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NSY PORTSMOUTH
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DEPARTMENT OF THE NAVY

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

5090
Code 1823/JMC

JUL 03 1996

Ms. Meghan Cassidy
U.S. Environmental Protection Agency New England Region
JFK Federal Building, HAN-CAN 1
Boston, MA 02203-2211

Ms. Nancy Beardsley
Maine Department of Environmental Protection
State House Station 17
Augusta, ME 04333-0017

Subj: GROUNDWATER INVESTIGATION AND MONITORING PLAN,
PORTSMOUTH NAVAL SHIPYARD, KITTERY, ME

Dear Ms. Cassidy and Ms. Beardsley:

Enclosed are the responses to your comments on the Draft Groundwater Investigation and Monitoring Plan for Portsmouth Naval Shipyard. Please provide your comments within 30 days of receipt so they we can incorporate them into the final.

These responses have also been sent to the members of the Restoration Advisory Board. If you have any questions on this matter please call me at (610) 595-0567 extension 117.

Sincerely,

JAMES M. CONROY, PE
LT, CEC, USN
Remedial Project Manager
By direction of the
Commanding Officer

Encl: Response to Comments

Distribution:

NOAA (K. Finkelstein)
US Fish & Wildlife Service (K. Munney)
ME Dept. of Marine Resources (D. Card)
NH Fish & Game (J. Nelson)
PNS (Code 121.10, F. Endyke)
COMSUBGRU TWO (R. Jones)



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MEMORANDUM

FOR THE MEMBERS OF THE RESTORATION ADVISORY BOARD (RAB),
INSTALLATION RESTORATION PROGRAM, PORTSMOUTH NAVAL SHIPYARD,
KITTERY, MAINE

Enclosed are the responses to regulatory comments on the Draft Groundwater Investigation and Monitoring Plan for Portsmouth Naval Shipyard. If you have any comments or questions on this document, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs Office at (207) 438-1140 or by writing to:

Portsmouth Naval Shipyard
Code 121.10 Bldg 44
Attn Fran Endyke
Portsmouth, NH 03804-5000

As always, we appreciate your time and efforts spent in support of the Portsmouth Naval Shipyard Installation Restoration Program.

Sincerely,

Jim Conroy

JAMES M. CONROY, PE
LT, CEC, USN
Remedial Project Manager
By direction of the
Commanding Officer

Encl: Response to Comments

Distribution w/encl:

Ms. Juanita Bell

Mr. Doug Bogen

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Mr. Onil Roy

Ms. Cathy Wolff

USEPA (M. Cassidy) w/o encl

MEDEP (N. Beardsley) w/o encl

Shipyard (Code 121, 121.10, 100PAO) w/o encl

Brown and Root Environmental (L. Klink) w/o encl

Brown and Root Environmental (B. Horne) w/o encl

**RESPONSE TO EPA COMMENTS DATED JUNE 5, 1996
DRAFT GROUNDWATER INVESTIGATION AND MONITORING PLAN
PNS, KITTERY, MAINE**

GENERAL COMMENTS

1. **Comment:** It is recommended that a detailed review of data coverage be performed after the first round of sampling and analysis is completed. At this time, we must make the assumption that the set of wells selected for the first round of sampling is adequate for meeting the objectives of the program. However, all parties should acknowledge that additional locations for sampling may need to be defined, based on analysis of the data collected and on the analysis and modeling that will be performed using the data. This aspect of the Monitoring Plan is highly important, because the overall approach should be to collect some data, improve and update the conceptual model(s) of the site, identify significant data gaps, fill them, and then collect more data – in a more focused way. This focus can only be gained by analyzing the data. Such modifications will include deletions, additions, and changes in which wells are sampled and what analytical testing is done.

Response: Agree.

SPECIFIC COMMENTS

1. **Comment:** Page 1-1, Section 1.2, 1st paragraph

The St. sentence says the objective of the Plan is to "provide information [on low-flow sampling]" and to "facilitate implementation ... of the long-term groundwater monitoring plan." However, the second sentence says that the data collected will be used to determine impacts. The overall objectives should be clarified. The second sentence should tell how the data will be used to determine impacts.

Response: The second sentence will be revised to read: "The data will be used as *input concentrations for the offshore migration modeling effort* to determine the sites impact on the quality of groundwater in the aquifer and impact on State waters.

2. **Comment:** page 1-2, Section 1.3, part (1)

It is good to see the use of "indicator" parameters that are not part of the TCL/TAL list. However, the specific parameters should be listed in the Plan, if possible, and the text should not say "may be tested" if specific parameters can be identified now. If it is not possible to list specific parameters now, then a list of candidate parameters should be presented, and guidance and/or criteria given that will be used for deciding whether or not to include them in the Plan.

Response: In response to MEDEP comments, indicator parameters (TOC, TOX, pH, nitrate, bromide, chloride, sulfate, and alkalinity) will now be analyzed throughout for each of the monitoring wells sampled during the first and second event sampling at PNS. In addition, pH and specific conductivity will be measured both in the field and in the laboratory and specific conductivity will be measured in the field. The text will be modified accordingly.

3. **Comment:** Page 1-3, Section 1.3, part (2)

The use of "tailored" analytes, and of lower-cost but adequate analytic procedures in concept is acceptable. However, these analyte series and testing methods must still meet the requirements for demonstrating potential impacts, and as stated in the text they must be approved by the agencies prior to implementation. In addition, the Navy must ensure comparability of data from round to round, especially as applies to the statistical analysis of trends and significance.

Response: Agreed. As already stated in the plan, future modifications to the Groundwater Investigation and Monitoring Plan regarding the addition or deletion of analytical parameters will be made with concurrence from the EPA and MEDEP.

4. **Comment:** Page 1-4, Section 1.3, part (4)

Two rounds of water levels annually may not be sufficient for characterizing groundwater flow patterns and dynamics. Additional rounds may be useful at selected wells. Such a determination can be made without delaying approval of the Plan. However, the Plan should acknowledge that water level data collection is driven not only by contaminant impact identification, but more so by the requirements of groundwater flow pattern analyses, including modeling.

Response: At the current time, it is not anticipated that additional rounds of water-levels will be collected other than those identified in the Groundwater Investigation and Monitoring Plan.

5. **Comment:** Page 1-4, Section 1.3, part (4)

The Plan should acknowledge that there may be locations (wells) where additional sample collection may be warranted, based on the results of the first round(s). For example, if LNAPL is still found in one or more of the FW series wells, it may be worthwhile tracking the LNAPL thickness more frequently than twice annually. The Plan should therefore acknowledge that the first round may identify "hot spot" or other "interest" zones where more frequent monitoring is warranted.

Response: It is not the intent of the Groundwater Investigation and Monitoring Plan to evaluate whether additional groundwater sampling is merited between the first and second event sampling rounds. Additional sampling will be recommended, if necessary, in the Groundwater Investigation and Monitoring Report following the second sampling event. For the given example, if free phase product is encountered it will be removed rather than monitored.

6. **Comment:** Page 3-1, Section 3.1

The mapping of wells (Map A) shows a lack of monitoring points in the interior section of the islands. From the perspective of groundwater flow analysis and modeling, this may prove to be a serious shortcoming for model development and calibration efforts. Similar to another comment above, this should not be a reason to delay the Plan's implementation. The Plan's emphasis is properly on the collection of contamination data along the perimeter of the islands, as the highest priority, and in the source areas as well. For the water level collection efforts, it may be more appropriate for the Navy to develop an addendum to the Plan, or a separate plan, specifically for the collection of water level data. This would offer the opportunity for the Navy's consultants to tailor the water level sampling to the needs of groundwater flow analysis and modeling, which are in some ways significantly different from the needs of perimeter and source area monitoring.

Response: As indicated previously, additional sampling may be recommended at the completion of the second sampling event. In response to the development of an addendum to the Groundwater Investigation and Monitoring Plan which addresses water level collection; there are currently no plans to undertake this activity, however during future field work, piezometers could be installed to provide additional groundwater level information.

7. **Comment:** Page 3-7, Section 3.4.1

This section contains the specification of how MPSs will be used to help select analytes. This section only acknowledges MPSs without mentioning the use of "indicator" or "tracer" parameters. This section should acknowledge other criteria that may be used for selection of parameters, not just the MPS-related ones.

In addition, it should be noted that groundwater data that is lower than the on-shore MPS will not be valid justification for omitting wells/parameters from the sampling program, since the on-shore MPS are reflective of protection of human health only do not take potential impacts to the off-shore environment into account.

Response: Agreed. The text will be modified accordingly.

8. **Comment: Page 3-11. Fuel Storage Area**

EPA notes that this "site" must be redefined by the parties. As such, determining the appropriate sampling program for the area cannot be done. Specifically, identifying "cross-gradient" wells is difficult until the site is fully defined.

Response: Agree. Currently all of the existing RFI and RFI Data Gap wells are being sampled. If new wells are installed in the future, they will be included in the groundwater monitoring plan.

9. **Comment: Page 3-11. Section 3.4.3**

This section does not appear complete or pertinent.

Response: Section 3-11 will be deleted from the text.

10. **Comment: Page 4-1. Sampling and Analysis**

In general, the Plan should include analysis-testing for parameters that are needed for design of remediation systems. For example, if groundwater pumping and treatment may be used, even in limited zones, then parameters affecting treatment system performance should be analyzed for, if possible.

Response: At the current time, additional parameters are not being considered for analysis. Alkalinity and TOC are two key parameters already included in the sampling program that were not part of the RFI. Additional parameters may be recommended, if necessary, after the first and second event sampling rounds and as the need becomes apparent (as a site approaches the design phase). For feasibility study purposes, existing data is adequate.

11. **Comment: Section 4 Tables**

Those tables listing analytes should include any field parameters that are to be tested for, and any "conventionals" to be tested in the lab. Such parameters include but are not limited to: pH, eH, DO, turbidity, specific conductivity, and temperature. Some of these parameters may be very useful in evaluating and identifying impacted groundwater. Others, like temperature, are needed so that empirical equations for determining hydraulic conductivity are properly corrected for ambient conditions.

Response: These tables present parameters to be analyzed by a fixed-base laboratory. Field parameters are identified in the footnotes at the bottom of Table 4-8. Any modifications occurring during the review process will be noted.

12. **Comment: Page 4-22, Section 4.3**

The standard operating procedures should ensure that the water level readings to be conducted on or near the same dates as the water quality sampling, are not disturbed by the sampling. Water levels should be collected in advance of the sampling. This is especially important in any low-yield wells.

Response: Agree. This is standard Brown & Root Environmental practice. A sentence will be added to the text to read "water level measurements will be obtained before purging and sampling activities are conducted."

13. **Comment: Page 4-32**

It must be noted in the Plan that EPA and DEP should be consulted prior to implementing any deviations to an approved work plan.

Response: The following sentence will be added at the end of Paragraph 5: The EPA and MEDEP will be consulted of any scope changes that may occur while fieldwork is ongoing.

14. **Comment: Page 5-1, Section 5.1**

Similar to EPA's previous comment on the 1995 Plan, data validation using current Region I guidelines is strongly recommended for the planned re-sampling events. If data collected during the re-sampling events are not validated, potential data problems could be missed; the consequences of addressing such problems at a later date could result in significant expense and schedule delays.

Response: The Navy has decided to change the data validation scope provide complete data validation of 10% of the data. The plan to perform limited data validation separately from what the analytical lab conducts will be dropped from the workplan. Depending on the findings from validating 10% of the samples, further validation can be conducted if warranted. The plan will be revised accordingly.

15. **Comment:** Page 5-2, 4th paragraph, 2nd sentence

The three reasons for concluding that "statistics (sic) are not expected to be utilized in determining variance" are not valid. (1) Statistical techniques may be used to evaluate situations where contaminant migration has occurred. These techniques are detailed under corrective action monitoring in RCRA guidance referenced later in this section of the Navy's report. (2) **Multivariate statistical techniques** can often help discern contaminant behavior in complex geologic settings. (3) The distribution of contaminants in impacted groundwater would not be expected to follow a normal distribution but transformations that would allow for parametric statistics to be applied should be considered. Even if transformations are not successful the use of distribution free statistical techniques should not be dismissed outright.

Response: Agreed. Statistical assessments were not dismissed outright. However, the Navy believes statistics will only have limited use based on site conditions (tidal influences, non-homogeneous fill, difficulty in establishing upgradient and downgradient monitoring locations).

16. **Comment:** Page 5-2, 4th paragraph, 3rd sentence

Data that follows a log normal distribution is skewed to the left or towards the detection limit.

Response: The sentence will be changed to read "to the right".

17. **Comment:** Page 5-3, 4th paragraph, last sentence

Statistical methods are only useful if properly applied and interpreted. How will the navy determine if a statistical analyses is useful?

Response: Joint efforts between the Navy, EPA and MEDEP will determine the usefulness of statistical analyses.

18. **Comment:** Page 5-3, St. paragraph

The tolerance interval approach for comparison of downgradient data for each constituent to the background data is inappropriate. The USEPA's Addendum to the Statistical Guidance Document for Groundwater Monitoring (1992) indicates that the tolerance interval approach should be used when downgradient data is being compared to an established ACL or MCL for those cases where a release has been determined (even in these cases use of tolerance intervals has been shown to result in unacceptably high false positive rates). comparison of downgradient data to upgradient data should be performed using confidence intervals. If contamination has not been established prediction intervals or control chart procedures should be used.

Response: Agreed. The text will be modified accordingly. However, most sites are adjacent to the river and there is no downgradient.

19. **Comment:** Page 5-3, 3rd paragraph

EPA does not believe that the proposed approach is a valid statistical procedure. Corrective action monitoring procedures employing confidence intervals should be used.

Response: Agreed. The text will be modified accordingly.

21. **Comment:** Page 7-1, Section 7.0

The second to last sentence in this section should be rewritten as follows: "Frequency of monitoring will be determined based on consultation...; it is expected that monitoring will occur semi-annually until such time that remedial decisions are made pursuant to CERCLA."

Response: The frequency of future sampling events beyond the initial first and second events cannot be committed to at the current time by the Navy. Decisions regarding future monitoring will be made in consultation with the EPA and MEDEP. The sentence will be modified as suggested except "may occur" will be used rather than "will occur".

**RESPONSE TO MEDEP COMMENTS DATED MAY 15, 1996
DRAFT GROUNDWATER INVESTIGATION AND MONITORING PLAN
PNS, KITTERY, MAINE**

MEDEP GENERAL COMMENTS

- **Comment:** Low-flow sampling protocols at PNSY should be modified to meet the requirements of EPA final low-flow sampling guidance once it is available in the next several months. (See Comment No. 16.)

Response: The Region I EPA final low-flow sampling procedures will be incorporated into the future Groundwater Monitoring Plans' purging and sampling requirements being used at PNS when they become final and as appropriate given specific site conditions. The interim low flow sampling procedures appended in the Groundwater Monitoring Plan will be used until the final guidance document is approved.

- **Comment:** The MEDEP strongly recommends the groundwater monitoring pilot study assess the use of peristaltic pumps as well as the proposed bladder pumps, particularly on monitoring wells with low hydraulic conductivity. The MEDEP has found that for certain low hydraulic conductivity wells, use of a peristaltic pump is the only effective means of meeting low-flow sampling drawdown and turbidity requirements. (See Comment No. 13.)

Response: The MEDEP makes a good point with the recommendation of using peristaltic pumps at certain locations. It was the intent of the Navy to use both submersible bladder pumps (deeper high yield monitoring wells) and peristaltic pumps (shallow low yield water table wells) initially; however, in the last version of the plan the MEDEP made exception, citing the need for consistency and specifying the use of like pumps for all wells. In addition, the EPA Region I Low-Flow Guidance Document does not recommend the use of peristaltic pumps during groundwater sampling for VOCs. The pilot study will include a low yield well. A peristaltic pump will be made available during the pilot study in case the bladder pump cannot maintain a low enough flow rate.

- **Comment:** The MEDEP proposes that, in addition to the proposed TAL inorganic analyses, the major anions (Cl⁻, SO₄²⁻, NO₃⁻, Br⁻, and alkalinity) be analyzed for each water sample collected for the initial two sampling rounds. (See Comment No. 15.)

Response: Chloride and sulfate were already included throughout as part of the initial analytical suite as was alkalinity for approximately 80 percent of the monitoring wells. Alkalinity will be added to the remaining 20 percent of the monitoring wells and the additional requested anions (nitrate and bromide) will be added to the analytical suite.

- **Comment:** The Final Report must be stamped and signed by a Maine Certified Geologist.

Response: The standard practice for PNS reports and work plans has been to have the final version reviewed and signed by a Maine Certified Geologist. The final report will be signed by a Maine Certified Geologist.

MEDEP SPECIFIC COMMENTS

1. **Comment:** 1.3 Approach, Page 1-2, Paragraph 2

"Monitoring wells previously installed throughout PNS (to evaluate groundwater parameters and geology) will be re-sampled. This sampling effort will be conducted to determine if the spatial distribution of chemicals in groundwater have changed over the last several years."

The low-flow sampling methods proposed for the current sampling effort are significantly different from sampling techniques associated with previous water quality data. Sample collection methods should be considered when comparing historical water quality results with data generated from the current investigation.

Response: The sentence will be revised to read: "This sampling effort will be conducted *and a qualitative assessment will be performed* to determine if the spatial distribution of chemicals in groundwater have changed over the last several years. *A quantitative comparison may not be possible when comparing historical water quality results with data generated from the current investigation due to differences in sampling techniques.*"

2. **Comment:** 1.3 Approach, Page 1-2, Paragraph 3

"Also, indicator parameters may include pH, specific conductance, total organic carbon (TOC), total organic halogen (TOX), chloride, and sulfate."

The parameters pH and specific conductance are routinely monitored and recorded as part of the low-flow sampling methodology. does the above statement imply laboratory pH and specific conductance will also be performed?

Response: pH and specific conductivity will be measured and recorded in the field as part of the low-flow sampling. Additionally, pH will be analyzed in the laboratory.

3. **Comment:** 1.3 Approach, Page 1-3, Paragraph 1

"It is anticipated that those wells installed solely to investigate site hydrogeology and those wells in excess of that required for adequate upgradient and down gradient monitoring of a site will be excluded for subsequent long-term monitoring rounds."

The Navy, MEDEP, EPA, and the RAB must reach a consensus regarding future monitoring locations and sampling frequency based on a careful review of the initial two rounds of monitoring and all other pertinent information.

Response: We agree that it is best to have all parties concurrence on all aspects of the IR Program. We agree that the Navy, EPA and MEDEP should hopefully agree on future efforts, however the RAB is not a consensus body. We do take seriously the concerns of the RAB members and will address them to the extent practical. No changes to the text are necessary.

4. **Comment:** 3.1 Monitoring Well Locations. Page 3-1. Paragraph 1

"The location of all existing wells proposed for monitoring can be found on the enclosed Map A."

In addition to wells proposed for monitoring, Map A should identify all the islands by name.

Response: Map A will be revised to include the location of Pumpkin Island and Fernald Island.

5. **Comment:** 3.1 Monitoring Well Locations. Page 3-1. Paragraph 2

"To elaborate, two of the existing former waste oil site monitoring wells (installed during Phase VI) will be replaced. New monitoring well HW-2 will replace damaged monitoring well WOT-6. New monitoring well HW-3 replaces monitoring well WOT-1; the screened interval of the new well extends into shallow bedrock. These new monitoring wells will be located during implementation of the Groundwater Investigation and Monitoring Plan."

Remove "To elaborate", clarify by spelling out which "new well extends into shallow bedrock", and change "wells will be located..." to "have been installed...".

Response: The 2nd paragraph will be revised to read: "Two existing monitoring wells at the former waste oil site have been damaged and are being replaced with overburden monitoring well HW-2 (replacement for WOT-6) and shallow bedrock monitoring well HW-3 (replacement for WOT-1), respectively. These two additional monitoring wells will be identified and located during the implementation of the Groundwater Investigation and Monitoring Plan."

6. **Comment:** 3.2.1 RFI Data Gap Monitoring Wells. Page 3-1. Paragraph 2

HW-2 and HW-3 were both drilled to a depth of 12 feet. HW-2..."

Consolidate information by either moving this paragraph up to 3.1, para 2, or moving 3.1, para 2, down to this section.

Response: Agreed. Information will be consolidated.

7. **Comment:** 3.2.3 Sterns & Wheeler Monitoring Wells. Page 3-3. Paragraph 2

"Five of the sixteen new monitoring wells could not be sampled, for the most part because of a lack of groundwater for sampling."

Please clarify why five of the sixteen wells could not be sampled.

Response: The sentence will be revised to read: "Five of the sixteen new monitoring wells could not be sampled because the wells were dry."

8 **Comment:** 3.2.3 Stems & Wheeler Monitoring Wells, Page 3-3, Paragraph 4

"Groundwater contamination is associated with No. 6 fuel oil, with lesser..."

Identify which well is contaminated.

Response: Agreed.

9 **Comment:** 3.3 Surveying, Page 3-7, Paragraph 2

"All monitoring wells have been surveyed. Monitoring well horizontal locations are surveyed to the nearest 0.10 foot. Vertical elevations are referenced to the 1929 North American Datum. Monitoring well elevations are surveyed to the nearest 0.01 foot at the measuring point where the uncapped riser pipe is notched."

The MEDEP would like a copy of the horizontal monitoring well location coordinates for all monitoring wells at PNSY. The MEDEP is attempting to track data associated with the monitoring well network using ArcView, a PC based GIS software package. The survey information would provide the most accurate location information for the monitoring wells.

Table 3-2 indicate fourteen (14) monitoring wells were re-surveyed during the RFI Data Gap Investigation. When were the remaining monitoring wells last surveyed? Freeze and thaw cycles over several years may cause monitoring well elevation reference points to shift.

Response: The Navy is currently pursuing a GIS system at PNS. Duplication of efforts is not cost effective. Therefore, when the Navy has completed the GIS data base will be provided to the State.

As indicated in the footnotes at the bottom of Table 3-2, these wells were repaired necessitating resurveying or were resurveyed because existing survey information could not be found. The remaining wells were surveyed when installed and will not be resurveyed as a matter of course except when necessary (i.e., modified due to repair).

10 **Comment:** 3.4.1 Available Groundwater Monitoring Data, Pages 3-8, 3-11

The site summaries should be identified by SWMU # in addition to the site name. Sites are shown on Map A by SWMU #.

SWMU #10 should be discussed in some manner, despite the fact that there are no wells currently present at the site. There is the potential that wells may be installed at SWMU #10 and these wells will be evaluated for inclusion in the groundwater monitoring plan.

Data presented within the individual site data summaries should be organized and written in the same way for each site, i.e., detections or non-detections of metals, SVOCs, VOCs, pesticides, etc., should be described in an identical manner for each site.

Response: Due to the sites being transferred from RCRA to CERCLA, the references to SWMU are being deleted from the text. Map A will be revised to reflect this.

Site 10 will be addressed in the future and not as part of the Groundwater Monitoring Plan in its current stage (sampling of the existing wells). When Site 10 is investigated further and better defined it may be incorporated as part of the Groundwater Monitoring Plan. This applies to other new sites as well.

The data summaries for each of the current sites will be revised to read in a similar order. The current text presents contaminants in order of concern.

11. **Comment:** 3.4.1 Available Groundwater Monitoring Data, DRMO Salvage Yard, Page 3-8, Paragraph 2

"In addition, during the RFI Data Gap Investigation, total diesel (EPA Method 8100, modified) was present in monitoring well DW-06 groundwater at a concentration of 160 µg/l."

Table 4-8 of the RFI Data Gap Report indicated 160 J µg/l diesel range total petroleum in monitoring well DW-07DB.

Response: The sentence will be revised to read: "In addition, during the RFI Data Gap Investigation, total diesel (EPA Method 8100, modified) was present in monitoring well DW-07DB groundwater at a concentration of 160 J µg/l."

12. **Comment:** 3.4.1 Available Groundwater Monitoring Data, DRMO Salvage Yard, Page 3-8, Paragraph 3

"Monitoring wells slightly upgradient of the DRMO (DW-1, DW-1B, DW-5, DW-4, and DW-10B) are contaminated as well, likely because of tidal effects."

Section 4.2.2 Subsequent Groundwater Monitoring, Page 4-21, Para 4 of this report indicates "Map B of the RFI Data Gap Report (Halliburton NUS, 1995a) supports the selection of monitoring wells DW-4 and DW-10B as being upgradient [of contamination?]." This would contradict the above statement.

Response: The sentence on Page 4-21, Para 4, will be revised to read "Map B of the RFI Data Gap Report (Halliburton NUS, 1995a) supports the selection of monitoring wells DW-4 and DW-10B as being *slightly* upgradient."

13. **Comment:** 3.4.1 Available Groundwater Monitoring Data, Former Waste Oil Tanks, Page 3-10, Paragraph 4

"However, no measurable free product layer was encountered at either the overburden well JW-16 or the bedrock well JW-16B."

Free product would not be observed in monitoring well JW-16B because the top of the well screen is approximately 10 feet below the water table. The top of the well screen for JW-16 is the approximate depth of the water table and may not be effective in intercepting free product.

Response: The following sentences will be added at the end of Paragraph 4. "It is unlikely that free product would be observed in monitoring well JW-16B because the top of the well screen is approximately 10 feet below the water table. The top of the well screen for JW-16 is at an elevation of 101.7', the approximate elevation of the water table is 101.4'. If free product is present in the area this well should intercept it. "

14. **Comment:** 3.4.1 Fuel Oil Spillage Area. Page 3-11

The site has not been delineated or defined. The MEDEP, EPA and Navy must define SWMU #27.

Response: The Navy is aware that the site has not been fully defined and has made reference to that in Paragraph 2 on Page 3-11. The plan will be updated in the future as necessary.

15. **Comment:** 3.4.3 Source Contamination. Page 3-11

This section doesn't seem to fit here. Consider either removing or expanding it.

Response: Section 3.4.3 Source Contamination, will be deleted from the text.

16. **Comment:** 4.1.1 Sampling Rationale. Page 4-1, Paragraph 2

"The primary objective of the pilot study will be to determine whether or not field measurements collected during low-flow purging of the monitoring wells will stabilize within the guidelines established for each of the individual groundwater quality parameters, as follows, in accordance with EPA guidance provided in Appendix B: pH, ± 0.2 standard units; specific conductance, $\pm 10\%$; temperature, $\pm 10\%$; turbidity, $\pm 10\%$; Eh, $\pm 10\%$; dissolved oxygen (DO), $\pm 10\%$; and salinity."

Minimal drawdown of water levels in monitoring wells during purging is also critical to the low-flow sampling protocol, as noted in Section 4.1.2.

The MEDEP understands the EPA will be issuing a final low-flow sampling guidance document in the next several months. Low-flow sampling protocols at PNSY should be modified to meet the requirements of the final guidance once it is available. Substantial changes to the low-flow sampling protocol are not anticipated in the final guidance document.

Response: When the final guidance document becomes available, it will be incorporated into the Groundwater Monitoring Plan as appropriate for site specific conditions. The Navy will implement the Groundwater Monitoring Workplan following regulatory concurrence.

17. **Comment: 4.1.1 Sampling Rationale, Page 4-1, Paragraph 4**

"The pilot study will consist of low-flow purging using stainless steel, bladder-style submersible pumps on five monitoring wells selected based on several criteria, as described below."

The MEDEP strongly recommends the pilot study assess the use of peristaltic pumps as well as the proposed bladder pumps, particularly on monitoring wells with low hydraulic conductivity. Peristaltic pumps are only effective on monitoring wells with water levels no deeper than approximately 20 feet below ground surface, which is the case for the majority of the monitoring wells at PNSY. The MEDEP has found that for certain low hydraulic conductivity wells, use of a peristaltic pump is the only effective means of meeting low-flow sampling drawdown and turbidity requirements. The MEDEP suggests assessment of three of the lowest hydraulic conductivity wells at PNSY (JW-14B, DW-07DB, FA-01) using peristaltic pumps. Comparison between bladder and peristaltic pumps should also be performed on at least two of the proposed pilot study wells.

Peristaltic pumps are not dedicated equipment as are the bladder pumps. It is anticipated that the number of monitoring wells will be reduced after the initial two rounds of sampling. Use of peristaltic pumps at certain wells would avoid the cost of the installation of dedicated pumps which may be used only twice.

Response: The MEDEP makes a good point with the recommendation of using peristaltic pumps at certain locations. It was the intent of the Navy to use both submersible bladder pumps (deeper high yield monitoring wells) and peristaltic pumps (shallow low yield water table wells) initially, however, the MEDEP made exception, citing the need for consistency and specifying the use of like pumps in all wells. In addition, the EPA Region I Low-Flow Guidance Document does not recommend the use of peristaltic pumps during groundwater sampling for VOCs. We will include a low yield well in the pilot study and have a peristaltic pump ready in case the bladder pump cannot maintain a low enough flow rate.

18. **Comment: 4.1.2 Technical Approach, Page 4-3, Paragraph 1**

"Water level parameters will be monitored and recorded approximately every 5 minutes throughout the purging cycle until all of the parameters have stabilized and a minimum purge volume of two saturated screen lengths is removed."

Parameters must stabilize within the required measurement ranges for a minimum of three consecutive readings taken at three to five minute intervals.

Response: The sentence will be revised to read: "Water quality parameters will be measured and recorded *approximately* every 5 minutes during the purging cycle until such time that 3 consecutive readings are recorded within the required measurement ranges."

19. **Comment: Tables 4-1 thru 4-5, Rational for Selection of Analytes, Groundwater Monitoring, PNS, Kittery, Maine, Pages 4-5 thru 4-14**

Tables 4-1 thru 4-5 indicated that both filtered and unfiltered TAL inorganic analyses will be performed on all groundwater samples collected for the initial two sampling rounds. Analytes included in previous TAL inorganic analyses performed at PNSY included major cations (Ca, Mg, K,

Na), minor cations (Al, Ba, Fe, Mn), and trace cations (Sb, As, Be, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Ti, V, Zn).

Analysis of the major anions chloride (Cl⁻), sulfate (SO₄²⁻), and alkalinity (~HCO₃⁻) have been proposed for groundwater collected from the DRMO, JILF, and the Former Waste Oil Tanks site. Analysis of Cl⁻ and SO₄²⁻ has been proposed for the Fuel Oil Spill area at Berth and the Non-site Monitoring Wells.

The MEDEP proposes that, in addition to the proposed TAL inorganic analyses, the major anions (Cl⁻, SO₄²⁻, NO₃⁻, Br⁻, and alkalinity) be analyzed for each water sample collected for the initial two sampling rounds. Inclusion of these additional anions in the monitoring plan would provide complete major ion chemistry for each monitoring location. The MEDEP sees the following benefits for performing these additional analyses:

- Results from comprehensive major ion analyses would provide a general characterization of groundwater conditions throughout PNSY;
- Comparison of total ion chemistry using stiff and/or piper diagrams may reveal common or distinct sources of groundwater between monitoring locations and dilution effects by intrusion of river water within tidal portions of the aquifer;
- Charge balances can be performed on total ion chemistry to assess the quality of laboratory results; and
- Finally, geochemical modeling can be performed on total ion chemistry and field parameters (e.g. Eh, DO, pH) using equilibrium computer models such as MINTEQ or PHREEQE. These models have the ability to assess aqueous speciation and possible precipitation of inorganic components for groundwater under equilibrium conditions. This may be helpful in determining the groundwater transport of metals within the aquifer.

In addition, the MEDEP proposes water samples be collected from the Piscataqua River at high and low tide and analyzed for the major cations and anions proposed above to aid in assessing dilution effects within the tidal portions of the aquifer. Given the fact the Piscataqua River is part of a tidal estuary, ionic concentrations in the surface water should change based on the tidal stage due to the relative mixing of fresh and salt water. Comparison of groundwater chemistry to river chemistry requires quantification of the ionic concentrations in both systems.

This proposed modification to the groundwater monitoring program would mean the inclusion of two (NO₃⁻ and Br⁻) or three anions (NO₃⁻, Br⁻, and alkalinity) per well and the addition of four surface water samples (two per sampling round). The MEDEP believes the added benefit to the investigation as outlined above far out-weighs the additional cost, especially given the relative low-cost of inorganic analyses.

Response: The Navy will add the additional major anions (Cl⁻, SO₄²⁻, NO₃⁻, Br⁻, and alkalinity) to the analytical suite for the initial two rounds of sampling. In addition, two surface water samples will be collected during each of the sampling rounds (one sample will be collected during high tide and one during low tide) for the cations and anions mentioned above. Please note that both filtered and unfiltered samples will not be taken from all groundwater wells. Table 4-7 indicates the number of

filtered and unfiltered samples. A footnote will be added to Tables 4-1 to 4-5 to refer readers to Tables 4-7.

20. **Comment: 4.3 Sampling and Analysis Procedures, Page 4-22, Paragraph 1**

"Ceimic has been selected to perform the analytical services for the groundwater monitoring."

Wasn't Ceimic dropped from performing analytical analyses for Phase II offshore samples because of performance problems encountered with Phase I analyses? Does this have any bearing on their ability to perform analyses on groundwater samples?

Response: Ceimic was not included in the offshore phase II study because the very low detection limits used were not achievable by a standard lab. Ceimic's ability to achieve the desired detection limits for this study is currently under evaluation.

21. **Comment: 4.3.1 Inspection of Existing Monitoring Wells, Page 4-23, Paragraph 2**

"Prior to sampling each monitoring well, a brief inspection will be conducted, evaluating the following conditions: ..."

Assessment for the presence of immiscible layers should be performed as part of the initial well inspection. Section 4.3.3 describes procedures for performing this task but it should also be mentioned in the summary list.

Response: Agreed. The presence of immiscible layers will be evaluated during the monitoring well inspection and will be added to the summary list noted in Section 4.3.1 Inspection of Existing Monitoring Wells.

22. **Comment: 4.3.3 Measurement of Immiscible Layers, Page 4-24, Paragraph 1**

"To address this problem wells containing LNAPL will be purged with a peristaltic pump before the submersible pump is installed."

Define LNAPL.

Response: Agreed on purging of LNAPL before pump installation. The definition of LNAPL (Light Non-aqueous Phase Liquid) will be provided on Page 4-24, paragraph 1.

23. **Comment: 4.3.5 Sampling Wells, Page 4-26, Paragraph 1**

"Monitoring wells sampled as part of the baseline conditions assessment will be sampled using a low-flow 1.66-inch diameter low flow bladder..."

Use consistent terminology. is "baseline conditions assessment" equivalent to First and Second Event Groundwater Sampling?

Response: The sentence will be revised to read "Monitoring wells will be sampled *during each event* using a low-flow 1.66-inch diameter low flow bladder-type pump and dedicated teflon or teflon-lined polyethylene tubing."

24. **Comment:** 4.3.5 Sampling Wells, Page 4-26, Paragraph 1

"Samples will be collected directly from the discharge pump."

The MEDEP assumes the flow-through cell will be disconnected prior to sample collection which would be the correct procedure.

Response: Agreed. The sentence will be revised to read: "*After purging is completed the flow-through cell will be disconnected and samples will be collected directly from the discharge of the pump.*"

25. **Comment:** 4.3.8 Sample Identification System page 4-29, Paragraph 1

"Therefore the proposed baseline conditions sampling, first event, will be considered Round 7."

See Comment No. 23.

Response: The sentence will be revised to read "Therefore the proposed *first event* sampling will be considered Round 7."

26. **Comment:** 4.3.8 Sample Identification System, Page 4-29, Paragraph 5

"Matrix Spike and Matrix Spike Duplicates (MS/MSD) samples will be designated on the field documentation forms and sample labels. MS/MSDs are collected at a frequency of 1 per 20 samples per matrix and double or triple volumes of sample are required for analytical purposes."

In the interest of performing sample collection within a reasonable time, only "high hydraulic conductivity" monitoring wells should be selected for the collection of MS/MSD samples. MS/MSD samples should be collected for salt, brackish and fresh water wells to assess matrix effects for each of these scenarios.

Response: Agreed, providing that high conductivity conditions are found in monitoring wells under each of the above conditions (salt, brackish, and fresh water). The text will be expanded accordingly.

27. **Comment:** 4.3.10 Chain of Custody, Field Documentation Responsibilities, Page 4-32, Paragraph 1

"Copies of all field logbooks will be sent to NORTHDIV monthly, to the attention of Lieutenant Jim Conroy."

Copies of the field logbooks must be included as an appendix to the groundwater monitoring report.

Response: Agreed. Copies of all field notes will be provided as part of the Groundwater Monitoring Report as already stated in on Page 6-3 (Appendix C).

25. **Comment:** 4.3.10 Chain of Custody. Field Documentation Responsibilities. Page 4-32. Paragraph 5

"If necessary, the Project Manager will discuss the change with the pertinent individuals (e.g., Navy Remedial Project Manager, B&R Environmental Quality Assurance Manager) and will provide verbal approval or denial to the FTL for the proposed change."

The MEDEP and the EPA must be notified of any proposed changes to the work plan prior to field implementation.

Response: The following sentence will be added at the end of Paragraph 5: *"The EPA and MEDEP will be consulted of any scope changes that may occur while field work is ongoing."*

29. **Comment:** 4.10 Corrective Action. Page 4-41. Paragraph 2

"If warranted by the severity of the problem (for example, if a change in the approved work plan is required), the Navy will be notified in writing and their approval will be obtained prior to implementing any change."

See previous comment.

Response: The following sentence will be added to the end of Paragraph 2. The EPA and MEDEP will be consulted of any scope changes that may occur while fieldwork is ongoing.

30. **Comment:** 5.1.2 Data Validation. Page 5-1. Paragraph 4

"Although no formal data validation will be conducted, limited analytical data evaluation will be conducted to ensure that only true data points are considered for decision-making purposes."

The MEDEP understands that CLP analytical methods require specified levels of data validation. does the above statement indicate that no independent data validation will be performed?

Response: Data validation (to be conducted by B&R Environmental) is performed independent of laboratory analyses. CLP analytical methods require specified data package deliverables, not necessarily levels of data validation to be performed. (Also refer to EPA comment #14.)

31. **Comment:** 5.2 Procedures for Determining Significant Increases for Monitored Contaminants and Indicator Parameters. Page 5-3. Paragraph 7

"A project file and computer database will also be kept by PNS with all of the groundwater monitoring data and statistical evaluations."

The MEDEP requests a copy of this database.

Response: The sentence will be revised to read "A project file and computer database will also be kept by PNS and provided to the EPA and MEDEP with all of the groundwater monitoring data and statistical evaluations."

32. **Comment:** 5.3 Remedial Action. Page 5-4. Paragraph 1

"A Draft Feasibility Study (FS) has been prepared..."

It seems appropriate a summary should be included that describes what happened after regulatory review of the Draft FS and formats for subsequent FS reports. The description of the modeling effort is too brief.

The purpose of the bulleted items is unclear. They don't appear to relate to the previous paragraph.

Response: The following sentence will be added: *"It is currently planned to develop new feasibility Studies specific to each Operable Unit; therefore, remedial action will be re-evaluated in the future."*

The modeling effort is still in the planning stages, therefore additional discussion is not merited at the current time.

The following sentence was inadvertently deleted and will be reincorporated at the end of the 1st paragraph of Section 5.3 to read: *"If future sampling results reveal evidence of significant contaminant increases in any of the monitored wells, the regulatory authorities will be notified in writing as to:"*

33. **Comment:** 5.3 Remedial Action. Page 5-4. Paragraph 4

"If vertical migration of contaminants is suspected to be a problem, existing deep bedrock monitoring wells DW-7DB at the DRMO and JW-13DB at the JILF will be added to the monitoring program."

Previous results reported for these wells included 160 J $\mu\text{g/L}$ diesel total petroleum at DW-7DB and 8 J $\mu\text{g/L}$ 1,1-dichloroethane and 15 $\mu\text{g/L}$ 1,2-dichloroethylene at JW-13DB.

Response: All existing RFI and RFI Data Gap wells will be sampled during the first and second event sampling. Discussions of additions or deletions of monitoring wells will be held at later point in time, following evaluation of results. Of note; the noted compounds did not warrant development of associated Media Protection Standards (MPSs).

34. **Comment:** Data Management and Reporting. Page 6-2. Paragraph 1

"Records of the groundwater analytical data will be kept in a computer database."

Will field parameters (i.e., pH, specific conductance, temperature, DO, Eh, and turbidity) also be included with this database? The MEDEP strongly urges that they be included if they are not presently being considered as part of the database.

Response: No. Field parameters will only be incorporated as part of the report appendices and not part of the database. Sample log sheets will be provided in the report appendix which includes the requested information. However, pH will be provided in the database as this parameter will be performed by the analytical laboratory.

35. **Comment:** Data Management and Reporting, Page 6-2, Paragraph 6

"Groundwater monitoring reports will be presented in the following format."

Does the Navy intend to prepare groundwater monitoring reports for each of the two initial sampling rounds or only prepare one report covering both sampling rounds?

Response: A single report will be prepared after the second sampling event is completed. The results of the first sampling event will be provided in the form of tables and maps, field notes will also be provided.

36. **Comment:** 7.0 Schedule, Page 7-1

"The pilot test to determine stabilization of field parameters for low-flow purging is planned for May or June of 1996."

Revise the dates for the pilot test.

Response: The sentence will be revised to read "The pilot test to determine stabilization of field parameters for low-flow purging is planned for July or August of 1996."