UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

June 29, 2012

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Lockheed West Seattle Superfund Site

FROM: Amy R. Legare, Chair
National Remedy Review Board

TO: Daniel D. Opalski, Director
Office of Environmental Cleanup
U.S. EPA Region 10

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Lockheed West Seattle Superfund Site, in Seattle, WA. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator established the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective remedy decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board review is intended to help control remedy costs and to promote both consistent and cost-effective decisions. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandates that, in addition to being protective, all remedies must be cost-effective. The Board considers the nature of the site; risks posed by the site; regional, state, tribal and potentially responsible party (PRP) opinions on proposed actions; the quality and reasonableness of the cost estimates; and any other relevant factors or program guidance in making our advisory recommendations. The overall goal of the review is to ensure sound decision making consistent with current law, regulations, and guidance.

Generally, the Board makes the advisory recommendations to the appropriate regional division director. Then, the region will include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the region is expected to give the

Board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the region's final remedy decision. The Board expects the regional division director to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. Although the Board's recommendations are to be given substantial weight, the Board does not change the Agency's current delegations or alter the public's role in site decisions; the region has the final decision-making authority.

Overview of the Proposed Action

The Lockheed West Seattle Superfund Site includes approximately 40 aquatic acres of the former Lockheed Shipyard No. 2 located along Elliott Bay and the West Waterway in Seattle, Washington. It is adjacent to upland areas of the Port of Seattle Terminal 5, including former upland shipyard support operations, which are not part of the current Site project area.

Analytical data from surface and subsurface sediment samples indicate that metals, polychlorinated biphenyls (PCBs), tributyltin, and polycyclic aromatic hydrocarbons are the most frequently detected contaminants. Elevated concentrations for metals including arsenic, copper, lead and mercury were also detected. Dioxins and furans were identified as contaminants of concern (COCs) based on their assumed presence in the sediments and seafood, as well as their assumed cancer-risk estimate above regulatory thresholds.

At the time of the review, the selection process for the preferred alternative was not complete. Region 10 proposed three candidate alternatives for Board review:

- Alternative 2A2a – $14.2 million (cap cleanup screening levels [CSL] areas and apply enhance natural recovery [ENR] to urban background boundary).
- Alternative 3A1 – $25.9 million (dredge CSL areas to 3 feet, partially backcap and apply ENR to urban background boundary).
- Alternative 3C – $45.5 million (full dredging in dry dock areas, partially backcap and apply ENR to urban background boundary).

National Remedy Review Board Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Region 10 staff and management (Piper Peterson, Lon Kissinger and Lori Cohen) on July 26, 2011. The Washington State Department of Natural Resources (DNR) was represented by John Bower, Lionel Klikoff and Erika Shaffer. Based on this review and discussion, the Board offers the following recommendations:

Site Characterization

Throughout the presentation to the Board, a number of issues and potential data gaps became evident. These issues centered on the need for additional site-specific data and re-assessment of the assumptions used in the cleanup level risk calculations. These issues/gaps include: 1) designation of future land use;

2) contaminant distribution (e.g., dioxins); 3) site-specific contaminant bioaccumulation data (e.g., site fish tissue collection); 4) chemical speciation in exposure media (e.g., arsenic [As] in fish tissue), which can impact the toxicity assessment; 5) reassessment of exposure assumptions (e.g., relative risk calculations/relative source contributions or additional risk for PCBs, or ingestion rates); 6) consideration of sedimentation rates and background levels from the neighboring Pacific Sound Resources Superfund Site (PSR); 7) associated recontamination potential from groundwater and Elliot Bay; and 8) the potential effects of seismic activity. In addition to ensuring an adequate administrative record to support the Region's cleanup approach for this site, this information could have a substantial influence on alternative approaches, conclusions on current risk and remedy protectiveness for the final remedy cleanup decisions made by the Region. The Board recommends the Region consider addressing all the issues above and document its data and findings in the administrative record and decision documents.

In addition, the Board recommends that the Region consider proceeding with an interim remedial action for this site at this time. An interim action could provide the limited dredging and related actions at the former shipyard area (e.g., 10,000 cubic yards plus some additional dredging and/or capping in selected areas with higher contamination levels) while additional studies and monitoring are conducted to better characterize the site and reduce as much as possible the uncertainties resulting from current data gaps.

The review package also shows that the site has significant bathymetric relief with peaks, valleys and steep slopes. There are also significant pilings and debris. Before any remedy is implemented, the Region indicated that the pilings and debris would be removed and leveling may be needed. The Board recommends that the Region evaluate the effect of sediment resuspension, redistribution of contamination and accompanying risk. There may be an effect on the implementability and cost of capping. The Region should consider if these factors make dredging costs more comparable to capping. If so, the comparative analysis of alternatives should be revised.

Waste Characterization and Possible Principal Threat Waste

The package presented to the Board did not contain information to support the identification of dioxins and furans as COCs. Information should be collected and presented in the administrative record and decision documents to support this identification. Depending on the concentrations of these contaminants in the sediment, some of this material may be considered a principal threat waste (PTW). The Board recommends that the Region include within the decision documents sufficient explanation regarding how COCs are identified and whether any of the contaminated media constitute principal threats consistent with the NCP (e.g., 40 CFR 300.430(b) and (d)), Office of Solid Waste and Emergency Response (OSWER) Directive No. 9355.3-01, October 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final* (e.g., Chapter 3.4), EPA guidance 540/1-89/002, December 1989, *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A), Interim Final* (e.g., Chapter 4); and OSWER Directive No.9380.3-06FS, November 1991, *A Guide to Principal Threat and Low Level Threat Wastes*. The Board recommends that in its decision documents, the Region more thoroughly explain how its reading of Agency guidance and its approach to treatment at this site are consistent with CERCLA and the NCP.

Future Land Use/Institutional Controls

The review package indicated, and the presentation confirmed, that the key stakeholders who control land use at the site have not reached a consensus or decided on future land use for the site. The Board recommends that the Region work with all interested stakeholders, including the DNR, Port of Seattle, tribes and community, to ensure the Region is using correct assumptions with regard to the reasonably anticipated future land use at this site. The Region then should be better able to consider reasonably anticipated future land use when making the remedy selection in accordance with OSWER Directive No. 9355.7-19, March 2010, *Considering Reasonably Anticipated Future Land Use and Reducing Barriers to Reuse at EPA-lead Superfund Remedial Sites*.

The information presented to the Board indicates that active remediation at this site will not, by itself, achieve a remedy that is protective of human health and the environment; institutional controls (ICs) will be needed to help ensure protectiveness. The Board recommends that the Region clarify in the decision documents the role of ICs that may be selected and implemented, including the potential role of fish consumption restrictions for subsistence fishermen and limitations on commercial fishing.

Human Health/Ecological Risk

In the presentation to the Board, the Region focused on the difficult issues related to human health exposure, the potential for site recontamination from non site-related sources, and the challenges associated with the ability to achieve protectiveness within the dietary exposure pathway (fish consumption). The Board notes that there are other substantive and significant site-related risks identified by the Region, both human health and ecological, from multiple contaminants (e.g., tributyltin, copper and arsenic) and exposure pathways (e.g., human health direct contact and incidental sediment ingestion). The Board recommends that the Region clearly articulate these risks in the decision documents, explain how the preferred site remedy would achieve protectiveness and also explain how these risks provide a basis for action. In addition, the Region should explain how the site cleanup, with the help of ICs, is designed to achieve protectiveness with regard to non-site related fish bioaccumulation of certain contaminants. Furthermore, the Board believes it may be appropriate for the Region to highlight the accomplishment of mass removal of contaminants from the Elliot Bay system, which may lead to future, long-term reduction in fish contaminant levels.

Remedial Action Objectives

In the package provided to the Board, remedial action objective (RAO) 1 states that an objective of the remedy is to reduce human health risks associated with the consumption of resident site seafood by reducing sediment and surface water concentrations of COCs to protective levels. The Board recommends defining the protective levels referenced in the RAO (i.e., based on number of fish meals) and clarifying what is meant by "reduce human health risks." In addition, baseline concentrations in seafood should be collected and documented so that the post-remediation reductions can be measured against pre-remediation levels. Providing more detail to the RAO will allow the Region to document when this RAO is achieved.

The package presented to the Board includes RAOs 1 and 4 that call for reduction of human health risks and reduction of risks to crabs, fish, birds and mammals to "protective levels" but specify that "no active remediation of surface water will be conducted." The Board recommends that the Region more clearly

specify what "protective levels" means (in light of the various descriptions used in the package and during the presentation for ultimate site cleanup numbers) when it includes RAOs in its decision documents. The Board also recommends that the parenthetical notes connected with RAOs 1 and 4 be deleted; if surface water (and potential groundwater contamination from the upland area) is not being addressed through this remedial action, the decision documents should explain how that will affect the Region's proposed approach to site cleanup (e.g., when surface and groundwater would be addressed and how they could be affected by continued migration of contamination).

Remedy Performance

The package provided information on the physical location of the site in relation to the Lower Duwamish Waterway, Todd Shipyard Sediment Operable Unit, Lockheed Shipyard No. 1 Sediment Operable Unit, West Waterway Operable Unit and Pacific Sound Resources Marine Sediment Unit. While several of these external sources have undergone response measures, other sources of contamination to the immediate area are in the investigation phase. The Board is concerned with the timing of the cleanup in relation to completion of all external source cleanups; thus, the Board recommends, based on the proximity to other sites, uncertainties about possible future land use and the timetable for achieving protectiveness of the ecosystem, and the site characterization issues mentioned above, that an interim action may be warranted at this time.

Furthermore, if the Region proceeds with a final remedy at this time, the Board notes that the Region is proposing to use urban (not site-specific) background as the basis for PCB cleanup levels in sediments. The urban background concentration is 119 parts per billion (ppb). However, a higher sediment cleanup level was employed at two nearby Superfund sites in Elliott Bay (i.e. Todd Shipyard and PSR). The Board is concerned that residual contaminant levels at these two sites will impact any remedial action and potentially recontaminate the Lockheed West site. This is further supported by the Region's belief that active remediation at the Lockheed site will not, by itself, result in a protective remedy from a fish consumption perspective (e.g., ICs will be needed to help ensure protectiveness). The Board recommends that the Region clarify its basis for the PCB sediment cleanup level in the context of the location of the Lockheed West site in a commercial harbor setting with other nearby and upstream sources of contamination (e.g., Lower Duwamish Waterway).

The information presented to the Board was not clear about whether the Region is using a site-wide averaging approach or surface-area weighted averaging when setting a cleanup level. The Board recommends that the Region's decision documents explain its averaging approach and how it is designed to ensure protectiveness of human health and the environment consistent with the NCP and existing Superfund program guidance (e.g., OSWER Directive No. 9285.6-10, December 2002, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites;* OSWER Directive No. 9285.7-41, September 2002, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites).* For large commercial/industrial areas, the Board recommends that the Region consider breaking the site or the individual OUs into small sub areas and meeting the cleanup criteria for each individual sub area.

The Board notes that the presentation and review materials described the cleanup levels in terms of preliminary remediation goals (PRGs), remedial action levels, sediment management standards to include cleanup screening levels and sediment quality standards, natural background and urban background. Each of these goals, standards and levels is presented using a different unit of measure.

The Board recommends that, consistent with the provisions and language of the NCP, the decision documents clarify what are the PRGs and cleanup levels, the areas where they apply, and the basis for the selected PRGs and cleanup levels. In addition, to ensure transparency and a meaningful opportunity for informed public participation, the decision documents should include standardized concentrations (i.e., same unit of measure) for all of the contaminant concentrations and PRGs.

Applicable or Relevant and Appropriate Requirements

The information presented to the Board indicated that surface water quality criteria applicable or relevant and appropriate requirements (ARARs) are not appropriate for use in developing numerical PRGs and setting cleanup levels. At the same time, the package identified federal ambient water quality standards as ARARs for the site. The Board recommends that the Region ensure that the decision documents clearly identify all appropriate ARARs and how they are being used in the remedy selection process (e.g., explain why water quality criteria are not ARARs consistent with CERCLA section 121 and the NCP). Furthermore, the Board recommends that the decision document clearly state if an ARAR waiver is being invoked, identify the data in the administrative record supporting a waiver determination and explain the basis for any potential ARAR waiver.

Conclusion

We commend the Region's collaborative efforts in working with the Board and stakeholder groups at this site. We request that a draft response to these recommendations be included with the draft proposed plan when it is forwarded to the Office of Superfund Remediation and Technology Innovation's Site Assessment and Remedy Decisions (SARD) branch for review. The SARD branch will work with both your staff and the Board to resolve any remaining issues prior to your release of the record of decision. This memo will be posted to the Board's website (http://www.epa.gov/superfund/programs/nrrb) within 30 calendar days of my signature. Once your response is final and made part of the site's administrative record your response will also be posted on the Board's website.

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 347-0124 should you have any questions.

cc: J. Woolford (OSRTI)
P. Anderson (OSRTI)
E. Gilberg (OSRE)
R. Cheatham (FFRRO)
D. Ammon (OSRTI)
D. Cooper (OSRTI)
NRRB members