



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

Mr. Orlando Monaco
Naval Facilities Engineering Command
Northern Division, Mailstop #82
Environmental Contracts Branch
10 Industrial Highway
Lester, Pennsylvania 19113

MAR 26 1993

Re: Naval Air Warfare Center - Warminster, PA

Dear Mr. Monaco:

Please find below EPA comments on a Draft Proposed Plan for the subject site submitted to EPA under letterhead dated March 9, 1992. These comments supercede "preliminary" EPA comments submitted to the Navy under EPA letterhead dated March 18, 1993.

Under "NAVY ANNOUNCES PROPOSED PLAN"

The document should be called a "Proposed Remedial Action Plan".

First two paragraphs should read:

"The Department of the Navy has completed a Focused Feasibility Study (FFS) addressing groundwater in overburden and shallow bedrock associated with the Naval Air Warfare Center (NAWC) in Warminster, Pennsylvania. This FFS has been completed as part of the Navy's Installation Restoration Program (IRP) and the Superfund remedial program. The purpose of the FFS was to evaluate remedial alternatives for contaminated groundwater attributable to NAWC in overburden and shallow bedrock. This Proposed Remedial Action Plan summarizes the findings of the FFS report, identifies the remedial alternative preferred by the Navy and the United States Environmental Protection Agency (EPA) and explains the reasons for this preference. In addition, the Proposed Remedial Action Plan explains how the public can participate in the decision-making process and provides addresses and telephone numbers for appropriate Navy contacts.

This document is issued by the Navy, the lead agency for IRP and Superfund activities at the facility, and the EPA, the support agency for Superfund activities. The Navy and the EPA shall

select a remedy for groundwater in overburden and shallow bedrock after the comment period has ended and the comments submitted during this time have been reviewed and considered."

Note: Elsewhere in this section and throughout the Proposed Remedial Action Plan, "shallow groundwater" should be referred to as "groundwater in overburden and shallow bedrock".

The terms "overburden" and "shallow bedrock" should be defined in the glossary as follows:

Overburden - soil and highly weathered bedrock directly below soil

Shallow bedrock - bedrock directly below overburden and monitored by "shallow bedrock monitoring wells" identified in Remedial Investigation report

Third paragraph

First sentence should read: "...responsibilities under the Superfund law, and in particular, Sections 113(k), 117(a) and 121(f) of the Comprehensive..."

Sixth paragraph

Should read: "A remedy for contaminated groundwater in overburden and shallow bedrock attributable to NAWC will be selected in a Record of Decision (ROD) to be issued after all public comments are considered. The ROD will also be placed in the administrative record files for review by the public."

Seventh paragraph

Should read: "**NOTE:** A glossary of relevant technical and regulatory terms is provided at the end of this Proposed Remedial Action Plan. Terms printed in **bold face** are defined in the glossary."

Bold face all of the terms of concern in the plan.

SITE BACKGROUND

First paragraph

Figure 1 should be the Site Location Map (Figure 1-1) depicted on

page 1-2 of Draft RI report.

Third paragraph

First sentence should read: "...the Superfund National Priorities..."

Second sentence should read: "This list includes those sites where uncontrolled hazardous waste releases may potentially present the most serious threat to human health and the environment."

This paragraph should reference the current Figure 1 for disposal area locations.

Fourth paragraph

First sentence should read: "To date, potential hazardous substance releases at NAWC Warminster have been investigated under CERCLA in two phases - a Phase I and a Phase II Remedial Investigation."

Fourth sentence should read: "The eight (8) waste disposal locations were also investigated through soil borings..."

The second sentence should read: "Phase I RI was initiated in late 1988 and completed on September 11, 1990 with the release of Stage I RI Report."

Fifth paragraph

A last sentence should be added to read: "The findings of the Phase II RI (and a summary of the Phase I (or Stage I) RI) are included in a Phase II RI report released on April 19, 1993."

Sixth paragraph

The first sentence should read: "The findings of RI work to date with regard to groundwater in overburden and shallow bedrock are as follows:"

The fourth bullet should be deleted and replaced with the following:

- A long-term water-level study combined with groundwater quality data suggest contaminated groundwater in the shallow

aquifer underlying Area A has migrated to deeper portions of the aquifer north of NAWC property

The fifth bullet should read:

The full nature and extent of groundwater contamination caused by releases at NAWC are not known at this time. Additional groundwater investigation is necessary at both on and offsite locations.

The sixth bullet should read:

Additional investigation is necessary to fully identify the nature and extent of contaminated groundwater attributable to NAWC

SCOPE AND ROLE OF REMEDIAL ACTION

As indicated in previous correspondence from EPA to the Navy, the scope of the OU-1 interim remedial action cannot be limited to the NAWC property. As you are aware, Monitoring Well C, located on the NAWC property boundary, contains a TCE level of 2100 ug/l, the highest known level of TCE attributable to NAWC. Based on this data, groundwater in shallow bedrock underlying non-NAWC property(ies) immediately north of Well C is very likely to be contaminated by NAWC. As a result, monitoring wells must be installed on these properties to identify the nature and extent of NAWC-related groundwater contamination and to monitor the effectiveness of the extraction well network. In addition, to maximize the effectiveness of this network, extraction wells will most likely be required on these neighboring properties. Comments on the sections below take this into consideration.

The first paragraph should read:

"The objective of this Proposed Remedial Action Plan is to present remedial alternatives for all contaminated groundwater attributable to NAWC in overburden and shallow bedrock, including groundwater associated with Areas A and B. This portion of the site has been identified as Operable Unit One (OU-1). NAWC Warminster is being divided into Operable Units to help expedite the selection and implementation of actions necessary to protect human health and the environment.

The second paragraph should read:

"The Navy is proposing to conduct a remedial action to address contaminated groundwater in overburden and shallow bedrock, underlying Area A and B (and at any other locations determined by additional studies) because this groundwater presents an

unacceptable risk to human health and sufficient information is available to select a remedy. Additional investigations are needed to determine the full extent of overburden and shallow bedrock aquifer contamination due to releases from NAWC within both Areas A and B and at other locations. Available data does suggest that groundwater in overburden and shallow bedrock in the vicinity of Sites 4 and 8 may not present an unacceptable risk and thus may not require remediation."

The third paragraph should read:

"The objectives of the remedy in this case are to minimize the migration of contaminated groundwater in overburden and shallow bedrock aquifers, to initiate the restoration of these aquifers and to fully identify the nature and extent of contamination in these aquifers. A remedy with these objectives is considered an interim remedy. A final remedy for OU-1 will be proposed and selected after the full nature and extent of the contamination is identified."

The fourth paragraph should read:

"Additional investigations to further identify the nature and extent of the contamination in overburden and shallow aquifers will be conducted by the Navy as part of the interim action for OU-1. These investigations shall include additional monitoring well installation and sampling, long-term water level monitoring, slug and step-drawdown tests, pumping tests and any other work necessary to fully identify the nature and extent of contamination in overburden and shallow bedrock and to identify a final remedy is completed.

Other media associated with NAWC shall be further investigated under the Remedial Investigation and Feasibility Study process. Further remedial actions will be proposed and selected as as soon as adequate information exists to support the selection of a remedy. Additional media being addressed as separate Operable Units include groundwater in deeper bedrock and soils."

SUMMARY OF SITE RISKS

This section should read:

"During the RI, a Risk Assessment was conducted with available data to estimate the potential risk to human health posed by the contaminated groundwater in overburden and shallow bedrock underlying Areas A and B. To assess this potential risk, the potential exposure scenarios identified below were assumed. (Please note there is no known actual exposure to the groundwater of concern at this time.)

- Ingestion of the groundwater as a drinking water source

Dermal exposure to the groundwater (e.g. through hand washing, showering, bathing, etc.)

Inhalation of contaminants in groundwater (i.e. volatile compounds emitted during showering)

Potential human health risks are categorized as **carcinogenic** or **noncarcinogenic**. A hypothetical carcinogenic risk increase from exposure should ideally fall within a range of 1×10^{-6} (an increase of one case of cancer for one million people exposed) to 1×10^{-4} (one additional case per ten thousand people exposed). Noncarcinogenic risks are estimated utilizing **Hazard Indices (HI)**, where an HI exceeding one (1) is considered an unacceptable health risk. Federal Maximum Contaminant Levels (MCLs) for public drinking water supplies are also utilized to assess potential risk posed by exposure to groundwater.

Area A

Groundwater in overburden and shallow bedrock underlying Area A was determined to present an unacceptable human health risk. In particular, the total HI and carcinogenic risk for hypothetical exposure to this groundwater exceeded values of one (1) and 10^{-4} respectively. Primary contributors to this unacceptable risk included elevated levels of TCE, PCE, arsenic and carbon tetrachloride. In addition, MCLs were exceeded for ten different contaminants in samples collected within Area A. The average of concentration of TCE and PCE in wells within Area A were 469 and 128 micrograms per liter (ug/l) respectively, well in exceedance of the MCL of 5 ug/l for each of these substances.

Area B

Groundwater in overburden and shallow bedrock underlying Area B was also determined to present an unacceptable human health risk. The HI for hypothetical exposure to this water exceeded one (1) due to elevated levels of arsenic, barium, cadmium and manganese, while the hypothetical carcinogenic risk associated with this water exceeded 10⁻⁵ due to contaminants including PCE, carbon tetrachloride, arsenic and TCE. In addition, concentrations of TCE in three shallow bedrock wells in Area B exceeded the MCL of 5 ug/l in samples collected during both Phase I and Phase II of the RI.

Actual or threatened releases of hazardous substances from NAWC, if not addressed by a response action, may present a potential or actual threat to public health, welfare or the environment."

NOTE: The terms "carcinogenic" and "noncarcinogenic" should be added to the glossary.

SUMMARY OF ALTERNATIVES

First paragraph, first sentence should read: "...posed by contaminated groundwater in overburden and shallow bedrock were identified and evaluated."

First paragraph, third sentence should read: "...three interim remedial alternatives for OU-1."

The balance of this section should be as follows:

Alternative 1: No Remedial Action with Groundwater Monitoring

First paragraph should read:

"CERCLA and the NCP require that the "no action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, no Remedial Action would be undertaken to address NAWC-related contaminated groundwater in overburden and shallow bedrock. Instead, additional studies necessary to identify the full nature and extent of contaminated groundwater in overburden and shallow bedrock would be conducted as part of continuing Remedial Investigations addressing the site. In addition to these studies, monitoring of groundwater in overburden and shallow bedrock would be conducted for thirty (30) years.

Second paragraph, first sentence should read: "For cost estimation purposes, it is assumed that a total of..."

Delete last paragraph.

Alternative 2: Groundwater Extraction, Onsite Treatment and Discharge to Surface Water

This section should read:

"Under this alternative, all groundwater in overburden and shallow bedrock contaminated by NAWC would be extracted using a series of extraction wells. The extracted groundwater would be pumped to an onsite treatment system constructed specifically to treat groundwater. Water treatment would include air stripping to remove VOCs and carbon adsorption to remove semi-volatile organics. Air emissions from the air stripper would be treated by vapor phase carbon adsorption as necessary. Metals in the water would be treated by precipitation and filtration (or other means, if necessary). Upon meeting effluent levels consistent with NPDES requirements, the treated water would be discharged to an unnamed tributary of Little Neshaminy Creek, an unnamed tributary of Southampton Creek and/or used as a source of water supply. Treatability studies would be performed to confirm effluent levels meet NPDES requirements prior to discharge.

The initial extraction well network installed under the interim remedy for OU-1 would be designed to pump and treat contaminated groundwater in overburden and shallow bedrock identified at this time and thus be limited to locations on NAWC property. Concurrent with the design of this initial extraction well network, a monitoring well system would be designed to identify the nature and extent of contaminated groundwater in overburden and shallow bedrock under neighboring properties. Should contaminated groundwater attributable to NAWC be identified in overburden and/or shallow bedrock of a neighboring property, the extraction well network and treatment system would be modified as necessary during the interim action for OU-1 to minimize migration of contaminants and initiate aquifer restoration in the newly identified area(s) of concern and/or to maximize the effectiveness of the extraction well network.

To estimate the cost of this alternative, the following assumptions were made: (1) a total of twenty-five (25) extraction wells would be installed (sixteen (16) within Area A and nine (9) within Area B), (2) a total flow of 56 gallons per minute would be pumped to a plant constructed near Area A for treatment and (3) on-site and off-site wells would be constructed and monitored on a quarterly basis for 30 years and (4) the pump and treat

system would operate for 30 years. (Additional costs would be incurred if additional ground water from overburden and/or shallow bedrock was extracted and treated.) Based on these assumptions, the present worth of this alternative was estimated at \$13,172,000 with a capital cost of \$3,515,000 and an operation and maintenance cost of \$628,000 annually. This alternative could be constructed in 12 months or less."

Alternative 3: Groundwater Extraction, Onsite Pretreatment, Discharge to NAWC Wastewater Treatment Plant or Publically Owned Treatment Works

First paragraph should read:

"Under this alternative, all ground water in overburden and shallow bedrock contaminated by NAWC would be extracted using a series of extraction wells. The extracted ground water would be pumped to an onsite treatment system designed to pretreat ground water prior to discharge to the NAWC WWTP Wastewater Treatment Plant (WWTP). In the event that the NAWC WWTP ceases operation as part of Base Realignment and Closure, the pretreated groundwater would have to be discharged to a Publically Owned Treatment Works (POTW) such as the Warminster Municipal Authority (WMA) WWTP. Pretreatment would be performed as necessary to meet the influent requirements of the receiving WWTP. Pretreatment may include air stripping to remove volatile organics, precipitation/filtration (or other means, if necessary) to remove metals and/or carbon adsorption to treat semi-volatiles organics. Emissions from the air stripper would be treated by vapor phase carbon adsorption as necessary. After pretreatment, the ground water would be discharged to the NAWC (or POTW) WWTP. Treatability studies would be conducted as necessary to confirm the pretreatment meets the requirements of the receiving WWTP."

Add second paragraph of the Alternative 2 description.

Add third paragraph of Alternative 2 description, inserting appropriate capital cost. Assumptions regarding the use of the NAWC and/or WMA WWTP should be stated in this paragraph when discussing the assumptions. For example, it may be stated that for cost estimation purposes, it was assumed that pretreated water would be discharged to the NAWC WWTP only.

EVALUATION OF ALTERNATIVES

This section should read:

Overall Protection

Alternatives 2 and 3 would both protect human health and the environment by minimizing the migration of contaminated groundwater in overburden and shallow bedrock aquifers and initiating the restoration of these aquifers. Additional studies to determine the full nature and extent of ground water contamination attributable to NAWC would be conducted concurrently with the extraction and treatment of known contaminated groundwater in overburden and shallow bedrock.

Under Alternative 1, the selection of a remedial alternative addressing contaminated ground water would not occur until the completion of the studies necessary to fully identify the nature and extent of contaminated groundwater attributable to NAWC.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternatives 2 and 3 would initiate the process of restoring affected aquifers toward chemical-specific ARARs. However, under these interim remedy alternatives, the requirement to attain chemical-specific ARARs for aquifer restoration (see 25 PA Code Chapter 264) may be waived until a final remedial action is selected. In the case of both alternatives, all ARARs for discharge of treated water and air emissions would be met.

Since no remedial action would be taken under Alternative 1, there would be no ARARs.

Long-Term Effectiveness and Permanence

By initiating a remedial action at this time, Alternatives 2 and 3 may reduce the time necessary to restore affected aquifers. Alternative 1 would not initiate the process of aquifer restoration.

Reduction of Toxicity, Mobility and Volume

Alternatives 2 and 3 would reduce the volume and toxicity of contaminated groundwater. Further migration of groundwater in

the overburden and shallow bedrock aquifers would be minimized by the extraction systems. The treatment systems for these alternatives would generate residual hazardous substances which would require further treatment or disposal.

Alternative 1 would not use treatment to reduce the toxicity, mobility or volume of contaminated groundwater in overburden or shallow bedrock.

Short-Term Effectiveness

Under Alternative 1, groundwater contaminants would continue to migrate and thus present a potential unacceptable risk to human health.

There would be no additional risks to the public or the environment under Alternatives 2 and 3. Under these alternatives, workers would be required to wear protective equipment during activities where they may be exposed to hazardous substances.

Implementability

No remedial action is included under Alternative GW-1.

For Alternatives 2 and 3, the remedial technologies and process options proposed for groundwater extraction and treatment are all demonstrated and commercially available. Treatability studies would be required for both alternatives to ensure NPDES discharge limits can be met.

Under Alternative 2, it is reasonable to assume that extracted groundwater could be treated onsite to meet NPDES effluent limits for discharge to a tributary to Little Neshaminy Creek or Southampton Creek.

Under Alternative 3, it is reasonable to assume that extracted groundwater could be pretreated onsite as necessary to meet the requirements of either the NAWC or a WMA WWTP. At this time, it is unknown how long the NAWC WWTP will remain operational or whether the WMA WWTP would accept pretreated ground water from NAWC.

If contaminated groundwater is found in overburden or shallow bedrock outside of Areas A and B, additional extraction wells or treatment units could be installed as part of the **remedial design/remedial action (RD/RA)** for OU-1 to provide a remedy for additional contaminated groundwater of concern.

Cost

The present worth of Alternative 1 is ----- . The present worth of Alternative 2 is _____ . The present worth of Alternative 3 is _____ .

State and Community Acceptance

The Commonwealth of Pennsylvania and community acceptance of the preferred alternative outlined in this Proposed Remedial Action Plan will be evaluated at the conclusion of the public comment period and will be described in the Record of Decision for OU-1.

SUMMARY OF THE PREFERRED INTERIM ALTERNATIVE

Should read:

"At this time, the Navy, with the support of the EPA, has selected **Alternative 3, Groundwater Extraction, Onsite Pr treatment, Discharge to NAWC Waste Water Treatment Plant or Publically Owned Treatment Works**, as the preferred interim alternative for remediation of contaminated groundwater attributable to NAWC in overburden and shallow bedrock . This alternative would meet the objectives of minimizing migration of the contaminated groundwater of concern and initiating the restoration of the affected aquifers. Treatment would be utilized to reduce the volume and toxicity of the contaminants in the groundwater prior to discharge to either the NAWC WWTP or a POTW. Alternative 3 would achieve this in a cost-effective manner and comply with NPDES requirements. The preferred alternative is believed to provide the best balance of trade-offs among the alternatives with respect to the response criteria.

Based on information available at this time, the Navy and the EPA believe the preferred alternative would be protective of human health and the environment, would comply with ARARs (with the possible exception of waived ARARs under 25 PA Code Chapter 264), would be cost effective, and would use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Because contaminants would be reduced in volume through treatment, the remedy would meet the statutory preference for use of a remedy which involves treatment as a principal element."

The EPA has provided the comments above to the Navy on March 29, 1993, prior to March 31, 1993, the scheduled date for transmittal of the subject comments. We understand the Navy can provide a

revised Proposed Remedial Action Plan (PRAP) to the EPA for final review by April 5, 1993 and that the Navy, PADER and EPA (including respective legal counsels) can meet on the morning of April 8, 1993 to resolve the final contents of the PRAP.

Should either of these dates not be possible, please contact Ben Mykijewycz at 597-3535 to arrange alternative dates.

Sincerely,

A handwritten signature in cursive script, appearing to read "Darius Ostrauskas".

Darius Ostrauskas
Remedial Project Manager

cc: Frank Kurdziel, NAWC
Ben Mykijewycz
David Kennedy, PADER
Craig Olewiler, PADER
Brian Nishitani