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*Via E-mail & U.S. Mail*

May 29, 2012

Ms. Amy Legare  
Chair, National Remedy Review Board  
United States Environmental Protection Agency  
One Potomac Yard (South Bldg)  
2777 S. Crystal Drive  
Arlington, VA 22202  
[legare.amy@epa.gov](mailto:legare.amy@epa.gov)

***Re: Sediment Management Work Group's Comments on the Draft Feasibility Study for the Gowanus Canal***

Dear Ms. Legare,

The Sediment Management Work Group ("SMWG")<sup>1</sup> is an ad hoc group of industry and government parties actively involved in the evaluation and management of contaminated sediments on a nationwide basis. The SMWG has long advocated a national policy addressing contaminated sediment issues that is founded on sound science and risk-based evaluation of contaminated sediment management options. The SMWG recognizes that the management of sites involving contaminated sediments frequently involves unique and complex scientific and technical issues, including assessment methodologies and evaluation of risk and risk reduction options. As an active participant in the national discussions on sediment management issues, the SMWG welcomes the opportunity to offer observations and comments on the draft *Feasibility Study* ("FS") for the Gowanus Canal.

The SMWG's review of the Gowanus Canal Draft FS has identified a number of critical areas where the draft FS does not comport with the *11 Risk Management Principles for Contaminated Sediment Sites* (U.S. EPA 2002)<sup>2</sup> and the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (U.S. EPA 2005)<sup>3</sup> ("Guidance"). In particular, the draft FS

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<sup>1</sup> See Exhibit "A" for a list of its Members.

<sup>2</sup> United States Environmental Protection Agency. 2002. Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites. OSWER Directive 9285.6-08.

<sup>3</sup> United States Environmental Protection Agency. 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. OSWER 9355.0-85.

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does not adequately consider the presence and contributions of significant on-going sources, completely characterize the site, or provide all of the information essential to support development of a full suite of remedial alternatives. Without source controls, any remediated area will be recontaminated and the public will not be protected from pathogens in the water.

The comments below offer more discussion of the significant limitations of the draft FS. Unless these limitations are addressed before a proposed plan is issued, the remedy that ultimately is selected for the Gowanus Canal is unlikely to achieve U.S. EPA's objectives.

### **I. U.S. EPA's National Contaminated Sediment Policy Is Embodied In The Contaminated Sediment Remediation Guidance For Hazardous Waste Sites.**

In December 2005, U.S. EPA issued the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*. This Guidance embodies national policy on contaminated sediment and should be followed at all contaminated sediment sites. The Guidance was issued for use "by federal and state project managers considering remedial response actions or non-time-critical removal actions" under CERCLA (p. 1-1). The Guidance provides a risk management decision-making framework to assist with selecting appropriate remedies.

There are at least seven key remedy selection principles in the Guidance:

- 1) Confirming that the site is ready for remediation by controlling sources to the greatest extent practical before commencing remediation (p. 2-20, 7-17).
- 2) The focus of remediation should be on risk reduction, not simply on contaminant removal or on the number of cubic yards of dredged sediment (p. 7-1, 7-16).
- 3) A realistic, site-specific evaluation of the potential effectiveness of each sediment management option, including dredging, capping, and monitored natural recovery, should be incorporated into the selection of remedies at a site (p. 7-3).
- 4) An appropriate evaluation of the comparative net risk reduction potential of the various sediment management options, including a realistic evaluation of their respective advantages and site-specific limitations should be conducted (p. 7-13, 7-14).
- 5) At large and/or complex sites, consideration of the use of combinations of remedies may be appropriate (p. 7-3).
- 6) Adaptive management concepts, which recognize the need for reconsideration of the original remedy chosen where new data and/or results of pilots suggest the appropriateness of revising the original approach, should be applied (p. 2-22, 3-1, 7-16).
- 7) Comparing and contrasting the costs and benefits of the various remedies is part of the risk management decision-making framework (p. 7-1).

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These principles all focus on risk reduction. If applied appropriately, they will lead to a protective remedy that is also cost effective, as required by CERCLA and the National Contingency Plan (“NCP”).

In order to comply with these principles of remedy selection and ultimately reduce risk, the Guidance emphasizes the importance of thorough site characterization. Site characterization includes collecting data to develop a conceptual site model, conducting risk assessments, understanding sediment and contaminant fate and transport, and identifying sources (Section 2.1). These data necessarily form the basis of the feasibility study, which subsequently informs the remedial decision (Sections 3 and 7). Thorough site characterization and developing a good understanding of what is driving the risk at the site via development of a conceptual site model are keys to informed decision-making at contaminated sediment sites.

### **II. The FS Deviates From U.S. EPA’s National Contaminated Sediment Policy.**

The draft FS deviates from the Guidance in a number of critical areas. These comments highlight some, but not all, of the many areas where the FS deviates from U.S. EPA’s national contaminated sediment policy as embodied in the Guidance.

#### **A. Source Control Is A Prerequisite But Has Not Been Adequately Addressed At The Site**

Early control of sources has long been a U.S. EPA priority and is essential to successful remedies at contaminated sediment sites. In its *Contaminated Sediment Management Strategy* (1998)<sup>4</sup>, the U.S. EPA stated that “before initiating any remediation, active or natural, it is important that point and nonpoint sources of contamination be identified and controlled.” This strategy identified specific point sources as potential contaminant sources, including “municipal treatment plants, combined sewer overflows (“CSOs”), storm water discharges from municipal and industrial facilities, direct industrial discharges of process waste, runoff and leachate from hazardous and solid waste sites, agricultural runoff, runoff from mining operations, runoff from industrial manufacturing and storage sites, atmospheric deposition of contaminants, and contaminated groundwater discharges to surface water.”

The need to control sources early is emphasized in the Guidance (as well as in the 2002 OSWER Directive 9285.6-08). The Guidance provides:

“Identifying and controlling contaminant sources typically is critical to the effectiveness of any Superfund sediment cleanup. Source control generally is defined for the purposes of this guidance as those efforts [that] are taken to eliminate or reduce, to the extent practicable, the release of contaminants from direct and indirect continuing sources to the water body under investigation.” (p. 2-20). ...

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<sup>4</sup> United States Environmental Protection Agency. 1998. EPA’s Contaminated Sediment Management Strategy. EPA-823-R-98-001.

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[S]ignificant upland sources (including ground water, NAPL, or upgradient water releases) should be controlled to the greatest extent possible before sediment cleanup.” (p. 2-21).

The Guidance, therefore, calls for these potential continuing sources to be identified (see Highlight 2-2) and for a source control strategy to be developed before sediment cleanup begins.

Although the FS acknowledges that addressing “contaminant contributions to the canal from upland properties, combined sewer overflows (CSOs) and other pipe outfalls is a prerequisite to a sustainable remedy for canal sediments,” the draft FS does not satisfy that prerequisite (FS, p. 1-1). There are over 200 non-permitted discharge pipes, 10 CSOs, 3 storm sewer outfalls (“SSOs”), and 5 other permitted discharges into the Gowanus Canal. These are likely on-going sources of contaminants, with the CSOs and SSOs alone discharging almost 400 million gallons of untreated sewage and runoff per year. Moreover, investigation and remediation activities are underway at three upland former manufactured gas plant sites. Unless these numerous sources are controlled before remedial action is taken in the Canal, recontamination is a virtual certainty.

As noted by the Contaminated Sediments Technical Advisory Group (“CSTAG”):

“there are long-term plans to reduce releases from lateral inputs and from major CSOs, but ... it may be many years if not decades before contaminant releases are reduced to levels that would not present unacceptable risks to human health and the environment. Of specific concern are releases of copper, PCBs, and PAHs from the outfalls and discharge pipes and the non-point releases of PAHs typical of heavily developed urban areas bordering the canal. ... CSTAG anticipates there would be significant recontamination of the surface sediment after any sediment remedy is implemented before the needed source control actions for other releases are completed” (*CSTAG Recommendations*, p. 3).

Recontamination, therefore, is a significant concern if any remedial action is undertaken before these numerous sources are controlled. This significant probability of recontamination should be seriously considered and factored into any planning for sediment response actions. Developing and evaluating alternatives for sediment remediation prior to implementation of source control activities and understanding their effects on improving sediment and water quality is premature.

### **B. Site Characterization Is Inadequate.**

Sediment site characterization activities are intended to provide the information necessary to permit effective remedial alternatives to be developed, evaluated, and selected. Site characterization is performed through the Remedial Investigation (“RI”). The Guidance specifies that a sediment site RI should accomplish the following goals:

- Identify and quantify the contaminants present in sediment, surface water, biota, and in some cases, ground water;

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- Understand the vertical and horizontal distribution of the contaminants within the sediment;
- Identify the sources of historical contamination and quantify any continuing sources;
- Understand the geomorphological setting and processes (e.g., resuspension, transport, deposition, weathering) affecting the stability of sediment;
- Understand the key chemical and biological processes affecting the fate, transport, and bioavailability of contaminants;
- Identify the complete or potentially complete human and ecological exposure pathways for the contaminants;
- Identify current and potential future human and ecological risks posed by the contaminants;
- Collect data necessary to evaluate the potential effectiveness of natural recovery, in-situ capping, sediment removal, and promising innovative technologies; and
- Provide a baseline of data that can be used to monitor remedy effectiveness in all appropriate media (generally sediment, water, and biota). (p. 2-1, 2-2).

To aid in accomplishing these goals, the Guidance provides, as an example, a list of sediment site characterization data that should be collected during the RI. (Highlight 2-1, page 2-5). The data gathered during the RI is then used in a feasibility study, which develops and evaluates alternative methods for achieving the remedial action objectives for the site (p. 3-1).

In contrast to the policy set forth in the Guidance, a complete remedial investigation has not been conducted and site characterization is incomplete at the Gowanus Canal. As a result, few of the data necessary for a feasibility study to develop and evaluate remedial alternatives are available. Collection of these data during design is not a substitute for collection and incorporation of these data into the draft FS.<sup>5</sup>

The significance of the missing information can be illustrated through a few examples where additional information is needed to develop and screen remedial alternatives. These examples are discussed below.

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<sup>5</sup> Even if an accelerated approach is viewed as necessary, proceeding with an early action without adequate data also would be inconsistent with the Guidance. Based on the site description and circumstances as described in the FS, however, there appears to be no justification to rush to conduct an early action in the absence of source control and adequate data to evaluate the appropriate early action.

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## **1. Information Required To Adequately Characterize The Site.**

In addition to the need to identify and further characterize historic and on-going sources, other key issues that need additional study in order to fully develop and refine the conceptual site model (“CSM”), which will aid in the development and evaluation of a full suite of remedial alternatives, include:

- Evaluation of on-going contaminant and particulate loading
- Assessment of sediment stability and contaminant fate and transport
- Development of a hydrodynamic and sediment transport model, which can evaluate the likely effects of wet weather events and the operation of the upgraded Flushing Tunnel (engineered to move over 200 million gallons of water per day)
- Development of a groundwater model to understand and predict discharges to the canal
- Evaluation of in-situ solidification technologies (bench-scale and field pilot study)
- Bulkhead stability analysis

This information is key to developing an accurate, comprehensive CSM that can be used to develop and evaluate a full suite of remedial alternatives. Without such a CSM, the effectiveness of remedial alternatives cannot be understood or evaluated.

## **2. Fate And Transport Modeling Suitable To The Site Is Essential To Develop An Effective Remedy.**

The Guidance emphasizes the importance of assessing the fate and transport of sediment and contaminants at sediment sites (Section 2.8). Such information is necessary to assess the exposure and risk associated with the contaminants and to evaluate the protectiveness of remedial alternatives (p. 2-23, 2-32). To assess sediment and contaminant fate and transport, modeling is required (p. 2-25). At large or complex sites, the Guidance emphasizes the importance of using mathematical modeling:

“Mathematical modeling generally is recommended for large or complex sites, especially where it is necessary to predict contaminant transport and fate over extended periods of time to evaluate relative differences among possible remedial approaches” (p. 2-36).

Developing a robust hydrodynamic and sediment transport model is critical to the development of an effective remedy, but it has not been done for the Gowanus Canal. CSOs and SSOs are responsible for a significant portion of the flow in the Canal. Upgrades to the Flushing Tunnel will be coming on-line in the near future and will increase the flow in the Canal. Understanding the effects of wet weather events and additional flows from the Flushing Tunnel is key to developing remedial alternatives and to evaluating their anticipated effects. Without this tool, the analysis of alternatives in the draft FS is incomplete.

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The failure to provide appropriate modeling for the site in the draft FS, coupled with the absence of site characterization data, precludes an effective remedial alternatives evaluation process as required by the Guidance. At a highly complex site, a comprehensive understanding of contaminant fate and transport under current and proposed post-remedy conditions is a necessity. More discussion of remedial alternatives development is included below.

**C. Inadequate Development Of Remedial Alternatives.**

Adequate development and analysis of remedial alternatives cannot be completed without proper site characterization. The Guidance's requirement of collecting and evaluating sufficient baseline data to support a realistic evaluation of remedial alternatives, the remedy's likely ability to reduce risk on a site-specific basis, and to provide realistic cost comparisons was not followed in developing the draft FS (see Sections 2.1, 2.3, 3.1, 3.4, and 3.5 of the Guidance). For these reasons, the draft FS fails to support the development and analysis of robust remedial alternatives.

First, as described above, the current level of site characterization is wholly inadequate to support the remedial alternative selection process under the Guidance. Proper site characterization and completion of necessary data collection tasks is a prerequisite to the development and analysis of a robust suite of remedial alternatives.

Second, the alternatives developed and evaluated in the draft FS did not follow CSTAG's appropriate recommendation that "the Region evaluate the expected limited effectiveness of dredging based on the relatively large amount of debris in the canal and the fact that the deeper sediments are much more contaminated than the surface sediments. Alternatives that focus on capping and minimize removal of sediments may be more effective" (*CSTAG Recommendations*, p. 5-6).

Third, the draft FS did not follow an additional CSTAG recommendation that "the Region consider developing and evaluating a range of remedial alternatives in the FS that include the following additional remedial alternatives:

- Use of a low permeability, reactive capping material to control NAPL migration. Gas ebullition from under the cap that can facilitate NAPL transport through the cap can be addressed with vents and activated carbon to treat gas
- Temporarily draining the canal and redirecting the water flow to allow sediments to consolidate before placing a cap or dredging, this should include consideration of installing a passive French-drain style NAPL collection system under a cap as part of a capping alternative
- Monitored natural recovery (MNR) as a remedial alternative for the lower reach
- For areas where maintaining a minimum navigational water depth is not an issue, evaluate further if a cap can be placed without pre-dredging. Based upon experiences at other sites with soft sediment and low bearing strength, a cap can

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be placed by using several thin lifts of sand, allowing time for consolidation between placing lifts

- Retain one or more capping-only remedies that may use different in-situ amendments such as activated carbon or organo-clays within the cap
- Consider use of in-situ amendments to reduce bioavailability of surface contaminants for other areas of the site.” (*CSTAG Recommendations*, p. 6).

Rather than developing and evaluating a full suite of remedial alternatives, only a limited suite of remedial alternatives was developed. The draft FS failed to develop or evaluate any capping-only remedial alternatives.

Finally, the draft FS also failed to quantify risk reduction expectations or to estimate the levels of recontamination that are expected to occur. As such, the draft FS is incomplete and cannot serve as the basis to select a cost-effective remedy that will protect human health and the environment, as required by the NCP.

### **D. Procedure For Addressing Contaminated Sediment Sites.**

USEPA’s Sediment Management Principles (2002) and the Guidance state that remedies are to be selected based on site-specific information. This information will not exist until the site is well characterized. Principle 7 of Principles for Managing Contaminated Sediment Risks At Hazardous Waste Sites (OSWER Directive 9285.6-08, February 12, 2002) states:

“Select Site-specific, Project-specific, and Sediment-specific Risk Management Approaches that will Achieve Risk-based Goals.

EPA’s policy has been and continues to be that there is no presumptive remedy for any contaminated sediment site, regardless of the contaminant or level of risk. ... At Superfund sites, for example, the most appropriate remedy should be chosen after considering site-specific data and the NCP’s nine remedy selection criteria. All remedies that may potentially meet the removal or remedial action objectives (e.g., dredging or excavation, in-situ capping, in-situ treatment, monitored natural recovery) should be evaluated prior to selecting the remedy. This evaluation should be conducted on a comparable basis, considering all components of the remedies, the temporal and spatial aspects of the sites, and the overall risk reduction potentially achieved under each option.” (Guidance, p. A-7).

The Gowanus Canal draft FS does not satisfy this principle.

Moreover, characterization of the dozens of on-going sources that are known to exist in this waterway has yet to be performed. Limited samples were taken prior to the preparation of the draft FS, and the draft FS omitted much of the modeling and analysis traditionally relied on in sediment site remedial decision-making. Further, the draft FS specified that the following studies be undertaken in the remedial design phase:



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- Development of a groundwater model for the entire project area
- Additional data collection and analysis to determine NAPL seepage rates
- Additional evaluation of in-situ solidification or other developing technologies that could increase the overall protection and permanence of the remedy
- Additional evaluation and analysis of the sustainability impacts of the selected remedy
- Other data collection activities and surveys such as a bulkhead stability evaluation, bathymetric and sediment-probing surveys to refine volumes and establish baseline conditions prior to remedial action, and sediment chemistry surveys to establish baseline, or pre-remedy, conditions
- Additional bench-scale testing to support disposal options
- Hydrodynamic modeling to support cap design

It seems apparent that much of this work is necessary due to the incomplete site characterization when the draft FS was prepared. It is inappropriate to defer these critical components of site-specific information to the remedial design phase. Much of this information is critical to the remedial alternative development and analysis phases, and could result in selection of a very different remedy than could occur at this time. These significant shortcomings are further examples of inconsistency with the Guidance.

### III. Conclusion.

The Guidance provides a scientifically sound, risk-based approach to addressing contaminated sediment sites. Sediment sites present challenging problems, but following the policy and procedures in the Guidance is necessary to assure that the selected remedy will reduce risk and be cost-effective. The draft FS for the Gowanus Canal deviates from the Guidance in several critical ways, including lack of source control, incomplete site characterization, and inadequate information to support development of a full suite of remedial alternatives. As a consequence, the remedial alternatives proposed in the draft FS are not likely to reduce risks to human health and the environment to any significant extent. Rather, significant recontamination of the surface sediment is a virtual certainty. Accordingly, the current draft FS should be withdrawn until sufficient information is developed to prepare a FS that can adequately address the issues presented at the Gowanus Canal.

Moving forward with the draft FS and issuance of a proposed plan in the absence of essential information is premature. Numerous uncontrolled sources pose a significant recontamination risk. It would, therefore, be ineffective to try to address all sediment-related risks at this time. The next step should be to identify and control sources to the greatest extent possible in accordance with the Guidance (Section 2.6). During this important activity, the work

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necessary to properly develop site-specific risk management approaches that will achieve risk-based goals under the Guidance should be undertaken and completed.

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The SMWG would be pleased to answer any questions about its comments on the draft FS for the Gowanus Canal. For further information, please feel free to contact the SMWG's Coordinating Director, Steven C. Nadeau, c/o Honigman Miller Schwartz and Cohn LLP, 2290 First National Building, 660 Woodward Avenue, Detroit, MI 48226, (313) 465-7492, [snadeau@honigman.com](mailto:snadeau@honigman.com).

Respectfully submitted,

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## Exhibit A

### SMWG Members

ALCOA, Inc.  
Atlantic Richfield (a BP company)  
BASF Corporation  
Beazer East, Inc.  
Boeing Company, The  
CBS Corporation  
Chevron Energy Technology Company  
Dow Chemical Company, The  
DTE Energy  
E.I. duPont de Nemours and Company  
El Paso Corporation  
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