTREAM-03-10-01-14	10/01/2014	17:02	G	SO		2			x	x	x	x	
04	SED-DOWNSTREAM-04-10-01-14	10/01/2014	16:10	G	SO		2			x	x	x	x	
05	SED-DOWNSTREAM-05-10-01-14	10/01/2014	15:15	G	SO		2			x	x	x	x	
06	SED-DOWNSTREAM-06-10-01-14	10/01/2014	12:30	G	SO		2			x	x	x	x	
07	SED-DOWNSTREAM-01-10-0214-FD	10/02/2014	11:20	G	SO		2			x	x	x	x	

MA DEP MCP CAM Report ☐ yes ☐ no
CT DPH RCP Report ☐ yes ☐ no
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

Relinquished by:	Received by:	Date	Time	Temp °C
		10/2/14	14:00	
	Mary	10214	1825	0.5

05/06 IF 01 10214 Mary

☑ EDD format: EQUIS
☑ E-mail to: kris.vannaerssen@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☑ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

SB97409 By

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HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- [x] Standard TAT - 7 to 10 business days
- [ ] Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: AECOM
500 Enterprise Dr
Rocky Hill, CT 06067
Telephone #: 860-283-5800
Project Mgr: Malcom Beeler

Invoice To: SAME
Attn: Kris van Naerssen
P.O No.: _____ RQN _____

Project No: 60225155
Site Name: Greenwich High School
Location: Greenwich State CT
Sampler(s): Kris Van Naerssen/Clare Murphy-Hagan

1=Na_2S2O_3 **2**=HCl **3**=H_2SO_4 **4**=HNO_3 **5**=NaOH **6**=Ascorbic Acid **7**=CH_3OH
8= $NaHSO_4$ **9**= Deionized Water **10**=H_3PO_4 **11**= _____ **12**= _____

List Preservative Code below:

QA/QC Reporting Notes:
*additional charges may appply

DW=Dinking Water **GW**= Groundwater **WW**= Waste Water
O= Oil **SW**= surface Water **SO**=Soil **SL**= Sludge **A**= Air
X1= _____ **X2**= _____ **X3**= _____

G= Grab **C**=Compsite

Lab ID	Sample ID	Date	Time	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: Metals (Method 6000/7000 series) *	PAHs (Method 8270 SIM)	Pesticides (Method 8081)	PCBs (Methods 3540 and 8082)
97409-01	SED-DOWNSTREAM-01-10-02-14	10/02/2014	11:20	G	SO		2			x	x	x	x
02	SED-DOWNSTREAM-02-10-01-14	10/01/2014	18:12	G	SO		2			x	x	x	x
03	SED-DOWNSTREAM-03-10-01-14	10/01/2014	17:02	G	SO		2			x	x	x	x
04	SED-DOWNSTREAM-04-10-01-14	10/01/2014	16:10	G	SO		2			x	x	x	x
05	SED-DOWNSTREAM-05-10-01-14	10/01/2014	15:15	G	SO		2			x	x	x	x
06	SED-DOWNSTREAM-06-10-01-14	10/01/2014	12:30	G	SO		2			x	x	x	x
07	SED-DOWNSTREAM-01-10-0214-FD	10/02/2014	11:20	G	SO		2			x	x	x	x

MA DEP MCP CAM Report ☐ yes ☐ no
CT DPH RCP Report ☐ yes ☐ no
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

*RSR 15 Metals per client request
BM 10/6

CT RCP per project History
BM 10/6

05/06/15 IP 01 mary
10214

Relinquished by:	Received by:	Date	Time	Temp °C
		10/2/14	14:00	
	mary	10214	1825	0.5

- [x] EDD format: EQUIS
- [x] E-mail to: kris.vannaerssen@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☑ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Appendix D

Summary of Chemicals of Potential Ecological Concern Selection

Table D-1
Summary of Surface Water Chemicals of Potential Ecological Concern

Greenwich High School
10 Hillside Road
Grenwich, CT

Analyte	CAS Number	Class	Subclass	BCC	Total Number of Samples	Number of Detections	Detection Frequency (%)	Minimum Detected Concentration (ug/l)	Average Concentration (ug/l)	Maximum Detected Concentration (ug/l)	Minimum Reporting Limit (ug/l)	Maximum Reporting Limit (ug/l)	SW SL Lower of Aquatic vs Amphibian (ug/l)	COPEC Determination
Mercury	7439-97-6	Inorganic		X	5	0	0%	ND	ND	ND	<0.20	<0.20	0.77	ND COPEC: MRL exceeds SL
Antimony	7440-36-0	Inorganic			5	0	0%	ND	ND	ND	<6.0	<6.0	30	Not a COPEC: MRL does not exceed SL
Arsenic	7440-38-2	Inorganic			5	0	0%	ND	ND	ND	<4.0	<4.0	150	Not a COPEC: MRL does not exceed SL
Barium	7440-39-3	Inorganic			5	5	100%	119	124	135			3.9	COPEC: Max sample value exceeds SL
Beryllium	7440-41-7	Inorganic			5	0	0%	ND	ND	ND	<2.0	<2.0	0.66	ND COPEC: MRL exceeds SL
Cadmium	7440-43-9	Inorganic			5	0	0%	ND	ND	ND	<2.5	<2.5	0.125	ND COPEC: MRL exceeds SL
Chromium	7440-47-3	Inorganic			5	0	0%	ND	ND	ND	<5.0	<5.0	11	Not a COPEC: MRL does not exceed SL
Copper	7440-50-8	Inorganic			5	3	60%	5.0	6.07	7.6			4.8	COPEC: Max sample value exceeds SL
Lead	7439-92-1	Inorganic			5	0	0%	ND	ND	ND	<7.5	<7.5	1.2	ND COPEC: MRL exceeds SL
Nickel	7440-02-0	Inorganic			5	0	0%	ND	ND	ND	<5.0	<5.0	28.9	Not a COPEC: MRL does not exceed SL
Selenium	7782-49-2	Inorganic			5	0	0%	ND	ND	ND	<15.0	<15.0	5	ND COPEC: MRL exceeds SL
Silver	7440-22-4	Inorganic			5	0	0%	ND	ND	ND	<5.0	<5.0	0.36	ND COPEC: MRL exceeds SL
Thallium	7440-28-0	Inorganic			5	0	0%	ND	ND	ND	<5.0	<5.0	12	Not a COPEC: MRL does not exceed SL
Vanadium	7440-62-2	Inorganic			5	0	0%	ND	ND	ND	<5.0	<5.0	19	Not a COPEC: MRL does not exceed SL
Zinc	7440-66-6	Inorganic			5	0	0%	ND	ND	ND	<45.0	<45.0	65	Not a COPEC: MRL does not exceed SL
alpha-BHC	319-84-6	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	2.2	Not a COPEC: MRL does not exceed SL
beta-BHC	319-85-7	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	2.2	Not a COPEC: MRL does not exceed SL
delta-BHC	319-86-8	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	141	Not a COPEC: MRL does not exceed SL
gamma-BHC (Lindane)	58-89-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	0.08	Not a COPEC: MRL does not exceed SL
Heptachlor	76-44-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.002	<0.002	0.0038	Not a COPEC: MRL does not exceed SL
Aldrin	309-00-2	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	3.0	Not a COPEC: MRL does not exceed SL
Heptachlor epoxide	1024-57-3	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.002	<0.002	0.0038	Not a COPEC: MRL does not exceed SL
Endosulfan I	959-98-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.002	<0.002	0.056	Not a COPEC: MRL does not exceed SL
Dieldrin	60-57-1	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	0.056	Not a COPEC: MRL does not exceed SL
4,4'-DDE (p,p')	72-55-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	105	Not a COPEC: MRL does not exceed SL
Endrin	72-20-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	0.036	Not a COPEC: MRL does not exceed SL
Endosulfan II	33213-65-9	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	0.056	Not a COPEC: MRL does not exceed SL
4,4'-DDD (p,p')	72-54-8	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.004	<0.004	0.011	Not a COPEC: MRL does not exceed SL
Endosulfan sulfate	1031-07-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	2.22	Not a COPEC: MRL does not exceed SL
4,4'-DDT (p,p')	50-29-3	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.004	<0.004	0.0005	ND COPEC: MRL exceeds SL
Methoxychlor	72-43-5	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	0.03	Not a COPEC: MRL does not exceed SL
Endrin ketone	53494-70-5	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	NA	Not a COPEC: No detects present and SLNA
Endrin aldehyde	7421-93-4	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.004	<0.004	NA	Not a COPEC: No detects present and SLNA
alpha-Chlordane	5103-71-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	0.0022	Not a COPEC: MRL does not exceed SL
gamma-Chlordane	5566-34-7	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.002	<0.002	NA	Not a COPEC: No detects present and SLNA
Toxaphene	8001-35-2	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.053	<0.054	0.0002	ND COPEC: MRL exceeds SL
Chlordane	57-74-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.007	<0.007	0.0043	ND COPEC: MRL exceeds SL
Alachlor	15972-60-8	PCB		X	5	0	0%	ND	ND	ND	<0.002	<0.002	0.014	Not a COPEC: MRL does not exceed SL
Acenaphthene	83-32-9	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	23	Not a COPEC: MRL does not exceed SL
Acenaphthylene	208-96-8	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	NA	Not a COPEC: No detects present and SLNA
1-Methylnaphthalene	90-12-0	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	2.1	Not a COPEC: MRL does not exceed SL
Anthracene	120-12-7	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	0.73	Not a COPEC: MRL does not exceed SL
Benzo (a) anthracene	56-55-3	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	0.027	ND COPEC: MRL exceeds SL
Benzo (a) pyrene	50-32-8	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	0.014	ND COPEC: MRL exceeds SL
Benzo (b) fluoranthene	205-99-2	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	9.1	Not a COPEC: MRL does not exceed SL
Benzo (g,h,i) perylene	191-24-2	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	NA	Not a COPEC: No detects present and SLNA
Benzo (k) fluoranthene	207-08-9	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	NA	Not a COPEC: No detects present and SLNA
Chrysene	218-01-9	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	NA	Not a COPEC: No detects present and SLNA
Dibenzo (a,h) anthracene	53-70-3	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	NA	Not a COPEC: No detects present and SLNA
Fluoranthene	206-44-0	PAH	HPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	8.1	Not a COPEC: MRL does not exceed SL
Fluorene	86-73-7	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	3.9	Not a COPEC: MRL does not exceed SL
Indeno (1,2,3-cd) pyrene	193-39-5	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	4.3	Not a COPEC: MRL does not exceed SL
2-Methylnaphthalene	91-57-6	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	4.7	Not a COPEC: MRL does not exceed SL
Naphthalene	91-20-3	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	24	Not a COPEC: MRL does not exceed SL
Phenanthrene	85-01-8	PAH	LPAH		5	0	0%	ND	ND	ND	<0.050	<0.050	6.3	Not a COPEC: MRL does not exceed SL
Pyrene	129-00-0	PAH	HPAH	X	5	0	0%	ND	ND	ND	<0.050	<0.050	0.025	ND COPEC: MRL exceeds SL

Notes:
BCC = bioaccumulative compound
COPEC = chemical of potential ecological concern
MDC = maximum detected concentration
ug/l = micrograms per liter
MRL = maximum reporting limit
NA = not available
ND COPEC = Non-detect chemical of potential concern
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
SL = screening level
SLNA = screening level not available

Table D-2
Summary of Sediment Chemicals of Potential Ecological Concern

Greenwich High School
10 Hillside Road
Grenwich, CT

Analyte	CAS Number	Class	Subclass	BCC	Total Number of Samples	Number of Detections	Detection Frequency (%)	Minimum Detected Concentration (mg/kg)	Average Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Minimum Reporting Limit (mg/kg)	Maximum Reporting Limit (mg/kg)	Sediment Threshold SL (mg/kg)	COPEC Determination
Antimony	7440-36-0	Inorganic			5	0	0%	ND	ND	ND	<6.82	<71.9	0.16	ND COPEC: MRL exceeds SL
Arsenic	7440-38-2	Inorganic			5	4	80%	6.5	11	14	<6.82	<71.9	9.79	COPEC: Max sample value exceeds SL
Beryllium	7440-41-7	Inorganic			5	0	0%	ND	ND	ND	<0.682	<7.19	NA	Not a COPEC: No detects present and SLNA
Cadmium	7440-43-9	Inorganic			5	1	20%	2.8	2.8	2.8	<0.682	<7.19	0.99	COPEC: Max sample value exceeds SL
Chromium	7440-47-3	Inorganic			5	5	100%	38	72	96			43	COPEC: Max sample value exceeds SL
Copper	7440-50-8	Inorganic			5	5	100%	82	303	416			32	COPEC: Max sample value exceeds SL
Lead	7439-92-1	Inorganic			5	5	100%	148	224	305			36	COPEC: Max sample value exceeds SL
Nickel	7440-02-0	Inorganic			5	5	100%	21.9	45	57			22.7	COPEC: Max sample value exceeds SL
Selenium	7782-49-2	Inorganic			5	0	0%	ND	ND	ND	<2.05	<21.6	2.0	ND COPEC: MRL exceeds SL
Silver	7440-22-4	Inorganic			5	0	0%	ND	ND	ND	<2.06	<21.7	1.0	ND COPEC: MRL exceeds SL
Thallium	7440-28-0	Inorganic			5	0	0%	ND	ND	ND	<4.09	<43.2	NA	Not a COPEC: No detects present and SLNA
Vanadium	7440-62-2	Inorganic			5	5	100%	41	80	101			50	COPEC: Max sample value exceeds SL
Zinc	7440-66-6	Inorganic			5	5	100%	208	452	580			121	COPEC: Max sample value exceeds SL
Barium	7440-39-3	Inorganic			5	5	100%	229	618	823			0.70	COPEC: Max sample value exceeds SL
Mercury	7439-97-6	Inorganic		X	5	5	100%	0.16	0.46	0.58			0.18	COPEC: Max sample value exceeds SL
alpha-BHC [2C]	319-84-6	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0060	ND COPEC: MRL exceeds SL
beta-BHC [2C]	319-85-7	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0050	ND COPEC: MRL exceeds SL
delta-BHC [2C]	319-86-8	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	6.4	Not a COPEC: MRL value does not exceed SL
gamma-BHC (Lindane) [2C]	58-89-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00462	<0.0443	0.0024	ND COPEC: MRL exceeds SL
Heptachlor [2C]	76-44-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.068	ND COPEC: MRL exceeds SL
Aldrin [2C]	309-00-2	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0020	ND COPEC: MRL exceeds SL
Heptachlor epoxide [2C]	1024-57-3	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0025	ND COPEC: MRL exceeds SL
Endosulfan I [2C]	959-98-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0029	ND COPEC: MRL exceeds SL
Dieldrin [2C]	60-57-1	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0019	ND COPEC: MRL exceeds SL
4,4'-DDE (p,p') [2C]	72-55-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	0.0032	ND COPEC: MRL exceeds SL
Endrin [2C]	72-20-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	0.0022	ND COPEC: MRL exceeds SL
Endosulfan II [2C]	33213-65-9	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	0.014	ND COPEC: MRL exceeds SL
4,4'-DDD (p,p') [2C]	72-54-8	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.0123	<0.118	0.0049	ND COPEC: MRL exceeds SL
Endosulfan sulfate [2C]	1031-07-8	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	0.0054	ND COPEC: MRL exceeds SL
4,4'-DDT (p,p') [2C]	50-29-3	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.0123	<0.118	0.0042	COPEC: Max sample value exceeds SL
Methoxychlor [2C]	72-43-5	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	0.019	ND COPEC: MRL exceeds SL
Endrin ketone [2C]	53494-70-5	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	NA	Not a COPEC: No detects present and SLNA
Endrin aldehyde [2C]	7421-93-4	Pesticide	Insecticide		5	0	0%	ND	ND	ND	<0.0123	<0.118	NA	Not a COPEC: No detects present and SLNA
alpha-Chlordane [2C]	5103-71-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	NA	Not a COPEC: No detects present and SLNA
gamma-Chlordane [2C]	5566-34-7	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.00771	<0.0739	NA	Not a COPEC: No detects present and SLNA
Toxaphene [2C]	8001-35-2	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.154	<1.480	0.028	ND COPEC: MRL exceeds SL
Chlordane [2C]	57-74-9	Pesticide	Insecticide	X	5	0	0%	ND	ND	ND	<0.0308	<0.296	0.0032	ND COPEC: MRL exceeds SL
Alachlor [2C]	15972-60-8	PCB			5	0	0%	ND	ND	ND	<0.00771	<0.0739	NA	Not a COPEC: No detects present and SLNA
Aroclor-1016	12674-11-2	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1221	11104-28-2	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1232	11141-16-5	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1242	53469-21-9	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1248	12672-29-6	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1254	11097-69-1	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	0.06	ND COPEC: MRL exceeds SL
Aroclor-1260	11096-82-5	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1262	37324-23-5	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Aroclor-1268	11100-14-4	PCB		X	5	0	0%	ND	ND	ND	<0.0308	<0.294	NA	Not a COPEC: No detects present and SLNA
Naphthalene	91-20-3	PAH	LPAH		5	0	0%	ND	ND	ND	<0.090	<1.000	0.18	ND COPEC: MRL exceeds SL
2-Methylnaphthalene	91-57-6	PAH	LPAH		5	0	0%	ND	ND	ND	<0.090	<1.000	0.20	ND COPEC: MRL exceeds SL
Acenaphthylene	208-96-8	PAH	LPAH		5	0	0%	ND	ND	ND	<0.090	<1.000	0.0059	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Acenaphthene	83-32-9	PAH	LPAH		5	0	0%	ND	ND	ND	<0.090	<1.000	0.0067	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Fluorene	86-73-7	PAH	LPAH		5	1	20%	0.61	0.61	0.61	<0.090	<1.000	0.077	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Phenanthrene	85-01-8	PAH	LPAH		5	5	100%	0.67	3	9.5			0.204	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Anthracene	120-12-7	PAH	LPAH		5	3	60%	0.31	1	1.4	<0.090	<1.000	0.057	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Fluoranthene	206-44-0	PAH	HPAH		5	5	100%	2.2	8	24			0.42	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Pyrene	129-00-0	PAH	HPAH	X	5	5	100%	1.8	6	19			0.20	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Benzo(a)anthracene	56-55-3	PAH	HPAH	X	5	5	100%	0.81	3	9.6			0.11	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Chrysene	218-01-9	PAH	HPAH	X	5	5	100%	0.97	3.3	9.3			0.17	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Benzo(b)fluoranthene	205-99-2	PAH	HPAH	X	5	5	100%	1.2	4.4	13			10.4	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Benzo(k)fluoranthene	207-08-9	PAH	HPAH	X	5	4	80%	0.57	2.4	6.5	<90	<1000	0.027	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Benzo(a)pyrene	50-32-8	PAH	HPAH	X	5	4	80%	0.81	3.3	9.1	<90	<1000	0.15	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Indeno(1,2,3-cd)pyrene	193-39-5	PAH	HPAH	X	5	4	80%	0.74	2.9	7.9	<90	<1000	0.017	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Dibenzo(a,h)anthracene	53-70-3	PAH	HPAH	X	5	0	0%	ND	ND	ND	<90	<1000	0.033	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
Benzo(g,h,i)perylene	191-24-2	PAH	HPAH	X	5	4	80%	0.61	2.3	6.0	<90	<1000	0.17	COPEC: Max sample value exceeds SL. Evaluated on a total PAH basis.
1-Methylnaphthalene	90-12-0	PAH	LPAH		5	0	0%	ND	ND	ND	<90	<1000	NA	Not a COPEC: No detects present and SLNA
Total Low Molecular Weight PAHs	RACALC-LPAH	PAH	HPAH	X	5	5	100%	0.31	1.49	11.5			0.08	COPEC: Max sample value exceeds SL
Total High Molecular Weight PAHs	RACALC-HPAH	PAH	LPAH		5	5	100%	0.57	3.9	104			0.193	COPEC: Max sample value exceeds SL
Total PAHs	RACALC-PAH	PAH			5	5	100%	0.31	3.29	116			1.6	COPEC: Max sample value exceeds SL

Notes:
BCC = bioaccumulative compound
COPEC = chemical of potential ecological concern
MDC = maximum detected concentration
mg/kg = milligrams per kilogram
MRL = maximum reporting limit
NA = not available
ND COPEC = Non-detect chemical of potential concern
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
SL = screening level
SLNA = screening level not available
PCBs - individual PCBs (as Aroclor or as homologues) are presented for reference only. PCBs are evaluated for sediment invertebrates and wildlife on a total PCB basis.
PAHs - indivual PAHs are presented for reference only. PAHs are evaluated on a total basis.
DDx - individual 4,4'-substituted DDT isomers (4,4'DDD and 4'4-DDE) are presented for reference only. DDT isomers are evaluated for sediment invertebrates and wildlife on a total DDx basis.
Endosulfans - individual endosulfan isomers (4endosulfan I, endosulfan II and endosulfan sulfate) are presented for reference only. Endosulfan is evaluated for sediment invertebrates and wildlife on a total endosulfan basis.

Appendix E

Evaluation of Aquatic-feeding Birds and Mammals

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FOOD WEB EVALUATION FOR AQUATIC-FEEDING BIRDS AND MAMMALS
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Receptor Species	Average Body Weight (kg)	Food Ingestion Rate (kg_{dw}/day)	Dietary Assumptions (%; kg_{dw}/day)			Incidental Soil/Sediment Ingestion (%; kg_{dw}/day)	Water Ingestion Rate (L/day)	Home/ feeding range (ha)	Area Use Factor - Step 3A Evaluation
			Plants	Fish	Benthic Invertebrates				
Birds									
Mallard *(Anas platyrhynchos)*	1.043 [a]	0.0523 [b]	25% [c] 0.01323	--	75% [d] 0.0391	2.0% [d] 0.00105	0.0607 [e]	307 - 719 [f]	0.007
Great Blue Heron *(Ardea herodias)*	2.229 [a]	0.0970 [b]	--	98% [c] 0.09506	2% [d] 0.00194	5% [e] 0.00485	0.10 [f]	0.6 - 8.4 [g]	0.80
Mammals									
Muskrat *Ondatra zibethicus*	0.837 [a]	0.0598 [b]	100% [c] 0.05976	--	--	0.009% [d] 0.0000054	0.08435 [e]	0.17 [f]	1
Mink *Neovison vison*	0.568 [a]	0.0307 [b]	2% [c] 0.0006	85% [c] 0.0261	13% [d] 0.00399	9.4% [e] 0.00289	0.0595 [f]	7.8 - 20.4 [g]	0.26
Raccoon *(Procyon lotor)*	5.740 [a]	0.153 [b]	39% [c] 0.0598	3% [d] 0.0046	58% [d] 0.0886	9.4% [e] 0.014	0.477 [f]	5.3 - 376 [g]	0.019

General Notes:

See individual organism notes for source, units, and conversion.

All receptors assumed to be present and actively foraging year-round for the Step 2 evaluation (area use factor and exposure duration set at 100%).

Area Use Factor for Step 3A is determined by dividing the mean home/foraging range by the approximate combined area of Upper, Middle, and Lower Milbrook Ponds (3.6 ha).

BW - Body Weight.

DW - Dry Weight.

FIR - Food Ingestion Rate.

Kg - Kilogram.

L/day - Liters per Day.

Notes for Mallard

[a] Mean adult female body weight (male, 1.225 kg) per Nelson and Martin (1953) as cited in US EPA (1993).
[b] Estimated using allometric equation per Nagy (2001) based on the adult male body weight of per Nelson and Martin (1953) as cited in US EPA (1993). Value expressed on a dry weight basis.
[c] Plant ingestion derived from breeding adult female data per Swanson (1985). Value is the mean of spring-time values (April, May, and June). (USEPA, 1993).
[d] Invertebrate ingestion derived from breeding adult female data per Swanson (1985). Value is the mean of spring-time values (April, May, and June). (USEPA, 1993)
[d] Calculated based on soil fraction in diet (2.0% of whole diet, per EPA 1993) and food ingestion (Kg/dayay)
[e] Allometric equation (as cited in EPA 1993) for the estimation of water intake for all birds is WI=0.059*BW(g)0.67, where WI = water ingestion (l/day).
[f] Range for adult, non-breeding females (USEPA, 1993).

Notes for Great Blue Heron

[a] Mean female/male body weight per Quinney (1982). (USEPA, 1993)
[b] Calculated based on food ingestion rate and the mean of adult female/male body weight presented by Quinney (1982).
[c] Fish ingestion is primarily composed of open-water fish per Alexander (1977). (USEPA, 1993).
[d] Invertebrate ingestion is primarily composed of crustaceans and amphibians per Alexander (1977). (USEPA, 1993).
[e] Calculated based on soil ingestion (Kg/day) and proportion of diet: FI (0.097 kg $_{dw}$/d x Ps (0.05. Incidental soil ingestion is derived from the Eco-SSL wildlife exposure model, assuming 100% small mammal diet for the red-tailed hawk. .
[f] Allometric equation (as cited in EPA, 1993) for the estimation of water intake for all birds is WI=0.059*BW $^{0.67}$ (kg), where WI = water ingestion (L/day).
[g] Range is the mean foraging ranges for adult birds in freshwater marsh and estuary habitats (USEPA, 1993).

APPENDIX E TABLE 1
EXPOSURE PARAMETERS FOR ECOLOGICAL RECEPTORS - DOWNSTREAM
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GREENWICH, CT

Notes for Muskrat
[a] Adult (springtime) mean female body weight (male, 0.909 kg) per Reeves and Williams (1956).(USEPA, 1993).
[b] Calculated based on an exclusive diet of greens (Svihla and Svihla,1931) and the body weight of Reeves and Williams (1956).
[c] Muskrat are exclusive (obligate) herbivores (Willner et al., 1975), feeding on aquatic vegetation.
[d] Calculated based on food intake and incidental soil ingestion: SI = FI x Ps
[e] Allometric equation (as cited in EPA 1993) for estimation of water consumption for all mammals is: WI = 0.099 BW0.99 (kg), where WI = water ingestion (L/day).
[f] Mean home range of juvenile and adult animals in marsh habitat (USEPA, 1993).

Notes for Mink
[a] Adult mean female body weight of fall and summer values (male, 1.137 kg) per Mitchell (1961) (USEPA, 1993).
[b] Calculated based on food ingestion rate and the mean of adult female body weight presented by Mitchell (1961).
[c] Value based on percent of stomach contents (wet weight) per Alexander (1977) (USEPA, 1993).
[d] Value based on percent of stomach contents (wet weight) per Alexander (1977) and consists largely of crustaceans. The dietary proportion derived from mammals, birds and amphibians is accounted for by invertebrates. (USEPA, 1993).
[e] Percent soil/sediment in diet estimated from acid-soluble ash of scat of surrogate species used (raccoon) per Beyer et al. (1994). (USEPA, 1993)
[f] Calculated based on water ingestion rate and the mean of adult female body weight per Micthell (1961).
[g] Range for adult females in riparian habitats (USEPA, 1993).

Notes for Raccoon
[a] Mean adult female body weight (male, 6.76 kg) per Nagel (1943). (USEPA, 1993).
[b] Allometric equation (as cited in Nagy 2001) for estimation of food ingestion for all mammals is: FI = 0.0687 BW0.727 (kg), where FI = food ingestion (kg/day). Food ingestion rate (FIR) = FI/BW (kg/kg-BW/day).
[c] Value estimated based on the mean year-round ingestion given as percent found in digestive tract, wet volume (Llewellyn and Uhler, 1952).
[d] Value based on the mean year-round ingestion given as percent found indigestive tract, wet volume (Llewellyn and Uhler 1952). The dietary proportion derived from mammals and amphibians is accounted for as invertebrates.(USEPA, 1993).
[e] Percent soil/sediment in diet estimated from acid-soluble ash of scat per Beyer et al. (1994). (USEPA, 1993).
[f] Water ingestion rate calculated using algorithm for all mammals developed by Calder and Braun, 1983 [WIR (kg/day) = 0.099*BW $^{0.90}$] using average body weight.
[g] Range for adult females in riparian habitat (USEPA, 1993).

APPENDIX E TABLE 2
MEDIA AND TISSUE CONCENTRATIONS - DOWNSTREAM
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

	Measured Media Concentrations [a]		Estimated Benthic Invertebrate Tissue			Estimated Fish Tissue Concentrations					Estimated Plant Tissue		
COPC	Maximum Sediment EPC (mg/kg_{dw})	Maximum Surface Water EPC [Total] (mg/L)	Sediment-to-Invertebrate Uptake Factor [b]		Maximum Benthic Invertebrate (mg/kg_{dw})	Water-to-Fish Uptake Factor [c]		Maximum Fish Tissue (mg/kg_{dw})	Sediment-to-Fish Uptake Factor		Maximum Fish Tissue (mg/kg_{dw})	Soil-to-Plant Uptake Factor [b]		Maximum Plant (mg/kg_{dw})
Inorganics														
ARSENIC	14	ND	0.69	Bechtel-Jacobs (1998b)	9.8	17	OEHHA (2012)	NC	NA [d]		NC	0.038	Bechtel-Jacobs (1998a)	0.54
BARIUM	823	0.14	0.160	Bechtel-Jacobs (1998b)	132	5.2	WDOE (1996)	2.81	NA [d]		NC	0.156	Bechtel-Jacobs (1998a)	128.4
CADMIUM	2.8	ND	7.99	Bechtel-Jacobs (1998b)	22.6	40	OEHHA (2012)	NC	NA [d]		NC	ln(Cp)=0.546*Ln(Cs)-0.475	Bechtel-Jacobs (1998a)	1.10
CHROMIUM, TOTAL	95.5	ND	0.47	Bechtel-Jacobs (1998b)	44.9	21	OEHHA (2012)	NC	NA [d]		NC	0.041	Bechtel-Jacobs (1998a)	3.92
COPPER	416	0.0076	5.25	Bechtel-Jacobs (1998b)	2184	36	NRWQC (HH), EPA (2002)	1.09	NA [d]		NC	ln(Cp)=0.394*Ln(Cs)+0.668	Bechtel-Jacobs (1998a)	21.0
LEAD	305	ND	0.610	Bechtel-Jacobs (1998b)	186	12	OEHHA (2012)	NC	NA [d]		NC	ln(Cp)=0.561*Ln(Cs)-1.328	Bechtel-Jacobs (1998a)	6.6
MERCURY	0.58	ND	2.9	Bechtel-Jacobs (1998b)	1.66	84	OEHHA (2012)	NC	NA [d]		NC	ln(Cp)=0.544*Ln(Cs)-0.996	Bechtel-Jacobs (1998a)	0.3
NICKEL	57	ND	2.32	Bechtel-Jacobs (1998b)	133	21	OEHHA (2012)	NC	NA [d]		NC	ln(Cp)=0.784*Ln(Cs)-2.223	Bechtel-Jacobs (1998a)	2.23
VANADIUM	101	ND	0.088	Bechtel-Jacobs (1998b) [e]	8.9	1	Default	NC	NA [d]		NC	0.00485	Bechtel-Jacobs (1998a)	0.490
ZINC	580	ND	7.5	Bechtel-Jacobs (1998b)	4367	47	NRWQC (HH), USEPA (2002)	NC	NA [d]		NC	ln(Cp)=0.554*Ln(Cs)+1.575	Bechtel-Jacobs (1998a)	164.0
Organics														
TOTAL LMW PAHs	12	ND	0.18	Anthracene used as surrogate (USEPA, 2005)	2	691	Maximum of IPAH BAFs per BCFwin, USEPA (2011)	NC	2.8	Mean of hPAH BSAFs per USEPA (2012) [f]	161.0	ln(Cp)=0.7784*Ln(Cs)-0.9887	Anthracene used as surrogate, EPA (2005)	2.5
TOTAL HMW PAHs	104	ND	0.18	Benzo(a)pyrene used as surrogate, USEPA (2005)	18.8	3268	Maximum of hPAH BAFs per BCFwin, USEPA (2011)	NC	0.26	Mean of hPAH BSAFs per USEPA (2012) [f]	135.7	ln(Cp)=0.975*Ln(Cs)-2.0615	BaP used as surrogate, EPA (2005)	11.8
TOTAL PAHs	116	ND	0.18	USEPA (2005)	21	1860	Maximum of PAH BAFs per BCFwin, USEPA (2011)	NC	1.48	Mean of hPAH BSAFs per USEPA (2012) [f]	856.8	ln(Cp)=0.7912*Ln(Cs)-1.1442	EPA (2005)	13.69

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
Notes continued on following page.

COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
PAHs - Polycyclic Aromatic Hydrocarbons.
USEPA - United States Environmental Protection Agency.

[a] Media summary statistics presented in Table 1 of the 2017 SLERA Addendum.
[b] The 90th percentile values, where available, are used for screening level evaluations. Where they are not available the median value is used.
[c] The fish BSAF value is modified to be presented in dry weight units assuming 75 percent moisture (i.e., modified BSAF / 0.25).
[d] Use of BSAFs for inorganics is not appropriate; therefore, inorganics were not evaluated (ODEQ 2007; USCOE 2009)
[e] Soil invertebrate value used as surrogate.
[f] The invertebrate BSAF is modified from the reported value that is given in organic carbon-lipid normalized units (kg-sediment-oc / kg-lipid-invertebrate). The value is further modified to be presented in dry weight units assuming 80 percent moisture (i.e., modified BSAF / 0.2).

References:

Bechtel-Jacobs Company LLC. 1998a. Empirical Models for the Uptake of Inorganic Chemicals by Plants. Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee. BJC/OR-133. Bechtel-Jacobs Company LLC.
Bechtel-Jacobs Company LLC. 1998b. Biota Sediment Accumulation Factors for Invertebrates: Review and Recommendations for the Oak Ridge Reservation. Bechtel-Jacobs Company LLC, Oak Ridge, Tennessee. BJC/OR-112
Travis, C.C. and Arms, A.D., 1988. "Bioconcentration of Organics in Beef, Milk and Vegetation," Environmental Science and Technology, 22:271-274.
EPA. 2002. National Recommended Water Quality Criteria: 2002 Human Health Criteria Calculation Matrix. United States Environmental Protection Agency, Office of Water (4304T), EPA-822-R-02-012, November 2002.
EPA. 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey: Second Edition. Office of Science and Technology, Washington, D.C. EPA-823-R-04-007. November. Table C-1.
EPA 2005. Ecological Soil Screening Level Guidance. Washington D.C.: Office of Emergency and Remedial Response. November 2003, Revised February 2005.
EPA. 2011. Estimations Programs Interface for Windows (EPI Suite) v. 4.1. BCFBAF Interface. Developed by the EPA's Office of Pollution Prevention Toxics and Syracuse Research Corporation (SRC). January 2011. Available online at: http://www.epa.gov/oppt/exposure/pubs/episuitedl.htm
EPA. 2012. Biota-Sediment Accumulation Factor Data Set (BSAF). Office of Research and Development with OSWER support. Available online at: http://www.epa.gov/med/prods_pubs.htm. Accessed September 7, 2012.
WDOE. 1996. Washington State Department of Ecology, Toxics Cleanup Program.
OEHHA. 2012. Technical Support Document for Exposure Assessment and Stochastic Analysis, FINAL. California Office of Environmental Health Assessment. August, 2012. Available at: oehha.ca.gov/air/hot_spots/pdf/apenh.pdf
ODEQ. 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment, April 17 and April 19, 2007 Public Workshop. Oregon Department of Environmental Quality. Available online at: http://www.deq.state.or.us/lq/pubs/Bioaccumtraining07041
USCOE. 2009. BSAF Database. U.S. Army Corps of Engineers. Technical Point of Contact, Mr. Charlie Lutz. Accessed online January 21, 2009 at: http://el.erdc.usace.army.mil/bsaf/bsaf.html

APPENDIX E TABLE 3
ECOLOGICAL TOXICITY REFERENCE VALUES FOR THE AVIAN RECEPTORS
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

COPEC	CAS	Endpoint Basis	Secondary Endpoint Basis	Test Species	Toxicity Endpoint	Dose[1] (mg/kg-BW/d)	Secondary Dose[1] (mg/kg-BW/d)	UF[2]		TRV_{NOAEL}[2] (mg/kg-BW/d)	TRV_{LOAEL}[3] (mg/kg-BW/d)	Comments and Source[5]
Polycyclic Aromatic Hydrocarbons												
Total High Molecular Weight PAHs	RACALC-HPAH	C LOAEL	NA	mallard	Hepatic effects	136.3	NA	5		27.3	136.3	Total PAHs used as surrogate
Total Low Molecular Weight PAHs	RACALC-LPAH	C LOAEL	NA	mallard	Hepatic effects	136.3	NA	5		27.3	136.3	Total PAHs used as surrogate
PAH (total)	RACALC-HPAH	C LOAEL	NA	mallard	Hepatic effects	136.3	NA	5		27.3	136.3	Patton and Dieter (1980)
Metals												
Arsenic	7440-38-2	C NOAEL	C LOAEL	[4]	Reproduction and Growth	2.2	4.5	1	1	2.2	4.5	EPA (2005b)
Barium	7440-39-3	SC NOAEL	SC LOAEL	chicks	Mortality	208.3	416.5	5	2	41.7	208.3	Sample et al. (1996)
Cadmium	7440-43-9	C NOAEL	C LOAEL	[4]	Reproduction and Growth	1.5	6.3	1	1	1.5	6.3	EPA (2005c)
Chromium	7440-47-3	C NOAEL	C LOAEL	[4]	Reproduction and Growth	2.7	8.9	1	1	2.7	8.9	EPA (2005d) [6]
Copper	7440-50-8	C NOAEL	C LOAEL	[4]	Reproduction and Growth	4.1	12.1	1	1	4.1	12.1	EPA (2006)
Lead	7439-92-1	C NOAEL	C LOAEL	[4]	Reproduction and Growth	1.6	3.3	1		1.6	3.3	EPA (2005e)
Nickel	7440-02-0	C NOAEL	C LOAEL	[4]	Reproduction and Growth	6.7	21.4	1	1	6.7	21.4	EPA (2007a)
Vanadium	7440-62-2	C NOAEL	C LOAEL	[4]	Reproduction and Growth	0.34	0.7	1		0.34	0.7	EPA (2005h)
Zinc	7440-66-6	C NOAEL	C LOAEL	[4]	Reproduction and Growth	66.1	188.6	1		66.1	188.6	EPA (2007b)
Mercury	7439-97-6	C NOAEL	C LOAEL	Japanese quail	Reproduction	0.45	0.9	1	1	0.45	0.9	Sample et al. (1996)

Notes:

[1] Dose values are the reported dose (converted to mg/kg-day, as appropriate) as cited in the listed source without the application of any uncertainty factor(s). Secondary dose refers to the corresponding LOAEL-based value observed in the same study, or derived used to derive the

[2] An uncertainty factor (UF) was used to extrapolate exposure duration and toxicologic endpoint to a chronic NOAEL-based TRV value. This was accomplished by dividing the reported dose by the recommended uncertainty factor. A second UF, if present, was applied to the secondary dose.

[3] An uncertainty factor of 5 (EPA, 1997) was used to extrapolate from a chronic NOAEL-based TRV (TRVNOAEL) to a chronic LOAEL- based TRV (TRVLOAEL) in the absence of a study-derived LOAEL value (i.e., TRVNOAEL * 5 = TRVLOAEL)

[4]Multiple species were used in development of the TRV. Toxicologic or intertaxon extrapolation not applicable.

[5] The source refers to the document (or internet site, as appropriate) from which the endpoint and dose were cited. For complete references refer to the listed source.

[6] Values presented are for trivalent chromium.

LOAEL - Lowest Observed Adverse Effects Level

NA - Not Applicable or No Data Available

C NOAEL - No Observed Adverse Effects Level based on chronic duration exposure

SC NOAEL - No Observed Adverse Effects Level based on intermediate (sub chronic) duration exposure

TRV - toxicity reference value

Note that the NOEL endpoint is assumed equivalent to the NOAEL, where indicated.

References:

Patton, J.F., and Dieter, M.P. 1980. "Effects of Petroleum Hydrocarbons on Hepatic Function in the Duck." *Comparative Biochemistry and Physiology C* , vol. 65C(1): 33-36. 1980.

Sample, B.E., D.M. Opresko and G.W. Suter II. 1996. T*oxicological Benchmarks for Wildlife: 1996 Revision* . ES/ER/TM-86/R3. Risk Assessment Program, Health Sciences Research Division, Oak Ridge National Laboratory.

EPA. 1997. EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund. June 1997

EPA. 2005a. Guidance for Developing Ecological Soil Screening Levels. Office of Emergency and Remedial Response. Washington D.C.November 2003, Revised February 2005.

EPA. 2005b. Ecological Soil Screening Levels for Arsenic. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005c. Ecological Soil Screening Levels for Cadmium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005d. Ecological Soil Screening Levels for Chromium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005e. Ecological Soil Screening Levels for Lead. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005h. Ecological Soil Screening Levels for Vanadium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2006. Ecological Soil Screening Levels for Copper Interim Final. Office of Emergency and Remedial Response. Washington DC. July

EPA. 2007a. Ecological Soil Screening Levels for Nickel Interim Final, OSWER Directive 9285.7-76. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. March 2007

EPA. 2007b. Ecological Soil Screening Levels for Zinc Interim Final, OSWER Directive 9285.7-73. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. June 2007

EPA. 2007c. Ecological Soil Screening Levels for DDT and Metabolites Interim Final, OSWER Directive 9285.7-57. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. April 2007

APPENDIX E TABLE 4
ECOLOGICAL TOXICITY REFERENCE VALUES FOR THE MAMMALIAN RECEPTORS
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

COPEC	CAS	Endpoint Basis	Secondary Endpoint Basis	Test Species	Toxicity Endpoint	Dose[1] (mg/kg-BW/d)	Secondary Dose[1] (mg/kg-BW/d)	UF[2]		TRV_{NOAEL}[2] (mg/kg-BW/d)	TRV_{LOAEL}[3] (mg/kg-BW/d)	Comments and Source[5]
Polycyclic Aromatic Hydrocarbons												
Total High Molecular Weight PAHs	RACALC-HPAH	C NOAEL	C LOAEL	[4]	Reproduction and Growth	0.6	3.1	1	1	0.62	3.1	EPA (2007a)
Total Low Molecular Weight PAHs	RACALC-LPAH	C NOAEL	C LOAEL	[4]	Reproduction and Growth	65.6	328	1	1	65.6	328	EPA (2007a)
PAH (total)	RACALC-HPAH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Metals												
Arsenic	7440-38-2	C NOAEL	C LOAEL	[4]	Reproduction and Growth	1.0	1.7	1	NA	1.0	1.7	EPA (2005b)
Barium	7440-39-3	C NOAEL	C LOAEL	[4]	Reproduction and Growth	51.8	119.0	1	NA	51.8	119.0	EPA (2005c)
Cadmium	7440-43-9	C NOAEL	C LOAEL	[4]	Reproduction and Growth	0.77	7.1	1	NA	0.77	7.1	EPA (2005d)
Chromium	7440-47-3	C NOAEL	C LOAEL	[4]	Reproduction and Growth	2.4	35.1	1	NA	2.4	35.1	EPA (2005e) [6]
Copper	7440-50-8	C NOAEL	C LOAEL	[4]	Reproduction and Growth	5.6	9.3	1	NA	5.6	9.3	EPA (2006)
Lead	7439-92-1	C NOAEL	C LOAEL	[4]	Reproduction and Growth	4.7	8.9	1	NA	4.7	8.9	EPA (2005f)
Nickel	7440-02-0	C NOAEL	C LOAEL	[4]	Reproduction and Growth	1.7	3.4	1	1	1.7	3.4	EPA (2007b)
Vanadium	7440-62-2	C NOAEL	C LOAEL	[4]	Reproduction and Growth	4.2	8.3	1	NA	4.2	8.3	EPA (2005g)
Zinc	7440-66-6	C NOAEL	C LOAEL	[4]	Reproduction and Growth	75.4	292.1	1	1	75.4	292.1	EPA (2007c)
Mercury	7439-97-6	C NOAEL	NA	mink	Reproduction	1.0	NA	1	NA	1.0	5	Sample et al. (1996)

Notes:

[1] Dose values are the reported dose (converted to mg/kg-day, as appropriate) as cited in the listed source without the application of any uncertainty factor(s). Secondary dose refers to the corresponding LOAEL-based value observed in the same study.

[2] An uncertainty factor (UF) was used to extrapolate exposure duration and toxicologic endpoint to a chronic NOAEL-based TRV value. This was accomplished by dividing the reported dose by the recommended uncertainty factor. A second UF, if present, was applied to the secondary dose.

[3] An uncertainty factor of 5 (U.S. EPA, 1997) was used to extrapolate from a chronic NOAEL-based TRV (TRVNOAEL) to a chronic LOAEL- based TRV (TRVLOAEL) in the absence of a study-derived LOAEL value (i.e., TRVNOAEL * 5 = TRVLOAEL)

[4] Multiple species used in development of the TRV. Toxicologic or intertaxon extrapolation not applicable.

[5] The source refers to the document (or internet site, as appropriate) from which the endpoint and dose were cited. For complete references refer to the listed source.

[6] Values presented are for trivalent chromium

NA - Not Applicable or No Data Available

NOAEL - No Observed Adverse Effects Level

TRV - toxicity reference value

Note that the NOEL endpoint is assumed equivalent to the NOAEL, where indicated.

The toxicity values presented are consitent with the approach and sources outlined in ADEC (2000) and general approach presented in Eco-SSL guidance (EPA 2005a).

References:

Sample, B.E., D.M. Opresko and G.W. Suter II, 1996. T*oxicological Benchmarks for Wildlife: 1996 Revision* . ES/ER/TM-86/R3. Risk Assessment Program, Health Sciences Research Division, Oak Ridge National Laboratory.

EPA. 1997. EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund. June 1997

EPA. 2005a. Guidance for Developing Ecological Soil Screening Levels. Office of Emergency and Remedial Response. Washington D.C.November 2003, Revised February 2005.

EPA. 2005b. Ecological Soil Screening Levels for Arsenic. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005c. Ecological Soil Screening Levels for Barium. Interim Final. Office of Emergency and Remedial Response. Washington DC. February

EPA. 2005d. Ecological Soil Screening Levels for Cadmium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005e. Ecological Soil Screening Levels for Chromium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005f. Ecological Soil Screening Levels for Lead. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2005g. Ecological Soil Screening Levels for Vanadium. Interim Final. Office of Emergency and Remedial Response. Washington DC. March

EPA. 2006. Ecological Soil Screening Levels for Copper Interim Final. Office of Emergency and Remedial Response. Washington DC. July

EPA. 2007a. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs) Interim Final, OSWER Directive 9285.7-78. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. June 2007

EPA. 2007b. Ecological Soil Screening Levels for Nickel Interim Final, OSWER Directive 9285.7-76. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. March 2007

EPA. 2007c. Ecological Soil Screening Levels for Zinc Interim Final, OSWER Directive 9285.7-73. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. June 2007

EPA. 2007d. Ecological Soil Screening Levels for DDT and Metabolites Interim Final, OSWER Directive 9285.7-57. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. April 2007

APPENDIX E TABLE 5
POTENTIAL RISKS TO THE GREAT BLUE HERON - STEP 2
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE GREAT BLUE HERON	
Average Body Weight (kg)	2.23
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.00485
Water Consumption Rate (kg/day)	0.1009
Fish Consumption Rate (kg_{dw}/day)	0.0951
Invertebrate Consumption Rate (kg_{dw}/day)	0.0019

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations					Potential Daily Dose (mg/kg_{bw}/day)								
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics														
ARSENIC	1.4E+01	ND	9.8E+00	NC	NC	3.1E-02	8.5E-03	NC	NC	NC	NC	3.9E-02	2.2E+00	1.8E-02
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	NC	1.8E+00	1.1E-01	1.2E-01	NC	1.2E-01	6.1E-03	2.0E+00	4.2E+01	4.9E-02
CADMIUM	2.8E+00	ND	2.3E+01	NC	NC	6.2E-03	2.0E-02	NC	NC	NC	NC	2.6E-02	1.5E+00	1.8E-02
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	NC	2.1E-01	3.9E-02	NC	NC	NC	NC	2.5E-01	2.7E+00	9.3E-02
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	NC	9.1E-01	1.9E+00	4.7E-02	NC	4.7E-02	3.4E-04	2.9E+00	4.1E+00	7.0E-01
LEAD	3.1E+02	ND	1.9E+02	NC	NC	6.6E-01	1.6E-01	NC	NC	NC	NC	8.3E-01	1.6E+00	5.1E-01
MERCURY	5.8E-01	ND	1.7E+00	NC	NC	1.3E-03	1.4E-03	NC	NC	NC	NC	2.7E-03	4.5E-01	6.0E-03
NICKEL	5.7E+01	ND	1.3E+02	NC	NC	1.2E-01	1.2E-01	NC	NC	NC	NC	2.4E-01	6.7E+00	3.6E-02
VANADIUM	1.0E+02	ND	8.9E+00	NC	NC	2.2E-01	7.7E-03	NC	NC	NC	NC	2.3E-01	3.4E-01	6.6E-01
ZINC	5.8E+02	ND	4.4E+03	NC	NC	1.3E+00	3.8E+00	NC	NC	NC	NC	5.1E+00	6.6E+01	7.7E-02
Organics														
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.5E-02	1.8E-03	NC	6.9E+00	6.9E+00	NC	6.9E+00	2.7E+01	2.5E-01
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	2.3E-01	1.6E-02	NC	5.8E+00	5.8E+00	NC	6.0E+00	2.7E+01	2.2E-01
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	2.5E-01	1.8E-02	NC	3.7E+01	3.7E+01	NC	3.7E+01	2.7E+01	**1.4E+00**

APPENDIX E TABLE 6
POTENTIAL RISKS TO THE GREAT BLUE HERON - STEP 3A
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE GREAT BLUE HERON	
Average Body Weight (kg)	2.23
Exposure Duration	1
Area Use Factor	0.8
Sediment Consumption Rate (kg_{dw}/day)	0.00485
Water Consumption Rate (kg/day)	0.1009
Fish Consumption Rate (kg_{dw}/day)	0.0951
Invertebrate Consumption Rate (kg_{dw}/day)	0.0019

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations					Potential Daily Dose (mg/kg_{bw}/day)											
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ	MATC-based TRV (mg/kg_{bw}/day)	MATC-based HQ
Inorganics																		
ARSENIC	1.4E+01	ND	9.8E+00	NC	NC	2.5E-02	6.8E-03	NC	NC	NC	NC	3.2E-02	2.2E+00	1.4E-02	4.5E+00	7.0E-03	3.2E+00	9.9E-03
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	NC	1.4E+00	9.2E-02	9.6E-02	NC	9.6E-02	4.9E-03	1.6E+00	4.2E+01	3.9E-02	2.1E+02	7.8E-03	9.3E+01	1.7E-02
CADMIUM	2.8E+00	ND	2.3E+01	NC	NC	4.9E-03	1.6E-02	NC	NC	NC	NC	2.1E-02	1.5E+00	1.4E-02	6.3E+00	3.3E-03	3.0E+00	6.8E-03
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	NC	1.7E-01	3.1E-02	NC	NC	NC	NC	2.0E-01	2.7E+00	7.4E-02	8.9E+00	2.2E-02	4.9E+00	4.1E-02
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	NC	7.2E-01	1.5E+00	3.7E-02	NC	3.7E-02	2.8E-04	2.3E+00	4.1E+00	5.6E-01	1.2E+01	1.9E-01	7.0E+00	3.3E-01
LEAD	3.1E+02	ND	1.9E+02	NC	NC	5.3E-01	1.3E-01	NC	NC	NC	NC	6.6E-01	1.6E+00	4.1E-01	3.3E+00	2.0E-01	2.3E+00	2.8E-01
MERCURY	5.8E-01	ND	1.7E+00	NC	NC	1.0E-03	1.2E-03	NC	NC	NC	NC	2.2E-03	4.5E-01	4.8E-03	9.0E-01	2.4E-03	6.4E-01	3.4E-03
NICKEL	5.7E+01	ND	1.3E+02	NC	NC	1.0E-01	9.2E-02	NC	NC	NC	NC	1.9E-01	6.7E+00	2.9E-02	2.1E+01	9.0E-03	1.2E+01	1.6E-02
VANADIUM	1.0E+02	ND	8.9E+00	NC	NC	1.8E-01	6.2E-03	NC	NC	NC	NC	1.8E-01	3.4E-01	5.3E-01	6.9E-01	2.6E-01	4.9E-01	3.7E-01
ZINC	5.8E+02	ND	4.4E+03	NC	NC	1.0E+00	3.0E+00	NC	NC	NC	NC	4.1E+00	6.6E+01	6.1E-02	1.9E+02	2.1E-02	1.1E+02	3.6E-02
Organics																		
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.0E-02	1.4E-03	NC	5.5E+00	5.5E+00	NC	5.5E+00	2.7E+01	2.0E-01	1.4E+02	4.0E-02	6.1E+01	9.0E-02
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	1.8E-01	1.3E-02	NC	4.6E+00	4.6E+00	NC	4.8E+00	2.7E+01	1.8E-01	1.4E+02	3.5E-02	6.1E+01	7.9E-02
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	2.0E-01	1.5E-02	NC	2.9E+01	2.9E+01	NC	2.9E+01	2.7E+01	**1.1E+00**	1.4E+02	2.2E-01	6.1E+01	4.8E-01

APPENDIX E TABLE 7
POTENTIAL RISKS TO THE MALLARD - STEP 2
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MALLARD	
Average Body Weight (kg)	1.04
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.00105
Water Consumption Rate (kg/day)	0.0607
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0132
Invertebrate Consumption Rate (kg_{dw}/day)	0.0391

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations				Potential Daily Dose (mg/kg_{bw}/day)						
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Aquatic Plants	Surface Water	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics											
ARSENIC	1.4E+01	ND	9.8E+00	5.4E-01	1.4E-02	3.7E-01	6.8E-03	NC	3.9E-01	2.2E+00	1.7E-01
BARIUM	8.2E+02	1.4E-01	1.3E+02	1.3E+02	8.3E-01	4.9E+00	1.6E+00	7.9E-03	7.4E+00	4.2E+01	1.8E-01
CADMIUM	2.8E+00	ND	2.3E+01	1.1E+00	2.8E-03	8.5E-01	1.4E-02	NC	8.6E-01	1.5E+00	5.9E-01
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	3.9E+00	9.6E-02	1.7E+00	5.0E-02	NC	1.8E+00	2.7E+00	6.9E-01
COPPER	4.2E+02	7.6E-03	2.2E+03	2.1E+01	4.2E-01	8.2E+01	2.7E-01	4.4E-04	8.2E+01	4.1E+00	**2.0E+01**
LEAD	3.1E+02	ND	1.9E+02	6.6E+00	3.1E-01	7.0E+00	8.3E-02	NC	7.4E+00	1.6E+00	**4.5E+00**
MERCURY	5.8E-01	ND	1.7E+00	2.7E-01	5.8E-04	6.2E-02	3.5E-03	NC	6.6E-02	4.5E-01	1.5E-01
NICKEL	5.7E+01	ND	1.3E+02	2.2E+00	5.7E-02	5.0E+00	2.8E-02	NC	5.1E+00	6.7E+00	7.5E-01
VANADIUM	1.0E+02	ND	8.9E+00	4.9E-01	1.0E-01	3.3E-01	6.2E-03	NC	4.4E-01	3.4E-01	**1.3E+00**
ZINC	5.8E+02	ND	4.4E+03	1.6E+02	5.8E-01	1.6E+02	2.1E+00	NC	1.7E+02	6.6E+01	**2.5E+00**
Organics											
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	2.5E+00	1.2E-02	7.8E-02	3.2E-02	NC	1.2E-01	2.7E+01	4.4E-03
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	1.2E+01	1.0E-01	7.0E-01	1.5E-01	NC	9.6E-01	2.7E+01	3.5E-02
TOTAL PAHs	1.2E+02	ND	2.1E+01	1.4E+01	1.2E-01	7.8E-01	1.7E-01	NC	1.1E+00	2.7E+01	3.9E-02

APPENDIX E TABLE 8
POTENTIAL RISKS TO THE MALLARD - STEP 3A
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MALLARD	
Average Body Weight (kg)	1.04
Exposure Duration	1
Area Use Factor	0.007
Sediment Consumption Rate (kg_{dw}/day)	0.00105
Water Consumption Rate (kg/day)	0.0607
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0132
Invertebrate Consumption Rate (kg_{dw}/day)	0.0391

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations				Potential Daily Dose (mg/kg_{bw}/day)								
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Aquatic Plants	Surface Water	Total	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ	MATC-based TRV (mg/kg_{bw}/day)	MATC-based HQ
Inorganics													
ARSENIC	1.4E+01	ND	9.8E+00	5.4E-01	1.0E-04	2.6E-03	4.8E-05	NC	2.7E-03	4.5E+00	6.0E-04	3.2E+00	8.6E-04
BARIUM	8.2E+02	1.4E-01	1.3E+02	1.3E+02	5.8E-03	3.5E-02	1.1E-02	5.5E-05	5.2E-02	2.1E+02	2.5E-04	9.3E+01	5.6E-04
CADMIUM	2.8E+00	ND	2.3E+01	1.1E+00	2.0E-05	5.9E-03	9.8E-05	NC	6.1E-03	6.3E+00	9.6E-04	3.0E+00	2.0E-03
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	3.9E+00	6.7E-04	1.2E-02	3.5E-04	NC	1.3E-02	8.9E+00	1.4E-03	4.9E+00	2.6E-03
COPPER	4.2E+02	7.6E-03	2.2E+03	2.1E+01	2.9E-03	5.7E-01	1.9E-03	3.1E-06	5.8E-01	1.2E+01	4.8E-02	7.0E+00	8.3E-02
LEAD	3.1E+02	ND	1.9E+02	6.6E+00	2.1E-03	4.9E-02	5.8E-04	NC	5.2E-02	3.3E+00	1.6E-02	2.3E+00	2.2E-02
MERCURY	5.8E-01	ND	1.7E+00	2.7E-01	4.1E-06	4.4E-04	2.4E-05	NC	4.6E-04	9.0E-01	5.2E-04	6.4E-01	7.3E-04
NICKEL	5.7E+01	ND	1.3E+02	2.2E+00	4.0E-04	3.5E-02	2.0E-04	NC	3.5E-02	2.1E+01	1.7E-03	1.2E+01	3.0E-03
VANADIUM	1.0E+02	ND	8.9E+00	4.9E-01	7.1E-04	2.3E-03	4.4E-05	NC	3.1E-03	6.9E-01	4.5E-03	4.9E-01	6.4E-03
ZINC	5.8E+02	ND	4.4E+03	1.6E+02	4.1E-03	1.1E+00	1.5E-02	NC	1.2E+00	1.9E+02	6.2E-03	1.1E+02	1.0E-02
Organics													
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	2.5E+00	8.1E-05	5.4E-04	2.2E-04	NC	8.5E-04	1.4E+02	6.2E-06	6.1E+01	1.4E-05
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	1.2E+01	7.3E-04	4.9E-03	1.1E-03	NC	6.7E-03	1.4E+02	4.9E-05	6.1E+01	1.1E-04
TOTAL PAHs	1.2E+02	ND	2.1E+01	1.4E+01	8.2E-04	5.5E-03	1.2E-03	NC	7.5E-03	1.4E+02	5.5E-05	6.1E+01	1.2E-04

APPENDIX E TABLE 9
POTENTIAL RISKS TO THE MINK - STEP 2
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MINK	
Average Body Weight (kg)	0.57
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.00289
Water Consumption Rate (kg/day)	0.0595
Fish Consumption Rate (kg_{dw}/day)	0.0261
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0006
Invertebrate Consumption Rate (kg_{dw}/day)	0.0040

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations						Potential Daily Dose (mg/kg_{bw}/day)									
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Aquatic Plants	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics																
ARSENIC	1.4E+01	ND	9.8E+00	NC	--	5.4E-01	7.2E-02	6.9E-02	NC	NC	NC	NC	5.8E-04	1.4E-01	1.0E+00	1.4E-01
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	--	1.3E+02	4.2E+00	9.3E-01	1.3E-01	NC	1.3E-01	1.4E-02	1.4E-01	5.4E+00	5.2E+01	1.0E-01
CADMIUM	2.8E+00	ND	2.3E+01	NC	--	1.1E+00	1.4E-02	1.6E-01	NC	NC	NC	NC	1.2E-03	1.7E-01	7.7E-01	2.3E-01
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	--	3.9E+00	4.9E-01	3.2E-01	NC	NC	NC	NC	4.2E-03	8.1E-01	2.4E+00	3.4E-01
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	--	2.1E+01	2.1E+00	1.5E+01	5.0E-02	NC	5.0E-02	8.0E-04	2.3E-02	1.8E+01	5.6E+00	**3.1E+00**
LEAD	3.1E+02	ND	1.9E+02	NC	--	6.6E+00	1.6E+00	1.3E+00	NC	NC	NC	NC	7.1E-03	2.9E+00	4.7E+00	6.1E-01
MERCURY	5.8E-01	ND	1.7E+00	NC	--	2.7E-01	2.9E-03	1.2E-02	NC	NC	NC	NC	3.0E-04	1.5E-02	1.0E+00	1.5E-02
NICKEL	5.7E+01	ND	1.3E+02	NC	--	2.2E+00	2.9E-01	9.3E-01	NC	NC	NC	NC	2.4E-03	1.2E+00	1.7E+00	7.2E-01
VANADIUM	1.0E+02	ND	8.9E+00	NC	--	4.9E-01	5.1E-01	6.2E-02	NC	NC	NC	NC	5.3E-04	5.8E-01	4.2E+00	1.4E-01
ZINC	5.8E+02	ND	4.4E+03	NC	--	1.6E+02	2.9E+00	3.1E+01	NC	NC	NC	NC	1.8E-01	3.4E+01	7.5E+01	4.5E-01
Organics																
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.5E+00	5.8E-02	1.5E-02	NC	7.4E+00	7.4E+00	NC	2.7E-03	7.5E+00	6.6E+01	1.1E-01
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	1.2E+01	5.3E-01	1.3E-01	NC	6.2E+00	6.2E+00	NC	1.3E-02	6.9E+00	6.2E-01	**1.1E+01**
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	1.4E+01	5.9E-01	1.5E-01	NC	3.9E+01	3.9E+01	NC	1.5E-02	4.0E+01	NA	**1.1E+01**

APPENDIX E TABLE 10
POTENTIAL RISKS TO THE MINK - STEP 3A
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MINK	
Average Body Weight (kg)	0.57
Exposure Duration	1
Area Use Factor	0.26
Sediment Consumption Rate (kg_{dw}/day)	0.00289
Water Consumption Rate (kg/day)	0.0595
Fish Consumption Rate (kg_{dw}/day)	0.0261
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0006
nvertebrate Consumption Rate (kg_{dw}/day)	0.0040

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations						Potential Daily Dose (mg/kg_{bw}/day)											
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Aquatic Plants	Total	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ	MATC-based TRV (mg/kg_{bw}/day)	MATC-based HQ
Inorganics																		
ARSENIC	1.4E+01	ND	9.8E+00	NC	--	5.4E-01	1.8E-02	1.8E-02	NC	NC	NC	NC	1.5E-04	3.6E-02	1.7E+00	2.1E-02	1.3E+00	2.7E-02
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	--	1.3E+02	1.1E+00	2.4E-01	3.3E-02	NC	3.3E-02	3.6E-03	3.5E-02	1.4E+00	1.2E+02	1.2E-02	7.9E+01	1.8E-02
CADMIUM	2.8E+00	ND	2.3E+01	NC	--	1.1E+00	3.7E-03	4.1E-02	NC	NC	NC	NC	3.0E-04	4.5E-02	7.1E+00	6.3E-03	2.3E+00	1.9E-02
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	--	3.9E+00	1.2E-01	8.1E-02	NC	NC	NC	NC	1.1E-03	2.1E-01	3.5E+01	5.9E-03	9.2E+00	2.2E-02
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	--	2.1E+01	5.4E-01	3.9E+00	1.3E-02	NC	1.3E-02	2.0E-04	5.8E-03	4.5E+00	9.3E+00	4.8E-01	7.2E+00	6.2E-01
LEAD	3.1E+02	ND	1.9E+02	NC	--	6.6E+00	4.0E-01	3.3E-01	NC	NC	NC	NC	1.8E-03	7.3E-01	8.9E+00	8.2E-02	6.5E+00	1.1E-01
MERCURY	5.8E-01	ND	1.7E+00	NC	--	2.7E-01	7.5E-04	3.0E-03	NC	NC	NC	NC	7.6E-05	3.8E-03	5.1E+00	7.5E-04	2.3E+00	1.7E-03
NICKEL	5.7E+01	ND	1.3E+02	NC	--	2.2E+00	7.4E-02	2.4E-01	NC	NC	NC	NC	6.2E-04	3.1E-01	3.4E+00	9.2E-02	2.4E+00	1.3E-01
VANADIUM	1.0E+02	ND	8.9E+00	NC	--	4.9E-01	1.3E-01	1.6E-02	NC	NC	NC	NC	1.4E-04	1.5E-01	8.3E+00	1.8E-02	5.9E+00	2.5E-02
ZINC	5.8E+02	ND	4.4E+03	NC	--	1.6E+02	7.5E-01	7.8E+00	NC	NC	NC	NC	4.5E-02	8.6E+00	2.9E+02	3.0E-02	1.5E+02	5.8E-02
Organics																		
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.5E+00	1.5E-02	3.7E-03	NC	1.9E+00	1.9E+00	NC	6.9E-04	1.9E+00	3.3E+02	5.8E-03	1.5E+02	1.3E-02
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	1.2E+01	1.4E-01	3.4E-02	NC	1.6E+00	1.6E+00	NC	3.3E-03	1.8E+00	3.1E+00	5.7E-01	1.4E+00	**1.3E+00**
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	1.4E+01	1.5E-01	3.7E-02	NC	1.0E+01	1.0E+01	NC	3.8E-03	1.0E+01	NA	5.8E-01	NC	**1.3E+00**

APPENDIX E TABLE 11
POTENTIAL RISKS TO THE RACCOON - STEP 2
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.74
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.01436
Water Consumption Rate (kg/day)	0.4772
Fish Consumption Rate (kg_{dw}/day)	0.0046
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0598
Invertebrate Consumption Rate (kg_{dw}/day)	0.0886

Total Daily Dose = $\frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations						Potential Daily Dose (mg/kg_{bw}/day)									
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Aquatic Plants	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics																
ARSENIC	1.4E+01	ND	9.8E+00	NC	--	5.4E-01	3.6E-02	1.5E-01	NC	NC	NC	NC	5.6E-03	1.9E-01	1.0E+00	1.8E-01
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	--	1.3E+02	2.1E+00	2.0E+00	2.2E-03	NC	2.2E-03	1.1E-02	1.3E+00	5.4E+00	5.2E+01	1.1E-01
CADMIUM	2.8E+00	ND	2.3E+01	NC	--	1.1E+00	7.1E-03	3.5E-01	NC	NC	NC	NC	1.1E-02	3.7E-01	7.7E-01	4.8E-01
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	--	3.9E+00	2.4E-01	6.9E-01	NC	NC	NC	NC	4.1E-02	9.7E-01	2.4E+00	4.1E-01
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	--	2.1E+01	1.0E+00	3.4E+01	8.7E-04	NC	8.7E-04	6.3E-04	2.2E-01	3.5E+01	5.6E+00	**6.2E+00**
LEAD	3.1E+02	ND	1.9E+02	NC	--	6.6E+00	7.6E-01	2.9E+00	NC	NC	NC	NC	6.8E-02	3.7E+00	4.7E+00	7.9E-01
MERCURY	5.8E-01	ND	1.7E+00	NC	--	2.7E-01	1.4E-03	2.6E-02	NC	NC	NC	NC	2.9E-03	3.0E-02	1.0E+00	3.0E-02
NICKEL	5.7E+01	ND	1.3E+02	NC	--	2.2E+00	1.4E-01	2.0E+00	NC	NC	NC	NC	2.3E-02	2.2E+00	1.7E+00	**1.3E+00**
VANADIUM	1.0E+02	ND	8.9E+00	NC	--	4.9E-01	2.5E-01	1.4E-01	NC	NC	NC	NC	5.1E-03	3.9E-01	4.2E+00	9.5E-02
ZINC	5.8E+02	ND	4.4E+03	NC	--	1.6E+02	1.5E+00	6.7E+01	NC	NC	NC	NC	1.7E+00	7.1E+01	7.5E+01	9.4E-01
Organics																
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.5E+00	2.9E-02	3.2E-02	NC	1.3E-01	1.3E-01	NC	2.6E-02	2.2E-01	6.6E+01	3.3E-03
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	1.2E+01	2.6E-01	2.9E-01	NC	1.1E-01	1.1E-01	NC	1.2E-01	7.8E-01	6.2E-01	**1.3E+00**
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	1.4E+01	2.9E-01	3.2E-01	NC	6.8E-01	6.8E-01	NC	1.4E-01	1.4E+00	NA	**1.3E+00**

APPENDIX E TABLE 12
POTENTIAL RISKS TO THE RACCOON - STEP 3A
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.74
Exposure Duration	1
Area Use Factor	0.019
Sediment Consumption Rate (kg_{dw}/day)	0.01436
Water Consumption Rate (kg/day)	0.4772
Fish Consumption Rate (kg_{dw}/day)	0.0046
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0598
Invertebrate Consumption Rate (kg_{dw}/day)	0.0886

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations						Potential Daily Dose (mg/kg_{bw}/day)											
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Benthic Invertebrate (mg/kg_{dw})	Fish (SW) (mg/kg_{ww})	Fish (Sed) (mg/kg_{dw})	Aquatic Plants (mg/kg_{dw})	Sediment	Benthic Invertebrate	Fish (SW)	Fish (Sed)	Fish (mean)	Surface Water	Aquatic Plants	Total	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ	MATC-based TRV (mg/kg_{bw}/day)	MATC-based HQ
Inorganics																		
ARSENIC	1.4E+01	ND	9.8E+00	NC	--	5.4E-01	6.7E-04	2.9E-03	NC	NC	NC	NC	1.1E-04	3.6E-03	1.7E+00	2.1E-03	1.3E+00	2.7E-03
BARIUM	8.2E+02	1.4E-01	1.3E+02	2.8E+00	--	1.3E+02	3.9E-02	3.8E-02	4.2E-05	NC	4.2E-05	2.1E-04	2.5E-02	1.0E-01	1.2E+02	8.6E-04	7.9E+01	1.3E-03
CADMIUM	2.8E+00	ND	2.3E+01	NC	--	1.1E+00	1.3E-04	6.6E-03	NC	NC	NC	NC	2.2E-04	6.9E-03	7.1E+00	9.8E-04	2.3E+00	3.0E-03
CHROMIUM, TOTAL	9.6E+01	ND	4.5E+01	NC	--	3.9E+00	4.5E-03	1.3E-02	NC	NC	NC	NC	7.7E-04	1.8E-02	3.5E+01	5.2E-04	9.2E+00	2.0E-03
COPPER	4.2E+02	7.6E-03	2.2E+03	1.1E+00	--	2.1E+01	2.0E-02	6.4E-01	1.6E-05	NC	1.6E-05	1.2E-05	4.1E-03	6.6E-01	9.3E+00	7.1E-02	7.2E+00	9.1E-02
LEAD	3.1E+02	ND	1.9E+02	NC	--	6.6E+00	1.4E-02	5.4E-02	NC	NC	NC	NC	1.3E-03	7.0E-02	8.9E+00	7.9E-03	6.5E+00	1.1E-02
MERCURY	5.8E-01	ND	1.7E+00	NC	--	2.7E-01	2.7E-05	4.8E-04	NC	NC	NC	NC	5.4E-05	5.6E-04	5.1E+00	1.1E-04	2.3E+00	2.5E-04
NICKEL	5.7E+01	ND	1.3E+02	NC	--	2.2E+00	2.7E-03	3.9E-02	NC	NC	NC	NC	4.4E-04	4.2E-02	3.4E+00	1.2E-02	2.4E+00	1.7E-02
VANADIUM	1.0E+02	ND	8.9E+00	NC	--	4.9E-01	4.8E-03	2.6E-03	NC	NC	NC	NC	9.6E-05	7.5E-03	8.3E+00	9.0E-04	5.9E+00	1.3E-03
ZINC	5.8E+02	ND	4.4E+03	NC	--	1.6E+02	2.7E-02	1.3E+00	NC	NC	NC	NC	3.2E-02	1.3E+00	2.9E+02	4.6E-03	1.5E+02	9.0E-03
Organics																		
TOTAL LMW PAHs	1.2E+01	ND	2.1E+00	NC	1.6E+02	2.5E+00	5.4E-04	6.0E-04	NC	2.4E-03	2.4E-03	NC	4.9E-04	4.1E-03	3.3E+02	1.2E-05	1.5E+02	2.8E-05
TOTAL HMW PAHs	1.0E+02	ND	1.9E+01	NC	1.4E+02	1.2E+01	4.9E-03	5.5E-03	NC	2.0E-03	2.0E-03	NC	2.3E-03	1.5E-02	3.1E+00	4.8E-03	1.4E+00	1.1E-02
TOTAL PAHs	1.2E+02	ND	2.1E+01	NC	8.6E+02	1.4E+01	5.5E-03	6.1E-03	NC	1.3E-02	1.3E-02	NC	2.7E-03	2.7E-02	NA	4.8E-03	NC	1.1E-02

APPENDIX E TABLE 13
POTENTIAL RISKS TO THE MUSKRAT - STEP 2
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MUSKRAT	
Average Body Weight (kg)	0.84
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.0000054
Water Consumption Rate (kg/day)	0.0844
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0598

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w = Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations			Potential Daily Dose (mg/kg_{bw}/day)					
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Aquatic Plants (mg/kg_{dw})	Sediment	Surface Water	Aquatic Plants	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics									
ARSENIC	1.4E+01	ND	5.4E-01	9.1E-05	NC	3.9E-02	3.9E-02	1.0E+00	3.7E-02
BARIUM	8.2E+02	1.4E-01	1.3E+02	5.3E-03	1.4E-02	9.2E+00	9.2E+00	5.2E+01	1.8E-01
CADMIUM	2.8E+00	ND	1.1E+00	1.8E-05	NC	7.8E-02	7.8E-02	7.7E-01	1.0E-01
CHROMIUM, TOTAL	9.6E+01	ND	3.9E+00	6.1E-04	NC	2.8E-01	2.8E-01	2.4E+00	1.2E-01
COPPER	4.2E+02	7.6E-03	2.1E+01	2.7E-03	7.7E-04	1.5E+00	1.5E+00	5.6E+00	2.7E-01
LEAD	3.1E+02	ND	6.6E+00	2.0E-03	NC	4.7E-01	4.7E-01	4.7E+00	1.0E-01
MERCURY	5.8E-01	ND	2.7E-01	3.7E-06	NC	2.0E-02	2.0E-02	1.0E+00	1.9E-02
NICKEL	5.7E+01	ND	2.2E+00	3.7E-04	NC	1.6E-01	1.6E-01	1.7E+00	9.4E-02
VANADIUM	1.0E+02	ND	4.9E-01	6.5E-04	NC	3.5E-02	3.6E-02	4.2E+00	8.6E-03
ZINC	5.8E+02	ND	1.6E+02	3.7E-03	NC	1.2E+01	1.2E+01	7.5E+01	1.6E-01
Organics									
TOTAL LMW PAHs	1.2E+01	ND	2.5E+00	7.4E-05	NC	1.8E-01	1.8E-01	6.6E+01	2.7E-03
TOTAL HMW PAHs	1.0E+02	ND	1.2E+01	6.7E-04	NC	8.4E-01	8.5E-01	6.2E-01	**1.4E+00**
TOTAL PAHs	1.2E+02	ND	1.4E+01	7.4E-04	NC	9.8E-01	9.8E-01	NA	**1.4E+00**

APPENDIX E TABLE 14
POTENTIAL RISKS TO THE MUSKRAT - STEP 3A
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

ASSUMPTIONS FOR THE MUSKRAT	
Average Body Weight (kg)	0.84
Exposure Duration	1
Area Use Factor	1
Sediment Consumption Rate (kg_{dw}/day)	0.0000054
Water Consumption Rate (kg/day)	0.0844
Aq. Plant Consumption Rate (kg_{dw}/day)	0.0598

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
MATC - Maximum Allowable Toxicant Concentration.
NA - Not Analyzed.
NC - Not Calculated.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.

HQs above 1 are bolded and highlighted.
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations			Potential Daily Dose (mg/kg_{bw}/day)							
COPC	Sediment (mg/kg_{dw})	Total Recoverable Phase Surface Water (mg/L)	Aquatic Plants (mg/kg_{dw})	Sediment	Surface Water	Aquatic Plants	Total	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ	MATC-based TRV (mg/kg_{bw}/day)	MATC-based HQ
Inorganics											
ARSENIC	1.4E+01	ND	5.4E-01	9.1E-05	NC	3.9E-02	3.9E-02	1.7E+00	2.3E-02	1.3E+00	2.9E-02
BARIUM	8.2E+02	1.4E-01	1.3E+02	5.3E-03	1.4E-02	9.2E+00	9.2E+00	1.2E+02	7.7E-02	7.9E+01	1.2E-01
CADMIUM	2.8E+00	ND	1.1E+00	1.8E-05	NC	7.8E-02	7.8E-02	7.1E+00	1.1E-02	2.3E+00	3.4E-02
CHROMIUM, TOTAL	9.6E+01	ND	3.9E+00	6.1E-04	NC	2.8E-01	2.8E-01	3.5E+01	8.0E-03	9.2E+00	3.1E-02
COPPER	4.2E+02	7.6E-03	2.1E+01	2.7E-03	7.7E-04	1.5E+00	1.5E+00	9.3E+00	1.6E-01	7.2E+00	2.1E-01
LEAD	3.1E+02	ND	6.6E+00	2.0E-03	NC	4.7E-01	4.7E-01	8.9E+00	5.3E-02	6.5E+00	7.3E-02
MERCURY	5.8E-01	ND	2.7E-01	3.7E-06	NC	2.0E-02	2.0E-02	5.1E+00	3.9E-03	2.3E+00	8.7E-03
NICKEL	5.7E+01	ND	2.2E+00	3.7E-04	NC	1.6E-01	1.6E-01	3.4E+00	4.7E-02	2.4E+00	6.7E-02
VANADIUM	1.0E+02	ND	4.9E-01	6.5E-04	NC	3.5E-02	3.6E-02	8.3E+00	4.3E-03	5.9E+00	6.1E-03
ZINC	5.8E+02	ND	1.6E+02	3.7E-03	NC	1.2E+01	1.2E+01	2.9E+02	4.0E-02	1.5E+02	7.9E-02
Organics											
TOTAL LMW PAHs	1.2E+01	ND	2.5E+00	7.4E-05	NC	1.8E-01	1.8E-01	3.3E+02	5.4E-04	1.5E+02	1.2E-03
TOTAL HMW PAHs	1.0E+02	ND	1.2E+01	6.7E-04	NC	8.4E-01	8.5E-01	3.1E+00	2.7E-01	1.4E+00	6.1E-01
TOTAL PAHs	1.2E+02	ND	1.4E+01	7.4E-04	NC	9.8E-01	9.8E-01	NA	2.7E-01	NC	6.1E-01

APPENDIX E TABLE 15
SUMMARY OF POTENTIAL RISKS TO WILDLIFE -- DOWNSTREAM AREA
ECOLOGICAL RISK ASSESSMENT
GREENWICH HIGHSCHOOL
GREENWICH, CT

COPC	MATC-based HQs - Maximum Concentrations				
	GREAT BLUE HERON	MALLARD	MINK	RACCOON	MUSKRAT
Step 2 Evaluation					
Inorganics					
ARSENIC	1.2E-02	1.2E-01	1.1E-01	1.4E-01	2.9E-02
BARIUM	2.2E-02	7.9E-02	6.9E-02	6.9E-02	1.2E-01
CADMIUM	8.5E-03	2.8E-01	7.5E-02	1.6E-01	3.4E-02
CHROMIUM, TOTAL	5.1E-02	3.8E-01	8.8E-02	1.1E-01	3.1E-02
COPPER	4.1E-01	**1.2E+01**	**2.4E+00**	**4.8E+00**	2.1E-01
LEAD	3.6E-01	**3.2E+00**	4.4E-01	5.7E-01	7.3E-02
MERCURY	4.2E-03	1.0E-01	6.6E-03	1.3E-02	8.7E-03
NICKEL	2.0E-02	4.2E-01	5.1E-01	9.2E-01	6.7E-02
VANADIUM	4.7E-01	9.1E-01	9.8E-02	6.7E-02	6.1E-03
ZINC	4.5E-02	**1.5E+00**	2.3E-01	4.8E-01	7.9E-02
Organics					
HPAH, TOTAL	9.9E-02	1.6E-02	**5.0E+00**	5.7E-01	6.1E-01
LPAH, TOTAL	1.1E-01	2.0E-03	5.1E-02	1.5E-03	1.2E-03
PAH, TOTAL	6.0E-01	1.8E-02	**5.1E+00**	5.7E-01	6.1E-01
Step 3A Evaluation					
Inorganics					
ARSENIC	9.9E-03	8.6E-04	2.7E-02	2.7E-03	2.9E-02
BARIUM	1.7E-02	5.6E-04	1.8E-02	1.3E-03	1.2E-01
CADMIUM	6.8E-03	2.0E-03	1.9E-02	3.0E-03	3.4E-02
CHROMIUM, TOTAL	4.1E-02	2.6E-03	2.2E-02	2.0E-03	3.1E-02
COPPER	3.3E-01	8.3E-02	6.2E-01	9.1E-02	2.1E-01
LEAD	2.8E-01	2.2E-02	1.1E-01	1.1E-02	7.3E-02
MERCURY	3.4E-03	7.3E-04	1.7E-03	2.5E-04	8.7E-03
NICKEL	1.6E-02	3.0E-03	1.3E-01	1.7E-02	6.7E-02
VANADIUM	3.7E-01	6.4E-03	2.5E-02	1.3E-03	6.1E-03
ZINC	3.6E-02	1.0E-02	5.8E-02	9.0E-03	7.9E-02
Organics					
HPAH, TOTAL	7.9E-02	1.1E-04	**1.3E+00**	1.1E-02	6.1E-01
LPAH, TOTAL	9.0E-02	1.4E-05	1.3E-02	2.8E-05	1.2E-03
PAH, TOTAL	4.8E-01	1.2E-04	**1.3E+00**	1.1E-02	6.1E-01

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations.
Potential risk is calculated using the maximum detected concentrations and MATC-based TRVs.
HQs above 1 are bolded and highlighted.
MATC-based TRV represents the geometric mean of the NOAEL- and LOAEL-based TRVs.

COPC - Chemical of Potential Concern.
HMW - High Molecular Weight.
HQ - Hazard Quotient (Dose/TRV).
LMW - Low Molecular Weight.
MATC - Maximum Allowable Toxicant Concentration.
PAHs - Polycyclic Aromatic Hydrocarbons.
TRV - Toxicity Reference Value.