



DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND 20640-5000

IN REPLY REFER TO

5090
Ser 04C/07
02 FEB 1987

Mr. Ronald Nelson, Director
Waste Management Administration
Office of Environmental Programs
201 West Preston Street
Baltimore, MD 21201

Dear Mr. Nelson:

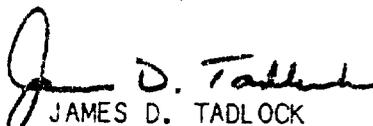
We appreciate the comments in Mr. Arthur Caple's letter of August 14, 1986.

The Naval Ordnance Station intends to follow the confirmation study recommendations to initiate remedial action for the mercury contamination and monitor the site for 5 years to ensure there is no threat to human health and the environment. I believe our mutual agreement on an appropriate plan is sufficient to accomplish the required action. I will sign a consent order if you believe one is necessary.

Our plan for aquatic assessment of Mattawoman Creek's marine life is enclosed for your review and comment. Contractors have been reluctant to develop a remedial plan because of a concern over indemnification. We expect to have a contractor onboard in April 1987 to develop a remedial plan. We will expedite this effort as much as possible consistent with obtaining a sound plan which will be mutually agreeable.

Please contact Mr. Thomas H. Woo of my staff at (301) 743-4320 if there are any questions concerning our intended course of action.

Sincerely,


JAMES D. TADLOCK
Captain, USN
Commanding Officer

Encl:
(1) Aquatic Assessment

Copy to:
CHESDIV (114)
NAVSEA (06G)
Mr. Arthur Caple
Mr. Harold L. Dye, Jr.

Aquatic Assessment Plan
for
Mattawoman Creek
Adjacent to
Naval Ordnance Station
Indian Head, Maryland 20640-5000

I. Introduction

This plan describes an environmental sampling program which will be conducted in areas which have been contaminated by Naval Ordnance Station operations. Except for a section of drainageway near site 8 which is subject to remedial action, these areas do not present a threat to human health and the environment; however, the long term trend of the level of contamination is unknown. This plan requires samples to be taken over a 5 year period to determine trends in contamination level. A report summarizing the data will be prepared at the end of each year with a final report prepared after the fifth year. If there is no threat to human health and the environment as evidenced by a steady state or declining level of contamination, then this plan will be terminated at the end of 5 years. If there is an observed increase in the level of contamination, then the threat to human health and the environment will be reevaluated and this plan revised accordingly to the observed threat.

II. Schedule

1) The initial water column sample was taken in November 1985 and quarterly samples have been taken since then. The 5-year period (20 samples) will be completed in September 1990.

2) Initial metal uptake studies were conducted by the U.S. Fish and Wildlife Service in June 1985. Both a spring and fall sampling are planned for 1987 with annual sampling to be completed in 1990 in order to correspond to the completion of the Water Column Study. Sampling could be extended to 1991 if additional data is required.

3) Reporting

a) The initial annual report of the water column studies will be submitted 90 days following the Office of Environmental Programs approval of this plan. The final report of the U.S. Fish and Wildlife study for 1985 will be submitted when received.

b) An initial draft annual report of each year's activities will be submitted by 31 December for the sampling completed by November of that year. The final report for the year will be submitted within 60 days of receipt of the U.S. Fish and Wildlife report for the year.

c) A draft final report of this 5-year Aquatic Assessment Plan will be submitted by 31 December 1990. This report will include data on samples collected through November 1990. The final report will be submitted within 90 days of the receipt of the U.S. Fish and Wildlife final report for the period including the 1990 sampling.

III. Water Column Studies

The Water Column Study samples will be collected in accordance with the attached Table. The report will list the results of each analysis along with a discussion of any observed trends.

IV. Metal Uptake Studies

The Department of the Navy is providing funds to the U.S. Fish and Wildlife Service, Division of Ecological Services, in Annapolis, Maryland to conduct metal uptake studies of mercury, cadmium, lead, arsenic, silver and Zinc. These uptake studies will build on a previous sampling by the Fish and Wildlife Service conducted in 1985 for mercury, cadmium, and zinc.

The data from the 1985 study has not been rigorously analyzed yet but it is most apparent that mercury accumulation in aquatic resources near Indian Head is not posing a human health problem. The Food and Drug Administration (FDA) action level (that contaminant level in food at which FDA will take legal action to remove it from the market) for methyl mercury is 1 part per million (ppm). Fish and Wildlife Service data for fish collected at Indian Head show that the species (channel catfish) with the highest average of 0.058 ppm is several orders of magnitude below the FDA action level. There are two things to keep in mind however:

a. Levels in these samples were total mercury and not the highly toxic methyl speciation. Therefore, these values, which include methyl mercury and all other forms, are higher and represent a conservative approach.

b. This data was based on whole fish, not edible portions, which is the FDA testing requirement. However, most research has shown that equal portions of mercury are found in the edible portion and the remaining carcass, so that this data can still serve to determine if there is a methyl mercury problem.

This information will be made available to the State so that they can make a complete assessment of the contaminant problem. We hope the final Fish and Wildlife Service Interpretive report will be available sometime in early 1987.

The first aspect is to choose two indigenous finfish to assess metal uptake. Office of Environmental Programs (OEP) states the species should be selected based on abundance in the creek, feeding habits, size, and bioaccumulation potential. Based on the 1985 Fish and Wildlife survey, we recommend using white perch (*Morone americana*) and the channel catfish (*Ictalurus punctatus*). Both species are relatively abundant throughout Mattawoman, are commercially and recreationally important, and attain suitable size to have the potential for bioaccumulation of metals. In addition, these fish have different habits, white perch being carnivorous feeders in open water (pelagic) while channel catfish are omnivorous feeders on the bottom (demersal).

There are no data on bioaccumulation of methyl mercury in these species. What little data exist in the literature are for brook trout (*Salvelinus fontinalis*), fathead minnow (*Pimephales promelas*), and the oyster (*Crassostrea virginica*), none of which are found in Mattawoman Creek. The bioconcentration values for these species ranged from 12,000X for the brook trout to 63,000X for the fathead minnow. The Fish and Wildlife Service anticipates this recommended species would be within this range.

Two stations should be established, one at the Indian Head facility and one upstream. The general locations used in the Fish and Wildlife study should probably be satisfactory. The control was located as far upstream as was navigable with a small 16 foot boat, which was about 1/2 mile below the Route 225 bridge. The other station was located in the vicinity of Marsh Island near the location where the mercury contaminated marsh drains into the Mattawoman. We have collected both channel catfish and white perch at these locations. Blue crabs (*Callinectes sapidus*), the shellfish species OEP recommended, were not sampled during the Fish and Wildlife study but we do not anticipate a problem collecting them.

OEP has recommended that sampling be conducted in the first year during the spring and fall. We believe this is a good recommendation. The spring sampling will be conducted between April and June, fall sampling between September and November.

There are three options for testing the fish: whole fish; edible portions only; and separate analysis of the edible portions and the remaining carcass. Data on the whole fish provides information affecting the entire food chain. Edible portions provide information affecting human health. We propose to obtain data on the whole fish as was collected in 1985.

The six specific metals to be analyzed, cadmium (Cd), lead (Pb), mercury (Hg), silver (Ag), zinc (Zn), and arsenic (As), are based on previous discharge data. Since FDA only has an action level for Hg, OEP needs to clarify what is to be done with data on the other metals. ~~Will a significant difference between contaminant body burdens at the control and Indian Head constitute a human health risk?~~ It must be understood that there is some movement of fish, especially white perch and blue crab, along Mattawoman Creek, so data interpretation will be important.

The FDA action level for mercury in seafood is based on only the methyl forms. However, we recommend that total mercury be analyzed, since the analytical techniques are more involved and expensive for methyl mercury. FDA staff has also recommended this as a good screening technique and if total levels are above or near the action level, specific tests for methyl mercury can be used. This is a conservative approach and should be acceptable to OEP.

We recommend that two composite samples consisting of a minimum of three to a maximum of five individuals, be collected for each species for each station. This would total 12 samples to be analyzed during each sampling period.

The specified analyses and detection limits are as follows:

Cd, Graphite Furnace Atomic Absorption Spectroscopy (GFA), 0.05 ppm
Ag, HGA, 0.01 ppm
Zn, Flame Absorption Spectroscopy (FA), 0.1 ppm
As, Hydride Generation Atomic Absorption (AAS), 0.05 ppm
Hg, Cold Vapor Reduction Atomic Absorption (CV), 0.02 ppm
Pb, HGA, 0.05 ppm

All these metals would be total metal expressed on a wet weight basis. The Patuxent Wildlife Research Center in Laurel, Maryland will analyze the samples.

LOCATION	TYPE	PARAMETERS TO BE ANALYZED (as preserved by Table 1, standard methods, 16th ed.)	COMMENTS
Site 4A	Surface water (grab)	Total Silver	Confirmation study (CS) recommended dissolved silver
Site 5	Surface water (grab)	Total silver	MD OEP recommended edge of tidewater
Site 6	Surface water (grab)	Total silver	MD OEP/CS for dissolved silver. NOS boundary/Shoreline of Mattawoman Creek.
Site 11	Surface water (grab) and sediment (grab)	specific conductance, 6 metals pH, Hg, Ag, Cd, Pb, As, Zn	IAS recommended, collect on outgoing tide near low tide.
Site 12	Surface water (grab) and sediment (grab)	specific conductance, 6 metals pH, Hg, Ag, Cd, Pb, As, Zn	IAS recommended
Site 13	Surface water (grab) and sediment (grab)	specific conductance, 6 metals pH, Hg, Ag, Cd, Pb, As, Zn	MD OEP/IAS recommended
Site 14	Surface water (grab) and sediment (grab)	specific conductance, 6 metals pH, Hg, Ag, Cd, Pb, As, Zn	MD OEP/IAS recommended
Site 15	Surface water (grab) and sediment (grab)	specific conductance, 6 metals pH, Hg, Ag, Cd, Pb, As, Zn	CS recommended (NOS boundary)