UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
1 CONGRESS STREET, SUITE 1100 (HBT)
BOSTON, MASSACHUSETTS 02114-2023

June 6, 2006

Curtis Frye
Dept of the Navy, BRAC PMO Northeast
Code 5090 BPMO NE/CF
4911 South Broad St
Philadelphia, PA 19112-1303

Re: Interim Groundwater Sampling Event 04-June 2005 Results Report for Site 03: Construction Equipment Department, at the former Davisville Naval Construction Battalion Center, North Kingstown, RI

Dear Mr. Frye:

Pursuant to § 7.6 of the Davisville Naval Construction Battalion Center Federal Facility Agreement dated March 23, 1992, as amended (FFA), the Environmental Protection Agency has reviewed the subject documents and comments are below.

General Comments:
The major observation is that there remains a lack of an effective conceptual site model for the Site 03 and peripheral areas. To date, data has been collected and reported, with no comprehensive assessment of what the data implies. This is not to say that definitive conclusions should be made at this time; however, interpretation of the data as it becomes available would be beneficial in making adjustments to the monitoring program and tying the observed data into a better picture of site wide hydrogeology and potential contaminant fate and transport. This is related to both Site 03 specific source areas and fate and transport, but also adjacent sites including the up gradient former Nike PR-58 site and the down gradient Site 16 area.

Also, inspection of the overburden and bedrock groundwater contours continues to show that the predominant direction of groundwater flow is to the southeast toward Site 16. The origin of up gradient Site 03 groundwater appears to be from two areas, one from the northwest and one from the west. The northwest area appears to be in the proximity of the disposal area just west of MW-Z3-01 and near EA-104 (not shown on figures in this report). The west area appears to be the vicinity of MW03-14D/R/R2. Thus, if the Site 03 Study Area boundaries (as designated) are not source areas, then these two alternative locations are likely sources. The groundwater flow directions presented suggest that any contaminants released in these areas have the potential to already, or in the future, migrate through and/or to the Site 16

area.

While a formal statistical analysis was not conducted on the data presented, review of the data (Figures 7 and 8) from several of the monitoring wells within the Site 03 boundary area suggest that concentrations of chlorinated volatile organic compounds (CVOC) in the deep overburden groundwater appear to be declining at the western up gradient area (MW03-08D and MW03-10D) and increasing at the northwest up gradient area (MW-Z3-01 and MW03-09D). Concentrations of CVOC in several down gradient locations (MW02-03D, MW02-08D, and MW02-11D) appear to be increasing. This assessment was based upon inspection of the presentation of the seven or eight rounds of data from 1995 to 2005. An increase in concentrations can also be inferred for monitoring well EA-111D for the six rounds of data collected. There is insufficient bedrock groundwater data for this evaluation, however, both in terms of the number of samples collected to date, and the number and locations of bedrock monitoring wells, to make similar observations.

Potential Northwest Source Area

It is not clear where the observed CVOC is originating from or where it is migrating to. While the down gradient, deep overburden groundwater does appear to be increasing in CVOC concentrations, the concentrations of CVOC are approximately 25 to 50 micrograms per liter (µg/L). At the MW01-14D location the concentrations are in the single digit range. Reverse path analysis of the deep groundwater flow from inspection of Figure 3A suggests that the origin of the CVOC for these monitoring wells may be in the vicinity of MW-Z3-01. Assuming that the average concentrations of CVOC in this well (750 µg/L) are representative of the CVOC concentrations for the origin for the observed down gradient deep overburden groundwater CVOC, there is a decline of approximately 95% CVOC concentrations. This seems unlikely given the travel times and difficulty of biodegradation of CVOC in groundwater.

Further, the two up gradient wells (MW-Z3-01 and MW03-09D) to the northwest appear to show increasing CVOC trends based on seven sampling events while one well, MW03-03D, located between the two up gradient wells and the down gradient wells with increasing CVOC concentrations, shows a declining trend for eight sampling events. It is not entirely clear what are the mechanisms for observed changes in CVOC concentrations along this pathway. The increases in concentrations of CVOC at the two locations relative to the decline at down gradient MW03-03D well may indicate pulses of CVOC release from the northwest area based upon fluctuations in groundwater elevation, changes in infiltration through overlying waste material, etc.

On the other hand, review of the available hydraulic conductivity values for deep overburden site wells along this pathway combined with the hydraulic gradient provided in this report combined with likely effective porosities for site soils suggests that the increase in CVOC noted in wells around Building 224 most likely did not have sufficient travel time to migrate from the far northwest corner of the Site 03 area. The source for this increase in CVOC concentrations appears to be in the formal Study Site 03

designated area shown on Figure 2, or possibly the eastern end of the Study Site 04 area. Nonetheless, there still appears to be a source area to the northwest that is not fully reflected in the deep overburden groundwater. That is, the increases noted at the two up gradient wells in the northwest corner may be due to migration from further to the west from the vicinity of EA-104.

Potential Western Source Area

Inspection of the groundwater flow (Figure 3A and 3B) as well as analytical data (Figures 7 and 8) for up gradient wells MW03-08D, MW03-10D appear to be showing declining concentrations of CVOC. Review of the groundwater flow directions resulted in two observations. The first is that the up gradient area for the deep overburden groundwater appears to correlate the area to the west of MW-Z3-01 while the bedrock groundwater flow directions correlate with the Nike PR-58 area, specifically, near monitoring well MW03-14D/R/R2. The CVOC concentrations for the bedrock well MW03-08R do not appear to be declining, as is the case for the deep overburden groundwater. This also may reflect two different source areas contributing to groundwater flowing in this area.

Another, significant observation is that the down gradient flow direction for these two wells is to the southeast toward monitoring wells EA-111D/R. The observed diminishment in CVOC concentrations between MW03-08D/R and EA-111D/R is striking. While the deep overburden and bedrock groundwater CVOC concentrations at MW03-08D/R were recently reported as 1,130 µg/L and 2,060 µg/L, respectively, the down gradient CVOC concentrations in groundwater at EA-111D/R were 7 µg/L and 4 µg/L, respectively. While the down gradient concentrations in CVOC may be increasing (based on only six sample intervals), they are far less than what is currently observed in groundwater at the up gradient monitoring well MW03-08D/R. Further, the CVOC concentrations in groundwater at MW03-08D were significantly higher in the past, especially for MW03-08D, at 8,380 µg/L, in 1995. Thus, the reduction in CVOC concentrations between these two locations is in excess of 99%, a highly unlikely scenario given the travel times and difficulty of biodegradation of CVOC, if groundwater is flowing essentially horizontally without significant recharge into the deeper bedrock aquifer.

Data Gaps:

There are several data gaps at Site 03. The most important of which is the lack of an all encompassing conceptual site model. This major data gap is discussed above in that there appears to be an incomplete picture of where the actual source areas are and what their potential fate and transport pathways are. There appears to be an additional source area to the northwest portion of Site 03, in addition to the likely contribution of CVOC from the former Nike PR-58 area. It is noted that this later likely contributing source area included other activities such as Navy training and operation of a solvent storage facility. Additionally, a past release at either Study Site 03 or Study Site 04 may be contributing to the observation of CVOC in down gradient deep overburden groundwater in the vicinity of Building 224. These areas and a potential additional source at the western edge of the Site 03 area or in that vicinity have not been

integrated into a conceptual site model.

The second major data gap also briefly discussed above is the unexplained behavior of CVOC in groundwater for the deep overburden and also the bedrock groundwater for groundwater that is migrating to the southeast. CVOC contaminated groundwater appears to be migrating vertically downward into the bedrock, at least in locations, rather than migrating predominantly in the deep overburden groundwater. While the vertical gradients between well pairs (deep overburden and shallow bedrock) are not always in the downward direction for all well locations, most have intervals where the vertical direction of groundwater flow is downward.

For instance, with the hydraulic gradient provided in the figures and the hydraulic conductivity for MW03-08D and EA-111D provided in the first monitoring event report, groundwater and associated contaminants would travel from the former location to the latter in approximately 8 to10 years, depending upon the effective porosity (0.20 or 0.25). This would appear to be sufficient elapsed time, given lateral dispersion, even with some level of retardation for higher concentrations of CVOC to be observed at EA-111D. That is, it would be expected that given the concentration of CVOC at MW03-08D of 8,380 µg/L in 1995 that more than 7 µg/L of CVOC would be observed at monitoring well EA-111D during the recent groundwater monitoring event.

Evaluation of groundwater flow directions from both the Site 03 CED Report and the Site 16 Supplemental Data Gap Investigations Report suggest that CVOC contaminated groundwater is likely to migrate to the southeast and then swing to the east from the area of the Former Nike PR-58 and Site 03 areas toward the Site 16 area. It is possible that this CVOC contaminated groundwater might discharge into Davol Pond, but is also just as likely to follow the previously interpreted likely bedrock fault zone running along Davisville Road. The sparseness of groundwater monitoring wells, both in the overburden and bedrock make definitive evaluation of the potential transport pathways impossible. Given the documented high concentrations of CVOC at the former Nike PR-58 site location, assessment of the groundwater and potential contaminant migration pathway from and/or through the Site 03 area is warranted. This is essential to the completion of the Remedial Investigation activities ongoing at the Site 16 area.

The limited ability to assess potential fate and transport, however, is especially limited in the bedrock. This is because of the sparseness of the bedrock monitoring wells in the Site 03 area and the area just to the south, as well as between these locations and the down gradient Site 16 area. Additionally, while there is some hydraulic conductivity data for the deep overburden wells, there is very limited hydraulic conductivity data for the bedrock wells. This is especially problematic since contaminants may migrate preferentially along bedrock fracture sets that may be difficult to find to begin with, but are much more so with few wells. The transport velocity in these bedrock fractures can be very high. The hydraulic conductivity values ranged from less than 1 foot per day at MW03-08R to over 170 feet per day for EA-106R, as noted in the first interim monitoring report. Therefore, it is likely that additional bedrock

groundwater monitoring wells will be necessary to provide information to assess fate and transport.

Specific Comments:

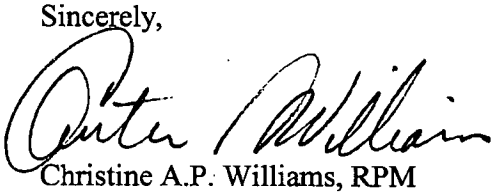
Page 2-3, §2.3, Visual Inspection. Please insert the planned submittal date for the completed LUCIP checklist and an explanation as to why the checklist was not completed.

Page 2-4, §2.4, Quality Assurance/Quality Control. Please summarize the validation report in the text to provide a more thorough explanation of the data qualifiers noted in the tables.

Page 2-2, and Tables 5 & 6. Please explain why the Navy made a unilateral decision to only report total 1,2 DCE instead of the isomers separately. EPA was not consulted nor do we agree with this change.

If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,



Christine A.P. Williams, RPM
Federal Facilities Superfund Section

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