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September 15, 2011

Mr. James Haklar
USEPA
Region 2 – Raritan Depot
2890 Woodbridge Avenue
Mail Code: MS105
Edison, NJ 08837-3679

Subject: **Feasibility Study Field Work**
Polychlorinated biphenyl (PCB) Sampling and Analysis Work Plan
BASF Rensselaer, NY

Dear Mr. Haklar:

AECOM, on behalf of BASF Corporation (BASF), is pleased to provide you with the attached Polychlorinated Biphenyl (PCB) Sampling and Analysis Work Plan. This work plan provides the rationale and scope of work for proposed PCB sampling and analysis activities in the Hudson River adjacent to BASF's former manufacturing facility in Rensselaer, New York.

BASF has been conducting a remedial investigation (RI) of the Rensselaer Site under the direction of the New York State Department of Environmental Conservation (NYSDEC) since 2001. As part of the RI, BASF has completed several phases of Hudson River sediment characterization. Recently, the NYSDEC informed BASF that it considered the RI portion of the sediment project completed and directed BASF to initiate preparation of the Feasibility Study (FS) for the Hudson River sediment.

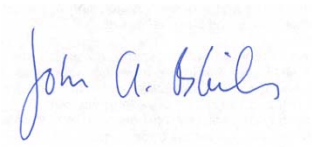
The FS will focus on the Hudson River sediment where the Site-related metals and volatile organic compounds (VOCs) have been found. This region of the river also contains elevated levels of PCBs, which both BASF and NYSDEC have concluded did not originate on the Site. However, the PCBs are located within the FS Study Area where remedial alternatives will be evaluated to address the metals and VOCs that are present at levels greater than NYSDEC sediment criteria. Therefore, supplemental information regarding the nature and extent of the PCBs is needed to allow compliance with the EPA's Toxic Substance Control Act (TSCA) regulations (40 CFR 761).

The attached work plan presents the scope of work that will be conducted to better characterize the extent to which PCBs are present in Hudson River sediment adjacent to the Site and to ensure that any PCBs that may be present in the sediment are managed in accordance with 40 CFR 761, if applicable. The attached work plan has been reviewed by NYSDEC, who indicated that they would defer to the USEPA regarding TSCA applicability.

BASF would like to complete the field work during the fall of 2011 (pending resolution of any forthcoming comments on the current submittal) and is hopeful that BASF, NYSDEC, and EPA can meet to discuss this work plan in the near future. If possible, we would like to schedule a meeting with you in the latter half of September 2011 so that we could complete the scope of work outlined in the attached Work Plan before inclement winter weather arrives.

Please do not hesitate to contact Mr. J. Douglas Reid-Green at BASF (908-507-8820) if you have any questions concerning the FS sampling and analysis activities outlined herein.

Sincerely yours,



John A. Bleiler .
Project Manager

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Nathan Epler, PhD (Roux Associates)

AECOM Environment

Prepared for:
BASF Corporation
Florham Park, NJ

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60135950
September 2011

Hudson River Operable Unit 2
PCB Sampling and Analysis Work Plan
BASF Rensselaer
Rensselaer, New York

Submitted to NYSDEC: June 15, 2011

Updated for EPA Submittal: September 15, 2011

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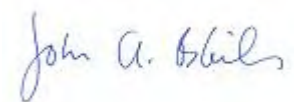

Prepared By John Bleiler

Reviewed By Mark Gerath

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1.0 Introduction

The BASF Corporation (BASF) has been conducting a remedial investigation (RI) of its former manufacturing facility in Rensselaer, New York (the Site; Figure 1) under the direction of the New York State Department of Environmental Conservation (NYSDEC) since 2001. As part of the RI, BASF has conducted soil and groundwater sampling in the uplands portion of the Site and, based on the results of the RI, has implemented a number of remedial actions including soil removal, installation of a groundwater treatment system, and construction and maintenance of engineering controls.

The RI has also included several phases of Hudson River sediment characterization, including collecting and analyzing several hundred sediment, samples, and performing benthic surveys and toxicity tests. All of the sediment RI has been conducted pursuant to work plans approved by the NYSDEC, and all of the results have been provided to the NYSDEC for its review and comment. Recently, the NYSDEC informed BASF that it considered the RI portion of the sediment project completed and directed BASF to initiate preparation of the Feasibility Study (FS) for the Hudson River sediment.

The sediment RI has found both metals and volatile organic compounds (VOCs) at levels greater than NYSDEC sediment quality criteria in sediment adjacent to the Site. Based on knowledge of historical operations at the Site, it has been concluded that the VOCs and at least a portion of the metals found in sediment adjacent to the Site originated from historic process wastewater discharges from historic Site production sewer lines. These discharges ended in 1973 when two wastewater treatment lagoons and a process wastewater treatment system were constructed and the production sewer lines were closed. No discharges of Site-related constituents from the former production sewers to the river occurred after construction of the wastewater treatment system.

The FS will focus on the Hudson River sediment where the Site-related metals and VOCs have been found. In general, this is the area immediately adjacent to and downstream of the Site (the “FS Study Area”; Figure 2). Previous reports referred to these adjacent and downstream areas as the “Adjacent Nearshore” and “Upper Navigation Channel” areas, respectively.

Sediment sampling conducted adjacent to the Site by another entity, the Empire Generating Project, in 2008 as part of the installation of an outfall in the Hudson River, found polychlorinated biphenyls (PCBs) in some samples at concentrations greater than 50 milligrams per kilogram (mg/kg). As discussed in greater depth in a later section of this work plan, the New York State Department of Environmental Conservation (NYSDEC) has concluded that the PCBs did not originate on the Site. However, the PCBs are located within the FS Study Area where remedial alternatives will be evaluated to address the metals and VOCs that are present at levels greater than NYSDEC sediment criteria. Therefore, supplemental information regarding the nature and extent of the PCBs is needed to allow compliance with the EPA’s Toxic Substance Control Act (TSCA) regulations (40 CFR 761).

This work plan presents the scope of work that will be conducted to better characterize the extent to which PCBs are present in Hudson River sediment adjacent to the Site and to ensure that any PCBs that may be present in the sediment are managed in accordance with 40 CFR 761, if applicable. The supplemental sampling for PCBs will be conducted in the FS Study Area.

2.0 Background

2.1 Sediment Investigations

BASF has conducted four phases of sediment investigation in the Hudson River adjacent to, upstream, and downstream of the Site. Additional sediment samples were also collected by representatives of the Empire Generating Project (Empire), the developer of a cogeneration facility on an adjacent property. A brief summary of the investigations and results is presented below.

1. An initial screening level investigation of Hudson River sediment was conducted by BASF in May 2004 at the direction of the NYSDEC. The intent of the sampling was to characterize sediment quality in the vicinity of three historic industrial sewer outfalls and two active municipal storm sewer outfalls located adjacent to the Site (Figure 3). The sampling was conducted pursuant to a work plan approved by the NYSDEC. A limited number of sediment samples were collected, and the results of the sampling found several VOCs and metals at levels greater than NYSDEC sediment screening criteria (Roux Associates, 2004).
2. Based on the results of the 2004 investigation, a second phase of sampling was conducted in the winter of 2005 through the spring of 2006. This investigation was conducted pursuant to a work plan approved by the NYSDEC. The investigation consisted of conducting bathymetric and geophysical studies, collecting surface water and sediment samples in several areas adjacent to, downstream of and upstream of the Site, and conducting a benthic macroinvertebrate community characterization. Similar to the results of the initial sediment screening investigation, VOCs and metals were found in sediment adjacent to the Site at levels greater than NYSDEC sediment screening criteria (ENSR-AECOM, 2007).
3. A third phase of sediment investigation was conducted in the winter of 2007/2008. The investigation was conducted in accordance with a work plan approved by the NYSDEC. The scope of work included collection of additional sediment samples to address data gaps identified following the 2005 – 2006 investigation as well as conducting chronic duration sediment toxicity tests at a number of locations. The results of the investigation found that VOCs were present in sediment at levels greater than NYSDEC sediment screening criteria in sediment immediately adjacent to the Site, and that metals were present at levels greater than NYSDEC sediment screening criteria in sediment adjacent to and immediately downstream of the Site. The investigation concluded that there were areas of benthic impairment due to potential exposures to VOCs and metals (AECOM, 2009). The report to the NYSDEC recommended some additional limited characterization activities designed to support the FS and a supplemental work plan was provided to the NYSDEC.
4. While the results of the 2007/2008 sediment investigation were being evaluated and a report and supplemental work plan were being prepared for submission to the NYSDEC, the developer of a cogeneration facility on an adjacent property conducted a limited sediment investigation designed to characterize sediment that would be removed during installation of an outfall pipe in the Hudson River adjacent to the Site. Empire collected nine sediment samples from three sediment cores located to the south of an area in which Empire intended to install a process outfall from the cogeneration facility (Figure 4).

   Similar to the results of the investigations conducted by BASF, Empire found VOCs and metals at levels greater than NYSDEC sediment screening criteria. However, Empire also

found PCBs at levels above the NYSDEC sediment screening criteria, and in three of the nine samples, the PCBs were found at levels greater than 50 mg/kg. The sole PCB mixture in the samples was Aroclor 1242. The concentrations of the PCBs in the sediment samples collected by Empire ranged from less than the detection limit to 220 mg/kg (Figure 5). Empire provided the results of its investigation to BASF in early 2009 and BASF reported these results to the NYSDEC shortly thereafter.

5. BASF began implementation of the supplemental sampling designed to support the FS in fall of 2009. The effort included collecting an additional 108 sediment samples and analyzing the samples for VOCs and metals. Based on the results of the Empire investigation, it was understood that the NYSDEC would require a portion of the samples to also be analyzed for PCBs, so separate aliquots of the sediment samples were frozen and archived for possible future PCB analysis. In March 2010, the NYSDEC provided direction that 64 of the archived samples were to be analyzed for PCBs. The samples included both surficial sediment as well as samples from as deep as 8 – 10 feet and 10 – 12 feet (Figure 6).

The results of the additional sediment characterization, including the PCB results, were presented to the NYSDEC in a Sediment Nature and Extent Summary Report (AECOM, 2011). As presented to the NYSDEC, the PCB data supported several conclusions:

- The dominant PCB mixture in sediment is Aroclor 1242.
- Aroclor 1254 and Aroclor 1260 are present but at much lower frequencies and concentrations.
- Aroclor 1242 was found at concentrations ranging from less than the method detection limit of 44 micrograms per kilogram (µg/kg) to a maximum of 190 mg/kg.
- PCBs were found at levels greater than 50 mg/kg in three of the 64 sediment samples:
  - Two of nine samples collected from the 0.5 – 2 foot interval, and
  - One sample collected from the 2 – 4 foot interval.
- No samples collected from the 0 – 0.5 foot interval or deeper than four feet contained PCBs at levels greater than 50 mg/kg.

Based on the results reported by Empire and the results of the 2009 investigation conducted by BASF, it can be concluded that PCBs are present in sediment adjacent to the Site. Figure 7 provides a summary of all PCB sediment data collected by BASF and reported by Empire.

2.2 Source of PCBs in Sediment

After Empire reported its results to BASF and the regulatory agencies, BASF conducted a detailed evaluation of the Site history and the data that had been collected in the uplands portion of the Site since initiation of the RI in 2001. An initial submission regarding the source of the PCBs was provided to the NYSDEC in March 2009 and a supplemental submission was provided to the NYSDEC in November 2010 in response to a NYSDEC request for additional information. In summary, BASF concluded that the PCBs did not originate on the Site based on several lines of evidence:

- There is no history of use of PCBs at or delivery of PCBs to the Site. A complete review of operational and material inventory files was conducted, and it was determined that PCBs were not used in any process, technology or treatment system at the Site.

- Upland soil sampling conducted as part of the RI found little evidence of PCB contamination. Three-quarters of the samples collected contained no detectable PCBs and, where PCBs were found in soil, the average concentration of total PCBs was approximately 0.5 mg/kg, and the highest concentration of PCBs was 3.9 mg/kg. Aroclor 1242, the dominant mixture in the sediment, was detected in only one soil sample at a concentration of 0.026 mg/kg.
- Samples of sludge from the former lagoons that are presumed to be the source of the VOCs and a portion of the metals found in sediment did not contain PCBs at elevated levels. Concentrations of Aroclor 1242 and Aroclor 1254 were both approximately 0.5 mg/kg in these sludge samples.
- Because the PCBs are not Site-related, there is no reason to believe that there is any relationship between PCB concentrations and VOC concentrations in river sediment. The VOCs are found in relatively consistent levels throughout much of the nearshore sediment while, as stated previously, the PCB concentrations vary widely both horizontally and vertically.
- The Hudson River database shows that Aroclor 1242 is present at elevated concentrations both upstream and downstream of the Site.

Based on the above lines of evidence, the NYSDEC (in a July 2011 letter) concurred with BASF's conclusion that the Site was not the source of the PCBs. A copy of the NYSDEC letter is included as Appendix A.

2.3 Objectives of PCB Work Plan

As stated in the NYSDEC July 2011 letter;

"The Department will require BASF to properly characterize and remediate PCB contaminated sediment that is comingled with contamination that is caused by its operations…".

Based on review of the existing PCB sediment data, there are three primary objectives that must be achieved in order to comply with the NYSDEC's requirement:

1. In areas of the FS Study Area where remedial actions may be needed to address Site-related VOCs and metals, the extent to which PCBs are present at levels greater than 50 mg/kg must be defined so that the material can be properly managed pursuant to 40 CFR 761;
2. A better understanding of the distribution of PCBs in Northern FS Study Area (i.e., sediments immediately adjacent to the Site), where the VOCs are present, is needed to provide the information needed for TSCA compliance; and
3. Data are needed in the Southern FS Study Area in order to ensure that the sediment is properly managed.

As discussed further in this work plan, the investigation will provide adequate data to support these three objectives.

2.4 Overview of Proposed PCB Sampling and Analysis Activities

The following proposed PCB sampling and analysis activities are described in this Work Plan:

- Sampling and analysis of sediment from surficial and sub-surficial sediment throughout the Northern FS Study Area (n = approximately 315 samples); and
- Sampling and analysis of surficial sediment samples from the Southern FS Study Area (n = approximately 17 samples).

These data, in conjunction with the PCB data collected during prior sediment investigations, will provide the information necessary to help characterize the nature and extent of PCB impacts for use in the FS alternatives analysis and report. It is anticipated that the PCB sampling and analysis described in this Work Plan will be conducted in the fall of 2011.

Proposed sampling station locations are depicted on Figure 8 and described below. The actual sampling locations may be slightly modified based on conditions encountered in the field and any recommendations provided by EPA Region 2 prior to field program initiation.

The sampling program has been designed using triangular grid nodes on 80-foot centers in the Northern FS Study Area and 160-foot centers in the Southern FS Study Area. This sampling frequency will provide the level of characterization needed to meet the stated objectives and support the FS. Further, BASF understands that EPA Region 2 has previously approved a similar sampling program at a large upstream Hudson River PCB site. This approved characterization program included PCB mapping using an 80 foot-on-center grid for high resolution nature and extent determination, and a 160 foot-on-center grid for lower resolution mapping efforts.

To meet the objectives of this investigation, a total of 91 locations will be sampled in the FS Study Area (Figure 8).

2.4.1 Northern FS Study Area

Sediment cores will be collected at up to 74 locations within the Northern FS Study Area. Given the presence of VOCs and metals throughout this area, this portion of the FS Study Area has been gridded with sampling locations on 80-ft triangular centers. This gridded spacing represents a high density sampling design to determine the distribution of PCBs in the sediment. The proposed depth of coring at each sampling location has been determined based on existing sediment quality data reported in the Nature and Extent Report: VOCs and selected inorganic compounds are known to occur in sub-surficial sediment in this portion of the river, especially near the historic outfalls, and the cores will be advanced to encompass depths of known VOC impacts.

Based on the VOC data presented in the 2011 Nature and Extent Report, sediments within the Northern FS Study Area will sampled for PCBs to the following depths, as depicted in Figure 8:

- Northern Nearshore: Cores to 4.0 ft
- Northern Outfalls: Cores to 8.0 ft
- Central Nearshore: Cores to 12.0 ft
- Southern Outfall Area: Cores to 8.0 ft

2.4.2 Southern FS Study Area

Up to 17 surficial grab samples (0 to 6 inches [0 to 15 cm]) will be collected in the Southern FS Study Area (i.e., the Upper Navigational Channel). This portion of the FS Study Area has been gridded with sampling locations on 160-ft triangular centers. This gridded spacing was selected because it is unknown whether the Site has impacted this area. The Southern FS Study Area is not known to contain VOCs (the primary benthic risk driver) and is characterized by a thin layer of sediment atop an area that has been historically dredged for navigational purposes.

Cores and grabs will be collected via boat-mounted vibracoring (or drilling) and grab equipment with an assumed depth of up to 12-ft below sediment surface as the target depth. Within each core, samples will be collected at 2-ft intervals down to 12-ft (up to six samples per station). Each sample will be analyzed for PCB Aroclors (EPA Method SW-846 8082A) and total organic carbon (TOC) (method of Lloyd Kahn). Columbia Analytical Services (CAS) of Rochester, NY will conduct the sediment analyses. Laboratory detection limits, method specific sampling requirements and QA/QC procedures are presented in the 2011 QAPP Tables (Appendix B).

2.4.3 Sampling and Analysis Procedures

The text presented in this work plan provides a concise summary of the field effort. Detailed descriptions of methods for sediment sampling (coring and grab sampling), documenting field conditions (e.g., log books, sample sheets, photographs), sample numbering, chain of custody, sample packaging and shipping, and collection and handling of Investigation-Derived Wastes (IDW) have been previously presented in the NYSDEC-approved Work Plan for the Hudson River OU-2 Investigation (ENSR, 2007), and are summarized in this section. The sampling tasks will be supported by the existing Quality Assurance Project Plan (QAPP; ENSR, 2005) and an updated QAPP Addendum (presented as Appendix B to this work plan). The field program will also be conducted under the existing Health and Safety Plan (HASP), which will be reviewed, updated, and modified as appropriate.

Data Quality Objectives

The Data Quality Objectives (DQOs) for the proposed investigation were developed using the EPA's DQO process, a multi-step, iterative process that ensures that the type, quantity, and quality of environmental data used in the decision making process are appropriate for its intended application. Appendix B presents the analytical chemistry DQOs.

Sediment Sampling Procedures

Discrete surficial sediment samples will be collected using a petit ponar dredge, pole-mounted Ekman grab sampler, Ted Young dredge, vibracore barrel, a gravity-corer, or equivalent depending upon specific sampling-station characteristics in accordance with Section 3.2 of the USEPA's (2001) Method for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analysis: Technical Manual. Sub-surface samples will be collected using a vibracore sampling device and will target cores from 2-foot interval horizons at each sampling station.

Surficial sediment will be collected from the upper 0 to 15 cm horizon. Generally, this is the sediment horizon of interest as it contains the most recently deposited sediments and the most epifaunal and infaunal organisms are found within this horizon (USEPA, 2001).

The appropriate sediment horizon (either surface or sub-surface) will be removed from the appropriate sampling device using a stainless steel spoon/scoop and placed in a decontaminated 1-gallon stainless steel or Pyrex glass mixing bowl. Each sample will be visually examined for physical characteristics such as composition, layering, odor, and discoloration. The sample will be homogenized in the mixing bowl and placed in appropriate sample containers. Sediment sampling equipment such as bowls, spoons, augers, and dredges will be decontaminated prior to and following sample collection as described below.

The sample containers will be labeled using the label code described in the earlier QAPP. Sample container, preservation, and holding time requirements are provided in Appendix B. Field notebooks and sample collection forms will be used to record pertinent data while sampling. The time of sampling will be recorded on each pre-labeled bottle. All samples will be stored on ice (at 4°C), packed in coolers, and shipped under chain of custody for laboratory analysis

The collection of sample duplicates will be consistent with the procedures outlined above for sediment sample collection. Other field QC samples will be collected as described in the QAPP (ENSR, 2005). Sample depth will be recorded for each sampling location along with sample station positioning using GPS. Data validation will be performed as specified in the QAPP (ENSR, 2005).

Decontamination

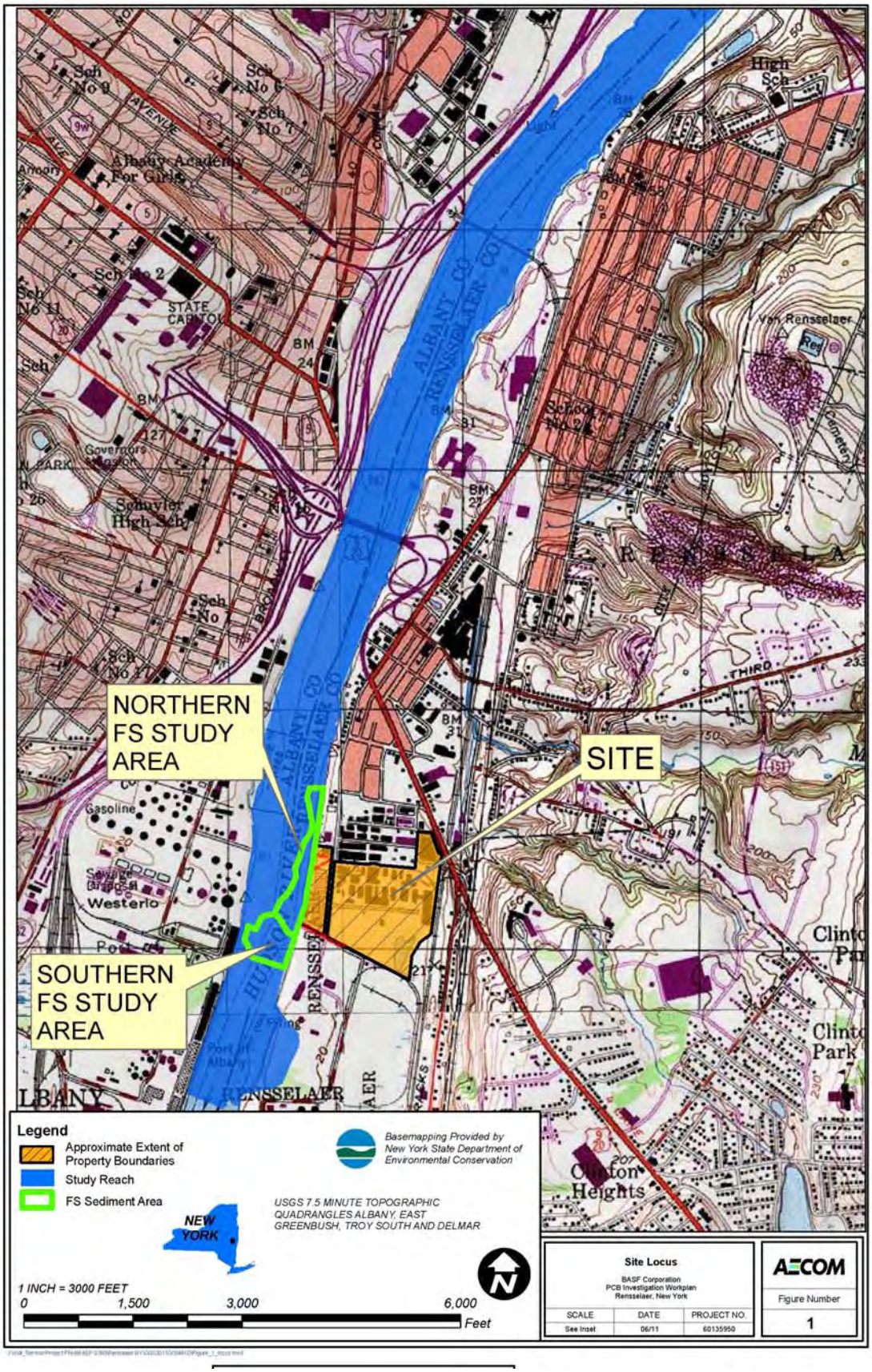
Sampling equipment (e.g., petit ponar, stainless spoons, stainless bowls, etc.) will be decontaminated prior to sampling and between samples. Cleaning of equipment is performed to prevent cross-contamination between samples and to maintain a clean working environment for all personnel. Decontamination will generally consist of a station river water rinse to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Alconox) water rinse, a rinse with deionized water, and followed by another a river station water rinse. If equipment is to be stored or transported, it will be wrapped in aluminum foil after air-drying. Water generated during decontamination of sampling equipment will be containerized and disposed of appropriately.

Personnel decontamination is discussed in the HASP.

3.0 Summary

In summary, BASF proposes to collect approximately 332 surficial and sub-surficial sediment samples from the Hudson River adjacent to the Site in order to characterize the nature and extent of PCB aroclor impacts for use in the FS alternatives analysis and report. In addition, each sample will also be evaluated for VOCs and TOC. This work is currently scheduled to be completed in the fall of 2011 and will commence upon EPA Region 2 approval.

Figures


NORTHERN FS STUDY AREA
SITE
SOUTHERN FS STUDY AREA
Legend
Approximate Extent of Property Boundaries
Study Reach
FS Sediment Area
Basemapping Provided by New York State Department of Environmental Conservation
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES ALBANY, EAST GREENBUSH, TROY SOUTH AND DELMAR
NEW YORK
1 INCH = 3000 FEET
0
1,500
3,000
6,000
Feet
Site Locus
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Rensselaer, New York
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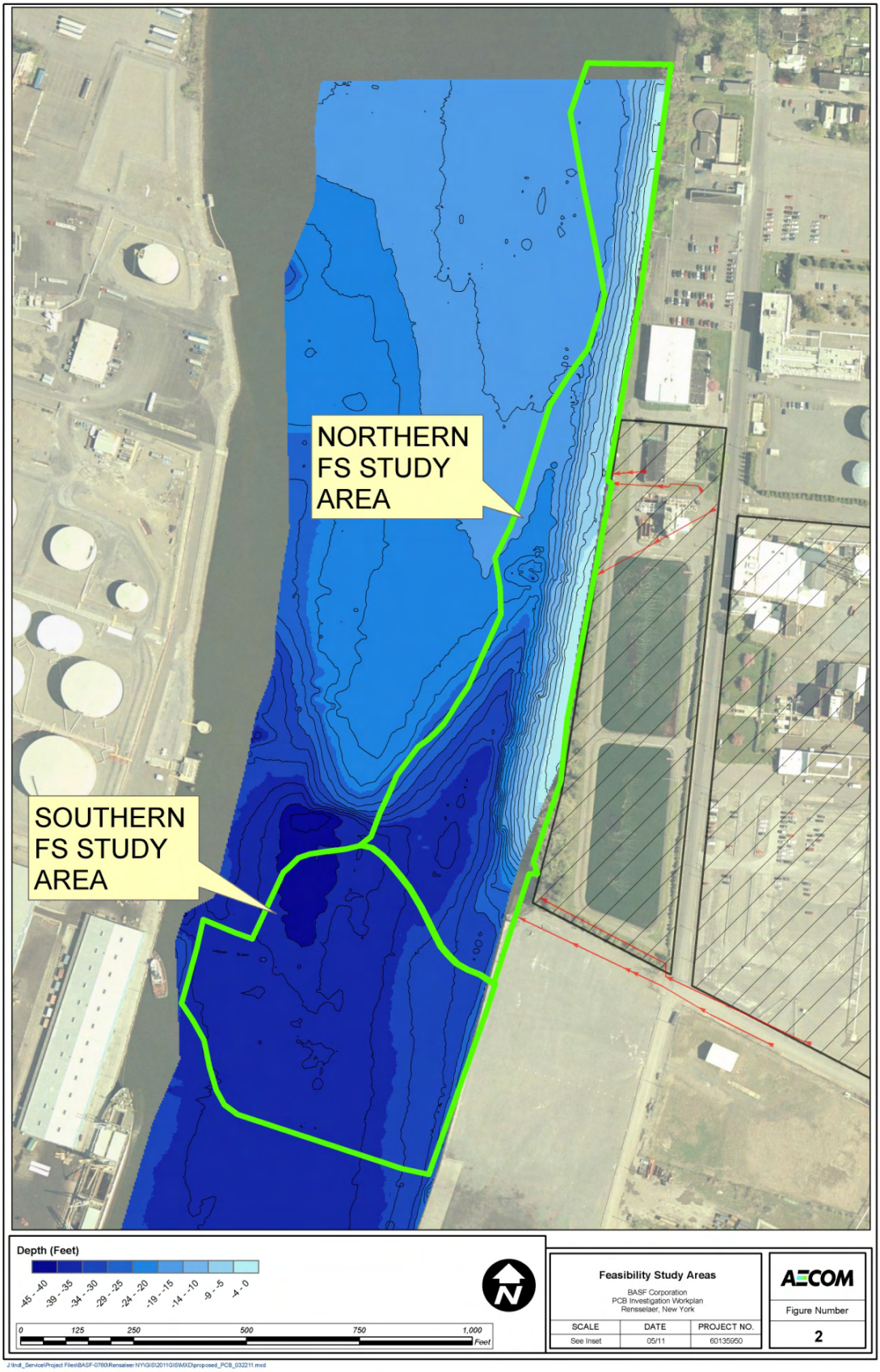
NORTHERN FS STUDY AREA
SOUTHERN FS STUDY AREA
Depth (Feet)
-45 - -40
-39 - -35
-34 - -30
-29 - -25
-24 - -20
-19 - -15
-14 - -10
-9 - -5
-4 - 0
0
125
250
500
750
1,000
Feet
Feasibility Study Areas
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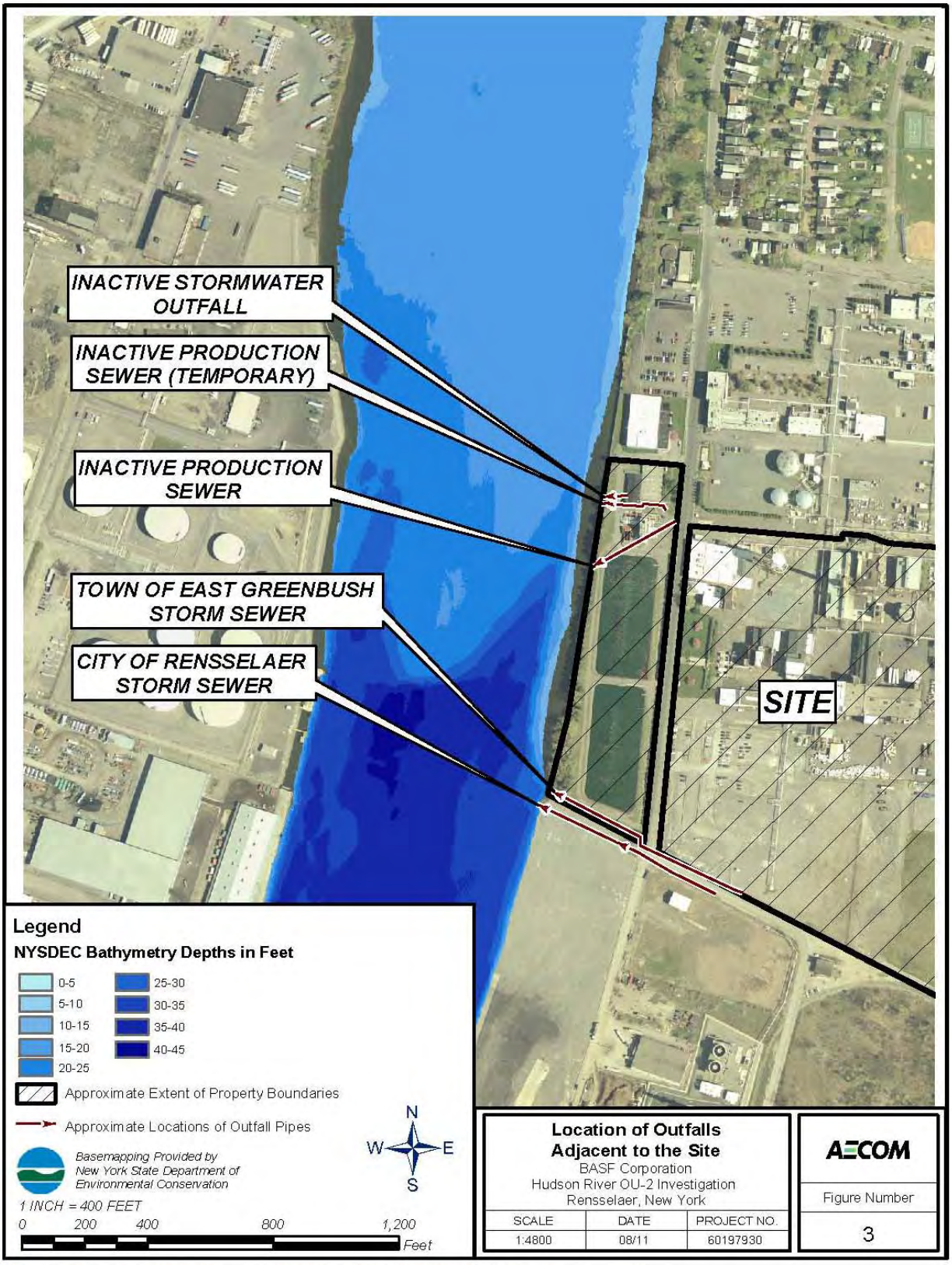

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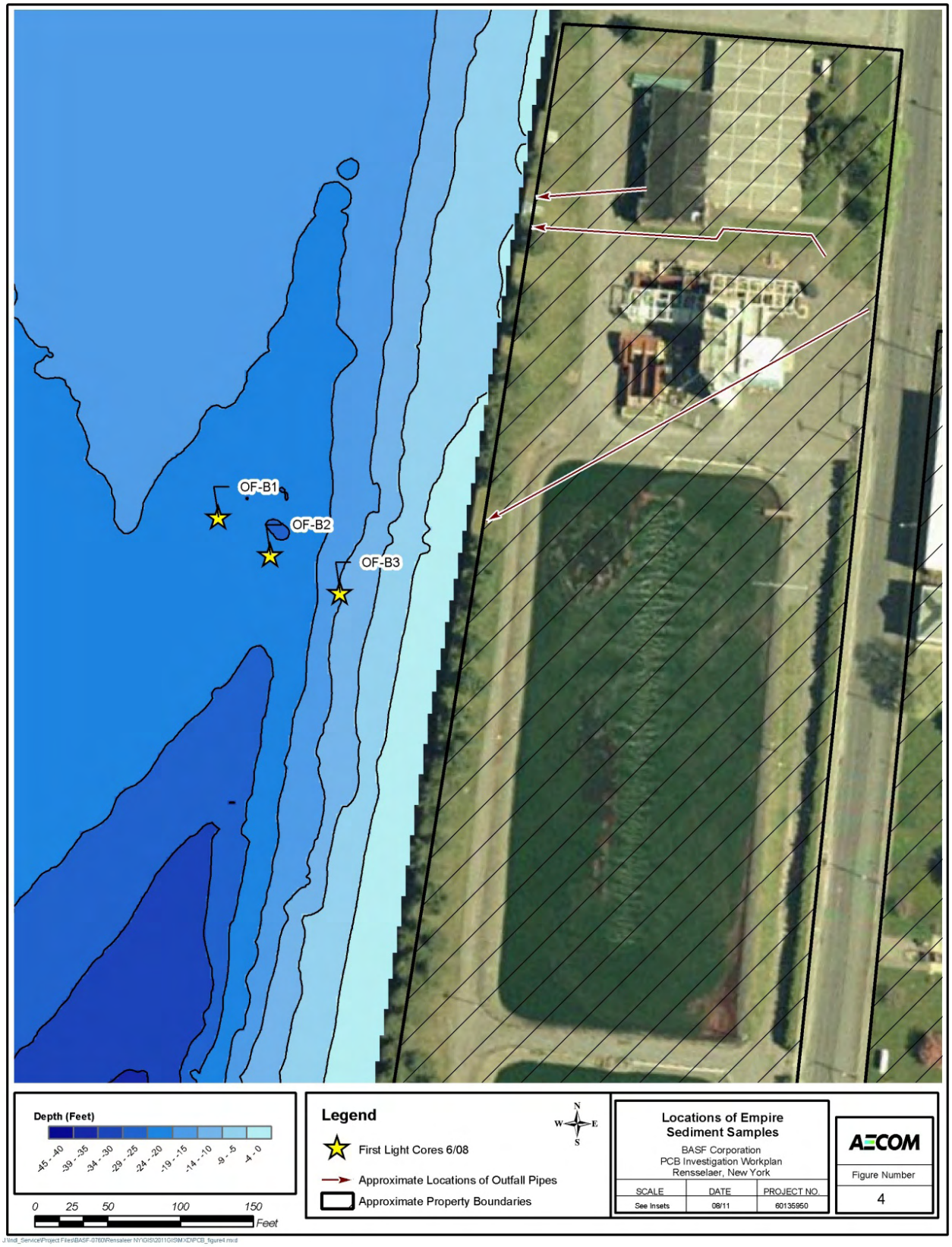
OF-B1
OF-B2
OF-B3
Depth (Feet)
-45 - -40
-39 - -35
-34 - -30
-29 - -25
-24 - -20
-19 - -15
-14 - -10
-9 - -5
-4 - 0
0 25 50 100 150
Feet
Legend
First Light Cores 6/08
Approximate Locations of Outfall Pipes
Approximate Property Boundaries
N
W E
S
Locations of Empire Sediment Samples
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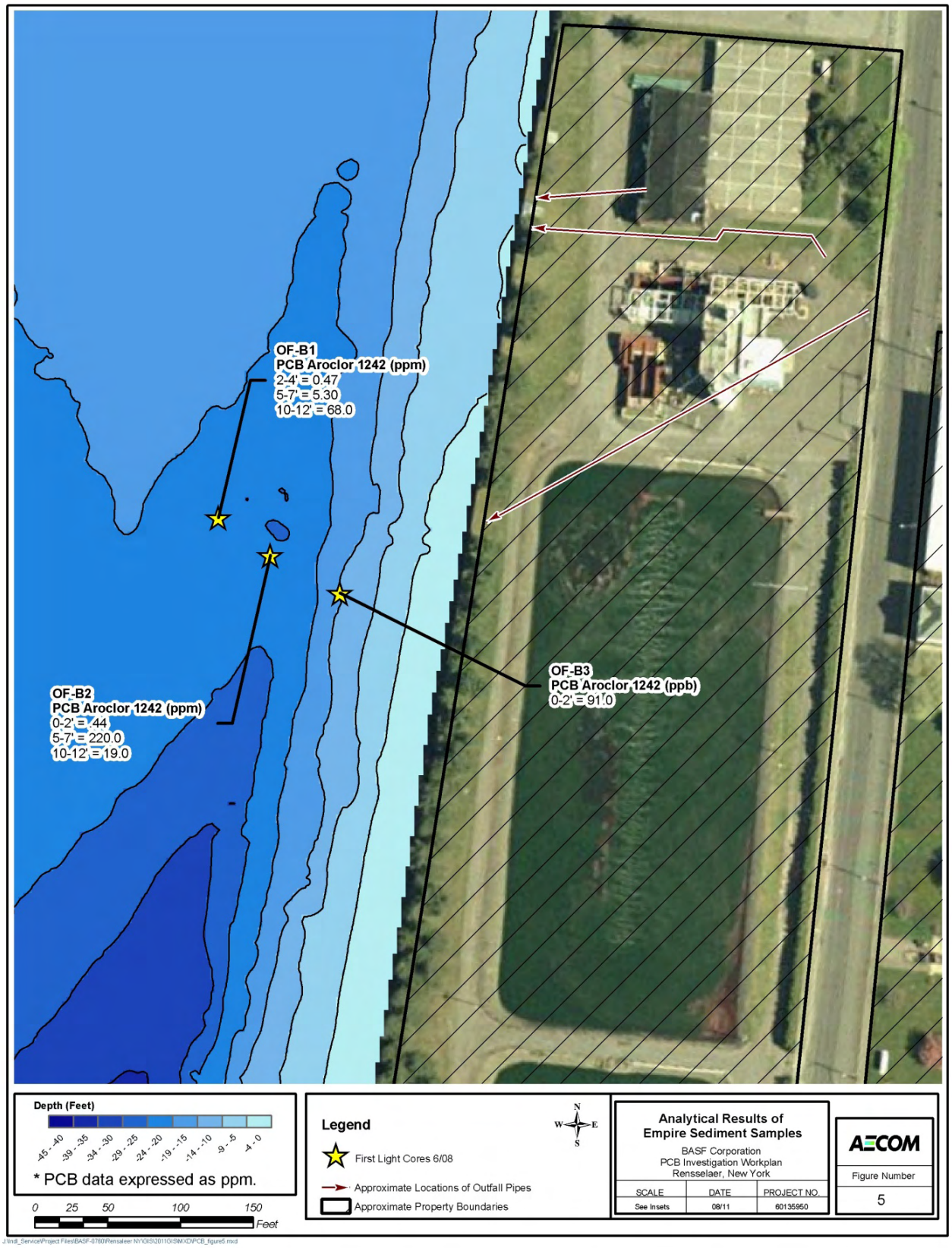

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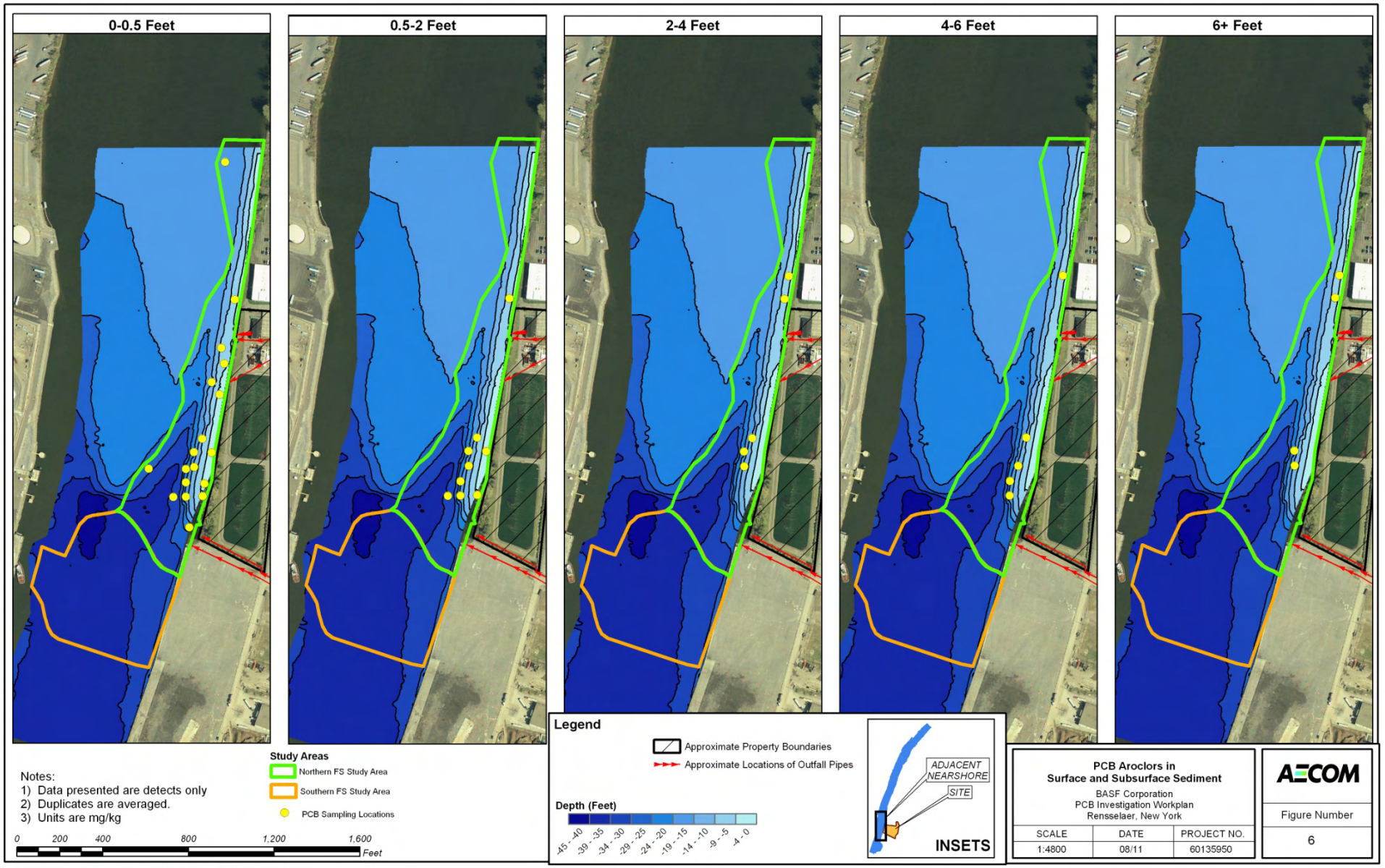
0-0.5 Feet
0.5-2 Feet
2-4 Feet
4-6 Feet
6+ Feet
Notes:
1) Data presented are detects only
2) Duplicates are averaged.
3) Units are mg/kg
Study Areas
Northern FS Study Area
Southern FS Study Area
PCB Sampling Locations
0 200 400 800 1,200 1,600
Feet
Legend
Approximate Property Boundaries
Approximate Locations of Outfall Pipes
Depth (Feet)
-45 - -40
-39 - -35
-34 - -30
-29 - -25
-24 - -20
-19 - -15
-14 - -10
-9 - -5
-4 - 0
ADJACENT NEARSHORE
SITE
INSETS
PCB Aroclors in
Surface and Subsurface Sediment
BASF Corporation
PCB Investigation Workplan
Rensselaer, New York
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08/11
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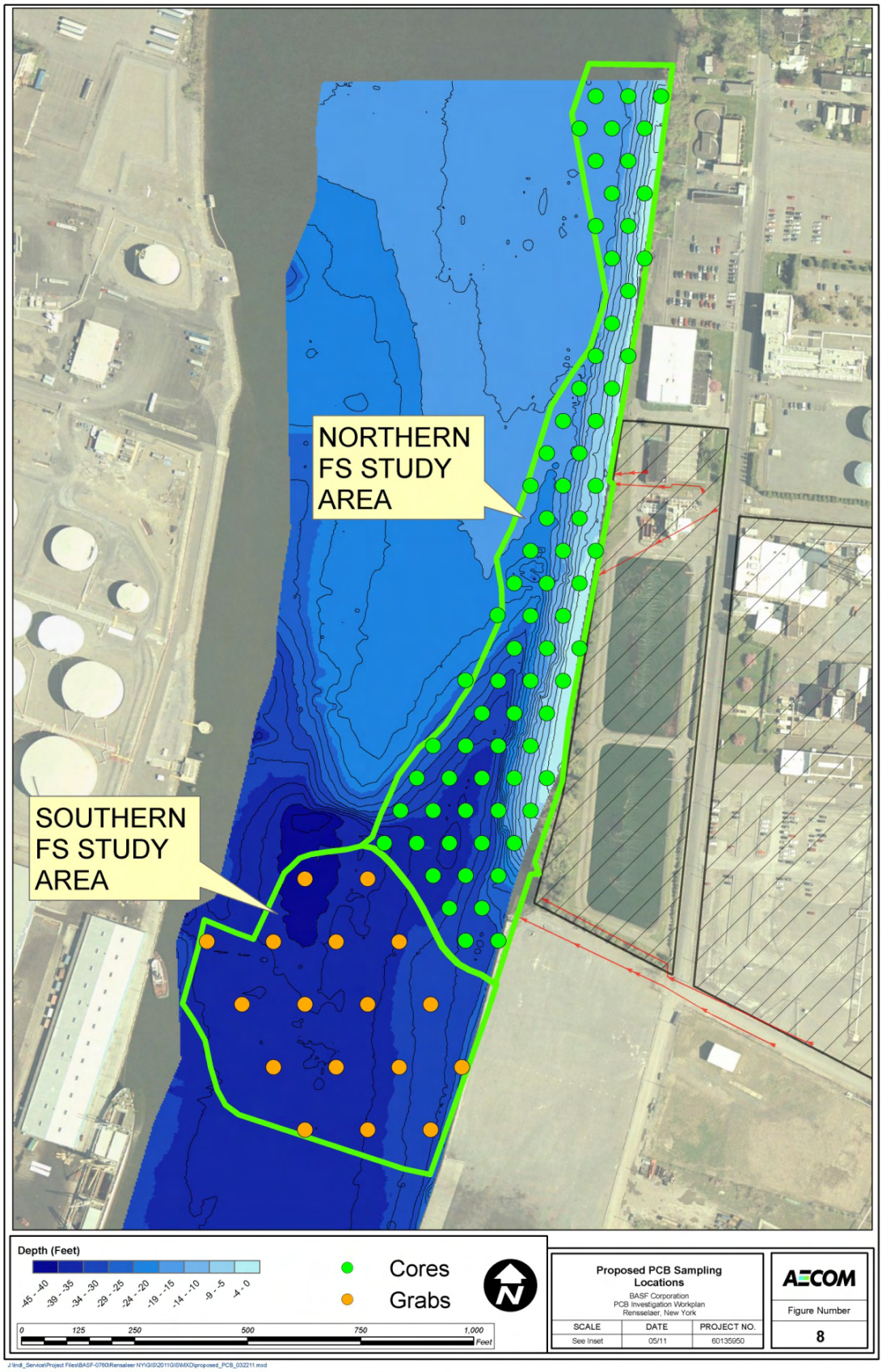
0-0.5 Feet
0.5-2 Feet
2-4 Feet
4-6 Feet
6+ Feet
SD163 Aroclor 1242 = 0.15
SD35X Aroclor 1242 = 1.2 Aroclor 1254 = 0.24
SD151 Aroclor 1242 = 16 Aroclor 1260 = 15
SD180 Aroclor 1242 = 0.17
SD154 Aroclor 1242 = 11 Aroclor 1254 = 2.2
SD150 Aroclor 1242 = 0.43 Aroclor 1254 = 0.14
OF-B2 (0-2 ft) Aroclor 1242 = 0.44
OF-B3 (0-2 ft) Aroclor 1242 = 91
SD165 Aroclor 1242 = 1.6
SD173 Aroclor 1242 = 20
SD169 Aroclor 1242 = 35
SD138 Aroclor 1242 = 0.3 Aroclor 1254 = 0.07
SD174 Aroclor 1242 = 0.35 Aroclor 1254 = 0.11
SD175 Aroclor 1242 = 22 Aroclor 1254 = 3.5
SD171 Aroclor 1242 = 0.43 Aroclor 1254 = 0.15
SD170 Aroclor 1242 = 0.31 Aroclor 1254 = 0.1
SD159 Aroclor 1242 = 0.21 Aroclor 1254 = 0.08
SD167 Aroclor 1242 = 0.55
SD168 Aroclor 1242 = 2
SD172 Aroclor 1242 = 0.26 Aroclor 1254 = 0.11
SD35X Aroclor 1242 = 0.12
SD165 Aroclor 1242 = 120
SD167 Aroclor 1242 = 13
SD173 Aroclor 1242 = 61 Aroclor 1254 = 11
SD168 Aroclor 1242 = 45
SD174 Aroclor 1242 = 13
SD175 Aroclor 1242 = 0.78
SD171 Aroclor 1242 = 3.5
SD172 Aroclor 1242 = 0.72
SD178 Aroclor 1242 = 0.09
SD35X Aroclor 1242 = 0.06
OF-B1 Aroclor 1242 = 0.47
SD165 Aroclor 1242 = 190
SD173 Aroclor 1242 = 0.06
SD168 Aroclor 1242 = 0.7 Aroclor 1254 = 0.11
SD178 Aroclor 1242 = 0.14
SD165 Aroclor 1242 = 14 Aroclor 1254 = 3.1
SD168 Aroclor 1242 = 0.25
SD174 Aroclor 1242 = 0.09
SD171 Aroclor 1242 = 0.07
SD178 (6-8 ft) Aroclor 1242 = 0.21
SD35X (8-10 ft) Aroclor 1242 = 0.08
SD35X (10-12 ft) Aroclor 1242 = 0.14
OF-B1 (5-7 ft) Aroclor 1242 = 5.3
OF-B1 (10-12 ft) Aroclor 1242 = 68
OF-B2 (5-7 ft) Aroclor 1242 = 220
OF-B2 (10-12 ft) Aroclor 1242 = 19
SD173 (6-8 ft) Aroclor 1242 = 0.41 Aroclor 1254 = 0.09
SD168 (8-10 ft) Aroclor 1242 = 0.13 Aroclor 1254 = 0
PCB Concentrations (mg/kg)
<1
<5
<10
<25
<50
>50
Study Year
2001
2008
2009
Notes:
1) Data presented are detects only
2) Duplicates are averaged.
3) Units are mg/kg
4) Date are unvalidated
Study Areas
Northern FS Study Area
Southern FS Study Area
0 200 400 800 1,200 1,600
Feet
Legend
Geophysical Data
Cobble
Gravelly Sand
Mud
Muddy Sand
Sandy Mud
Sand
Approximate Property Boundaries
Approximate Locations of Outfall Pipes
ADJACENT NEARSHORE
SITE
INSETS
PCB Aroclors in Surface and Subsurface Sediment
BASF Corporation
PCB Investigation Workplan
Rensselaer, New York
SCALE 1:4800
DATE 08/11
PROJECT NO. 60135950
AECOM
Figure Number
7
J:\Indl_Service\Project Files\BASF-0760\Rensaleer NY\GIS\2011GIS\MXD\PCB_figure7.mxd


NORTHERN FS STUDY AREA
SOUTHERN FS STUDY AREA
Depth (Feet)
-45 - -40
-39 - -35
-34 - -30
-29 - -25
-24 - -20
-19 - -15
-14 - -10
-9 - -5
-4 - 0
Cores
Grabs
0
125
250
500
750
1,000
Feet
Proposed PCB Sampling Locations
BASF Corporation
PCB Investigation Workplan
Rensselaer, New York
SCALE
See Inset
DATE
05/11
PROJECT NO.
60135950
AECOM
Figure Number
8

Appendix A

NYSDEC PCB Letter – 07/12/2011

New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway, Albany, New York 12233-1500
Fax: (518) 402-9018 or (518) 402-9019
Website: www.dec.ny.gov

Joe Martens
Commissioner

July 12, 2011

Nan Bernardo, Esq.
Senior Environmental Counsel
BASF Corporation
100 Campus Drive
Florham Park, NJ 07932

Re: BASF Manufacturing Plant, Site No. 442027, Rensselaer
PCBs in Hudson River Sediment

Dear Nan:

This letter is a response to BASF's request for the Department's position on BASF's responsibility for PCBs that have been found in Hudson River sediment adjacent to the former Rensselaer facility.

In forming our position, the Department has reviewed a March 31, 2009 letter and attached materials from Roux Associates, a November 8, 2010 letter and attached materials from you in response to my request for additional information, and the various sediment data that has been collected during investigations of the Hudson River as part of Operable Unit 2 for the BASF Manufacturing Plant site.

As a result of our review, the Department has found no evidence to date which indicates that BASF used or disposed of PCBs during the history of industrial practices at the Rensselaer facility. Accordingly, the Department will limit BASF's investigation and remediation of PCBs to those areas of Hudson River sediment that are co-located with contamination from BASF's operations. The Department will require BASF to properly characterize and remediate PCB contaminated sediment that is commingled with contamination caused by its operations, but BASF will only be required to continue remediation until remedial obligations are achieved, as determined by the Department, for the contamination caused by BASF-related operations. Please note that our position is based on information known to the Department at this time, and our position is subject to change based on discovery of new information or unknown conditions.

The Department is currently reviewing work plans submitted by BASF, including a PCB Sampling and Analysis Work Plan, and the Department will contact BASF under separate cover responding to such work plans.

Nothing herein waives any of the Department's rights and the Department expressly reserves all rights with respect to BASF and any other party under applicable law.

Very Truly Yours,

Andrew Guglielmi

ec: Doug Reid-Green, BASF
John Strang, DEC

Appendix B

QAPP and QAPP Addendum Tables

Table 1. Field and Laboratory QC

QC Sample	Field Duplicate	MS/MSD	LCS/LCSD	MS/MSD	LCS/LCSD	Surrogate Spikes	Laboratory Method Blanks	Equipment Rinsate Blanks	Cooler Temperature Blanks
DQI	**Precision**			**Accuracy - Bias**			**Accuracy-Bias/Contamination**		**Accuracy-Bias/Preservation**
PCB - aroclors	RPD ≤ 50% if both sample and duplicate are >5x RL	RPD ≤ 30%	RPD ≤ 30%	Lab Limits	Lab Limits	Lab Limits	Target analytes < RL	Target analyte < RL	4°C ± 2°C
TOC		RPD ≤ 30%	RPD ≤ 30%	39-144%	75-125%	NA	Target analyte < RL	Target analyte < RL	

Notes:

*	< 5x RL for common laboratory contaminants
DQI	Data Quality Indicator
NA	Not applicable
RL	Reporting limit
MS/MSD	Matrix spike/matrix spike duplicate
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate

Table 2. Project Action Limits[1] and Reporting Limits

Parameter	Laboratory Reporting Limit (µg/kg)
Aroclor -1016	33.0
Aroclor -1221	67.0
Aroclor -1232	33.0
Aroclor -1242	33.0
Aroclor -1248	33.0
Aroclor -1254	33.0
Aroclor -1260	33.0
Total Organic Carbon (TOC)	300

Notes:

NA Not Applicable

Table 3. Sample Container, Preservation, and Holding Time

Parameter	Container [1]	Preservation	Holding Time [2]
PCB -Aroclors	1 4 oz. jar	Ice, 4°C.	14 days to extraction; 40 days from extraction to analysis
TOC	1 4 oz. jar	Ice, 4°C.	14 days

Notes:

[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 and any re-analyses required by the method.

[2] Holding time begins from date of sample collection.

Table 4. Analytical Methodologies

Parameter	Methodology
PCB -Aroclors	SW-846 8082A
TOC	Lloyd Kahn

[1] Risk-based PALs to be established based on NYSDEC Sediment Quality Criteria

Table 5. Laboratory Analytical SOPs

Reference Number	Laboratory Performing Analysis	Title	Analytical Parameter
SOC-8082	Columbia Analytical Services - Rochester	PCB's Revision 6	PCB - Aroclors
GEN-TOCLK/TICLK		Total Organic Carbon in Soils Revision 3	TOC