

N00174.AR.000601
NSWC INDIAN HEAD
5090.3a

LETTER FROM U S NAVY REGARDING CLEAN UP LEVELS FOR SILVER CONTAMINATED
SOIL AT SITE 5 NSWC INDIAN HEAD MD
12/20/1991
NSWC INDIAN HEAD

517 0465C



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

5090
Ser 0965/812
20 Dec 91

Maryland Department of the Environment
CERCLA Response Division
Attn: Mr. Mark Schoppet
2500 Broening Highway
Baltimore, MD 21224

Gentlemen:

The purpose of this letter is to obtain your concurrence on the cleanup level for silver contaminated soil located near Building 731 at our facility. As you know, this site is in our Installation Restoration (IR) Program, and is located in the area where an explosive berm will be extended for a new \$8 million mix, cure, and assembly facility. The maximum silver contamination discovered at this site was 571 parts per million (ppm).

Enclosed is a letter from our contractor, ABB, who is responsible for sampling and developing a site remediation plan. They have sampled the site to determine the extent of silver contamination. The area of highest contamination (571 ppm) was tested using the Toxicity Characteristic Leachate Procedure (TCLP) and did not exhibit the hazardous waste characteristic.

The proposed action limit, as given by 40 Code of Federal Regulations (CFR) Part 264, Subpart S, requires cleanup of soil that contains 200 ppm silver. The majority of the silver contamination is under 100 ppm except directly where the photographic solution was discharged. Therefore, it is reasonable to remediate the soil to a level of 10 ppm as stated in the enclosure.

Although it is not TCLP toxic, the silver contaminated soil present in the existing swale, which passes through the proposed construction area, will be removed, stabilized, and placed in the explosive berm. The amount of stabilized soil to be placed in the berm from the swale will be approximately 300 cubic yards (cy), which is under 1% of the total soil in the berm.

In addition, we plan to remediate the silver contaminated soil that is located at the west end of Building 731. This swale was used before the existing swale and samples show that it has a lower silver contamination level. Therefore, we plan to use the same cleanup criteria to remediate both swales at the same time. We estimate that the maximum volume of soil from the second swale



5090
Ser 0965/812

to be excavated, stabilized, and placed in the explosive berm is 600 cy. The total volume of stabilized soil in the berm will compose less than 2% of the explosive berm.

Cleanup of the soil to a level of 10 ppm of silver will be accomplished by the removal and stabilization of soil down to a 2 foot depth and 4 foot width from the center of the swale. This same process of soil removal will also be used to remove contamination from the swale at the west end of Building 731.

If you have any questions on this matter, please feel free to call Mr. Shawn Jorgensen of my office on (301) 743-6745.

Sincerely,



KENNETH D. MORIN, P.E.
Director, Utilities/
Environmental Division
By direction of
the Commanding Officer

Encl:
(1) ABB ltr of 10 Dec 1991

5090
Ser 0965/812
20 Dec 91

Maryland Department of the Environment
CERCLA Response Division
Attn: Mr. Mark Schoppet
2500 Broening Highway
Baltimore, MD 21224

Gentlemen:

The purpose of this letter is to obtain your concurrence on the cleanup level for silver contaminated soil located near Building 731 at our facility. As you know, this site is in our Installation Restoration (IR) Program, and is located in the area where an explosive berm will be extended for a new \$8 million mix, cure, and assembly facility. The maximum silver contamination discovered at this site was 571 parts per million (ppm).

Enclosed is a letter from our contractor, ABB, who is responsible for sampling and developing a site remediation plan. They have sampled the site to determine the extent of silver contamination. The area of highest contamination (571 ppm) was tested using the Toxicity Characteristic Leachate Procedure (TCLP) and did not exhibit the hazardous waste characteristic.

The proposed action limit, as given by 40 Code of Federal Regulations (CFR) Part 264, Subpart S, requires cleanup of soil that contains 200 ppm silver. The majority of the silver contamination is under 100 ppm except directly where the photographic solution was discharged. Therefore, it is reasonable to remediate the soil to a level of 10 ppm as stated in the enclosure.

Although it is not TCLP toxic, the silver contaminated soil present in the existing swale, which passes through the proposed construction area, will be removed, stabilized, and placed in the explosive berm. The amount of stabilized soil to be placed in the berm from the swale will be approximately 300 cubic yards (cy), which is under 1% of the total soil in the berm.

In addition, we plan to remediate the silver contaminated soil that is located at the west end of Building 731. This swale was used before the existing swale and samples show that it has a lower silver contamination level. Therefore, we plan to use the same cleanup criteria to remediate both swales at the same time. We estimate that the maximum volume of soil from the second swale

5090
Ser 0965/812

to be excavated, stabilized, and placed in the explosive berm is 600 cy. The total volume of stabilized soil in the berm will compose less than 2% of the explosive berm.

Cleanup of the soil to a level of 10 ppm of silver will be accomplished by the removal and stabilization of soil down to a 2 foot depth and 4 foot width from the center of the swale. This same process of soil removal will also be used to remove contamination from the swale at the west end of Building 731.

If you have any questions on this matter, please feel free to call Mr. Shawn Jorgensen of my office on (301) 743-6745.

Sincerely,

KENNETH D. MORIN, P.E.
Director, Utilities/
Environmental Division
By direction of
the Commanding Officer

Encl:
(1) ABB ltr of 10 Dec 1991

Writer: S. Jorgensen, Code 0965C, x6745
Typist: J. Gallagher, 20 Dec 91

0965E SJA/12/20/91
0965 SM



December 10, 1991

MEMORANDUM

To: Paul Berkman
From: Franco Godoy
Subject: Site 5, Naval Ordnance Station, Indian Head, MD; Contract No. N62477-91-D-0043, Delivery Order No. 0001

This memorandum has been developed to address outstanding issues associated with environmental conditions at the above-referenced site and planned military construction at and adjacent to the site. The goal of the document is to provide key decision-makers with a synopsis of pertinent site background, characterization, regulatory, and environmental management information. The material provided herein supplements the Draft Site Characterization and Remediation Evaluation Report, Naval Ordnance Station, Site 5, Indian Head, MD dated September 13, 1991. The specific material addressed in this memorandum includes:

1. A discussion of the Project Origin/Purpose.
2. Site Background/Characterization information defining the source, nature, and extent of contamination at the site.
3. Key Regulatory Issues pertinent to actions which may be appropriate for environmental management of conditions at the site.
4. An overview of and rationale for the Proposed Management Approach to address site conditions.

1. Project Origin/Purpose

Materials and ingredients required for the production of today's weapons are rapidly changing and Naval Ordnance Station (NOS) Indian Head, MD has limited facilities which meet these requirements. To support the Station's mission requirements, construction of a new Mix, Assemble and Cure Facility has been authorized by Congress. A MILCON project designed to provide adequate, secure, and properly configured facilities will be constructed on 24 acres within NOS; however, environmental media within an area of the construction zone has been impacted by past waste management practices. Due to the presence of contamination within the planned construction zone, the Navy has undertaken a program to characterize the area impacted by construction, evaluate associated risk, and identify remedial alternatives, should remediation be warranted. All remedial response actions must be completed prior to construction start-up, scheduled for the spring of 1992.

2. Site Background/Characterization

Due to past photographic waste management practices at Site 5, drainage ditch sediments have been impacted. Previous studies (1985) completed at the site indicated maximum silver sediment concentrations of 1,920 mg/kg, with concentration of 11.3 and 9.46 mg/kg found within the area impacted by MILCON P-059 (explosion berm expansion). A recent study, completed by ABB-ES, focused on the segment of the drainage ditch within and upstream of the area designated for construction. The sampling program, completed in August 1991, consisted of acquisition and analysis of 48 ditch sediment samples along transects within the drainage ditch

ABB Environmental Services, Inc.

adjacent to Building 731 as depicted in Figure 1. The analytical program involved testing for total silver and cyanide, along with TCLP metals to support a waste management determination, should remediation be necessary. The study results suggest that silver concentrations in sediments have decreased at areas adjacent to the source (Bldg. 731), while concentration within the planned berm zone have increased to an average of 61 mg/kg. A statistical summary of silver concentrations by depth and distance from center stream are provided in Table 1.

Figure 1
Sampling Locations

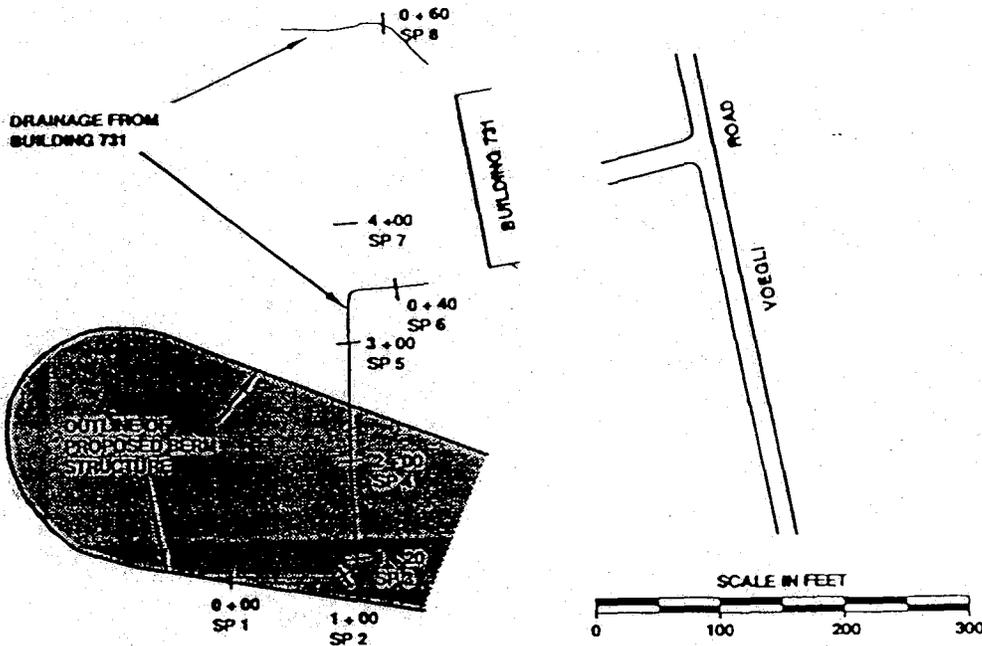


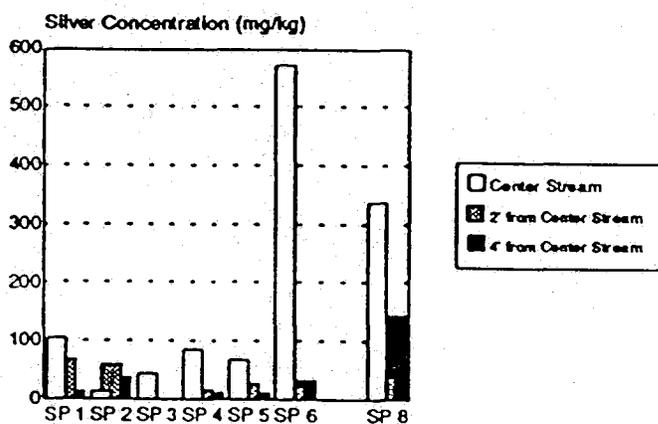
Table 1
Silver Distribution
in Drainage Ditch
(mg/kg)

Sampling Depth		Sampling Point		
		Center Stream	2' from Center	4' from Center
0"	Max Value	571	67	144
	Min Value	7.3	ND	ND
	Average Value	153	30	32
18" bgs	Max Value	16	13	23
	Min Value	ND	ND	ND
	Average Value	6	5	3

Study analytical results are presented graphically in Figure 2. These data indicate that migration of silver has occurred from hotspot areas adjacent to Building 731 (SP 6) to locations downstream. In terms of vertical migration of silver within sediments, values of silver at 18 inches in depth are significantly below surficial levels, slightly above background levels (approx. 1ppm). Distribution within the drainage ditch indicates that surficially the highest concentrations are located at center stream and rapidly decrease with distance from that location. The migration of the silver appears to predominantly occur through surficial sediment/surface water flow within the drainage ditch channel. Vertical migration within the subsurface is minimal, likely due to setting conditions which retard subsurface vertical migration (clays and silts).

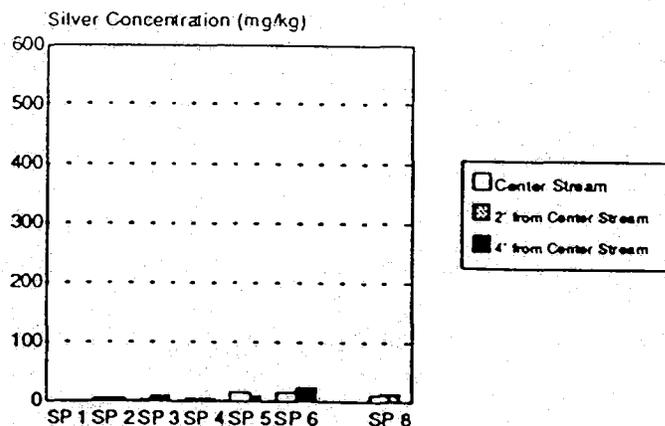
Silver Concentrations in Soils/Sediments

Sample Acquisition at 0"



Silver Concentrations in Soils/Sediments

Sample Acquisition at 18"



3. Regulatory Issues

Regulatory issues addressed in this section focus on those relevant to management of contaminated sediments at the NOS facility. The three key issues involve:

1. The classification of excavated sediments (hazardous vs. non-hazardous);
2. Proposed action levels for silver in soil; and
3. Regulations impacting treatment of excavated sediments.

To be categorized as a hazardous waste, a material must fall within one of three categories: (1) a listed waste from a specific source, (2) a listed waste from a non-specific source, or (3) a waste which exhibits the characteristics of a hazardous waste as defined within 40 CFR 261. The silver-contaminated sediments are not listed waste and do not exhibit the characteristics of a hazardous waste as defined by TCLP criteria. TCLP metals testing completed on composite samples at each sampling transect and on a non-composite sample obtained from sediments exhibiting the highest silver concentrations were all non-detect for silver; therefore, excavated sediments are not a hazardous waste.

Currently there exist no final or proposed rules concerning cleanup levels for silver in soils, sediments or debris. Proposed action levels for concentrations of silver in soils have been promulgated, in 55 FR 30798, as rules to be included in Subpart S of 40 CFR 264. As described in 55 FR 30798, contamination exceeding the proposed action level indicates "a potential threat to human health or the environment which may require further study." The proposed action level for silver in soils is 200 milligrams per kilogram (mg/kg).

The EPA has recently (June 1, 1990; and May 30 & October 24, 1991) proposed rules for Contaminated Soil and Debris which impact the treatment of hazardous wastes containing heavy metals. Under these regulations, treatment standards will be developed using a concentration-based Best Demonstrated Available Technology (BDAT) approach. The EPA is investigating three general categories, extraction, destruction and immobilization techniques. To date, for most metals, the data received by the Agency indicate that concentrations below characteristic levels can be achieved through the use of either stabilization or vitrification. The treatment strategy recommended for long-term onsite management of excavated sediments is stabilization, which is consistent with current BDAT data.

4. Proposed Management Approach

The objective of the remediation strategy for contaminated sediments within the construction zone, centers on protection of human health and the environment. Due to the study's focused nature on primary source areas, the scope of remediation can be characterized as a source control action. When assessing the need for and development of remediation alternatives, the following key information was used to select the most feasible approach:

- (1) Silver distribution within sediments at the site is surficial in nature (approximately at background levels at 18" in depth).
- (2) The primary migration mechanism involves transport through surficial sediment/surface water flow as indicated by study data.
- (3) Sediments are not a RCRA hazardous waste.
- (4) Developing BDAT treatment standards for heavy metal Contaminated Soil and Debris indicate that solidification/stabilization is an effective technology in reducing mobility. Additionally, the

technique augments desirable physical/chemical properties (compressive strength, leachability, etc.)

- (5) Ecological risk information presented in the Draft Site Characterization and Remediation Evaluation Report suggests silver concentrations in the sediments may pose a risk at the site.

Based on this material, removal and treatment (stabilization/solidification) of sediments containing greater than 10 ppm of silver followed by onsite management within the planned explosion berm expansion is recommended. The primary objective of solidification of upstream sediments centers on producing a suitable material for incorporation into the explosion berm. The containment remediation strategy effectively removes contaminated materials from the active transport pathway. Additionally, TCLP testing completed on sediments indicates that mobilization of silver is not occurring under test conditions. Treatment through solidification should further reduce the potential for migration; however, the principal goal of treatment is to enhance constructability. Subsequent to the removal of materials from the drainage ditch, the ditch will be relocated approximately 20' laterally to further minimize the potential for future site disturbance. The lateral displacement of the ditch effectively eliminates any residual sediment contamination concerns with respect to future transport. The remediation project would consist of the following elements:

- a. Treatability Study - This project component is necessary to determine optimal binder formulation and develop physical/chemical data defining the treated waste.
- b. Site Preparation - Which would include clearing/grubbing of vegetated areas and process-specific site preparation (e.g., treatment pad, utilities, etc.).
- c. Excavation/Stabilization/Placement - This project element would consist of removing contaminated sediments to a depth of 2 feet, solidification using a formulation developed through treatability testing, and placement of material within the berm. Based on preliminary drawings of the MILCON P-059 site area, the volume of material that composes the explosion berm is estimated to be approximately 28,500 cubic yards (cy). The estimated volume of soils and sediments to be excavated from the drainage ditch is 300 cy, only about 1 percent of the total berm volume. The above factors (the solidification process, and the relatively small volume of solidified materials) should ensure a minimal effect on the structural integrity of the berm.
- d. Compaction/Soil Cover Installation - This component would involve shaping, grading and compacting the treated material and placement of a 1' thick soil cover on contaminated materials within the berm footprint.
- e. Restoration of the Drainage Ditch - Which would consist of re-establishing the drainage network (displaced laterally by 20') using suitable backfill material along with appropriate erosion control techniques. *- seeding -*

The net effect of this remediation strategy would be removal of silver-contaminated sediments from the migration pathway, removal of the high concentration source area, as well as restoration/relocation of the ditch network above the planned construction zone. This approach satisfies site risk management needs indicated by both human health and ecological assessments by lowering sediment concentration to less than 1 ppm in the 0 to 2 foot zone in the drainage ditch and laterally moving the ditch 20' to eliminate the potential for any migration.

Process Flow Diagram for Onsite Management of Silver-Contaminated Materials

