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DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
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IN REPLY REFER TO
Ser 2460/1823/JMC

APR 17 1995

Ms. Meghan Cassidy
U.S. Environmental Protection Agency Region I
JFK Federal Building, HAN-CAN 1
Boston, MA 02203-2211

Ms. Nancy Beardsley
Maine Department of Environmental Protection
State House Station 17
Augusta, ME 04333-0017

Subj: CERCLA REMEDIAL ACTION PROGRAM AT PORTSMOUTH NAVAL SHIPYARD, KITTERY, ME.

Dear Ms. Cassidy and Ms. Beardsley:

Enclosed are the responses to your comments on the Draft Offshore Media Protection Standards for Portsmouth Naval Shipyard; MEDEP letter dated November 29, 1994 and EPA letter dated March 16, 1995.

If you have any questions on this matter please call me at (610) 595-0567 extension 117.

Sincerely,

Jim Conroy

JAMES M. CONROY, PE
LT, CEC, USN
Remedial Project Manager
By direction of the
Commanding Officer

Encl:

cc w/enclosure:
PNS (Code 121.10, F. Endyke)
HNUS (M. Perry)
HNUS (K. Trapp)
NCCOSC (B. Johnston)

DRAFT MPS PROPOSAL FOR OFFSHORE MEDIA (CHAPTERS 2 AND 4)
RESPONSES TO REGULATORY AGENCY COMMENTS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
CTO #201

MEDEP COMMENTS ON CHAPTER 2: DRAFT MPS PROPOSAL FOR OFFSHORE MEDIA BASED ON HUMAN HEALTH RISKS

Comment: I am assuming that the MPS Proposal will be evaluated to determine if any of the proposed changes to the Offshore Human Health Risk Assessment will affect the Offshore MPS.

Response: There are currently no proposed changes to the Offshore Human Health Risk Assessment. We will evaluate the risk assessm nt when the data from the Phase II off-shore studies become available to determine if significant differences exist. However, this will not be completed prior to submission of the revised draft m dia protection standards.

1. Comment: The MPS have been developed for contaminants in the Lower Piscataqua that are contributing to the risks to human health as identified in the Human Health Risk Assessment Report for Offshore Media. Most of the risks associated with offshore m dia are derived from ingestion of biota. The MPS have been developed for biota, although the proposal doesn't clearly state the relationship between the sediment concentrations and biota concentrations and the usefulness of setting a standard for biota.

Response: The proposed standards for biota will be translated into sediment and surface water standards that will be protectiv of human health. Methods outlined in "Assessment and Control of Bioconcentratable Contaminants in Surface Waters" (EPA-833-D94-001) will be adopted to calculate Media Protection Standards (MPS) for each identified contaminant of concern. The development of these MPS values for surface water and sediments will largely revolv around equilibrium partitioning theory - the partitioning of a contaminant between two different phases (e.g., fish and water), assuming that the chemical is in equilibrium between the two phases.

For bioconcentratable surface water contaminants, partitioning between the fish tissue and water phases is largely a function of the chemical's octanol-water partitioning coefficient, the lipid concentration of the fish or shellfish, and the trophic level of the target species of fish/shellfish. For non-polar organic sediment contaminants, current application of equilibrium partitioning (EP) theory suggests that the bioavailabl concentration of contaminant present in the pore water (wat r between grains of sediment) is a function of the octanol-wat r partitioning coefficient for a given chemical and the concentration of organic carbon present in the sediments. Using site-specific,

measured concentrations of sediment organic carbon, the pore water concentrations of organic contaminants can be predict d. Equilibrium partitioning also applies to cationic metals, but s diment concentrations of acid-volatile sulfides (AVS), rather than sediment organic carbon concentrations, largely govern th bioavailability of these contaminants. This information can b coupled with the formulas described above for the development of water MPS to define sediment MPS values.

Application of equilibrium partitioning to derive MPS for human h alth purposes will require that some rather broad assumptions be applied to the development of these values (e.g., predicted por water concentrations of contaminant equals water column concentrations). It should also be acknowledged that the approach outlined above is simplistic but at least serves as a starting point. Factors such as seasonal changes in AVS concentrations, differences in sediment composition (sandy versus high organic, fine grained substrates), shifts from anaerobic to aerobic sediment conditions, etc. will alter the binding capacity of sediments for contaminants. The impact of these factors on interpreting th results on the MPS calculations will need to be addressed, possibly in a section of the document summarizing uncertainty.

Information contained in the Human Health Risk Assessment Report for Off-shore Media (McLaren/Hart 1994) will serve as the basis for the development of the MPS (e.g., RfD values). Documents prepar d in support of the ecological risk assessment may also serve as sources of additional information for the development of MPS values. Modifications to information contained in the Human Health Risk Assessment will be made as necessary (i.e., possibl modification in the values used to reflect daily intake of shellfish), pending discussions with Region I of the United Stat s Environmental Protection Agency (EPA) and the State of Main Department of Environmental Protection (MEDEP).

A preliminary strategy for development of the Human Health MPS was submitted to MEDEP/EPA and discussed with MEDEP/EPA on March 8, 1995.

Input parameters to be used in development of the Human Health MPS will be submitted to MEDEP/EPA on April 5, 1995. A meeting will then be scheduled for April 10 or 11, 1995 to discuss the input parameters with MEDEP/EPA.

Comment: Section 2.3. This section conceptualizes mussels as good indicators of the local environment. It defines local as the Low r Piscataqua near the Shipyard, and states that mussels are good indicators of this environment because they are residents of fix d geographical locations. The authors contrast the sessile lifestyle of mussels to those of lobsters and flounder which they imply will not be as useful in an assessment of the lower Piscataqua.

There is a conceptual mistake in the proposed use of mussels as indicators of local environmental conditions. The mussels major route of exposure is the surface water, and this is the environment that their body burdens reflect. The body burdens in mussels are much less a reflection of the sediment conditions in the low r Piscataqua because this surface water environment is refreshed to varying degrees with each tidal cycle.

Sessile organisms are generally used as indicators of local environmental conditions, but the indicator organisms are more often sediment dwelling infauna. These organisms not only ar confined to a small range, but their contact with the relativ ly static sediment conditions is intimate and a more likely reflection of local conditions.

Mussels are a reasonable choice to indicate surface water exposures in an area such as the lower Piscataqua. They are not a good choice to reflect conditions in sediment. They are also not a good indicator of what body burdens may be in other organisms with feeding habits more closely tied to the benthos and sediments.

The local background mussels taken "upriver" of the shipyard probably- reflect the same water mass as occurs in the low r Piscataqua. These will give a good measure of conditions throughout the estuary, but the water to which these mussels are exposed is to some measure the same water mass in the low r Piscataqua, given the tidal range and mixing characteristics on this coast. There is no true "upstream" in an estuary until the stations are much greater than one tidal excursion from each other and are beyond the range which the average tide may carry the salt water prism. Therefore, it is not surprising to find that muss l contaminant levels found in the lower Piscataqua are "consist nt" with background. They are exposed to similar exposure fields, th tidal waters which are moving in both directions.

<u>Response:</u> The corrective action can remediate the sediment and surface water, not biota. Therefore, MPS will be established for sediment and surface water rather than biota. Since MPS for biota will not be established, there will be no comparison to background biota concentrations and the discussion of mussels will be delet d.

The determination of background concentrations for sediment and surface water will be based on existing data from sampling Stations located furthest upstream from Portsmouth Naval Shipyard. The discussion of background concentrations will be kept separate from the discussion of risk based MPS.

3. <u>Comment</u>: Section 2.3.2. This section ends with a comparison of lower Piscataqua samples to various background data. However, th section is unclear regarding the significance of this discussions. For example, the text alludes to mercury and cadmium "which exc d risk guidelines in lobster hepatopancreas, but not in mussels,..."

but it is not clear what the relationship is between lobst r hepatopancreas and mussel.

Response: The comparison to background biota concentrations will be liminated. See the response to Comment No. 2.

4 Comment: Table 2.

A. Please explain why the samples collected from Great Bay Estuary have been used as background rather than risk based media protection standard for mussels. It is a misnomer to call this a media protection standard. It is merely the local background. In the ecological risk assessment York Harbor was used to provid background data. What happened to these data?

B. Why have NOAA average values been set as the MPS for some compounds?

C. The proposed MPS for Lindane and aldrin are theoretically bas d on the NOAA data, although the proposed values are ten-fold high r than the literature values.

D. Footnote b implies that background founder fillet and background lobster are similar to or less than the body burdens found in mussels. It also assumes that mussels are the best biotic indicator of background environmental conditions. Neither of thes implications are necessarily true.

Response: See the response to Comment No. 3

5. Comment: It is unclear in the text and tables as to which NOAA mussel and sediment sampling locations were used to derive th "average" concentrations in the respective media. The Departm nt is concerned that data from Boston and New Bedford Harbors w r used.

Response: See the response to Comment No. 3.

6. Comment: Although lead is a major contributor to risk, it appears to have been eliminated from the MPS.

Response: Lead will be included in the MPS. The strategy for development of a lead MPS will revolve around "back calculation" of the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) used in the Human Health Risk Assessment to assess risks to children from exposures to lead. This model is based on multiple exposure pathways, which include inhalation, dietary ingestion, water ingestion, and soil and dust ingestion. For th purposes of developing MPS values for water and sediment, dietary uptake (e.g., ingestion of seafood) will be the focus of this xercise. Input Parameters used in the model and assumptions necessary to perform this "back calculation" will be reviewed with

EPA and MEDEP prior to establishment of MPS values for lead.

7. Comment: Two compounds, beryllium and dioxins were not analyz d for in the offshore media. There must have been some discussion at to this decision, although these compounds are typically found where nuclear submarines are repaired.

Response: Dioxin was not analyzed for because it was not a contaminant of concern at any of the Solid Waste Management Units (SWMUs). Beryllium is not a contaminant of concern in the marine environment due to its limited solubility and toxicity in th marine environment. There are no salt-water criteria (acute or chronic) for beryllium. The analyte list for off-shore Investigations considered SWMU related contaminants and pollutants which because of their characteristics are of concern in the marin environment.

We are not aware of any basis for the belief that beryllium and dioxin are typically found where nuclear submarines are repair d. Please provide further details as to the basis for this statement.

EPA COMMENTS ON DRAFT MEDIA PROTECTION STANDARDS CHAPTER 2

1. Comment: Revise proposed standards for Mercury to reflect us of toxicity information for methyl mercury in the risk assessment.

Mercury found in biota should have been treated as methyl mercury.

Response: Toxicity information for methyl mercury rather than inorganic will be used to develop the sediment and surface water MPS.

2. Comment: Translate proposed standards for biota into sediment and surface water standards that will be protective of human health.

The corrective action can remediate the sediment and surface water not biota. This information was useful and important but must b built upon to determine appropriated target levels for the media which will actually be controlled or remediated.

Response: See the response to MEDEP Comment Nos. 1 and 2.

3. Comment: Expand the presentation of information on data used to stablish background levels and justify use of this data.

Data drawn from Great Bay appears to potentially be within the zon of influence of shipyard releaseses. Comparability of mussel watch data to shipyard area needs to be demonstrated. The significance of using the 84th percentile of mussel watch sediment data is unclear.

Response: See the response to MEDEP Comment No. 3.

EPA COMMENTS ON DRAFT MEDIA PROTECTION STANDARDS CHAPTER 4

1. Comment: Revise Chapter 4 as needed based on impact of revisions to Chapter 2 & 3.

Response: Chapter 4 will be revised as needed based on the impact of revisions to Chapter 2 and 3. Chapter 4 will be revised after Chapter 2 and 3 have been approved by EPA/MEDEP.

2. Comment: On page 4-9 explain the sentence which reads "One would not expect to find marine organisms living in the immediat area of seep sample locations and would not expect marine organisms to be exposed continuously to this level of contaminant." Why not?

Response: This statement will be removed from the document. Th MPS set for surface water should focus on water quality of th Piscataqua River. These standards should not be applied to th localized area in the immediate vicinity of the seeps because (a) marine organisms are not continuously exposed to groundwater or surface water seeps throughout the tidal cycle, (b) seep samples to date have shown levels generally below Marine Water Quality Criteria, and (c) the very significant differences in the tim scale and volumes of flow between the seeps and the Piscataqua River. Furthermore, marine water quality criteria are applicable to ambient water column concentrations rather than potential (se p) discharges.

3. Comment: On page 4-9 explain the sentence which reads "Station 1 is located in Portsmouth Harbor, not in the immediate vicinity of the shipyard, and is not representative of the area of potential impact by releases from the Shipyard." Why not?

Response: This chapter, prepared by McLaren/Hart, combined th Ecological MPS proposed in the September 1993 Off-Shore Ecological MPS ~Chapter 3) submittal with the proposed Human Health MPS from Chapter 2. Since that time the Ecological MPS have been revised (June 1994) and will be further evaluated against the results of the Ecological Risk Assessment.

The paragraph containing the statement that "Station 1 .. is not representative of the area of potential impact by releases from the Shipyard" looks at locations with exceedances of ecological criteria for surface water. There were three locations having these exceedances: Stations 1, 3 and 4. Stations 3 and 4 ar located in or near Clark's Cove whereas Station 1 is located farther away from the Shipyard and is less likely to be directly impacted by potential Shipyard releases. However, Station 1 is still within an area which could be impacted by the Shipyard and

will not be excluded from consideration in the MPS.