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

IN REPLY REFER TO

5090
Ser 04C1/83
JUN 02 1987

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

Dear Mr. Nelson:

Attached is a Fish and Wildlife Service letter with suggested revisions to our Aquatic Assessment Plan and also our revised Water Column Analysis table. These were requested in your letter of March 30, 1987. As discussed with Mr. Larry Ramsey of your office on April 20, 1987, we have delayed our revisions in order to coordinate sampling with the U. S. Fish and Wildlife Service.

Included in the Fish and Wildlife Serivce's letter is a "Preliminary Report on Effects of Mercury in the Mattawoman Creek." This report compares mercury levels in Mattawoman Creek fish with mercury levels in fish from the tidal Potomac and the Chesapeake Bay as reported by the Office of Environmental Programs in the 1984, "Basic Water Monitoring Program Report of Fish Tissue Analysis 1981 and 1982." This report shows the mercury level in each of the fish was less than 1/10 of the Food and Drug Administration limit of 1 ppm. Based on the information provided, we recommend the requirement for samples from the Nanjemoy Creek area be deleted. We are anxious to reach agreement so further sampling can proceed.

Specific points are covered in response to your letter of March 30, 1987. The Fish and Wildlife Service letter of April 24, 1987 also follows this format.

A1. Map attached as Figure 1.

A2. Fish and Wildlife Service letter of April 24, 1987, specified a cold vapor atomic absorption technique to analyze mercury in fish tissue. This is the same technique used in methods 7470 and 7471 of SW 846, "Test Methods for Evaluating Solid Waste"; however, sample preparation will be different because the sample is neither aqueous or sludge, as assumed in SW 846.

A3. Fish and Wildlife Service letter of April 24, 1987, discussed study design and statistical approach.

Attachment 1

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B1. Fish and Wildlife Service letter of April 24, 1987, discussed the use of an upstream control. The Fish and Wildlife Service preliminary report on mercury contamination shows that Mattawoman mean mercury levels are generally less than lower Potomac River or State of Maryland mean mercury levels as reported in 1984 by the Maryland Department of Health and Mental Hygiene. Based on this data, we do not believe a Nanjemoy control is required.

B2. Fish and Wildlife Service letter of April 24, 1987, proposes to spend 3 days in the sampling effort to collect at least three species of fish plus blue crab, if available. However, this sampling period will be extended in order to collect at least two species of fish.

B3. The Fish and Wildlife Service letter of April 24, 1987, proposes a 3 day effort to collect fish which will be analyzed as individuals in order to increase the statistical base. We do not propose composite samples.

C1. See revised Water Column Analysis, Enclosure (1).

C2. See revised Waste Column Analysis. Please consider deleting requirement for Nanjemoy samples.

C3. See revised Water Column Analysis which is enclosed with this letter.

The Navy has received the E. C. Jordan Company work plan to design remedial measures for the mercury contamination downstream from building 766. We anticipate the Navy will tell E. C. Jordan Company to proceed with the design effort providing the work plan is satisfactory. Naval and E. C. Jordan representatives met to discuss the plan on May 19, 1987.

Mr. Thomas H. Woo of my staff is aware of the status of the changes requested in your letter of March 30, 1987, and can answer any further questions. You may contact Mr. Woo on telephone number (301)743-4320.

Sincerely,

R. H. Spotz
Head, Safety Department
By direction of
the Commanding Officer

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Encl:
(1) U. S. Fish and Wildlife Service letter
(2) Water Column Analysis

Copy to:
CHESDIV 114.2LC
Larry Ramsey, WMA
Harold L. Dye, WMA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825 VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401
April 24, 1987

Mr. Robert H. Spotz
Director of Safety
Indianhead Naval Ordinance Station
Indianhead, Maryland 20640-5000

RE: Mattawoman Creek Mercury
Contaminant Study

Dear Mr. Spotz:

This study proposal supplements the one we submitted on February 2, 1987 and is in response to a Maryland OEP letter of March 30, 1987. Before this revised proposal is reviewed, the attached draft report should be read.

Changes to the study will follow the outline of the Maryland OEP March 30, 1987 letter.

A.1. Figure 1. included in the F&WS report shows the proposed sampling locations; however no wetland vegetation will be collected (see comments under B.1.).

2. The U.S. Fish and Wildlife Service will use the standard method of analyzing mercury in tissue, cold vapor reduction Atomic Absorption Spectroscopy. The Detection limit will be 0.02 ppm. If specific methodology is needed, the F&WS will provide as requested. Our understanding is that mercury will be the only contaminant analyzed in this study.

3. This study design is to evaluate accumulation of mercury in important finfish and shellfish resources as a result of the Indianhead Naval Ordinance Station discharges or accidential spills. In order to accomplish this, five samples of at least two species of fish and five samples of blue crabs will be collected during spring and fall above the discharges and in the vicinity of the discharges.

Locations of the sampling locations are the same as in the F&WS study.

Fish will be collected by gill net, trap, otter trawl or electroshocker. For each species, 5 whole fish will be weighed and measured, then individually wrapped in clean aluminium foil and placed on ice until transport to the Annapolis Field Office where samples will be frozen until analysis.

Data anaylsis will consist of transforming mercury concentrations by species and station into natural logs and performing a one way ANOVA. This will test the hypothesis that the geometric means of mercury concentration by species is not significantly different between stations ($P \leq 0.05$).

Geometric means from the Indianhead samples will be compared to MD OEP mercury tissue data by species for the same year. When temporal data is available, a one way ANOVA will be performed to test for any difference between season and year.

B.1. The objective of this study is to document bioaccumulation of mercury in Mattawoman Creek beyond natural background levels (i.e. compared to bioaccumulation upstream). We therefore propose to collect samples at the upstream control station and in the vicinity of Marsh Island.

2. We suggest that it is more important to collect additional samples than more species because the statistical analysis will be more powerful. Therefore we propose to collect 5 samples for at least two species (control and Marsh Island) of finfish to include a resident bottom feeder (carp, channel catfish, brown bullhead) and a resident predator such as largemouth bass, black crappie etc., if available.

In addition the F&WS will make an effort to collect one more species in the middle of the food chain (an omnivorous forage fish) such as bluegill or pumpkinseed. If the required number of fish of the additional species can not be collected in 3 days of effort, no additional effort will be expended. The F&WS's study showed that mercury concentrations in six species of fish were similar (all within the same order of magnitude 10^{-2} and only exhibited a small variation; with this in mind, collecting 4 species of fish to insure mercury contamination is detected is probably not necessary. We also are confident that the two selected finfish species to be intially collected can be collected throughout the study period.

3. Fish will not be composited so as to avoid any problems with data anaylsis. Because human health does not appear to be a problem, we will use whole fish. In this manner the data will also be comparable to MD OEP tissue data.

4. During each sampling collection a hydrolab will be used to record D.O., temperature, pH and conductivity. Since we are proposing an upstream control, all water quality parameters should be similar.

The preceding information is to supplement our original proposal. We hope, based on the F&WS's report that the additional information will meet with your approval. If it is not, we would be happy to discuss any unresolved issues further, especially the Nanjemoy reference. We do recognize the use of this type of station has merit but believe an upstream control is a better control for the study objective. Any questions please give Mr. Steven Goodbred of my staff a call at 301-269-5448.

Sincerely yours,

Supervisor
Annapolis Field Office