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Project 5838

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

Reference: CLEAN Contract No. N642472-90-D-1298
Contract Task Order (CTO) No. 225

Subject: Comment Responses for Summary Report for Area B Groundwater Monitoring
Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

As requested, Tetra Tech NUS (TtNUS) has responded to comments regarding the Summary Report for Area B Groundwater Monitoring (October 1998). The enclosure to this letter provides these responses.

Based on these responses, TtNUS currently does not plan to provide a revised version of this report. Please contact me if you have any questions or comments.

Sincerely,

Neil Teamerson
Project Manager

ANT/ejc

Enclosure

c: Thomas Ames (NAVFACENGCOM)
Michael Fohner (NAVENGCOM)
Kathryn Davies (EPA Region III)
Darius Ostrauskas (EPA Region III)
April Flipse (PADEP)
David Fennimore (Earth Data)
Anthony Sauder (Pennoni)
Ronald Sloto (USGS)
Jeffrey Orient (Tetra Tech NUS)
Garth Glenn (Tetra Tech NUS) (without enclosure)

**RESPONSES TO COMMENTS
SUMMARY REPORT FOR AREA B GROUNDWATER MONITORING**

General Response to Comments

The Navy does not plan to produce a revised version of this report. A final RI Report for Area B groundwater is being prepared, and the comments made on the Summary Report will be considered in the preparation of this report.

USGS Comments (undated)

USGS indicated that the report was acceptable as written. *Response: None required.*

Pennoni Comments (dated March 2, 1999)

Groundwater flow direction is presented as shallow (i.e., less than 60 feet), intermediate (i.e., 60 to 110 feet), and deep (i.e., 110 to 160 feet). However, there is no discussion of the screened interval with respect to the dip and the geology of the Stockton Formation. It would be clearer if this report discussed the strike and dip of the bedding and the strike/dip of fractures, if known, to justify the hydrogeologic units. The United States Geological Survey (USGS) report entitled "Geohydrology and Distribution of Volatile Organic Compounds in Ground Water in the Casey Village Area, Bucks County) Pennsylvania" uses intervals of 18 to 64 feet and 48 to 106 feet to present their data. It is not clear whether the same hydrogeologic units are being evaluated in the two (2) reports. *Response: Section 2.2 of the report discusses groundwater flow directions and the structure (dip direction) of the bedrock units. The Summary Report was not intended to provide a detailed understanding of the site-specific hydrogeology associated with Area B. As such, a detailed discussion of the screened interval versus the strike and dip of bedding planes was beyond the scope of the report. The draft Area B Hydrogeologic Report (Halliburton NUS, April 1995) provides further information regarding the selection/designation of hydrogeologic units in the vicinity of Area B. It should be noted that groundwater flow directions in Area B appear to be controlled by topography more so than bedrock structure.*

The Navy and the USGS used similar well locations and corresponding water-level elevation measurements to develop independent potentiometric surface maps. The Navy believes that the USGS and Summary Report potentiometric surface maps are relatively consistent with each other.

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An aquifer test was conducted by the USGS in Casey Village in October 1996. Well BK-2799 was pumped for 5-6 hours with a drawdown of 57 feet maintained. This well was pumped at a flow rate of 3.7 gallons per minute. The USGS confirms that this alters the groundwater flow direction in the two (2) zones they identified with geophysical surveys. The potential migration pathways influencing the plume identified as surrounding HN-61 and HN-49 need to be evaluated. Pumping of several potable wells in Casey Village would increase the cone of depression; therefore groundwater flow under non-pumping conditions should not be used to determine from where the source originated. It is premature to conclude that the HN-49 contamination has originated off-base. *Response: The Navy notes that it is no longer practicable to evaluate groundwater flow under pumping conditions that existed in the adjacent Casey Village Area prior to 1993. To attempt to duplicate or approximate those conditions is not feasible at this time since the domestic wells are no longer in use. In addition, while the Casey Village domestic wells were in use the pattern of use varied and was not a steady-state effect on a local scale. The pumping of well BK-2799 and the resultant effects on groundwater flow in two hydrogeologic water-bearing zones is typical of what would be expected of any of the residential wells in the area, and during the period of active usage of wells in the Casey Village area, was only one of multiple factors influencing groundwater migration patterns. Other data exist that also need to be considered in any evaluation to determine the probable source of the TCE contamination, in addition to a pumping test. The Navy, after extensive investigation work and after reviewing work performed by the USGS for EPA, believes that the cumulative data collected indicate an off-base source for the TCE present in groundwater in the Casey Village area.*

The Navy does not believe it is necessary to further evaluate potential migration pathways in the vicinity of well clusters HN-49 and HN-61. Groundwater/contaminant migration along the base property boundary adjacent to Casey Village is primarily controlled by topography and stream traces. As the Summary Report indicates, both surface water and groundwater divides are present and influence groundwater flow directions as well as preferential contaminant migration pathways. Even under pumping conditions, it is hypothesized that the pattern of groundwater contamination in this general area would not be significantly affected. This hypothesis is supported by analytical data obtained from Casey Village well samples both before and after residences were connected to municipal water-supply systems.

In Figure 2-2, "Potentiometric Surface - Intermediate Groundwater (Well Depth Range 60-110 feet)", the groundwater elevation for HN-61I was used even though the screened interval is stated as 110-124.5 feet in Table 2-1. It is unclear how the decision was made to use HN-61I and not HN61S with a screened interval of 81-95.5 feet. The shallow versus intermediate designation is further complicated by the designation of HN-49I (screened interval: 55-75 feet) as "intermediate" when it is actually shallower than

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HN-61S (screened interval: 81-95.5 feet) which is designated as "shallow." *Response: Figure 2-2 should have reflected well HN-61S instead of well HN-61I. Appendix B indicates that the groundwater elevation at HN-61S was 329.41 feet (as indicated in Figure 2-2); the elevation measured at HN-61I was 331.50 feet (as shown in Figure 2-3). Well HN-61S and well HN-49I are considered to be intermediate-depth wells by the Navy and the USGS.*

EPA Comments (dated August 3, 1999)

Section 2.3.1. Organic Results.

Comparisons between the 1998 sampling event and previous sampling events and statements regarding contaminant trends are presented on pages 2-11, 2-14 and in Section 3.2 of the report. All comparisons note that the VOC levels are decreasing over time. This conclusion may or may not have merit. On page 1-9 it was stated that the majority of monitoring wells was sampled using a low-flow purging and sampling technique. As previously noted in comments provided on the Summary Report for Areas A and D Groundwater, it is not clear that the purging and sampling methodology was appropriately utilized during the sampling events and thus, that the resultant analyses are actually representative of site conditions. Contaminant trend analyses should not be based on comparing data from two sampling events, the second of which is suspect with regards to sample representativeness. Additional samples, taken using the appropriate sampling protocol, would be helpful in establishing contaminant trends with time in this area. *Response: The Navy believes that the sampling event and resultant laboratory analyses are representative of site conditions regarding groundwater quality. A variety of sampling procedures has been used since the early 1980s to collect groundwater samples at the base. The analytical results generated as part of Area B sampling are not significantly different in relative terms than previous sampling events. For example, samples from wells previously containing elevated levels of VOCs revealed comparable levels as part of the June/July 1998 sampling event, and more recent (June 1999) sampling using sampling techniques recently agreed to between the Navy's contractor and EPA (non low flow) yielded results that were comparable to earlier data. As such, the Navy feels that the laboratory data are representative of those groundwater quality conditions that existed in June and July 1998.*

Section 2.3.2.1. Organic Results.

The values for TCE and cis-1,2-DCE in well HN-61S should be reported in this discussion, considering it was one of two wells with detectable VOC amounts greater than MCLs (and the other well data was presented here). Additionally, it is noted that all other wells have TCE levels no greater than 4 ppb. To clarify the discussion, it would help having all pertinent concentration data presented. *Response: This is a valid suggestion. The TCE result for well sample HN-61S was mistakenly discussed in Section 2.3.1.1. The TCE and cis-1,2-DCE results for sample HN-61S were presented in Section 3.2.2.*

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The presentation of positive results for SVOCs, pesticides and PCBs in intermediate-depth samples on page 2-14 is somewhat confusing. The relevance of including the statement that the sample from well HN-64I as tested for these organic substances is not clear. Was this the only well tested for these analytes? **Response:** *Section 1.3.1 indicates that well samples HN-49S, HN-64S, and HN-64I were tested for these parameters. HN-64I was the only intermediate-depth well sample tested for SVOCs, pesticides, and PCBs.*

In the next paragraph, it should be noted that the intermediate well 61S also had elevated levels of TCE and cis-1,2-DCE so that the narrow pattern of contamination on Navy property can be properly discerned. **Response:** *This is a valid suggestion. The TCE result for well sample HN-61S was mistakenly discussed in Section 2.3.1.1.*