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HNP/51-12-3-5

December 1, 1993

Project Number 0159

Mr. Lonnie Monaco  
Naval Facilities Engineering Command  
Northern Division, Mailstop No. 82  
Environmental Contracts Branch  
10 Industrial Highway  
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62472-90-D-1298  
Contract Task Order (CTO) No. 134

Subject: Response to EPA Comments  
Area B Hydrogeologic Investigation  
Naval Air Warfare Center (NAWC)  
Warminster, Pennsylvania

Dear Mr. Monaco:

Enclosed please find the responses to United States Environmental Protection Agency (EPA) comments for the Area B Hydrogeologic Investigation. As explained in the letter, most of the EPA comments have been resolved and will either be incorporated into the final project plans or the final scope of work. The responses discussed in this letter deal only with unresolved issues. Of particular importance is the rationale behind the groundwater sampling plan. EPA has requested the opportunity to comment on this plan prior to sampling.

Please contact me at (215) 971-0900 if you have any questions or comments.

Sincerely,

A handwritten signature in cursive script that reads "Kevin C. Kilmartin".

Kevin C. Kilmartin, C.P.G.  
Assistant Project Manager

KCK/dhd

cc: Ray Mannella (NAVFACENGCOM)  
Jeffrey Orient (Halliburton NUS)  
Neil Teamerson (Halliburton NUS)  
Michael Turco (Halliburton NUS)

**RESPONSE TO COMMENTS**  
**to the**  
**WORK PLAN ADDENDUM for AREA B HYDROGEOLOGIC INVESTIGATION**  
**and the**  
**QUALITY ASSURANCE PROJECT PLAN for**  
**AREA B HYDROGEOLOGIC INVESTIGATION**  
**at**  
**NAWC WARMINSTER, PENNSYLVANIA**

This response to comments addresses Environmental Protection Agency (EPA) comments on the Work Plan Addendum for Area B Hydrogeologic Investigation and the Quality Assurance Project Plan for Area B Hydrogeologic Investigation as detailed in letters from EPA to the U.S. Navy dated September 10, 1993; September 17, 1993; September 30, 1993; and October 20, 1993. Most of the EPA comments were addressed in the final Work Plan Addendum, which was distributed October 6, 1993. Several EPA comments, particularly those of October 20, were not addressed in the final Work Plan Addendum or the final Quality Assurance Project Plan (QAPP). This response to comments addresses only those comments that had not already been responded to or incorporated into the final documents.

**Comment No. 1:** In the letter of October 20, 1993, The EPA requested the rationale behind the proposed sample locations for the parameters as outlined in the sampling plan on Tables 4-3A and 4-3B of the Work Plan Addendum. In addition, the EPA questioned why only certain wells were targeted for VOC analyses, and requested that all wells be sampled for VOCs.

**Response:** The rationale for the proposed sample plan is as follows:

1. Low-concentration volatile organics

As proposed, all bedrock wells in the vicinity of Area B will be sampled for low-concentration volatile organics (VOCs). This sampling will determine the spatial (lateral and vertical) distribution of VOCs in the bedrock at Area B. The wells to be sampled include all of the shallow wells installed prior to the Area B investigation and all shallow, intermediate, and deep wells installed during the Area B investigation. The only wells that will not be sampled are the overburden wells that were installed prior to the Area B investigation. A complete round of samples was obtained from these wells during the Phase II RI. As no

new overburden wells will be installed as part of this investigation (since the focus of this study is the shallow bedrock water quality), there are no new sampling or data points to integrate into the existing interpretation.

## 2. TCL semi-volatile organics

The new intermediate and deep bedrock wells at clusters A, B, E, and G and the intermediate well at cluster I will be sampled for semi-volatile organics (see Fig. 4-1 of the Work Plan Addendum). The clusters to be sampled were selected to obtain chemical data for the deeper horizons in three areas: in the immediate vicinity of the sites, immediately adjacent to the residences in Casey Village, and between these two locations.

The shallow wells will not be sampled during the Area B investigation because the existing shallow monitoring wells that have been sampled during the previous phases of investigation have not contained significant amounts of semi-volatile organics.

## 3. TCL PCBs and Pesticides

Samples to be analyzed for TCL PCBs and Pesticides will be obtained from the same suite of wells to be sampled for TCL semivolatile organic compounds. Limited sampling of existing wells during the previous phases of investigation has not indicated that these compounds are contaminants of concern at this site.

## 4. TAL metals (total and filtered)

The new shallow, intermediate, and deep bedrock wells at clusters E, G, I, and J, and the new intermediate and deep bedrock wells at clusters A, B, and C (see Fig. 4-1 of the Work Plan Addendum) will be sampled for TAL metals (total and dissolved). The clusters to be sampled were selected to obtain total and dissolved metals concentrations in three areas: upgradient and downgradient of the sites, immediately adjacent to the residences in Casey Village, and between the sites and Casey Village.

The existing shallow bedrock wells at Area B were sampled for metals during the Phase II RI. The analyses indicated that metals are a contaminant of concern. The shallow wells will not be resampled as part of the Area B investigation because the results would not be expected to differ significantly from the

last sampling event, due to the relatively low mobility of the metals.

**Comment No. 2:** The EPA requested that sampling of groundwater from a newly constructed well should be performed at least two weeks after the completion of the well development.

**Response:** As requested, the sampling of groundwater from all newly constructed wells will be performed at least two weeks after the completion of development of each well.

**Comment No. 3:** In the letter of October 20, 1993, the EPA requested that during water level monitoring, water level measurements be performed as outlined in the letter from EPA to the Navy dated September 17, 1993. In this letter, the EPA requested that 1) agreement should be reached regarding which wells should actually be monitored for water levels, 2) levels should be measured every 15 minutes if possible and no less often than every hour, and 3) that levels should be measured for at least one day before the Northampton Township supply well is turned off, while this well pump is turned off, and for at least one day after this well pump has been turned back on to identify the impact of the pumping of this well on groundwater flow between Area B and the supply well. These readings should be taken during the middle of the three week water level monitoring period and should not be taken close to a rain event.

**Response:** The water level monitoring network will not be designed until the current Area B drilling program is complete and at least the preliminary hydrogeological data obtained from this program has been reviewed. At that time, it is anticipated that EPA and the USGS will have the opportunity to comment or have input into the design of the water level monitoring program.

**Comment No. 4:** In the letter of October 20, 1993, EPA noted that a revised QAPP was not included in the final Work Plan Addendum for Area B. EPA requested that the final QAPP should address EPA comments regarding Sampling Equipment and Protocols as included in the EPA letter to the Navy dated September 10, 1993. In this letter, EPA stated that 1) in regards to the evacuation of static water (purging), "the purge rate should not exceed the rate of the rate of pumping during the well development process. While purging three to five well volumes has been considered effective, "overpurging" of water should be avoided to prevent encouraging flow of groundwater from other areas into the well. Stabilization of certain groundwater parameters (e.g. pH, DO, etc.) (measured through real-time monitoring) has been recognized as an appropriate measurement of when purging should cease", and 2) in regards to the actual sampling, "to obtain representative samples, groundwater should be sampled using either a bottom-

loading bailer or a low-flow pump. Should a pump be utilized, the flow rate of the pump should be specified in the final QAPP."

**Response:** The existing shallow bedrock wells at Area B have very low yields. It is unlikely that more than two well volumes of groundwater could be purged from these wells before they go dry. These wells will be purged either until a minimum of three well volumes have been removed or until dry, or until groundwater parameters measured in the field during purging (temperature, electrical conductance, and pH) have stabilized. For all wells, the rate of purging shall not exceed the rate of pumping achieved during the development of that well. All groundwater samples shall be obtained with a stainless-steel, bottom-loading bailer.

**Comment No. 5:** In the letter of October 20, 1993, EPA requested the specific nature of the 50/50 bentonite-chip and sand mix proposed for sealing open boreholes.

**Response:** The nature of the well sealant has been modified from that proposed in the Work Plan Addendum. The sealant, to be used to backfill and seal the open portion of the borehole below the screen interval, will consist entirely of bentonite emplaced as chips. The exact brand of bentonite chips has not been determined. Several brands that have been used successfully at many sites are readily available on the market. Typically, the chips are approximately 1/2 - inch to 5/8 - inch in size, and are manufactured so as to not hydrate until after their emplacement. The top of the bentonite seal will be approximately five feet below the bottom of the monitoring well screen.