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October 21, 2011

AECOM Project No. 60163799

Via Electronic Mail
(Battaglia.frank@epa.gov)

Mr. Frank Battaglia
US EPA Region I New England
5 Post Office Square
Mail Code: OSRR07-3
Boston, MA 02109-3912

RE: Former Ciba-Geigy Facility, 180 Mill Street, Cranston, RI
IRM Workplan for Sediment Removal in the Pawtuxet River

Dear Mr. Battaglia,

On behalf of BASF Corporation (BASF), please find attached the Interim Remedial Measures (IRM) Workplan for Sediment Removal within the Pawtuxet River, adjacent to the former Ciba-Geigy facility at 180 Mill Street, Cranston, RI. This Workplan incorporates USEPA comments that AECOM received verbally on 10/14/2011. If this document is acceptable to you, we will move forward according to our schedule to remove river sediment before the calendar end of 2011. We request an email or letter for our files acknowledging and accepting the Workplan at your earliest convenience.

Please do not hesitate to contact Joanne Lynch at 978.905.2296 if you have any questions or concerns.

Sincerely,
AECOM

Joanne M. Lynch, P.Eng.
Project Manager

Enclosures

cc: Dr. Joseph Guarnaccia, BASF
Kris Carbonneau, Remediation Engineer, AECOM (electronic)
Jeffrey Melton, Remediation Engineer, AECOM (electronic)
Thomas Keough, Permitting Specialist, AECOM (electronic)

SEMS DocID 643657

AECOM Environment

Prepared for:
BASF
Toms River, NJ

Prepared by:
AECOM
Chelmsford, MA
60163799
October 21, 2011

Interim Remedial Measure Workplan for Sediment Removal within the Pawtuxet River

Pawtuxet River Remedial Dredging Project
Cranston, Rhode Island
BASF

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Prepared for:
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Interim Remedial Measure Workplan for Sediment Removal within the Pawtuxet River

Pawtuxet River Remedial Dredging Project
Cranston, Rhode Island
BASF

Prepared By Jeff Melton
Environmental Engineer

Reviewed By Kristine M. Carbonneau, P.E.

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Figure 2: Proposed Sediment Removal Areas

List of Supporting Documents

Sand Cap Inspection and Sediment Quality Investigation Report, Feb 7, 2011, AECOM.

Sediment Sampling Results and Scope of Work for Sediment Removal at Former Ciba-Geigy Facility, Cranston, RI, Sep. 16, 2011, AECOM.

1.0 Introduction

This work plan is submitted by AECOM to provide general information on the means and methods for contaminated sediment removal at the former Ciba-Geigy facility in Cranston, RI. The proposed sediment removal activities, supporting activities and master project schedule are presented in the following sections. It should be noted that the sediment removal covered in this work plan is limited to three areas of elevated contaminant concentrations identified by AECOM from the results of sediment sampling conducted in the Pawtuxet River in November 2010 and July 2011.

1.1 Objective

The objective of activities described in this work plan is to facilitate the voluntary removal of PCB contaminated sediment from the Pawtuxet River adjacent to the former Ciba-Geigy facility. The contaminated sediment and associated water will be treated and disposed of at appropriate facilities. The excavation areas will be filled with clean material to restore the river bottom to the appropriate grade.

1.2 Project Schedule

The project master schedule is presented in Appendix A. The milestone dates for this work include removal completion in November and project completion report submission prior to the end of the calendar year.

1.3 Supporting Documents

Two supporting documents by AECOM, Sand Cap Inspection and Sediment Quality Investigation Report (AECOM, February 2011) and Sediment Sampling Results and Scope of Work for Sediment Removal at Former Ciba-Geigy Facility, Cranston, RI (AECOM, September 2011), are included at the end of this work plan to provide additional information.

2.0 Background

The former Ciba-Geigy production facility is located on Mill Street in Cranston, Rhode Island (Site) and consists of approximately 5.5 acres with several unoccupied buildings and open land upon which chemical production buildings were located adjacent to the Pawtuxet River (Figure 1, Appendix B).

2.1 Site Data

Beginning in 1930, the Alrose Chemical Company manufactured chemicals at the Site. The GEIGY Chemical Company purchased the Site in 1954 and merged with the Ciba Corporation in 1970. Throughout its operational history, the Site was used for the manufacture of various agricultural products, leather and textile auxiliaries, plastics additives, optical brighteners, pharmaceuticals, and bacteriostats. The facility operated until May 1986, when at that time Ciba ceased chemical manufacturing operations at the Site and began decommissioning and razing the existing plant. The production plant was demolished in the late 1980's, and there are currently four buildings that remain on the property (Buildings #15, #20, #25 and #26) which are located north of the railroad spur and upgradient from the former Production Area. BASF Corporation acquired Ciba-Geigy Corporation in 2009.

Site soils, sediments and groundwater were found to be impacted with Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs) and Polychlorinated biphenyls (PCBs). Accordingly, remedial actions such as the installation of a pump-and-treat system to limit groundwater discharge to the river and voluntary soil removal were implemented. Additionally, Ciba performed a voluntary excavation and capping corrective measure within the Pawtuxet River and submitted a follow up report to verify the findings of the RI. A major flooding event occurred during the spring of 2010 and at that time the EPA requested that BASF resample the sediment cap to ensure that it is functioning as intended, and to propose and implement a work plan to that end. On behalf of BASF, AECOM prepared and performed sediment cap testing and sediment characterization work in November of 2010. The conclusion of that work was that: 1) a 12-inch clean sand cover was confirmed in all 12 sampling locations; and 2) PCB concentrations in the vicinity of upstream location SD-2R remain though it was confirmed that the impacts are not widespread and consistent with the previous sediment sampling reports. Sampling locations for this event are shown in Figure 1. Analytical results for PCB are presented in Appendix C.

AECOM also completed sediment sampling in the Pawtuxet River on July 13 and 14, 2011 as there were two outlying areas where PCBs were also found to remain and since it was determined that further remedial action is warranted in location SD-2R, investigation in these areas was warranted to be consistent with the previous work objectives. The sediment sampling was conducted in locations where elevated total PCB concentrations (SD-TUF2C, SD-TUF7C) were measured during historical sediment investigations (RFI Pawtuxet River, 1995). The sampling activities were designed to delineate areas for a voluntary remedial action. Sediment samples were collected from the historic SD-TUF7C and SD-TUF2C locations and the immediate surrounding area. Figures 1 and 2 located in Appendix B present the sediment sample locations from the July 2011 event and location SD-2R, re-sampled during the November 2010 event. Sediment data from the November 2010 and July 2011 sampling events were presented as Figures 2 through 4 in the Sediment Sampling Results and Scope of Work for Sediment Removal Memorandum (AECOM, 9/16/11), provided in the Supporting

Documents section of this submittal. Analytical results for total PCB and TOC concentrations are presented in Appendix C.

2.2 Meetings/Agreements

An Administrative Consent Order (AOC) was entered into with the Environmental Protection Agency (EPA) in June of 1989 (RCRA Docket No: I-88-1088), and was subsequently modified during September of 1992. The AOC identified the steps that were to be taken to evaluate the nature and extent of any releases of hazardous waste or hazardous constituents at or from the facility, and to take the necessary steps to develop a Corrective Measures Study (CMS). Table 2-1 below provides a list of key site documents that have been prepared in order to achieve this goal.

Table 2-1. Site Documentation

USEPA AOC	June 1989
RCRA Facility Investigation Interim Report	November 1991
Revisions to the Phase 1 Interim Report and Phase II Proposal	July 1993
RCRA Facility Investigation Report	July 1995
RCRA Facility Investigation Report for the Pawtuxet River	March 1996
On-Site Soil IRM Report	August 1996
Corrective Measures Study Report	August 1996
Sediment Sampling Report for the Pawtuxet River	May 2003
Special Monitoring Report	July 2008
Annual Monitoring Reports	2004 through 2008
POTW Quarterly Discharge Monitoring Reports	2007 through 2010
As-built drawings of the former production facility	Various

3.0 Limits of Work and Site Preparation

The remedial program has been designed so that the activities will result in an overall benefit to the environment by improving the local ecological habitat and eliminating potential harm to humans and environmental receptors. The primary components of the remedial program are described in the following section.

3.1 Limits of Work

The work boundaries for this project are the upland property lines of the former Ciba-Geigy facility. This includes the property lines shown in Figure 1 as well as the northwestern side of the railroad bridge and the riverbank to the north of the railroad bridge.

The excavation areas are shown in Figure 2. The westernmost area is identified as SD-2R. It covers 120 ft^2 with impacted sediment to a depth of 1 foot. The middle area is identified as area SD-34, which covers 180 ft^2 with impacted sediment to a depth 2 feet. The easternmost area is identified as area SD-42, which covers 90 ft^2 with impacted sediment to a depth of 0.5 feet. Excavation of the sediment will be restricted to these three areas. The allowable overdepth will be 1 foot vertically below the impacted sediment and 1 foot laterally from the boundary of impacted sediment.

3.2 Access Points

Access to the upland property is limited to a gate at 180 Mill Street in Cranston, RI. A paved road leads to the edge of area formally occupied by Ciba-Geigy buildings. The upland project area proper is now an overgrown field adjacent to the River. Access to the river is available downstream for hand carried boats at Rhodes on Pawtuxet. The Howard Conservation Area Canoe Launch at the end of Pontiac Street provides easier access for hand carried boats, but it is significantly farther away from the site than Rhodes at Pawtuxet. It may be possible to access the Site via boats launched from Pawtuxet Cove, though the navigability of the former dam is unknown.

3.3 Clearing and Grubbing

The upland property is largely overgrown with small trees, brush and other vegetation. Trees and shrubs include northern catalpa, eastern cottonwood, hawthorne, staghorn sumac, tree of heaven and white pine. Herbacious vegetation included goldenrod, Japanese knotweed, various grasses, vetch, purslain and common mullien. Poison ivy and Eurasian bittersweet vines were also noted at the site, predominantly along the fence line. Standing trees will be cut and lay down in the staging area. Similarly, brush and other vegetation will be cut and piled in the staging area. Stockpiled materials will either be stored for later site management measures or chipped and managed for disposal offsite. All root matter and material below sediment line will be managed with the impacted sediment.

SD-42 is also known to contain submerged branches and other debris. The area will be grubbed prior to excavation. Materials removed during grubbing will be placed in a container and sent to a landfill for disposal.

A chain-link fence runs along the top of the bulkhead. The fence will have to be disassembled and stored during excavation and then reassembled when the work is done and/or replaced with new in kind material to ensure that Site access conditions are maintained.

3.4 Staging Areas

All staging will take place on the property of the former Ciba-Geigy facility. There is an asphalt surface at the western edge of the Site that may be suitable for staging rolloffs and heavy equipment. Geogrids or swamp mats may be needed to support equipment and heavy material that is staged in the earthen area after it is grubbed and cleared. Any geogrid or swamp mat used in the course of conducting the work will be removed upon demobilizing from the Site and either disposed or decontaminated prior to moving offsite.

3.5 Chain of Custody

All grubbed materials, excavated sediments and other construction and demolition debris generated during the work will be inspected and signed for by AECOM's representative and the Site owner's representative prior to transport away from the Site. Appropriate material characterization will be performed prior to offloading and will accompany the material shipping logs as required for legal transport.

4.0 Environmental Controls

4.1 Ambient Environment

The Site is immediately adjacent to a residential neighborhood to the north, and Mill Street also runs through a residential neighborhood. Every effort will be made to limit working hours to between 8:00 am and 5:00 pm, and to limit truck traffic during heavy traffic times. Dust control measures will be implemented during grubbing and excavation activities. Loud activities will be scheduled toward the middle of the day when possible to minimize the impact on the adjacent community. Excavated sediment will be covered to prevent odor issues.

4.2 In Water

Silt curtains will be required around all excavations. The curtains will be weighted at the bottom and in contact with the river bottom and suspended from the water surface with flotation devices at the top. The curtains will be placed approximately 180° around the excavation area downstream of each area but located as close as possible to the limits of the excavation without interfering with the operations. The staging and dismantling of the silt curtain will be managed carefully so as not to disturb the sediment. AECOM personnel will periodically test the turbidity of downstream waters to ensure suspended solid action levels are not exceeded. Turbidity action levels for the work are proposed at 50 N.T.U. (average) above background outside curtained areas. Readings will be taken at 3 times within the construction day; one prior to the commencement of activities and two readings during the conduct of the construction activities, consistent with the SOP provided in Appendix D. If the 50 N.T.U. level is reached, work will temporarily stop and the silt curtain will be inspected to insure that it has not been compromised. If no obvious rips or tears are identified, work will start up again but proceed more slowly to minimize turbidity. If at any point during the excavation, the action level is exceeded, prior to demobilizing from the area, surficial sediment will be scraped from the surface within the limits of the curtain. Absorbent booms will also be in place around the work area to mitigate fuel or oil spills. Coast Guard practices will be used when refueling boats as necessary.

4.3 Upland

Once the clearing and grubbing is complete, best practices will be employed to prevent erosion of the exposed soil. In addition, periodic wetting or other best practices will be employed to limit dust.

Vehicle and equipment fueling areas will be equipped with spill response materials and equipment as well as a spill containment system. All fuels and fluids will be stored in approved containers. When possible, environmentally friendly fluids will be used.

Given the limited volume of excavated material, it is possible that the excavated sediment will be placed directly in TSCA certified containers; however, characterization samples will be collected and analyzed in accordance with the SOP provided in Appendix D. The nature of the sediment is such that it will dewater quickly, so the excess water will be drained into a TSCA certified container prior to the trucks leaving for the disposal site. The excess water will be filtered through a bag filter to remove any sediment or debris, containerized, sampled and analyzed and sent to an appropriate disposal facility. If a drainage pad is used, then protection must be in place to prevent the release of excess water during transport of the sediment to the dewatering pad. The drainage pad will direct excess

water to a lined sump for capture and treatment prior to disposal. Regardless of the drainage method used, secondary containment will be used prevent the release of sediment or excess water.

5.0 Excavation

The preferred method for excavating the impacted sediment is to use a land-based long-arm excavator or crane. This method is preferred due to the limited access to river for boats, and the need to re-handle sediment is reduced. A second method is to mount a mechanical dredge on a barge and conduct in-water removal. In each case, sand backfilling operations would use the same placement method as with removal. While land-based excavation is preferable, the chosen approach will be subject to availability/preference of the contractor, availability of equipment and safety restrictions related to the proximity of the power lines over the Facility Railroad Bridge. Any equipment that touches the impacted sediment will require steam cleaning prior to placement of backfill and when moving the equipment from one location to the next location.

6.0 Dredge Spoil and Residuals Management

6.1 Dredge Solids

AECOM will ensure that the contractor providing sediment removal at the Site will manage dredge spoils consistent with appropriate governing regulations. While not all material will contain PCBs over TSCA limits, the anticipation is that all material will be managed consistent with TSCA procedures. Management will consist of post-excavation stockpiling and gravity dewatering, sampling and analysis for free liquids and PCBs consistent with the SOP provided in Appendix D, management of free liquids using Portland cement or other pozzolanic reagent that will aid in moisture reduction, follow up confirmation testing that free liquids have been removed and offloading to TSCA certified trucks with appropriate shipping manifests. In the performance specification that AECOM will prepare for the contractor on behalf of BASF, the management responsibilities will be dictated to the Contractor. The Contractor will:

- Place residuals onto a dewatering pad to permit gravity drainage of entrained liquids (as needed);
- Monitor free liquids at a minimum of 24 hours but no more than 72 hours after placement;
- Maintain stockpiling area by covering the stockpile with 6 mil poly sheeting at the close of each construction day and during inclement weather;
- Measure free liquids of material after gravity draining for pass/fail status;
- Add Portland cement or other approved water absorbent material to reduce free liquids and attain satisfactory passage of free liquid testing;
- Obtain representative samples of material for characterization testing required for transport and disposal at TSCA facility;
- Load and transport soils in lined and covered vehicles for disposal;
- Provide evidence of receipt, acceptance and weigh out of received soils for documentation; and
- Prior to demobilizing from the Site, inspect and provide good housekeeping of areas to return Site to current status.

6.2 Decant Water

Any liquids decanting from the stockpiled material will be collected and directed to a storage container onsite for temporary collection and characterization prior to disposal. Characterization efforts will be consistent with the SOP provided in Appendix D. In the performance specification that AECOM will prepare for the contractor on behalf of BASF, the management responsibilities will be dictated to the Contractor. The Contractor will:

- Contract for the delivery and rental of a liquids container;
- Provide necessary collection and pumping equipment to direct water from the lined, bermed dewatering pad to the collection container including any inline filtration unit;
- At conclusion of the project or at an interim point in time at such time that the container fills, characterize and arrange for offsite disposal and
- At the conclusion of the project, provide cleaning and return of the container.

7.0 Restoration

7.1 Backfill

The areas under remediation at this Site will be brought to pre-excavation grades with certified clean medium grained sand matching to the best extent possible the material gradation of the in place material. The method of placement will be the same as removal, however, buckets or other equipment in direct contact with the sediment will be steam cleaned prior to placement. Turbidity curtains will remain in place until such time the backfill material is placed and inspected to insure that restoration elevations approximately match the pre-excavation grades. Pre-excavation grades will be established based on depth of water as referenced on an in river staff gauge as substantial fluctuation over the performance of remediation activities is not likely. A minimum of three (3) point elevations will be measured in each restored area.

7.2 Erosion Control Removal

Following completion of the restoration of the areas, AECOM will measure turbidity levels and ensure that background turbidity levels are restored prior to removing the turbidity curtain. Sediment and erosion controls placed around the sediment dewatering pad will be cleared after removal of the pad and restoration of the grounds. At the discretion of AECOM, some controls may remain in place to insure that the denuded ground area is protected from erosion should the area of restoration warrant this protection. In this case the controls will be permitted to remain in place through the next growing period to ensure that the disturbed ground area is sufficiently re-vegetated and able to withstand surface runoff across the area.

8.0 Health and Safety

AECOM will maintain a health and safety plan governing site activities for our work. We will also require that the contractor meet minimum standards established under our Quality Management System for performing work under a subcontract to AECOM. One element of this system is the preparation and successful review of health and safety procedures as document in a project specific health and safety plan. Additionally, the contractor will be required to meet OSHA regulations and AECOM health and safety matrices for demonstration of safe work practices.

9.0 Reporting

The purpose of post-remedial reporting is to document the Site activities for confirmation of conducting work consistent with this plan and in accordance with appropriate permits. AECOM will prepare this report and include at a minimum:

- Summary of work deviating from workplan (if any)
- Daily report logs and photo documentation of all work activities
- Submission of all analytical testing data (residual characterization)
- Material certification sheets (as needed)
- Material shipping logs
- Certification of receipt of material at designated facility

Appendix A

Project Schedule

Projected Implementation Schedule. The approximate projected schedule for the scope of work is as follows:

- Work plan Submittal to EPA (Draft): 10/11
  - Approval from EPA (estimated): 10/17
- Performance Specification Preparation: 10/17 – 10/24
- Contractor Construction Approach: 10/24 – 10/28
- AECOM Review of Construction Approach: 10/31 – 11/4
- Mobilization and Preconstruction Meeting: 11/14
- Project Field Completion: 11/30
- Project Completion Report to EPA (Draft): 12/23
  - Approval from EPA (estimated): 12/30

Appendix B

Figures

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996

0 30 60 Feet

N W E S

FORMER CIBA-GEIGY CRANSTON, RI 60163799.1			SEDIMENT SAMPLING LOCATION
DATE: 10/12/11	DRWN: J.E.B.		FIGURE 1

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\9_Permitting\ACOE\GIS\Projects\Figure 2 Sediment Sampling Location.mxd

AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996

0 30 60 Feet

N W E S

FORMER CIBA-GEIGY
SITE INVESTIGATION
CRANSTON, RI
60163799.1

PROPOSED SEDIMENT REMOVAL AREAS

DATE: 08/08/11 | DRWN: KNH | FIGURE 2

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\7_Deliverables\GIS_Database\Projects\Proposed_Excavation_2011_Updated.mxd

Appendix C

Analytical Data

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107150	1107151	1107151	1107151	1107151
		sys_loc_code	SD29	SD32	SD32	SD32	SD33
		sys_sample_code	SD-29-A_071411	SD-32-A_071311	SD-32-B_071311	SD-32-C_071311	SD-33-A_071311
		sample_date	7/14/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0586 U	0.304	0.682	0.562	< 0.0663 U
SW8082	PCB-1254	mg/kg	0.131	< 0.0864 U	< 0.0823 U	< 0.0894 U	0.266
SW8082	PCB-1221	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
SW8082	PCB-1232	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
SW8082	PCB-1248	mg/kg	< 0.0586 U	4.31 D	9.57 D	11.5 D	< 0.0663 U
SW8082	PCB-1242	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	3900	19000	40000	52000	5300
	TOTAL PCBs	mg/kg	0.131	4.614	10.252	12.062	0.266

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1107151	1107151	1107151	1107151
		sys_loc_code	SD33	SD33	SD34	SD34	SD34
		sys_sample_code	SD-33-B_071311	SD-33-C_071311	SD-34-A_071311	SD-34-B_071311	SD-34-B-2_071311
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0708 U	0.660	0.129	0.865	0.788
SW8082	PCB-1254	mg/kg	6.61 D	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1221	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1232	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1248	mg/kg	9.69 D	9.53 D	0.360	18.1 D	14.2 D
SW8082	PCB-1242	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	12000	20000	15000	36000	40000
	TOTAL PCBs	mg/kg	16.3	10.19	0.489	18.965	14.988

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1107151	1107151	1107151	1107151
		sys_loc_code	SD34	SD35	SD35	SD36	SD36
		sys_sample_code	SD-34-C_071311	SD-35-A_071311	SD-35-B_071311	SD-36-A_071311	SD-36-B_071311
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1254	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	0.239	0.162
SW8082	PCB-1221	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1232	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1248	mg/kg	169 D	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1242	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	30000	11000	14000	12000	26000
	TOTAL PCBs	mg/kg	169	< 0.0579 U	< 0.0547 U	0.239	0.162

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1108108	1108108	1108108	1108108
		sys_loc_code	SD36	SD21	SD21	SD21	SD21
		sys_sample_code	SD-36-C_071311	SD-21-A_07132011	SD-21-B_07132011	SD-21-B-2_07132011	SD-21-C_07132011
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0596 U	< 0.0580 U	0.207	0.180	< 0.0784 U
SW8082	PCB-1254	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1221	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1232	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1248	mg/kg	< 0.0596 U	0.789	0.783	0.949	7.70 D
SW8082	PCB-1242	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	4000	11000	21000	18000	34000
	TOTAL PCBs	mg/kg	< 0.0596 U	0.789	0.99	1.129	7.7

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF2C AREA			
		lab_sdg	1107150	1108108	1108108	1108108
		sys_loc_code	SD42	SD23	SD23	SD23
		sys_sample_code	SD-42-A_071411	SD-23-A_07142011	SD-23-A-2_07142011	SD-23-B_07142011
		sample_date	7/14/2011	7/14/2011	7/14/2011	7/14/2011
analytic_method	chemical_name	report_result_unit				
SW8082	PCB-1260	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1254	mg/kg	68.5 D	0.514	< 0.0630 U	0.169
SW8082	PCB-1221	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1232	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1248	mg/kg	114 D	0.205	0.366	< 0.0622 U
SW8082	PCB-1242	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	62000	9900	6500	3300
	TOTAL PCBs	mg/kg	182.5	0.719	0.366	0.169

BASF, Cranston, RI

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TABLE 2
Summary of PCBs in Sediment Samples - SD-2R Area

Sample Location	1 (Upstream)		2R (Subject Area)					3 (Channel)		4 (Downstream)		
Sample ID	SD-1-A-1	SD-1-B-1	SD-2R-A-1	SD-2R-A-2	SD-2R-B-1	SD-2R-B-2	SD-2R-C-1	SD-3-A-1	SD-3-B-1	SD-4-A-1	SD-4-B-1	SD-4-C-1
Sample Interval (in.)	0-6	6-12	0-6	0-6	6-11	6-11	11-17	0-6	6-9	0-6	6-11	11-17
Sample Date	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Analyte												
PCB-1221	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1232	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1242	**2.95**	**6.29**	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	**3.49**	**0.213**	**36.6**	**8.02**
PCB-1248	<0.0998 U	<0.0858 U	**95.0 D**	**187 D**	**17.1 D**	**16.5 D**	**0.578**	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1254	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1260	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572

Notes:

U = Not detected at detection limit

D = Diluted result

Samples SD-2R-A2 and -B2 are sample duplicates

Bolded results indicate detection of analyte above the detection limit

Appendix D

Standard Operating Procedures

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Standard Operating Procedure

Pawtuxet River Remedial Dredging Project
Cranston, Rhode Island

Revision: 1
Date: October 2011

Stockpile and Sump Sampling Procedures for Dewatered Dredged Material Characterization, Classification, and Disposal

Contents

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A.0 Purpose and Applicability

This procedure describes the methodology to be used for the collection of valid and representative waste characterization and classification samples from the dredged contaminated sediment stockpile and the sump used to collect excess water from the stockpile. The sediment stockpile will be generated by dredging operations in the Pawtuxet River (PR). The sediment will be placed on a dewatering pad for gravity driven dewatering of the material. The effluent will be collected in a sump prior to being placed in drums for transportation and disposal. This procedure applies to the collection of both sediment and effluent characterization samples.

Note that the disposal requirements for non-sediment and non-liquid contaminated waste, including sampling supplies and personal protective equipment (PPE), will be evaluated based on the analytical results of the sediment and effluent classification sampling. Therefore, samples of non-sediment and non-liquid waste will not be collected for waste classification purposes.

Other specific project requirements, as described in previously approved project-specific Standard Operating Procedures (SOPs) and/or the project-specific Health and Safety Plan (HASP), which incorporates AECOM's core HASP procedures[1] have been incorporated herein by reference.

[1] AECOM Safety, Health, and Environment Manual North America – S3NA-000-MN SHE Manual – Revision 0 01 October 2010

B.0 Responsibilities

The AECOM on-site Field Team Manager will have the responsibility to oversee and ensure that all sampling from the sediment stockpile and effluent sump is performed in accordance with the task-specific HASP, applicable SOPs, and the sample collection protocol described herein.

AECOM sampling personnel will be responsible for implementing activities related to sediment and effluent sampling, including preparation, sample collection and handling, and recordkeeping, as described in this document.

C.0 Health and Safety

This section presents general safety precautions to be employed during collection of samples from the sediment stockpile and sump effluent. Consideration must be given to the following precautionary measures during sample collection activities.

The sediment removed from the PR has been pre-characterized as material with PCB levels in excess of 50 ppm. Appropriate PPE must be worn to prevent inhalation, ingestion, or trans-dermal exposure to PCBs when sampling from the stockpile or sump. Consult the task-specific HASP for requirements. Also refer to AECOM SOP S3NA 507 PR Hazardous Materials Communication – WHMIS regarding the properties and potential effects of PCBs. Also refer to S3NA 508 PR Hazardous Materials Handling and Shipping for procedures for handling and transporting PCB contaminated material.

Precautionary measures must be taken when moving or lifting heavy objects. Refer to the task-specific HASP for the necessary measures.

Precautionary measures must be taken when moving around the sump. Refer to the task-specific HASP for the necessary measures.

Ensure that coolers used to transport samples are free of pieces of broken glass to prevent cuts and abrasions.

D.0 Supporting Materials

The list below identifies the equipment and materials that may be needed for the collection and documentation of sediment and effluent samples. Not all equipment listed below may be necessary for a specific activity. Additional information may be required pending field conditions.

D.1 General

- Decontamination materials and equipment (for non-disposable sampling equipment)
- PPE as specified in the task-specific HASP
- Field data sheets and field logbook
- Laboratory-supplied sample containers, labels, and preservation solutions
- AECOM-supplied sample containers and labels
- Chain-of-custody records and seals
- Sample packaging and shipment materials (coolers, packaging materials, etc.)
- Ice
- Paper towels or chemical-free cloths
- Polyethylene (poly) sheeting
- Absorbent pads
- Material Safety Data Sheets (MSDSs)
- A copy of the task-specific HASP
- Copies of applicable SOPs as referenced herein

D.2 Sample Collection

- Disposable trowels (sediments)
- Stainless steel hand auger, trier, or other similar coring devices (sediments)
- Stainless steel trowel, scoop or spoons (sediments)
- Lexan core liner
- 5-gallon plastic bucket (sediments)
- 5-gallon carboy (liquids)
- Disposable bailers (liquids)
- Peristaltic pump
- Tygon tubing

- Poly tubing
- Drum funnel
- Small shovel

E.0 Methods and Procedures

Prior to sampling, all containers that will receive sampled materials will be labeled with an identification number and description of the contents. The corresponding ID number will be entered in the field log book and the field data sheets. If the materials are to be shipped off-site, then chain of custody documents with the ID should be created as well.

E.1 Sampling Rationale

Based on knowledge of the nature of the sediment to be dredged, it is assumed that the drainage properties of the sediment from the three different hotspots will be relatively similar, but that the PCB concentrations will be different. Samples to determine the free water in the sediment stockpile will not be composited to ensure that all parts of the stockpile have sufficiently dewatered. Samples of the stockpile will be taken and composited to determine the average PCB concentration level for transport and disposal documentation even though the sediment has been pre-characterized as TSCA regulated material (PCBs > 50 ppm). Additionally, the sample may be characterized for other parameters as needed for acceptance at the disposal facility. Composite samples of the effluent water in the sump will be taken to determine the appropriate transportation and disposal procedures. Sample collection methods are described below in Section E.2.

E.2 Sample Collection

E.2.1 Sediment Stockpile Sampling

Poly sheeting will be placed around all sampling and compositing areas in order to prevent contamination of the work area.

A clean pair of chemically impervious gloves and disposable or decontaminated sampling tools will be used when handling the samples during collection.

Depending on the overall consistency of the sediment ("near solid", "semi-solid/sludge") samples will be collected using either a disposable or stainless steel hand trowel, scoop, hand auger or lexan core liner.

For free water measurements, a minimum of three (3) representative sediment sample aliquots of at least 100 grams should be collected from equally spaced points at the base of the stockpile (with gravity dewatering the base of the stockpile will have the highest moisture content). Aliquot sample locations should be recorded to prevent multiple sampling at the same location. Sampling will continue every 24 hours at a minimum until the stockpile passes the EPA Paint Filter Liquids Test (Method 9095B).

For sediment characterization samples, a minimum of three (3) representative sediment sample aliquots of at least 100 grams (total volume should be assessed based on the sample volume requirements for the required analyses as indicated on Table 1) will be collected from sediment disposed from each hot spot. After excavation of a hot spot is complete, samples will be taken from sediment placed on the dewatering pad prior to placement of sediment from another hotspot. The

sediment samples will be stored in appropriate containers (see Table 1) on ice until samples have been taken from each hotspot. The samples will then be composited in a decontaminated stainless steel bowl and sent for analysis. Samples collected for the purpose of volatiles characterization will be collected directly into the appropriate container (see Table 1) from each of the sampling locations.

When using a hand auger to collect the samples, the following procedure will be followed:

Place the auger at the sediment surface and then rotate the auger while pushing downward until the auger head has completely penetrated the surface. Remove the auger and transfer the sediment in the auger to the decontaminated bucket.

Place the auger back into the borehole from the first sample, and rotate the auger while pushing downward until the bucket auger has penetrated the middle third of the sediment in the drum. Remove the auger and transfer the sediment in the auger to the decontaminated bucket.

Place the auger back into the borehole from the first and second sample, and rotate the auger while pushing downward until the bucket auger has penetrated the bottom third of the sediment in the drum. Remove the auger and transfer the sediment in the auger to the decontaminated bucket.

When using a core liner, the following procedure will be followed:

Insert the core liner to refusal.

Create a vacuum (using the liner cap, tape, and a minimal amount of water, if needed) so that the material is retained in the liner.

Retrieve the core liner and transfer the material to a labeled, decontaminated bucket.

Samples collected with a trowel or scoop will be done as follows:

Insert the sampling tool into the sediment and rotate the device such that a representative sample of sediment is collected with the device.

Transfer the sediment into a labeled, decontaminated bucket.

Repeat the above steps until a volume of sediment is collected from the stockpile is sufficient for the test requirements.

Sample storage will follow the guidelines listed in Table 1.

E.2.2 Waste Liquid Sampling

Poly sheeting will be placed around all sampling and compositing areas in order to prevent contamination of the work area. Absorbent pads will be available to contain any spilled liquids.

Clean pair of chemically impervious gloves and disposable or decontaminated sampling tools will be used when handling the samples during collection.

A peristaltic pump may be used to remove effluent from the sump as follows:

Place poly sheeting around the work area in order to prevent contamination. Make sure absorbent pads are available in the work area to contain any spilled liquids.

Assemble the peristaltic pump according to the manufacturer's instructions and place the pump on the poly sheeting next to sump.

Cut a length of poly tubing of sufficient length to reach the liquid in the sump from the pump head of the peristaltic pump (i.e., influent). Cut a second length of poly tubing of sufficient length to reach a container of sufficient size from the pump head of the peristaltic pump.

Place a length of tygon tubing in the pump head and connect the influent and effluent lengths of poly tubing. (It is recommended that one person hold the end of the influent tubing in the sump, and a second person hold the end of the effluent tubing in the container to receive the liquid. Alternately, one end of the tubing may be secured in some way.)

Turn on the peristaltic pump and pump the effluent out of the sump.

If using a container to collect the effluent, stop the pump when it is approximately ¾ full.

Sample storage will follow the guidelines listed in Table 1.

Record sampling information relevant to the composite samples (e.g., those containers comprising the composite) in the field logbook.

E.3 Sample Custody and Shipping

Specific procedures pertaining to the handling and shipment of samples shall be in accordance with AECOM Sample Custody and Sample Packing and Shipping SOPs.

E.4 Decontamination

Decontamination of re-usable sample collection devices and tools used during sampling will be completed as outlined in AECOM's Industrial Hygiene SOPs. Decontamination of equipment between samples for the same composite is not necessary. Disposable equipment will not be decontaminated. With the exception of bailers, disposable sampling devices, if utilized, will be disposed of with the sediment.

E.5 Sample Analysis

The Pain Filter Liquid Test will be conducted by AECOM sampling personal on site. Total PCB samples will be analyzed by the laboratories specified in the task-specific QAPP. Analysis will be requested and conducted, pursuant to United States Environmental Protection Agency (USEPA) SW-846 Methodology, as follows:

Total Polychlorinated Biphenyl (PCB) Aroclors (SW-846 8082A)

Paint Filter Liquid Test (sediment only) (SW-846 9095B)

F.0 Quality Assurance/Quality Control

No field quality control (QC) samples (trip blanks, equipment rinsate blanks, or field duplicates) are required for samples collected for waste characterization.

The Field Team Manager and/or Task Manager will check to ensure that sediment and effluent sampling procedures are in conformance with those stated in this protocol and that the associated records are complete and accurate.

G.0 Documentation

A number of documents will be completed and maintained as a part of the sample collection. The documents will provide a summary of the sample collection procedures and conditions, shipment method, the analyses requested, and the sample custody history. The documents may include:

Field logbooks;

Sample labels;

Chain-of-custody forms;

Shipping receipts;

Health and safety forms (Task Hazard Analysis [THA] and/or task-specific HASPs); and

Field Log Forms.

Deviations to the procedures detailed in this protocol will be initially documented in the field logbook and subsequently recorded on a Nonconformance Report. All deviations will be summarized on the Daily Activity Log.

All records associated with the activities described in this protocol will be ultimately maintained in accordance with AECOM Standard QA\QC protocols.

Table 1. Sample Container, Preservation, and Holding Requirements

Parameter	Container[1]	Preservation
Sediment		
PCB Aroclors, Reactive Cyanide, as Total	1 250-mL wide-mouth glass with Teflon-lined lid	Cool 4°C
Reactive Sulfide, as Acid Soluble and Insoluble (Titrimetric)	1 50-mL wide mouth glass	Fill jar to minimize headspace; pour NaOH/zinc acetate solution over top of sample; Cool 4°C
PCDDs/PCDFs	1 50-mL wide mouth glass	Cool 4°C
TCLP VOCs	1 125- mL wide-mouth glass	Cool 4°C, minimal headspace
TPH, TCLP SVOCs, Pesticides, Herbicides, and Metals; Ignitability, Corrosivity, Paint Filter Test	1 1-L wide-mouth glass	Cool 4°C
Aqueous		
TPH (Silica Gel Treated n-Hexane Extractable Material [SGT HEM])	2 1-L amber glass with Teflon-lined lid	HCl to pH<2; Cool 4°C
PCDDs/PCDFs	2 1-L amber glass with Teflon-lined lid	Cool 4°C
PCBs	2 1-L amber glass with Teflon-lined lid	Cool 4°C
Reactive Cyanide, as Total	1-250 mL plastic	NaOH to pH>12; Cool 4°C
Reactive Sulfide, as Acid Soluble and Insoluble (Titrimetric)	1-250 mL plastic	NaOH to pH>12 and 4 drops zinc acetate per liter; Cool 4°C
TCLP Metals	1 1-500 mL plastic	Cool 4°C
TCLP VOCs	3 40-mL VOA vials	Cool 4°C
TCLP SVOCs	2 1-L amber glass with Teflon-lined lid	Cool 4°C
TCLP Pesticides	2 1-L amber glass with Teflon-lined lid	Cool 4°C
TCLP Herbicides	2 1-L amber glass with Teflon-lined lid	Cool 4°C

[1] Laboratory may provide alternate containers as long as the containers meet the requirements of the method and allow the collection of sufficient volume to perform the analyses.

AECOM

Standard Operating Procedure

Pawtuxet River Remedial Dredging Project
Cranston, Rhode Island

Revision: 1
Date: October 2011

CTD/Turbidity Data Collection and Water Sampling

Contents

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B.0 RESPONSIBILITIES ..... ERROR! BOOKMARK NOT DEFINED.

C.0 HEALTH AND SAFETY ..... ERROR! BOOKMARK NOT DEFINED.

D.0 SUPPORTING MATERIALS ..... ERROR! BOOKMARK NOT DEFINED.

E.0 METHODS AND PROCEDURES ..... ERROR! BOOKMARK NOT DEFINED.

F.0 QUALITY ASSURANCE/QUALITY CONTROL . ERROR! BOOKMARK NOT DEFINED.

G.0 DOCUMENTATION ..... ERROR! BOOKMARK NOT DEFINED.

A.0 Scope and applicability

This project Standard Operating Procedure (SOP) defines the operating procedures for the collection of water samples and physical water property data using conductivity, temperature and depth (CTD)/turbidity sensors from a boat or other sampling platform during sample/data collection activities. This SOP also provides for the moored deployment of CTD/turbidity instrument sensors. Specialized handling of trace metal or trace organic samples is beyond the scope of this SOP.

The collection of water samples is limited to suspended solids concentrations (SSC), particulate organic carbon (POC), and dissolved organic carbon (DOC).

It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

B.0 Health and safety considerations

The health and safety considerations for the work associated with this SOP, including physical, chemical, and biological hazards are addressed in the site-specific Health and Safety Plan (HASP) and associated addenda . The major health and safety considerations for the work associated with water and CTD/turbidity data collections are the marine safety aspects of the program.

Daily safety briefs are to be conducted at the start of each working day before any work commences. These daily briefs are to be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risk areas covering every aspect of the work to be completed. Weather conditions are often part of these discussions. As detailed in the HASP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are fully remedied to the satisfaction of the SSO.

C.0 Interferences

Ensuring that the (in situ) sensors are maintained properly will help reduce interference risks related to these data collection efforts. Bio-fouling is generally the greatest concern related to moored systems, particularly when sensing turbidity. Data bias can arise related to suspended solids if the entire sample is not used during sample processing (USGS 2000) and special handling is required to minimize sea salt bias when processing seawater. However, these handling concerns should be addressed in laboratory SOPs.

D.0 Equipment and materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Water pump (diaphragm pump ca. 10 L/min or better; Shurflo™ or equivalent)
- CFLEX™ or equivalent polymer tubing (typical configuration requires 3/8 inch ID), a 50-foot length will be required
- Water sample containers
- CTD/turbidity instrument package (OBS3A or equivalent)
- Connective (serial) cabling
- Weight bearing line/cable and anchor weight
- Field laptop computer
- Chemical-free wipes
- Tap water supply
- Manufacturers operating manual
- Replacement batteries
- Survey vessel fitted with differential global positioning system (DGPS) navigational equipment
- Safety gear (work vests, HASP specified personal protective equipment [PPE])

Moored operations:

- Buoy, instrument caging, and connector deployment cable/chain
- Sufficient battery and memory capacity for the deployment period
- If station requirements are limited to turbidity, or pressure, then individual turbidity or pressure sensing systems (e.g., HOBO™ or equivalent) will be needed

Water sample processing for POC/DOC

- Glass fiber filters (GF/Fs), generally (pre-combusted) 25mm for POC
- Filter supports/holders
- Vacuum pump
- Forceps
- Aluminum foil (POC) packets
- Pre-cleaned Wheaton-33™ low extractable borosilicate glass vials (40-mL) or equivalent

E.0 Procedures

E.1 CTD/Turbidity Instrument Set-Up

Fasten the pump tubing to the CTD/turbidity sensor package avoiding any obstruction to the turbidity sensor. Attach the CTD instrument and the tubing inlet to the weighted deployment line at approximately 3 feet above the anchor weight. The tubing and the sensor cable should then be fastened (with plastic tape) to the weighted deployment line at regular intervals over the entire length. Refer to Section 2.1 "Mounting Suggestions" of the OBS-3A instrument manual (attached). Sensors should be inspected for cleanliness and to ensure they are free of corrosion.

Install the instrument batteries (3 D-size alkaline) and operating software according to Section 2.2 and 3.1 of the operating manual. A new configuration file should be named for each (multi-day) survey or mooring event to aid in data tracking. Annotation in the field records will describe the naming conventions used for the survey/mooring locations.

E.2 System Testing

Test the turbidity, temperature and conductivity sensors as outlined in Section 3.5 of the operating manual. Water density and barometric correction procedures are provided in Section 3.6 of the manual.

E.3 Calibration

The CTD and turbidity sensors are factory calibrated. CTD sensors should be returned to the manufacturer if they are not operating within the specified accuracy/precision limits. Initial checking can be accomplished in a large basin of water with known conductivity/salinity, temperature, and depth. Turbidity/optical backscatter (OBS) sensor calibration should be accomplished following Section 6.1 of the instrument manual once/at the start of each (multi-day) survey/mooring deployment.

E.4 Water Pump

Connect the pump to a 12-volt battery or directly to the vessel's 12-volt electrical system using appropriate electrical connections. The water pumps and associated tubing used on this data collection effort should be new and dedicated to the project. Water pumps should be rinsed with tap water before and after each sampling day. Between-station (or between sampling depth) rinsing is not generally required for major component (POC/DOC, SSC) sampling/analysis, however, the internal volume of water carried in the system (pump inlet to pump outlet) should be purged with a least one volume of water to ensure that a representative sample is collected. Attachment 1 provides additional water sample collection handling requirements for discrete water sample handling.

E.5 Deployment/Field Data Collection

Navigate to the station of interest using the navigational procedures outlined in the HASP.

Deploy the instrument group and attached sampling tube and begin CTD/turbidity data profiling.

At the station of interest, the instruments (and sampling tubing) should be lowered through the water column until the anchor weight strikes the bottom, thus fixing the initial near bottom position of the gear at approximately 3 feet above the bottom. Based on the water depth provided by the CTD, field technicians will determine the water column structure and define the desired depths for data and sample collection. Water collections are then generally made upon instrument recovery (near-bottom water first, then intermediate depths as needed, and surface water last).

Once fixed at a given sampling point, the sampling tubing should be flushed with at least one system volume prior to the collection of any water samples, Given the small (typically 3/8-inch ID) tube diameter, tube flushing will be complete for a 25-50 foot tube well within 10 seconds, with a flow rate of 10 liter (L)/min or better. After flushing the tubing, the requisite volume of water can be collected for the parameter set of interest.

SSC water samples should be collected directly in pre-labeled plastic bottles and stored on ice in the dark.

POC/DOC water samples should be collected in pre-labeled plastic bottles, held in the dark on ice, and processed within hours if possible. This can be performed either on deck, at the dock, or at the field facility (see Attachment 1).

All discrete water samples should be collected and stored/transferred to laboratories under Chain of Custody.

F.0 Quality assurance / quality control

It is the responsibility of the Field Team Manager (FTM) or designee to check the instrument calibration/test information, to spot check adherence to the procedural requirements of this SOP, and to review the associated documentation for accuracy and completeness.

During boat-based transects, newly acquired data should be reviewed for reasonableness by the FTM or designee before moving off station.

Quality control (QC) samples will be collected in the field (i.e., duplicates, POC/DOC filter blanks) to assess field handling precision and in the laboratory (i.e. control sample, lab blanks) to assess measurement accuracy and precision.

G.0 Data and records management

Field records will be generated and maintained by the field staff. These documents cover all aspects of collection including chronology of events, station locations, time/date, sampler name, and data collected.

Instrument check/test records including turbidity sensor calibration records will be maintained in the field logbook. POC sample filtration volumes will be recorded on POC sample processing sheets (Attachment 1).

During boat-based surveys in situ CTD/turbidity data will be captured on a laptop PC using a data acquisition system that integrates instrument software and Hypack navigation software. Furthermore, acquired data should be downloaded on a daily basis to the AECOM Data Manager for permanent storage. Data collected from moored systems will be downloaded at regular intervals (during servicing surveys) and again transferred to the AECOM Data Manager for final upload/storage.

Data files recorded by the instrument may be tracked by date/time stamp and associated navigational data. Furthermore, sensor data files should be logged to track transect, start and end time, and the associated file sequence (Attachment 2). Note: as indicated in Section 5, each boat-based survey or mooring should provide a new configuration file name to aid data file tracking. The field laptop time/clock should be checked at the start of the survey against an accurate source (e.g., cell phone or DGPS time stamp) to ensure accurate time synchronization for these tidally sensitive data.

Field data will be maintained and distributed to the appropriate personnel.

Deviations to the procedures detailed in the SOP must be recorded in the field logbook at the time of occurrence, summarized on a non-conformance report, and communicated to the FTM no later than the end of the day.

H.0 Personnel qualifications and training

The individuals executing these procedures must have read, and be familiar with, the requirements of this SOP and the corresponding plans (e.g., Sediment Removal Workplan, Site-Specific HASP). Water quality data collection is a relatively simple procedure requiring minimal training. However, initial instrument calibration and sample/data collections should be supervised by the FTM or designee.

I.0 References

Campbell Scientific, Inc., 2008. OBS-3A Turbidity and Temperature Monitoring System Operators Manual. Revision 11/08.

USGS 2000. Comparability of Suspended-Sediment Concentration and Total Suspended Solids Data. Water-Resources Investigations Report 00-4191, Reston, VA. 20 pp.

J.0 Revision History

Revision	Date	Changes
0	March 2009	NA
1	October 2011	Site-specific references to documentation.

Attachment 1

Suspended Solids Sample Handling

Samples collected for SSC can be either filtered in the field or simply containerized and transferred to a fixed laboratory for filtration and analysis. To simplify logistics on the program, SSC samples will be containerized and transferred to a fixed laboratory.

Further, if total volatile solids are to be determined, no added sample is required as this measurement can be obtained from the same SSC filter after initial gravimetric analysis.

POC/DOC Sample Filtration

POC samples should be collected in triplicate for analysis. Whenever possible, POC/DOC water samples should be filtered immediately following sample collection in the following manner1,2:

i. Place a pre-combusted filter on fritted filter base of the filtration apparatus and attach the filtration tower (store filters covered if not immediately used).

ii. Thoroughly shake the sample container to suspend the particulate matter.

iii. Measure and record the required sample volume using a graduated cylinder. Pour the measured sample into the filtration tower, no more than 50-mL at a time.

iv. Filter the sample using a vacuum pulling no more than 10 inches of mercury.

v. Transfer an aliquot of the filtrate to a small (~ 40-mL) borosilicate glass vial3 and freeze without delay for DOC determination/storage.

vi. If less than the measured volume of sample can be practically filtered due to clogging, measure and record the actual volume filtered.

Important: Do not rinse the filter following filtration

vii. Air dry the filter after the sample has passed through by continuing the vacuum for 30 s.

viii. Using Teflon™-coated flat-tipped forceps, fold the filters in half while still on the fritted glass base of the filter apparatus.

ix. Transfer the filter pads to aluminum "packets", seal completely, and either freeze or dry at 103-105°C (24 hr) and place in a desiccator for long-term storage.

1If storage of the water sample is necessary, place the sample into a clean amber bottle and store at 4°C until filtration is done.

2Before the program commences, obtain pre-combusted GF/F filters for the purpose of DOC filtration/POC collection or prepare a batch by pre-combusting GF/F glass fiber filters at 500 °C for 1.5 hr.

3Before the program commences, obtain pre-cleaned glass vials for DOC sample storage or prepare a batch by rinsing with 10% hydrochloric acid (reagent grade) and then deionized water (DIW). Approximately 30-mL are needed for the analysis; use Wheaton-33™ low (40-mL) extractable borosilicate glass vials or equivalent.

Particulate samples should have some coloration following filtration to ensure sample delectability. Under most circumstances, filtering 500 mL will be sufficient under low flow/low particulate conditions and 100 mL will be sufficient under high flow conditions when using a 25-mm diameter GF/F filter pad. Corresponding larger volumes will be required when using a 47-mm filter; smaller volumes when using a 13-mm filter. Refer to USEPA Method 440 for additional details.

Reference:

USEPA Method 440. Determination of Carbon and Nitrogen in Sediments and Particulates of Estuarine/Coastal Waters Using Elemental Analysis. Rev 1.4, 1997. National Exposure Research Laboratory, Office of Research and Development, USEPA Cincinnati, OH. 10 pp.

Attachment 2

POC Sample Processing Form

Program: _____

Recorded By: _____ ***Date*** _____

Sample ID	Date/Time (filtered)	Volume (filtered)	Filtered By	Storage/Time*

*Stored in freezer/on dry ice without delay

Attachment 3

In Situ Data Log

Program: _____ ***Survey Name*** _____

Recorded By: _____ ***Survey Date*** _____

Transect Name/Location	**Time* EST__EDST__**		**File Name(s)**	**Comment**
	Start	**End**		

*Record as 24-hour; Check either Eastern Standard Time or Eastern Daylight Savings Time (EST/EDST).

Supporting Documents

AECOM

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February 7, 2011

AECOM Project No.: 60163799.1

Submitted via Electronic Mail
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Mr. Frank Battaglia
USEPA Region 1
RCRA Corrective Action Unit
5 Post Office Square
Mail Code: OSRR07-3
Boston, MA 02109-3912

RE: BASF (former Ciba-Geigy facility), 180 Mill Street, Cranston, Rhode Island Sand Cap Inspection and Sediment Quality Investigation Report for the Pawtuxet River

Dear Mr. Battaglia,

On behalf of the BASF Corporation (BASF), AECOM has prepared this report presenting the findings of the sand cap inspection and sediment sampling program conducted during November 2010 in the Pawtuxet River, adjacent to the former Ciba-Geigy facility in Cranston, Rhode Island. This work was completed in accordance with the Sand Cap and Sediment Quality Investigation Work Plan ([Work Plan], AECOM letter report dated October 21, 2010) approved by the EPA on October 29, 2010. This work was conducted in response to EPA receiving comments from the public concerning the integrity of the sand cap following the flooding of the Pawtuxet River during March-April 2010. As part of this work, EPA also requested that BASF re-sample the sediment at former sampling location SD-2R due to PCB concentrations detected during the 2002 sediment sampling event.

The following information provides the scope and methods of the sediment sampling program conducted during November 2010, the analytical results of the sediment samples collected during the field program, and recommendations.

1.0 Sand Cap and Sediment Sampling Program

The sand cap and sediment sampling was completed by AECOM on November 18 and 19, 2010. AECOM subcontracted with Geologic Field Services (GFS) of Melrose, MA to provide boat support and sampling equipment to collect the core samples. AECOM field personnel were stationed on land to process the sediment cores and containerize the samples for subsequent lab analysis. Sampling was done in a downstream to upstream manner to prevent the potential for cross-contamination from the coring operation. Consistent with this concept, the sand cap area was sampled first, followed by the sediment in the area around location SD-2R.

Twelve sand cap sampling locations were completed in the sand cap area (Locations 5 through 16) and four sediment sampling locations were completed around former location SD-2R (Locations 1 through 4). Each sand cap or sediment sample location was determined in the field using a portable GPS, and the locations are depicted in Figure 1. Once at the location, GFS secured the boat and lowered their push core system to the top of the sand cap or sediment. The core system was fitted with an internal 2-inch diameter acetate liner in order to collect an intact sediment core for

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visual and laboratory analysis. New acetate liners were used at each location. Field measurements and observations were made at each sample location to record: length of the water column (i.e., distance from top of the water to the top of the sediment); depth of penetration; length of sediment core recovered in the push cores; cap thickness; matrix type; total volatile organic vapors; and qualitative observations (color, odor, presence of witness barrier). Please see Table 1, Summary of Sediment Core Observations and Attachments A, Sediment Core Logs and Attachment B, Sediment Core Photographs for more details.

The intention of the sand cap sampling was to avoid penetrating the witness barrier. However, in some cases this could not be avoided because the witness barrier is composed of a thin woven plastic layer which the push core sampler was easily able to penetrate. By design, the witness barrier was intended to provide a visual indication of the footprint of the former sediment coffer dam remediation area, and not an actual RCRA-engineered barrier. AECOM informed EPA on the first day of field work (November 18) that the witness barrier had been penetrated in some locations. On the following day, EPA informed AECOM by phone that the penetrations to the witness barrier were not a significant consequence because it was not intended to be a RCRA-engineered barrier.

The purpose for sampling at another location SD-2R (locations 1 through 4) was to verify the polychlorinated biphenyl (PCB) data result from 2002 (location 2), and if verified by a similar detection, provide a measure of PCB distribution, where locations 1, 3 and 4 are positioned within 7 to 13 feet in a radial pattern (see Figure 1).

Observations of core samples

The amount of sediment recovered in the cores from locations 5 through 16 in the sand cap area ranged from [illegible] feet to 4 feet. In the vicinity of station SD-2R (Locations 1 through 4) the recovered sediment thickness ranged from 0.95 feet to 1.5 feet. The sediment type recovered in the cores from the cap area was sand, indicating the cap is intact. The material recovered in the cores from the locations around SD-2R was heterogeneous with layers of sand, silt and clay. Field PID readings of the sand samples from the sand cap area were primarily less than 3 ppmv, with the exception of Location 12 (see Figure 1) where an interval of sediment was recovered from below the witness barrier yielding a headspace screening value of 150 ppmv, suggesting volatile organic compound- (VOC) impacted sediment below the witness barrier and sand cap. The sand cap was approximately one foot thick at this location and the sand directly on top of the witness barrier at this location yielded a much lower headspace screening value of 0.2 ppmv. Refer to Table 1, Summary of Sediment Core Observations and Attachments A, Sediment Core Logs and Attachment B, Sediment Core Photographs for more details on the cores.

2.0 Laboratory Analyses

In accordance with the Work Plan, three samples of sand from atop the witness barrier were submitted for lab analysis from Locations 7 (hot spot area), 9 (downstream) and 11 (upstream). Sediment samples from four locations (Locations 1, 2, 3 and 4) around SD-2R were collected and submitted for lab analysis (please see Figure 1). All sand cap and sediment samples were submitted by AECOM to ESS Labs in Cranston, Rhode Island under a chain of custody for analysis.

The samples of sand from Locations 7, 9 and 11 were analyzed for the same parameters tested in 2002, except for Tinuvin 328, which is not a chemical of concern. These parameters included four specific VOCs by EPA Method 5035/8260 (chlorobenzene, m&p xylene, o-xylene, and toluene); two specific semivolatile organic compounds (SVOCs) (1,2-dichlorobenzene and 4-chloroaniline) and 12 polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270; six specific inorganics (cadmium,

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copper, cyanide, lead, thallium, and zinc) by EPA Methods 6010B, 7841, and 9014 (cyanide); and PCBs by EPA Method 8082. The sediment samples from the area around SD-2R were analyzed for PCBs only, by EPA Method 8082.

Sand cap samples

The analytical results from the three sand samples are summarized in Table 2 and copies of the laboratory reports are included in Attachment C. In summary, the analytical data indicates non-detectable levels or low levels of certain compounds. No VOCs were detected in the sand cap, except chlorobenzene in the Location 11 sample (0.0336 mg/kg); SVOCs and PAHs were only detected in two samples, Location 9 and Location 7; and PCBs were only detected at low levels (0.0925 mg/kg to 0.364 mg/kg) in three samples, SD-07-A-1, SD-07-A-2, and SD-11. As a result, the analyses indicate the absence of impacts from any residuals that may be present below the witness barrier and sand cap.

Station SD-2R samples

The analytical results from the sediment samples are summarized in Table 3 and copies of the laboratory reports are included in Attachment D. Initially, only the three sediment samples (0-6 in., 6-11 inches, and 11-17 inches) from Location 2 were analyzed for PCBs. This location was adjacent (less than five feet away) to former location SD-2R in order to confirm the 2002 results. Regarding the results from this location, PCB, was reported in all three samples with the highest concentration detected in the surface sample (0-6 inches) at 95 mg/kg and 187 mg/kg in the sample duplicate. PCB concentrations decrease in the two underlying samples from 17.1 mg/kg (6-11 inches) to 0.578 mg/kg (11-17 inches). Based upon these results, which were analogous to those obtained in 2002, sediment samples were collected from 7 to 13 feet of location 2 (locations 1, 3 and 4) and analyzed by EPA Method 8082, consistent with the Work Plan. The analytical results from these three surrounding locations show detections of PCBs at each location but at lower concentrations than Location 2 ranging from 0.213 mg/kg (Location 4, 0-6 inches) to 36.6 mg/kg (Location 4, 6-11 inches)

3.0 Summary and Conclusions

Based on the data collected and the information presented herein, AECOM provides the following conclusions:

1. Based upon a physical inspection and sampling program throughout the capped area, the clean sand cap on top of the witness barrier (approximately 1-foot thick with variations in thickness at different sampling locations) remains present at all 12 locations sampled, indicating that the sand cap is essentially the same thickness as when it was installed over 15 years ago and that it is performing as intended (despite the recent flood event in 2010).

2. The laboratory analyses of select sand cap samples for site contaminants of concern indicate non-detectable levels or low levels of various compounds, revealing that contaminant migration is not occurring through the sand cap.

3. PCB concentrations remain in the sediment in the area of former upstream location SD-2R, at a similar concentration to the 2002 sampling round. The PCB concentrations decrease both horizontally and vertically, moving away from Location 2 (on the order of 13 feet in radius). This confirms that the area is small and isolated, suggesting that the conclusions provided in the *Sediment Sampling Report* (dated May 2003) concerning river data and processes are still valid.

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4.0 Recommendations

Based on the data collected and the information presented herein, AECOM recommends no further actions regarding the sand cap and the discrete area of PCB-impacted sediment. After 15 years, the sand cap remains in place, intact, and appears to be performing as intended, despite being subject to sheer stresses during a major flooding event in spring 2010.

The PCB sampling and analyses at historic sediment location SD-2R and three surrounding locations in the river sediment indicated the absence of a widespread impact beyond the SD-2R location, consistent with data evaluated in previous reports (Sediment Sampling Report, Ciba, May 2003).

Please contact Joe Guarnaccia with BASF at (732) 762-4743, or the undersigned if you have any questions.

Yours sincerely,

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cc: Joe Guarnaccia, BASF

Attachments:

Figure 1 – Sediment sample locations
Tables 1 - 3
Attachment A – Sediment core logs
Attachment B – Sediment core photographs
Attachment C - Laboratory reports for sediment cap samples
Attachment D - Laboratory reports for sediment samples around SD-2R

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Attachments

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Tables

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BASF, Cranston, RI

TABLE 1
Summary of Sediment Coring Observations
November 18 - 19, 2010

Sediment Cap Area

Sample Location #	Latitude	Longitude	Water depth	Sediment Recovery (ft.)	Depth of Penetration (ft.)	Cap Thickness (ft.)	Matrix Type (silt, clay, sand, etc.)	Observations			
								PID reading (ppmv)	Color	Odor	Evidence of witness barrier recovered
5	42 31.0714538	72 25.8641329	7' 6"	0.85	4.5	> 0.85	Medium to coarse SAND, entirely cap material	0	Tan	None	No
6	42 31.0748250	72 25.8586489	7' 4"	1.3	4.6	1.15	Organic material top 0.1 ft, 0.1-1.25 ft medium to coarse SAND, trace gravel (cap material), 1.25-1.3 ft very fine SAND (below witness barrier)	0	0.1- Brown organic material, 0.1 - 1.25 Tan, 1.25-1.3 Grey	None	Yes @ 1.25 ft
7a	42 31.0773621	72 25.8562425	8' 5"	1.0	4.6	1.00	Medium to coarse SAND, entirely cap material	0	Tan	Slight odor @ 1 ft	Yes @ 1 ft
7b	42 31.0773621	72 25.8562425		0.75	4.2	0.75	Medium to coarse SAND, entirely cap material	0	Tan/Grey @ 0.5 ft distinct orange iron stain	None	No
8	42 31.0812134	72 25.8539104	8' 2"	0.95	4.4	< 0.25	0.0-0.4 ft fine to medium SAND, 0.4-0.95 ft medium to coarse SAND, trace gravel	0	Tan/Grey	None	No
9	42 31.0844666	72 25.8505028	8' 4"	0.95	1.0	0.95	Coarse sand/gravel, cap material to bottom, 0.5-0.6 piece of wood, 0.9-0.95 bivalve shell	0	Tan	None	No
10	42 31.0877198	72 25.8470953	9' 6"	1.20	3.4	1.00	0.0-1.0 Medium to coarse sand, some gravel, entirely cap material, 1.0-1.2 large rock/cobble	0.1	Tan/Brown	None	Yes @ 1 ft
11	42 31.0689460	72 25.8597217	7' 7"	1.10	4.3	0.70	0.0-0.7 Medium to coarse sand, trace gravel, entirely cap material, 0.7-1.1 coarse to very fine sand, trace gravel	0 / 2.6	0.0-0.7 Tan, 0.7-1.1 Dark grey	Chemical-like odor below 0.7	Yes @ 0.7 ft
12	42 31.0721980	72 25.8563122	8'	1.30	4.5	1.00	0.0-1.0 Medium to coarse sand, entirely cap material, 1.0-1.3 fine sand, some silt	0.2 / 150	0.0-1.0 Tan/Grey, 1.0-1.3 Dark grey/black, White/green discoloration	Strong chemical-like odor below barrier	Yes @ 1 ft
13	42 31.0754506	72 25.8529036	8' 6"	1.00	4.0	0.80	0.0-0.8 Medium to coarse sand, cap material, 0.8-1.0 fine sand/very fine sand	0	0.0-0.8 Tan, 0.8-1.0 Grey	None	Yes @ 0.8
14	42 31.0787075	72 25.8495025	8' 8"	0.98	4.2	0.60	0.0-0.6 Coarse to fine sand, trace pebbles, 0.6-0.75 coarse to fine sand, 0.75-0.98 fine sand to very fine sand	0	0.0-0.6 Tan, 0.6-0.75 Dark grey, 0.75-0.98 Grey	None	Yes @ 0.6 ft
15	42 31.0819555	72 25.8460859	8' 10"	0.80	3.2	0.60	0.0-0.6 Coarse to medium sand, trace fines and gravel, 0.6-0.8 fines	0	0.0-0.6 Tan, 0.6-0.8 Grey	None	Yes @ 0.6 ft
16	42 31.0851093	72 25.8447262	8' 6"	1.40	5.0	0.80	0.0-0.8 Coarse sand/fine gravel, 0.8-1.4 fine sand	0.2-0.5	0.0-0.8 Tan, 0.8-0.9 Dark brown/black, 0.9-1.4 Rust colored	None	No

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TABLE 1
Summary of Sediment Coring Observations
November 18 - 19, 2010

SD-2R Area

Sample Location #	Latitude	Longitude	Water depth	Sediment Recovery (ft.)	Depth of Penetration (ft.)	Cap Thickness (ft.)	Matrix Type (silt, clay, sand, etc.)	Observations		
								PID reading (ppm)	Color	Odor Present
1 (Upstream)	42 31.0474971	72 25.8940483	4' 11"	0.0-0.3	4.1	NA	Very fine sand/silt some organic matter	6	Brown	Slight organic odor
				0.3-0.4		NA	Fine sand	6	Brown	Slight organic odor
				0.4-0.5		NA	Medium sand, decomposing leaf matter	25	Dark brown/Black - Sheen	Strong petroleum-like odor
				0.5-0.7		NA	Fine sand	6	Grey	Strong petroleum-like odor
				0.7-0.95		NA	Silt	28	Dark grey to very dark grey color	Strong petroleum-like odor
2 (Subject Area)	42 31.0480323	72 25.8928720	5' 10"	0.0-0.1	3.1	NA	Decomposing leaf matter	3	Dark brown	None
				0.1-0.2		NA	Medium sand, trace gravel	3	Brown, sheen	Strong petroleum-like odor
				0.2-0.9		NA	Silt/Trace fines	3	Grey	Strong petroleum-like odor
				0.9-1.4		NA	Coarse sand and gravel	0	Dark grey	None
				1.4-1.5		NA	Clay	0	Light grey	None
3 (Channel)	42 31.0499228	72 25.8934252	4' 11"	0.0-0.5	5.0	NA	Medium to coarse sand	7	Brown	Petroleum-like odor
				0.5-0.7		NA	Medium to coarse sand, some gravel	2	Dark grey	Strong petroleum-like odor
				0.7-0.95		NA	Clay	0	Light grey	None
4 (Downstream)	42 31.0491297	72 25.8903061	5' 3"	0.0-0.5	4.9	NA	Medium to coarse sand	0.3-0.7	Brown	None
				0.5-0.9		NA	Silt and very fine sand, organic matter	0	Grey	Petroleum-like odor
				0.9-1.2		NA	Coarse sand, some gravel	15	Color gradient grey to dark grey	None
				1.2-1.4		NA	Clay/silt	15	Light grey	None

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BASF, Cranston, RI

TABLE 2
Analytical Data Summary for Sand Samples Collected on top of the Witness Barrier

	Sample Location	**7 (former Hot Spot Area)**		**9 (Downstream)**	**11 (Upstream)**
	Sample ID	**SD-07-A-1**	**SD-07-A-2**	**SD-09-A-1**	**SD-11-A-1**
	Sample Interval (in.)	**0-12**	**0-9**	**0-11**	**0-9**
	Sample Date	**11.18.10**	**11.18.10**	**11.18.10**	**11.18.10**
	Units	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Parameters	**Analyte**				
Inorganics	CADMIUM	< 0.41 U	< 0.47 U	< 0.54 U	< 0.40 U
	COPPER	**2.9**	**3.0**	**8.6**	**3.0**
	LEAD	< 4.1 U	< 4.7 U	**17.1**	< 4.0 U
	ZINC	**19.4**	**25.6**	**36.3**	**21.1**
	THALLIUM	< 1.01 D U	< 1.16 D U	< 1.34 D U	< 0.99 D U
	CYANIDE	< 1.12 U	< 1.12 U	< 1.15 U	< 1.15 U
PCBs	PCB-1221	< 0.0585 U	< 0.0579 U	< 0.0589 U	< 0.0595 U
	PCB-1232	< 0.0585 U	< 0.0579 U	< 0.0589 U	< 0.0595 U
	PCB-1242	< 0.0585 U	< 0.0579 U	< 0.0589 U	< 0.0595 U
	PCB-1248	**0.364**	< 0.0579 U	< 0.0589 U	**0.158**
	PCB-1254	< 0.0585 U	**0.0925**	< 0.0589 U	< 0.0595 U
	PCB-1260	< 0.0585 U	< 0.0579 U	< 0.0589 U	< 0.0595 U
VOCs	CHLOROBENZENE	< 0.0058 U	< 0.0058 U	< 0.0074 U	**0.0338**
	m-Xylene & p-Xylene	< 0.0115 U	< 0.0116 U	< 0.0149 U	< 0.0090 U
	O-XYLENE	< 0.0058 U	< 0.0058 U	< 0.0074 U	< 0.0045 U
	TOLUENE	< 0.0058 U	< 0.0058 U	< 0.0074 U	< 0.0045 U
SVOCs / PAHs	1,2-BENZPHENANTHRACENE	< 0.020 U	< 0.020 U	**0.065**	< 0.020 U
	1,2-DICHLOROBENZENE	< 0.389 U	< 0.387 U	< 0.396 U	< 0.391 U
	2-METHYLNAPHTHALENE	< 0.389 U	< 0.387 U	< 0.396 U	< 0.391 U
	ANTHRACENE	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U
	BENZO[A]ANTHRACENE	< 0.020 U	< 0.020 U	**0.052**	< 0.020 U
	BENZO[A]PYRENE	< 0.020 U	< 0.020 U	**0.061**	< 0.020 U
	BENZO[B]FLUORANTHENE	< 0.020 U	< 0.020 U	**0.071**	< 0.020 U
	BENZO[G,H,I]PERYLENE	< 0.020 U	< 0.020 U	**0.046**	< 0.020 U
	BENZO[K]FLUORANTHENE	< 0.020 U	< 0.020 U	**0.037**	< 0.020 U
	DIBENZO[A,H]ANTHRACENE	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U
	FLUORANTHENE	< 0.020 U	**0.026**	**0.132**	< 0.020 U
	INDENO[1,2,3-CD]PYRENE	< 0.020 U	< 0.020 U	**0.041**	< 0.020 U
	P-CHLOROANILINE	< 0.780 U	< 0.776 U	< 0.794 U	< 0.784 U
	PYRENE	< 0.020 U	< 0.020 U	**0.097**	< 0.020 U

Notes:
U = Not detected at detection limit
D = Diluted result
Sample SD-07-A-2 is a duplicate
Bolded results indicate detection of analyte above the detection limit

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TABLE 3
Summary of PCBs in Sediment Samples - SD-2R Area

Sample Location	1 (Upstream)		2R (Subject Area)					3 (Channel)		4 (Downstream)		
Sample ID	SD-1-A-1	SD-1-B-1	SD-2R-A-1	SD-2R-A-2	SD-2R-B-1	SD-2R-B-2	SD-2R-C-1	SD-3-A-1	SD-3-B-1	SD-4-A-1	SD-4-B-1	SD-4-C-1
Sample Interval (in.)	0-6	6-12	0-6	0-6	6-11	6-11	11-17	0-6	6-9	0-6	6-11	11-17
Sample Date	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10	11.19.10
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Analyte												
PCB-1221	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1232	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1242	**2.95**	**6.29**	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	**3.49**	**0.213**	**36.6**	**8.02**
PCB-1248	<0.0998 U	<0.0858 U	**95.0 D**	**187 D**	**17.1 D**	**16.5 D**	**0.578**	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1254	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572
PCB-1260	<0.0998 U	<0.0858 U	< 4.90 D U	< 11.1 D U	< 1.43 D U	< 1.53 D U	< 0.0549 U	<0.0588 U	<0.0569 U	<0.0581 U	<3.38 U	<0.0572

Notes:

U = Not detected at detection limit

D = Diluted result

Samples SD-2R-A2 and -B2 are sample duplicates

Bolded results indicate detection of analyte above the detection limit

Figures

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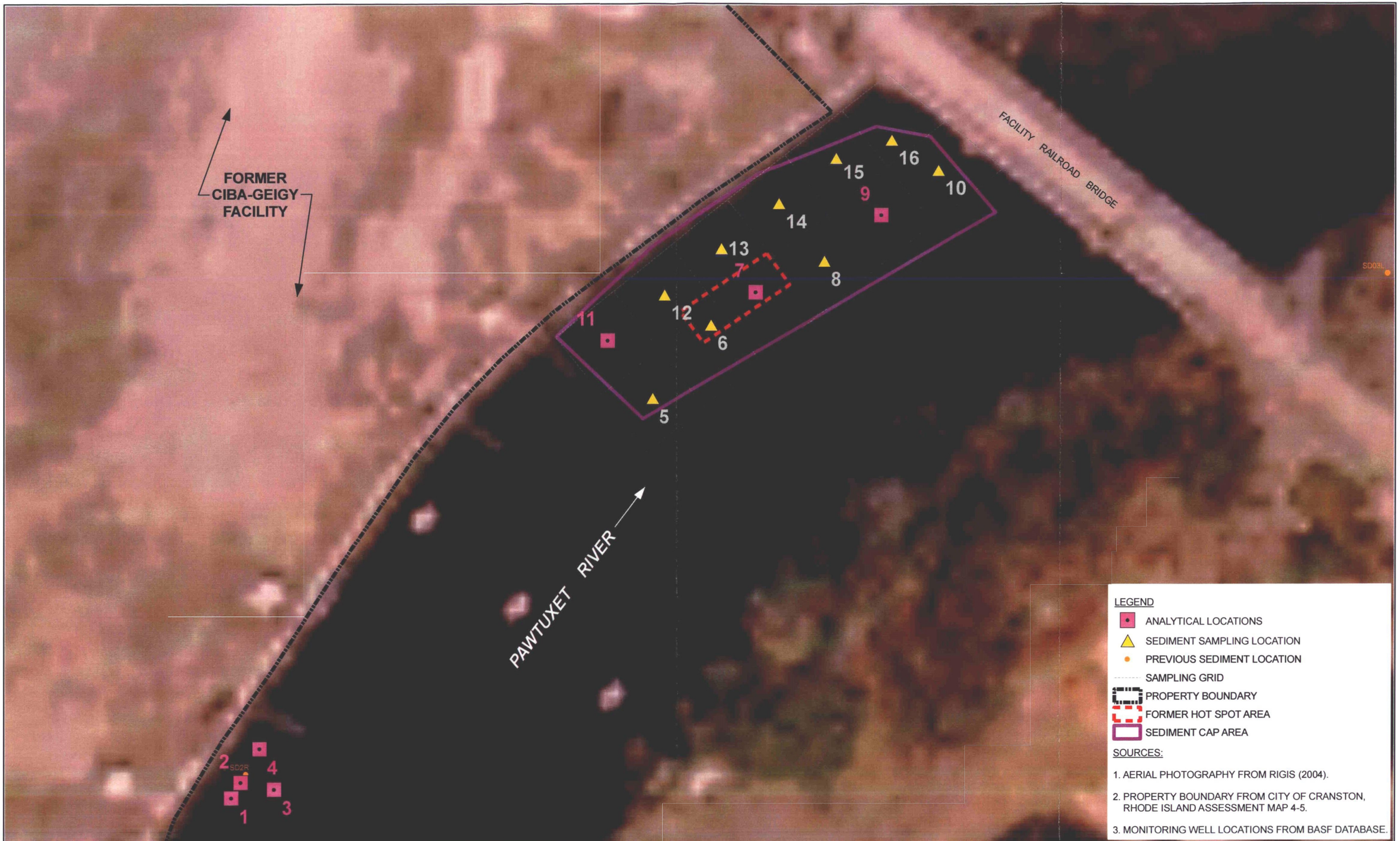

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J:\Indl_Service\Project Files\BASF-0760\Cranston RI\3. GIS_Database\Projects\Sediment Sampling Locations_010511.mxd

0 15 30 Feet

N W E S

FORMER CIBA-GEIGY
CRANSTON, RI
60163799.1

SEDIMENT SAMPLE LOCATIONS

DATE: 1/05/11 | DRWN: RMC | FIGURE 1

DRAFT

Attachment A

Sediment Core Logs

AECOM	Client: BASF		CORE NO:
	Project Number: 60163799.1		SD-1
	Station Location: SD-1		
	GPS Coordinates: 42.31.0474971 / 72.25.8940483		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 4'11"	MLW:	Core Size (in.) 1.5
	Weather: Cloudy/calm/ 40°F	Seas: N/A	

Survey Vessel: Jonn Boat	Logged By: KNH	Date: 11/19/2010	Time: 10:00
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.1 ft.	Recovery: 0.95 ft.	% Recovery: 23	No. Attempts:

Depth 1/16 ft.	SKETCH	DESCRIPTION
		0.0-0.3 = very fine sand and brown silt, organic matter mixed w/ sediment. Slight organic odor PID ~ 6.00 ppm
4		0.3-0.4 - Fine brown sand - PID ~ 6.00 ppm
		0.4-0.5 - Dark brown to black sand, partially decomposed leaf litter, sheen and strong petrol odor - PID = 25.0 ppm
		0.5-0.7 - fine grey sand, strong petrol odor
8		0.7-0.95 - Dark grey silt, strong odor, defined PID ~ 6.0 color gradient, silt is much darker grey at bottom of core, sheen noted - PID = 28.0 ppm
12		
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-2R
	Project Number: 60163799.1		
	Station Location: SD-2R		
	GPS Coordinates: 4231.0480323/7225.8928120		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 5'10"	MLW:	Core Size (in.) 1.5
	Weather: Cloudy/calm/40°F	Seas: N/A	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/19/2010	Time: 944
Survey Personnel: GFS/Luke/Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 3.1 ft	Recovery: 1.5 ft.	% Recovery: 48	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0.0-0.1 - Organic material = decomposing leaf litter. PID ≈ 2.6 ppm
		0.1-0.2 - Sheen visible, slight petrol odor, medium sand trace gravel = Brown in color = PID ≈ 2.6 ppm
4		0.2-0.9 - Silt grey in color, trace fine sands, Strong petrol odor. PID ≈ 2.6 ppm
8		
		0.9-1.4 - Coarse dark grey sand and gravel PID ≈ 0.1 ppm
12		
16		
		Grey Clay plug @ bottom of core
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-2R (DUP)
	Project Number: 60163799.1		
	Station Location: SD-2R (DUP)		
	GPS Coordinates: 42.31.0480323 / 72.25.8928720		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 5'10"	MLW:	Core Size (in.): 1.5
	Weather: Cloudy / Patchy Sun / 40°F	Seas: N/A	
Survey Vessel: Jon Boat	Logged By: KNH	Date: 11/9/2010	Time: 0950
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration: 3.5 ft	Recovery: 1.3 ft	% Recovery: 37	No. Attempts:

Depth (in.) ft	SKETCH	DESCRIPTION
		0.0-1.3 fine silt and trace fine sand throughout
		sheen visible at 0.4 and 0.8
		PID: 0.0-0.6 = 4.0 ppm
4		0.6-1.3 = 0.0-0.3 ppm
8		
12		
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-3
	Project Number: 60163799.1		
	Station Location: SD-3		
	GPS Coordinates: 42.31.099228 / 71.25.8934252		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 4'11"	MLW:	Core Size (in.) 1.5
	Weather: Cloudy/overcast/40°F	Seas: N/A	
Survey Vessel: Jonn Boat	Logged By: ASH	Date: 11/19/2010	Time: 1640
Survey Personnel: GFS/Luke/Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 5.0 ft	Recovery: 0.95 ft	% Recovery: 19	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
4		0.0-0.5 - medium to coarse brown sand, odor of petrol PID = 6.5 ppm
8		0.5-0.7 - medium to coarse dark grey sand, some gravel, strong petrol odor PID = 2.0 ppm
		0.7-0.95 - Grey clay cap PID = 0.0 ppm
12		
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF			CORE NO: SD-4
	Project Number: 60163799.1			
	Station Location: SD-4			
	GPS Coordinates: 42 31.049297 / 72 25.890366			
	Geographic Reference: Pawtuxet River – Cranston, RI			Sheet: 1 of 1
	Water Depth: 5'3"	MLW:		Core Size (in.)
	Weather: Cloudy / overcast / 40°F		Seas:	
Survey Vessel: John Boat	Logged By: EWH		Date: 11/9/10	Time: 1054
Survey Personnel: GFS / Luke / Ryan				
Sampling Equipment: Vibracore				
Estimated Penetration Range:	Project Depth:			
Actual Penetration): 4.85 ft	Recovery: 1.4 ft		% Recovery: 28	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
4		0.0-0.5 - medium to coarse brown sand PID= 0.3 ppm @ 0.4 = 0.7 ppm
8		0.5-0.9 = grey silt and very fine sand, trace organic matter - petrol odor PID= 0.3ppm
12		0.9-1.2 = coarse sand, some gravel, color gradient lighter grey to dark grey towards bottom of core. PID= 15 ppm
16		1.2-1.4 - Clay cap/very fine silt - light grey PID= 15 ppm
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-5
	Project Number: 60163799.1		
	Station Location: SD-5		
	GPS Coordinates: 42 31.0714538 / 72 25.8641329		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 7'6"	MLW:	Core Size (in.) 1.5
	Weather: Sunny, calm, 40°F	Seas: N/A	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/19/2010	Time: 0857
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.5 ft	Recovery: 0.85 ft	% Recovery: 18	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0-0.85 - All cap material - Tan medium to coarse sand, trace gravel
4		PID = 0.0 ppm
8		
12		
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-6
	Project Number: 60163799.1		
	Station Location: SD-06		
	GPS Coordinates: 42.31.0-148250 / 72.25.858489		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: ~~4'4"~~ 7'4"	MLW:	Core Size (in.) 1.5
	Weather: Clear calm 40°F	Seas: N/A	
Survey Vessel: John Boat	Logged By: PNH	Date: 11/19/10	Time: 0818
Survey Personnel: GFS, Luke, Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.6 ft	Recovery: 1.3 ft	% Recovery: 28	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0.0-0.1 - Trace organic material PID = 0.0ppm
4		0.1-1.25 - Coarse tan sand all cap material Some mixed medium sand - No odor Trace gravel & grayish / tan in color PID = 0.8 ppm
8		
12		
16		@1.25 Fabric membrane barrier 1.25-1.3 Gray very fine sand & no odor PID = 0.0 ppm
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-07a
	Project Number: 60163799.1		
	Station Location: SD-07		
	GPS Coordinates: 42.31.0773621 / 72.25.8562425		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8'5"	MLW:	Core Size (in.) 1.5
	Weather: Overcast / 40°F	Seas:	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/18/10	Time: 1535
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.6 ft	Recovery: 1.0 ft	% Recovery: 22	No. Attempts:

Depth 1/10 ft	SKETCH	DESCRIPTION
		0.0-1.0 - Sandy coarse tan material - no odor - All cap material PID = 0.0 ppm
4		
8		
		@1.0 - fines grey in color covering protection barrier - very slight odor PID = 0.0 ppm
12		
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-07b
	Project Number: 60163799.1		
	Station Location: SD-07b		
	GPS Coordinates: 4231.0773621 / 7225.8562425		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8'5"	MLW: N/A	Core Size (in.): 1.6
	Weather: Overcast 40°F	Seas:	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/18/10	Time: 1525
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.2 ft	Recovery: 0.75 ft	% Recovery:	No. Attempts:

Depth (1/10th ft)	SKETCH	DESCRIPTION
		0.0-0.5 - coarse grey sand - no odor - tan/grey CAP material PID = 0.0 ppm
4		
		@ 0.5 - distinct orange iron staining
		0.5-0.75 - coarse sand - no odor - tan/grey color CAP material PID = 0.0 ppm
8		
12		
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF			CORE NO: SD-8
	Project Number: 60163799.1			
	Station Location: SD-8			
	GPS Coordinates: 42 31 081234 / 72 25 853964			
	Geographic Reference: Pawtuxet River – Cranston, RI			Sheet: 1 of 1
	Water Depth: 8' 2"	MLW:		Core Size (in.): 1.5
	Weather: Overcast / windy		Seas:	
Survey Vessel: John Boat	Logged By: KNH		Date: 11/18/10	Time: 1450
Survey Personnel: GFS / Luke / Ryan				
Sampling Equipment: Vibracore				
Estimated Penetration Range:	Project Depth:			
Actual Penetration: 4.4 ft	Recovery: .95 ft		% Recovery: 23	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
4		0.0-0.4 fine to medium sand, organic debris, living roots, no odor PID = 0.8 ppm
8		0.4-0.95 - coarse sand, fine gravel, trace coarse gravel. No odor. Some organics as leaf litter partially decomposed. PID = 0.0 ppm
12		
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A):		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-09
	Project Number: 60163799.1		
	Station Location: SD-9		
	GPS Coordinates: 42 31.084466 / 12 25.850508		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8' 4"	MLW:	Core Size (in.): 1.5
	Weather: Windy / Cloudy / 40°F	Seas: N/A	
Survey Vessel: Jonn Boat	Logged By: KNA	Date: 11/8/10	Time: 1250

Survey Personnel: GFS / Luke / Ryan

Sampling Equipment: Vibracore

Estimated Penetration Range:	Project Depth:		
Actual Penetration): 1.0 ft	Recovery: 0.95 ft	% Recovery: 95	No. Attempts: 2

Depth 1/10 (ft)	SKETCH	DESCRIPTION
		0.0-0.5 = Coarse Sand/gravel - no odor tan in color PID = 0.0 ppm
4		
		0.5-0.6 - wood piece / dark brown / black
8		0.6-0.9 - Sand / coarse sand and gravel - no odor PID = 0.0 ppm
		0.9-0.95 - white colored shell hash piece - tan color
12		
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-10
	Project Number: 60163799.1		
	Station Location: SD-10		
	GPS Coordinates: 42.31.68.7198 / 72.25.847.0953		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 9'6"	MLW:	Core Size (in.) 1.5
	Weather: Windy / Cloudy / 40°F	Seas: N/A	
Survey Vessel: Jonn Boat	Logged By: KNH	Date: 11/8/10	Time: 1217
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration: 3.35 ft	Recovery: 1.2 ft	% Recovery: 36	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0.0-1.0: Coarse sand, brownish / tan color, some coarse gravel @ 1.0 - no odor
4		PID = 0.1 ppm
8		
		@ 1.0 Membrane barrier
12		1.0-1.2 Large piece of rock / cobble
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) - (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-11
	Project Number: 60163799.1		
	Station Location: SD-11		
	GPS Coordinates: 42.31.0689466 / 72.25.859727		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 7' 7"	MLW:	Core Size (in.) 1.5
	Weather: Overcast / patchy clouds / 40°	Seas:	
Survey Vessel: Jonn Boat	Logged By: KNH	Date: 11/19/10	Time: 0835
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration: 4.3 ft	Recovery: 1.1 ft	% Recovery: 25	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
4		0.0-0.7 Coarse tan Sand, Some medium Sand → trace gravel. No odor all cap material PID = 0.0 ppm
8		@ 0.7 distinct color change w/ fragments of the membrane barrier
12		0.7-1.1 Coarse sand → very fine sand, some silt Dark grey → chemical odor trace gravel Color gradient → darkest grey @ 0.7 PID = 2.6 ppm
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100		

AECOM	Client: BASF		CORE NO: SD-12
	Project Number: 60163799.1		
	Station Location: SD-12		
	GPS Coordinates: 42.31.072198 / 12.25.851631		
	Geographic Reference: Pawtuxet River - Cranston, RI		Sheet: 1 of 1
	Water Depth: 8.0'	MLW:	Core Size (in.): 1.5
	Weather: Clear, calm, Sunny, 40°F	Seas: N/A	
Survey Vessel: John Boat	Logged By: RWH	Date: 11/4/10	Time: 0800
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.5 ft	Recovery: 1.3 ft	% Recovery: 29	No. Attempts:

Depth (1/10th ft)	SKETCH	DESCRIPTION
4		0.0-1.0 Coarse Sand / Medium Sand - All gray cap material PID = @0.6 - 0.2 ppm @1.0 = 5.2 ppm
8		
12		@1.0 membrane present 1.0-1.3 - fine sand, some silt, black / dark gray white / green discoloration → strong chemical smell
16		PID = 150.0 ppm
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100		

AECOM	Client: BASF		CORE NO: SD-13
	Project Number: 60163799.1		
	Station Location: SD-13		
	GPS Coordinates: 42.31.0754506 / 72.25.8529036		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8'6"	MLW:	Core Size (in.) 1.5
	Weather: Cloudy / windy / 40°F	Seas: N/A	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/18/10	Time: 1459
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.0 ft	Recovery: 1.0 ft	% Recovery: 25	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0.0-0.8 Medium to coarse sand - tan in color. No odor ⇒ Cap material
		PID = 0.0ppm
4		
8		@ 0.8 ⇒ membrane material
		0.8 ⇒ 1.0 - grey fine sand / very fine sand
12		PID = 0.0ppm
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A):		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-14
	Project Number: 60163799.1		
	Station Location: SD-14		
	GPS Coordinates: 42.31.0787075 / 7225.8495025		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8'8"	MLW:	Core Size (in.) 1.5
	Weather: Windy / 40°F	Seas:	
Survey Vessel: John Boat	Logged By: KNH	Date: 11/18/2010	Time: 1311
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 4.2 ft	Recovery: 0.98 ft	% Recovery: 23	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
		0.0-0.6: Coarse Sand / tan fine Sand, trace pebbles no odor PID = 0.0 ppm
4		
		@0.6 - black membrane barrier PID = 0.0 ppm
8		0.6-0.75 - Coarse / fine Sand - Dark grey PID = 0.0 ppm
		0.75-0.98 - Grey fine Sand to very fine Sand PID = 0.0 PPM
12		
16		
20		
24		

Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO:
	Project Number: 60163799.1		SD-15
	Station Location: SD-15		
	GPS Coordinates: 42 31 .0819555 / 72 25 .8460859		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8' 10"	MLW:	Core Size (in.) 1.5
	Weather: Windy / cloudy	Seas: N/A	

Survey Vessel: John Boat	Logged By: KNH	Date: 11/18/2010	Time: 1400
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 3.15 ft	Recovery: 0.8 ft	% Recovery: 25	No. Attempts:

Depth (in) ft	SKETCH	DESCRIPTION
		0.0-0.6 - coarse sand, trace fines and gravel - no odor - some medium sand PID = 0.0 ppm
4		
		@ 0.6 = witness barrier
		~~Fines~~ 0.6-0.8: fines - gray sand
8		
12		
16		
20		
24		

	Core Recovery Calculation:		
	Starting Barrel Depth (A):		
	Final Barrel Depth (B):		
	Penetration Depth (C) = (B) – (A)		
	Measured Core Recovery (D):		
	% Recovery = [(D) / (C)] x 100:		

AECOM	Client: BASF		CORE NO: SD-11e
	Project Number: 60163799.1		
	Station Location: SD-11e		
	GPS Coordinates: 42 31.085 / 093 / 72 25.844 / 262		
	Geographic Reference: Pawtuxet River – Cranston, RI		Sheet: 1 of 1
	Water Depth: 8.16'	MLW:	Core Size (in.): 1.5
	Weather: Sunny / windy / 40's	Seas:	
Survey Vessel: John Boat	Logged By: KWH	Date: 11/8/2010	Time: 1030
Survey Personnel: GFS / Luke / Ryan			
Sampling Equipment: Vibracore			
Estimated Penetration Range:	Project Depth:		
Actual Penetration): 5.0 ft	Recovery: 1.4 ft	% Recovery: 28	No. Attempts:

Depth (ft)	SKETCH	DESCRIPTION
4		0.0-0.8 = Coarse Sand / fine gravel → tan in color. no odor PID = 0.4 ppm
8		
12		0.8-0.9 = Dark brown / black fine Sand PID = 0.5ppm 0.9-1.4 = Rust colored fine Sand to bottom of core, no odor PID = 0.2 ppm
16		
20		
24		

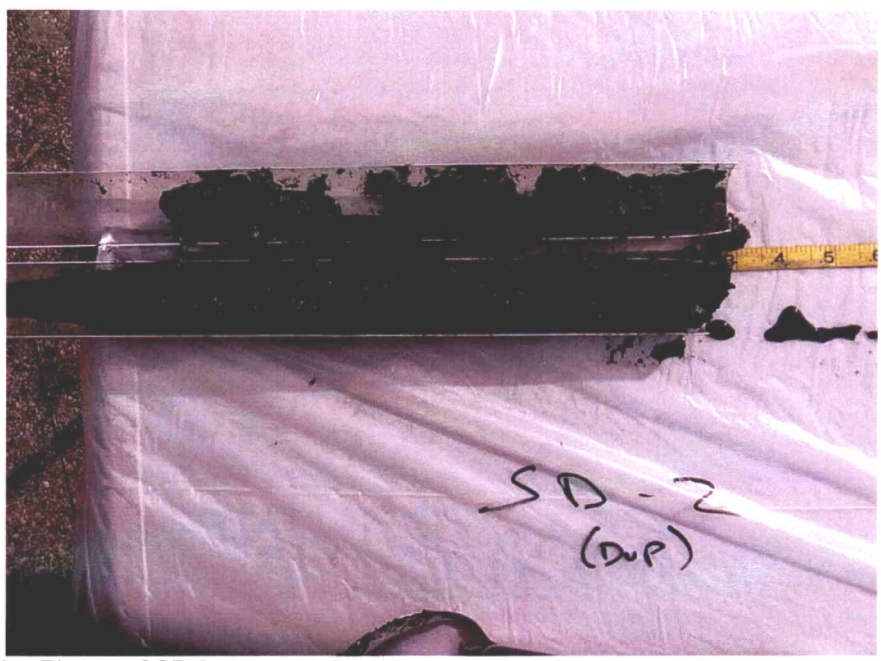
Core Recovery Calculation:		
Starting Barrel Depth (A):		
Final Barrel Depth (B):		
Penetration Depth (C) = (B) – (A)		
Measured Core Recovery (D):		
% Recovery = [(D) / (C)] x 100:		

Attachment B

Sediment Core Photographs

DRAFT

SD-1

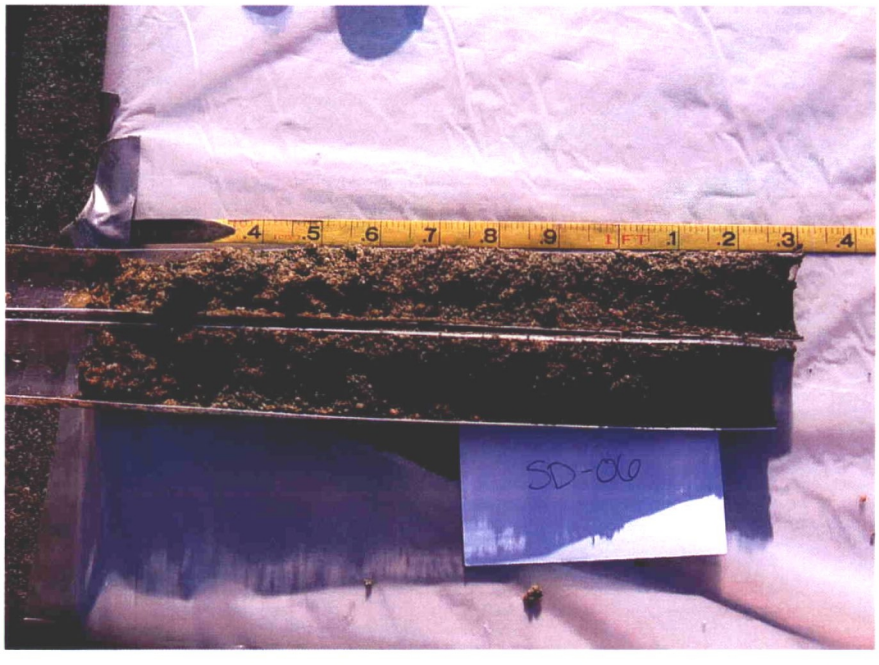


SD 2R (Dup) – Picture of SD 2 was not taken

SD-3

SD-4

SD-5



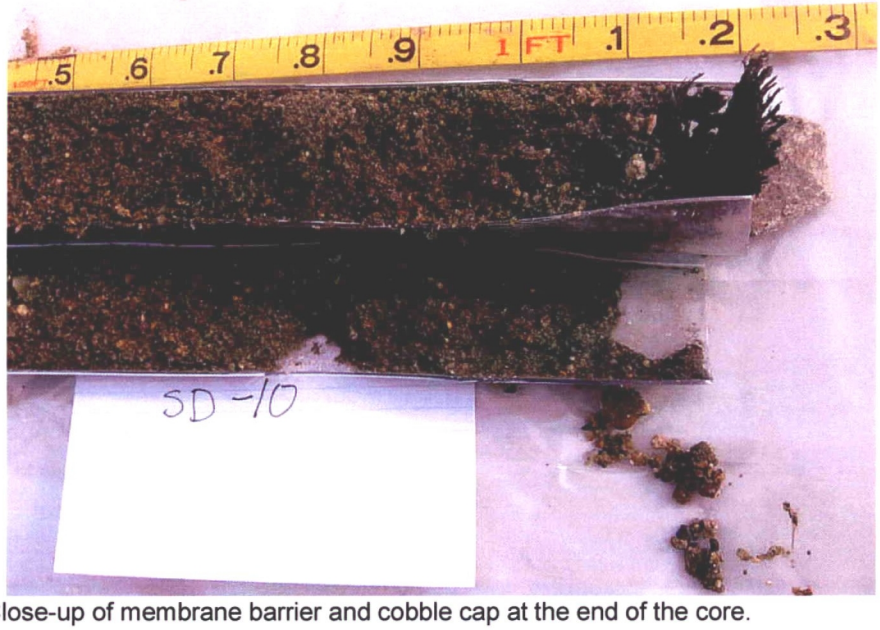
SD-6

SD-07a – SD 07b was not photographed

SD-08

SD-09A – Two cores were retrieved from this location. The "A" core was used for core logging and lab analysis. Further information on the "B" core can be found in field notes.

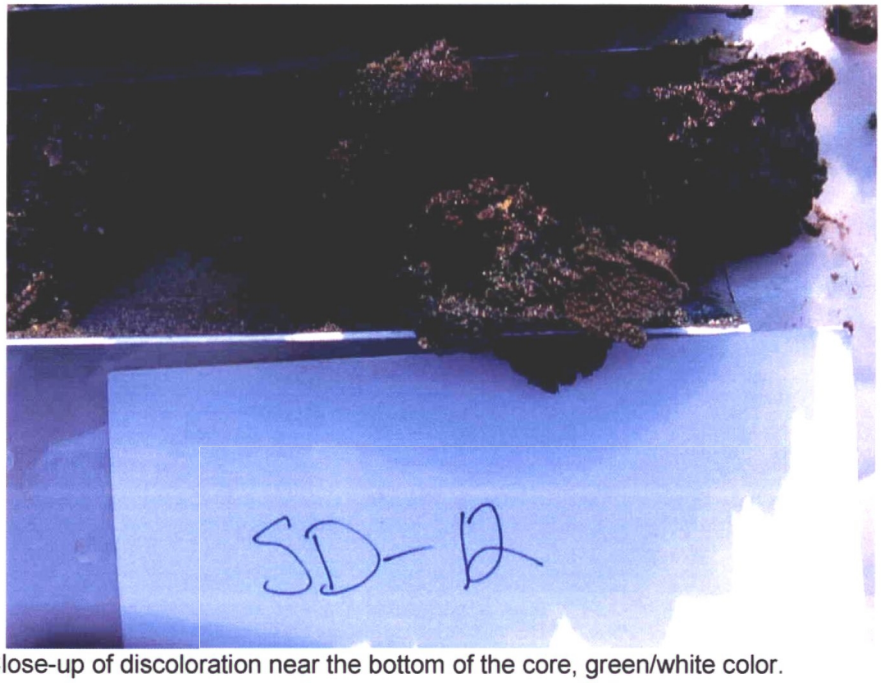
SD-10



SD-10 – Close-up of membrane barrier and cobble cap at the end of the core.

SD-11

SD-12



SD-12 – Close-up of discoloration near the bottom of the core, green/white color.

SD-13

SD-14

SD-15

SD-16

Attachment C

Laboratory Reports, Sediment Core Locations 7, 9, and 11

DRAFT

CERTIFICATE OF ANALYSIS

Scott Wozniakowski
AECOM Environment - ENSR
2 Technology Park Drive
Westford, MA 01886

RE: BASF - Cranston RI (60163799.1)
ESS Laboratory Work Order Number: 1011296

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

SAMPLE RECEIPT

The following samples were received on November 18, 2010 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	SampleName	Matrix	Analysis
1011296-01	SD-09-A-1	Soil	6010B, 7841, 8082, 8260B Low, 8270C, 8270C SIM, 9014
1011296-02	SD-07-A-1	Soil	6010B, 7841, 8082, 8260B Low, 8270C, 8270C SIM, 9014
1011296-03	SD-07-A-2	Soil	6010B, 7841, 8082, 8260B Low, 8270C, 8270C SIM, 9014

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

PROJECT NARRATIVE

3050B/6000/7000 Total Metals

CK02217-MS1 **Matrix Spike recovery is below lower control limit (M-).**
Zinc (72% @ 75-125%)

8082 Polychlorinated Biphenyls (PCB)

CK01913-MSD1 **Due to high target values, matrix spike compound(s) is masked (MT).**
Aroclor 1016 (144% @ 40-140%)

8270C Semi-Volatile Organic Compounds

CK02225-MS1 **Matrix Spike recovery is below lower control limit (M-).**
Benzoic Acid (% @ 40-140%)

CK02225-MSD1 **Matrix Spike recovery is below lower control limit (M-).**
Benzoic Acid (18% @ 40-140%)

CK02225-MSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzoic Acid (200%), Hexachloroethane (57%)

[illegible](SIM) Polynuclear Aromatic Hydrocarbons

C[illegible]0209-CCV1 **Benzidine tailing factor >2.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil
Units: mg/kg dry

3050B/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Cadmium	ND (0.54)	6010B		1	SVD	11/22/10 22:45	2.2	100	CK02217
Copper	**8.6** (2.7)	6010B		1	SVD	11/22/10 22:45	2.2	100	CK02217
Lead	**17.1** (5.4)	6010B		1	SVD	11/22/10 22:45	2.2	100	CK02217
Thallium	ND (1.34)	7841		5	SVD	11/23/10 17:51	2.2	100	CK02217
Zinc	**36.3** (2.7)	6010B		1	SVD	11/22/10 22:45	2.2	100	CK02217

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84
Initial Volume: 4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Chlorobenzene	ND (0.0074)		1	11/22/10 19:17	CTK0179	CK02222
Toluene	ND (0.0074)		1	11/22/10 19:17	CTK0179	CK02222
Xylene O	ND (0.0074)		1	11/22/10 19:17	CTK0179	CK02222
Xylene P,M	ND (0.0149)		1	11/22/10 19:17	CTK0179	CK02222

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	114 %		70-130
Surrogate: 4-Bromofluorobenzene	90 %		70-130
Surrogate: Dibromofluoromethane	108 %		70-130
Surrogate: Toluene-d8	97 %		70-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84
Initial Volume: 20.2
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 11/19/10 17:15

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0589)		1	11/23/10 4:38		CK01913
Aroclor 1232	ND (0.0589)		1	11/23/10 4:38		CK01913
Aroclor 1242	ND (0.0589)		1	11/23/10 4:38		CK01913
Aroclor 1248	ND (0.0589)		1	11/23/10 4:38		CK01913
Aroclor 1254	ND (0.0589)		1	11/23/10 4:38		CK01913
Aroclor 1260	ND (0.0589)		1	11/23/10 4:38		CK01913

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	88 %		30-150
Surrogate: Decachlorobiphenyl [2C]	86 %		30-150
Surrogate: Tetrachloro-m-xylene	72 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	75 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/22/10 16:00

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,2-Dichlorobenzene	ND (0.396)		1	11/22/10 20:31	CTK0182	CK02225
2-Methylnaphthalene	ND (0.396)		1	11/22/10 20:31	CTK0182	CK02225
4-Chloroaniline	ND (0.794)		1	11/22/10 20:31	CTK0182	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	59 %		30-130
Surrogate: 2,4,6-Tribromophenol	72 %		30-130
Surrogate: 2-Chlorophenol-d4	62 %		30-130
Surrogate: 2-Fluorobiphenyl	64 %		30-130
Surrogate: 2-Fluorophenol	61 %		30-130
Surrogate: Nitrobenzene-d5	61 %		30-130
Surrogate: Phenol-d6	64 %		30-130
Surrogate: p-Terphenyl-d14	73 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/22/10 16:00

8270C(SIM) Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Anthracene	ND (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Benzo(a)anthracene	**0.052** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Benzo(a)pyrene	**0.061** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Benzo(b)fluoranthene	**0.071** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Benzo(g,h,i)perylene	**0.046** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Benzo(k)fluoranthene	**0.037** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Chrysene	**0.065** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Dibenzo(a,h)Anthracene	ND (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Fluoranthene	**0.132** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Indeno(1,2,3-cd)Pyrene	**0.041** (0.020)		1	11/25/10 4:40	CTK0209	CK02225
Pyrene	**0.097** (0.020)		1	11/25/10 4:40	CTK0209	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	63 %		30-130
Surrogate: 2-Fluorobiphenyl	59 %		30-130
Surrogate: Nitrobenzene-d5	56 %		30-130
Surrogate: p-Terphenyl-d14	71 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-09-A-1
Date Sampled: 11/18/10 12:50
Percent Solids: 84

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Cyanide	ND (1.15)	9014		1	EEM	11/22/10 11:50	mg/kg dry	CK02205

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil
Units: mg/kg dry

3050B/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Cadmium	ND (0.41)	6010B		1	SVD	11/22/10 22:49	2.88	100	CK02217
Copper	**2.9** (2.0)	6010B		1	SVD	11/22/10 22:49	2.88	100	CK02217
Lead	ND (4.1)	6010B		1	SVD	11/22/10 22:49	2.88	100	CK02217
Thallium	ND (1.01)	7841		5	SVD	11/23/10 17:57	2.88	100	CK02217
Zinc	**19.4** (2.0)	6010B		1	SVD	11/22/10 22:49	2.88	100	CK02217

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85
Initial Volume: 5.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Chlorobenzene	ND (0.0058)		1	11/22/10 19:44	CTK0179	CK02222
Toluene	ND (0.0058)		1	11/22/10 19:44	CTK0179	CK02222
Xylene O	ND (0.0058)		1	11/22/10 19:44	CTK0179	CK02222
Xylene P,M	ND (0.0115)		1	11/22/10 19:44	CTK0179	CK02222

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	121 %		70-130
Surrogate: 4-Bromofluorobenzene	89 %		70-130
Surrogate: Dibromofluoromethane	117 %		70-130
Surrogate: Toluene-d8	93 %		70-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 11/19/10 17:15

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0585)		1	11/23/10 5:07		CK01913
Aroclor 1232	ND (0.0585)		1	11/23/10 5:07		CK01913
Aroclor 1242	ND (0.0585)		1	11/23/10 5:07		CK01913
Aroclor 1248	**0.364** (0.0585)		1	11/23/10 5:07		CK01913
Aroclor 1254	ND (0.0585)		1	11/23/10 5:07		CK01913
Aroclor 1260	ND (0.0585)		1	11/23/10 5:07		CK01913

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	86 %		30-150
Surrogate: Decachlorobiphenyl [2C]	86 %		30-150
Surrogate: Tetrachloro-m-xylene	82 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	88 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/22/10 16:00

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,2-Dichlorobenzene	ND (0.389)		1	11/22/10 21:04	CTK0182	CK02225
2-Methylnaphthalene	ND (0.389)		1	11/22/10 21:04	CTK0182	CK02225
4-Chloroaniline	ND (0.780)		1	11/22/10 21:04	CTK0182	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2,4,6-Tribromophenol	85 %		30-130
Surrogate: 2-Chlorophenol-d4	71 %		30-130
Surrogate: 2-Fluorobiphenyl	75 %		30-130
Surrogate: 2-Fluorophenol	72 %		30-130
Surrogate: Nitrobenzene-d5	72 %		30-130
Surrogate: Phenol-d6	73 %		30-130
Surrogate: p-Terphenyl-d14	92 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/22/10 16:00

8270C(SIM) Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Anthracene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Benzo(a)anthracene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Benzo(a)pyrene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Benzo(b)fluoranthene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Benzo(g,h,i)perylene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Benzo(k)fluoranthene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Chrysene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Dibenzo(a,h)Anthracene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Fluoranthene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Indeno(1,2,3-cd)Pyrene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225
Pyrene	ND (0.020)		1	11/25/10 5:25	CTK0209	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	75 %		30-130
Surrogate: 2-Fluorobiphenyl	68 %		30-130
Surrogate: Nitrobenzene-d5	64 %		30-130
Surrogate: p-Terphenyl-d14	85 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-1
Date Sampled: 11/18/10 15:35
Percent Solids: 85

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Cyanide	ND (1.12)	9014		1	EEM	11/22/10 11:50	mg/kg dry	CK02205

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil
Units: mg/kg dry

3050B/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Cadmium	ND (0.47)	6010B		1	SVD	11/22/10 23:11	2.48	100	CK02217
Copper	**3.0** (2.3)	6010B		1	SVD	11/22/10 23:11	2.48	100	CK02217
Lead	ND (4.7)	6010B		1	SVD	11/22/10 23:11	2.48	100	CK02217
Thallium	ND (1.16)	7841		5	SVD	11/23/10 18:37	2.48	100	CK02217
Zinc	**25.6** (2.3)	6010B		1	SVD	11/22/10 23:11	2.48	100	CK02217

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86
Initial Volume: 5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Chlorobenzene	ND (0.0058)		1	11/22/10 20:11	CTK0179	CK02222
Toluene	ND (0.0058)		1	11/22/10 20:11	CTK0179	CK02222
Xylene O	ND (0.0058)		1	11/22/10 20:11	CTK0179	CK02222
Xylene P,M	ND (0.0116)		1	11/22/10 20:11	CTK0179	CK02222

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	110 %		70-130
Surrogate: 4-Bromofluorobenzene	95 %		70-130
Surrogate: Dibromofluoromethane	109 %		70-130
Surrogate: Toluene-d8	95 %		70-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 11/19/10 17:15

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0579)		1	11/23/10 6:34		CK01913
Aroclor 1232	ND (0.0579)		1	11/23/10 6:34		CK01913
Aroclor 1242	ND (0.0579)		1	11/23/10 6:34		CK01913
Aroclor 1248	ND (0.0579)		1	11/23/10 6:34		CK01913
Aroclor 1254	**0.0925** (0.0579)		1	11/23/10 6:34		CK01913
Aroclor 1260	ND (0.0579)		1	11/23/10 6:34		CK01913

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	84 %		30-150
Surrogate: Decachlorobiphenyl [2C]	87 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	91 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/22/10 16:00

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,2-Dichlorobenzene	ND (0.387)		1	11/22/10 21:38	CTK0182	CK02225
2-Methylnaphthalene	ND (0.387)		1	11/22/10 21:38	CTK0182	CK02225
4-Chloroaniline	ND (0.776)		1	11/22/10 21:38	CTK0182	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2,4,6-Tribromophenol	84 %		30-130
Surrogate: 2-Chlorophenol-d4	70 %		30-130
Surrogate: 2-Fluorobiphenyl	70 %		30-130
Surrogate: 2-Fluorophenol	69 %		30-130
Surrogate: Nitrobenzene-d5	68 %		30-130
Surrogate: Phenol-d6	72 %		30-130
Surrogate: p-Terphenyl-d14	85 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/22/10 16:00

8270C(SIM) Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Anthracene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Benzo(a)anthracene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Benzo(a)pyrene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Benzo(b)fluoranthene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Benzo(g,h,i)perylene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Benzo(k)fluoranthene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Chrysene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Dibenzo(a,h)Anthracene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Fluoranthene	**0.026** (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Indeno(1,2,3-cd)Pyrene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225
Pyrene	ND (0.020)		1	11/25/10 6:11	CTK0209	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	72 %		30-130
Surrogate: 2-Fluorobiphenyl	63 %		30-130
Surrogate: Nitrobenzene-d5	63 %		30-130
Surrogate: p-Terphenyl-d14	80 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-07-A-2
Date Sampled: 11/18/10 15:25
Percent Solids: 86

ESS Laboratory Work Order: 1011296
ESS Laboratory Sample ID: 1011296-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Cyanide	ND (1.12)	9014		1	EEM	11/22/10 11:50	mg/kg dry	CK02205

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
3050B/6000/7000 Total Metals										
Batch CK02217 - 3050B										
Blank										
Cadmium	ND	0.50	mg/kg wet							
Copper	ND	2.5	mg/kg wet							
Lead	ND	5.0	mg/kg wet							
Thallium	ND	0.25	mg/kg wet							
Zinc	ND	2.5	mg/kg wet							
LCS										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120			
Copper	69.2	8.5	mg/kg wet	74.70		93	80-120			
Lead	153	17.0	mg/kg wet	152.0		101	80-120			
Thallium	170	41.9	mg/kg wet	171.0		99	80-120			
Zinc	265	8.5	mg/kg wet	299.0		89	80-120			
LCS Dup										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120	0.008	20	
Copper	68.8	8.5	mg/kg wet	74.70		92	80-120	0.7	20	
Lead	154	17.0	mg/kg wet	152.0		102	80-120	0.9	20	
Thallium	172	41.9	mg/kg wet	171.0		101	80-120	1	20	
Zinc	264	8.5	mg/kg wet	299.0		88	80-120	0.7	20	
Duplicate **Source: 1011296-02**										
Cadmium	0.089	0.46	mg/kg dry		0.091			2	35	
Copper	2.80	2.3	mg/kg dry		2.94			5	35	
Lead	3.91	4.6	mg/kg dry		3.40			14	35	
Thallium	ND	1.14	mg/kg dry		ND				35	
Zinc	17.7	2.3	mg/kg dry		19.4			9	35	
Matrix Spike **Source: 1011296-02**										
Cadmium	8.55	0.43	mg/kg dry	10.81	0.091	78	75-125			
Copper	19.7	2.2	mg/kg dry	21.63	2.94	77	75-125			
Lead	20.6	4.3	mg/kg dry	21.63	3.40	79	75-125			
Thallium	19.2	4.28	mg/kg dry	21.63	ND	89	75-125			
Zinc	35.0	2.2	mg/kg dry	21.63	19.4	72	75-125			M-
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
[illegible]ne	ND	0.0500	mg/kg wet							
4[illegible]toluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
M[illegible]t-Butyl Ether	ND	0.0050	mg/kg wet							
M[illegible]e Chloride	ND	0.0250	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0524		mg/kg wet	0.05000		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0516		mg/kg wet	0.05000		103	70-130			
Surrogate: Toluene-d8	0.0481		mg/kg wet	0.05000		96	70-130			
LCS										
1,1,1,2-Tetrachloroethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,1-Trichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2,2-Tetrachloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloropropene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,4-Trimethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dibromoethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloropropane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,3,5-Trimethylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,3-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130			
1-Chlorohexane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
2,2-Dichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
2-Butanone	0.244	0.0500	mg/kg wet	0.2500		98	70-130			
2-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130			
4-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
4-Isopropyltoluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.246	0.0500	mg/kg wet	0.2500		99	70-130			
Acetone	0.226	0.0500	mg/kg wet	0.2500		91	70-130			
Benzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Bromochloromethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Bromodichloromethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Bromoform	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Bromomethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130			
Carbon Disulfide	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Carbon Tetrachloride	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
[illegible]nzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
C[illegible]hane	0.0511	0.0100	mg/kg wet	0.05000		102	70-130			
Chloroform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130			
cis-1,2-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
cis-1,3-Dichloropropene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Dibromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromomethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dichlorodifluoromethane	0.0515	0.0100	mg/kg wet	0.05000		103	70-130			
Diethyl Ether	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Ethyl tertiary-butyl ether	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Ethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Hexachlorobutadiene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Isopropylbenzene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Methyl tert-Butyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Methylene Chloride	0.0502	0.0250	mg/kg wet	0.05000		100	70-130			
Naphthalene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
n-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
n-Propylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Tetrachloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrahydrofuran	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,2-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
t[illegible]Dichloropropene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
T[illegible]thene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Vinyl Acetate	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Vinyl Chloride	0.0550	0.0100	mg/kg wet	0.05000		110	70-130			
Xylene O	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Xylene P,M	0.0993	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0499		mg/kg wet	0.05000		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0489		mg/kg wet	0.05000		98	70-130			
Surrogate: Dibromofluoromethane	0.0498		mg/kg wet	0.05000		100	70-130			
Surrogate: Toluene-d8	0.0483		mg/kg wet	0.05000		97	70-130			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	0.3	25	
1,1,1-Trichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
1,1,2,2-Tetrachloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	7	25	
1,1,2-Trichloroethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
1,1-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,1-Dichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,1-Dichloropropene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
1,2,3-Trichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,3-Trichloropropane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,2,4-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,4-Trimethylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
1,2-Dibromoethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	0.4	25	
1,2-Dichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,2-Dichloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,2-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
1,3,5-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
1,4-Dichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130	0.2	20	
1-Chlorohexane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	1	25	
2,2-Dichloropropane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	1	25	
2-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
2-Hexanone	0.246	0.0500	mg/kg wet	0.2500		98	70-130	2	25	
4-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
4-Isopropyltoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
4-Methyl-2-Pentanone	0.249	0.0500	mg/kg wet	0.2500		99	70-130	0.9	25	
Acetone	0.210	0.0500	mg/kg wet	0.2500		84	70-130	8	25	
Benzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Bromobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
Bromochloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
Bromodichloromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
Bromoform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
Bromomethane	0.0485	0.0100	mg/kg wet	0.05000		97	70-130	0.8	25	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Carbon Disulfide	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	0.4	25	
Chloroethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	2	25	
Chloroform	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
Chloromethane	0.0464	0.0100	mg/kg wet	0.05000		93	70-130	3	25	
cis-1,2-Dichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
cis-1,3-Dichloropropene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.8	25	
Dibromochloromethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Dibromomethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Dichlorodifluoromethane	0.0501	0.0100	mg/kg wet	0.05000		100	70-130	3	25	
Diethyl Ether	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	0.3	25	
Di-isopropyl ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Ethyl tertiary-butyl ether	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Ethylbenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	0.8	25	
[illegible]robutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1[illegible]benzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Methyl tert-Butyl Ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
Methylene Chloride	0.0494	0.0250	mg/kg wet	0.05000		99	70-130	2	25	
Naphthalene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.2	25	
n-Propylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
sec-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Styrene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
tert-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tertiary-amyl methyl ether	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Tetrachloroethene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Tetrahydrofuran	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
Toluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
trans-1,2-Dichloroethene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
trans-1,3-Dichloropropene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Trichloroethene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
Vinyl Acetate	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
Vinyl Chloride	0.0548	0.0100	mg/kg wet	0.05000		110	70-130	0.5	25	
Xylene O	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Xylene P,M	0.0987	0.0100	mg/kg wet	0.1000		99	70-130	0.6	25	
Surrogate: 1,2-Dichloroethane-d4	0.0509		mg/kg wet	0.05000		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0485		mg/kg wet	0.05000		97	70-130			
Surrogate: Dibromofluoromethane	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Toluene-d8	0.0482		mg/kg wet	0.05000		96	70-130			
Matrix Spike **Source: 1011296-02**										
1,1,1,2-Tetrachloroethane	0.0564	0.0059	mg/kg dry	0.05882	ND	96	70-130			
1,1,1-Trichloroethane	0.0682	0.0059	mg/kg dry	0.05882	ND	116	70-130			
1[illegible]trachloroethane	0.0655	0.0059	mg/kg dry	0.05882	ND	111	70-130			
1,[illegible]hloroethane	0.0617	0.0059	mg/kg dry	0.05882	ND	105	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
1,1-Dichloroethane	0.0634	0.0059	mg/kg dry	0.05882	ND	108	70-130			
1,1-Dichloroethene	0.0659	0.0059	mg/kg dry	0.05882	ND	112	70-130			
1,1-Dichloropropene	0.0637	0.0059	mg/kg dry	0.05882	ND	108	70-130			
1,2,3-Trichlorobenzene	0.0564	0.0059	mg/kg dry	0.05882	ND	96	70-130			
1,2,3-Trichloropropane	0.0570	0.0059	mg/kg dry	0.05882	ND	97	70-130			
1,2,4-Trichlorobenzene	0.0544	0.0059	mg/kg dry	0.05882	ND	92	70-130			
1,2,4-Trimethylbenzene	0.0616	0.0059	mg/kg dry	0.05882	ND	105	70-130			
1,2-Dibromo-3-Chloropropane	0.0653	0.0059	mg/kg dry	0.05882	ND	111	70-130			
1,2-Dibromoethane	0.0609	0.0059	mg/kg dry	0.05882	ND	104	70-130			
1,2-Dichlorobenzene	0.0587	0.0059	mg/kg dry	0.05882	ND	100	70-130			
1,2-Dichloroethane	0.0695	0.0059	mg/kg dry	0.05882	ND	118	70-130			
1,2-Dichloropropane	0.0626	0.0059	mg/kg dry	0.05882	ND	106	70-130			
1,3,5-Trimethylbenzene	0.0625	0.0059	mg/kg dry	0.05882	ND	106	70-130			
1,3-Dichlorobenzene	0.0570	0.0059	mg/kg dry	0.05882	ND	97	70-130			
1,3-Dichloropropane	0.0611	0.0059	mg/kg dry	0.05882	ND	104	70-130			
1,4-Dichlorobenzene	0.0559	0.0059	mg/kg dry	0.05882	ND	95	70-130			
1,4-Dioxane	1.35	0.118	mg/kg dry	1.176	ND	115	70-130			
1-Chlorohexane	0.0550	0.0059	mg/kg dry	0.05882	ND	93	70-130			
2,2-Dichloropropane	0.0561	0.0059	mg/kg dry	0.05882	ND	95	70-130			
2-Butanone	0.320	0.0588	mg/kg dry	0.2941	ND	109	70-130			
2-Chlorotoluene	0.0621	0.0059	mg/kg dry	0.05882	ND	106	70-130			
2-Hexanone	0.283	0.0588	mg/kg dry	0.2941	ND	96	70-130			
4-Chlorotoluene	0.0611	0.0059	mg/kg dry	0.05882	ND	104	70-130			
4-Isopropyltoluene	0.0580	0.0059	mg/kg dry	0.05882	ND	99	70-130			
4-Methyl-2-Pentanone	0.319	0.0588	mg/kg dry	0.2941	ND	108	70-130			
Acetone	0.301	0.0588	mg/kg dry	0.2941	0.0293	92	70-130			
Benzene	0.0614	0.0059	mg/kg dry	0.05882	ND	104	70-130			
Bromobenzene	0.0621	0.0059	mg/kg dry	0.05882	ND	106	70-130			
Bromochloromethane	0.0609	0.0059	mg/kg dry	0.05882	ND	104	70-130			
Bromodichloromethane	0.0645	0.0059	mg/kg dry	0.05882	ND	110	70-130			
Bromoform	0.0564	0.0059	mg/kg dry	0.05882	ND	96	70-130			
Bromomethane	0.0652	0.0118	mg/kg dry	0.05882	ND	111	70-130			
Carbon Disulfide	0.0635	0.0059	mg/kg dry	0.05882	ND	108	70-130			
Carbon Tetrachloride	0.0665	0.0059	mg/kg dry	0.05882	ND	113	70-130			
Chlorobenzene	0.0580	0.0059	mg/kg dry	0.05882	ND	99	70-130			
Chloroethane	0.0671	0.0118	mg/kg dry	0.05882	ND	114	70-130			
Chloroform	0.0631	0.0059	mg/kg dry	0.05882	ND	107	70-130			
Chloromethane	0.0605	0.0118	mg/kg dry	0.05882	ND	103	70-130			
cis-1,2-Dichloroethene	0.0704	0.0059	mg/kg dry	0.05882	ND	120	70-130			
cis-1,3-Dichloropropene	0.0607	0.0059	mg/kg dry	0.05882	ND	103	70-130			
Dibromochloromethane	0.0584	0.0059	mg/kg dry	0.05882	ND	99	70-130			
Dibromomethane	0.0655	0.0059	mg/kg dry	0.05882	ND	111	70-130			
Dichlorodifluoromethane	0.0640	0.0118	mg/kg dry	0.05882	ND	109	70-130			
Diethyl Ether	0.0723	0.0059	mg/kg dry	0.05882	ND	123	70-130			
Di-isopropyl ether	0.0657	0.0059	mg/kg dry	0.05882	ND	112	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Ethyl tertiary-butyl ether	0.0615	0.0059	mg/kg dry	0.05882	ND	104	70-130			
Ethylbenzene	0.0573	0.0059	mg/kg dry	0.05882	ND	97	70-130			
Hexachlorobutadiene	0.0494	0.0059	mg/kg dry	0.05882	ND	84	70-130			
Isopropylbenzene	0.0549	0.0059	mg/kg dry	0.05882	ND	93	70-130			
Methyl tert-Butyl Ether	0.0639	0.0059	mg/kg dry	0.05882	ND	109	70-130			
Methylene Chloride	0.0656	0.0294	mg/kg dry	0.05882	0.0022	108	70-130			
Naphthalene	0.0562	0.0059	mg/kg dry	0.05882	ND	96	70-130			
n-Butylbenzene	0.0582	0.0059	mg/kg dry	0.05882	ND	99	70-130			
n-Propylbenzene	0.0642	0.0059	mg/kg dry	0.05882	ND	109	70-130			
sec-Butylbenzene	0.0628	0.0059	mg/kg dry	0.05882	ND	107	70-130			
Styrene	0.0595	0.0059	mg/kg dry	0.05882	ND	101	70-130			
tert-Butylbenzene	0.0605	0.0059	mg/kg dry	0.05882	ND	103	70-130			
Tertiary-amyl methyl ether	0.0592	0.0059	mg/kg dry	0.05882	ND	101	70-130			
Tetrachloroethene	0.0547	0.0059	mg/kg dry	0.05882	ND	93	70-130			
Tetrahydrofuran	0.0671	0.0059	mg/kg dry	0.05882	ND	114	70-130			
[illegible]	0.0624	0.0059	mg/kg dry	0.05882	ND	106	70-130			
t[illegible]2-Dichloroethene	0.0609	0.0059	mg/kg dry	0.05882	ND	104	70-130			
trans-1,3-Dichloropropene	0.0582	0.0059	mg/kg dry	0.05882	ND	99	70-130			
Trichloroethene	0.0622	0.0059	mg/kg dry	0.05882	ND	106	70-130			
Vinyl Acetate	0.0676	0.0059	mg/kg dry	0.05882	ND	115	70-130			
Vinyl Chloride	0.0698	0.0118	mg/kg dry	0.05882	ND	119	70-130			
Xylene O	0.0570	0.0059	mg/kg dry	0.05882	ND	97	70-130			
Xylene P,M	0.114	0.0118	mg/kg dry	0.1176	ND	97	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0695		mg/kg dry	0.05882		118	70-130			
Surrogate: 4-Bromofluorobenzene	0.0571		mg/kg dry	0.05882		97	70-130			
Surrogate: Dibromofluoromethane	0.0673		mg/kg dry	0.05882		114	70-130			
Surrogate: Toluene-d8	0.0576		mg/kg dry	0.05882		98	70-130			
Matrix Spike Dup Source: 1011296-02										
1,1,1,2-Tetrachloroethane	0.0580	0.0059	mg/kg dry	0.05882	ND	99	70-130	3	30	
1,1,1-Trichloroethane	0.0669	0.0059	mg/kg dry	0.05882	ND	114	70-130	2	30	
1,1,2,2-Tetrachloroethane	0.0646	0.0059	mg/kg dry	0.05882	ND	110	70-130	1	30	
1,1,2-Trichloroethane	0.0631	0.0059	mg/kg dry	0.05882	ND	107	70-130	2	30	
1,1-Dichloroethane	0.0636	0.0059	mg/kg dry	0.05882	ND	108	70-130	0.3	30	
1,1-Dichloroethene	0.0654	0.0059	mg/kg dry	0.05882	ND	111	70-130	0.8	30	
1,1-Dichloropropene	0.0640	0.0059	mg/kg dry	0.05882	ND	109	70-130	0.4	30	
1,2,3-Trichlorobenzene	0.0552	0.0059	mg/kg dry	0.05882	ND	94	70-130	2	30	
1,2,3-Trichloropropane	0.0622	0.0059	mg/kg dry	0.05882	ND	106	70-130	9	30	
1,2,4-Trichlorobenzene	0.0531	0.0059	mg/kg dry	0.05882	ND	90	70-130	2	30	
1,2,4-Trimethylbenzene	0.0626	0.0059	mg/kg dry	0.05882	ND	106	70-130	2	30	
1,2-Dibromo-3-Chloropropane	0.0652	0.0059	mg/kg dry	0.05882	ND	111	70-130	0.2	30	
1,2-Dibromoethane	0.0622	0.0059	mg/kg dry	0.05882	ND	106	70-130	2	30	
1,2-Dichlorobenzene	0.0589	0.0059	mg/kg dry	0.05882	ND	100	70-130	0.5	30	
1,2-Dichloroethane	0.0683	0.0059	mg/kg dry	0.05882	ND	116	70-130	2	30	
1[illegible]ropropane	0.0618	0.0059	mg/kg dry	0.05882	ND	105	70-130	1	30	
1,[illegible]methylbenzene	0.0628	0.0059	mg/kg dry	0.05882	ND	107	70-130	0.5	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
1,3-Dichlorobenzene	0.0570	0.0059	mg/kg dry	0.05882	ND	97	70-130	0.1	30	
1,3-Dichloropropane	0.0607	0.0059	mg/kg dry	0.05882	ND	103	70-130	0.7	30	
1,4-Dichlorobenzene	0.0565	0.0059	mg/kg dry	0.05882	ND	96	70-130	1	30	
1,4-Dioxane	1.34	0.118	mg/kg dry	1.176	ND	114	70-130	1	20	
1-Chlorohexane	0.0573	0.0059	mg/kg dry	0.05882	ND	97	70-130	4	30	
2,2-Dichloropropane	0.0556	0.0059	mg/kg dry	0.05882	ND	95	70-130	0.9	30	
2-Butanone	0.325	0.0588	mg/kg dry	0.2941	ND	111	70-130	2	30	
2-Chlorotoluene	0.0633	0.0059	mg/kg dry	0.05882	ND	108	70-130	2	30	
2-Hexanone	0.313	0.0588	mg/kg dry	0.2941	ND	106	70-130	10	30	
4-Chlorotoluene	0.0611	0.0059	mg/kg dry	0.05882	ND	104	70-130	0.04	30	
4-Isopropyltoluene	0.0582	0.0059	mg/kg dry	0.05882	ND	99	70-130	0.4	30	
4-Methyl-2-Pentanone	0.330	0.0588	mg/kg dry	0.2941	ND	112	70-130	3	30	
Acetone	0.313	0.0588	mg/kg dry	0.2941	0.0293	96	70-130	4	30	
Benzene	0.0610	0.0059	mg/kg dry	0.05882	ND	104	70-130	0.7	30	
Bromobenzene	0.0631	0.0059	mg/kg dry	0.05882	ND	107	70-130	2	30	
Bromochloromethane	0.0600	0.0059	mg/kg dry	0.05882	ND	102	70-130	1	30	
Bromodichloromethane	0.0655	0.0059	mg/kg dry	0.05882	ND	111	70-130	2	30	
Bromoform	0.0575	0.0059	mg/kg dry	0.05882	ND	98	70-130	2	30	
Bromomethane	0.0661	0.0118	mg/kg dry	0.05882	ND	112	70-130	1	30	
Carbon Disulfide	0.0643	0.0059	mg/kg dry	0.05882	ND	109	70-130	1	30	
Carbon Tetrachloride	0.0661	0.0059	mg/kg dry	0.05882	ND	112	70-130	0.7	30	
Chlorobenzene	0.0597	0.0059	mg/kg dry	0.05882	ND	101	70-130	3	30	
Chloroethane	0.0680	0.0118	mg/kg dry	0.05882	ND	116	70-130	1	30	
Chloroform	0.0616	0.0059	mg/kg dry	0.05882	ND	105	70-130	2	30	
Chloromethane	0.0616	0.0118	mg/kg dry	0.05882	ND	105	70-130	2	30	
cis-1,2-Dichloroethene	0.0688	0.0059	mg/kg dry	0.05882	ND	117	70-130	2	30	
cis-1,3-Dichloropropene	0.0606	0.0059	mg/kg dry	0.05882	ND	103	70-130	0.2	30	
Dibromochloromethane	0.0603	0.0059	mg/kg dry	0.05882	ND	102	70-130	3	30	
Dibromomethane	0.0672	0.0059	mg/kg dry	0.05882	ND	114	70-130	3	30	
Dichlorodifluoromethane	0.0659	0.0118	mg/kg dry	0.05882	ND	112	70-130	3	30	
Diethyl Ether	0.0711	0.0059	mg/kg dry	0.05882	ND	121	70-130	2	30	
Di-isopropyl ether	0.0650	0.0059	mg/kg dry	0.05882	ND	111	70-130	1	30	
Ethyl tertiary-butyl ether	0.0620	0.0059	mg/kg dry	0.05882	ND	105	70-130	1	30	
Ethylbenzene	0.0595	0.0059	mg/kg dry	0.05882	ND	101	70-130	4	30	
Hexachlorobutadiene	0.0479	0.0059	mg/kg dry	0.05882	ND	81	70-130	3	30	
Isopropylbenzene	0.0552	0.0059	mg/kg dry	0.05882	ND	94	70-130	0.6	30	
Methyl tert-Butyl Ether	0.0641	0.0059	mg/kg dry	0.05882	ND	109	70-130	0.3	30	
Methylene Chloride	0.0648	0.0294	mg/kg dry	0.05882	0.0022	106	70-130	1	30	
Naphthalene	0.0577	0.0059	mg/kg dry	0.05882	ND	98	70-130	3	30	
n-Butylbenzene	0.0587	0.0059	mg/kg dry	0.05882	ND	100	70-130	0.9	30	
n-Propylbenzene	0.0644	0.0059	mg/kg dry	0.05882	ND	109	70-130	0.4	30	
sec-Butylbenzene	0.0623	0.0059	mg/kg dry	0.05882	ND	106	70-130	0.8	30	
Styrene	0.0596	0.0059	mg/kg dry	0.05882	ND	101	70-130	0.2	30	
tert-Butylbenzene	0.0608	0.0059	mg/kg dry	0.05882	ND	103	70-130	0.4	30	
Tertiary-amyl methyl ether	0.0587	0.0059	mg/kg dry	0.05882	ND	100	70-130	0.9	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Tetrachloroethene	0.0574	0.0059	mg/kg dry	0.05882	ND	98	70-130	5	30	
Tetrahydrofuran	0.0659	0.0059	mg/kg dry	0.05882	ND	112	70-130	2	30	
Toluene	0.0623	0.0059	mg/kg dry	0.05882	ND	106	70-130	0.08	30	
trans-1,2-Dichloroethene	0.0614	0.0059	mg/kg dry	0.05882	ND	104	70-130	0.8	30	
trans-1,3-Dichloropropene	0.0584	0.0059	mg/kg dry	0.05882	ND	99	70-130	0.4	30	
Trichloroethene	0.0612	0.0059	mg/kg dry	0.05882	ND	104	70-130	2	30	
Vinyl Acetate	0.0685	0.0059	mg/kg dry	0.05882	ND	116	70-130	1	30	
Vinyl Chloride	0.0727	0.0118	mg/kg dry	0.05882	ND	124	70-130	4	30	
Xylene O	0.0576	0.0059	mg/kg dry	0.05882	ND	98	70-130	1	30	
Xylene P,M	0.118	0.0118	mg/kg dry	0.1176	ND	100	70-130	3	30	
Surrogate: 1,2-Dichloroethane-d4	0.0671		mg/kg dry	0.05882		114	70-130			
Surrogate: 4-Bromofluorobenzene	0.0559		mg/kg dry	0.05882		95	70-130			
Surrogate: Dibromofluoromethane	0.0666		mg/kg dry	0.05882		113	70-130			
Surrogate: Toluene-d8	0.0582		mg/kg dry	0.05882		99	70-130			
8082 Polychlorinated Biphenyls (PCB)										
Batch CK01913 - 3540										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	0.0210		mg/kg wet	0.02500		84	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0206		mg/kg wet	0.02500		82	30-150			
Surrogate: Tetrachloro-m-xylene	0.0192		mg/kg wet	0.02500		77	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
LCS										
Aroclor 1016	0.458	0.0500	mg/kg wet	0.5000		92	40-140			
Aroclor 1260	0.401	0.0500	mg/kg wet	0.5000		80	40-140			
Surrogate: Decachlorobiphenyl	0.0219		mg/kg wet	0.02500		88	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0235		mg/kg wet	0.02500		94	30-150			
Surrogate: Tetrachloro-m-xylene	0.0210		mg/kg wet	0.02500		84	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0212		mg/kg wet	0.02500		85	30-150			
LCS Dup										
Aroclor 1016	0.471	0.0500	mg/kg wet	0.5000		94	40-140	3	50	
Aroclor 1260	0.406	0.0500	mg/kg wet	0.5000		81	40-140	1	50	
Surrogate: Decachlorobiphenyl	0.0215		mg/kg wet	0.02500		86	30-150			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB)										
Batch CK01913 - 3540										
Surrogate: Decachlorobiphenyl [2C]	0.0220		mg/kg wet	0.02500		88	30-150			
Surrogate: Tetrachloro-m-xylene	0.0209		mg/kg wet	0.02500		83	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0215		mg/kg wet	0.02500		86	30-150			
Matrix Spike **Source: 1011296-02**										
Aroclor 1016	0.815	0.0588	mg/kg dry	0.5882	ND	139	40-140			
Aroclor 1260	0.497	0.0588	mg/kg dry	0.5882	ND	85	40-140			
Surrogate: Decachlorobiphenyl	0.0263		mg/kg dry	0.02941		89	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0262		mg/kg dry	0.02941		89	30-150			
Surrogate: Tetrachloro-m-xylene	0.0229		mg/kg dry	0.02941		78	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0239		mg/kg dry	0.02941		81	30-150			
Matrix Spike Dup **Source: 1011296-02**										
Aroclor 1016	0.843	0.0585	mg/kg dry	0.5853	ND	144	40-140	3	50	MT
Aroclor 1260	0.494	0.0585	mg/kg dry	0.5853	ND	84	40-140	0.6	50	
Surrogate: Decachlorobiphenyl	0.0246		mg/kg dry	0.02927		84	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0246		mg/kg dry	0.02927		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0239		mg/kg dry	0.02927		82	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0251		mg/kg dry	0.02927		86	30-150			
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
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ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
[illegible]pyrene	ND	0.167	mg/kg wet							
B[illegible])fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
N[illegible]ene	ND	0.333	mg/kg wet							
N[illegible]dimethylamine	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.07		mg/kg wet	3.333		62	30-130			
Surrogate: 2,4,6-Tribromophenol	3.79		mg/kg wet	5.000		76	30-130			
Surrogate: 2-Chlorophenol-d4	3.37		mg/kg wet	5.000		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.22		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorophenol	3.51		mg/kg wet	5.000		70	30-130			
Surrogate: Nitrobenzene-d5	2.25		mg/kg wet	3.333		67	30-130			
Surrogate: Phenol-d6	3.39		mg/kg wet	5.000		68	30-130			
Surrogate: p-Terphenyl-d14	2.59		mg/kg wet	3.333		78	30-130			
LCS										
1,1-Biphenyl	2.82	0.333	mg/kg wet	3.333		85	40-140			
1,2,4-Trichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,2-Dichlorobenzene	2.75	0.333	mg/kg wet	3.333		83	40-140			
1,3-Dichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,4-Dichlorobenzene	2.66	0.333	mg/kg wet	3.333		80	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	2.94	0.333	mg/kg wet	3.333		88	30-130			
2,4,6-Trichlorophenol	3.07	0.333	mg/kg wet	3.333		92	30-130			
2,4-Dichlorophenol	2.86	0.333	mg/kg wet	3.333		86	30-130			
2,4-Dimethylphenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2,4-Dinitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
2,4-Dinitrotoluene	3.13	0.333	mg/kg wet	3.333		94	40-140			
2,6-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140			
2-Chloronaphthalene	2.52	0.333	mg/kg wet	3.333		76	40-140			
2-Chlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2-Methylnaphthalene	2.86	0.333	mg/kg wet	3.333		86	40-140			
2-Methylphenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
2-Nitroaniline	2.82	0.333	mg/kg wet	3.333		85	40-140			
2-Nitrophenol	2.89	0.333	mg/kg wet	3.333		87	30-130			
3,3'-Dichlorobenzidine	2.49	0.667	mg/kg wet	3.333		75	40-140			
3+4-Methylphenol	5.97	0.667	mg/kg wet	6.667		90	30-130			
3-Nitroaniline	2.76	0.333	mg/kg wet	3.333		83	40-140			
4,6-Dinitro-2-Methylphenol	3.05	1.67	mg/kg wet	3.333		92	30-130			
4-Bromophenyl-phenylether	2.97	0.333	mg/kg wet	3.333		89	40-140			
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130			
4-Chloroaniline	2.09	0.667	mg/kg wet	3.333		63	40-140			
4-Chloro-phenyl-phenyl ether	3.03	0.333	mg/kg wet	3.333		91	40-140			
4-Nitroaniline	3.02	0.333	mg/kg wet	3.333		91	40-140			
4-Nitrophenol	2.88	1.67	mg/kg wet	3.333		86	30-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Acenaphthene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Acenaphthylene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Acetophenone	2.85	0.667	mg/kg wet	3.333		85	40-140			
Aniline	2.30	0.667	mg/kg wet	3.333		69	40-140			
Anthracene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Azobenzene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Benzo(a)anthracene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Benzo(a)pyrene	3.17	0.167	mg/kg wet	3.333		95	40-140			
Benzo(b)fluoranthene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Benzo(g,h,i)perylene	3.09	0.333	mg/kg wet	3.333		93	40-140			
Benzo(k)fluoranthene	3.23	0.333	mg/kg wet	3.333		97	40-140			
Benzoic Acid	1.91	1.67	mg/kg wet	3.333		57	40-140			
Benzyl Alcohol	2.79	0.333	mg/kg wet	3.333		84	40-140			
bis(2-Chloroethoxy)methane	2.59	0.333	mg/kg wet	3.333		78	40-140			
bis(2-Chloroethyl)ether	2.97	0.333	mg/kg wet	3.333		89	40-140			
[illegible]roisopropyl)Ether	2.76	0.333	mg/kg wet	3.333		83	40-140			
b[illegible]ylhexyl)phthalate	3.01	0.333	mg/kg wet	3.333		90	40-140			
Butylbenzylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140			
Chrysene	3.13	0.167	mg/kg wet	3.333		94	40-140			
Dibenzo(a,h)Anthracene	3.27	0.167	mg/kg wet	3.333		98	40-140			
Dibenzofuran	2.88	0.333	mg/kg wet	3.333		86	40-140			
Diethylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Dimethylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140			
Di-n-butylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Di-n-octylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140			
Fluorene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Hexachlorobenzene	3.06	0.167	mg/kg wet	3.333		92	40-140			
Hexachlorobutadiene	2.68	0.333	mg/kg wet	3.333		80	40-140			
Hexachlorocyclopentadiene	2.27	1.67	mg/kg wet	3.333		68	40-140			
Hexachloroethane	2.46	0.333	mg/kg wet	3.333		74	40-140			
Indeno(1,2,3-cd)Pyrene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Isophorone	2.13	0.333	mg/kg wet	3.333		64	40-140			
Naphthalene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Nitrobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140			
N-Nitrosodimethylamine	2.51	0.333	mg/kg wet	3.333		75	40-140			
N-Nitroso-Di-n-Propylamine	2.67	0.333	mg/kg wet	3.333		80	40-140			
N-nitrosodiphenylamine	3.03	0.333	mg/kg wet	3.333		91	40-140			
Pentachlorophenol	3.08	1.67	mg/kg wet	3.333		92	30-130			
Phenanthrene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Phenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
Pyrene	3.33	0.333	mg/kg wet	3.333		100	40-140			
[illegible]	2.22	1.67	mg/kg wet	3.333		67	40-140			
S[illegible]e: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Surrogate: 2,4,6-Tribromophenol	4.78		mg/kg wet	5.000		96	30-130			
Surrogate: 2-Chlorophenol-d4	4.34		mg/kg wet	5.000		87	30-130			
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: 2-Fluorophenol	3.98		mg/kg wet	5.000		80	30-130			
Surrogate: Nitrobenzene-d5	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: Phenol-d6	4.22		mg/kg wet	5.000		84	30-130			
Surrogate: p-Terphenyl-d14	3.19		mg/kg wet	3.333		96	30-130			
LCS Dup										
1,1-Biphenyl	2.85	0.333	mg/kg wet	3.333		85	40-140	1	30	
1,2,4-Trichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	7	30	
1,2-Dichlorobenzene	2.52	0.333	mg/kg wet	3.333		76	40-140	9	30	
1,3-Dichlorobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	10	30	
1,4-Dichlorobenzene	2.42	0.333	mg/kg wet	3.333		73	40-140	9	30	
2,3,4,6-Tetrachlorophenol	2.87	1.67	mg/kg wet	3.333		86	30-130	3	30	
2,4,5-Trichlorophenol	2.84	0.333	mg/kg wet	3.333		85	30-130	3	30	
2,4,6-Trichlorophenol	3.20	0.333	mg/kg wet	3.333		96	30-130	4	30	
2,4-Dichlorophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	2	30	
2,4-Dimethylphenol	2.66	0.333	mg/kg wet	3.333		80	30-130	2	30	
2,4-Dinitrophenol	2.53	1.67	mg/kg wet	3.333		76	30-130	8	30	
2,4-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140	5	30	
2,6-Dinitrotoluene	3.00	0.333	mg/kg wet	3.333		90	40-140	0.6	30	
2-Chloronaphthalene	2.56	0.333	mg/kg wet	3.333		77	40-140	2	30	
2-Chlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130	9	30	
2-Methylnaphthalene	2.77	0.333	mg/kg wet	3.333		83	40-140	3	30	
2-Methylphenol	2.52	0.333	mg/kg wet	3.333		76	30-130	6	30	
2-Nitroaniline	2.80	0.333	mg/kg wet	3.333		84	40-140	1	30	
2-Nitrophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	4	30	
3,3'-Dichlorobenzidine	2.59	0.667	mg/kg wet	3.333		78	40-140	4	30	
3+4-Methylphenol	5.59	0.667	mg/kg wet	6.667		84	30-130	7	30	
3-Nitroaniline	2.77	0.333	mg/kg wet	3.333		83	40-140	0.5	30	
4,6-Dinitro-2-Methylphenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
4-Bromophenyl-phenylether	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130	0.2	30	
4-Chloroaniline	2.39	0.667	mg/kg wet	3.333		72	40-140	13	30	
4-Chloro-phenyl-phenyl ether	3.27	0.333	mg/kg wet	3.333		98	40-140	8	30	
4-Nitroaniline	3.07	0.333	mg/kg wet	3.333		92	40-140	2	30	
4-Nitrophenol	2.77	1.67	mg/kg wet	3.333		83	30-130	4	30	
Acenaphthene	3.05	0.333	mg/kg wet	3.333		91	40-140	0.8	30	
Acenaphthylene	2.80	0.333	mg/kg wet	3.333		84	40-140	2	30	
Acetophenone	2.71	0.667	mg/kg wet	3.333		81	40-140	5	30	
Aniline	2.15	0.667	mg/kg wet	3.333		65	40-140	7	30	
Anthracene	3.22	0.333	mg/kg wet	3.333		97	40-140	3	30	
Azobenzene	2.80	0.333	mg/kg wet	3.333		84	40-140	4	30	
Benzo(a)anthracene	3.32	0.333	mg/kg wet	3.333		100	40-140	5	30	
Benzo(a)pyrene	3.44	0.167	mg/kg wet	3.333		103	40-140	8	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Benzo(b)fluoranthene	3.47	0.333	mg/kg wet	3.333		104	40-140	12	30	
Benzo(g,h,i)perylene	3.24	0.333	mg/kg wet	3.333		97	40-140	5	30	
Benzo(k)fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Benzoic Acid	1.72	1.67	mg/kg wet	3.333		52	40-140	11	30	
Benzyl Alcohol	2.52	0.333	mg/kg wet	3.333		76	40-140	10	30	
bis(2-Chloroethoxy)methane	2.65	0.333	mg/kg wet	3.333		80	40-140	2	30	
bis(2-Chloroethyl)ether	2.66	0.333	mg/kg wet	3.333		80	40-140	11	30	
bis(2-chloroisopropyl)Ether	2.46	0.333	mg/kg wet	3.333		74	40-140	12	30	
bis(2-Ethylhexyl)phthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	2	30	
Butylbenzylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	0.3	30	
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140	0.2	30	
Chrysene	3.22	0.167	mg/kg wet	3.333		97	40-140	3	30	
Dibenzo(a,h)Anthracene	3.35	0.167	mg/kg wet	3.333		101	40-140	3	30	
Dibenzofuran	2.89	0.333	mg/kg wet	3.333		87	40-140	0.4	30	
Diethylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
[illegible]hthalate	3.00	0.333	mg/kg wet	3.333		90	40-140	1	30	
D[illegible]ylphthalate	2.98	0.333	mg/kg wet	3.333		89	40-140	2	30	
Di-n-octylphthalate	3.26	0.333	mg/kg wet	3.333		98	40-140	6	30	
Fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140	2	30	
Fluorene	3.12	0.333	mg/kg wet	3.333		94	40-140	1	30	
Hexachlorobenzene	3.00	0.167	mg/kg wet	3.333		90	40-140	2	30	
Hexachlorobutadiene	2.58	0.333	mg/kg wet	3.333		78	40-140	4	30	
Hexachlorocyclopentadiene	2.18	1.67	mg/kg wet	3.333		65	40-140	4	30	
Hexachloroethane	2.27	0.333	mg/kg wet	3.333		68	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	3.30	0.333	mg/kg wet	3.333		99	40-140	3	30	
Isophorone	2.14	0.333	mg/kg wet	3.333		64	40-140	0.7	30	
Naphthalene	2.68	0.333	mg/kg wet	3.333		81	40-140	2	30	
Nitrobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	4	30	
N-Nitrosodimethylamine	2.30	0.333	mg/kg wet	3.333		69	40-140	9	30	
N-Nitroso-Di-n-Propylamine	2.56	0.333	mg/kg wet	3.333		77	40-140	4	30	
N-nitrosodiphenylamine	3.11	0.333	mg/kg wet	3.333		93	40-140	3	30	
Pentachlorophenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
Phenanthrene	3.05	0.333	mg/kg wet	3.333		92	40-140	1	30	
Phenol	2.13	0.333	mg/kg wet	3.333		64	30-130	7	30	
Pyrene	3.42	0.333	mg/kg wet	3.333		102	40-140	3	30	
Pyridine	2.13	1.67	mg/kg wet	3.333		64	40-140	4	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: 2,4,6-Tribromophenol	4.76		mg/kg wet	5.000		95	30-130			
Surrogate: 2-Chlorophenol-d4	3.86		mg/kg wet	5.000		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.81		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorophenol	3.66		mg/kg wet	5.000		73	30-130			
Surrogate: Nitrobenzene-d5	2.62		mg/kg wet	3.333		79	30-130			
Surrogate: Phenol-d6	3.98		mg/kg wet	5.000		80	30-130			
[illegible] p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			

M[illegible]pike **Source: 1011296-02**

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
1,1-Biphenyl	2.29	0.392	mg/kg dry	3.922	ND	58	40-140			
1,2,4-Trichlorobenzene	2.12	0.392	mg/kg dry	3.922	ND	54	40-140			
1,2-Dichlorobenzene	1.95	0.392	mg/kg dry	3.922	ND	50	40-140			
1,3-Dichlorobenzene	2.00	0.392	mg/kg dry	3.922	ND	51	40-140			
1,4-Dichlorobenzene	1.92	0.392	mg/kg dry	3.922	ND	49	40-140			
2,3,4,6-Tetrachlorophenol	2.53	1.96	mg/kg dry	3.922	ND	64	30-130			
2,4,5-Trichlorophenol	2.38	0.392	mg/kg dry	3.922	ND	61	30-130			
2,4,6-Trichlorophenol	2.46	0.392	mg/kg dry	3.922	ND	63	30-130			
2,4-Dichlorophenol	2.27	0.392	mg/kg dry	3.922	ND	58	30-130			
2,4-Dimethylphenol	2.16	0.392	mg/kg dry	3.922	ND	55	30-130			
2,4-Dinitrophenol	1.87	1.96	mg/kg dry	3.922	ND	48	30-130			
2,4-Dinitrotoluene	2.61	0.392	mg/kg dry	3.922	ND	67	40-140			
2,6-Dinitrotoluene	2.49	0.392	mg/kg dry	3.922	ND	64	40-140			
2-Chloronaphthalene	2.09	0.392	mg/kg dry	3.922	ND	53	40-140			
2-Chlorophenol	1.97	0.392	mg/kg dry	3.922	ND	50	30-130			
2-Methylnaphthalene	2.20	0.392	mg/kg dry	3.922	ND	56	40-140			
2-Methylphenol	2.02	0.392	mg/kg dry	3.922	ND	52	30-130			
2-Nitroaniline	2.47	0.392	mg/kg dry	3.922	ND	63	40-140			
2-Nitrophenol	2.21	0.392	mg/kg dry	3.922	ND	56	30-130			
3,3´-Dichlorobenzidine	2.49	0.785	mg/kg dry	3.922	ND	63	40-140			
3+4-Methylphenol	4.32	0.785	mg/kg dry	7.843	ND	55	30-130			
3-Nitroaniline	2.48	0.392	mg/kg dry	3.922	ND	63	40-140			
4,6-Dinitro-2-Methylphenol	2.55	1.96	mg/kg dry	3.922	ND	65	30-130			
4-Bromophenyl-phenylether	2.49	0.392	mg/kg dry	3.922	ND	63	40-140			
4-Chloro-3-Methylphenol	2.39	0.392	mg/kg dry	3.922	ND	61	30-130			
4-Chloroaniline	1.94	0.785	mg/kg dry	3.922	ND	49	40-140			
4-Chloro-phenyl-phenyl ether	2.45	0.392	mg/kg dry	3.922	ND	62	40-140			
4-Nitroaniline	2.73	0.392	mg/kg dry	3.922	ND	70	40-140			
4-Nitrophenol	2.78	1.96	mg/kg dry	3.922	ND	71	30-130			
Acenaphthene	2.49	0.392	mg/kg dry	3.922	ND	63	40-140			
Acenaphthylene	2.24	0.392	mg/kg dry	3.922	ND	57	40-140			
Acetophenone	2.03	0.785	mg/kg dry	3.922	ND	52	40-140			
Aniline	1.94	0.785	mg/kg dry	3.922	ND	50	40-140			
Anthracene	2.65	0.392	mg/kg dry	3.922	ND	67	40-140			
Azobenzene	2.22	0.392	mg/kg dry	3.922	ND	57	40-140			
Benzo(a)anthracene	2.91	0.392	mg/kg dry	3.922	ND	74	40-140			
Benzo(a)pyrene	2.84	0.196	mg/kg dry	3.922	ND	72	40-140			
Benzo(b)fluoranthene	2.89	0.392	mg/kg dry	3.922	ND	74	40-140			
Benzo(g,h,i)perylene	2.57	0.392	mg/kg dry	3.922	ND	65	40-140			
Benzo(k)fluoranthene	2.73	0.392	mg/kg dry	3.922	ND	70	40-140			
Benzoic Acid	ND	1.96	mg/kg dry	3.922	ND		40-140			M-
Benzyl Alcohol	2.08	0.392	mg/kg dry	3.922	ND	53	40-140			
bis(2-Chloroethoxy)methane	2.17	0.392	mg/kg dry	3.922	ND	55	40-140			
bis(2-Chloroethyl)ether	2.25	0.392	mg/kg dry	3.922	ND	57	40-140			
bis(2-chloroisopropyl)Ether	2.01	0.392	mg/kg dry	3.922	ND	51	40-140			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
bis(2-Ethylhexyl)phthalate	2.56	0.392	mg/kg dry	3.922	ND	65	40-140			
Butylbenzylphthalate	2.57	0.392	mg/kg dry	3.922	ND	65	40-140			
Carbazole	2.61	0.392	mg/kg dry	3.922	ND	67	40-140			
Chrysene	2.75	0.196	mg/kg dry	3.922	ND	70	40-140			
Dibenzo(a,h)Anthracene	2.75	0.196	mg/kg dry	3.922	ND	70	40-140			
Dibenzofuran	2.38	0.392	mg/kg dry	3.922	ND	61	40-140			
Diethylphthalate	2.60	0.392	mg/kg dry	3.922	ND	66	40-140			
Dimethylphthalate	2.52	0.392	mg/kg dry	3.922	ND	64	40-140			
Di-n-butylphthalate	2.52	0.392	mg/kg dry	3.922	ND	64	40-140			
Di-n-octylphthalate	2.62	0.392	mg/kg dry	3.922	ND	67	40-140			
Fluoranthene	2.63	0.392	mg/kg dry	3.922	ND	67	40-140			
Fluorene	2.60	0.392	mg/kg dry	3.922	ND	66	40-140			
Hexachlorobenzene	2.47	0.196	mg/kg dry	3.922	ND	63	40-140			
Hexachlorobutadiene	2.03	0.392	mg/kg dry	3.922	ND	52	40-140			
Hexachlorocyclopentadiene	1.84	1.96	mg/kg dry	3.922	ND	47	40-140			
[illegible]oethane	1.74	0.392	mg/kg dry	3.922	ND	44	40-140			
In[illegible]1,2,3-cd)Pyrene	2.69	0.392	mg/kg dry	3.922	ND	68	40-140			
Isophorone	1.69	0.392	mg/kg dry	3.922	ND	43	40-140			
Naphthalene	2.13	0.392	mg/kg dry	3.922	ND	54	40-140			
Nitrobenzene	2.02	0.392	mg/kg dry	3.922	ND	52	40-140			
N-Nitrosodimethylamine	1.87	0.392	mg/kg dry	3.922	ND	48	40-140			
N-Nitroso-Di-n-Propylamine	2.04	0.392	mg/kg dry	3.922	ND	52	40-140			
N-nitrosodiphenylamine	2.52	0.392	mg/kg dry	3.922	ND	64	40-140			
Pentachlorophenol	2.60	1.96	mg/kg dry	3.922	ND	66	30-130			
Phenanthrene	2.56	0.392	mg/kg dry	3.922	ND	65	40-140			
Phenol	1.83	0.392	mg/kg dry	3.922	ND	47	30-130			
Pyrene	2.72	0.392	mg/kg dry	3.922	ND	69	40-140			
Pyridine	1.66	1.96	mg/kg dry	3.922	ND	42	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	1.95		mg/kg dry	3.922		50	30-130			
Surrogate: 2,4,6-Tribromophenol	4.11		mg/kg dry	5.882		70	30-130			
Surrogate: 2-Chlorophenol-d4	3.16		mg/kg dry	5.882		54	30-130			
Surrogate: 2-Fluorobiphenyl	2.35		mg/kg dry	3.922		60	30-130			
Surrogate: 2-Fluorophenol	3.21		mg/kg dry	5.882		54	30-130			
Surrogate: Nitrobenzene-d5	2.18		mg/kg dry	3.922		56	30-130			
Surrogate: Phenol-d6	3.27		mg/kg dry	5.882		56	30-130			
Surrogate: p-Terphenyl-d14	2.71		mg/kg dry	3.922		69	30-130			
Matrix Spike Dup Source: 1011296-02										
1,1-Biphenyl	2.45	0.374	mg/kg dry	3.747	ND	65	40-140	7	30	
1,2,4-Trichlorobenzene	2.26	0.374	mg/kg dry	3.747	ND	60	40-140	6	30	
1,2-Dichlorobenzene	2.21	0.374	mg/kg dry	3.747	ND	59	40-140	13	30	
1,3-Dichlorobenzene	2.31	0.374	mg/kg dry	3.747	ND	62	40-140	14	30	
1,4-Dichlorobenzene	2.18	0.374	mg/kg dry	3.747	ND	58	40-140	13	30	
2,3,4,6-Tetrachlorophenol	2.61	1.88	mg/kg dry	3.747	ND	70	30-130	3	30	
2[illegible]hlorophenol	2.53	0.374	mg/kg dry	3.747	ND	68	30-130	6	30	
2,[illegible]hlorophenol	2.67	0.374	mg/kg dry	3.747	ND	71	30-130	8	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
2,4-Dichlorophenol	2.41	0.374	mg/kg dry	3.747	ND	64	30-130	6	30	
2,4-Dimethylphenol	2.29	0.374	mg/kg dry	3.747	ND	61	30-130	6	30	
2,4-Dinitrophenol	2.23	1.88	mg/kg dry	3.747	ND	60	30-130	18	30	
2,4-Dinitrotoluene	2.76	0.374	mg/kg dry	3.747	ND	74	40-140	5	30	
2,6-Dinitrotoluene	2.55	0.374	mg/kg dry	3.747	ND	68	40-140	2	30	
2-Chloronaphthalene	2.24	0.374	mg/kg dry	3.747	ND	60	40-140	7	30	
2-Chlorophenol	2.21	0.374	mg/kg dry	3.747	ND	59	30-130	11	30	
2-Methylnaphthalene	2.41	0.374	mg/kg dry	3.747	ND	64	40-140	9	30	
2-Methylphenol	2.23	0.374	mg/kg dry	3.747	ND	59	30-130	10	30	
2-Nitroaniline	2.54	0.374	mg/kg dry	3.747	ND	68	40-140	3	30	
2-Nitrophenol	2.35	0.374	mg/kg dry	3.747	ND	63	30-130	6	30	
3,3'-Dichlorobenzidine	2.45	0.750	mg/kg dry	3.747	ND	65	40-140	2	30	
3+4-Methylphenol	5.03	0.750	mg/kg dry	7.493	ND	67	30-130	15	30	
3-Nitroaniline	2.51	0.374	mg/kg dry	3.747	ND	67	40-140	1	30	
4,6-Dinitro-2-Methylphenol	2.60	1.88	mg/kg dry	3.747	ND	69	30-130	2	30	
4-Bromophenyl-phenylether	2.61	0.374	mg/kg dry	3.747	ND	70	40-140	5	30	
4-Chloro-3-Methylphenol	2.54	0.374	mg/kg dry	3.747	ND	68	30-130	6	30	
4-Chloroaniline	1.99	0.750	mg/kg dry	3.747	ND	53	40-140	3	30	
4-Chloro-phenyl-phenyl ether	2.54	0.374	mg/kg dry	3.747	ND	68	40-140	4	30	
4-Nitroaniline	2.75	0.374	mg/kg dry	3.747	ND	73	40-140	0.9	30	
4-Nitrophenol	2.72	1.88	mg/kg dry	3.747	ND	73	30-130	2	30	
Acenaphthene	2.61	0.374	mg/kg dry	3.747	ND	70	40-140	5	30	
Acenaphthylene	2.39	0.374	mg/kg dry	3.747	ND	64	40-140	6	30	
Acetophenone	2.46	0.750	mg/kg dry	3.747	ND	66	40-140	19	30	
Aniline	2.15	0.750	mg/kg dry	3.747	ND	57	40-140	10	30	
Anthracene	2.71	0.374	mg/kg dry	3.747	ND	72	40-140	2	30	
Azobenzene	2.33	0.374	mg/kg dry	3.747	ND	62	40-140	5	30	
Benzo(a)anthracene	2.91	0.374	mg/kg dry	3.747	ND	78	40-140	0.1	30	
Benzo(a)pyrene	2.81	0.188	mg/kg dry	3.747	ND	75	40-140	0.9	30	
Benzo(b)fluoranthene	2.96	0.374	mg/kg dry	3.747	ND	79	40-140	2	30	
Benzo(g,h,i)perylene	2.38	0.374	mg/kg dry	3.747	ND	64	40-140	8	30	
Benzo(k)fluoranthene	2.82	0.374	mg/kg dry	3.747	ND	75	40-140	4	30	
Benzoic Acid	0.670	1.88	mg/kg dry	3.747	ND	18	40-140	200	30	D+, M-
Benzyl Alcohol	2.31	0.374	mg/kg dry	3.747	ND	62	40-140	11	30	
bis(2-Chloroethoxy)methane	2.33	0.374	mg/kg dry	3.747	ND	62	40-140	7	30	
bis(2-Chloroethyl)ether	2.45	0.374	mg/kg dry	3.747	ND	65	40-140	8	30	
bis(2-chloroisopropyl)Ether	2.28	0.374	mg/kg dry	3.747	ND	61	40-140	13	30	
bis(2-Ethylhexyl)phthalate	2.59	0.374	mg/kg dry	3.747	ND	69	40-140	1	30	
Butylbenzylphthalate	2.56	0.374	mg/kg dry	3.747	ND	68	40-140	0.4	30	
Carbazole	2.60	0.374	mg/kg dry	3.747	ND	70	40-140	0.2	30	
Chrysene	2.75	0.188	mg/kg dry	3.747	ND	73	40-140	0.1	30	
Dibenzo(a,h)Anthracene	2.61	0.188	mg/kg dry	3.747	ND	70	40-140	5	30	
Dibenzofuran	2.49	0.374	mg/kg dry	3.747	ND	67	40-140	5	30	
Diethylphthalate	2.66	0.374	mg/kg dry	3.747	ND	71	40-140	3	30	
Dimethylphthalate	2.62	0.374	mg/kg dry	3.747	ND	70	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Di-n-butylphthalate	2.56	0.374	mg/kg dry	3.747	ND	68	40-140	1	30	
Di-n-octylphthalate	2.79	0.374	mg/kg dry	3.747	ND	74	40-140	6	30	
Fluoranthene	2.64	0.374	mg/kg dry	3.747	ND	71	40-140	0.4	30	
Fluorene	2.75	0.374	mg/kg dry	3.747	ND	73	40-140	6	30	
Hexachlorobenzene	2.59	0.188	mg/kg dry	3.747	ND	69	40-140	5	30	
Hexachlorobutadiene	2.29	0.374	mg/kg dry	3.747	ND	61	40-140	12	30	
Hexachlorocyclopentadiene	1.98	1.88	mg/kg dry	3.747	ND	53	40-140	7	30	
Hexachloroethane	3.12	0.374	mg/kg dry	3.747	ND	83	40-140	57	30	D+
Indeno(1,2,3-cd)Pyrene	2.55	0.374	mg/kg dry	3.747	ND	68	40-140	5	30	
Isophorone	1.86	0.374	mg/kg dry	3.747	ND	50	40-140	10	30	
Naphthalene	2.31	0.374	mg/kg dry	3.747	ND	62	40-140	8	30	
Nitrobenzene	2.26	0.374	mg/kg dry	3.747	ND	60	40-140	11	30	
N-Nitrosodimethylamine	2.23	0.374	mg/kg dry	3.747	ND	59	40-140	17	30	
N-Nitroso-Di-n-Propylamine	2.22	0.374	mg/kg dry	3.747	ND	59	40-140	8	30	
N-nitrosodiphenylamine	2.61	0.374	mg/kg dry	3.747	ND	70	40-140	4	30	
[illegible]rophenol	2.63	1.88	mg/kg dry	3.747	ND	70	30-130	1	30	
P[illegible]rene	2.61	0.374	mg/kg dry	3.747	ND	70	40-140	2	30	
Phenol	2.05	0.374	mg/kg dry	3.747	ND	55	30-130	11	30	
Pyrene	2.71	0.374	mg/kg dry	3.747	ND	72	40-140	0.4	30	
Pyridine	1.96	1.88	mg/kg dry	3.747	ND	52	40-140	17	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.17		mg/kg dry	3.747		58	30-130			
Surrogate: 2,4,6-Tribromophenol	4.08		mg/kg dry	5.620		73	30-130			
Surrogate: 2-Chlorophenol-d4	3.40		mg/kg dry	5.620		60	30-130			
Surrogate: 2-Fluorobiphenyl	2.42		mg/kg dry	3.747		65	30-130			
Surrogate: 2-Fluorophenol	3.54		mg/kg dry	5.620		63	30-130			
Surrogate: Nitrobenzene-d5	2.33		mg/kg dry	3.747		62	30-130			
Surrogate: Phenol-d6	3.51		mg/kg dry	5.620		63	30-130			
Surrogate: p-Terphenyl-d14	2.62		mg/kg dry	3.747		70	30-130			
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.017	mg/kg wet							
2-Methylnaphthalene	ND	0.017	mg/kg wet							
Acenaphthene	ND	0.017	mg/kg wet							
Acenaphthylene	ND	0.017	mg/kg wet							
Anthracene	ND	0.017	mg/kg wet							
Benzo(a)anthracene	ND	0.017	mg/kg wet							
Benzo(a)pyrene	ND	0.017	mg/kg wet							
Benzo(b)fluoranthene	ND	0.017	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.017	mg/kg wet							
Benzo(k)fluoranthene	ND	0.017	mg/kg wet							
Ch[illegible]ne	ND	0.017	mg/kg wet							
D[illegible]h)Anthracene	ND	0.017	mg/kg wet							
Flu[illegible]thene	ND	0.017	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Batch CK02225 - 3546										
Fluorene	ND	0.017	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.017	mg/kg wet							
Naphthalene	ND	0.017	mg/kg wet							
Phenanthrene	ND	0.017	mg/kg wet							
Pyrene	ND	0.017	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.31		mg/kg wet	3.333		69	30-130			
Surrogate: 2-Fluorobiphenyl	2.03		mg/kg wet	3.333		61	30-130			
Surrogate: Nitrobenzene-d5	2.01		mg/kg wet	3.333		60	30-130			
Surrogate: p-Terphenyl-d14	2.53		mg/kg wet	3.333		76	30-130			
Classical Chemistry										
Batch CK02205 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.92	1.00	mg/kg wet	5.015		98	90-110			
LCS										
Total Cyanide	19.7	1.00	mg/kg wet	20.06		98	90-110			
LCS Dup										
Total Cyanide	19.9	1.00	mg/kg wet	20.06		99	90-110	1	20	
Duplicate **Source: 1011296-02**										
Total Cyanide	0.29	1.12	mg/kg dry		0.33			12	20	
Matrix Spike **Source: 1011296-02**										
Total Cyanide	11.0	1.13	mg/kg dry	11.36	0.33	94	75-125			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011296

Notes and Definitions

U	Analyte included in the analysis, but not detected
MT	Due to high target values, matrix spike compound(s) is masked (MT).
M-	Matrix Spike recovery is below lower control limit (M-).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED above the detection limit (LOD for DoD Reports)
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[illegible]D	Limit of Detection
[illegible]LC]	Calculated Analyte
LOQ	Limit of Quantitation
DL	Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
ESS Laboratory Work Order: 1011296

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

South Carolina Volatile Organic Compounds in Potable Water: 78003

New Jersey Potable (VOA) and Non Potable Water (RCRA), Solids and Hazardous Waste: RI002
http://www.nj.gov/dep/oqa/certlabs.htm

Pensylvania Potable and Non Potable Water, Solid and Hazardous Waste: 68-01752
http://files.dep.state.pa.us/RegionalResources/Labs/LabsPortalFiles/2009-0911_accredited_laboratories.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: AECOM - ESS
Client Project ID: _____
Shipped/Delivered Via: Client

ESS Project ID: 10110296
Date Project Due: 11/25/10
Days For Project: 5 Day

ms to be checked upon receipt:

1. Air Bill Manifest Present? *** No**
   Air No.:
2. Were Custody Seals Present? **No**
3. Were Custody Seals Intact? **N/A**
4. Is Radiation count < 100 CPM? **Yes**
5. Is a cooler present? **Yes**
   Cooler Temp: **4.0**
   Iced With: **Icepacks**
6. Was COC included with samples? **Yes**
7. Was COC signed and dated by client? **Yes**
8. Does the COC match the sample **Yes**
9. Is COC complete and correct? **Yes**
10. Are the samples properly preserved? **Yes**
11. Proper sample containers used? **Yes**
12. Any air bubbles in the VOA vials? **N/A**
13. Holding times exceeded? **No**
14. Sufficient sample volumes? **Yes**
15. Any Subcontracting needed? **No**
16. Are ESS labels on correct containers? **Yes|No**
17. Were samples received intact? **Yes|No**

ESS Sample IDs: _____
Sub Lab: _____
Analysis: _____
TAT: _____

18. Was there need to call project manager to discuss status? If yes, please explain.

_____

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	40 ml - VOA	2	MeOH
1	Yes	40 ml - VOA	1	other
1	Yes	8 oz Soil Jar	2	NP
2	Yes	40 ml - VOA	3	MeOH
2	Yes	40 ml - VOA	6	other
2	Yes	8 oz Soil Jar	3	NP
3	Yes	40 ml - VOA	1	MeOH
3	Yes	40 ml - VOA	2	other
3	Yes	8 oz Soil Jar	1	NP
4	Yes	40 ml - VOA	1	MeOH

Completed By: MK Date/Time: 11/18/10
Reviewed By: [illegible] Date/Time: 11/18/10

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Page 1 of 1

Turn Time ___ Standard Other _____
If faster than 5 days, prior approval by laboratory is required # _____

Reporting Limits

ESS LAB PROJECT ID

State where samples were collected from:
MA RI CT NH NJ NY ME Other _____

Electronic Deliverable ___ Yes ___ No
Format: Excel ___ Access ___ PDF ___ Other _____

Is this project for any of the following:
MA-MCP Navy USACE Other _____

Co. Name	Project #	Project Name (20 Char. or less)
[illegible]	[illegible]	[illegible]

Contact Person	Address
[illegible]	[illegible]

City	State	Zip	PO#
[illegible]	[illegible]	[illegible]	

Telephone #	Fax #	Email Address
[illegible]		[illegible]

Write Required Analysis

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Total Cyanide	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]		X	[illegible]	SD-09-A-1		2	[illegible]	X	X				X							
	[illegible]	[illegible]		X	[illegible]	SD-09-A-1		3	[illegible]			X	X									
	[illegible]	[illegible]		X	[illegible]	SD-07-A-1		3	[illegible]	X	X			X	X							
	[illegible]	[illegible]		X	[illegible]	SD-07-A-1		4	[illegible]			X	X	X								
	[illegible]	[illegible]		X	[illegible]	SD-07-A-2		1	[illegible]	X	X				X							
	[illegible]	[illegible]		X	[illegible]	SD-07-A-2		3	[illegible]			X	X									

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA: ___
Cooler Temp: [illegible]

Internal Use Only
[X] Pickup [illegible]
[ ] Technicians _____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- _____

Sampled by: [illegible]

Comments: [illegible]

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[illegible]	[illegible]	[illegible]	[illegible]				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By [illegible] MA-MCP, client acknowledges samples were collected

Please fax all chang[illegible] Chain of Custody in writing.

1 (White) Lab Copy 2 ([illegible] Client Receipt

CERTIFICATE OF ANALYSIS

Scott Wozniakowski
AECOM Environment - ENSR
2 Technology Park Drive
Westford, MA 01886

RE: BASF - Cranston RI (60163799.1)
ESS Laboratory Work Order Number: 1011299

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

SAMPLE RECEIPT

The following samples were received on November 19, 2010 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	SampleName	Matrix	Analysis
1011299-01	SD-2R-A-2	Soil	8082
1011299-02	SD-2R-B-2	Soil	8082
1011299-03	SD-2R-A-1	Soil	8082
1011299-04	SD-2R-B-1	Soil	8082
1011299-05	SD-2R-C-1	Soil	8082
1011299-13	SD-11-A-1	Soil	6010B, 7841, 8082, 8260B Low, 8270C, 8270C SIM, 9014

This data package duplicated in Attachment D to present SD-2R sample data.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB)

1011299-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-02 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-03 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-04 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

8270C(SIM) Polynuclear Aromatic Hydrocarbons

CTK0209-CCV1 **Benzidine tailing factor >2.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-A-2
Date Sampled: 11/19/10 09:50
Percent Solids: 45
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1232	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1242	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1248	**187** (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1254	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1260	ND (11.1)		100	11/24/10 12:46		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-B-2
Date Sampled: 11/19/10 09:50
Percent Solids: 65
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1232	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1242	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1248	**16.5** (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1254	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1260	ND (1.53)		20	11/24/10 17:20		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-A-1
Date Sampled: 11/19/10 09:44
Percent Solids: 51
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1232	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1242	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1248	**95.0** (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1254	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1260	ND (4.90)		50	11/24/10 17:02		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-B-1
Date Sampled: 11/19/10 09:44
Percent Solids: 70
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1232	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1242	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1248	**17.1** (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1254	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1260	ND (1.43)		20	11/24/10 14:04		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-C-1
Date Sampled: 11/19/10 09:44
Percent Solids: 91
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1232	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1242	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1248	**0.578** (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1254	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1260	ND (0.0549)		1	11/24/10 13:07		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	74 %		30-150
Surrogate: Decachlorobiphenyl [2C]	68 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	79 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry

3050B/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Cadmium	ND (0.40)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Copper	**3.0** (2.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Lead	ND (4.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Thallium	ND (0.99)	7841		5	SVD	11/23/10 18:43	2.97	100	CK02217
Zinc	**21.1** (2.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Chlorobenzene	**0.0338** (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Toluene	ND (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Xylene O	ND (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Xylene P,M	ND (0.0090)		1	11/23/10 0:18	CTK0179	CK02222

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	114 %		70-130
Surrogate: 4-Bromofluorobenzene	92 %		70-130
Surrogate: Dibromofluoromethane	112 %		70-130
Surrogate: Toluene-d8	97 %		70-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1232	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1242	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1248	**0.158** (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1254	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1260	ND (0.0595)		1	11/24/10 13:26		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	81 %		30-150
Surrogate: Decachlorobiphenyl [2C]	96 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	83 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/22/10 16:00

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,2-Dichlorobenzene	ND (0.391)		1	11/22/10 22:11	CTK0182	CK02225
2-Methylnaphthalene	ND (0.391)		1	11/22/10 22:11	CTK0182	CK02225
4-Chloroaniline	ND (0.784)		1	11/22/10 22:11	CTK0182	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	73 %		30-130
Surrogate: 2,4,6-Tribromophenol	87 %		30-130
Surrogate: 2-Chlorophenol-d4	78 %		30-130
Surrogate: 2-Fluorobiphenyl	77 %		30-130
Surrogate: 2-Fluorophenol	78 %		30-130
Surrogate: Nitrobenzene-d5	75 %		30-130
Surrogate: Phenol-d6	79 %		30-130
Surrogate: p-Terphenyl-d14	88 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/22/10 16:00

8270C(SIM) Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(a)anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(a)pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(b)fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(g,h,i)perylene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(k)fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Chrysene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Dibenzo(a,h)Anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Indeno(1,2,3-cd)Pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	80 %		30-130
Surrogate: 2-Fluorobiphenyl	69 %		30-130
Surrogate: Nitrobenzene-d5	71 %		30-130
Surrogate: p-Terphenyl-d14	84 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Cyanide	ND (1.15)	9014		1	EEM	11/22/10 11:50	mg/kg dry	CK02205

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
3050B/6000/7000 Total Metals										
Batch CK02217 - 3050B										
Blank										
Cadmium	ND	0.50	mg/kg wet							
Copper	ND	2.5	mg/kg wet							
Lead	ND	5.0	mg/kg wet							
Thallium	ND	0.25	mg/kg wet							
Zinc	ND	2.5	mg/kg wet							
LCS										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120			
Copper	69.2	8.5	mg/kg wet	74.70		93	80-120			
Lead	153	17.0	mg/kg wet	152.0		101	80-120			
Thallium	170	41.9	mg/kg wet	171.0		99	80-120			
Zinc	265	8.5	mg/kg wet	299.0		89	80-120			
LCS Dup										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120	0.008	20	
C[illegible]	68.8	8.5	mg/kg wet	74.70		92	80-120	0.7	20	
L[illegible]	154	17.0	mg/kg wet	152.0		102	80-120	0.9	20	
Thallium	172	41.9	mg/kg wet	171.0		101	80-120	1	20	
Zinc	264	8.5	mg/kg wet	299.0		88	80-120	0.7	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1[illegible]e	ND	0.100	mg/kg wet							
1-C[illegible]hexane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Trichloroethene	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0524		mg/kg wet	0.05000		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0516		mg/kg wet	0.05000		103	70-130			
Surrogate: Toluene-d8	0.0481		mg/kg wet	0.05000		96	70-130			
LCS										
1,1,1,2-Tetrachloroethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,1-Trichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2,2-Tetrachloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
[illegible]roethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,[illegible]loropropene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,4-Trimethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dibromoethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloropropane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,3,5-Trimethylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,3-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130			
1-Chlorohexane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
2,2-Dichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
2-Butanone	0.244	0.0500	mg/kg wet	0.2500		98	70-130			
2-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130			
4-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
4-Isopropyltoluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.246	0.0500	mg/kg wet	0.2500		99	70-130			
Acetone	0.226	0.0500	mg/kg wet	0.2500		91	70-130			
Benzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Bromochloromethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
B[illegible]loromethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
B[illegible]m	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Bromomethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130			
Carbon Disulfide	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Carbon Tetrachloride	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Chlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Chloroethane	0.0511	0.0100	mg/kg wet	0.05000		102	70-130			
Chloroform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130			
cis-1,2-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
cis-1,3-Dichloropropene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Dibromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromomethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dichlorodifluoromethane	0.0515	0.0100	mg/kg wet	0.05000		103	70-130			
Diethyl Ether	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Ethyl tertiary-butyl ether	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Ethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Hexachlorobutadiene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Isopropylbenzene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Methyl tert-Butyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Methylene Chloride	0.0502	0.0250	mg/kg wet	0.05000		100	70-130			
Naphthalene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
n-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
n-Propylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Tetrachloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrahydrofuran	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,2-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
trans-1,3-Dichloropropene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Trichloroethene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Vinyl Acetate	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Vinyl Chloride	0.0550	0.0100	mg/kg wet	0.05000		110	70-130			
Xylene O	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Xylene P,M	0.0993	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0499		mg/kg wet	0.05000		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0489		mg/kg wet	0.05000		98	70-130			
Surrogate: Dibromofluoromethane	0.0498		mg/kg wet	0.05000		100	70-130			
Surrogate: Toluene-d8	0.0483		mg/kg wet	0.05000		97	70-130			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	0.3	25	
1,1,1-Trichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
1,1,2,2-Tetrachloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	7	25	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
1,1,2-Trichloroethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
1,1-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,1-Dichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,1-Dichloropropene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
1,2,3-Trichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,3-Trichloropropane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,2,4-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,4-Trimethylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
1,2-Dibromoethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	0.4	25	
1,2-Dichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,2-Dichloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,2-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
1,3,5-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
[illegible]ropropane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
1,[illegible]lorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130	0.2	20	
1-Chlorohexane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	1	25	
2,2-Dichloropropane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	1	25	
2-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
2-Hexanone	0.246	0.0500	mg/kg wet	0.2500		98	70-130	2	25	
4-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
4-Isopropyltoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
4-Methyl-2-Pentanone	0.249	0.0500	mg/kg wet	0.2500		99	70-130	0.9	25	
Acetone	0.210	0.0500	mg/kg wet	0.2500		84	70-130	8	25	
Benzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Bromobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
Bromochloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
Bromodichloromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
Bromoform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
Bromomethane	0.0485	0.0100	mg/kg wet	0.05000		97	70-130	0.8	25	
Carbon Disulfide	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	0.4	25	
Chloroethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	2	25	
Chloroform	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
Chloromethane	0.0464	0.0100	mg/kg wet	0.05000		93	70-130	3	25	
cis-1,2-Dichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
cis-1,3-Dichloropropene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.8	25	
Dibromochloromethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Dibromomethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
D[illegible]fluoromethane	0.0501	0.0100	mg/kg wet	0.05000		100	70-130	3	25	
D[illegible]ner	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	0.3	25	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Di-isopropyl ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Ethyl tertiary-butyl ether	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Ethylbenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	0.8	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Isopropylbenzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Methyl tert-Butyl Ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
Methylene Chloride	0.0494	0.0250	mg/kg wet	0.05000		99	70-130	2	25	
Naphthalene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.2	25	
n-Propylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
sec-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Styrene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
tert-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tertiary-amyl methyl ether	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Tetrachloroethene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Tetrahydrofuran	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
Toluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
trans-1,2-Dichloroethene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
trans-1,3-Dichloropropene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Trichloroethene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
Vinyl Acetate	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
Vinyl Chloride	0.0548	0.0100	mg/kg wet	0.05000		110	70-130	0.5	25	
Xylene O	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Xylene P,M	0.0987	0.0100	mg/kg wet	0.1000		99	70-130	0.6	25	
Surrogate: 1,2-Dichloroethane-d4	0.0509		mg/kg wet	0.05000		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0485		mg/kg wet	0.05000		97	70-130			
Surrogate: Dibromofluoromethane	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Toluene-d8	0.0482		mg/kg wet	0.05000		96	70-130			
8082 Polychlorinated Biphenyls (PCB)										
Batch CK02334 - 3540										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	0.0195		mg/kg wet	0.02500		78	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB)										
Batch CK02334 - 3540										
Surrogate: Tetrachloro-m-xylene [2C]	0.0212		mg/kg wet	0.02500		85	30-150			
LCS										
Aroclor 1016	0.433	0.0500	mg/kg wet	0.5000		87	40-140			
Aroclor 1260	0.365	0.0500	mg/kg wet	0.5000		73	40-140			
Surrogate: Decachlorobiphenyl	0.0188		mg/kg wet	0.02500		75	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0195		mg/kg wet	0.02500		78	30-150			
Surrogate: Tetrachloro-m-xylene	0.0197		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
LCS Dup										
Aroclor 1016	0.460	0.0500	mg/kg wet	0.5000		92	40-140	6	50	
Aroclor 1260	0.400	0.0500	mg/kg wet	0.5000		80	40-140	9	50	
Surrogate: Decachlorobiphenyl	0.0207		mg/kg wet	0.02500		83	30-150			
S[illegible]e: Decachlorobiphenyl [2C]	0.0214		mg/kg wet	0.02500		86	30-150			
S[illegible]e: Tetrachloro-m-xylene	0.0208		mg/kg wet	0.02500		83	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0216		mg/kg wet	0.02500		86	30-150			
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3[illegible]line	ND	0.333	mg/kg wet							
4,[illegible]ro-2-Methylphenol	ND	1.67	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.07		mg/kg wet	3.333		62	30-130			
Surrogate: 2,4,6-Tribromophenol	3.79		mg/kg wet	5.000		76	30-130			
Surrogate: 2-Chlorophenol-d4	3.37		mg/kg wet	5.000		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.22		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorophenol	3.51		mg/kg wet	5.000		70	30-130			
Surrogate: Nitrobenzene-d5	2.25		mg/kg wet	3.333		67	30-130			
Surrogate: Phenol-d6	3.39		mg/kg wet	5.000		68	30-130			
Surrogate: p-Terphenyl-d14	2.59		mg/kg wet	3.333		78	30-130			
LCS										
1,1-Biphenyl	2.82	0.333	mg/kg wet	3.333		85	40-140			
[illegible]hlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,[illegible]lorobenzene	2.75	0.333	mg/kg wet	3.333		83	40-140			
1,3-Dichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,4-Dichlorobenzene	2.66	0.333	mg/kg wet	3.333		80	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	2.94	0.333	mg/kg wet	3.333		88	30-130			
2,4,6-Trichlorophenol	3.07	0.333	mg/kg wet	3.333		92	30-130			
2,4-Dichlorophenol	2.86	0.333	mg/kg wet	3.333		86	30-130			
2,4-Dimethylphenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2,4-Dinitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
2,4-Dinitrotoluene	3.13	0.333	mg/kg wet	3.333		94	40-140			
2,6-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140			
2-Chloronaphthalene	2.52	0.333	mg/kg wet	3.333		76	40-140			
2-Chlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2-Methylnaphthalene	2.86	0.333	mg/kg wet	3.333		86	40-140			
2-Methylphenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
2-Nitroaniline	2.82	0.333	mg/kg wet	3.333		85	40-140			
2-Nitrophenol	2.89	0.333	mg/kg wet	3.333		87	30-130			
3,3'-Dichlorobenzidine	2.49	0.667	mg/kg wet	3.333		75	40-140			
3+4-Methylphenol	5.97	0.667	mg/kg wet	6.667		90	30-130			
3-Nitroaniline	2.76	0.333	mg/kg wet	3.333		83	40-140			
4,6-Dinitro-2-Methylphenol	3.05	1.67	mg/kg wet	3.333		92	30-130			
4-Bromophenyl-phenylether	2.97	0.333	mg/kg wet	3.333		89	40-140			
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130			
4-Chloroaniline	2.09	0.667	mg/kg wet	3.333		63	40-140			
4-Chloro-phenyl-phenyl ether	3.03	0.333	mg/kg wet	3.333		91	40-140			
4-Nitroaniline	3.02	0.333	mg/kg wet	3.333		91	40-140			
4-Nitrophenol	2.88	1.67	mg/kg wet	3.333		86	30-130			
A[illegible]ene	3.02	0.333	mg/kg wet	3.333		91	40-140			
A[illegible]hylene	2.74	0.333	mg/kg wet	3.333		82	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Acetophenone	2.85	0.667	mg/kg wet	3.333		85	40-140			
Aniline	2.30	0.667	mg/kg wet	3.333		69	40-140			
Anthracene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Azobenzene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Benzo(a)anthracene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Benzo(a)pyrene	3.17	0.167	mg/kg wet	3.333		95	40-140			
Benzo(b)fluoranthene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Benzo(g,h,i)perylene	3.09	0.333	mg/kg wet	3.333		93	40-140			
Benzo(k)fluoranthene	3.23	0.333	mg/kg wet	3.333		97	40-140			
Benzoic Acid	1.91	1.67	mg/kg wet	3.333		57	40-140			
Benzyl Alcohol	2.79	0.333	mg/kg wet	3.333		84	40-140			
bis(2-Chloroethoxy)methane	2.59	0.333	mg/kg wet	3.333		78	40-140			
bis(2-Chloroethyl)ether	2.97	0.333	mg/kg wet	3.333		89	40-140			
bis(2-chloroisopropyl)Ether	2.76	0.333	mg/kg wet	3.333		83	40-140			
bis(2-Ethylhexyl)phthalate	3.01	0.333	mg/kg wet	3.333		90	40-140			
Butylbenzylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140			
Chrysene	3.13	0.167	mg/kg wet	3.333		94	40-140			
Dibenzo(a,h)Anthracene	3.27	0.167	mg/kg wet	3.333		98	40-140			
Dibenzofuran	2.88	0.333	mg/kg wet	3.333		86	40-140			
Diethylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Dimethylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140			
Di-n-butylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Di-n-octylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140			
Fluorene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Hexachlorobenzene	3.06	0.167	mg/kg wet	3.333		92	40-140			
Hexachlorobutadiene	2.68	0.333	mg/kg wet	3.333		80	40-140			
Hexachlorocyclopentadiene	2.27	1.67	mg/kg wet	3.333		68	40-140			
Hexachloroethane	2.46	0.333	mg/kg wet	3.333		74	40-140			
Indeno(1,2,3-cd)Pyrene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Isophorone	2.13	0.333	mg/kg wet	3.333		64	40-140			
Naphthalene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Nitrobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140			
N-Nitrosodimethylamine	2.51	0.333	mg/kg wet	3.333		75	40-140			
N-Nitroso-Di-n-Propylamine	2.67	0.333	mg/kg wet	3.333		80	40-140			
N-nitrosodiphenylamine	3.03	0.333	mg/kg wet	3.333		91	40-140			
Pentachlorophenol	3.08	1.67	mg/kg wet	3.333		92	30-130			
Phenanthrene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Phenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
Pyrene	3.33	0.333	mg/kg wet	3.333		100	40-140			
Pyridine	2.22	1.67	mg/kg wet	3.333		67	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: 2,4,6-Tribromophenol	4.78		mg/kg wet	5.000		96	30-130			
Surrogate: 2-Chlorophenol-d4	4.34		mg/kg wet	5.000		87	30-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: 2-Fluorophenol	3.98		mg/kg wet	5.000		80	30-130			
Surrogate: Nitrobenzene-d5	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: Phenol-d6	4.22		mg/kg wet	5.000		84	30-130			
Surrogate: p-Terphenyl-d14	3.19		mg/kg wet	3.333		96	30-130			
LCS Dup										
1,1-Biphenyl	2.85	0.333	mg/kg wet	3.333		85	40-140	1	30	
1,2,4-Trichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	7	30	
1,2-Dichlorobenzene	2.52	0.333	mg/kg wet	3.333		76	40-140	9	30	
1,3-Dichlorobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	10	30	
1,4-Dichlorobenzene	2.42	0.333	mg/kg wet	3.333		73	40-140	9	30	
2,3,4,6-Tetrachlorophenol	2.87	1.67	mg/kg wet	3.333		86	30-130	3	30	
2,4,5-Trichlorophenol	2.84	0.333	mg/kg wet	3.333		85	30-130	3	30	
2,4,6-Trichlorophenol	3.20	0.333	mg/kg wet	3.333		96	30-130	4	30	
2[illegible]rophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	2	30	
2[illegible]thylphenol	2.66	0.333	mg/kg wet	3.333		80	30-130	2	30	
2,4-Dinitrophenol	2.53	1.67	mg/kg wet	3.333		76	30-130	8	30	
2,4-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140	5	30	
2,6-Dinitrotoluene	3.00	0.333	mg/kg wet	3.333		90	40-140	0.6	30	
2-Chloronaphthalene	2.56	0.333	mg/kg wet	3.333		77	40-140	2	30	
2-Chlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130	9	30	
2-Methylnaphthalene	2.77	0.333	mg/kg wet	3.333		83	40-140	3	30	
2-Methylphenol	2.52	0.333	mg/kg wet	3.333		76	30-130	6	30	
2-Nitroaniline	2.80	0.333	mg/kg wet	3.333		84	40-140	1	30	
2-Nitrophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	4	30	
3,3'-Dichlorobenzidine	2.59	0.667	mg/kg wet	3.333		78	40-140	4	30	
3+4-Methylphenol	5.59	0.667	mg/kg wet	6.667		84	30-130	7	30	
3-Nitroaniline	2.77	0.333	mg/kg wet	3.333		83	40-140	0.5	30	
4,6-Dinitro-2-Methylphenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
4-Bromophenyl-phenylether	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130	0.2	30	
4-Chloroaniline	2.39	0.667	mg/kg wet	3.333		72	40-140	13	30	
4-Chloro-phenyl-phenyl ether	3.27	0.333	mg/kg wet	3.333		98	40-140	8	30	
4-Nitroaniline	3.07	0.333	mg/kg wet	3.333		92	40-140	2	30	
4-Nitrophenol	2.77	1.67	mg/kg wet	3.333		83	30-130	4	30	
Acenaphthene	3.05	0.333	mg/kg wet	3.333		91	40-140	0.8	30	
Acenaphthylene	2.80	0.333	mg/kg wet	3.333		84	40-140	2	30	
Acetophenone	2.71	0.667	mg/kg wet	3.333		81	40-140	5	30	
Aniline	2.15	0.667	mg/kg wet	3.333		65	40-140	7	30	
Anthracene	3.22	0.333	mg/kg wet	3.333		97	40-140	3	30	
Azobenzene	2.80	0.333	mg/kg wet	3.333		84	40-140	4	30	
Benzo(a)anthracene	3.32	0.333	mg/kg wet	3.333		100	40-140	5	30	
B[illegible]pyrene	3.44	0.167	mg/kg wet	3.333		103	40-140	8	30	
B[illegible]luoranthene	3.47	0.333	mg/kg wet	3.333		104	40-140	12	30	
Benzo(g,h,i)perylene	3.24	0.333	mg/kg wet	3.333		97	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Benzo(k)fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Benzoic Acid	1.72	1.67	mg/kg wet	3.333		52	40-140	11	30	
Benzyl Alcohol	2.52	0.333	mg/kg wet	3.333		76	40-140	10	30	
bis(2-Chloroethoxy)methane	2.65	0.333	mg/kg wet	3.333		80	40-140	2	30	
bis(2-Chloroethyl)ether	2.66	0.333	mg/kg wet	3.333		80	40-140	11	30	
bis(2-chloroisopropyl)Ether	2.46	0.333	mg/kg wet	3.333		74	40-140	12	30	
bis(2-Ethylhexyl)phthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	2	30	
Butylbenzylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	0.3	30	
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140	0.2	30	
Chrysene	3.22	0.167	mg/kg wet	3.333		97	40-140	3	30	
Dibenzo(a,h)Anthracene	3.35	0.167	mg/kg wet	3.333		101	40-140	3	30	
Dibenzofuran	2.89	0.333	mg/kg wet	3.333		87	40-140	0.4	30	
Diethylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Dimethylphthalate	3.00	0.333	mg/kg wet	3.333		90	40-140	1	30	
Di-n-butylphthalate	2.98	0.333	mg/kg wet	3.333		89	40-140	2	30	
Di-n-octylphthalate	3.26	0.333	mg/kg wet	3.333		98	40-140	6	30	
Fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140	2	30	
Fluorene	3.12	0.333	mg/kg wet	3.333		94	40-140	1	30	
Hexachlorobenzene	3.00	0.167	mg/kg wet	3.333		90	40-140	2	30	
Hexachlorobutadiene	2.58	0.333	mg/kg wet	3.333		78	40-140	4	30	
Hexachlorocyclopentadiene	2.18	1.67	mg/kg wet	3.333		65	40-140	4	30	
Hexachloroethane	2.27	0.333	mg/kg wet	3.333		68	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	3.30	0.333	mg/kg wet	3.333		99	40-140	3	30	
Isophorone	2.14	0.333	mg/kg wet	3.333		64	40-140	0.7	30	
Naphthalene	2.68	0.333	mg/kg wet	3.333		81	40-140	2	30	
Nitrobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	4	30	
N-Nitrosodimethylamine	2.30	0.333	mg/kg wet	3.333		69	40-140	9	30	
N-Nitroso-Di-n-Propylamine	2.56	0.333	mg/kg wet	3.333		77	40-140	4	30	
N-nitrosodiphenylamine	3.11	0.333	mg/kg wet	3.333		93	40-140	3	30	
Pentachlorophenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
Phenanthrene	3.05	0.333	mg/kg wet	3.333		92	40-140	1	30	
Phenol	2.13	0.333	mg/kg wet	3.333		64	30-130	7	30	
Pyrene	3.42	0.333	mg/kg wet	3.333		102	40-140	3	30	
Pyridine	2.13	1.67	mg/kg wet	3.333		64	40-140	4	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: 2,4,6-Tribromophenol	4.76		mg/kg wet	5.000		95	30-130			
Surrogate: 2-Chlorophenol-d4	3.86		mg/kg wet	5.000		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.81		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorophenol	3.66		mg/kg wet	5.000		73	30-130			
Surrogate: Nitrobenzene-d5	2.62		mg/kg wet	3.333		79	30-130			
Surrogate: Phenol-d6	3.98		mg/kg wet	5.000		80	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Batch CK02225 - 3546										

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.017	mg/kg wet							
2-Methylnaphthalene	ND	0.017	mg/kg wet							
Acenaphthene	ND	0.017	mg/kg wet							
Acenaphthylene	ND	0.017	mg/kg wet							
Anthracene	ND	0.017	mg/kg wet							
Benzo(a)anthracene	ND	0.017	mg/kg wet							
Benzo(a)pyrene	ND	0.017	mg/kg wet							
Benzo(b)fluoranthene	ND	0.017	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.017	mg/kg wet							
Benzo(k)fluoranthene	ND	0.017	mg/kg wet							
Chrysene	ND	0.017	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.017	mg/kg wet							
Fluoranthene	ND	0.017	mg/kg wet							
Fluorene	ND	0.017	mg/kg wet							
[illegible]2,3-cd)Pyrene	ND	0.017	mg/kg wet							
Naphthalene	ND	0.017	mg/kg wet							
Phenanthrene	ND	0.017	mg/kg wet							
Pyrene	ND	0.017	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.31		mg/kg wet	3.333		69	30-130			
Surrogate: 2-Fluorobiphenyl	2.03		mg/kg wet	3.333		61	30-130			
Surrogate: Nitrobenzene-d5	2.01		mg/kg wet	3.333		60	30-130			
Surrogate: p-Terphenyl-d14	2.53		mg/kg wet	3.333		76	30-130			
Classical Chemistry										
Batch CK02205 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.92	1.00	mg/kg wet	5.015		98	90-110			
LCS										
Total Cyanide	19.7	1.00	mg/kg wet	20.06		98	90-110			
LCS Dup										
Total Cyanide	19.9	1.00	mg/kg wet	20.06		99	90-110	1	20	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
D	Diluted.
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED above the detection limit (LOD for DoD Reports)
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
LOD	Limit of Detection
[CALC]	Calculated Analyte
LOQ	Limit of Quantitation
DL	Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

South Carolina Volatile Organic Compounds in Potable Water: 78003

New Jersey Potable (VOA) and Non Potable Water (RCRA), Solids and Hazardous Waste: RI002
http://www.nj.gov/dep/oqa/certlabs.htm

Pensylvania Potable and Non Potable Water, Solid and Hazardous Waste: 68-01752
http://files.dep.state.pa.us/RegionalResources/Labs/LabsPortalFiles/2009-0911_accredited_laboratories.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: AECOM - ESS
Client Project ID: _____
Shipped/Delivered Via: Client

ESS Project ID: 10110299
Date Project Due: 11/26/10
Days For Project: 5 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present? * No
   Air No.:
2. Were Custody Seals Present? No
3. Were Custody Seals Intact? N/A
4. Is Radiation count < 100 CPM? Yes
5. Is a cooler present? Yes
   Cooler Temp: **2.8**
   Iced With: **Ice**
6. Was COC included with samples? Yes
7. Was COC signed and dated by client? Yes
8. Does the COC match the sample Yes
9. Is COC complete and correct? Yes
10. Are the samples properly preserved? Yes
11. Proper sample containers used? Yes
12. Any air bubbles in the VOA vials? N/A
13. Holding times exceeded? No
14. Sufficient sample volumes? Yes
15. Any Subcontracting needed? No
16. Are ESS labels on correct containers? Yes No
17. Were samples received intact? Yes No
    ESS Sample IDs: _____
    Sub Lab: _____
    Analysis: _____
    TAT: _____
18. Was there need to call project manager to discuss status? If yes, please explain.

_____

_____

_____

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	8 oz Soil Jar	1	NP
2	Yes	8 oz Soil Jar	1	NP
3	Yes	8 oz Soil Jar	1	NP
4	Yes	8 oz Soil Jar	1	NP
5	Yes	8 oz Soil Jar	1	NP
6	Yes	8 oz Soil Jar	1	NP
7	Yes	8 oz Soil Jar	1	NP
8	Yes	8 oz Soil Jar	1	NP
9	Yes	8 oz Soil Jar	1	NP
10	Yes	8 oz Soil Jar	1	NP
11	Yes	8 oz Soil Jar	1	NP
12	Yes	8 oz Soil Jar	1	NP
13	Yes	40 ml - VOA	1	MeOH
13	Yes	40 ml - VOA	2	other
13	Yes	8 oz Soil Jar	1	NP

Completed By: MK Date/Time: 11/19/10
Reviewed By: _____ Date/Time: ~~11/19/10~~ 11/19/10

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time X Standard Other ___
If faster than 5 days, prior approval by laboratory is required # ___

State where samples were collected from:
MA (RI) CT NH NJ NY ME Other ___

Is this project for any of the following:
MA-MCP Navy USACE Other ___

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable X Yes ___ No
Format: Excel X Access X PDF ___ Other ___

Co. Name	Project #	Project Name (20 Char. or less)
AECOM	60163799.1	BASF - CRANSTON, RI

Contact Person	Address
SCOTT WOZNIAKOWSKI	2 TECHNOLOGY PARK DR.

City	State	Zip	PO#
WESTFORD	MA	01886	

Telephone #	Fax #	Email Address
978-589-3000		SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: RI - 8082 (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	RI - 8082
1	11/19/2010	0950		X		SD-2R-A-2		1	G	X
2	11/19/2010	0950		X		SD-2R-B-2		1	G	X
3	11/19/2010	0944		X		SD-2R-A-1		1	G	X
4	11/19/2010	0944		X		SD-2R-B-1		1	G	X
5	11/19/2010	0944		X		SD-2R-C-1		1	G	X

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA: X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians ___

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- ___

Sampled by: K. HARTMAN, K. VAN NAERSSEN

Comments: SEE ATTACHED ANALYSIS SHEET

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/10 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 (Yellow) Client Receipt

ESS Laboratory

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Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time ___ Standard Other _____
If faster than 5 days, prior approval by laboratory is required # _____
State where samples were collected from: MA RI CT NH NJ NY ME Other _____
Is this project for any of the following: MA-MCP Navy USACE Other _____

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable ___ Yes ___ No
Format: Excel__ Access__ PDF__ Other_____

Co. Name	Project #	Project Name (20 Char. or less)
AECOM	60163799.1	BASF - CRANSTON, RI

Contact Person	Address
SCOTT WOZNIAKOWSKI	2 TECHNOLOGY PARK DR.

City	State	Zip	PO#
WOBURN	MA	01886	

Telephone #	Fax #	Email Address
978-589-3000		SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: PCB-8082 (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	PCB-8082
6	11/19/2010	10:06		X		SD-1-A-1		1	G	X
7		10:06				SD-1-B-1				
8		10:40				SD-3-A-1				
9		10:40				SD-3-B-1				
10		10:54				SD-4-A-1				
11		10:54				SD-4-B-1				
12		10:54				SD-4-C-1				

ARCHIVE

Container Type: P-Poly, G-Glass S-Sterile V-VOA | Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians ____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- _____

Sampled by: K. HARTMAN, K. VAN NAMESSON

Comments: PLEASE ARCHIVE. ANALYSIS PENDING SD-2R RESULTS. SEE ATTACHED FOR FULL ANALYTICAL REQUIREMENTS

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/2010 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By [illegible] MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 ([illegible]) Client Receipt

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Page 3 of 3

Turn Time: X Standard Other ____
If faster than 5 days, prior approval by laboratory is required # ____
State where samples were collected from: MA (RI) CT NH NJ NY ME Other ____
Is this project for any of the following: MA-MCP Navy USACE Other ____

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable: X Yes ___ No
Format: Excel X Access X PDF ___ Other ____

Co. Name: AECOM
Project #: 6013799.1
Project Name (20 Char. or less): BASF-Cranston, RI
Contact Person: Scott Wozniakowski
Address: 2 Technology Park Drive
City: Westford State: MA Zip: 01886 PO#:
Telephone #: 978-589-3000 Fax #: Email Address: Scott.Wozniakowski@aecom

Write Required Analysis: (See attached sheet for full analysis)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	PCBs 8082	PP metals/TAL Metals (6010) 7471	VOCs 8260	SVOCs 8270	CN (9014)
13	11/19/2010	0835		X	SD	SD-11-A-1		1	8 oz G	X	X			X
13	↓	0835		X	SP	SD-11-A-1		3				X	X	
—		1310		X	SW	EB-01-A		1	G	X				
—		~~1320~~ 1310		X	SW	EB-01-B		1	G	X				
—		1320		X	SW	EB-02-A		1	P		X			
—		1320		X	SW	EB-03-A		1	P					X
—		1325		X	SW	EB-04-A/B/C		3	V			X		
—	↓	1330		X	SW	EB-05-A/B		2	G				X	

Container Type: P-Poly G-Glass S-Sterile V-VOA
Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present: X Yes ___ No
Seals Intact: ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only: [ ] Pickup [ ] Technicians ____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- ____
Sampled by: K. Hartman K. Van Narseen
Comments: See attached list for full analysis requirements.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/10 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 (Yellow) Client Receipt

Attachment 2
Proposed Method Detection and Reporting Limits for Sediment Samples

VOC: 5035/8260 ppm CC List - Low in Solid (8260B)

Analyte	MDL mg/Kg	MRL mg/Kg	MS/MSD %REC	MS RPD	BS/BSD %REC	BS RPD
Chlorobenzene	0.0016	0.0050	70 - 130	20	70 - 130	20
Toluene	0.0016	0.0050	70 - 130	20	70 - 130	20
Xylene O	0.0016	0.0050	70 - 130	20	70 - 130	20
Xylene P,M	0.0032	0.0100	70 - 130	20	70 - 130	20

SVOC: 8270 ppm CC List in Solid (8270C)

Analyte	MDL mg/kg	MRL mg/kg	MS/MSD %REC	MS RPD	BS/BSD %REC	RPD
1,2-Dichlorobenzene	0.086	0.333	40 - 140	30	40 - 140	30
2-Methylnaphthalene	0.072	0.333	40 - 140	30	40 - 140	30
4-Chloroaniline	0.075	0.667	40 - 140	30	40 - 140	30

MET: ICP ppm CC List in Solid (6010B)

Analyte	MDL mg/Kg	MRL mg/Kg	DUP RPD	MS %REC	MS RPD	BS %REC	BS RPD
Cadmium	0.09	0.67	35	75 - 125	35	80 - 120	20
Copper	0.5	1.3	35	75 - 125	35	80 - 120	20
Lead	0.3	6.7	35	75 - 125	35	80 - 120	20
Zinc	0.7	3.3	35	75 - 125	35	80 - 120	20

MET: GFAA ppm CC List in Solid (7000)

Analyte	MDL mg/Kg	MRL mg/Kg	DUP RPD	MS %REC	RPD	BS %REC	RPD
Thallium	0.11	0.33	35	75 - 125	35	80 - 120	20

CN: Total Cyanide 9014 in Solid (9014)

	MDL mg/kg	MRL mg/kg	DUP	MS %REC		BS/BSD %REC	RPD
Total Cyanide	0.2	1.0	20	75 - 125		90 - 110	20

SVOC: 8270/3541 ppm PAH SIM in Solid (8270C)

Analyte	MDL mg/kg	MRL mg/kg	MS/MSD %REC	MS RPD	BS/BSD %REC	RPD
Anthracene	0.0014	0.0170	40 - 140	30	40 - 140	30
Benzo(a)anthracene	0.0012	0.0170	40 - 140	30	40 - 140	30
Benzo(a)pyrene	0.0014	0.0170	40 - 140	30	40 - 140	30
Benzo(b)fluoranthene	0.0017	0.0170	40 - 140	30	40 - 140	30
Benzo(g,h,I)perylene	0.0019	0.0170	40 - 140	30	40 - 140	30
Benzo(k)fluoranthene	0.0014	0.0170	40 - 140	30	40 - 140	30
Chrysene	0.0013	0.0170	40 - 140	30	40 - 140	30
Dibenzo(a,h)Anthracene	0.0020	0.0170	40 - 140	30	40 - 140	30
Fluoranthene	0.0011	0.0170	40 - 140	30	40 - 140	30
Indeno(1,2,3-cd)Pyrene	0.0020	0.0170	40 - 140	30	40 - 140	30
Pyrene	0.0028	0.0170	40 - 140	30	40 - 140	30

SVOC: 8082 PCB-Low Level in Solid (8082)

Analyte	MDL mg/kg	MRL mg/kg	BS/BSD %REC	BS RPD %REC	MS/MSD %REC	MS RPD %REC
Aroclor 1221	0.0150	0.0500				
Aroclor 1232	0.0150	0.0500				
Aroclor 1242	0.0150	0.0500				
Aroclor 1248	0.0150	0.0500				
Aroclor 1254	0.0150	0.0500				
Aroclor 1260	0.0150	0.0500	40 - 140	50	40 - 140	50

Information provided by ESS Labs, Cranston, RI.

Attachment D

Laboratory Reports, SD-2R Area, Locations 1-4

DRAFT

CERTIFICATE OF ANALYSIS

Scott Wozniakowski
AECOM Environment - ENSR
2 Technology Park Drive
Westford, MA 01886

RE: BASF - Cranston RI (60163799.1)
ESS Laboratory Work Order Number: 1011299

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

SAMPLE RECEIPT

The following samples were received on November 19, 2010 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	SampleName	Matrix	Analysis
1011299-01	SD-2R-A-2	Soil	8082
1011299-02	SD-2R-B-2	Soil	8082
1011299-03	SD-2R-A-1	Soil	8082
1011299-04	SD-2R-B-1	Soil	8082
1011299-05	SD-2R-C-1	Soil	8082
1011299-13	SD-11-A-1	Soil	6010B, 7841, 8082, 8260B Low, 8270C, 8270C SIM, 9014

This data package duplicated in Attachment C to present SD-11 sample under Sediment Cap.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB)

1011299-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-02 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-03 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

1011299-04 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

8270C(SIM) Polynuclear Aromatic Hydrocarbons

CTK0209-CCV1 **Benzidine tailing factor >2.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-A-2
Date Sampled: 11/19/10 09:50
Percent Solids: 45
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1232	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1242	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1248	**187** (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1254	ND (11.1)		100	11/24/10 12:46		CK02334
Aroclor 1260	ND (11.1)		100	11/24/10 12:46		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-B-2
Date Sampled: 11/19/10 09:50
Percent Solids: 65
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1232	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1242	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1248	**16.5** (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1254	ND (1.53)		20	11/24/10 17:20		CK02334
Aroclor 1260	ND (1.53)		20	11/24/10 17:20		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-A-1
Date Sampled: 11/19/10 09:44
Percent Solids: 51
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1232	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1242	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1248	**95.0** (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1254	ND (4.90)		50	11/24/10 17:02		CK02334
Aroclor 1260	ND (4.90)		50	11/24/10 17:02		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-B-1
Date Sampled: 11/19/10 09:44
Percent Solids: 70
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1232	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1242	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1248	**17.1** (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1254	ND (1.43)		20	11/24/10 14:04		CK02334
Aroclor 1260	ND (1.43)		20	11/24/10 14:04		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-2R-C-1
Date Sampled: 11/19/10 09:44
Percent Solids: 91
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1232	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1242	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1248	**0.578** (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1254	ND (0.0549)		1	11/24/10 13:07		CK02334
Aroclor 1260	ND (0.0549)		1	11/24/10 13:07		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	74 %		30-150
Surrogate: Decachlorobiphenyl [2C]	68 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	79 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry

3050B/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Cadmium	ND (0.40)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Copper	**3.0** (2.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Lead	ND (4.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217
Thallium	ND (0.99)	7841		5	SVD	11/23/10 18:43	2.97	100	CK02217
Zinc	**21.1** (2.0)	6010B		1	SVD	11/22/10 23:15	2.97	100	CK02217

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 6.6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Chlorobenzene	**0.0338** (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Toluene	ND (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Xylene O	ND (0.0045)		1	11/23/10 0:18	CTK0179	CK02222
Xylene P,M	ND (0.0090)		1	11/23/10 0:18	CTK0179	CK02222

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	114 %		70-130
Surrogate: 4-Bromofluorobenzene	92 %		70-130
Surrogate: Dibromofluoromethane	112 %		70-130
Surrogate: Toluene-d8	97 %		70-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/23/10 17:00

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1232	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1242	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1248	**0.158** (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1254	ND (0.0595)		1	11/24/10 13:26		CK02334
Aroclor 1260	ND (0.0595)		1	11/24/10 13:26		CK02334

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	81 %		30-150
Surrogate: Decachlorobiphenyl [2C]	96 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	83 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ML
Prepared: 11/22/10 16:00

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,2-Dichlorobenzene	ND (0.391)		1	11/22/10 22:11	CTK0182	CK02225
2-Methylnaphthalene	ND (0.391)		1	11/22/10 22:11	CTK0182	CK02225
4-Chloroaniline	ND (0.784)		1	11/22/10 22:11	CTK0182	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	73 %		30-130
Surrogate: 2,4,6-Tribromophenol	87 %		30-130
Surrogate: 2-Chlorophenol-d4	78 %		30-130
Surrogate: 2-Fluorobiphenyl	77 %		30-130
Surrogate: 2-Fluorophenol	78 %		30-130
Surrogate: Nitrobenzene-d5	75 %		30-130
Surrogate: Phenol-d6	79 %		30-130
Surrogate: p-Terphenyl-d14	88 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/22/10 16:00

8270C(SIM) Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(a)anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(a)pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(b)fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(g,h,i)perylene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Benzo(k)fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Chrysene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Dibenzo(a,h)Anthracene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Fluoranthene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Indeno(1,2,3-cd)Pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225
Pyrene	ND (0.020)		1	11/25/10 6:56	CTK0209	CK02225

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	80 %		30-130
Surrogate: 2-Fluorobiphenyl	69 %		30-130
Surrogate: Nitrobenzene-d5	71 %		30-130
Surrogate: p-Terphenyl-d14	84 %		30-130

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-11-A-1
Date Sampled: 11/19/10 08:35
Percent Solids: 84

ESS Laboratory Work Order: 1011299
ESS Laboratory Sample ID: 1011299-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Cyanide	ND (1.15)	9014		1	EEM	11/22/10 11:50	mg/kg dry	CK02205

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
3050B/6000/7000 Total Metals										
Batch CK02217 - 3050B										
Blank										
Cadmium	ND	0.50	mg/kg wet							
Copper	ND	2.5	mg/kg wet							
Lead	ND	5.0	mg/kg wet							
Thallium	ND	0.25	mg/kg wet							
Zinc	ND	2.5	mg/kg wet							
LCS										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120			
Copper	69.2	8.5	mg/kg wet	74.70		93	80-120			
Lead	153	17.0	mg/kg wet	152.0		101	80-120			
Thallium	170	41.9	mg/kg wet	171.0		99	80-120			
Zinc	265	8.5	mg/kg wet	299.0		89	80-120			
LCS Dup										
Cadmium	106	1.70	mg/kg wet	110.0		96	80-120	0.008	20	
Copper	68.8	8.5	mg/kg wet	74.70		92	80-120	0.7	20	
Lead	154	17.0	mg/kg wet	152.0		102	80-120	0.9	20	
Thallium	172	41.9	mg/kg wet	171.0		101	80-120	1	20	
Zinc	264	8.5	mg/kg wet	299.0		88	80-120	0.7	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
C[illegible]trachloride	ND	0.0050	mg/kg wet							
C[illegible]nzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
t[illegible]Dichloroethene	ND	0.0050	mg/kg wet							
t[illegible]Dichloropropene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Trichloroethene	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0524		mg/kg wet	0.05000		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0516		mg/kg wet	0.05000		103	70-130			
Surrogate: Toluene-d8	0.0481		mg/kg wet	0.05000		96	70-130			
LCS										
1,1,1,2-Tetrachloroethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,1-Trichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2,2-Tetrachloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloropropene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,4-Trimethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dibromoethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloropropane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,3,5-Trimethylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,3-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130			
1-Chlorohexane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
2,2-Dichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
2-Butanone	0.244	0.0500	mg/kg wet	0.2500		98	70-130			
2-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130			
4-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
4-Isopropyltoluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.246	0.0500	mg/kg wet	0.2500		99	70-130			
Acetone	0.226	0.0500	mg/kg wet	0.2500		91	70-130			
Benzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Bromochloromethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Bromodichloromethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Bromoform	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Bromomethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130			
Carbon Disulfide	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Carbon Tetrachloride	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Chlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Chloroethane	0.0511	0.0100	mg/kg wet	0.05000		102	70-130			
Chloroform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130			
cis-1,2-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
cis-1,3-Dichloropropene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Dibromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromomethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dichlorodifluoromethane	0.0515	0.0100	mg/kg wet	0.05000		103	70-130			
Diethyl Ether	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Ethyl tertiary-butyl ether	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
[illegible]ene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
H[illegible]robutadiene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Isopropylbenzene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Methyl tert-Butyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Methylene Chloride	0.0502	0.0250	mg/kg wet	0.05000		100	70-130			
Naphthalene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
n-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
n-Propylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Tetrachloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrahydrofuran	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,2-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
trans-1,3-Dichloropropene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Trichloroethene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Vinyl Acetate	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Vinyl Chloride	0.0550	0.0100	mg/kg wet	0.05000		110	70-130			
Xylene O	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Xylene P,M	0.0993	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0499		mg/kg wet	0.05000		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0489		mg/kg wet	0.05000		98	70-130			
Surrogate: Dibromofluoromethane	0.0498		mg/kg wet	0.05000		100	70-130			
Surrogate: Toluene-d8	0.0483		mg/kg wet	0.05000		97	70-130			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	0.3	25	
1[illegible]hloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
1,[illegible]etrachloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	7	25	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
1,1,2-Trichloroethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
1,1-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,1-Dichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,1-Dichloropropene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
1,2,3-Trichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,3-Trichloropropane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,2,4-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,2,4-Trimethylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
1,2-Dibromoethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	0.4	25	
1,2-Dichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,2-Dichloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,2-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
1,3,5-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
1,4-Dichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130	0.2	20	
1-Chlorohexane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	1	25	
2,2-Dichloropropane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	1	25	
2-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
2-Hexanone	0.246	0.0500	mg/kg wet	0.2500		98	70-130	2	25	
4-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
4-Isopropyltoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
4-Methyl-2-Pentanone	0.249	0.0500	mg/kg wet	0.2500		99	70-130	0.9	25	
Acetone	0.210	0.0500	mg/kg wet	0.2500		84	70-130	8	25	
Benzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Bromobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
Bromochloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
Bromodichloromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
Bromoform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
Bromomethane	0.0485	0.0100	mg/kg wet	0.05000		97	70-130	0.8	25	
Carbon Disulfide	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.6	25	
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	0.4	25	
Chloroethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	2	25	
Chloroform	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.3	25	
Chloromethane	0.0464	0.0100	mg/kg wet	0.05000		93	70-130	3	25	
cis-1,2-Dichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
cis-1,3-Dichloropropene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.8	25	
Dibromochloromethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Dibromomethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
Dichlorodifluoromethane	0.0501	0.0100	mg/kg wet	0.05000		100	70-130	3	25	
Diethyl Ether	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	0.3	25	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
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ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CK02222 - 5035										
Di-isopropyl ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Ethyl tertiary-butyl ether	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Ethylbenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	0.8	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Isopropylbenzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Methyl tert-Butyl Ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0.9	25	
Methylene Chloride	0.0494	0.0250	mg/kg wet	0.05000		99	70-130	2	25	
Naphthalene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.2	25	
n-Propylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
sec-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Styrene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
tert-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tertiary-amyl methyl ether	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Tetrachloroethene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
T[illegible]ofuran	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
To[illegible]	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
trans-1,2-Dichloroethene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
trans-1,3-Dichloropropene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Trichloroethene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
Vinyl Acetate	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
Vinyl Chloride	0.0548	0.0100	mg/kg wet	0.05000		110	70-130	0.5	25	
Xylene O	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
Xylene P,M	0.0987	0.0100	mg/kg wet	0.1000		99	70-130	0.6	25	
Surrogate: 1,2-Dichloroethane-d4	0.0509		mg/kg wet	0.05000		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0485		mg/kg wet	0.05000		97	70-130			
Surrogate: Dibromofluoromethane	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Toluene-d8	0.0482		mg/kg wet	0.05000		96	70-130			
8082 Polychlorinated Biphenyls (PCB)										
Batch CK02334 - 3540										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Su[illegible]te: Decachlorobiphenyl	0.0195		mg/kg wet	0.02500		78	30-150			
S[illegible] Decachlorobiphenyl [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB)										
Batch CK02334 - 3540										
Surrogate: Tetrachloro-m-xylene [2C]	0.0212		mg/kg wet	0.02500		85	30-150			
LCS										
Aroclor 1016	0.433	0.0500	mg/kg wet	0.5000		87	40-140			
Aroclor 1260	0.365	0.0500	mg/kg wet	0.5000		73	40-140			
Surrogate: Decachlorobiphenyl	0.0188		mg/kg wet	0.02500		75	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0195		mg/kg wet	0.02500		78	30-150			
Surrogate: Tetrachloro-m-xylene	0.0197		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
LCS Dup										
Aroclor 1016	0.460	0.0500	mg/kg wet	0.5000		92	40-140	6	50	
Aroclor 1260	0.400	0.0500	mg/kg wet	0.5000		80	40-140	9	50	
Surrogate: Decachlorobiphenyl	0.0207		mg/kg wet	0.02500		83	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0214		mg/kg wet	0.02500		86	30-150			
Surrogate: Tetrachloro-m-xylene	0.0208		mg/kg wet	0.02500		83	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0216		mg/kg wet	0.02500		86	30-150			
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
[illegible],i)perylene	ND	0.333	mg/kg wet							
B[illegible]fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N[illegible]Di-n-Propylamine	ND	0.333	mg/kg wet							
N[illegible]diphenylamine	ND	0.333	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.07		mg/kg wet	3.333		62	30-130			
Surrogate: 2,4,6-Tribromophenol	3.79		mg/kg wet	5.000		76	30-130			
Surrogate: 2-Chlorophenol-d4	3.37		mg/kg wet	5.000		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.22		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorophenol	3.51		mg/kg wet	5.000		70	30-130			
Surrogate: Nitrobenzene-d5	2.25		mg/kg wet	3.333		67	30-130			
Surrogate: Phenol-d6	3.39		mg/kg wet	5.000		68	30-130			
Surrogate: p-Terphenyl-d14	2.59		mg/kg wet	3.333		78	30-130			
LCS										
1,1-Biphenyl	2.82	0.333	mg/kg wet	3.333		85	40-140			
1,2,4-Trichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,2-Dichlorobenzene	2.75	0.333	mg/kg wet	3.333		83	40-140			
1,3-Dichlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
1,4-Dichlorobenzene	2.66	0.333	mg/kg wet	3.333		80	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	2.94	0.333	mg/kg wet	3.333		88	30-130			
2,4,6-Trichlorophenol	3.07	0.333	mg/kg wet	3.333		92	30-130			
2,4-Dichlorophenol	2.86	0.333	mg/kg wet	3.333		86	30-130			
2,4-Dimethylphenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2,4-Dinitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
2,4-Dinitrotoluene	3.13	0.333	mg/kg wet	3.333		94	40-140			
2,6-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140			
2-Chloronaphthalene	2.52	0.333	mg/kg wet	3.333		76	40-140			
2-Chlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2-Methylnaphthalene	2.86	0.333	mg/kg wet	3.333		86	40-140			
2-Methylphenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
2-Nitroaniline	2.82	0.333	mg/kg wet	3.333		85	40-140			
2-Nitrophenol	2.89	0.333	mg/kg wet	3.333		87	30-130			
3,3'-Dichlorobenzidine	2.49	0.667	mg/kg wet	3.333		75	40-140			
3+4-Methylphenol	5.97	0.667	mg/kg wet	6.667		90	30-130			
3-Nitroaniline	2.76	0.333	mg/kg wet	3.333		83	40-140			
4,6-Dinitro-2-Methylphenol	3.05	1.67	mg/kg wet	3.333		92	30-130			
4-Bromophenyl-phenylether	2.97	0.333	mg/kg wet	3.333		89	40-140			
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130			
4-Chloroaniline	2.09	0.667	mg/kg wet	3.333		63	40-140			
4-Chloro-phenyl-phenyl ether	3.03	0.333	mg/kg wet	3.333		91	40-140			
4-Nitroaniline	3.02	0.333	mg/kg wet	3.333		91	40-140			
4-Nitrophenol	2.88	1.67	mg/kg wet	3.333		86	30-130			
Acenaphthene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Acenaphthylene	2.74	0.333	mg/kg wet	3.333		82	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Acetophenone	2.85	0.667	mg/kg wet	3.333		85	40-140			
Aniline	2.30	0.667	mg/kg wet	3.333		69	40-140			
Anthracene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Azobenzene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Benzo(a)anthracene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Benzo(a)pyrene	3.17	0.167	mg/kg wet	3.333		95	40-140			
Benzo(b)fluoranthene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Benzo(g,h,i)perylene	3.09	0.333	mg/kg wet	3.333		93	40-140			
Benzo(k)fluoranthene	3.23	0.333	mg/kg wet	3.333		97	40-140			
Benzoic Acid	1.91	1.67	mg/kg wet	3.333		57	40-140			
Benzyl Alcohol	2.79	0.333	mg/kg wet	3.333		84	40-140			
bis(2-Chloroethoxy)methane	2.59	0.333	mg/kg wet	3.333		78	40-140			
bis(2-Chloroethyl)ether	2.97	0.333	mg/kg wet	3.333		89	40-140			
bis(2-chloroisopropyl)Ether	2.76	0.333	mg/kg wet	3.333		83	40-140			
bis(2-Ethylhexyl)phthalate	3.01	0.333	mg/kg wet	3.333		90	40-140			
B[illegible]ylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
C[illegible]e	2.96	0.333	mg/kg wet	3.333		89	40-140			
Chrysene	3.13	0.167	mg/kg wet	3.333		94	40-140			
Dibenzo(a,h)Anthracene	3.27	0.167	mg/kg wet	3.333		98	40-140			
Dibenzofuran	2.88	0.333	mg/kg wet	3.333		86	40-140			
Diethylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Dimethylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140			
Di-n-butylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Di-n-octylphthalate	3.07	0.333	mg/kg wet	3.333		92	40-140			
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140			
Fluorene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Hexachlorobenzene	3.06	0.167	mg/kg wet	3.333		92	40-140			
Hexachlorobutadiene	2.68	0.333	mg/kg wet	3.333		80	40-140			
Hexachlorocyclopentadiene	2.27	1.67	mg/kg wet	3.333		68	40-140			
Hexachloroethane	2.46	0.333	mg/kg wet	3.333		74	40-140			
Indeno(1,2,3-cd)Pyrene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Isophorone	2.13	0.333	mg/kg wet	3.333		64	40-140			
Naphthalene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Nitrobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140			
N-Nitrosodimethylamine	2.51	0.333	mg/kg wet	3.333		75	40-140			
N-Nitroso-Di-n-Propylamine	2.67	0.333	mg/kg wet	3.333		80	40-140			
N-nitrosodiphenylamine	3.03	0.333	mg/kg wet	3.333		91	40-140			
Pentachlorophenol	3.08	1.67	mg/kg wet	3.333		92	30-130			
Phenanthrene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Phenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
Pyrene	3.33	0.333	mg/kg wet	3.333		100	40-140			
Pyridine	2.22	1.67	mg/kg wet	3.333		67	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			
S[illegible] 2,4,6-Tribromophenol	4.78		mg/kg wet	5.000		96	30-130			
S[illegible]: 2-Chlorophenol-d4	4.34		mg/kg wet	5.000		87	30-130			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: 2-Fluorophenol	3.98		mg/kg wet	5.000		80	30-130			
Surrogate: Nitrobenzene-d5	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: Phenol-d6	4.22		mg/kg wet	5.000		84	30-130			
Surrogate: p-Terphenyl-d14	3.19		mg/kg wet	3.333		96	30-130			
LCS Dup										
1,1-Biphenyl	2.85	0.333	mg/kg wet	3.333		85	40-140	1	30	
1,2,4-Trichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	7	30	
1,2-Dichlorobenzene	2.52	0.333	mg/kg wet	3.333		76	40-140	9	30	
1,3-Dichlorobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	10	30	
1,4-Dichlorobenzene	2.42	0.333	mg/kg wet	3.333		73	40-140	9	30	
2,3,4,6-Tetrachlorophenol	2.87	1.67	mg/kg wet	3.333		86	30-130	3	30	
2,4,5-Trichlorophenol	2.84	0.333	mg/kg wet	3.333		85	30-130	3	30	
2,4,6-Trichlorophenol	3.20	0.333	mg/kg wet	3.333		96	30-130	4	30	
2,4-Dichlorophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	2	30	
2,4-Dimethylphenol	2.66	0.333	mg/kg wet	3.333		80	30-130	2	30	
2,4-Dinitrophenol	2.53	1.67	mg/kg wet	3.333		76	30-130	8	30	
2,4-Dinitrotoluene	2.98	0.333	mg/kg wet	3.333		89	40-140	5	30	
2,6-Dinitrotoluene	3.00	0.333	mg/kg wet	3.333		90	40-140	0.6	30	
2-Chloronaphthalene	2.56	0.333	mg/kg wet	3.333		77	40-140	2	30	
2-Chlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130	9	30	
2-Methylnaphthalene	2.77	0.333	mg/kg wet	3.333		83	40-140	3	30	
2-Methylphenol	2.52	0.333	mg/kg wet	3.333		76	30-130	6	30	
2-Nitroaniline	2.80	0.333	mg/kg wet	3.333		84	40-140	1	30	
2-Nitrophenol	2.79	0.333	mg/kg wet	3.333		84	30-130	4	30	
3,3'-Dichlorobenzidine	2.59	0.667	mg/kg wet	3.333		78	40-140	4	30	
3+4-Methylphenol	5.59	0.667	mg/kg wet	6.667		84	30-130	7	30	
3-Nitroaniline	2.77	0.333	mg/kg wet	3.333		83	40-140	0.5	30	
4,6-Dinitro-2-Methylphenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
4-Bromophenyl-phenylether	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
4-Chloro-3-Methylphenol	2.90	0.333	mg/kg wet	3.333		87	30-130	0.2	30	
4-Chloroaniline	2.39	0.667	mg/kg wet	3.333		72	40-140	13	30	
4-Chloro-phenyl-phenyl ether	3.27	0.333	mg/kg wet	3.333		98	40-140	8	30	
4-Nitroaniline	3.07	0.333	mg/kg wet	3.333		92	40-140	2	30	
4-Nitrophenol	2.77	1.67	mg/kg wet	3.333		83	30-130	4	30	
Acenaphthene	3.05	0.333	mg/kg wet	3.333		91	40-140	0.8	30	
Acenaphthylene	2.80	0.333	mg/kg wet	3.333		84	40-140	2	30	
Acetophenone	2.71	0.667	mg/kg wet	3.333		81	40-140	5	30	
Aniline	2.15	0.667	mg/kg wet	3.333		65	40-140	7	30	
Anthracene	3.22	0.333	mg/kg wet	3.333		97	40-140	3	30	
Azobenzene	2.80	0.333	mg/kg wet	3.333		84	40-140	4	30	
Benzo(a)anthracene	3.32	0.333	mg/kg wet	3.333		100	40-140	5	30	
Benzo(a)pyrene	3.44	0.167	mg/kg wet	3.333		103	40-140	8	30	
Benzo(b)fluoranthene	3.47	0.333	mg/kg wet	3.333		104	40-140	12	30	
Benzo(g,h,i)perylene	3.24	0.333	mg/kg wet	3.333		97	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CK02225 - 3546										
Benzo(k)fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Benzoic Acid	1.72	1.67	mg/kg wet	3.333		52	40-140	11	30	
Benzyl Alcohol	2.52	0.333	mg/kg wet	3.333		76	40-140	10	30	
bis(2-Chloroethoxy)methane	2.65	0.333	mg/kg wet	3.333		80	40-140	2	30	
bis(2-Chloroethyl)ether	2.66	0.333	mg/kg wet	3.333		80	40-140	11	30	
bis(2-chloroisopropyl)Ether	2.46	0.333	mg/kg wet	3.333		74	40-140	12	30	
bis(2-Ethylhexyl)phthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	2	30	
Butylbenzylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	0.3	30	
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140	0.2	30	
Chrysene	3.22	0.167	mg/kg wet	3.333		97	40-140	3	30	
Dibenzo(a,h)Anthracene	3.35	0.167	mg/kg wet	3.333		101	40-140	3	30	
Dibenzofuran	2.89	0.333	mg/kg wet	3.333		87	40-140	0.4	30	
Diethylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Dimethylphthalate	3.00	0.333	mg/kg wet	3.333		90	40-140	1	30	
Di-n-butylphthalate	2.98	0.333	mg/kg wet	3.333		89	40-140	2	30	
D[illegible]phthalate	3.26	0.333	mg/kg wet	3.333		98	40-140	6	30	
F[illegible]ene	2.99	0.333	mg/kg wet	3.333		90	40-140	2	30	
Fluorene	3.12	0.333	mg/kg wet	3.333		94	40-140	1	30	
Hexachlorobenzene	3.00	0.167	mg/kg wet	3.333		90	40-140	2	30	
Hexachlorobutadiene	2.58	0.333	mg/kg wet	3.333		78	40-140	4	30	
Hexachlorocyclopentadiene	2.18	1.67	mg/kg wet	3.333		65	40-140	4	30	
Hexachloroethane	2.27	0.333	mg/kg wet	3.333		68	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	3.30	0.333	mg/kg wet	3.333		99	40-140	3	30	
Isophorone	2.14	0.333	mg/kg wet	3.333		64	40-140	0.7	30	
Naphthalene	2.68	0.333	mg/kg wet	3.333		81	40-140	2	30	
Nitrobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140	4	30	
N-Nitrosodimethylamine	2.30	0.333	mg/kg wet	3.333		69	40-140	9	30	
N-Nitroso-Di-n-Propylamine	2.56	0.333	mg/kg wet	3.333		77	40-140	4	30	
N-nitrosodiphenylamine	3.11	0.333	mg/kg wet	3.333		93	40-140	3	30	
Pentachlorophenol	2.97	1.67	mg/kg wet	3.333		89	30-130	3	30	
Phenanthrene	3.05	0.333	mg/kg wet	3.333		92	40-140	1	30	
Phenol	2.13	0.333	mg/kg wet	3.333		64	30-130	7	30	
Pyrene	3.42	0.333	mg/kg wet	3.333		102	40-140	3	30	
Pyridine	2.13	1.67	mg/kg wet	3.333		64	40-140	4	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: 2,4,6-Tribromophenol	4.76		mg/kg wet	5.000		95	30-130			
Surrogate: 2-Chlorophenol-d4	3.86		mg/kg wet	5.000		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.81		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorophenol	3.66		mg/kg wet	5.000		73	30-130			
Surrogate: Nitrobenzene-d5	2.62		mg/kg wet	3.333		79	30-130			
Surrogate: Phenol-d6	3.98		mg/kg wet	5.000		80	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Ba[illegible]K02225 - 3546										

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C(SIM) Polynuclear Aromatic Hydrocarbons										
Batch CK02225 - 3546										
Blank										
1,1-Biphenyl	ND	0.017	mg/kg wet							
2-Methylnaphthalene	ND	0.017	mg/kg wet							
Acenaphthene	ND	0.017	mg/kg wet							
Acenaphthylene	ND	0.017	mg/kg wet							
Anthracene	ND	0.017	mg/kg wet							
Benzo(a)anthracene	ND	0.017	mg/kg wet							
Benzo(a)pyrene	ND	0.017	mg/kg wet							
Benzo(b)fluoranthene	ND	0.017	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.017	mg/kg wet							
Benzo(k)fluoranthene	ND	0.017	mg/kg wet							
Chrysene	ND	0.017	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.017	mg/kg wet							
Fluoranthene	ND	0.017	mg/kg wet							
Fluorene	ND	0.017	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.017	mg/kg wet							
Naphthalene	ND	0.017	mg/kg wet							
Phenanthrene	ND	0.017	mg/kg wet							
Pyrene	ND	0.017	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.31		mg/kg wet	3.333		69	30-130			
Surrogate: 2-Fluorobiphenyl	2.03		mg/kg wet	3.333		61	30-130			
Surrogate: Nitrobenzene-d5	2.01		mg/kg wet	3.333		60	30-130			
Surrogate: p-Terphenyl-d14	2.53		mg/kg wet	3.333		76	30-130			
Classical Chemistry										
Batch CK02205 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.92	1.00	mg/kg wet	5.015		98	90-110			
LCS										
Total Cyanide	19.7	1.00	mg/kg wet	20.06		98	90-110			
LCS Dup										
Total Cyanide	19.9	1.00	mg/kg wet	20.06		99	90-110	1	20	

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1011299

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
D	Diluted.
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED above the detection limit (LOD for DoD Reports)
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
LOD	Limit of Detection
[CALC]	Calculated Analyte
LOQ	Limit of Quantitation
	Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
ESS Laboratory Work Order: 1011299

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

South Carolina Volatile Organic Compounds in Potable Water: 78003

New Jersey Potable (VOA) and Non Potable Water (RCRA), Solids and Hazardous Waste: RI002
http://www.nj.gov/dep/oqa/certlabs.htm

Pensylvania Potable and Non Potable Water, Solid and Hazardous Waste: 68-01752
http://files.dep.state.pa.us/RegionalResources/Labs/LabsPortalFiles/2009-0911_accredited_laboratories.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: AECOM - ESS
Client Project ID: _____
Shipped/Delivered Via: Client

ESS Project ID: 10110299
Date Project Due: 11/26/10
Days For Project: 5 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present? * No
   Air No.:
2. Were Custody Seals Present? No
3. Were Custody Seals Intact? N/A
4. Is Radiation count < 100 CPM? Yes
5. Is a cooler present? Yes
   Cooler Temp: **2.8**
   Iced With: **Ice**
6. Was COC included with samples? Yes
7. Was COC signed and dated by client? Yes
8. Does the COC match the sample Yes
9. Is COC complete and correct? Yes
10. Are the samples properly preserved? Yes
11. Proper sample containers used? Yes
12. Any air bubbles in the VOA vials? N/A
13. Holding times exceeded? No
14. Sufficient sample volumes? Yes
15. Any Subcontracting needed? No
16. Are ESS labels on correct containers? Yes No
17. Were samples received intact? Yes No
    ESS Sample IDs: _____
    Sub Lab: _____
    Analysis: _____
    TAT: _____
18. Was there need to call project manager to discuss status? If yes, please explain.

_____

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	8 oz Soil Jar	1	NP
2	Yes	8 oz Soil Jar	1	NP
3	Yes	8 oz Soil Jar	1	NP
4	Yes	8 oz Soil Jar	1	NP
5	Yes	8 oz Soil Jar	1	NP
6	Yes	8 oz Soil Jar	1	NP
7	Yes	8 oz Soil Jar	1	NP
8	Yes	8 oz Soil Jar	1	NP
9	Yes	8 oz Soil Jar	1	NP
10	Yes	8 oz Soil Jar	1	NP
11	Yes	8 oz Soil Jar	1	NP
12	Yes	8 oz Soil Jar	1	NP
13	Yes	40 ml - VOA	1	MeOH
13	Yes	40 ml - VOA	2	other
13	Yes	8 oz Soil Jar	1	NP

Completed By: MK Date/Time: 11/19/10
Reviewed By: _____ Date/Time: ~~11/19/10~~ 11/19/10

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time: X Standard Other _____
If faster than 5 days, prior approval by laboratory is required # _____

State where samples were collected from:
MA (RI) CT NH NJ NY ME Other _____

Is this project for any of the following:
MA-MCP Navy USACE Other _____

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable: X Yes ___ No
Format: Excel X Access X PDF ___ Other _____

Co. Name	Project #	Project Name (20 Char. or less)
AECOM	60163799.1	BASF - CRANSTON, RI

Contact Person	Address
SCOTT WOZNIAKOWSKI	2 TECHNOLOGY PARK DR.

City	State	Zip	PO#
WESTFORD	MA	01886	

Telephone #	Fax #	Email Address
978-589-3000		SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: RCP - 8082 (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	RCP - 8082
1	11/19/2010	0950		X		SD-2R-A-2		1	G	X
2	11/19/2010	0950		X		SD-2R-B-2		1	G	X
3	11/19/2010	0944		X		SD-2R-A-1		1	G	X
4	11/19/2010	0944		X		SD-2R-B-1		1	G	X
5	11/19/2010	0944		X		SD-2R-C-1		1	G	X

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present: X Yes ___ No
Seals Intact: ___ Yes ___ No NA: X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians _____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- _____

Sampled by: K. HARTMAN, K. VAN NAERSSEN

Comments: SEE ATTACHED ANALYSIS SHEET

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/10 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By [illegible] MA-MCP, client acknowledges samples were collected in ac[illegible]nce with MADEP CAM VII A

Please fax all chan[illegible] Chain of Custody in writing.

1 (White) Lab Copy 2 ([illegible] Client Receipt

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time ___ Standard Other _____
If faster than 5 days, prior approval by laboratory is required # _____

State where samples were collected from:
MA RI CT NH NJ NY ME Other _____

Is this project for any of the following:
MA-MCP Navy USACE Other _____

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable ___ Yes ___ No
Format: Excel__ Access__ PDF__ Other_____

Co. Name	Project #	Project Name (20 Char. or less)
AECOM	60163799.1	BASF - CRANSTON, RI

Contact Person	Address
SCOTT WOZNIAKOWSKI	2 TECHNOLOGY PARK DR.

City	State	Zip	PO#
WOBURN	MA	01886	

Telephone #	Fax #	Email Address
978-589-3000		SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: PCB-8082 (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	PCB-8082
6	11/19/2010	10:06		X		SD-1-A-1		1	G	X
7		10:06				SD-1-B-1				
8		10:40				SD-3-A-1				
9		10:40				SD-3-B-1				
10		10:54				SD-4-A-1				
11		10:54				SD-4-B-1				
12		10:54				SD-4-C-1				

ARCHIVE

Container Type: P-Poly G-Glass S-Sterile V-VOA | Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians ____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- _____

Sampled by: K. HARTMAN, K. VAN NAERSSEN

Comments: PLEASE ARCHIVE. ANALYSIS PENDING SD-2R RESULTS. SEE ATTACHED FOR FULL ANALYTICAL REQUIREMENTS

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/2010 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 (Yellow) Client Receipt

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Page 3 of 3

Turn Time: X Standard Other ____
If faster than 5 days, prior approval by laboratory is required # ____
State where samples were collected from: MA (RI) CT NH NJ NY ME Other ____
Is this project for any of the following: MA-MCP Navy USACE Other ____

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable: X Yes ___ No
Format: Excel X Access X PDF ___ Other ____

Co. Name: AECOM
Project #: 6013799.1
Project Name (20 Char. or less): BASF-Cranston, RI
Contact Person: Scott Wozniakowski
Address: 2 Technology Park Drive
City: Westford State: MA Zip: 01886 PO#:
Telephone #: 978-589-3000 Fax #: Email Address: Scott.Wozniakowski@aecom

Write Required Analysis: (See attached sheet for full analysis)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	PCBs 8082	PP metals/TAL Metals 6010/7471	VOCs 8260	SVOCs 8270	CN (9014)
13	11/19/2010	0835		X	SD	SD-11-A-1		1	8 oz G	X	X			X
13	↓	0835		X	SD	SD-11-A-1		3				X	X	
—		1310		X	SW	EB-01-A		1	G	X				
—		~~1320~~ 1310		X	SW	EB-01-B		1	G	X				
—		1320		X	SW	EB-02-A		1	P		X			
—		1320		X	SW	EB-03-A		1	P					X
—		1325		X	SW	EB-04-A/B/C		3	V			X		
—	↓	1330		X	SW	EB-05-A/B		2	G				X	

Container Type: P-Poly G-Glass S-Sterile V-VOA
Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present: X Yes ___ No
Seals Intact: ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only: [ ] Pickup [ ] Technicians ____

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- ____
Sampled by: K. Hartman K. Van Narseen
Comments: See attached list for full analysis requirements.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/10 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By [illegible] MA-MCP, client acknowledges samples were collected in ac[illegible]nce with MADEP CAM VII A

Please fax all chan[illegible] Chain of Custody in writing.

1 (White) Lab Copy 2 ([illegible] Client Receipt

Attachment 2
Proposed Method Detection and Reporting Limits for Sediment Samples

VOC: 5035/8260 ppm CC List - Low in Solid (8260B)

Analyte	MDL mg/Kg	MRL mg/Kg	MS/MSD %REC	MS RPD	BS/BSD %REC	BS RPD
Chlorobenzene	0.0016	0.0050	70 - 130	20	70 - 130	20
Toluene	0.0016	0.0050	70 - 130	20	70 - 130	20
Xylene O	0.0016	0.0050	70 - 130	20	70 - 130	20
Xylene P,M	0.0032	0.0100	70 - 130	20	70 - 130	20

SVOC: 8270 ppm CC List in Solid (8270C)

Analyte	MDL mg/kg	MRL mg/kg	MS/MSD %REC	MS RPD	BS/BSD %REC	RPD
1,2-Dichlorobenzene	0.086	0.333	40 - 140	30	40 - 140	30
2-Methylnaphthalene	0.072	0.333	40 - 140	30	40 - 140	30
4-Chloroaniline	0.075	0.667	40 - 140	30	40 - 140	30

MET: ICP ppm CC List in Solid (6010B)

Analyte	MDL mg/Kg	MRL mg/Kg	DUP RPD	MS %REC	MS RPD	BS %REC	BS RPD
Cadmium	0.09	0.67	35	75 - 125	35	80 - 120	20
Copper	0.5	1.3	35	75 - 125	35	80 - 120	20
Lead	0.3	6.7	35	75 - 125	35	80 - 120	20
Zinc	0.7	3.3	35	75 - 125	35	80 - 120	20

MET: GFAA ppm CC List in Solid (7000)

Analyte	MDL mg/Kg	MRL mg/Kg	DUP RPD	MS %REC	RPD	BS %REC	RPD
Thallium	0.11	0.33	35	75 - 125	35	80 - 120	20

CN: Total Cyanide 9014 in Solid (9014)

	MDL mg/kg	MRL mg/kg	DUP	MS %REC		BS/BSD %REC	RPD
Total Cyanide	0.2	1.0	20	75 - 125		90 - 110	20

SVOC: 8270/3541 ppm PAH SIM in Solid (8270C)

Analyte	MDL mg/kg	MRL mg/kg	MS/MSD %REC	MS RPD	BS/BSD %REC	RPD
Anthracene	0.0014	0.0170	40 - 140	30	40 - 140	30
Benzo(a)anthracene	0.0012	0.0170	40 - 140	30	40 - 140	30
Benzo(a)pyrene	0.0014	0.0170	40 - 140	30	40 - 140	30
Benzo(b)fluoranthene	0.0017	0.0170	40 - 140	30	40 - 140	30
Benzo(g,h,I)perylene	0.0019	0.0170	40 - 140	30	40 - 140	30
Benzo(k)fluoranthene	0.0014	0.0170	40 - 140	30	40 - 140	30
Chrysene	0.0013	0.0170	40 - 140	30	40 - 140	30
Dibenzo(a,h)Anthracene	0.0020	0.0170	40 - 140	30	40 - 140	30
Fluoranthene	0.0011	0.0170	40 - 140	30	40 - 140	30
Indeno(1,2,3-cd)Pyrene	0.0020	0.0170	40 - 140	30	40 - 140	30
Pyrene	0.0028	0.0170	40 - 140	30	40 - 140	30

SVOC: 8082 PCB-Low Level in Solid (8082)

Analyte	MDL mg/kg	MRL mg/kg	BS/BSD %REC	BS RPD %REC	MS/MSD %REC	MS RPD %REC
Aroclor 1221	0.0150	0.0500				
Aroclor 1232	0.0150	0.0500				
Aroclor 1242	0.0150	0.0500				
Aroclor 1248	0.0150	0.0500				
Aroclor 1254	0.0150	0.0500				
Aroclor 1260	0.0150	0.0500	40 - 140	50	40 - 140	50

Information provided by ESS Labs, Cranston, RI.

CERTIFICATE OF ANALYSIS

Scott Wozniakowski
AECOM Environment - ENSR
2 Technology Park Drive
Westford, MA 01886

RE: BASF - Cranston RI (60163799.1)
ESS Laboratory Work Order Number: 1012021

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012021

SAMPLE RECEIPT

The following samples were received on December 01, 2010 for the analyses specified on the enclosed Chain of Custody Record.

These samples were originally received on hold on November 19, 2010.

Lab Number	SampleName	Matrix	Analysis
1012021-01	SD-1-A-1	Soil	8082
1012021-02	SD-3-A-1	Soil	8082
1012021-03	SD-4-A-1	Soil	8082

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012021

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-1-A-1
Date Sampled: 11/19/10 10:06
Percent Solids: 56
Initial Volume: 17.9
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012021
ESS Laboratory Sample ID: 1012021-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 12/1/10 16:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0998)		1	12/02/10 16:07		CL00129
Aroclor 1232	ND (0.0998)		1	12/02/10 16:07		CL00129
Aroclor 1242	**2.95** (0.499)		5	12/02/10 17:22		CL00129
Aroclor 1248	ND (0.0998)		1	12/02/10 16:07		CL00129
Aroclor 1254	ND (0.0998)		1	12/02/10 16:07		CL00129
Aroclor 1260	ND (0.0998)		1	12/02/10 16:07		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	77 %		30-150
Surrogate: Decachlorobiphenyl [2C]	79 %		30-150
Surrogate: Tetrachloro-m-xylene	65 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	48 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-3-A-1
Date Sampled: 11/19/10 10:40
Percent Solids: 83
Initial Volume: 20.5
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012021
ESS Laboratory Sample ID: 1012021-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 12/1/10 16:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0588)		1	12/02/10 16:25		CL00129
Aroclor 1232	ND (0.0588)		1	12/02/10 16:25		CL00129
Aroclor 1242	ND (0.0588)		1	12/02/10 16:25		CL00129
Aroclor 1248	ND (0.0588)		1	12/02/10 16:25		CL00129
Aroclor 1254	ND (0.0588)		1	12/02/10 16:25		CL00129
Aroclor 1260	ND (0.0588)		1	12/02/10 16:25		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	77 %		30-150
Surrogate: Decachlorobiphenyl [2C]	86 %		30-150
Surrogate: Tetrachloro-m-xylene	79 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	74 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-4-A-1
Date Sampled: 11/19/10 10:54
Percent Solids: 86
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012021
ESS Laboratory Sample ID: 1012021-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 12/1/10 16:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0581)		1	12/02/10 16:44		CL00129
Aroclor 1232	ND (0.0581)		1	12/02/10 16:44		CL00129
Aroclor 1242	**0.213** (0.0581)		1	12/02/10 16:44		CL00129
Aroclor 1248	ND (0.0581)		1	12/02/10 16:44		CL00129
Aroclor 1254	ND (0.0581)		1	12/02/10 16:44		CL00129
Aroclor 1260	ND (0.0581)		1	12/02/10 16:44		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	77 %		30-150
Surrogate: Decachlorobiphenyl [2C]	82 %		30-150
Surrogate: Tetrachloro-m-xylene	78 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	71 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012021

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB)										
Batch CL00129 - 3540										
Blank										
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	0.0181		mg/kg wet	0.02500		72	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0164		mg/kg wet	0.02500		66	30-150			
Surrogate: Tetrachloro-m-xylene	0.0204		mg/kg wet	0.02500		82	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0185		mg/kg wet	0.02500		74	30-150			
LCS										
Aroclor 1260	0.357	0.0500	mg/kg wet	0.5000		71	40-140		50	
Surrogate: Decachlorobiphenyl	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0190		mg/kg wet	0.02500		76	30-150			
Surrogate: Tetrachloro-m-xylene	0.0206		mg/kg wet	0.02500		82	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0182		mg/kg wet	0.02500		73	30-150			
LCS Dup										
Aroclor 1260	0.375	0.0500	mg/kg wet	0.5000		75	40-140	5	50	
Surrogate: Decachlorobiphenyl	0.0206		mg/kg wet	0.02500		82	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0179		mg/kg wet	0.02500		72	30-150			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012021

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012021

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

South Carolina Volatile Organic Compounds in Potable Water: 78003

New Jersey Potable (VOA) and Non Potable Water (RCRA), Solids and Hazardous Waste: RI002
http://www.nj.gov/dep/oqa/certlabs.htm

Pensylvania Potable and Non Potable Water, Solid and Hazardous Waste: 68-01752
http://files.dep.state.pa.us/RegionalResources/Labs/LabsPortalFiles/2009-0911_accredited_laboratories.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: AECOM - ESS
Client Project ID: _____
Shipped/Delivered Via: ESS Courier

ESS Project ID: 10120021
Date Project Due: 12/8/10
Days For Project: 5 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present? *** No**
   Air No.:
2. Were Custody Seals Present? **No**
3. Were Custody Seals Intact? **N/A**
4. Is Radiation count < 100 CPM? **Yes**
5. Is a cooler present? **Yes**
   Cooler Temp: **2.8**
   Iced With: **Ice**
6. Was COC included with samples? **Yes**
7. Was COC signed and dated by client? **Yes**
8. Does the COC match the sample **Yes**
9. Is COC complete and correct? **Yes**
10. Are the samples properly preserved? **Yes**
11. Proper sample containers used? **Yes**
12. Any air bubbles in the VOA vials? **N/A**
13. Holding times exceeded? **No**
14. Sufficient sample volumes? **Yes**
15. Any Subcontracting needed? **No**
16. Are ESS labels on correct containers? **Yes | No**
17. Were samples received intact? **Yes | No**

ESS Sample IDs: _____
Sub Lab: _____
Analysis: _____
TAT: _____

18. Was there need to call project manager to discuss status? If yes, please explain.

_____

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	8 oz Soil Jar	1	NP
2	Yes	8 oz Soil Jar	1	NP
3	Yes	8 oz Soil Jar	1	NP

Completed By: MK Date/Time: 12/1/10
Reviewed By: _____ Date/Time: 12/1/10

1012021

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Page 2 of 3

Turn Time ___ Standard Other ___
If faster than 5 days, prior approval by laboratory is required # ___
State where samples were collected from:
MA RI CT NH NJ NY ME Other ___
Is this project for any of the following:
MA-MCP Navy USACE Other ___

Reporting Limits

ESS LAB PROJECT ID: 1011299 MK 12/1/10

Electronic Deliverable ___ Yes ___ No
Format: Excel__ Access__ PDF__ Other ___

Co. Name	Project #	Project Name (20 Char. or less)
AECOM	60163799.1	BASF - CRANSTON, RI

Contact Person: SCOTT WOZNIAKOWSKI
Address: 2 TECHNOLOGY PARK DR.
City: WESTFORD State: MA Zip: 01886 PO#:
Telephone #: 978-589-3000 Fax #: Email Address: SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

	ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	PCB-8082	
1	*6	11/19/2010	10:06		X		SD-1-A-1		1	G	X	ARCHIVE
	7		10:06				SD-1-B-1					
2	*8		10:40				SD-3-A-1					
	9		10:40				SD-3-B-1					
3	*10		10:54				SD-4-A-1					
	11		10:54				SD-4-B-1					
	12		10:54				SD-4-C-1					

Container Type: P-Poly, G-Glass S-Sterile V-VOA
Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present X Yes ___ No
Seals Intact ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians ___

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- ___

Sampled by: K. HARTMAN, K. VAN NAERSSEN

Comments: PLEASE ARCHIVE. ANALYSIS PENDING SD-2R RESULTS. SEE ATTACHED FOR FULL ANALYTICAL REQUIREMENTS

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/2010 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 (Yellow) Client Receipt

CERTIFICATE OF ANALYSIS

Scott Wozniakowski
AECOM Environment - ENSR
2 Technology Park Drive
Westford, MA 01886

RE: BASF - Cranston RI (60163799.1)
ESS Laboratory Work Order Number: 1012026

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012026

SAMPLE RECEIPT

The following samples were received on December 02, 2010 for the analyses specified on the enclosed Chain of Custody Record.

These samples were originally received on November 19, 2010 as ESS Laboratory Sample IDs 1011299-07, 1011299-09, 1011299-11 and 1011299-12.

Lab Number	SampleName	Matrix	Analysis
1012026-01	SD-1-B-1	Soil	8082
1012026-02	SD-3-B-1	Soil	8082
1012026-03	SD-4-B-1	Soil	8082
1012026-04	SD-4-C-1	Soil	8082

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012026

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB)

1012026-03 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-1-B-1
Date Sampled: 11/19/10 10:06
Percent Solids: 58
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012026
ESS Laboratory Sample ID: 1012026-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 12/2/10 15:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0858)		1	12/03/10 17:00		CL00129
Aroclor 1232	ND (0.0858)		1	12/03/10 17:00		CL00129
Aroclor 1242	**6.29** (0.858)		10	12/03/10 18:16		CL00129
Aroclor 1248	ND (0.0858)		1	12/03/10 17:00		CL00129
Aroclor 1254	ND (0.0858)		1	12/03/10 17:00		CL00129
Aroclor 1260	ND (0.0858)		1	12/03/10 17:00		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	69 %		30-150
Surrogate: Decachlorobiphenyl [2C]	56 %		30-150
Surrogate: Tetrachloro-m-xylene	50 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	32 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-3-B-1
Date Sampled: 11/19/10 10:40
Percent Solids: 87
Initial Volume: 20.2
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012026
ESS Laboratory Sample ID: 1012026-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 12/2/10 15:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0569)		1	12/03/10 17:19		CL00129
Aroclor 1232	ND (0.0569)		1	12/03/10 17:19		CL00129
Aroclor 1242	**3.49** (0.569)		10	12/03/10 18:34		CL00129
Aroclor 1248	ND (0.0569)		1	12/03/10 17:19		CL00129
Aroclor 1254	ND (0.0569)		1	12/03/10 17:19		CL00129
Aroclor 1260	ND (0.0569)		1	12/03/10 17:19		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	76 %		30-150
Surrogate: Decachlorobiphenyl [2C]	78 %		30-150
Surrogate: Tetrachloro-m-xylene	104 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	89 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-4-B-1
Date Sampled: 11/19/10 10:54
Percent Solids: 74
Initial Volume: 20
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012026
ESS Laboratory Sample ID: 1012026-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 12/2/10 15:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (3.38)		50	12/03/10 17:57		CL00129
Aroclor 1232	ND (3.38)		50	12/03/10 17:57		CL00129
Aroclor 1242	**36.6** (3.38)		50	12/03/10 17:57		CL00129
Aroclor 1248	ND (3.38)		50	12/03/10 17:57		CL00129
Aroclor 1254	ND (3.38)		50	12/03/10 17:57		CL00129
Aroclor 1260	ND (3.38)		50	12/03/10 17:57		CL00129

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
Client Sample ID: SD-4-C-1
Date Sampled: 11/19/10 10:54
Percent Solids: 87
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1012026
ESS Laboratory Sample ID: 1012026-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 12/2/10 15:30

8082 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1221	ND (0.0572)		1	12/03/10 17:38		CL00129
Aroclor 1232	ND (0.0572)		1	12/03/10 17:38		CL00129
Aroclor 1242	**8.02** (0.572)		10	12/03/10 18:53		CL00129
Aroclor 1248	ND (0.0572)		1	12/03/10 17:38		CL00129
Aroclor 1254	ND (0.0572)		1	12/03/10 17:38		CL00129
Aroclor 1260	ND (0.0572)		1	12/03/10 17:38		CL00129

	%Recovery	Qualifier	Limits
S[illegible] Decachlorobiphenyl	81 %		30-150
S[illegible] Decachlorobiphenyl [2C]	83 %		30-150
Surrogate: Tetrachloro-m-xylene	97 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	67 %		30-150

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012026

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB)										
Batch CL00129 - 3540										
Blank										
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	0.0181		mg/kg wet	0.02500		72	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0164		mg/kg wet	0.02500		66	30-150			
Surrogate: Tetrachloro-m-xylene	0.0204		mg/kg wet	0.02500		82	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0185		mg/kg wet	0.02500		74	30-150			
LCS										
Aroclor 1260	0.357	0.0500	mg/kg wet	0.5000		71	40-140		50	
Surrogate: Decachlorobiphenyl	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0190		mg/kg wet	0.02500		76	30-150			
Surrogate: Tetrachloro-m-xylene	0.0206		mg/kg wet	0.02500		82	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0182		mg/kg wet	0.02500		73	30-150			
LCS Dup										
Aroclor 1260	0.375	0.0500	mg/kg wet	0.5000		75	40-140	5	50	
Surrogate: Decachlorobiphenyl	0.0206		mg/kg wet	0.02500		82	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0203		mg/kg wet	0.02500		81	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0179		mg/kg wet	0.02500		72	30-150			

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI

ESS Laboratory Work Order: 1012026

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte

CERTIFICATE OF ANALYSIS

Client Name: AECOM Environment - ENSR
Client Project ID: BASF - Cranston RI
ESS Laboratory Work Order: 1012026

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

South Carolina Volatile Organic Compounds in Potable Water: 78003

New Jersey Potable (VOA) and Non Potable Water (RCRA), Solids and Hazardous Waste: RI002
http://www.nj.gov/dep/oqa/certlabs.htm

Pensylvania Potable and Non Potable Water, Solid and Hazardous Waste: 68-01752
http://files.dep.state.pa.us/RegionalResources/Labs/LabsPortalFiles/2009-0911_accredited_laboratories.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: AECOM - ESS
Client Project ID: _____
Shipped/Delivered Via: ESS Courier

ESS Project ID: 10120026
Date Project Due: 12/9/10
Days For Project: 5 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present? *** No**
   Air No.:
2. Were Custody Seals Present? **No**
3. Were Custody Seals Intact? **N/A**
4. Is Radiation count < 100 CPM? **Yes**
5. Is a cooler present? **Yes**
   Cooler Temp: **2.8**
   Iced With: **Icepacks**
6. Was COC included with samples? **Yes**
7. Was COC signed and dated by client? **Yes**
8. Does the COC match the sample **Yes**
9. Is COC complete and correct? **Yes**
10. Are the samples properly preserved? **Yes**
11. Proper sample containers used? **Yes**
12. Any air bubbles in the VOA vials? **N/A**
13. Holding times exceeded? **No**
14. Sufficient sample volumes? **Yes**
15. Any Subcontracting needed? **No**
16. Are ESS labels on correct containers? **Yes | No**
17. Were samples received intact? **Yes | No**
    ESS Sample IDs: _____
    Sub Lab: _____
    Analysis: _____
    TAT: _____
18. Was there need to call project manager to discuss status? If yes, please explain.

_____

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	8 oz Soil Jar	1	NP
2	Yes	8 oz Soil Jar	1	NP
3	Yes	8 oz Soil Jar	1	NP
4	Yes	8 oz Soil Jar	1	NP

Completed By: MK Date/Time: 12/2/10
Reviewed By: KAB Date/Time: 12/3/10

1012026

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time ___ Standard Other ___
If faster than 5 days, prior approval by laboratory is required # ___
State where samples were collected from: MA RI CT NH NJ NY ME Other ___
Is this project for any of the following: MA-MCP Navy USACE Other ___

Reporting Limits

ESS LAB PROJECT ID: 1011299

Electronic Deliverable ___ Yes ___ No
Format: Excel__ Access__ PDF__ Other___

Co. Name: AECOM
Project #: 60163799.1
Project Name (20 Char. or less): BASF - CRANSTON, RI
Contact Person: SCOTT WOZNIAKOWSKI
Address: 2 TECHNOLOGY PARK DR.
City: WOBURN State: MA Zip: 01886 PO#:
Telephone #: 978-589-3000 Fax #: Email Address: SCOTT.WOZNIAKOWSKI@AECOM.COM

Write Required Analysis: PCB-8082 (SEE ATTACHED FOR FULL ANALYSIS REQUIREMENTS)

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Press Code	Number of Containers	Type of Containers	PCB-8082
6	11/19/2010	10:06		X		SD-1-A-1		1	G	X
01 7		10:06				SD-1-B-1				
8		10:40				SD-3-A-1				
02 9		10:40				SD-3-B-1				
10		10:54				SD-4-A-1				
03 11		10:54				SD-4-B-1				
04 12		10:54				SD-4-C-1				

ARCHIVE

Container Type: P-Poly, G-Glass S-Sterile V-VOA
Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present: X Yes ___ No
Seals Intact: ___ Yes ___ No NA X
Cooler Temp: 2.8 ice

Internal Use Only
[ ] Pickup
[ ] Technicians ___

Preservation Code: 1- NP, 2- HCl, 3- H_2SO_4, 4- HNO_3, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAct, 9- ___
Sampled by: K. HARTMAN, K. VAN NAMESSEN
Comments: PLEASE ARCHIVE. ANALYSIS PENDING SD-2R RESULTS. SEE ATTACHED FOR FULL ANALYTICAL REQUIREMENTS

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	11/19/2010 1505	[signature]	11/19/10 1500				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

*By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VII A

Please fax all changes to Chain of Custody in writing.

1 (White) Lab Copy 2 (Yellow) Client Receipt

AECOM
250 Apollo Drive
Chelmsford, MA 01824

978.905.2100 tel
978.905.2101 fax

Memorandum

To	Frank Battaglia, EPA	Page	1
CC	Joseph Guarnaccia, BASF		
Subject	Sediment Sampling Results and Scope of Work for Sediment Removal at Former Ciba-Geigy Facility, Cranston, RI		
From	Joanne Lynch / Kris Carbonneau, AECOM		
Date	September 16, 2011		

Summary of Sampling Results (July 2011). On behalf of BASF, AECOM completed sediment sampling in the Pawtuxet River on July 13 and 14, 2011. The objective of this work was to complete a supplemental assessment of sediment quality in former locations where elevated total PCB concentrations (SD-TUF2C, SD-TUF7C) were measured during historical sediment investigations (RFI Pawtuxet River, 1995). The sampling activities were designed to help delineate areas that could potentially require remediation to address surficial PCB concerns. This field work and analysis was consistent with previous work conducted to delineate PCB concentrations at location SD-2R (see 2/7/11 letter report from AECOM to EPA).

Sediment samples were collected from the historic SD-TUF7C location and the immediate surrounding area. Attached Figure 1 presents actual sediment sample locations from the July 2011 event. Sediment collection locations, SD-32, SD-33, SD-34, SD-35, SD-36 (shown in blue on Figure 1), were submitted for total PCB and total organic carbon (TOC) analyses. Sediment samples were collected from 0-6" (A), 6-12" (B), and 12-24" (C) intervals from each sediment core. Sediment samples from the locations shown in green on Figure 1 were collected and archived with the laboratory. Based on the initial PCB results in the SD-TUF7C area, SD-21 was submitted for PCB analysis from the archive. Analytical results for total PCB and TOC concentrations are presented in attached Table 1. Field observations are presented in attached Table 2.

Similarly, sediment samples were collected from the historic SD-TUF2C location and the immediate surrounding area. However, field conditions indicated that sediment in this area was scoured and there was a significant deposition of debris (e.g., tree branches, logs, cobbles, rocks). Attempts to collect sediment from seven (7) discrete locations in this area were unsuccessful (see Figures 2, 3, and 4 for attempted locations). Sediment collection was possible at four (4) discrete locations, SD-29, SD-42, SD-22, SD-23, as shown on Figure 1. Sediment samples from SD-29 and SD-42 (shown in blue) were submitted for total PCB and TOC analyses. Sediment samples from SD-22 and SD-23 (shown in green) were archived with the laboratory. Based on the initial PCB results from SD-42, SD-23 was submitted for PCB analysis. Analytical results for total PCB and TOC concentrations are presented in attached Table 1. Field observations are presented in attached Table 2.

All sediment PCB data are presented, by depth interval on Figures 2 through 4. Figure 5 presents three discrete areas around SD-2R, SD-TUF7C, and SD-TUF2C, proposed for removal.

Implications of Sampling Results. Based on review of the analytical results, the following observations are made:

- Prior to sampling, data suggested a well-bounded delineation at SD-2R laterally and to a depth of 1 foot in sediment. The proposed work is to excavate sediment over an area of 120 ft^2 to a depth of at least 2 ft, and replace that volume with clean sand. The total volume of sediment removal is approximately 11 CY.

- Two additional areas of potential PCB impact identified from previous sampling results were confirmed. At area SD-42, data provide a well-bounded delineation laterally (90 ft^2) and to a depth of 1 foot to encompass the measured impact depth of 0.5 ft. At area SD-34, data provide a well-bounded delineation laterally (180 ft^2) and to a depth of 2.5 ft to encompass the measured impact depth of 2 ft. Collectively the estimated total volume of sediment removal is 20 CY. This volume will be replaced with clean sand.

Remedial Action Overview. Remedial action is projected to proceed as follows:

Workplan. On behalf of BASF, AECOM would prepare a brief work plan to outline the execution approach for purposes of presentation to EPA for approval. Details on the workplan are provided below.

Performance Specification. Upon receipt of EPA approval, a brief performance specification for use in soliciting bids from one (or more) qualified contractors will be prepared. A formal competitive bid process is not intended for this work to hasten the schedule to allow a 2011 completion; however, a minimum performance specification is needed to communicate the terms of the project and the execution quality assurance. Details on the specification content are provided below.

Contractor Construction Plan. In response to the performance specification, AECOM will receive and review one execution plan from either the sole solicited contractor or the contractor with the lowest stated bid price. Should the contractor specify a land-based removal process (see Construction Execution Approach below) then AECOM will also review potential stability concerns associated with the steel sheet pile wall. Following construction approach review, AECOM would discuss concerns with the contractor and review any needed follow up submission. AECOM has assumed that the contractor will be bound contractually to BASF.

Mobilization/Kickoff. AECOM will schedule and attend a kickoff meeting at the start of the field work. Given the short duration of the work, it is intended that this meeting occur at the start of construction but not prior to mobilization.

Construction Oversight. AECOM envisions that the work will take approximately 6 working days barring weather and equipment related issues. AECOM intends to provide oversight of the contractor.

Field Construction Reports. AECOM will generate daily construction reports for inclusion in a final completion report. AECOM will also review the post-dredge data report provided by the contractor to confirm that the actual removal volumes are consistent with the work plan.

Construction Completion Report. AECOM will generate a concise construction completion report for purposes of documenting the removal for EPA. It is envisioned that the report will consist of a summary of the daily report forms inclusive of a photo log as well as the review and confirmation of post-dredge removal.

Engineering Work Plan Approach. AECOM will generate a workplan for submission to EPA. The purpose of the workplan is to establish guidelines for the removal work for review, comment and approval by EPA. The workplan will outline the following:

- Site location and project limit of work boundaries
- Site conditions including access points, elevations, grades, structures and utilities (to the extent known)
- Dredge areas, depths and overdepth requirements
- Material characterization (from historical data)
- Contractor staging and set down areas as well as sediment stockpiling and dewatering area
- Site access and work limitations
- Allowable forms of removal and re-suspension limits
- Minimum standards for controlling sediment re-suspension and soil erosion
- Construction quality assurance requirements
- Collection and management of sediment decant water (on water and on land)
- Backfill material description and placement method
- Post removal data collection and documentation for post-construction completion report

AECOM will generate the workplan for submission to BASF for review, make necessary revisions and submit to the EPA. It is anticipated that the scope of comments will not require more than one (1) day of revisions to finalize the document. AECOM anticipates review and approval by EPA within 7 calendar days.

Construction Execution Approach. AECOM will generate a construction performance specification which will include prepared scaled figures with established survey data and datum which will serve as a project plan which one or more qualified area contractors will receive. Given the short timeframe for conducting this work, it is AECOM's intention to provide the performance specification to more than one qualified contractor so as to receive at least one firm bid which complies with the window of execution (i.e., by the end of calendar 2011).

While it will be up to the contractor to select their preferred method of executing the removal work, two general approaches exist. One method is to use a long-arm excavator positioned on shore to conduct the removal and the second is to mount a mechanical dredge on a barge and conduct in-water removal. In each case, backfilling with sand would use the same placement method as with removal. Method of selection may be a function of contractor availability if land-based operations are not restricted based on the proximity of the power lines over the Facility Railroad Bridge. The anticipated sequence of the execution is as follows:

- Mobilize equipment to site
- Construct ancillary facilities including dewatering pad and upland soil erosion controls
- Secure staging/access points for sediment removal and on-site transport equipment and confirm infrastructure suitability to support the staging/access

- Deploy silt curtain to minimize dispersion of re-suspended sediment
- Conduct removal activities and stockpile sediment on dewatering pad
- Process sediment as needed with reagent to address free liquids
- Load out soil into transfer trucks with collection and analysis of sediments as required by the final disposal facility
- Backfill sandy soil into excavation to restore grades
- Analyze decant water for offsite management
- After confirming adequate removal depths have been achieved, demobilize all equipment and materials from the site.

The contractor will need to summarize their construction approach in a technical execution plan which AECOM will review and comment on prior to mobilization. In addition to the technical requirements of this work, the contractor will need to assure AECOM that it has adequate health and safety procedures in place to perform the work through the preparation and submission of a Health and Safety Plan.

Projected Implementation Schedule. The approximate projected schedule for the scope of work is as follows:

• Workplan:	9/16 – 10/7
○ Submittal to EPA:	10/11
○ Approval from EPA:	10/17
• Performance Specification:	10/17 – 10/24
• Contractor Generates Construction Approach:	10/24 – 10/28
• Review of Construction Approach:	10/31 – 11/4
• Mobilization and Preconstruction Meeting:	11/14
• Project Field Completion:	11/30
• Project Completion Report:	11/30 – 12/23
○ Submittal to EPA:	12/23
○ Approval from EPA:	12/30

The milestone dates for this work include removal completion prior to the Thanksgiving holiday and project completion report submission prior to the end of the calendar year.

Thank you for your attention to this project. We look forward to discussing the project in more detail and addressing any comments or concerns that you may have.

Sincerely yours,

Joanne Lynch
joanne.lynch@aecom.com

Kris Carbonneau
kris.carbonneau@aecom.com

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\7_Deliverables\GIS_Database\Projects\Figure_1_July_2011.mxd

AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996

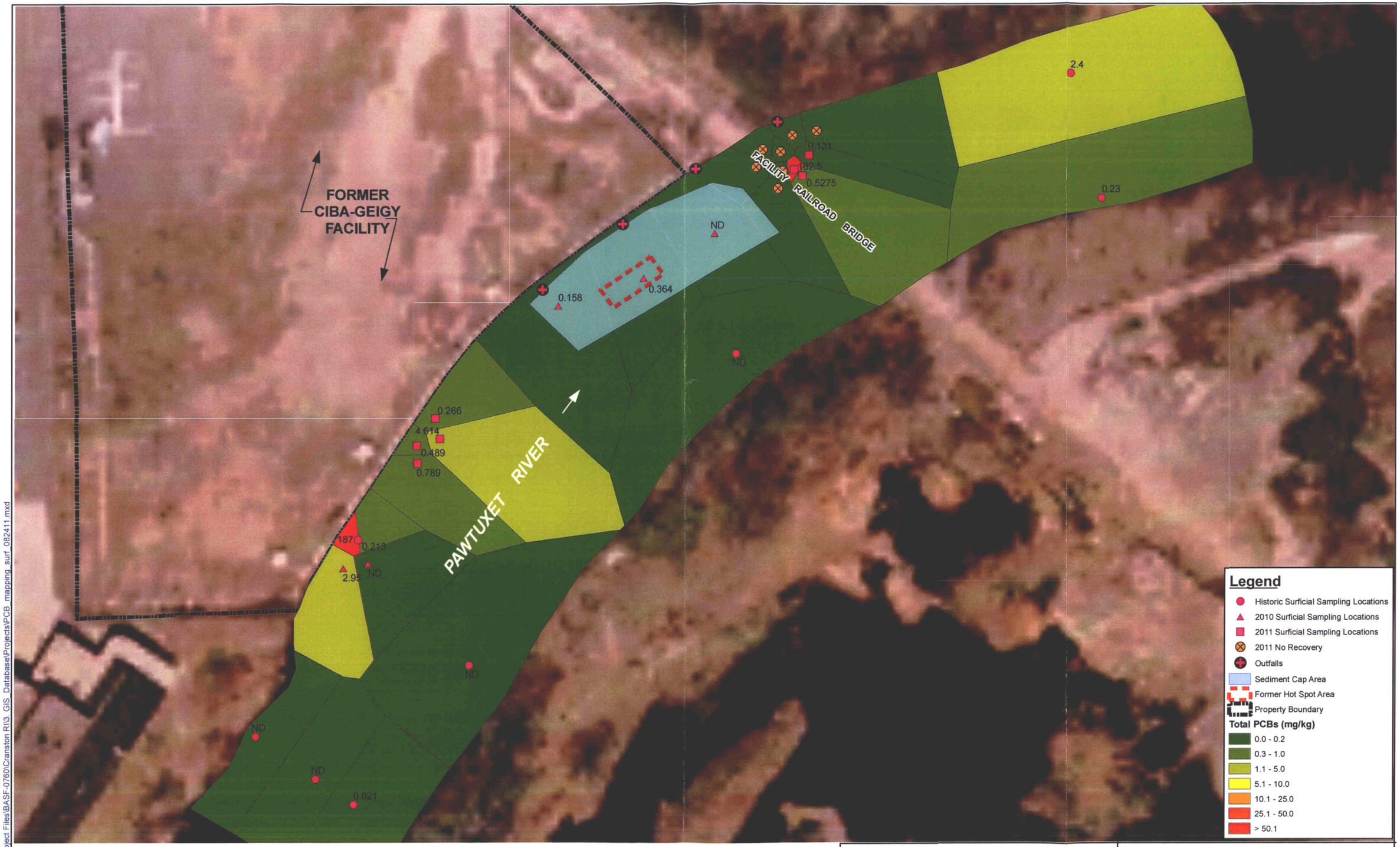
0 30 60 Feet

N W E S

FORMER CIBA-GEIGY
SITE INVESTIGATION
CRANSTON, RI
60163799.2

JULY SEDIMENT SAMPLE LOCATIONS

DATE: 08/08/11 | DRWN: KNH | FIGURE 1



J:\Indl_Service\Project Files\BASF-0760\Cranston RI\3_GIS_Database\Projects\PCB_mapping_surf_082411.mxd

AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. SAND CAP INSPECTION AND SEDIMENT QUALITY INVESTIGATION REPORT, AECOM FEBRUARY 2011
4. SEDIMENT SAMPLING REPORT FOR THE PAWTUXET RIVER, CIBA, MAY 2003
5. SEDIMENT IRM REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, JULY 1996
6. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996
7. RFI INTERIM REPORT, CIBA-GEIGY, NOVEMBER 1991

NOTE: TOTAL PCBS ARE REPORTED AS DETECTS ONLY

0 50 100 Feet

N W E S

FORMER CIBA-GEIGY
CRANSTON, RI
60163799.1

TOTAL PCB CONCENTRATION POLYGONS - SURFICIAL SEDIMENTS IN THE PAWTUXET RIVER 0.0 - 0.5 FT HORIZON

DATE: 08/24/2011 | DRWN: KNH | FIGURE 2

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\3_GIS_Database\Projects\PCB_mapping_0.5_1.0_082411.mxd

AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. SAND CAP INSPECTION AND SEDIMENT QUALITY INVESTIGATION REPORT, AECOM FEBRUARY 2011
4. SEDIMENT SAMPLING REPORT FOR THE PAWTUXET RIVER, CIBA, MAY 2003
5. SEDIMENT IRM REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, JULY 1996
6. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996
7. RFI INTERIM REPORT, CIBA-GEIGY, NOVEMBER 1991

NOTE: TOTAL PCBS ARE REPORTED AS DETECTS ONLY

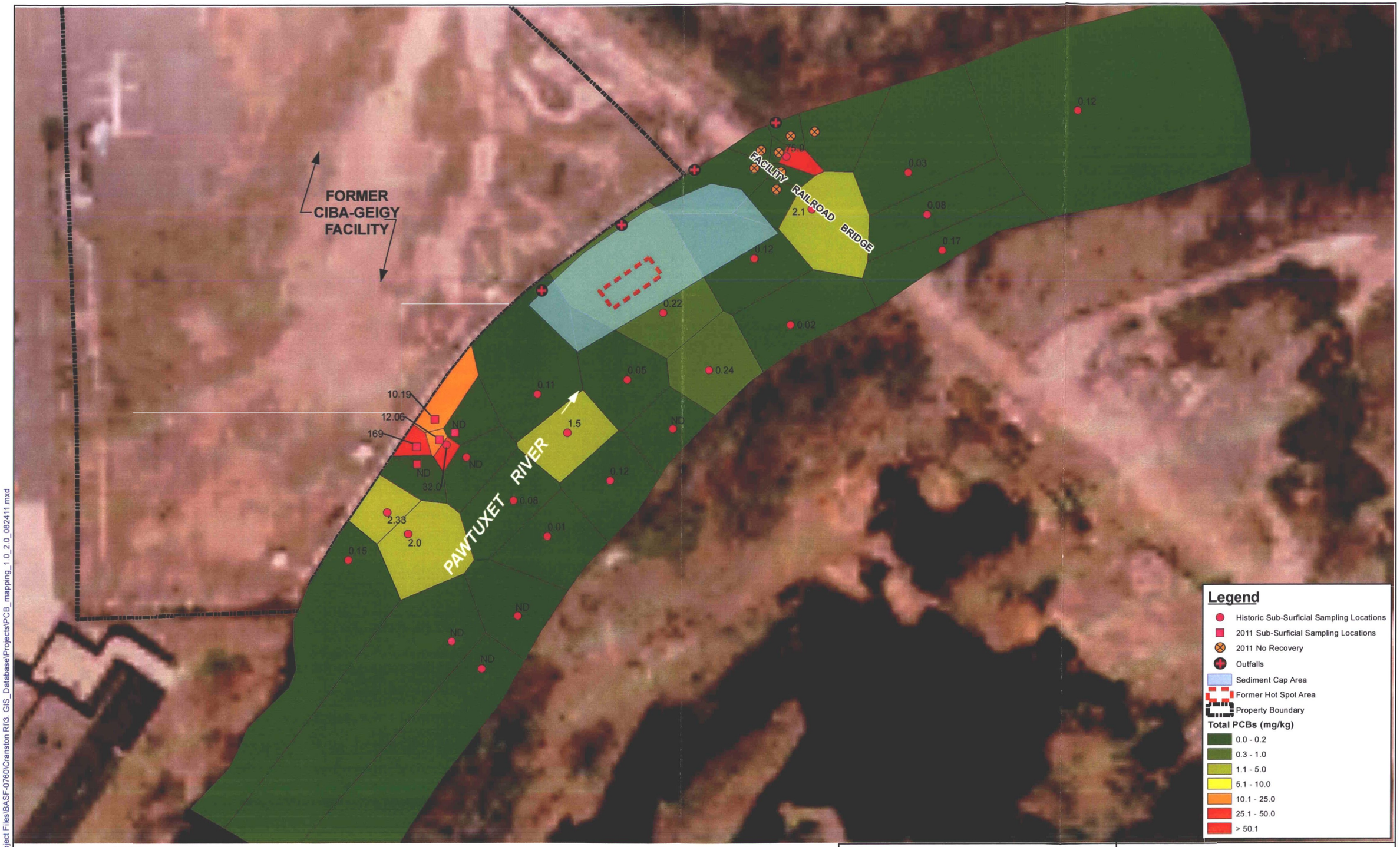
0 50 100 Feet

N W E S

FORMER CIBA-GEIGY
CRANSTON, RI
60163799.1

TOTAL PCB CONCENTRATION POLYGONS - SUB-SURFICIAL SEDIMENTS IN THE PAWTUXET RIVER 0.5 - 1.0 FT HORIZON

DATE: 08/24/2011 | DRWN: KNH | FIGURE 3



AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. SAND CAP INSPECTION AND SEDIMENT QUALITY INVESTIGATION REPORT, AECOM FEBRUARY 2011
4. SEDIMENT SAMPLING REPORT FOR THE PAWTUXET RIVER, CIBA, MAY 2003
5. SEDIMENT IRM REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, JULY 1996
6. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996
7. RFI INTERIM REPORT, CIBA-GEIGY, NOVEMBER 1991

NOTE: TOTAL PCBS ARE REPORTED AS DETECTS ONLY

0 50 100 Feet

N W E S

FORMER CIBA-GEIGY
CRANSTON, RI
60163799.1

TOTAL PCB CONCENTRATION POLYGONS - SUB-SURFICIAL SEDIMENTS IN THE PAWTUXET RIVER 1.0 - 2.0 FT HORIZON

DATE: 08/24/2011 | DRWN: KNH | FIGURE 4

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\3. GIS_Database\Projects\PCB_mapping_1.0_2.0_082411.mxd

AECOM

SOURCES:
1. AERIAL PHOTOGRAPHY FROM RIGIS (2004).
2. PROPERTY BOUNDARY FROM CITY OF CRANSTON, RHODE ISLAND ASSESSMENT MAP 4-5.
3. RFI REPORT, PAWTUXET RIVER, WOODWARD-CLYDE, MARCH 1996

0 30 60 Feet

N W E S

FORMER CIBA-GEIGY
SITE INVESTIGATION
CRANSTON, RI
60163799.1

PROPOSED SEDIMENT REMOVAL AREAS

DATE: 08/08/11 | DRWN: KNH | FIGURE 5

J:\Indl_Service\Project Files\BASF-0760\Cranston RI\7_Deliverables\GIS_Database\Projects\Proposed_Excavation_2011_Updated.mxd

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107150	1107151	1107151	1107151	1107151
		sys_loc_code	SD29	SD32	SD32	SD32	SD33
		sys_sample_code	SD-29-A_071411	SD-32-A_071311	SD-32-B_071311	SD-32-C_071311	SD-33-A_071311
		sample_date	7/14/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0586 U	0.304	0.682	0.562	< 0.0663 U
SW8082	PCB-1254	mg/kg	0.131	< 0.0864 U	< 0.0823 U	< 0.0894 U	0.266
SW8082	PCB-1221	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
SW8082	PCB-1232	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
SW8082	PCB-1248	mg/kg	< 0.0586 U	4.31 D	9.57 D	11.5 D	< 0.0663 U
SW8082	PCB-1242	mg/kg	< 0.0586 U	< 0.0864 U	< 0.0823 U	< 0.0894 U	< 0.0663 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	3900	19000	40000	52000	5300
	TOTAL PCBs	mg/kg	0.131	4.614	10.252	12.062	0.266

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1107151	1107151	1107151	1107151
		sys_loc_code	SD33	SD33	SD34	SD34	SD34
		sys_sample_code	SD-33-B_071311	SD-33-C_071311	SD-34-A_071311	SD-34-B_071311	SD-34-B-2_071311
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0708 U	0.660	0.129	0.865	0.788
SW8082	PCB-1254	mg/kg	6.61 D	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1221	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1232	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
SW8082	PCB-1248	mg/kg	9.69 D	9.53 D	0.360	18.1 D	14.2 D
SW8082	PCB-1242	mg/kg	< 0.0708 U	< 0.0873 U	< 0.0739 U	< 0.0943 U	< 0.0958 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	12000	20000	15000	36000	40000
	TOTAL PCBs	mg/kg	16.3	10.19	0.489	18.965	14.988

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1107151	1107151	1107151	1107151
		sys_loc_code	SD34	SD35	SD35	SD36	SD36
		sys_sample_code	SD-34-C_071311	SD-35-A_071311	SD-35-B_071311	SD-36-A_071311	SD-36-B_071311
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1254	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	0.239	0.162
SW8082	PCB-1221	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1232	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1248	mg/kg	169 D	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
SW8082	PCB-1242	mg/kg	< 8.54 D U	< 0.0579 U	< 0.0547 U	< 0.0743 U	< 0.0968 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	30000	11000	14000	12000	26000
	TOTAL PCBs	mg/kg	169	< 0.0579 U	< 0.0547 U	0.239	0.162

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF7C AREA				
		lab_sdg	1107151	1108108	1108108	1108108	1108108
		sys_loc_code	SD36	SD21	SD21	SD21	SD21
		sys_sample_code	SD-36-C_071311	SD-21-A_07132011	SD-21-B_07132011	SD-21-B-2_07132011	SD-21-C_07132011
		sample_date	7/13/2011	7/13/2011	7/13/2011	7/13/2011	7/13/2011
analytic_method	chemical_name	report_result_unit					
SW8082	PCB-1260	mg/kg	< 0.0596 U	< 0.0580 U	0.207	0.180	< 0.0784 U
SW8082	PCB-1254	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1221	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1232	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
SW8082	PCB-1248	mg/kg	< 0.0596 U	0.789	0.783	0.949	7.70 D
SW8082	PCB-1242	mg/kg	< 0.0596 U	< 0.0580 U	< 0.0620 U	< 0.0638 U	< 0.0784 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	4000	11000	21000	18000	34000
	TOTAL PCBs	mg/kg	< 0.0596 U	0.789	0.99	1.129	7.7

Table 1
PCB Aroclor and TOC Results
July 2011 Sediment Sampling in Pawtuxet River
Former Ciba-Geigy Facility, Cranston, RI

			SD-TUF2C AREA			
		lab_sdg	1107150	1108108	1108108	1108108
		sys_loc_code	SD42	SD23	SD23	SD23
		sys_sample_code	SD-42-A_071411	SD-23-A_07142011	SD-23-A-2_07142011	SD-23-B_07142011
		sample_date	7/14/2011	7/14/2011	7/14/2011	7/14/2011
analytic_method	chemical_name	report_result_unit				
SW8082	PCB-1260	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1254	mg/kg	68.5 D	0.514	< 0.0630 U	0.169
SW8082	PCB-1221	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1232	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
SW8082	PCB-1248	mg/kg	114 D	0.205	0.366	< 0.0622 U
SW8082	PCB-1242	mg/kg	< 6.75 D U	< 0.0691 U	< 0.0630 U	< 0.0622 U
TOC.LK	TOTAL ORGANIC CARBON	mg/kg	62000	9900	6500	3300
	TOTAL PCBs	mg/kg	182.5	0.719	0.366	0.169

July 2011 Sediment Investigation

Sample Location #	Core Depth (in)	Sediment type (silt, clay, sand, etc.)	Observations: Color	Observations: Odor Present	Observations: PID Reading Depth (in)	Observations: PID Reading (ppm)
17	0.0-4.0	Medium sand with some silt, leaf litter at top of core	Light brown/Tan	None	0.0-6.0	9.5
	4.0-8.0	Silt	Light brown/Tan	Petroleum-like odor		
	8.0-15.0	Silt	Dark brown/Black	Strong petroleum-like odor	6.0-12.0	6.0
	15.0-21.5	Medium sand	Dark brown/Black	None	12.0-21.5	25.0
18	0.0-1.0	Coarse sand	Dark brown	None		
	1.0-4.5	Silt/Medium sand	Dark brown	Petroleum-like odor, piece of spongy	0.0-6.0	1.3
	4.5-10.0	Medium sand/gravel	Dark brown	None	6.0-12.0	2.3
19	0.0-2.0	Root material/wood/eelgrass	Brown/Green	None		
	2.0	Gravel/sand	Tan	None	0.0-6.0	0.8
	2.0-10.0	Medium/coarse sand/gravel	Grey	None		
	10.0-13.0	Medium/coarse sand	Brown/dark brown	None	6.0-12.0	0.7
	13.0-15.0	Medium sand/coarse sand	Dark brown/black	Petroleum-like odor		
	15.0-16.0	Medium/coarse sand	Light grey	None		
	16.0-18.0	Medium sand/coarse sand	Dark brown/black	Petroleum-like odor	12.0-18.0	0.6
20	0.0-6.0	Medium/coarse sand/gravel/organic material at top of core	Tan/brown	None	No PID	No PID
21	0.0-6.0	Fine sand/silt	Light brown/brown	None		
	6.0	Lens material	Yellow/dark brown/black	Petroleum-like odor	0.0-6.0	34.0
	6.0-9.0	Soft silt	Brown/grey	None		
	9.0-10.0	Silt	Dark brown	None		
	10.0-12.0	Very fine sand/silt	Brown	None	6.0-12.0	73.0
	12.0-17.0	Silt	Brown	Faint Petroleum-like odor		
	17.0-18.0	Fine sand/silt	Brown	Faint Petroleum-like odor		
	18.0-20.5	Silt	Dark brown	None		
	20.5-22.0	Fine sand	Light brown/tan/sheen present	None	12.0-24.0	92.0
	22.0-26.0	Silt	Black	Petroleum-like odor	24.0-28.0	66.0
22	0.0	Organics/leaf litter/sticks	Brown/Green	Petroleum-like odor		
	0.0-1.0	Coarse sand	Tan/brown	Petroleum-like odor		
	1.0	Woody debris	Brown	Petroleum-like odor		
	1.0-2.0	Coarse sand/woody debris	Brown	Petroleum-like odor		
	2.0-4.0	Silt/sand/woody debris	Dark brown/black	Petroleum-like odor	0.0-4.0	1.1

TABLE 2
Summary of Sediment Coring Observations
July 13 - 14, 2011

AECOM

July 2011 Sediment Investigation

Sample Location #	Core Depth (in)	Sediment type (silt, clay, sand, etc.)	Observations: Color	Observations: Odor Present	PID Reading Depth (in)	PID Reading (ppm)
23	0.0-2.0	Fine/medium sand/leaf litter/roots/small pebbles	Dark brown	None		
	2.0-9.0	Medium/coarse sand/gravel/sticks	Dark brown	None	0.0-6.5	5.5
	9.0	Possible Zinc chunk	Yellow	None		
	9.0-13.0	Fine sand/gravel	Grey/brown/rust colored streak at 11.0 in	None	6.5-13.0	4.8
29	0.0-1.0	Medium sand/organic material	Brown/black	None		
	1.0-3.5	Coarse sand	Tan	None	0.0-3.5	1.0
32	0.0-4.0	Fine sand/silt	Light brown	None	0.0-6.0	1.4
	4.0-12.0	Silt	Brown	Faint Petroleum-like odor	6.0-12.0	1.6
	12.0-14.0	Silt/fine sand	Brown	None		
	14.0-16.0	Fine sand	Tan	None		
	16.0-23.0	Silt/fine sand	Black	Petroleum-like odor	12.0-23.0	134.0
33	0.0-9.0	Fine sand	Brown	Faint Petroleum-like odor	0.0-6.0	1.2
	9.0-14.0	Silt/fine sand	Dark brown	Faint Petroleum-like odor	6.0-12.0	4.6
	14.0-17.0	Silt/fine sand	Light brown	None		
	17.0-24.0	Silt	Dark brown	Petroleum-like odor	12.0-24.0	188.0
34	0.0-5.0	Fine sand	Brown/dark brown	None	0.0-6.0	1.6
	5.0-10.0	Silt/fine sand	Dark brown	Petroleum-like odor		
	10.0-11.0	Silt	Dark brown/Olive brown	None		
	11.0	Chunk of Zinc like material	Yellow	Petroleum-like odor	6.0-12.0	5.0
	11.0-16.0	Silt	Olive brown	None	12.0-16.0	83.6
35	0.0-3.0	Coarse sand/gravel	Tan/brown	None		
	3.0-6.0	Fine sand	Black	Petroleum-like odor	0.0-6.0	2.0
	6.0-11.0	Sand/gravel	Brown	None	6.0-11.0	1.6
36	0.0-3.5	Coarse sand/eelgrass/root material	Tan/rust colored	None	0.0-6.0	1.9
	3.5-9.0	Silt/fine sand/organic material	Black	Faint Petroleum-like odor	6.0-12.0	3.3
	9.0-15.0	Medium sand/gravel	Dark brown	None	12.0-15.0	2.2
37	0.0-7.0	Silt/sand/roots/sticks/organics	Brown	None	0.0-6.0	5.7
	7.0-14.0	Silt/organics	Brown	None	6.0-12.0	76.0
	14.0-15.0	Fine sand	Tan/Light brown	Petroleum-like odor		
	15.0-31.0	Silt	Brown	None		
	27.0-28.0	Chunk of Zinc like material	Yellow	None	12.0-31.0	288.0

[illegible]LE 2
Summary of Sediment Coring Observations
July 13 - 14, 2011

July 2011 Sediment Investigation

Sample Location #	Core Depth (in)	Sediment type (silt, clay, sand, etc.)	Observations: Color	Observations: Odor Present	Observations: PID Reading Depth (in)	Observations: PID Reading (ppm)
38	0.0-2.0	Medium sand/silt/gravel/organic debris	Brown	None		
	2.0-2.5	Silt	Black	Petroleum-like odor		
	2.5-8.0	Silt/fine sand	Light brown	None	0.0-6.0	115.0
	8.0-11.5	Fine/medium sand/silt	Brown	None		
	11.5	1" gravel piece	Grey	None	6.0-12.0	1056.0
	11.5-15.0	Silt	Brown	Petroleum-like odor		
	13.0	Chunk of Zinc like material	Yellow	Petroleum-like odor		
	15.0-17.0	Fine/medium sand/silt/small gravel	Brown	None		
	17.0-21.0	Silt	Brown/black	Petroleum-like odor	12.0-21.0	44.8
39	0.0-3.0	Organics/sticks/leaves/roots	Brown	None	No PID	No PID
	3.0-9.0	Medium/coarse sand/gravel	Light brown/tan	None	No PID	No PID
	9.0-11.5	Medium/coarse sand/gravel	Dark brown	None	No PID	No PID
40	0.0-2.0	Sand/gravel/eelgrass/root material	Brown/green	None	No PID	No PID
	2.0-9.5	Coarse sand/gravel	Brown	None	No PID	No PID
42	0.0-5.0	Coarse sand/fine silt/plastic sheeting	Brown/black/yellow flecks	None	0.0-5.0	57.8