United States Environmental Protection Agency
One Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023

October 18, 1999

Mr. Emil Klawitter,
Northern Division - NAVFAC
10 Industrial Highway,
Code 1811/EK - Mail Stop 82
Lester, PA 19113-2090

Re: Additional QA and Hydrogeo Comments on the Draft Work Plan for the Characterization of CVOC Contamination at the former Nike PR-58 and adjacent Navy NCBC Davisville Site 03, dated September 3, 1999, former Naval Construction Battalion Center (NCBC), Davisville, Rhode Island

Dear Mr. Klawitter:

Pursuant to §7.6 of the NCBC Federal Facility Agreement, please find enclosed the Environmental Protection Agency's (EPA) final additional comments on the above referenced document. If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,

Christine A.P. Williams
Remedial Project Manager
Federal Facilities Superfund Section

Enclosure

cc: Richard Gottlieb, RIDEM
Walter Davis, CSO
Peter Hugh, ACOE
Steve DiMattei, EPA
Bill Brandon, EPA
Eileen Cury, Dynamac Corporation
Jim Shultz, EA Engineering, Science and Technology
Marilyn Cohen, Town of North Kingston
Howard Cohen, RIEDC
Anne Heffron, Applied Enviro-Tech, Inc.
Dinalyn Spears-Audette, Narragansett Tribe

EPA COMMENTS ON NIKE/SITE 3 ROCK WORK PLAN

General Comments:

1. The Document title is somewhat misleading in that "CVOC Contamination" is not the only remaining issue here. Previous EPA comments pointed out the need to perform additional assessment concerning the extent of additional COCs such as inorganics and SVOCs. This is not to dispute the fact that the central goal of this study is indeed to examine "CVOC Contamination". Perhaps some clarifying language could be added to the title.

2. Deep Overburden and Weathered Bedrock Characterization: In Section 2.3, the work plan states that, "the sandy gravel/gravelly sand and weathered bedrock units are considered as a single ground water zone." EPA disagrees with this generalization, and has offered numerous previous comments which speak to this issue, (most recently on 9-18-98). This issue needs to be addressed on a case-by-case basis at each location. The best zone(s) should be selected for well screen placement based on an examination of the available data, including geologic, geophysical, hydraulic, and chemical data. More than one screen may be required in this general interval, particularly if the zone is thick (e.g., greater than 15 feet in aggregate thickness) and/or the various assumptions listed in Section 2.3 are not found to be true (i.e., low permeability layers are encountered and/or the weathered bedrock zone is found to differ substantially from the overlying deep overburden with respect to hydraulic, chemical, or geologic criteria). It should be noted that even in cases where the weathered bedrock zone is "in direct hydraulic communication" with the overlying deep overburden, separate screens may be needed. Such a case would exist when one of the units varied substantially with respect to hydraulic conductivity. As noted previously at meetings and in written comments (most recently 9-18-98), EPA is particularly concerned that the uppermost portion of the bedrock surface is adequately considered, particularly at the bedrock/overburden interface. In this respect, EPA requests that work plan be modified, as follows, to incorporate actions which are needed to facilitate comparison of the uppermost weathered bedrock zone with the overlying deep overburden with respect to hydraulic, chemical, or geologic criteria:

A.) Geologic material (e.g., split spoon samples) from the deep overburden (i.e., within 10 feet of the bedrock/overburden interface) should be directly compared with material samples from the uppermost 3-5 feet of bedrock. It should be noted that recovery of samples from the uppermost part of the bedrock is difficult to achieve as a practical matter. It should also be noted that the work plan currently calls for drilling 3 foot "sockets" into bedrock prior to installation of steel casing. In this respect, chemical and/or hydraulic comparative data should be collected, as follows;

B) Chemical data should be used to compare the CVOC levels within the deep overburden and uppermost weathered bedrock zones. CVOC screening data should be collected from the deep overburden and uppermost weathered bedrock. CVOC results from screening level ground

water samples from the deep overburden (i.e., within 10 feet of the bedrock/overburden interface) should be directly compared with ground water screening samples from the uppermost 3-5 feet of bedrock. An approach of this kind was used in the later stages of the Site 03 investigation, but alternate approaches could be considered.;

C) Hydraulic data should be collected from the deep overburden and uppermost weathered bedrock zones for direct comparison. During the drilling process, discrete interval slug tests should be conducted on at least one 3 foot vertical section in the deep overburden (i.e., within 10 feet of the bedrock/overburden interface) as well as from the uppermost 3 feet or so of weathered bedrock as follows: 1) Advance casing to bottom of desired 3-foot interval, 2) Install 3-4 feet of pea-gravel or filter sand into casing; 3) retract casing 3 feet; 4) conduct slug test; 5) continue advancing borehole to the next interval to be tested. It has been previously noted that the work plan currently calls for drilling 3 foot "sockets" into bedrock prior to installation of steel casing. Following the manner discussed above, this 3 foot "socket" would be evaluated for hydraulic conductivity prior to installation of a permanent steel casing.

3. Role of Borehole geophysics: SOPs for the borehole geophysical methods to be used need to be supplied to regulators for review. Of equal importance, is the role of borehole geophysics in comparison to packer testing or other methods. EPA has noted previously (9-22-99, 9-18-98, etc.) that the geologic and hydraulic properties of the bedrock materials are critical data objectives. It is therefore necessary that the work plan detail how this information will be gathered at all new bedrock boring/well locations. To this end, borehole geophysical logging should be conducted on all new bedrock boreholes, regardless of drilling method. Similarly, packer testing should be conducted on all new bedrock boreholes, regardless of drilling method, unless it can be demonstrated that the borehole geophysical techniques to be used will result in an equivalent level of hydraulic characterization. It should be noted that bedrock fracture orientations are of critical importance to this study, and therefore, ATV logging is needed in the "drive and wash" bedrock borings despite the collection of core for the simple reason that the cores are not oriented. Oriented cores could be collected at a substitute.

4. Preferential Pathways: Several types of preferential pathways are possible, if not probable at this site, as have been discussed in previous comment letters (most recently 9-22-99 & 9-18-98). These include the former storm drain system, major fractures in the bedrock, and the uppermost weathered bedrock unit. It is not clear that the current work plan addresses any of these issues to sufficient detail. Following data collection from the first round of wells, it will be necessary to assess the new information from the perspective of preferential pathways. Further work may or may not be needed. EPA appreciates the planned evaluation of the storm drain system and recently groundwater elevation map. Additional methods, such as fracture-trace analysis, pumping tests, and/or 2-D electrical resistivity surveys may be needed to further define the orientation, hydraulic properties, and lateral/vertical extent of the major bedrock fracture zones. Use of borehole geophysics may also need to be expanded in the event that the weathered

bedrock zone is determined to be an important aquifer zone or potentially a localized preferential pathway. As an example, natural gamma logging of existing wells could be used to help identify the existence and thickness of the uppermost weathered zone so that maps can be prepared.

5. Contingency Wells: Various contingency wells are outlined in the work plan (e.g., Table 1b). Prior to finalizing the list of contingency wells/locations, EPA recommends that the BCT meet to review the results of the initial investigation/well installation phase. Comprehensive ground water flow maps will be needed for all key hydrostratigraphic units in order to make the final determinations.

6. Ground water Flow issues: Several issues exist at the site with respect to ground water flow. These include the following:

> 1) flow directions/head gradients (i.e.,for all relevant hydrostratigraphic units) relative to the residences to the north of the site, 2) and flow directions/head gradients in the down-gradient part of the system, and 3) head gradients within any significant bedrock fracture zones, e.g., the fracture zone which is hypothesized to extending northeastward from the NIKE site.

In order to address these issues, the following steps are needed:

> 1)Head data is needed in the residential areas for all relevant hydrostratigraphic units. Currently planned wells are south or east of the residences, and as such, the head field will not be constrained in the residential areas.; 2) Ground water and surface water head data is needed in the wetland areas east of the residences and north of site 01/02/03 in order to constrain the head field in the downgradient portion of the system. This is needed in order to insure that down-gradient wells on the Navy property are optimally located (i.e., are along flow lines) relative to the source(s) at the NIKE site. The role of these wetlands as potential ground water/contaminant discharge areas needs to be examined.; 3) It has been noted that contaminant migration to the northeast is apparently at odds with the prevailing gradient, which are believed by the Navy to be generally to the southeast. It is possible that the head gradients in major fractures are to the northeast, and thus do not correspond to the prevailing average gradients. Discrete head values may need to be determined in significant major fracture zones if they are determined to be a significant issue with respect to contaminant migration at this site.

7. Additional soil gas studies should be considered in the EA-107 area, building 344 area, or at other potential source areas that may be discovered by the planned groundwater monitoring.

8. The following required elements of a QAPP have not been adequately detailed in this work

plan: a Distribution List of those who will receive a copy of the work plan;

Quality Objectives and Criteria for Measurement Data; Special Training Requirements/Certification; Documentation and Records; Instrument/Equipment Testing, Inspection, and Maintenance Requirements; Inspection/Acceptance Requirements for Supplies and Consumables; Data Acquisition Requirements (Non-direct Measurements); Data Management; Assessments and Response Actions; Reports to Management (other than QA Reports); Data Review, Validation, and Verification Requirements; and Reconciliation with User Requirements.

Specific Comments:

9. Table of Contents: Borehole Geophysical procedures should be provided for regulatory review as soon as they are available.

10. Page 1-1, last para.; Please consider the following rewording for clarity: "The plume in the water-table overburden aquifer at the former NIKE PR-58 site has considerable characterization from previous investigations, but some additional study is needed, particularly in the deep overburden aquifer."

12. Page 1-2, 2nd bullet; For clarity the area indicated as, "just east of the bermed area" should be indicated on Figure 2 (e.g., shaded).

13. Page 1-2, 2nd bullet; Typo.; "weathered rock".

14. Page 1-2, 7th bullet; Several additional objectives have been previously identified by EPA, most of which pertain directly to the "further assess natural attenuation" objective, and should be included directly in this work plan. These include, further assessment of current source area strength at site 02, fate and transport potential of on-site sewers, and various comments directed towards understanding ground water flow direction at a level needed to support a rigorous evaluation of MNA, etc. Please refer to previously submitted comments as well as General Comments, above. It should be emphasized that a rigorous MNA assessment will require a greater level of supporting information than has been provided up to this point.

15. Page 2-1, para. 1; Further information is needed concerning the decommissioning of the former silos. EPA questions whether the holes which were reported to have been drilled in the base of the structures are sufficient to allow rapid exfiltration of precipitation/runoff introduced into the structures. Ground water mounding conditions may exist in these areas at least intermittently. This issue becomes more important in terms of establishing the nature and extent of the CVOC material as well as fate and transport proximal to the source area. As a first step, EPA recommends that piezometers are installed into the sand backfill material in each of the

three former silos. Head values in the fill can then be compared directly to adjacent monitoring points to establish wether or not a mounding condition exists during each monitoring activity.

16. Page 2-2, para. 3; To what extent has the Building 344 and the associated/adjacent USTs been assessed ? One might expect the former use here, i.e., missile assembly and testing, to have been a potential contributor to CVOC contamination. It is not clear whether the actions proposed in the current work plan will resolve this issue. Additional focus may be needed here, if the data gathered in this round of sampling point to additional source areas.

17. Page 2-3, para. 2; EPA has requested that MW02-07D be replaced for the reason that this well, before it was destroyed, detected the highest CVOC levels at site 02. Source area evaluation, as well as being a general site characterization goal, is particularly important in terms of evaluation the MNA potential of a site. In this context, the magnitude of the CVOC source area at site 02 bears further scrutiny. EPA notes that, all vehicle maintenance reportedly occurred IN building 224, various floor drains were closed by the Navy under the EBS Phase II investigation, however no groundwater samples were taken directly down gradient through the floors. Further, no stained or darkened soils were observed on aerial photographs from the area west of 224. A 23 year gap in aerial photo coverage (i.e., 1970 to 1993) must be pointed out, but in the same breath, the Navy has done extensive characterization in this area which has not identified significant source material. Again, the highest measured CVOC concentrations were detected at MW-02-07D, a well located near the southern building footprint, and also associated with a former dry well. This may be suggestive of a sub-building source. Although it is difficult to make a strong case for this, future monitoring should be evaluated carefully to ascertain the persistence of CVOC contaminants at Building 224. For example, persistence of CVOC at 224 following remediation of NIKE site and diminishment of CVOC contribution from NIKE area would suggest further examination of Building 224. MW-02-07D is the best existing location to assess this as the highest CVOC values in the vicinity of building 224 have historically been measured here. Replacement of this well would therefore seem prudent at that time. EPA will agree to the Navy's proposed plan to evaluate data from the wells surrounding the building 224 and especially at MW-03-05 and MW-02-8 prior to making a decision to re-install MW02-07 or evaluate a potential source area under building 224.

18. Page 3-1, Section 3.2, Para. 3;Additional detail and discussion concerning the borehole geophysical program is needed, particularly as it pertains to screened interval selection/well installation. Please see general comment above, Deep Overburden and Weathered Bedrock Characterization.

19. Page 4-6, Sec. 4.4.3.2; Log should also include a running tally of cumulative quantity/volume of drilling water introduced into the hole. Air/water pressure and downhole bit pressure should also be continuously recorded during drilling operations.

EPA COMMENTS ON NIKE/SITE 3 ROCK WORK PLAN

20. Page 4-8; EPA prefers that drilling mud be used only as a last resort.

21. Page 4-9; 5th and 6th bullets; A "T" fitting should be installed prior to the flow-through cell in order to allow for turbidity sample collection.