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OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

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OFFICE OF LAND AND
EMERGENCY MANAGEMENT

OLEM Directive 9200.1-130

MEMORANDUM

SUBJECT: Remediating Contaminated Sediment Sites – Clarification of Several Key Remedial Investigation/Feasibility Study and Risk Management Recommendations, and Updated Contaminated Sediment Technical Advisory Group Operating Procedures

FROM: Mathy Stanislaus
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TO: Regional Administrators, Regions I–X

PURPOSE

The purpose of this memorandum is to continue to facilitate cleanups at contaminated sediment sites subject to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). This memorandum continues the Office of Land and Emergency Management's (OLEM) practice of employing the best science and promoting transparent response decisions. Within the framework of existing EPA CERCLA guidance, this document identifies eleven recommendations based on current best practices for characterizing sediment sites, evaluating remedial alternatives, and selecting and implementing appropriate response actions. As such, it does not supersede existing EPA CERCLA policy. This memorandum also includes updated Contaminated Sediment Technical Advisory Group (CSTAG) Operating Procedures.

BACKGROUND

EPA has issued extensive guidance generally addressing the response selection process at different kinds of sites (e.g., contaminated soil, ground water restoration, mining, etc.) under CERCLA and the NCP. In 2002, EPA released its first guidance specifically addressing contaminated sediment remediation, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* ([OSWER Directive 9285.6-08](#); hereafter, *Sediment Risk Guidance*). The Agency followed the 2002 guidance with another document in 2005, the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* ([OSWER Directive 9355.0-85](#); hereafter, *Sediment Remediation Guidance*). Since issuing these

documents, the Agency has overseen or conducted site investigations and cleanups at dozens of contaminated sediment sites. Based on these site experiences, this document discusses lessons learned and clarifies the 2002 and 2005 guidance documents, as well as other existing EPA CERCLA guidance, to further facilitate the development, evaluation, selection and implementation of CERCLA response actions at contaminated sediment sites.¹

In addition, on October 24, 2016, the Government Accountability Office (GAO) released a report: [GAO-16-777](#), *Superfund Sediment Sites – EPA Considers Risk-Management but Could Clarify Certain Procedures*. GAO found that EPA generally followed its steps for providing national consistency in its management of Superfund sediment sites and recognized the important contribution of scientists and experts from the CSTAG. GAO noted that “EPA faces two main challenges in managing cleanups of Superfund sediment sites – technical complexities and stakeholder involvement – according to EPA officials.” As discussed in the report, technical complexities include the use of sampling and modeling in developing a cleanup remedy, and stakeholder involvement challenges, including differing opinions, competing interests, and varying levels of knowledge of the Superfund process. GAO found that the CSTAG’s operating procedures do not clearly describe what type of information should be provided to the CSTAG members before site update meetings. They made the following recommendation: “To ensure that CSTAG’s information needs are met for update meetings, we recommend that the EPA Administrator direct CSTAG to clarify in its operating procedures what type of information and documentation, if any, should be prepared by regional offices and provided to CSTAG members in advance of these meetings.” Concurrent with developing this guidance, EPA has updated the CSTAG Operating Procedures (Appendix) to clarify when the regions should submit a revised consideration memorandum to the CSTAG as part of the briefing material developed for update meetings.

RECOMMENDATIONS

This memorandum sets forth eleven recommendations for regions to consider at contaminated sediment sites. OLEM encourages regions to consider these recommendations when developing and evaluating contaminated sediment sites and response alternatives, especially those sites contaminated with bioaccumulative contaminants where the use of CERCLA response authority is warranted at least in part due to unacceptable risk to human health resulting from the consumption of contaminated fish or shellfish.

1. Consider early actions during the remedial investigation/feasibility study in site areas presenting high risks to help reduce risks quickly

¹ This document provides guidance to EPA regions and others regarding how the Agency intends to interpret and implement the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the blueprint for CERCLA implementation. However, this document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus it cannot impose legally binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances. Any decisions regarding a particular situation will be based on CERCLA and the NCP, and EPA decision-makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate.

Taking appropriate early actions during the site investigation is consistent with the NCP and existing guidance. Section 300.430(a)(1) of the NCP states, “Remedial actions are to be implemented as soon as site data and information make it possible to do so.” The preamble to the NCP further states:

EPA expects to take early action at sites where appropriate, and to remediate sites in phases using operable units as early actions to eliminate, reduce or control the hazards posed by a site or to expedite the completions of total site cleanup. In deciding whether to initiate early actions, EPA must balance the desire to definitively characterize site risks and analyze alternative remedial approaches for addressing those threats in great detail with the desire to implement protective measures quickly. Consistent with today's management principles, EPA intends to perform this balancing with a bias for initiating response actions necessary or appropriate to eliminate, reduce, or control hazards posed by a site as early as possible. EPA promotes the responsiveness and efficiency of the Superfund program by encouraging action prior to or concurrent with conduct of an RI/FS as information is sufficient to support remedy selection. These actions may be taken under removal or remedial authorities, as appropriate. (55 Fed. Reg. at page 8704, March 8, 1990).

Section 2.7 of the Sediment Remediation Guidance also states: “Even before the sediment at a site is well characterized, if risk is obvious, it may be very important to begin to control significant ongoing land-based sources. It also may be appropriate to take other early or interim actions, followed by a period of monitoring, before deciding on a final remedy.”

EPA’s February 2000 Guidance: *Use of Non-Time Critical Removal Actions in Superfund Response Actions* ([OSWER Directive 9360.0-40P](#)) goes on to say: “Similarly, even technically complex actions may be appropriately implemented under removal authority. For example, dredging large quantities of contaminated sediment could be conducted using removal authority where such action was the appropriate course for abating or controlling a time-sensitive threat.”

Consistent with Superfund policy, OLEM recommends that regions evaluate site data early in the process, and continuously as new information becomes available, to determine if there are opportunities to reduce the duration of unacceptable human health and ecological exposure and risk through the use of early actions. Where sufficient data supporting early action are in the site record, regions are encouraged to consider taking early actions to control these current or potential future exposures and risks in these areas.

Depending on site circumstances, an early action can be a time-critical or non-time critical removal action, an interim, or a final remedial action that is expected to be consistent with a site’s final action. Early actions could occur at any time including during the RI/FS or may be identified during remedy implementation.

2. Ensure adequate data collection during the remedial investigation/feasibility study to support the evaluation of alternatives

As stated in the 1988 *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* ([OSWER Directive 9355.3-01](#)), “[t]he objective of the RI/FS process is not the unobtainable

goal of removing all uncertainty, but rather to gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for a given site.”

As part of the RI, site teams often devote substantial effort to defining contaminants of concern (COCs), evaluating multiple exposure pathways, and developing protective levels for a wide range of contaminants and possible receptors. However, at sites or portions of sites where unacceptable risks have been documented, site teams should consider focusing efforts on collecting data to evaluate and compare remedial alternatives early in the RI/FS. For example, due to the long time frame often needed to collect data to evaluate Monitored Natural Recovery (MNR) as a remedial option, it is particularly important to start collecting natural recovery lines of evidence as soon as possible once a basis for action has been established and documented (*i.e.*, long-term data demonstrating decreases in contaminant levels in sediment, water, and biota [EPA 2005, highlight 4-4]). Other lines of evidence may also be important to establish the processes that drive natural recovery mechanisms. For example, a series of bathymetric surveys can be useful to identify site-specific patterns or areas of sediment erosion or deposition over time that can indicate where burial or dispersion of contaminated sediments is likely to occur.

At some sites contaminated with bioaccumulative contaminants (e.g., PCBs, dioxins and furans, or methyl mercury), cleanup levels,² performance levels, and target levels may be based on background levels of contamination in the environment. As stated in the 2002 memorandum on background ([OSWER Directive 9285.7-41](#)): “The contribution of background concentrations to risk associated with CERCLA releases may be important for refining specific cleanup levels for COCs that warrant remedial action. For example, in cases where a risk-based cleanup goal for a COC is below background concentrations, the cleanup level may be established based on background.” At large contaminated sediment sites, it may be important to evaluate background concentrations and the potential for recontamination to determine the level of risk reduction and contaminant levels that can be achieved through the remedial action.

The Sediment Remediation Guidance describes site conditions conducive to various remedial approaches (Highlights 4-2, 5-1, and 6-2). A remedy’s implementation success and effectiveness will often be influenced by these conditions. Thus, the RI/FS should focus early on understanding conditions in site areas conducive to dredging, capping, *in-situ* amendments, enhanced natural recovery (ENR), or MNR. OLEM also recommends that a sediment erosion and deposition assessment be performed similar to the 2014 guidance provided in the U.S. Army Corps of Engineers’ document: *Technical Guidelines on Performing a Sediment Erosion and Deposition Assessment (SEDA) at Superfund Sites* ([ACE ERDC, 2014; TR-14-9](#)).

Consistent with existing EPA guidance, Regions should collect sufficient information and data to develop and refine the conceptual site model (CSM). This focused approach does not eliminate the need to collect sufficient information to develop and refine the CSM.

² The Superfund program considers “cleanup levels” and “remediation goals,” as well as the terms “preliminary cleanup levels” and “preliminary remediation goals,” to be interchangeable terms. The 1999 ROD Guidance indicates that the term “cleanup level” implies an enforceable standard and is preferable.

3. Evaluate the risks associated with exposure to contaminated sediments, including submerged sediments

As noted in the Sediments Remediation Guidance:

Generally, the human health risk assessment should consider the cancer risks and non-cancer health hazards associated with ingestion of fish and other biota inherent to the site (e.g., shellfish, ducks); dermal contact with and incidental ingestion of contaminated sediment; inhalation of volatilized contaminants; swimming; and possible ingestion of river water if it is used as a drinking water supply. Separate analyses should also consider risks from exposure to floodplain soils and may include direct contact, ingestion, and exposures to homegrown crops, beef, and dairy products where appropriate. The relevance and importance of each pathway to actual risks will vary with different contaminants or contaminant classes at a site (see page 2-8).

At contaminated sediment sites with bioaccumulative contaminants, the human health exposure pathway driving the risk is usually ingestion of biota, most commonly the ingestion of fish by recreational anglers and sometimes by subsistence anglers. However, depending on the contaminant and the use of the site there can also be significant risks from direct contact with the sediment, water, or floodplain soils, through incidental ingestion and dermal contact (see page. 2-13).

Direct contact (dermal exposure) with sediments may be particularly important in areas where swimming or wading may occur, including contact to submerged sediment, and therefore, is an important exposure pathway to evaluate at contaminated sediments sites.

4. When considering the use of sediment toxicity testing, collect decision-oriented ecological effects data to document a linkage between site contaminants and adverse effects

Sediment toxicity test data are often used to assist in making risk-based decisions at contaminated sediment sites. Therefore, regions should design site-specific sediment toxicity tests to generate data that support the risk assessment and remedy selection under CERCLA, consistent with the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments Interim Final* (EPA 540-R-97-006. [OSWER 9285.7-25](#), June 1997). It is not unusual for the sediments at Superfund sites to contain contaminants related to the site as well as contaminants or stressors not readily identified as associated with the site. In these situations, an adverse response in a tested sediment may not definitively inform whether a site-related hazardous substance is the source of toxicity. Where possible, when regions decide to conduct sediment toxicity tests, they should design the toxicity testing to develop an exposure-response relationship between site-related contaminants and potential adverse responses. Reference sediments may also need to be tested to help identify and distinguish between site-related risk drivers and ubiquitous stressors. In developing toxicity testing, regions should evaluate whether the test organism is sensitive to the contaminants of interest, and the test endpoint evaluated is consistent with the mechanism of effect.

5. Clearly describe risk reduction expectations by identifying the monitoring endpoints that will be used to evaluate achievement of all remedial action objectives

The Agency endeavors to be transparent and realistic about risk reduction expectations at contaminated sediment sites and how risk reduction will be measured. In this regard, 40 CFR 300.430(e)(2)(i) of NCP states that site managers, “Establish remedial action objectives specifying contaminants and media of concern, potential exposure pathways, and remediation goals...Remediation goals shall establish acceptable exposure levels that are protective of human health and the environment and shall be developed...”

Remedial action objectives (RAOs) that are clear and definitive, and cleanup levels that are directly linked to the RAO with contaminant levels in environmental media, are important to provide a way to communicate transparent descriptions of remediation objectives and how achievement of those objectives will be measured. Therefore, RAOs should be supported by statements that quantitatively describe the condition to be achieved by the remedy (*e.g.*, expected concentrations in sediments or fish or expected levels of sediment toxicity) and the estimated timeframe for achieving the objective. Consistent with the NCP, the record of decision (ROD) should include appropriate performance measures (*see* 40 CFR 300.430(f)(5)). The monitoring endpoints used to measure progress towards or achievement of RAOs (*e.g.*, fish tissue contaminant concentration or benthic toxicity) are site-specific, and should directly indicate the RAO and be linked to the remediation (*i.e.*, the remediation is intended to directly affect those receptors).

A remedy’s risk reduction expectations should answer several fundamental questions:

- What condition (*e.g.*, contaminant concentration or level of toxicity) is expected to be achieved?
- In what media (*e.g.*, sediment, fish tissue, surface water, porewater)?
- In what area?

If cleanup levels or RAOs are not expected to be achieved within a few years after active remediation, site managers should develop a general timeframe for achievement of objectives along with a monitoring plan or an adaptive management plan that includes monitoring progress toward objectives (*see* Recommendation 7). Beyond serving as a critical communication tool for stakeholders, the questions will serve as the basis of the monitoring plan (*see* Recommendation 8) and to determine when cleanup levels and RAOs are achieved and, therefore, long-term monitoring may be adjusted, as appropriate.

For bioaccumulative organics such as PCBs (the primary COC at approximately half of all Superfund sediment sites), risk reduction is often measured by declines in fish tissue PCB concentrations to be achieved by reducing sediment PCB contamination. Thus, it is important to communicate the expected reductions in concentrations of both sediments and fish tissue when discussing risk reduction expectations in CERCLA decision documents. Therefore, OLEM recommends that, for sediment sites with RAOs to reduce contaminant levels in fish tissue, generally the feasibility study (FS) and ROD should state the fish tissue and sediment contaminant concentrations that are expected to be achieved by the remediation, along with the areas expected to meet those objectives (*e.g.*, sitewide or by segments or river reaches) and the general timeframe. The uncertainty in the expected risk reductions and associated time frames should also be discussed.

There are some circumstances where fish tissue cleanup levels, performance levels or targets may not be appropriate and only sediment cleanup levels may be developed. For example, in some cases, a release from a National Priorities List (NPL) site may only be one of several sources of contamination posing unacceptable risk to the waterway and fish species may have broad migratory ranges that exceed the site study area. Quantifying the contribution of NPL-site contamination to fish tissue for these species versus contributions from other sources may not be possible. However, in some cases where the fish consumption exposure pathway has been documented and the source of the contamination is attributable to a release from the site, it is recommended that regions establish fish tissue cleanup levels. Under this circumstance, the remedial action is expected to directly impact the contaminant levels in fish. Under all circumstances, selected remedies should emphasize the need for robust pre- and post-remediation fish tissue monitoring. In all cases, the exposure media, cleanup level, and monitoring endpoints (sediment, surface water, biota, etc.) used to indicate achievement of the RAO should be clearly described in the decision document.

Furthermore, when describing the expected risk reduction level in each media, regions should discuss acceptable exposure levels and protectiveness of human health and the environment as provided in the 40 CFR 300.430(e) (i.e., HI = 1, cancer risk = 1×10^{-4} and 1×10^{-6}) and background levels.

6. Develop risk reduction expectations that are achievable by the remedial action

The NCP (40 CFR 300.430(e)(2)(A)) provides that remediation goals are developed by considering applicable or relevant and appropriate requirements (ARARs), if they are available. In the absence of ARARs which ensure protectiveness of human health and the environment, the NCP goes on to state that “[f]or systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety.” With regard to “known or suspected carcinogens, acceptable exposure levels are generally concentration levels” within the 10⁻⁴ to 10⁻⁶ cancer risk range.

At many sites, for contaminants such as PCBs and dioxins, the surface sediment concentrations and the corresponding fish tissue concentrations considered to be protective of human-health may be very low under common exposure scenarios. EPA recognizes that, because of site conditions, background contamination and the current limitations of available remedial technologies, achieving protective fish tissue or sediment concentrations may take many years to achieve, or may not be possible within a reasonable time frame.

The Sediment Remediation Guidance states, “Generally, under CERCLA, cleanup levels are not set at concentrations below natural or anthropogenic background levels.” It also recommends that “RAOs should reflect objectives that are achievable from the site cleanup.” In instances where risks unrelated to the CERCLA release exist, the site’s risk reduction expectations (embodied in the RAOs and cleanup levels) should generally be based on contaminant concentrations in fish and sediment that are achievable by remedial action. Until fish tissue levels are within the acceptable risk range it is important that the remedy include a fish consumption advisory to ensure that the remedy is protective in the short and long term. In instances where ARAR-based cleanup levels are not achievable, a CERCLA ARAR waiver is required to be documented with supporting information in the decision document.

7. Consider the limitations of models in predicting future condition for purposes of decision making

At many large sediment sites, computational models have been developed to simulate the complex interconnected processes of water flows, sediment transport, and contaminant fate and bioaccumulation by organisms. Regardless of their sophistication and level of complexity, models are simplifications of the complex environmental processes and the time and spatial scales over which the processes occur. Model framework uncertainty (i.e., how well a model's mathematical structure adequately depicts an area's movements of water, sediment, and contaminants over time) and parameter uncertainty (i.e., how well a model's assigned parameter values depict current and future conditions) may limit a model's ability to provide an accurate (i.e., quantitatively correct) depiction of future conditions. Such potential limitations should be considered by regions when making remedy selection decisions.

The 2007 National Research Council's report [*Models in Environmental Regulatory Decision Making*](#) summarized this issue:

Models will always be constrained by computational limitations, assumptions and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all aspects for a particular regulatory application.

Future predictions of sediment and fish tissue contaminant concentrations are sometimes presented with a degree of certainty that fails to account for the inherent unknown accuracy of those predictions. Since the accuracy and uncertainty of future projections are generally not known, the use of and comparisons among quantitative endpoints (e.g., time to achieve a sediment or biota contaminant level) should be made with a high degree of caution, if at all.

8. Consider a structured adaptive management approach to response action implementation that includes using early actions, interim and contingency remedies

The Sediment Remediation Guidance encourages site managers to use an adaptive management approach, "especially at complex sites to provide additional certainty of information to support decisions." An adaptive approach could include early removal or remedial actions as described in Recommendation 1, an interim ROD, a contingency ROD, or could be done as part of the remedy implementation. As described in the 1999 *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (OSWER 9200.1-23P)*: "A contingency ROD may be appropriate when there is significant uncertainty about the ability of remedial options to achieve cleanup levels...."

In considering the usefulness of an iterative, structured approach for optimizing decision-making in the face of potential uncertainties, and how such an adaptive management approach may be appropriate for addressing CERCLA sediment sites, regions may consider the following example steps:

- i. Establish measurable remedial action objectives; (*i.e.*, what levels are expected to be achieved in what media over what area, and in what timeframe?)
- ii. Establish an adaptive management plan that:
 - a. Specifies key indicators (*i.e.*, monitored parameters that are tied to the remedial action objectives),
 - b. Selects specific trigger criteria (*i.e.*, concentrations and timeframes) of those key indicators that might trigger a change in the remedy, and
 - c. Specifies the specific actions based on attainment or non-attainment of trigger criteria;
- iii. Implement the remedial action; and
- iv. Monitor the response action and implement the adaptive management plan:
 - a. Monitor and compare collected data to timeframes and trigger criteria, and
 - b. Take action as specified if trigger criteria were not met, (*i.e.*, remedial objectives were not achieved in stated timeframe).

This type of approach is well-suited for application within the five-year review process where the protectiveness of the remedy and the progress towards achieving the site RAOs is evaluated regularly. Where early actions or interim remedies target the most heavily contaminated areas, this approach may help regions evaluate the protectiveness of these actions and determine what further actions are necessary, if any, to achieve protectiveness.

9. Collect baseline contaminant trend data in all appropriate media and use monitoring data to evaluate remedial effectiveness

Principle 11 in the 2002 Sediment Risks Guidance emphasizes the importance of having adequate baseline data to interpret post-remediation monitoring data and recommends: “Monitor during and after sediment remediation to assess and document remedy effectiveness.” As discussed in that guidance and in Chapter 8 of the 2005 Sediment Remediation Guidance, the ROD should describe the monitoring program as part of the remedy in order to evaluate:

[I]f short-term and long-term health and ecological risk are being adequately mitigated at the site and to evaluate how well all remedial action objectives are being met. Monitoring should be conducted during remedial implementation and as long as necessary to ensure that all sediment risks have been adequately managed.

To support evaluations of remedial effectiveness consistent with the NCP’s nine criteria provided in 40 CFR 300.430(e)(9), OLEM recommends that site managers collect adequate baseline pre-remedial/cleanup data that allow them to evaluate, predict, and communicate environmental improvements from implemented remedial actions. Pre- and post-remediation time trends of contaminant levels in affected media can help evaluate the effectiveness of the remediation on risk reduction. However, collection of this baseline data should not delay implementation of early response actions.

Because of the typically strong, but not always well understood, inter-relationship between surface sediment and fish tissue concentrations, both media should be monitored at sites where risks from the consumption of fish provide the basis for action. At some sites, monitoring of surface water or sediment

pore water concentrations may also be appropriate. Monitoring should employ parameters and sampling frequencies sensitive to potential environmental change rates. Time trends in baseline data serve as the basis of comparison in the long-term monitoring plan.

The 2008 Sediment Assessment and Monitoring Sheet 1: *Using Fish Tissue Data to Monitor Remedy Effectiveness* ([OSWER Directive 9200.1-77D](#)) recommends that the fish data collected be used to evaluate remedy effectiveness and protectiveness during the Five-Year Review process where there is an RAO to address risks from fish consumption. This guidance suggests that for many sites, “A sampling plan that specifies a minimum of 5 composites consisting of at least 5 fish per composite is often adequate to determine with a confidence level of 90-95% if the post remediation concentrations have decreased at least 50%.” However, some sites may also benefit from analyzing individual fish if a fuller depiction of spatial patterns in contamination is desired. Generally, regions should evaluate sediment remedy effectiveness after the collection and evaluation of at least three sets of sediment and fish tissue samples collected over five to ten years, post remediation. These data should be used to evaluate the progress toward the RAOs and remediation goals.

10. Collaborate with Clean Water Act (CWA) programs

EPA’s memorandum *Promoting Water, Superfund and Enforcement Collaboration on Contaminated Sediments* (February 2015, [EPA 720523](#)) encourages cross-program collaboration to achieve water quality goals and public health and environmental protection at Superfund cleanups and other contaminated sediment sites. Close coordination between the Superfund and CWA programs can make both programs more effective and better serve the public. For example, permits and other actions taken under CWA authority could reduce the risk of sediment remedy re-contamination, and actions taken under Superfund authority could hasten achieving water quality standards. Similarly, data collected through the Superfund program can help support the CWA program in defining and addressing areas of ongoing recontamination. Sharing information, such as water and sediment data collected at a Superfund Site, National Pollutant Discharge Elimination System (NPDES) permits, impaired waters designations and Total Maximum Daily Load (TMDL) development, or RI/FS and long-term monitoring data, can leverage the authorities of each program.

Coordinating with the CWA program during cleanup helps ensure the Superfund Remedial Program addresses ARARs and helps to control sources of contamination to the water body. For example, the cleanup program should work with CWA NPDES program where a response action includes a point source discharge. The cleanup program can also benefit by coordinating with the CWA program in designing long-term monitoring programs to maximize each program’s data collection efforts and assess the water to sediment contamination pathway.

EPA Region 5 is piloting a mapping tool that will facilitate such collaboration, overlaying Superfund site boundary data (polygon) with CWA data such as 303(d) impairments, TMDLs, NPDES outfalls, and other water quality related data. Such maps provide excellent visualization of the overlap between Superfund and CWA at a site for all stakeholders (federal, state, local, communities, potentially responsible parties (PRPs)) and decision-makers. EPA’s 2007 *Integrating Water and Waste Programs to Restore Watersheds Guidance* provides additional recommendations for Superfund and CWA collaboration ([EPA 540K07001](#)).

11. Consider authorized navigation channels in Superfund sediment sites

Superfund sediment sites may include a federally authorized navigation channel. In developing alternatives for remediation, EPA considers the future use of a waterbody. As a related matter, Section 10 of the *Rivers and Harbors Act of 1899* (33 U.S.C. §403) may be a potential ARAR at CERCLA sediment sites. Section 10 states that “[t]he creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited.” The Army Corps of Engineers (ACE) is responsible for implementing section 10, and its regulations published in 33 CFR §322.3(b)(2) provide that “Congress has delegated to the Secretary of the Army in Section 10 the duty to authorize or prohibit certain work or structures in navigable waters of the United States, upon recommendation of the Chief of Engineers.”

In developing and evaluating remedial alternatives, and selecting a remedy, for a waterway with an authorized navigation channel, OLEM recommends that regions consider the requirements of 33 U.S.C. §403 to determine whether a Superfund response action within the boundaries of a federal navigation channel may create an obstruction to the navigable capacity of the channel, taking into account the specific navigation depths authorized by Congress. For example, if the remedial action involves placement of a cap (either with or without preliminary dredging), the cap could be a potential obstruction to navigable capacity if it is not below the depth required to maintain the authorized depth of the channel. To ensure effective interagency collaboration, OLEM also recommends that site managers meet with the ACE early in the RI/FS and continue to communicate with them throughout the remedy selection and remedial action process

IMPLEMENTATION

When developing and evaluating contaminated sediment site remedial alternatives, regions should consider the eleven recommendations identified above, as well as the *Sediment Risk Guidance*, the *Sediment Remediation Guidance*, and other existing EPA CERCLA Guidance. The recommendations are especially relevant at sites contaminated with bioaccumulative contaminants where the risks are driven by contaminated fish or shellfish consumption. Additionally, the regions should engage with the Office of Superfund Remediation and Technology Innovation (OSRTI) and CSTAG early in the RI/FS process, and should engage with the Office of Site Remediation Enforcement (OSRE) regarding the PRP search. At PRP-lead sites, the Superfund program and counsel offices should work together to ensure PRP participation throughout the removal and remedial processes.

The recommendations provided in this memorandum should be considered in the preparation of all RI/FS reports, proposed plans, RODs, ROD Amendments, and Action Memos for Non-Time Critical Removal Actions at CERCLA sites where sediment contamination will be addressed. These recommendations do not change the scope of the information that should be included in a Tier 1 Consideration Memorandum.

Attachments:

Appendix - Revised CSTAG Process and Procedures

Attachment A - Guidelines for the OSRTI Review of Consideration Memos on Tier 1 Sediment Sites

Attachment B - Attachment B - Example Invitation Letter from EPA Regional Site RPM to Stakeholders to Participate in CSTAG Site Meeting

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Appendix - Revised CSTAG Process and Procedures

Background

OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (February 12, 2002), established an Office of Superfund Remediation and Technology Innovation (OSRTI) consultation process to “help ensure that regional site managers appropriately consider these principles before site-specific risk management decisions are made.” The memorandum also established the Contaminated Sediments Technical Advisory Group (CSTAG) as a technical advisory group to “monitor the progress of and provide advice regarding a small number of large, complex, or controversial contaminated sediment Superfund sites.” The memorandum suggested that the CSTAG would meet annually to review the progress on most sites until the record of decision (ROD) was signed and then periodically until all remedial action objectives (RAOs) had been met. The memorandum did not provide specifics on the scope of the reviews, but stated: “The specific areas of assistance or specific documents to be reviewed will be decided by the group on a case-by-case basis in consultation with the site team.” This memorandum clarifies the role of the CSTAG and revises the processes and procedures that should be followed by the regions, OSRTI and the CSTAG.

Purposes of the CSTAG

- To help remedial project managers (RPMs) of large and potentially expensive and/or controversial sediment sites appropriately investigate and manage their sites consistent with CERCLA and the NCP, the 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, and other EPA guidances and policies appropriate for sediment sites.
- To encourage the use of state-of-the-science tools and methods to complete an adequate and timely characterization of the nature and extent of contamination and to help ensure the selection of a cost-effective remedy that will control sources and achieve long-term protection while minimizing short-term impacts.
- To encourage national consistency in the characterization and management of sediment sites by providing a forum for exchange of technical information among the CSTAG members.

Membership

CSTAG membership has changed periodically since it was created in 2002. Currently it includes one representative from each EPA region (except Region 7), two from EPA’s Office of Research and Development, three from EPA/OSRTI, and two from the Army Corps of Engineer’s Engineer Research and Development Center. All members are expected to have expertise in evaluating sediment sites and to have the time to participate in monthly conference calls and in one or two meetings per year. Some meetings will include a site visit, but most meetings will be by conference call. Each member is expected to pay their own travel costs, which should be charged to the site-specific account. Membership entails a significant time commitment, especially when preparing for a meeting in the host region. Each member’s obligation is to support the role of the CSTAG and to provide unbiased technical

advice. There should be no expectation that the regional member will support his/her region's position on site issues. Periodically, the OSRTI Office Director may request regional management to re-evaluate the region's member based on the following criteria:

- 1 – Current or former RPM with experience and expertise in developing remedial investigations and feasibility studies (RI/FSs) for sediment sites.
- 2 – Experience in developing or reviewing proposed plans for sediment sites.
- 3 – Willingness to share technical knowledge with other RPMs and CSTAG members.
- 4 – Willingness to actively participate in national technical meetings and conferences.
- 5 – Ability to objectively evaluate site-specific information from a scientific and technical perspective to assess the extent to which site evaluations and decisions follow the recommendations in the sediment remediation guidance and the general state of practice for sediment sites.
- 6 – Ability to compromise and reach consensus on issues when drafting CSTAG recommendations.

Initial Site Meeting or Conference Call

The date for the meeting will be set by the site's RPM and CSTAG Chair. The meeting should typically occur by conference call during the scoping phase of the RI/FS, before the sampling and analysis plans or other work plans have been finalized. A site information package should be sent to all CSTAG members at least two weeks before the meeting. The initial meeting usually occurs within one year of listing for all NPL sites. The RPM should provide a summary of the current and historical distribution of contaminants in surface sediment, sub-surface sediment, water, and biota and describe the current conceptual site model (CSM).

Site Visit, Detailed Briefing and Stakeholder Presentations

If there are significant data available for the site, the site visit and stakeholder presentations may be part of the initial site meeting. The representative for the region where the site is under review is expected to make arrangements for hotel rooms and meeting space. For most new CSTAG sites, however, it is expected that the site visit will not take place until after the collection of site data (*i.e.*, during the RI/FS). The site team should provide:

1. A summary of all available contaminant data in sediment (surface and at depth), biota, and surface water.
2. A full description of the CSM.
3. Information on existing and potential ecological and human health risks.
4. Information on site conditions most conducive to dredging, capping, in-situ amendments, enhanced natural recovery (ENR), or monitored natural recovery (MNR).
5. Information on sediment deposition and erosion.
6. Information on on-going releases and uncontrolled sources, including background contaminant concentrations in appropriate media.

A Consideration Memo describing how the RPM considered each of the 11 risk management principles should also be submitted to the CSTAG. The Consideration Memo should generally be less than 30

pages and follow the recommended format presented in the *Guidelines for the OSRTI Review of Consideration Memos on Tier 1 Sediment Sites* (attachment A).

The site briefing is based upon the complexity of the site and the amount of data available and may take eight hours. It can include other EPA staff and contractors, and other federal agency staff, where appropriate. The meeting will include a site visit, a half-day session where stakeholders may make presentations to the CSTAG, and at least a half-day CSTAG-only session where the CSTAG drafts its recommendations. Members of the site team should be available during the CSTAG deliberations to answer questions. In addition to the CSTAG members and regional/state staff, the OSRTI regional coordinator will also be invited to attend.

The EPA RPM will invite others that have had significant involvement with the site to give a short oral presentation to the CSTAG. This will normally include the lead state agency, lead PRP, lead trustee, tribes, and community groups. The state and tribal regulators and stakeholders should be sent invitations at least six weeks before the meeting. An example invitation letter is attached as Appendix B. The presentation should identify any issues important to the stakeholder. Each presentation should be no more than 20 minutes and allow 10 minutes for CSTAG questions. Invited stakeholders may elect to submit written comments instead. All written submittals, including a summary of each oral presentation, should be sent to the EPA RPM at least one week before the meeting and should not exceed 30 pages.

CSTAG Updates

In order to keep the CSTAG informed of site progress, the region should update the CSTAG with periodic conference calls until the Proposed Plan stage (*e.g.*, every two years). The dates for the update calls will be set by the site's RPM working with the regional CSTAG representative and the CSTAG Chair. New data on the same topics presented at the detailed briefing should be presented. A revised Consideration Memo does not need to be prepared for these update conference calls. The CSTAG will not track the progress of sites after the ROD is signed; this is the role of the OSTRI Sediment Team. However, if the region decides that an amendment to the ROD is needed, the region needs to provide a full update to the CSTAG, and a revised Consideration Memo before developing a Proposed Plan for the ROD Amendment.

Second CSTAG Meeting

For sites where at least one alternative that may be preferred by the region is expected to exceed \$500 million, a second CSTAG meeting should occur at the regional office after completion of the RI data collection and draft FS. No stakeholder presentations will occur at this second meeting. If the estimated cost of the preferred remedy for a CSTAG site does not exceed the cost trigger for a NRRB review (currently at \$50 million), the second and final CSTAG meeting will be held before the issuance of the Proposed Plan for the site. The region should submit a detailed briefing package and an updated Consideration Memo at this time.

Joint NRRB/CSTAG Meetings

For CSTAG sites where the cost of the region's preferred remedy exceeds \$50 million, there will be a joint NRRB/CSTAG meeting. This would be a third CSTAG meeting for sites with an alternative that

exceeds \$500 million. When an RPM prepares the site package for the joint NRRB/CSTAG meeting, the RPM should also develop a revised Consideration Memo. The CSTAG chair will distribute the memo to the CSTAG members for review. At least five members of the CSTAG, including two regional members and the chair, will normally attend the NRRB/CSTAG meeting to offer technical advice and assistance to the NRRB and participate in the drafting and reviewing of the NRRB recommendations. The NRRB chair will lead the joint meeting and NRRB procedures will be followed, but the CSTAG chair will co-sign the recommendations memo.

CSTAG Recommendations

Within six weeks after the CSTAG-only meetings, the CSTAG Chair will send recommendations on how the RPM might better address the ongoing and planned work at the site and the evaluation of alternatives. The appropriate OSRTI Regional Branch Chief, Division Director, and Office Director and the Regional Branch Chief will be copied, and a copy will be placed on the CSTAG web page at: <https://www.epa.gov/superfund/list-contaminated-sediments-technical-advisory-group-sites>.

The RPM will provide the CSTAG chair a written response to the recommendations within two months. The RPM will also send a copy of the response, along with the CSTAG recommendations, to all stakeholders that attended the initial meeting. OSRTI will place the regional response on the CSTAG web page. Draft recommendations and comments on the drafts are considered pre-decisional and will not be posted on the CSTAG website.

Summary

The CSTAG will have two or three meetings for each CSTAG site and several conference calls to review site information. The initial meeting will occur early in the RI and will include a site visit and stakeholder presentations. For potentially very expensive sites that are expected to go to the NRRB, the second meeting will occur after the first draft of the FS has been completed. For sites not going to the NRRB, the second and final meeting will take place after the region has identified its preferred alternative before drafting the proposed plan. For sites going to the NRRB, the second or third meeting of the CSTAG will occur at the joint NRRB/CSTAG meeting. Update meetings will occur as needed via conference call.

Attachment A - Guidelines for the OSRTI Review of Consideration Memos on Tier 1 Sediment Sites

BACKGROUND

These guidelines have been developed by OSRTI with input from the Contaminated Sediment Technical Advisory Group (CSTAG) to provide OSRTI regional coordinators a tool to evaluate how well RPMs have documented how the OSWER Directive 9285.6-08, Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites were considered when proposing a remedy at a contaminated sediment site. These Guidelines also apply to the CSTAG review of the Tier 2 CSTAG sites.

Under the Tier 1 review process, Directive 9285.6-08 requested that RPMs (or OSCs) submit written documentation (*i.e.*, a Consideration Memo) to the headquarters Superfund program office before proposing a response at all Tier 1 sites. Tier 1 sites are sites that include a proposed sediment action which, in combination with other sediment actions at a site, would result in dredging more than 10,000 cubic yards or capping or using monitored natural recovery as a remedy for more than five acres, calculated on a site-wide basis. The Consideration Memo should be sent to the OSRTI regional coordinator at least 30 days before issuing the Proposed Plan or EE/CA. A typical Tier 1 Consideration Memo should be no longer than 30 pages, but will vary with the complexity of the site. OSRTI will send comments to the RPM within three weeks. OSRTI expects that these comments will be reflected in the final version of the Consideration Memo that will become part of the administrative record for the site when the ROD is issued and considered in finalizing the Proposed Plan and drafting the ROD.

Directive 9285.6-08 also established the CSTAG to advise project managers at a limited number of large, complex or controversial Tier 2 sites. CSTAG requests similar written documentation for the sites it is reviewing. For these Tier 2 CSTAG sites, the Consideration Memo should be sent to the CSTAG chair.

QUESTIONS OSRTI REGIONAL COORDINATORS SHOULD ASK WHILE REVIEWING CONSIDERATION MEMOS

OSRTI recommends that Superfund project managers address each of the following 11 principles when documenting their consideration of Directive 9285.6-08 under either the Tier 1 or Tier 2 review process. The questions listed below are intended to help OSRTI coordinators assess how well RPMs explained how they considered the principles. The questions apply to a site at the draft Proposed Plan stage or when the draft Engineering Evaluation/Cost Analysis (EE/CA) is prepared for public comment. Where a proposed plan or EE/CA applies to one or more (but not all) of several sediment operable units, the memorandum should address sediment aspects of the site as a whole, to the extent practicable and relevant to the proposed remedy.

These questions are derived from information and guidance provided in the 2002 Principles Memo and in the 2005 *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*.

1. Control Sources Early.

A. Were all significant continuing sources of sediment contamination at the site identified? For each continuing source, were the plans to control these sources described, including the expected time to complete these actions, who will undertake them, and how any continuing sources are being monitored?

B. Where there is uncertainty about the timing or effectiveness of source control actions, or if all sources cannot be controlled, did the memo indicate (1) how the potential for recontamination had been considered in the selection of the proposed sediment remedy, and (2) to what extent the proposed sediment remedy is expected to be beneficial if source control is not effective or not complete by the time the proposed sediment remedy is planned to be implemented, and (3) where sources are ongoing, are risk-based goals likely to be achieved??

2. Involve the Community Early and Often.

A. Was the role of the community in the developing the RI/FS or EE/CA and the mechanisms that were used to solicit effective involvement of a variety of community members described?

B. Did the memo briefly describe how local societal and cultural practices were identified and considered in (1) the human health risk assessment (*e.g.*, local recreational use of the water body, local fishing practices) and (2) the selection or development of the proposed remedy (*e.g.*, current and future uses of the water body)?

C. Did the memo describe the major ways the proposed sediment remedy is expected to affect the local community, including impacts that occur during remedy implementation?

D. Was the expected level of community support for the proposed sediment remedy discussed? Did the memo identify any aspects that are expected to be of most concern to the community and briefly describe how these concerns have been addressed or considered?

3. Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees.

A. Did the memo briefly describe the major sediment-related issues where state and local governments have been involved at the site? If there were any aspects that are expected to be of most concern to state and local governments, did the memo describe how those concerns have been addressed or considered?

B. For sites that include water bodies where Total Maximum Daily Loads (TMDLs) are being or have been developed, were the coordination efforts with the state and with EPA's water program described? Were any aspects of the TMDL development that were considered in selecting the proposed remedy discussed?

C. If there are tribal interests at the site, did the memo identify any aspects of the proposed sediment remedy that are expected to be of most concern to the tribe(s) and how those concerns have been addressed or considered?

D. If there are natural resource trustee interests at the site, did the memo identify the major areas of coordination related to the performance of the RI/FS or the ecological risk assessment? Were any trustee restoration activities that may be concurrent with or follow the Superfund action and the extent to which those restoration activities are dependent on the Superfund action discussed?

4. Develop and Refine a Conceptual Site Model (CSM) that Considers Sediment Stability.

A. Was a clear description of the conceptual site model for site presented? Did it provide a conceptual understanding of the cause-effect relationships among contaminated sources, transport mechanisms, exposure pathways, human receptors, and ecologic receptors at each affected level of the food chain?

B. Did the CSM clearly identify the risk pathway(s) driving the need for remediation and how the proposed response will address this risk?

C. Did the memo identify the natural and man-made disruptive events or forces that were considered when evaluating sediment alternatives, including the recurrence interval or probabilities of those events or forces? Did it relate these forces to rates of erosion and sedimentation?

D. Was an evaluation of the stability or potential instability of buried contaminant deposits and their potential for exposure in the bioavailable zone included in CSM in order to be able to differentiate between significant and insignificant routes of exposure?

5. Use an Iterative Approach in a Risk-Based Framework.

A. Did the memo briefly describe the major ways in which an iterative approach was used at the site? (An iterative approach is one that incorporates testing of hypotheses and conclusions and fosters re-evaluation of new information as it is gathered).

B. Did the memo describe any early or interim actions (other than the proposed remedy) planned or implemented at the site that address threats from contaminated sediment?

C. If the proposed sediment remedy will be implemented in phases or if it is part of a larger phased approach to the site as a whole, were the phases clearly described?

D. If there was substantial uncertainty concerning the predicted effectiveness of dredging, capping, or in-situ amendments, were pilot studies performed as part of the FS or proposed as part of the design phase?

6. Carefully Evaluate the Assumptions and Uncertainties Associated with Site Characterization Data and Site Models.

A. Did the memo briefly describe the most significant uncertainties associated with characterizing site conditions? Where mathematical models were used, were the uncertainties

around the input parameters (*i.e.*, those used to estimate human health and ecological risk and the predicted effectiveness of potential sediment remedies) discussed? Did the memo briefly explain how those uncertainties were accounted for (*i.e.*, use of sensitivity analyses or reasonable conservative assumptions)?

B. If a new mathematical model was used, or if a model at a large or complex site was calibrated using site data, did the memo describe the peer review process used for the model and briefly summarize the results of the peer review?

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

A. Were dredging, capping, in-situ amendments, Enhanced Natural Recovery (ENR), and Monitored Natural Recovery (MNR) alternatives evaluated? If one of these was screened out, did the memo clearly explain why? Was at least one combination remedy alternative that included capping, dredging, ENR, in-situ amendments and/or MNR included? If not, did the memo explain why not?

B. If appropriate, did the memo describe how the proposed sediment remedy for the site relates to any other sediment operable units at the site or to other nearby sites in the same waterbody?

C. Did the memo describe the expected relative levels of short-term risk increases and long-term risk decreases for each alternative, and the time frames for these?

D. For each site or area where dredging, capping, ENR and MNR were selected, did the memo identify which of the site conditions from the Sediment Remediation Guidance made the site or area especially conducive for the proposed alternative?

8. Ensure that Sediment Cleanup Levels are Clearly Tied to Risk Management Goals.

A. Did the memo briefly summarize the baseline risks associated with contaminated sediment that were identified in the human health and ecological risk assessments?

B. Did the memo describe the remedial action objectives (RAOs) or removal objectives, and risk-based numerical remedial goals (RGs)? If risk-based measures were not presented, did the memo explain why not?

C. Did the memo describe the sediment cleanup and/or action levels, and briefly describe how they were derived, how they relate to the RAOs and RGs, and when they are expected to be met?

9. Maximize the Effectiveness of Institutional Controls and Recognize their Limitations.

A. Did the memo identify any institutional controls that are part of the proposed sediment remedy, and if so, describe how they will be implemented and any plans to maximize their effectiveness (*e.g.*, public education regarding fish consumption advisories, bans on anchoring over a cap)?

B. Did the memo briefly describe any plans for monitoring or information collection at the site that will be used to evaluate the effectiveness of institutional controls?

10. Design Remedies to Minimize Short-term Risks While Achieving Long-Term Protection.

A. For *in situ* capping alternatives, did the memo describe the measures that will be taken to minimize contaminant releases during cap placement, and the expected impact of cap materials on the recolonization of the cap by biota?

B. For dredging alternatives, did the memo briefly describe the measures that will be taken to minimize contaminant releases and sediment resuspension during dredging? Did it describe how and when the dredged habitat is expected to recover? If on-site disposal is planned, did it briefly describe the disposal unit and monitoring that will be required to assess protectiveness?

C. Did the memo briefly describe the major expected effects of the proposed remedy on societal and cultural practices and how these were considered in remedy selection?

11. Monitor During and After Sediment Remediation to Assess and Document Remedy Effectiveness.

A. For capping remedies or components, did the memo briefly describe the type of monitoring that will be required in order to evaluate cap erosion and release of contaminant through the cap?

B. For dredging remedies, did the memo describe the monitoring that will be done to ensure that cleanup-levels have been met and maintained?

C. For all remedies, did the memo describe how risk reduction is going to be measured? If sufficient baseline data were not available, were plans for collecting additional data before implementing the remedy described?

D. Did the memo briefly describe other plans for long term monitoring (*e.g.*, monitoring of long-term success of source control measures, effects of disruptive events, migration of buried contaminants, cap integrity)?

Attachment B - Example Invitation Letter from EPA Regional Site RPM to Stakeholders to Participate in CSTAG Site Meeting

Dear [];

On behalf of EPA and as the EPA's Remedial Project Manager (RPM) for [insert site name], I am pleased to invite you to participate in a meeting on [insert date] regarding the Remedial Investigation/Feasibility Study (RI/FS) for the site. The purpose of this meeting is to provide the community and other stakeholders with an opportunity to share its views with EPA's Contaminated Sediments Technical Advisory Group (CSTAG) on the [site name] project. They are interested in hearing your:

- ideas and insights about the investigation thus far,
- thoughts on current and future uses of the waterbody,
- concerns about the impact of the project on the community,
- ideas about how EPA can best disseminate site-related information and provide opportunities for meaningful stakeholder involvement, and
- recommendations for improvement to the site investigation.

Background

On February 12, 2002, the EPA issued OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* to help EPA RPMs make scientifically sound and nationally consistent risk management decisions at contaminated sediment sites. The Directive presents eleven risk management principles to consider when planning and conducting site investigations, involving the affected parties, and selecting and implementing a response. I am enclosing a copy of the OSWER Directive for your information.

To better ensure that the EPA Regional Superfund program appropriately considers these principles before making site-specific risk management decisions, this Directive established a consultation process that applies to many contaminated sediment sites. It also established a national advisory group called the CSTAG that monitors site progress and provides advice on certain large, complex, or controversial contaminated sediment Superfund sites. The group is comprised of sixteen scientists and engineers from across the various EPA and US Army Corps of Engineers regions, laboratories, and headquarters locations.

CSTAG Review of [site name]

The [site name] has been identified as a site subject to the CSTAG review process. The purposes of the CSTAG are:

- To help RPMs at a small number of large and potentially controversial sediment sites appropriately investigate and manage their sites in accordance with the 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, and other relevant EPA guidances and policies appropriate for sediment sites.

- To encourage the use of state-of-the-science tools and methods to complete an adequate and timely characterization of the nature and extent of contamination and to help ensure the selection of a cost-effective remedy that will control sources and achieve long-term risk reduction while minimizing short-term impacts.
- To encourage national consistency in the characterization and management of sediment sites by providing a forum for exchange of technical information among the CSTAG members.

The CSTAG will discuss the [site name] at a meeting to be held [dates] at [location]. Because the CSTAG believes that it is important to hear from various stakeholders associated with the site, we are inviting you to present any information that you believe is important for the CSTAG to consider. The [afternoon or morning of date] is reserved for stakeholders to make oral presentations to the CSTAG. If you wish to make a presentation, please call me at [phone number] before [date] to schedule a time slot for you. Other stakeholders are also afforded this opportunity. Twenty minutes will be allotted to each stakeholder for a presentation, followed by ten minutes of clarifying questions by the CSTAG members to the presenter. Please understand that schedule adjustments may be necessary if many stakeholders are interested in presenting. Written materials in addition to, or instead of, an oral presentation are also welcome but are not required. Any written material should not exceed thirty pages. If you are interested in providing written information for the CSTAG's consideration, please send it to me at the address below by [date] or via e-mail to [RPM E-mail address].

RPM name
US EPA, Region Y
Address

Since the CSTAG will be briefed on the site background and available data before your presentation, it is not necessary for you to repeat site information. I recognize that it may be challenging to limit the information you believe should be presented to twenty minutes and/or thirty pages, so please focus on the issues that you believe are most important for the CSTAG to consider. I will distribute all written submittals to the CSTAG for their review before the upcoming meeting.

EPA welcomes your participation in this meeting and we look forward to hearing your ideas regarding how best to investigate the [site name]. If you have any questions regarding the CSTAG, the upcoming meeting, or the consultation process, please contact me at [RPM phone no] or Steve Ells, the CSTAG chair, at (703) 603-8822.

Sincerely yours,

[RPM name]

Enclosure

cc: Steve Ells, CSTAG Chair, OSRTI

