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June 15, 2011

Mr. John R. Strang, P.E.
New York Department of Environmental Conservation
Region 4 Headquarters
1130 North Westcott Road
Schenectady, NY 12306

Subject: **Feasibility Study Field Work**
Draft Hudson River Operable Unit 2 Feasibility Study (FS)
BASF Rensselaer, NY

Dear Mr. Strang:

AECOM is pleased to provide you with the following two work plans on behalf of BASF Corporation (BASF) and as a follow-up to our May 24, 2011 meeting:

1. Polychlorinated biphenyl (PCB) Sampling and Analysis Work Plan; and
2. Southern Portion FS Study Area Sampling and Analysis Work Plan.

It is BASF's understanding that the New York State Department of Environmental Conservation (NYSDEC) requested these brief work plans to outline the sampling and analysis scope of work presented by BASF at the May 24 meeting.

PCB Sampling and Analysis Plan

The attached PCB work plan includes the scope of work for collection of approximately 332 PCB samples from the Hudson River adjacent to and downriver from the BASF Site. As described in detail in a March 31, 2009 technical memorandum from BASF to NYSDEC, there are multiple lines of evidence demonstrating that PCBs in Hudson River sediment adjacent to the Site are non-Site related. A copy of the March 31, 2009 submittal was attached to the April 2011 Nature and Extent Report response to comments package for the convenience of the NYSDEC, and based on conversations between NYSDEC and BASF at the May 24, 2011 project team meeting, it is our understanding that the NYSDEC will provide a written response to this memorandum in June 2011.

Based on our most recent discussions, it is our understanding that NYSDEC will review this work plan, and will also initiate review of the work plan by US EPA Region 2 pursuant to the Toxic Substances Control Act (TSCA). As we discussed at this meeting, BASF would like to complete the field work during the summer of 2011 (pending resolution of any forthcoming NYSDEC comments on the March 31, 2009 submittal) and is hopeful that BASF, NYSDEC, and EPA can meet to discuss this work plan in the near future.

Southern Portion FS Study Area Sampling and Analysis Plan

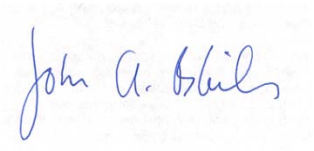
The attached sampling and analysis plan presents the scope of work for sampling and analysis of surficial sediments in the Southern Portion of the FS Study Area, immediately downstream from the BASF site. The proposed activities include sampling and chemical analysis of sediment from surficial grab samples throughout the Upper Navigational

Channel study area (n = up to 36 stations), as well as toxicological analysis of surficial sediment samples from 16 co-located sampling stations. These data, in conjunction with the historically collected data from the Site, will provide the information necessary to help further characterize the areas to be evaluated in the FS Report, and will be used to evaluate potential remedies to address impacted sediments.

Summary

In summary, BASF looks forward to completing the FS sampling and analysis activities outlined above in the summer of 2011. To meet this schedule, we look forward to meeting with NYSDEC and EPA in the near future. 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

cc: J. Douglas Reid-Green (BASF)
Hank Martin, P.E. (ELM)
Nathan Epler, PhD (Roux Associates)

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Hudson River Operable Unit 2
Southern Portion FS Study Area
Sampling and Analysis Work Plan
BASF Rensselaer
Rensselaer, New York

June 15, 2011

Introduction

This work plan has been prepared on behalf of BASF Corporation (BASF) to present the scope of work for sampling and analysis activities that will be conducted at the BASF Renssalaer Site (the "Site") in support of the Hudson River Operable Unit 2 (OU-2) Feasibility Study (FS). The need for additional sampling and analysis activities in the Southern Portion of the FS Study Area was anticipated in the conclusions of the OU-2 Sediment Nature and Extent Summary Report (AECOM, 2011), which was revised, finalized, and submitted to the NYSDEC in April 2011.

Background

The OU-2 Nature and Extent Report included a summary of all sediment quality data from the Hudson River adjacent to the Site that have been collected since 2005, as well as an evaluation of potential risks to human health and the environment from exposure to Site-related constituents in sediment. As described in the Nature and Extent Report, lead and other inorganic constituents are present in levels in excess of NYSDEC screening criteria in the Hudson River within the Southern Portion of the FS Study area, immediately downstream of the BASF Site (Figure 1) (formerly referred to as the Upper Navigational Channel). Both BASF and the NYSDEC are in agreement that sufficient data are available for BASF to commence preparation of the FS for this portion of the Site. Limited biological and toxicological data are available from this reach of the river, which has resulted in some uncertainty in the ecological risk characterization of this area. Collection of additional chemical and toxicological data in this reach of the river will provide information to be used to develop, screen, and assemble a final set of remedial alternatives and to conduct a detailed evaluation of those alternatives.

Overview of Proposed Sampling and Analysis Activities

The following proposed sampling and analysis activities are scheduled to be completed in the summer of 2011:

- Sampling and chemical analysis of sediment from surficial grab samples throughout the Southern Portion of the FS Study Area (n = up to 36 stations);
- Toxicological analysis of surficial sediment samples throughout the Southern Portion of the FS Study Area (n = 16 stations, co-located with 16 stations selected for chemical analysis).

These data, in conjunction with the historically collected data from the Site, will provide supplemental information to further characterize the areas that will be evaluated in the FS Report, and will be used to evaluate potential remedies to address impacted sediments.

It is anticipated that the field sampling described below will be conducted in the summer of 2011, in conjunction with the proposed PCB characterization sampling survey (described in an accompanying work plan). Proposed sampling station locations are depicted on Figure 2 and described below. The actual sampling locations may be slightly modified based on Site conditions encountered in the field and based on the recommendations of NYSDEC upon field program initiation.

The text presented below 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). The sampling tasks will be supported by the existing Quality Assurance Project Plan (QAPP; ENSR, 2005) and an updated QAPP Addendum (presented as Appendix A to this Work Plan). The field program will also be conducted under the existing include Health and Safety Plan (HASP; ENSR, 2005), which will be reviewed, updated, and modified where appropriate.

To meet the objectives of this investigation, a total of up to 36 locations will be sampled in the Southern Portion of the FS Study Area (Figure 2). A subset of these samples will be co-located with the proposed 160-ft on center grid that is being used in the proposed PCB characterization sampling survey (described in an accompanying work plan).

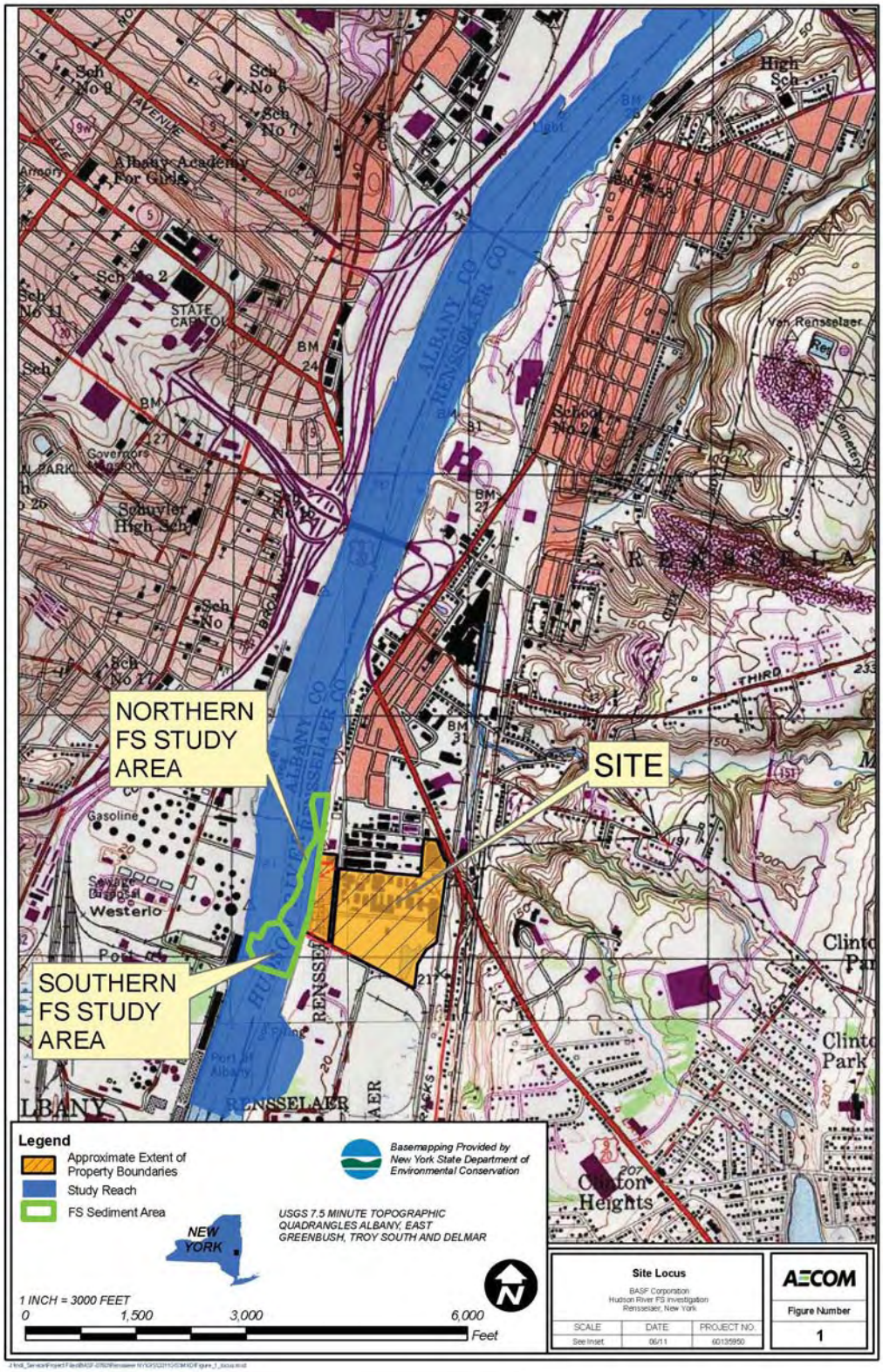
Sediment grab samples (0 to 6 inches [0 to 15 cm]) will be collected at up to 36 locations within and adjacent to the Southern Portion of the FS Study Area. These stations include broad coverage of this reach of the Hudson River, including the northeastern end of the river reach (i.e., towards the BASF site). A subset of these samples has been biased geographically towards historic sediment sampling locations SD-69 and SD-11V; these historic locations were noteworthy due to their elevated inorganic concentrations and increased toxicity in sediment. It is expected that these samples will be collected from a muddy sand substrate, which has been identified in previous investigations.

To further evaluate whether or not direct exposures to sediments have the potential to cause toxicity to ecological receptors, laboratory toxicity tests are planned at 16 locations. All toxicity tests will be conducted under specified laboratory conditions using whole environmental media only (e.g., no dilution series toxicity testing is planned). Laboratory toxicity test sampling locations will be co-located in time and space with 16 sediment chemistry sampling locations (Figure 2), allowing for a detailed evaluation of the co-occurring data. The midge (*Chironomus dilutus*) has been selected as the invertebrate species for sediment toxicity testing. This species was used in the 2007 toxicity sampling event, and the identical protocol will be used in this sampling effort – this protocol provides lethal and sub-lethal endpoints for evaluation of sediment toxicity.

Sediment grab samples will be collected via boat-mounted grab equipment with an assumed depth of six inches (15 cm) as the target depth. Each sample will be analyzed for Target Analyte List (TAL) metals, total organic carbon (TOC), and grain size. Columbia Analytical Services (CAS) of Rochester, NY will conduct the sediment analyses and the toxicity testing will be conducted by Aqua Surveys, Inc of Flemington, NJ. Laboratory detection limits, method specific sampling requirements and QA/QC procedures are presented in 2011 QAPP Appendix Tables (attached).

Summary

In summary, BASF proposes to collect up to 32 surficial sediment samples from the Southern Portion of the FS Study Area to characterize inorganic constituent impacts; in addition, 16 co-located samples will be collected for toxicological analysis. These data will be collected for use in the FS alternatives analysis and report. This work is currently scheduled to be completed in the summer of 2011 and will commence upon NYSDEC approval.



To enhance and sustain the world's built, natural and social environments

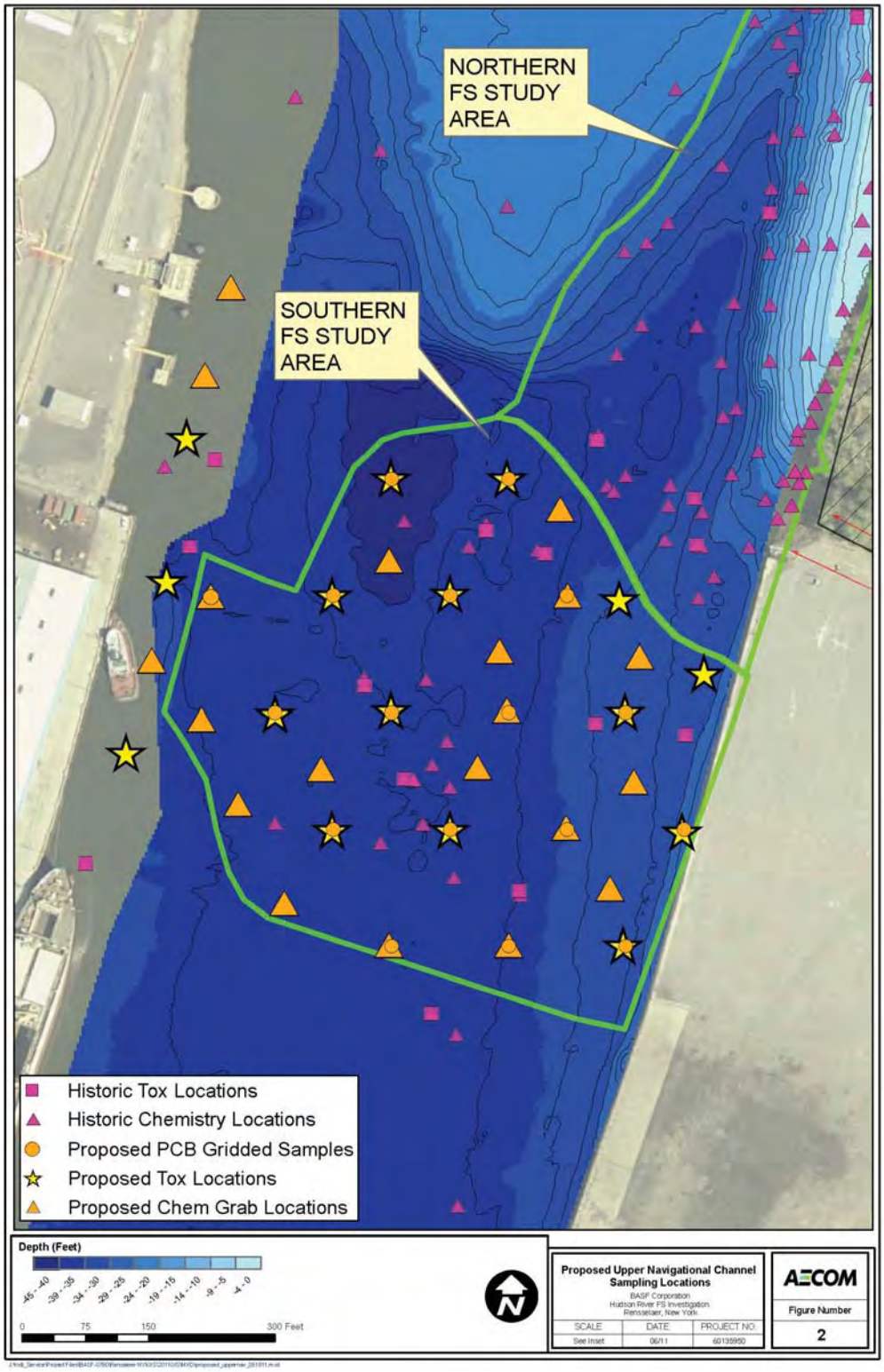

NORTHERN FS STUDY AREA
SOUTHERN FS STUDY AREA
Historic Tox Locations
Historic Chemistry Locations
Proposed PCB Gridded Samples
Proposed Tox Locations
Proposed Chem Grab Locations
Depth (Feet)
-45 - -40
-39 - -35
-34 - -30
-29 - -25
-24 - -20
-19 - -15
-14 - -10
-9 - -5
-4 - 0
0
75
150
300 Feet
Proposed Upper Navigational Channel Sampling Locations
BASF Corporation
Hudson River FS Investigation
Rensselaer, New York
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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**
Metals		RPD ≤ 20%	RPD≤ 20%	75-125%	Lab Limits	NA	Target analytes < RL	Target analytes < RL	4°C ± 2°C

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)
Antimony	6000
Aluminum	10000
Arsenic	1000
Barium	2000
Beryllium	500
Cadmium	500
Calcium	100000
Cobalt	5000
Chromium	1000
Copper	2000
Iron	10000
Lead	5000
Magnesium	100000
Manganese	1000
Mercury	50
Nickel	4000
Potassium	200000
Selenium	500
Silver	1000
Sodium	100000
Thallium	1000
Vanadium	5000
Zinc	2000

NA Not applicable

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

Table 3 Sample Container, Preservation, and Holding Time

Parameter	Container [1]	Preservation	Holding Time [2]
Metals	1 4 oz. jar	Ice, 4°C.	28 days to analysis (mercury); 180 days to analysis (other metals).
Toxicity Tests: *C. dilutus*	1-2 gal plastic bucket	Ice, 4°C. Maintain in dark; lab storage at 4°C.	56 days from collection to test initiation

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
Metals	SW-846 6010C/7471B/7740
C. dilutus	USEPA 2000 and ASTM 2006 Methods

Table 5 Laboratory Analytical SOPs

Reference Number	Laboratory Performing Analysis	Title	Analytical Parameter
MET-200.7/6010B	Columbia Analytical Services – Kelso and Rochester	Metals and Trace Metals by ICP Revision 5	Metals (excl. mercury and selenium)
MET-7471B/245.5		Mercury in Solid by Cold Vapor Revision 0	Mercury
MET-GFAA		Trace Metals by Graphite Furnace Revision 5	Selenium
TBD	TBD	TBD	Toxicity Testing