



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

N62578.AR.002234
NCBC DAVISVILLE
5090.3a

May 3, 2007

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

Re: Transmittal Of Notes From Feb 14 Conference Call, Navy Responses To Emails And Memoranda Submitted By EPA To Support The 2/14/07 Conference Call, And Navy Responses To February 2007 EPA Follow-Up Comments Phase III Remedial Investigation Quality Assurance Project Plan For IRP Site 16, At The Former Davisville Naval Construction Battalion Center, North Kingstown, RI, Dated March 23, 2007

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 document and comments are below. No response is necessary, however, please include this record in an appendix of the phase III QAPP.

Enclosure 1, Notes from the 14 February 2007 Teleconference

General Comment: Overall, the summary is a good reflection of the teleconference. Several clarifications and/or corrections are noted below.

Pg. 1, 2nd to last para.; EPA views the importance of an upgradient investigation to be that of *reducing* uncertainty rather than "ruling out uncertainty". EPA's long-standing view on the site 16 RI is that the upgradient portion of the investigation has been incomplete, which has generally reflected an unacceptable degree of uncertainty on the project as a whole. Additional investigation/monitoring in the areas discussed may also "test the hypothesis" that a plume may be entering the site from the upgradient direction, but the central focus is to provide technically defensible upgradient characterization/monitoring which is commensurate with the site's hydrogeologic complexity so that the current CSM may reflect this, and that - moving forward - there is an appropriate upgradient monitoring network in place.

(Page 2, 6th paragraph): The discussion is somewhat incomplete. C. Leszkiewicz stated that there were only three or four bedrock hydraulic conductivity values over a vast area and even these were focused in

the northwest corner of Site 03. Therefore, a determination of very low bedrock hydraulic conductivity value and hence transport rates could not be made. Also, C. Leszkiewicz noted that he had observed hydraulic interconnections in bedrock extending over large distance exceeding a half mile. This is not uncommon in rocks that have experienced faulting, etc.

Pg. 3, 3rd para.; An issue not reflected in the summary is that of finer-scale geologic layering or other features which may not have been reflected in the logs, irrespective of the skill of the on-site field geologist. Reasons for this are many and may vary. For example, fine-scale laminations (not visible to the naked eye) are common in these types of deposits, as are thin stratigraphically controlled contaminant zones. B. Brandon pointed out that the observations noted at MW16-55D *may* be explained by such finer-scale hydrogeologic variability and, as expressed in previous EPA comments, it is difficult to dismiss the presence of contamination at that depth interval in view of the Navy's screening data. In any event, the field work proposed for the current field mobilization will serve to clarify the situation at the MW16-55D area.

Pg. 3, 4th para. While it is acknowledged that there are many challenges at this site, B. Brandon indicated that geophysics *may* not be capable of identifying smaller, narrower features, but the converse is also true. . . Actual results will be dictated by the site conditions, the particular methods selected, the manner in which the surveys are set up, how the data processed, etc. In view of the risks presented to the overall site 16 program from potentially missing or mischaracterizing potential upgradient pathways to the site (e.g., in bedrock), a strong argument can still be made for a greater level of geophysics than is currently planned, the limitations of available methods notwithstanding. There are limitations to all of the options, available, including the DPT-focused approach which the Navy advocates. Moving forward, all parties should keep an open mind toward additional options should the planned approach prove to be ineffectual.

Pg 3., 5th para. The NIKE source area includes locations where severely contaminated bedrock is co-located with clean overburden units. It is likely that there are many other such locations in the NIKE-Site 16 area depending on a particular well pairs' location with respect to a release area, the nature of the release, vertical gradients, stratigraphic controls, location of a well with respect to significant fracture zones, and other factors. With respect to contaminant transport "0.5 mile long" in bedrock, EPA is aware of many sites where contaminants have been transported over such distances or greater in bedrock. The possibility of a similar condition at the greater NIKE-Site16 area should perhaps be an expectation rather than a possibility which is dismissed upfront. While it is true that a network of interconnected fractures would be necessary for transport over such distances, the discussion points out the fact that neither the Navy or the ACOE have yet done work which attempts to delineate fracture interconnections over the scale which includes the greater NIKE-Site16 area. As such, given the extreme heterogeneity inherent in fractured rock systems, statements regarding well-specific hydraulic conditions, etc. at individual wells are of somewhat limited value in the absence of knowledge of a particular well's location and degree of connection with respect to the larger fracture network. Future discussions should bear this in mind.

Page 3, last para. and page 4, 1st para.; EPA rejects the presumption that deep overburden in all cases and locations is indicative of conditions in the underlying bedrock. While this is indeed the case at

many sites and locations, the converse is also true. What is clear is that bedrock has been impacted at this site, and the only way to truly determine the spatial extent and degree of those impacts is to investigate the bedrock aquifer, even though this is more technically challenging than typical overburden investigations.

Page 4, para. 5; Clarification. EPA expects to look at all the available information, e.g., ColorTech screening data, geophysical data, etc. in determining where to install (or not to install) monitoring wells. Note that this evaluation will also assess whether the existing information is *sufficient* to make sound well location recommendations, (or whether supplemental data is recommended).

Page 4, para. 6; EPA continues to contend that geophysics, if properly applied, *may* shed considerable light onto subsurface conditions, particularly with respect to conditions in bedrock, beyond what may be learned from DPT alone.

Page 5, 4th and 5th para.; It is noted that potentiometric data and ground water chemistry data are of limited value if they do not represent the target depths, or e.g., if there is an unknown confining layer between bedrock and overburden and a hydraulic connection is assumed without substantiation. In this context, the meeting summary points out an issue which needs further clarification. How will the BCT evaluate whether the DPT borings have penetrated "close enough" to the bedrock surface? Further discussion is needed to insure consensus on how this will be evaluated and what follow-up steps will be needed in the event that the DPT's do not achieve target depths. With this in mind, EPA continues to support a role for geophysics. At a minimum, EPA expects the DPT "TDs" to achieve the top-of-rock depth within the vertical-depth error-bar associated with the reprocessed seismic data (expected to be +/- five feet, or less). Further clarification/discussion is needed.

Page 6, 2nd bullet; EPA expects that the Navy will share the results of the reprocessed geophysical data with the BCT in the context of reaching consensus on next-steps regarding the follow-up drilling program.

Enclosure 2; Comments on Hydrogeologic Information Contained in Memo From Ms. Christine Williams to Curtis Frye et. al., dated 14 February 2007, 9:21 EST.

(Paragraph 2 of EPA E-mail): This well has historically been depicted as a deep ground water elevation, similar to MW-Z4-01 by the Navy contractors as shown on the deep overburden ground water contours provided for the teleconference. If the Navy is saying that it has erred in presenting ground water contours in the past, the comment is noted. Nonetheless, the well construction details for this well should be provided to the USEPA. A review of all previous shallow ground water elevation maps prepared by the Navy for Site 16 and the USACOE shows that MW-Z4-01 has never been included as a shallow ground water elevation.

However, even if this well is shallow, it does not necessarily eliminate the inferred inflection. If vertical ground water gradients are neutral, the deep elevation would be similar to the shallow elevation. Unless the deep ground water elevation was significantly lower, the 17 foot contour drawn

by the Navy still should not extend to the position shown (i.e. near the 18 foot contour by PGU-Z3-11D). An inflection would likely still exist to the north around EA-110D.

More importantly though, this comment by the Navy reinforces the need to conduct a “comprehensive” synoptic set of ground water elevation measurements, including the PGU-series wells noted in the comments on the Stage I QAPP. In particular, if MW-Z4-01 is not a deep well, then it is even more critical that the nearby “deep” PGU-Z4-02D, which is located just to the southeast, be measured for ground water elevation. The Stage I QAPP does not include the PGU-series piezometers in the synoptic ground water elevation measurement program.

(Paragraph 3 of EPA E-mail): The Navy is now stating that numerous ground water contour elevations that it has prepared for the up gradient area in the past are incorrect due, at least in part, to incorrectly including MW-Z4-02 as a deep monitoring well. If this well is shallow, there is of course a possibility that the ground water contours in the deep overburden may be interpreted differently. However, this suggests a major data gap for this area. As noted in this Navy response, there is no ground water elevation measurement for PGU-Z4-02D either. Therefore, presentation of deep overburden ground water contours entails significant subjectivity since there is an approximately 1,000 foot by 1,500 foot zone south of Davisville Road and west of MW16-10D and MW16-54D without a deep overburden well monitoring point.

Pg. 2, Navy response to para. 4: The report of erroneous well casing elevations is troubling. The chronology of this issue needs to be detailed in the RI. When was the error identified? Is this a data transcription error? Or are the casing elevation discrepancies due to physical changes (e.g., heaving, settling)? If so when did the problem occur? When was it identified? How much information has been compromised? The issue suggests that a complete resurvey of all wells, piezometers, injection points, staff gages, etc. in the greater NIKE-site 16 area is needed given the crucial importance of accurate ground water flow determinations to all other aspects of the program. EPA would like to review the QA procedures for the resurvey.

(Paragraph 4 of EPA E-mail): It is not clear why this comment refers to RMW—02S/D. The USACOE interpretation was not based upon the elevation for RMW-02D. Inspection of Figure 3-7, “Ground-Water Contours Deep Wells July 2000,” USACE NED Characterization of CVOC Contamination Report Former PR-58 Nike Site, North Kingston, Rhode Island, is based upon RMW-01D, PGU-Z3-07D, EA-110D, MW02-11D, MW-Z4-01, MW-Z4-02, PGU-Z3-10D, PGU-Z4-03D, and other wells. Alternatively, perhaps all of this work is in error. If this is possibly so, it again reinforces the need for a comprehensive, synoptic round of ground water elevation measurements for all available ground water monitoring points, not just selected points as outlined in the Phase III QAPP.

(Paragraph 5 of EPA E-mail): It is not clear why the Navy refers to its previous response for this comment. Inspection of the Navy figures, even when excluding MW-Z4-01 shows an axis of ground water flow from the former Nike PR-58 site (and/or Site 03) into the Site 16 area between MW-Z4-01 and MW-Z4-02 to between the former Building 41 and Building 39. A complete, synoptic measurement of all ground water elevation points is needed. This has not been proposed in the Stage I Phase III QAPP.

(Paragraph 6 of EPA E-mail): Commented noted. However, it is also noted that Davol Pond and the two adjacent water bodies appear to be storm water detention features (Quonset Business Park Storm Drainage Plan, January 2007). Inspection of that plan shows that these water bodies receive runoff from an extensive area of paved as well as unpaved watershed to the north and south of Davisville Road. To that extent, they have the potential to serve as ground water recharge areas which deflect ground water flow to the east. This was a reason for using the “no flow” boundary at this location of the simplified ground water model.

Enclosure 3: Navy Response to CDW Memorandum Received 14 February 2007, Major Data Gap Exists at Western Boundary of Site 16.

1st Navy response (page 1); Even if the presumption that a release at Building 41 is responsible for ground water contamination at site 16 is a correct one, this does not preclude the possibility of additional releases in other areas. This long-standing bias should be eliminated.

The USEPA is not discouraging additional investigative work near former Building 41. This point was provided to underscore that given the resources being allocated to an already intensively studied portion of the site that has not, to date, resulted in identification of a source, at least some additional scrutiny should be given to another reasonably potential pathway for CVOC migration.

However, regardless of who has the responsibility for the Nike-PR-58 site contamination, it will not be possible to complete the remedial investigation and subsequently, the feasibility study without knowledge of at least current impacts to Site 16. This is the reason for USEPA requesting investigation of the up gradient western boundary within the Site 16 area.

2nd Navy Response (pg. 2); A fundamental aspect of any site investigation is to establish whether or not there is a pathway from upgradient of the site which may be responsible (or partially responsible for) the on-site conditions. To that extent, it is incumbent on the Navy to complete a technically defensible “upgradient” investigation. If an upgradient contribution is identified, further work would be required, which may or may not be more appropriately directed as part of the ongoing NIKE investigation.

3rd Navy Response (pg. 2); Moving forward, strong consideration should be given to installing water level recorders (transducers) in key well pairs to determine whether the “snapshot” vertical gradient data at issue, are in-fact representative of ‘typical’ conditions, or whether temporal or seasonal variability not reflected in the episodic water level measurements are underrepresented in the analysis. Further discussions are needed.

However, the interpretation that there is insignificant upward discharge of ground water from the bedrock to the deep overburden is still not concurred with. The data presented in the Phase II Supplemental Data Gap report supports the interpretation made by USEPA. It is noted that the issue is discharge from the bedrock to the deep overburden not from the shallow to the intermediate, etc. Further, discharge of ground water (and potentially contaminants) does not have to be uniform or

ubiquitous throughout the Site 16 area. Ground water flow in bedrock is generally controlled by fracture zones. There is ample data in the report to suggest that this is what is occurring.

4th Navy Response (pg. 2); Since the number of points of comparison for D/R pairs are few, the instances cited by EPA represent a significant percentage of the total. Further attention is needed to insure that representative comparison of “D” and “R” zones is achieved in the future.

Nonetheless, inspection of the data does not provide a robust case for the Navy interpretation. There appears to be no distinction that would suggest CVOC is higher in the deep overburden. As noted previously, screen interval does affect the apparent observed concentrations in the bedrock and overburden. These observances are not “minor exceptions.”

However, even if they were, they still point out the potential for CVOC to be discharging from the bedrock to the deep overburden (and then migrating away from those bedrock locations) in the deep overburden. As with the upward gradients of ground water from the bedrock to the deep overburden, the discharge of CVOC from the bedrock does not have to be uniform throughout the bedrock to deep overburden interface to “prove” that CVOC is discharging from the bedrock.

It should be reiterated that the USEPA is not trying to convince the Navy that CVOC is migrating from the bedrock into the deep overburden. However, in the absence of identification of a source in the former Building 41 area in spite of extensive investigation, and a well documented source up gradient of Site 16, it is reasonable to explore this potential pathway through application of at least some investigative effort.

5th Navy Response (pg. 3); The navy’s response underscores the need for an updated and expanded modeling effort which addressed all of the issues identified by the Navy as well as those previously highlighted by EPA. This effort should be completed following the current field effort as a means of clarifying lingering uncertainties with respect to possible connections between NIKE and site 16. It is acknowledged that the model was simplistic and does have limitations (i.e. Bullets 1 and 2). However, given the Navy statements, several comments are warranted.

Bullet 3: Davol Pond was not ignored. Because it (and the adjacent two water bodies to the east along Davisville Road) receives significant storm water runoff, they are likely ground water recharge areas that can result in elevated ground water in their vicinity and reverse or deflect the ambient ground water flow direction. Therefore, it was reasonable to assume that these features would constitute a “no flow” boundary.

Bullet 4: The USEPA has not stated that contaminant transport is restricted to the bedrock only. The potential pathways have always been suggested as deep overburden, possibly within a buried stream channel as well as fractured bedrock.

Bullet 5: The statement that the plume generated by the model does not match either plume at Site 03 or Site 16, and therefore, should be dismissed, is somewhat disingenuous. The observed CVOC distribution is an artifact of a lack of adequate monitoring south/southeast of the former Nike PR-58 site

and to the west of Site 16 and into Site 16 (hence, the USEPA request to investigate the western boundary of Site 16). As has been repeatedly stated by USEPA (including during the teleconference) there are major areas of the site between the former Nike PR-58 site, Site 03, and Site 16 that have virtually no ground water quality monitoring. This is especially true for the area south and southeast of the former Nike PR-58 site along Davisville Road. This was the reason for conducting the exploratory model (i.e. as a tool to see if it would be reasonable to expect CVOC could be present in ground water in areas where there are either no or very few ground water quality monitoring points).

It was not the intent of the model to input source releases into other locations than MW-03-14 only (also expressed during the teleconference call). USEPA has noted that other sources likely exist including the immediate vicinity of MW03-14 where there is documented extremely elevated CVOC including DNAPL. These areas include the immediate northeast around EA-104. In fact, a CVOC source was input to this area during the modeling effort with the resultant distribution of CVOC that is currently observed at the northern area of Site 03 with the limited ground water monitoring well network that is biased to that area. This additional "plume" or pathway was not presented in order to keep the focus on the southern-southwestern pathway where there are virtually no monitoring points. It is likely that there are several source areas up gradient including Site 03 that are contributing CVOC to down gradient ground water. Some of those sources may either be unknown, or have been removed with residuals continuing to migrate in ground water.

Although the Navy may not believe that there is any potential for contaminants released up gradient to have migrated to Site 16, it has not provided any investigative data to counter this interpretation. Further, review of the Phase III QAPP does not provide a high degree of certainty that the additional work will be able to settle the question of up gradient contributions. As noted in previously submitted comments on the Phase III QAPP, the Navy has not committed to performing additional seismic investigations to assess fractured bedrock zones or buried stream channels; has not committed to installation of bedrock wells (only that wells may *either* be installed in bedrock or overburden – i.e. not even specifically committing to deep overburden); and has chosen an investigative approach, i.e. direct push technology that is not likely to penetrate further than 40 to 50 feet below the ground surface for many location of the up gradient site area, which has up to 90-100 feet of overburden. Further, the limitations of the Color-Tec® screening methodology also suggest that it will be mandatory to reach the top of bedrock, not "close to" the top of bedrock in order for it to detect any contamination even several feet below. Detailed comments are provided of the Phase III QAPP.

6th Navy Response (pg. 3); Note that it is incumbent on the Navy, not EPA, to investigate conditions west (up-gradient) of site 16. These uncertainties highlight the need for additional focus/data in up-gradient areas to site 16. The three concerns listed remain. There is still an unknown relative to the west, up gradient boundary of Site 16. The Geoprobe® approach outlined by the Navy in the Phase III QAPP is not likely to resolve this issue (see comments to Phase III QAPP). The responsibility is on the Navy to show why there can be no contamination potentially migrating onto the Site 16 area from up gradient in spite of the documented source (and likely others) and the ground water flow directions. Without adequate investigation and resolution of this issue, the feasibility study (or the remedial investigation) cannot be successfully completed.

Enclosure 4: *Navy response to memorandum from W. Brandon to C. Williams, Subject: Major Data Gap Exists at the Western Boundary of Site 16; Additional Considerations and Recommendations.*

1st Navy response (pg. 1-2); While the limitations the Navy identifies with respect to the model are true of many modeling efforts, the limitations of the data set, which reflect on the model, are specific to this site. EPA maintains that there are some key limitations of the current database in terms of spatial coverage.

2nd Navy response (page 2); As previously stated, EPA did not intend for this model to be a definitive representation, but rather a tool for giving insight into what is known and what is not known about the site. The Navy's response points out a key issue, which has been unknown for many years, e.g., what is the hydraulic relationship of the ponds to ground water along the southern boundary of the site/model? In addition to updated synoptic water level data, field data should be collected which clarifies the ground water/surface water relationships at Davol pond and the associated water bodies. A revised model can be constructed with the benefit of this information.

3rd Navy Response (page 3); The additional water level and chemistry data can be used as a starting point toward determining locations for additional data points needed to constrain the position of the plume in upgradient areas.

7th Navy Response (page 4); Why weren't Z3-11D and Z4-04 included? Please include.

Enclosure 5; *Navy Response to Email Received wed. 2/14/07 at 9:13 AM from Christine Williams.*

1st Navy Response (page 1): USEPA believes that the modeling effort, while limited, was reasonable and did incorporate reasonable values, assumptions, etc. for input variables. As shown on the model output, CVOC in concentrations in the range of those currently found around the former Building 41 area were predicted and shown with higher concentrations further to the west. As for the "plumes" moving across Site 03, as noted in comments on Bullet 5 above, inputs were also run that showed a CVOC plume moving across to the east, toward the former Building 224 area and to the southeast as well as to the northeast. But, for those to be shown, the source(s) needed to be input just to the northeast of MW03-14. These source inputs were not provided with the model of input to MW03-14 in order to focus on the issue at hand, i.e. a lack of effective monitoring to the south and southeast of the Nike PR-58 site (a well documented, known high mass source).

However, this is not to say that USEPA thinks that there are no other sources and it was not stated that there was only one source that contributed CVOC contamination to Site 03 and Site 16. There are/were likely several sources, both on the former Nike PR-58 site and Site 03. There are strong indications that a source exists, or did exist, at the northwest corner of Site 03 (or just to the northeast of MW03-14). There was at least one removal action conducted in the northwest corner of Site 03, the asphalt disposal trench area (Study Area 1), which likely involved solvents in the use of cleaning operations. There were three other study areas located on Site 03. USEPA never stated that the intent of this model was to incorporate all of these potential past or current undetected sources. Nonetheless, the model was

valid for the intended assessment purpose to evaluate whether it was feasible for CVOC from a known, well-documented, high mass source to have migrated to Site 16.

2nd Navy Response (pg. 1); The model suggests that the plume centroid may be beyond the effective limits of the current monitoring well network. As such, the 'predicted plume' would not be expected to correspond to the (partial) representation of the plume afforded by the current well network. The Navy does not have to "accept" all aspects of the model. The Navy is not even being asked to accept the model as is. Nonetheless, in fact, as the Navy states, it was useful for "visualization" of what might be occurring and to express USEPA concerns. That is all that it was intended for to begin with. To that extent, it does demonstrate the possibility of CVOC migrating from the former Nike PR-58 site to the former Building 41 area. It is fine that the Navy does not believe that it is a plausible scenario; however, the Navy has not provided a cogent rebuttal based upon investigative data of the deep overburden and bedrock aquifers to the west of Site 16. This is a USEPA concern when there is a documented high mass source up gradient of the Site 16 area and no source has been found in the Site 16 area in spite of intensive investigations around the former Building 41 area.

4th Navy Response (pg. 2); The bedrock was included in this model with hydraulic conductivity values for that layer adjusted for the high degree of fracturing around the former Building 41 area. It is acknowledged that detailed modeling of the bedrock would require more bedrock wells, etc. However, even if CVOC transport is limited to the deep overburden, the model still shows the feasibility of CVOC migration to the vicinity of the former Building 41 area. The Navy is discussing this model as if it were a major ground water modeling effort. It was made clear to the Navy that simplifying assumptions were made. This is standard ground water modeling methodology, that is, start with the simplest approach and then, if needed, elaborate and flesh out the model. This first step is what was done. The purpose of the model was to evaluate the feasibility of CVOC migration from the former Nike PR-58 site only, and it clearly supports the concern that USEPA has.

The Navy is welcomed to provide information/data to refute this interpretation by evaluating the up gradient western boundary of Site 16. This is all that is being requested by the USEPA, not that the Navy is being asked to concur with all aspects of the model or agree that there is an impact to Site 16. At present, the Navy is rejecting out of hand, without data, the potential that this might be a pathway, in spite of failing to find a source for the CVOC in ground water around the former Building 41 area. This rationale by the Navy is not understood. Perhaps the source of the CVOC around the former Building 41 area is only due to isolated minor spills that may never be detected. However, given that there is a significant mass of CVOC up gradient, dismissal of that source as a potential contributor either in the deep overburden of the bedrock based only upon opinion, and without data, is not concurred with. The model demonstrates that there is more than a degree of plausibility of contribution from up gradient, and that the up gradient area must be further investigation in order complete the Site 16 remedial investigation and feasibility study.

5th Navy Response (pg. 2); The Navy has concluded that concerns about impacts from up gradient are “unfounded” without any supporting data. This rationale is not comprehended given that the Navy not provided any additional data to support its rejection of the possibility. While the model may be limited in scope, it does incorporate available data and used reasonable assumptions and does point to the need to investigate further up gradient. The Navy has based its opinion upon conjecture only.

In contrast to this approach, the USEPA has not asked anyone, the Navy or the Army to “buy” the “hypothesis.” Further, the USEPA has not rejected the possibility that there is no impact to Site 16 from up gradient as the Navy believes. All that is being stated is that there is a reasonable interpretation of a data gap to the up gradient direction of the former Building 41 area, given that extensive investigation at the former Building 41 area has not found a source for the “plume” emanating from that location.

ENCLOSURE 6 Navy Plan for Investigating Hydrogeologic Conditions upgradient (West) of Buildings 39 and 41, site 16-Former NCBC Davisville, North Kingstown, RI

Detailed comment on the actual plan outlined in the Phase III QAPP will be submitted under separate cover(s) including Stage I and Stage II, III. The information contained in those documents does not provide a reasonable degree of certainty that the stated up gradient investigation will achieve the necessary information to resolve the data gap. Summary comments are provided in the following paragraphs with specific comments to numbered items of the Enclosure 6 Plan following.

Review of the QAPP direct push technology (DPT) Standard Operating Procedures indicates that the direct push technology will not be able to be advanced beyond 15 to 40 feet below the ground surface in many, if not all locations in the up gradient area due to density of the subsurface soils. The SOP states that DPT is limited to this depth if the soils are “dense.” Dense soils are defined in another QAPP SOP as having blow counts in excess of 30 blows per foot of penetration. Review of the soil boring logs for MW16-55D and a number of soil borings around the former Building 41 indicate numerous lenses with soil densities in excess of 30 blows per foot including many layers with much higher densities.

Inspection of the log for MW16-55D/R indicates that the top of bedrock is at around 108 feet below the ground surface with a layer of several feet of either gravelly material or highly weathered rock above that. The seismic survey data for that area also show that the depth to bedrock is likely to be at least 80 to 90 feet below the ground surface to the south of MW16-55D/R and Davisville Road, the area of concern between MW-Z4-01 and MW-Z4-02. The QAPP DPT SOP also notes that even under favorable conditions, (i.e. assumed to be very soft soils with low blow counts) the maximum depth of penetration of the DPT is only 60 to 80 feet.

Review of the Color-Tec® screening methodology notes that the detection limit for total

CVOC is around 25 to 30 micro grams per liter ($\mu\text{g/L}$). It also states that at low concentrations the observed color change is very slight and requires a highly skilled operator to detect. Therefore, concentrations even somewhat higher than, 25 to 30 $\mu\text{g/L}$ may be missed. Review of the ground water quality sample data for deep overburden and intermediate wells around the former Building 41 area indicate that this should be a major concern. Concentrations of CVOC of 1,000 to 2,000 $\mu\text{g/L}$ were detected in the deep overburden at those locations, while the overlying intermediate wells had concentrations of CVOC around 10 $\mu\text{g/L}$. These wells were only 10 to 20 feet above the deep wells. Therefore, if the end of the DPT boring cannot be advanced to the bedrock, it cannot be relied upon to detect CVOC in the deeper overburden a few feet below, let alone the bedrock, even if concentrations of CVOC as high as 1,000 to 2,000 $\mu\text{g/L}$ exist there.

The Phase III QAPP does not commit to the installation of bedrock monitoring wells. While it states that three permanent wells will be installed, the QAPP text also states that a well may be installed in *either* the overburden or bedrock. Further, there is no definition of where an overburden well would be installed. The text does not commit to installation of a deep overburden monitoring well. It was the USEPA understanding that even if the DPT and Color-Tec® approach was successful, and could be advanced to the top of bedrock, and if additional geophysics were conducted, that three well *clusters* would be installed including a *bedrock, deep overburden, and intermediate overburden* well in each. This would be in lieu of five or more cluster wells that may be required to assess the up gradient area.

1. This plan does not incorporate additional geophysical survey that may be needed to supplement or substitute for the reprocessed existing seismic data. The “synoptic” ground water measurement round described is inadequate. It is not comprehensive and omits many of the existing monitoring/observation well locations. In addition, there will be no survey conducted prior to Stage III. Therefore, in addition to lack of all data points, there will be uncertainty regarding actual monitoring well elevations (i.e. the Navy comment relative to RMW-02S/D, even though that comment was irrelevant to the ground water contour inflections issue).

2. Advancing the DPT “or as far as possible” is not acceptable. The DPT approach was put forth as a viable substitute to standard soil borings that could reach bedrock. Simply getting “as far as possible” even if “close” is not satisfactory to evaluate deep ground water quality using the Color-Tec® methodology given the detection limits and requirement of highly skilled operation of the testing equipment. This plan notes three *bedrock* wells. These are not committed to in the QAPP. The QAPP clearly suggests that *either* bedrock or overburden wells will be installed.

3. Decisions regarding placement of the three bedrock wells (if the Navy intends to install them, QAPP uncertainty aside) need to be made on DPT achieving bedrock and supplemental geophysics.

4. As noted in note 2, there is no commitment in the Phase III QAPP to install bedrock wells. Further, deep overburden wells must be installed if the DPT cannot be advanced to the top of bedrock. Intermediate wells also need to be installed if the DPT cannot be advanced at least one-half way to the top of bedrock.

ENCLOSURE 7 Responses to EPA follow-up Comments on Navy Responses to EPA RISK and Forensics Related Comments originally received from EPA on September 20, 2006 (EPA Follow-up Comments received Feb 13, 2007)

EPA General Comment 9: The original comment recommended that risk to the future indoor worker and future resident include an evaluation of risk due to inhalation of VOCs that may have migrated from groundwater to indoor air. The text on Pages B-11 and B-12, Section 4.0 in the Draft Final QAPP recognize this potential pathway. The tables presenting exposure parameters and intake equations for the future industrial worker/facility personnel and future resident, however, do not include this pathway. If VOCs in groundwater exceed screening thresholds and the pathway is evaluated quantitatively, it should be noted that the method used to estimate risk has not yet been reviewed/accepted by regulators.

The comment also recommended that exposure via surface water and sediment be evaluated for residents. The response indicated that risk via this pathway would be calculated in a manner similar to that proposed for the recreational receptor, and that this would be noted in the protocol. The Draft Final QAPP does not address this pathway for future residents. Please add the surface water and sediment pathways for future residents.

Finally, the comment recommended that risk to the construction worker include incidental ingestion of groundwater. This pathway is recognized in the text on Page B-11 of the Draft Final QAPP but is not presented in the exposure tables. Please add the incidental ingestion of groundwater by the construction worker to the exposure tables so that the proposed method for calculating risk can be reviewed.

EPA General Comment 10: concur, provided that subsurface and surface soils are evaluated separately for risk. For instance, risk should not be evaluated for 0-10 ft soil if 0-2 ft soil OR 2-10 ft soil has higher concentrations than 0-10 ft soil.

EPA General Comment 11: The comment noted EPA's preference to compare calculated indoor air concentrations with use inhalation reference concentrations and inhalation unit risk values rather than comparing calculated and reference doses. The Draft Final QAPP has not incorporated this comment: Table 1-7 still indicates that the inhalation exposure will be calculated as a dose (mg/kg-d) for the construction worker and the text on Page 5.1 only refers to inhalation RfDs and CSFs. Please consider using calculated concentrations, reference concentrations, and unit risk values rather than doses.

Response to EPA Specific Comment 66: Since this comment, EPA has placed toxicity

values for iron and aluminum on the Human Health Provisional Peer Reviewed Toxicity Value database (<http://hhpprtv.ornl.gov>). EPA will email the printout of these toxicity values separately. Please include iron and aluminum in the risk assessment if the concentrations exceed human health screening levels.

Response to EPA Specific Comment 67: Since HHPRTV values for aluminum and iron have been issued, please evaluate these chemicals for risk. Since there is no value for copper, please do not evaluate risk of copper.

Response to EPA Specific Comment 79: In order to be consistent with risk assessment of sediment at Naval Air Station South Weymouth and NCBC Calf Pasture Point Site 07, please use a sediment adsorption factor of 0.2 mg/cm² for children and 0.07 mg/cm² for adults. Please use these factors for both RME and CTE.

Response to EPA Specific Comment 80: In order to be consistent with risk assessment of sediment at Naval Air Station South Weymouth and NCBC Calf Pasture Point Site 07, please use a Fraction Ingested value = 1 for sediment exposure pathways for both RME and CTE.

Response to EPA Specific Comment 84: In order to be consistent with risk assessment of sediment at Naval Air Station South Weymouth and NCBC Calf Pasture Point Site 07, please use a Fraction Ingested value = 1 for sediment exposure pathways for both RME and CTE.

EPA Specific Comment 85: In order to be consistent with risk assessment of sediment at Naval Air Station South Weymouth and NCBC Calf Pasture Point Site 07, please use a sediment adsorption factor of 0.2 mg/cm² for children and 0.07 mg/cm² for adults. Please use these factors for both RME and CTE. Please make these changes throughout the document.

EPA Specific Comment 92: The reference for the Canadian Soil Quality Guidelines lists a 1997 document. Please note that the CCME web site provides a table of updated (2006) screening benchmarks, some of which do not agree with the values presented in Table C-1. Please update Table C-1 with the 2006 values as appropriate.

EPA Specific Comment 98: The follow-up EPA comment referred to the value used for the food ingestion rate for the northern bobwhite. As noted in the comment, the Wildlife Exposure Factors Handbook (EPA 1993) indicates that the study in Koerth and Guthery (1990) presents the ingestion rate on dry weight basis. This is indeed the case. Please refer to Koerth, N. and F. Guthery. 1990. Water requirements of captive northern bobwhites under subtropical seasons. *J. Wildl. Manage.* 54(4):667-672. The study presents the ingestion rates (Table 3) as "dry matter feed intake." The values in this study have not been converted to a wet weight basis in EPA (1993). Please remove the dry weight conversion factor (0.15) for this receptor.

(Navy's paraphrase) EPA General Comment 27a: EPA believes that the PAH concentration in Allen Harbor should be more uniform if contributions from the dock pilings were the primary PAH source. (Note: Navy has paraphrased EPA's General Comment 27 (which summarized the original comment made in the Phase III QAPP Comment Letter of September 20, 2006) and has structured their responses so that they address five points of the original comment.)

Navy Response to EPA GC27a: In this response, Navy attempts to demonstrate why the PAH concentrations in Allen Harbor are consistent with sources not associated with Site 16.

EPA follow-up: In the first paragraph, Navy offers an interesting, although apparently speculative, description of sedimentation in Allen Harbor. Navy's picture of particulate deposition assumes that fines will be carried from Narragansett Bay through the narrow inlet into Allen Harbor, and these will settle out at increasing distance from the inlet, toward "...the inner reach of Allen Harbor." The Response also asserts that "...the fines contain higher proportions of PAHs than larger particles." Thus the 'preferential deposition of fines in the Inner Harbor versus the Outer Harbor' will create the overall subtle but observed PAH gradient. Navy's conceptual model is intriguing but lacks quantitative support. Has the influx of sediment, through the inlet into Allen Harbor, been measured? Is there information, e.g. from sediment traps or other data, that can be used to quantify the relative proportion of fines coming into the Harbor? What data support the statement regarding the association between higher concentrations of PAHs and fines? Has this affinity of PAHs for fine particles been quantified for Allen Harbor sediments, e.g. by PAH analysis of grain-size fractions of individual samples? If so, those data should be discussed and referenced here. How does Navy's hydrodynamic model account for the sediment flux from the perimeter of the Harbor? How are fines from this terrestrial input distinguished from fines coming through the narrow inlet to the Harbor? One could conceivably argue that fines would be deposited uniformly across the harbor through suspension and mixing in the water column. Is dredging, or any other harbor maintenance activities, an important consideration in assessing sediment distribution in the Harbor? What is known of the hydrodynamic processes in Allen Harbor? Until these questions can be answered quantitatively, this response does not adequately explain the contribution of PAHs to Allen Harbor from Narragansett Bay sediments.

The second paragraph of Navy's response suggests that the nature of creosote migration from treated wood (dock structures) is "...complex and variable..." and the compositions of the pilings may be variable. From this, it is concluded that areas of elevated PAHs associated with the pilings are expected to be "...heterogeneous in concentration and composition." In the presentation of the PAH Forensic Investigation at the meeting on 12/8, Navy showed two examples of concentration gradients that were consistent with marina pilings as the source. These gradients were constructed using data from AH35, Core 1, and AH40 (Slide 25 of 51, in the Forensic presentation) and AH29, AH32/AH33, and AH45/AH47 (Slide 28 of 51), respectively. Please reconcile this Response, which indicates that heterogeneity in PAH concentration and composition in the vicinity of pilings is to be expected, with the

concentration gradients (shown in the forensic presentation) as a demonstration of the pilings as the PAH source. (Please note, also, that EPA has commented previously that three data points, of varying co-linearity, are not particularly persuasive evidence of a concentration gradient.)

(Navy's paraphrase) EPA General Comment 27c: EPA believes that the PAH gradients demonstrated in the SLERA report are too sparse to develop a persuasive picture of the gradient near the southern dock.

Navy's Response to EPA GC27c: Navy has taken exception to what it perceives as the 'significant incongruity' between EPA's comment (as paraphrased above) and a previous EPA comment that indicated "...generally good coverage of the three sections in the harbor" (Navy 2003, RTC-EPA Comment 11).

EPA follow-up: EPA sees no incongruity between these two comments. The perceived incongruity may arise from an inference of 'generally good coverage' for overall characterization of PAH distribution in the harbor, and the use of a few discrete points to develop concentration gradients. Please see the related discussion under Navy's Response to EPA's GC27a, above. Three data points, each separated from the other by tens of feet, in an environment where PAH migration mechanisms are expected, by Navy's own admission, to be "...complex and variable" do not present a compelling argument that a particular piling (e.g., AH29) is a source, especially in the absence of data from that piling linking it to the 'downgradient' samples. EPA endorses Navy's plan to collect a limited number of additional sediment samples between the Site 16 shoreline and the southern dock. It is also hoped that this sampling effort will also include the collection of creosote samples directly from marine pilings, in addition to samples of harbor sediments, in order to demonstrate concentration gradients convincingly.

(Navy's paraphrase) EPA General Comment 27d: EPA is troubled by the inconsistency of elevated PAHs next to selected dock structures. It questions why some samples collected near marina structures would have elevated PAHs (AH-29 EPAPAH = 24 mg/kg and AH-35 EPAPAH = 22 mg/kg) while others are not particularly elevated (AH-17 EPAPAH = 6.88 mg/kg and AH-23 EPAPAH = 11.9 mg/kg).

Navy's Response to EPA GC27d: EPA appreciates Navy's clarification of the reasons for varying concentrations in sediments immediately adjacent to marina structures. It is understood that a number of factors, including variable dilution rates, differences in wood type and preservative formulation, and age, will result in differences in PAH concentrations near pilings.

EPA follow-up: Given these factors, it is not clear how much confidence can be attached to the examples of concentration gradients, shown in the Forensic presentation and discussed in RTC 27a (above). If, as Navy concludes in the fourth paragraph of the response to EPA GC27d, the release of PAHs from marina structures into proximal sediments is variable, then please explain how the factors

causing this variability are expected to affect the concentrations used to define the gradients in the examples given in the Forensic presentation (please see RTC GC27a, above).

(Navy's paraphrase) EPA General Comment 27e: EPA observed that a strong correlation exists between one groundwater sample collected from a temporary monitoring well (03 28-GW-07S) in 1998 and sediment from Seep 16-01. It contends that this compositional similarity is inconsistent with forensic evidence that demonstrates an incomplete pathway between the Source Areas, Seep 16-01, and Allen Harbor sediments.

Navy's Response to EPA GC27e: Navy believes that the observed correlation is "an anomaly" because a) the PAHs in this groundwater sample are below screening levels and not hazardous, b) other groundwater results yielded non-detects, c) Navy believes that low levels of fuel from Building E107 and/or an underground storage tank "...may have caused the anomalous PAH measurements," and d) the groundwater results from 03 28-GW-07S were affected by turbidity (suspended particulates).

EPA follow-up: None of these reasons negate or explain the strong correlation that was observed between the groundwater and seep samples (please note that the seep sample was an aqueous sample, not sediment as stated in Navy's paraphrase of EPA's comment). The effect of fuels from Building E107 or the UST on the PAH correlation is not clear, nor is it clear from this Response how the presence of suspended particulates would nevertheless yield such a strong correlation with the seep sample. Similarly, the rationale for Navy's demonstration of a lack of correlation between the groundwater sample and Site 16 soils, Reference Area sediments, and Allen Harbor sediments is not clear. Different PAHs have different solubilities; the more soluble PAHs would partition from the solid phase into solution at higher concentrations than less-soluble PAHs, thus one would not expect to find a strong correlation between concentrations of individual PAH constituents in solution and concentrations in soils or sediment.

In summary, Navy's assertion that "...[T]he notion that sample 03 28-GW-07S demonstrates a potential pathway from the Site 16 Source Areas to Allen Harbor is erroneous" is inconsistent with the reasons given in the Response to EPA GC27e. EPA endorses Navy's stated intent to collect additional soil and groundwater samples in the vicinity of 03 28-GW-07S and the UST (details to be provided in a forthcoming work plan under separate cover).

(Navy's paraphrase) EPA EFT Comment 1a: EPA is concerned that environmental weathering could alter PAH composition of hydrocarbon migrating from Site 16 to Allen Harbor, especially with respect to ratios used in the forensic investigation to identify refined tar products (i.e., the ratio of anthracene to phenanthrene – A0/P0). EPA emphasized that the conditions under which environmental weathering occurs is different on land than in sediment.

Navy's Response to EFI Comment 1a: Navy's Response contains a reasonably thorough discussion of

generic abiotic and biochemical mechanisms of PAH degradation, concluding that A0 and P0 are "...expected to reduce both compounds at approximately equal rates..."

EPA follow-up: The intent of EPA's original comment was to ask about effects of environmental weathering at Site 16 and, specifically, how weathering of source-area soils by relatively low-pH meteoric infiltration, under aerobic conditions, and with a terrestrial microbial population, might result in an A0/P0 ratio in the harbor sediments (a saline and suboxic to anoxic environment, with different microbiota) different from the ratio observed at the source area. The Response indicates that the ratio will not change "...significantly..." because biotic and abiotic processes reduce both A0 and P0 at "...approximately equal rates." The magnitude of the uncertainty to which Navy's Response alludes requires further discussion and quantification. Please add to this section an explanation of the uncertainty that should be attached to these ratios, with appropriate references.

(Navy's paraphrase) EPA EFT Comment 1b: EPA requests a more extensive discussion about the variability in the A0/P0 ratio among Source Area samples.

Navy's Response to EFI Comment 1b: Navy acknowledges the variation in A0/P0 ratios from source-area samples (from approximately 2 in the sample from Source 1-2 to 0.14 in soil from Source 2-1) and summarizes the multiple lines of evidence that establish that the Harbor sediments are not impacted by Site 16 source areas.

EPA follow-up: The summary of the multiple lines of evidence is very helpful in understanding how Navy has arrived at its conclusions regarding the incomplete pathway from Site 16 to Allen Harbor. EPA's original EFI Comment 1 requested an explanation of the general gradient in A0/P0 ratios across the harbor, with the lowest values consistently along the southern shoreline and higher values toward the north. Please discuss this distribution in light of uncertainties associated with A0/P0 ratios due to alteration by environmental processes (abiotic and microbial degradation, etc.; please see preceding Comment 1a). Please include in this discussion how the observed gradient in the A0/P0 ratio is reconciled with Navy's conceptual site model and the purported PAH sources to harbor sediments (e.g., marina structures, stormwater input, contributions from Narragansett Bay, etc.).

(Navy's paraphrase) EPA EFT Comment 1c: EPA requests a more extensive discussion about the analytical uncertainty of diagnostic PAH compounds. EPA is concerned because the concentrations of PAH in some of the duplicates vary by a factor of 2.

Navy's Response to EFI Comment 1c: Navy summarizes the laboratory procedures used to assess variability of the A0/P0 ratio.

EPA follow-up: EPA appreciates the clarification. However, EPA's original EFI Comment 1 requested that Navy address uncertainties associated with ratios of other diagnostic PAHs, in addition to A0 and P0.

(storm drain outfall) and AH-28 (southeastern shoreline), no correlation of PAHs with Pb is apparent.

As was discussed in the meeting additional source area forensic studies should be performed on the “new pavement” and “old pavement” to conclusively tie the pavement at the former NCBC site to the sediment in Allen Harbor.

(Navy’s paraphrase) EPA EFI Comment 2b: EPA stated that the number and distribution of forensic samples is not sufficient to demonstrate unequivocally that the docks are the source of PAHs in Harbor sediments.

Navy’s Response to EFI Comment 2b: Navy’s Response states clearly that it was the objective of this work to determine Site 16 contributions to Allen Harbor, not “...to reconcile the full magnitude of non-Site 16 sources of PAHs..”

EPA follow-up: It is not clear that EPA has expressed interest in ‘an unequivocal source apportionment for non-Site 16 sources,’ as Navy has implied. Rather, EPA has found Navy’s results to be inconclusive with respect to non-Site 16 sources (docks and storm-water runoff). EPA concurs with the plan to collect samples of new and old paving materials, as discussed at the meeting on 12/8 (details to be included in a forthcoming work plan).

(Navy’s paraphrase) EPA EFI Comment 3: EPA expressed an interest in incorporating examples of weathered creosotes with different formulations into the report.

Navy’s Response to EFI Comment 3: Navy has agreed to collect additional samples from the creosote treating area on Site 16, as well as samples from the marina pilings and sediments near the pilings sampled previously.

EPA follow-up: These data will go a long way toward developing a more persuasive argument that the marina structures are a primary source of the PAHs in harbor sediments. Please consider, when developing the sampling scheme, previous comments about number and location of samples used to establish concentration gradients in the vicinity of the pilings.

No further response is necessary.

(Navy’s paraphrase) EPA EFI Comment 4b: EPA noted a high correlation between the groundwater sample 03 28-GW-07S and Seep 16-01. It expressed a need to further investigate the source of SEEP 16-01.

Navy’s Response to EFI Comment 4b: Navy’s Response reiterates its contention that the PAHs observed in Seep 16-01 are not related to PAHs in the source areas or in harbor sediments (please see

EPA GC27e discussion, above).

EPA follow-up: While EPA still finds Navy's explanation inconclusive, EPA concurs with the decision to collect additional soil and groundwater samples to address this issue.

No further response is necessary.

(Navy's paraphrase) EPA EFI Comment 5a: EPA believes the data are inconclusive with respect to Navy's assertion that the PAH concentrations in Allen Harbor are homogeneous. EPA is also not convinced that the dock piling and storm sewers are the "most likely" sources of PAHs in Allen Harbor.

Navy's Response to EFI Comment 5a: Navy's Response reiterates its belief that Allen Harbor sediments are 'relatively homogeneous.' Navy also emphasizes that the "...most significant source of PAHs in Allen Harbor is most likely the marina pilings and storm sewer effluent."

EPA follow-up: The intent of EPA's original comment was to point out that PAH concentrations in the Outer Harbor are generally low, while concentrations in the Middle and Inner Harbor areas are generally higher. It is recognized that sampling density increases with increasing proximity to the southern shoreline, and that concentrations are elevated near marina structures and stormwater outfalls. It is apparent that the intent of Navy's Response was to describe PAH composition in Allen Harbor sediments as homogeneous. EPA will look forward to seeing the results of the planned sampling of new and aged pavement, marina pilings, and the stormwater effluent. It is anticipated that those results will add weight to the argument that the pilings and the stormwater outfall are the primary sources of PAHs in Allen Harbor sediments.

No further response is necessary.

(Navy's paraphrase) EPA EFI Comment 7: EPA questions the use of A0/P0 to identify PAH impacts from Site 16 to Allen Harbor.

Navy's Response to EFI Comment 7: Navy's Response states that the A0/P0 ratio was used appropriately to help establish that Site 16 creosote did not impact harbor sediments and refers to the Navy Response to EPA EFI Comment 1b regarding multiple lines of evidence.

EPA follow-up: As stated above, EPA appreciates the clarification provided by the summary of the 'multiple lines of evidence.' However, it is still not clear how the observed A0/P0 ratios, with their associated uncertainties and with the observed gradient across the harbor, support the non-Site 16 PAH sources that Navy has identified. Please see the follow-up to EFI Comment 1b, above. In addition, EPA believes it is a bit preliminary at this time for Navy to state that "[I]f these data support the conceptual site

model proposed in the SLERA report, regulatory concurrence with the results is anticipated". Please change to some language such as "Following this additional work, Navy will demonstrate how the new data support the conceptual site model. If the group agrees with Navy's results and conclusions, regulatory concurrence may be anticipated."

Enclosure 8; *Responses to EPA Follow-up comments on Navy Response to EPA Hydrogeological comments originally received in correspondence dated February 20, 2007.*

Response to para. 4; We agree that BCT should work towards consensus, and that such consensus should be based on scientifically defensible interpretations. This premise implies that all parties are open to alternative explanations for the same data sets, and that key data gaps and areas of uncertainty are identified in that manner (i.e., through technical discussions/consensus building). Reliable upgradient information is an essential, non-negotiable element to any technically defensible site investigation, particularly when credible upgradient sources are known to exist. For this reason, EPA has advocated a need for additional upgradient data for some time now. We look forward to an objective open-minded discussion of the results of the Navy's proposed upgradient activities.

Response to EPA follow-up Comment no. 19: The response is accepted, but it is noted that the response ignores numerous specific and substantive issues listed in the original comment.

Response to EPA follow-up Comment no. 20: The response is accepted, but it is also noted that the response does not address a myriad of specific and technical issues listed in the original comment.

Response to EPA follow-up Comment no. 21: As above.

Response to EPA follow-up Comment no. 22: As above.

Response to EPA follow-up Comment no. 26: A more detailed investigation plan for the stormwater system should be forwarded for BCT review once it is developed.

Response to EPA follow-up Comment no. 43: Please forward the list of wells slated for slug/packer testing for BCT review.

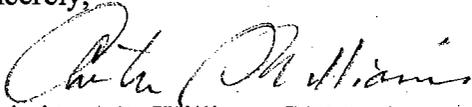
Response to EPA follow-up Comment no. 57: Could road salt application and/or breakdown products from chlorinated solvent biodegradation be expected to contribute chloride ions to the environment. Please clarify. What steps will be taken to insure that interferences from such sources are not a problem? However, depending upon the quantities of chlorinated water released, it cannot be concluded that chlorinated water residual would be negligible. In part, this is due to the transport time of ground water, i.e. discharge of water from the up gradient underground reservoir or the water tower a "few years" ago would not necessarily be dissipated. Volumes released are also unknown. It is also not clear from the

Color-Tec® information what concentration or level of chlorine would pose interference to the sample results.

Additional EPA Follow-up Comments after Conference Call: See above comments on Enclosure 6. The proposed work plan and the actual submitted QAPP are not likely to ensure adequate characterization of the up gradient ground water migrating onto the Site 16 property.

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

cc:

Brian Baluconis, RIDEM
Johnathan Reiner , ToNK
Steven King, RIEDC
Bill Brandon, EPA (via e-mail only)
Steve DiMattei, EPA (via e-mail only)
Rick Suggat, EPA (via e-mail only)
Kathleen Campbell, CDW (via e-mail only)
Conrad Leszkiewicz, CDW (via e-mail only)
Peter Golonka, Gannett Fleming (via e-mail only)
Carol Stein, Gannett Fleming (via e-mail only)
R.Todd Finlayson, Gannett Fleming (via e-mail only)
Lee Ann Sinagoga, Tetra Tech NUS, Inc (via e-mail only)