



DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION

INDIAN HEAD, MARYLAND 20640

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NSWC INDIAN HEAD
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IN REPLY REFER TO
6260/6
Ser 04/60
24 SEP 1984

From: Commanding Officer, Naval Ordnance Station, Indian Head, MD
To: State of Maryland Department of Health and Mental Hygiene
Attn: Enforcement Division, Baltimore, MD

Subj: MERCURY CLEAN-UP PROCEDURES

Ref: (a) Maryland State Department of Health Inspection of 9 Sept 84
(b) Mtg at Naval Ordnance Station, Indian Head btwn Navy
Representatives and Maryland State Inspector, Harold S. Dye, Jr.

Encl: (1) Mercury Clean-Up Procedures, NAVORDSTA Indian Head Bldg 766

1. The report covering the reference (a) inspection contained a comment that the mercury clean-up should proceed until soil samples show no further mercury contamination or background level concentrations.

2. During reference (b) the comments of reference (a) were clarified and several clean-up options were discussed. Enclosure (1) is forwarded for your consideration and concurrence.

3. Our point of contact for this matter is the station's Mercury Control Officer, Mr. J. Volman. He can be reached on (301) 743-4485.

A handwritten signature in cursive script, appearing to read "E. O. Schiele".

E. O. SCHIELE
Acting

MERCURY CLEAN-UP PROCEDURE
NAVORDSTA Indian Head, Bldg. 766

Background

Elemental mercury has been used in the laboratory procedures in Building 766 at the Naval Ordnance Station, Indian Head since about 1958. Until the summer of 1984 wastewater containing elemental mercury was routinely discharged through sink and floor drains which were connected to a manhole by a 3-inch iron sewer pipe. This manhole is discharged through a buried 36-inch pipe that runs under the railroad tracks for approximately 60 feet into a natural drainageway. The drainageway and the connecting tidal wetlands are part of an ongoing confirmation study.

During recent contractor excavation for the routing of a new sewer line in front of Building 766 the 3-inch sewer pipe was inadvertently ruptured. Mercury was observed in the pipe and in the adjacent soil. Clean-up efforts were undertaken under the supervision of the NAVORDSTA Indian Head Mercury Control Officer. After the filling of 4 drums of contaminated soil in double lined plastic bags there was still some evidence of mercury in the excavated hole. It was decided to suspend operations and evaluate how best to complete decontamination of the area. It was decided that an assessment of the situation by the contractor involved in the confirmation study, CH₂M Hill, be performed. After this assessment a scope of work was prepared which estimated that upwards of 750 cubic yard of soil would need to be removed, packaged, and shipped to a RCRA approved landfill. The cost was estimated at \$250,000. Consultation with the Navy's Ordnance Environmental Support Office and Dr. Mae I. Fauth, a research chemist at the Naval Surface Weapons Center, to assess the validity of this proposal led to the conclusion that it is in fact a drastic over-statement of what is required to ensure no threat to health and environment. Dr. Fauth was consulted because of her long and extensive background in the environmental sciences. She holds a PhD in Inorganic Chemistry and has been involved in environmental problems since 1970. She was the Assistant to the President of Charles County Community College for Environmental Research under the Federal Mobility Program. She is a consultant to DoD, EPA, and others on toxic and hazardous chemicals. She has been a member of the Institute of Environmental Sciences and was one of 18 environmental scientists selected by the National Environmental Training Association to visit the Peoples Republic of China in 1983 at the request of the Chinese Environmental Sciences Society.

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Proposed Clean Up Procedure

This procedure was prepared in consultation and collaboration with Dr. Fauth.

1. Where free mercury may be present under water in the excavated hole pump into drums for separation.
2. Any visible globules and droplets of mercury will be taken up by suction if at all possible. This material will be stored under water for redistillation. Where this is not possible the soil with visible mercury will be treated with sulfur to immobilize the mercury, removed and stored in drums as during initial clean-up.
3. The entire excavation will be treated with powdered sulfur and allowed to stand for a week. If sulfur is washed off, retreat area and allow to stand.
4. As final treatment, treat with HgX in water. Repeat daily for 3 days. HgX is a mercury decontaminant described by the manufacturer, Acton Associates of Pittston, PA as "a non-odorous water soluble metallic-mercury sulfide converting powder combined with a chelating compound and a dispersing agent".
5. After completion of procedure sample soil and analyze for mercury using the EP toxicity criteria.
6. Continue to monitor the natural drainageway to confirm the assumption that the clean-up procedure was adequate to ensure no threat to health and environment.

The chemical and physical properties associated with this procedure are well documented and Dr. Fauth is available for consultation if necessary. Since both free sulfur and mercuric sulfide are insoluble in water, an excess of sulfur and the formation of mercuric sulfide in the soil should present no environmental problem.