

Baker

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December 14, 1993

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Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attn: Ms. Kate Landman
Navy Technical Representative
Code 1823

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0160
Response to Comments
Draft Final RI/FS Project Plans for Operable Unit No. 7
MCB Camp Lejeune, North Carolina

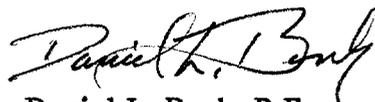
Dear Ms. Landman:

Baker Environmental, Inc. (Baker) has reviewed the comments from Naval Environmental Health Center (NEHC), LANTDIV, U.S. Environmental Protection Agency (USEPA) Region IV, North Carolina Department of Environment, Health, and Natural Resources (DEHNR) Division of Solid Waste Management, and Marine Corps Base (MCB) Camp Lejeune Environmental Management Department (EMD), regarding the Draft Final Remedial Investigation/Feasibility Study Project Plans for Operable Unit No. 7 (Sites 1, 28, and 30). The Project Plans include the Work Plan, Field Sampling and Analysis Plan, Health and Safety Plan, and Quality Assurance Project Plan. Responses to these comments are provided in Attachments A through E. A copy of NEHC's, LANTDIV's, USEPA's, DEHNR's, and MCB Camp Lejeune's comment letter is also provided. The responses are also included on the enclosed disc under the file names: "RESNEH" (NEHC), "RESPLANT" (LANTDIV), "RESPEPA" (USEPA), "RESPNC" (NC DEHNR) and "RESPCL" (MCB Camp Lejeune).

If you have any questions, or would like further information, please do not hesitate to contact me at (412) 269-2033.

Sincerely,

BAKER ENVIRONMENTAL, INC.



Daniel L. Bonk, P.E.
Project Manager

REB/jc
Attachments

cc: Mr. Neal Paul
Ms. Lee Ann Rapp (w/o attachments)
Ms. Beth Hacie (w/o attachments)



A Total Quality Corporation

Attachment A
Navy Environmental Health Center Comments and
Responses on the Draft Final RI/FS Project Plans
for Sites 1, 28, and 30 (Operable Unit No. 7)

ATTACHMENT A

**Response to Comments Submitted by the Navy Environmental Health Center (NEHC) on
the Draft Final RI/FS Project Plans for Sites 1, 28, and 30 (Operable Unit No. 7),
MCB Camp Lejeune, North Carolina
Comment Letter by Ms. Kate Landman
Received by Baker Environmental, Inc., via Fax on 11-29-93**

**Response to Specific Comments - Field Sampling and Analysis Plan
(Comments 1 through 6)**

- 1) No changes to the text required - The surface soil samples will be collected in accordance with USEPA Region IV guidelines which considers surface soil samples as those collected from 0 to 12 inches.
- 2) The text will be modified to indicate that the risk assessment will be based on total metals analysis results and the dissolved metals analysis results will be used for comparison.
- 3) Groundwater samples obtained for analysis of VOCs will be collected and prepared according to USEPA Region IV standard operating procedures (SOPs) as stated in the FSAP.
- 4) No changes to the text required - The fish collected from the designated stations at Site 28 will be used for both the ecological and human health risk assessments. No fish will be collected from Sites 1 and 30. For the ecological risk assessment purposes, an examination of upstream and downstream effects are warranted for the site investigation. Consideration of potential harvest areas by human receptors is not appropriate for data used in an ecological risk assessment. However, these streams are used by estuarine fish species that migrate seasonally up and down tributaries leading to the New River estuary. Therefore, fish that have been exposed to the environmental conditions within the tributaries have the potential to be harvested both while in the tributary and when they travel out of the tributary and into the New River estuary. For human health risk assessment purposes, the tissue data collected will be used to assess the risk from harvest areas of concern. In addition, stations have been designated within the New River mainstem and are areas of potential harvest by human receptors.

5a/b/c)

No changes to the text required - There are a total of six stations where fish will be collected and composited for tissue analysis. Therefore, the maximum statistical sample size for the fish collection effort at Site 28 is six for each species of fish collected. However, if sampling success precludes obtaining the same species of fish from each station, the statistical sample size for the fish collected will be less than six. The benefit of composite sampling is to ensure that adequate sample volume is collected for the laboratory to conduct their analytical sampling. There are many field conditions that are not within the control of the field sampling team that potentially may impact the success rate of the fish collection effort. Although fishing success rate does affect the number of samples collected, previous studies have successfully collected an adequate number of fish from similar tributaries on MCB Camp Lejeune to ensure that equal numbers of

similar size fish have been included in each composite from the designated stations.

- d) Stations have been sampled in the White Oak River as reference stations. Based on conversations with representatives of the North Carolina Department of Environmental, Health, and Natural Resources, stations were located in Hadnot Creek. In addition, fish and shellfish currently are part of state and federal contaminant monitoring programs and will provide additional opportunity for statistical comparison of tissue concentrations.
- e) The fish collected and composite tissue samples analyzed will be used to conduct CERCLA ecological and human health risk assessments. CERCLA guidance was used to guide the selection of appropriate sample size and target species for conducting the risk assessments and for making risk management decisions.

6a/b/c)

No changes to the text required - Fish with scales will have scales removed but not the skin. Scaleless fish will have the skin removed. The fillets will include side flesh from immediately behind the base of the pectoral fin to the base of the tail. The belly flap and dark muscle tissue in the vicinity of the lateral line will not be separated from the light muscle tissue that constitutes the rest of the muscle tissue mass. Bones will be removed that remain in the tissues after filleting. The selection of the side flesh including white and dark muscle tissue for tissue analysis is appropriate for the targeted receptors because it is not believed that the fishermen that harvest fish caught will consume all the edible portions of the fish.

Response to Specific Comments - Work Plans (Comments 7 through 12)

- 7) No changes to the text required - Information on the sampling results were obtained from the Final Site Summary Report (ESE, 1990) which is provided in Appendix A of the Work Plan. The report states that "all of the samples contained total chromium". Accordingly, it is presumed that all samples analyzed for hexavalent chromium were free of this contaminant.
- 8) No changes to the text required - The exposure resulting from consumption of wild fowl and/or other wildlife will not be considered for this RI investigation for the following reasons:
 - Animals which may be present at OU No. 7 such as turkey, deer, and bear are generally migratory in nature and, therefore, may not inhabit these sites for long periods of time. Accordingly, their exposure to any potential contaminants, which may have an adverse affect on them, is very limited.
 - In lieu of evaluating the consumption of wild fowl and/or other wildlife, the risk assessment will evaluate more conservative potential risks such as ingestion of contaminants by children.
- 9) Air pathways involving exposure to volatile organic compounds VOCs will be added to the three sections. Air Pathways will be identified in Section 3.2.2.

- 10) No changes to the text required - Exposure pathways applicable to current and future exposure scenarios, and future land uses for each site will be addressed in the Baseline Risk Assessment. Determination of future exposure scenarios and future land use evaluation will be performed using appropriate guidance documents (EPA).
- 11) No changes to the text required - Although it is suggested that a short description of the toxic effects for each contaminant be provided in text, it is beneficial to the reader if this information is provided in an appendix format (i.e, Toxicity Profiles). In the event that there is a large number of COPCs, the risk assessment text would become awkward and the reader may be distracted from the scope. Therefore, it is advantageous to place information (i.e, RfD studies, animal carcinogenicity, human carcinogenicity, supporting data for carcinogenicity) in an appendix and refer to this appendix in the risk assessment text.
- 12) No changes to the text required - The information presented in Section 5.7.1 is sufficient enough to provide general guidelines for completing exposure assessments, toxicity assessments, and risk characterizations in the RI Report.
- 13) No changes to the text required - Baker views the RAGs Manual as a guidance document rather than as a set of specifications. The information identified in this comment will be presented in the Baseline Risk Assessment. Baker, however, feels it would be inappropriate and excessively costly to address format and presentation questions in the Work Plan or FSAP.

Response to Specific Comments - Site Health and Safety Plan

- 1) Section 1.2, References. The last reference cited has been changed to reference the latest, June 1992, revision of the U.S. EPA, Standard Operating Safety Guides.
- 2) Section 2.0. The name of the Site Manager will be included in the final HASP. The Site Health and Safety Officer (SHSO) cannot be determined at this time, however, the person designated will have prior experience conducting these responsibilities.
- 3) No changes to the text required - Section 3.0. The organization of this section presents the site background, site work plans, and the hazard evaluation for each task as opposed to each site. This format has been successfully used with several other Health and Safety Plans developed for MCB Camp Lejeune. This section is in compliance with 29 CFR 1910.120(b)(4)(ii) and the Navy/Marine Corps IR Manual (neither regulation/guidance manual is specific with how information is to be presented in the plan). The time required to reorganize this section to the approval of the reviewer is not cost effective or necessary.

Based on the time of year this project is to take place and various potential levels of protection it is actually possible that either cold stress or heat stress to be a potential concern.

- a) No changes to the text required - Section 3.3.3.6. Past experience evaluating noise levels of similar projects with limited drill rig and backhoe activity does not warrant a requirement for noise monitoring.
- b) Section 3.3.3.7 of the HASP indicates that confined space entry is not anticipated for this project. This section has been included to maintain compliance with 29

CFR 1910.120(b)(4)(ii)(I), which includes confined space entry as one of the minimum items the site HASP must address.

- 4) Section 3.3.4. Radiation monitoring equipment will be made available as a screening instrument solely for precautionary measures.
- 5) The last sentence in Section 3.3.5 has been removed for the Final HASP.
- 6) Section 4.0. Additional site specific information has been included with this section, such as, a detailed safe work practice with drill rigs. Some of the information in this section is general in nature because exact site controls measures can be dynamic in nature and are flexible based on changing site conditions. The Site Manager and SHSO use their professional judgment to incorporate the ideas presented in this section based on such things as, various work locations at a site, air monitoring results, protection levels, and work task. The Project Manager and Project Health and Safety Officer (PHSO) are available and contacted as needed. This has worked successfully with other similar projects conducted for the Navy.
- 7) Section 5.0. Environmental Monitoring.
 - a) The OSHA TWA exposure standards are used as a reference to help evaluate the health hazards of the chemicals of concern that could potentially be at a site. The nonspecific real-time air monitoring that will be conducted as part of this project is more conservative than the OSHA TWAs.
 - b) Previous comments received from NEHC indicated that from a health physics perspective, a more protective measure for site workers is to determine the background radiation exposure level and establish the stop work criteria as two times the background radiation exposure level. The Final HASP will reflect the two times background as the stop work criteria.
- 8) Section 6.2 presents the site specific anticipated levels of protection for each task. Section 6.3 describes the respiratory protection that would be used if air monitoring results indicated an upgrade in protection level, as presented in Section 5.0. References to Level B respiratory protection in this section will be deleted, Level C will remain.
- 9) Section 7.0. Decontamination Procedures, References to Level B decontamination procedures will be removed for the Final HASP.
- 10) Section 8.0. Emergency Procedures.
 - a) The new telephone area code at MCB Camp Lejeune will replace the previous base emergency telephone numbers on the emergency telephone list. The Agency for Toxic Substances and Disease Registry will be included with the Final HASP. The On-Scene Commander responsibilities are performed by the on-duty Fire Chief, as reported by base environmental personnel. This telephone number is listed.
 - b) A minimum of two personnel trained in first aid/CPR will be available on the site, as stated in the HASP. A copy of the Bloodborne Pathogen Program will be available onsite and a statement regarding this program will be referenced in the HASP.

- c) **References to Level B protection levels will be eliminated in the Final HASP. Personnel will be prepared to upgrade to Level C, as necessary.**
 - d) **The snake bite and spider bite sections will be reviewed. The last paragraph in the snake bite section will be removed in the Final HASP.**
 - e) **The Navy Medical Treatment facilities for civilian contractor personnel will be used in the event of a chemical exposure type injury requiring emergency attention. The base hospital would also be used in the event of a life threatening injury when it is the closest hospital to access. In addition, the base ambulance only transports to the base hospital.**
- 11) **Section 10.0. Medical Surveillance Procedures, The first sentence of the second paragraph indicates that the occupational medical physician is provided information to base the medical surveillance.**
- 12) **A statement will be added to Section 8.0 that references Appendix C as containing hazardous material exposure procedures.**

Response to Specific Comments - Quality Assurance Project Plan

No comments were received from NEHC on the Draft Final Quality Assurance Project Plan.



DEPARTMENT OF THE NAVY

NAVY ENVIRONMENTAL HEALTH CENTER
2510 WALMER AVENUE
NORFOLK, VIRGINIA 23513-2917

5090
Ser 64/- 5208
26 NOV '93

From: Commanding Officer, Navy Environmental Health Center
To: Commanding Officer, Atlantic Division, Naval Facilities
Engineering Command, Code 1822, Norfolk, VA 23511-6287

Subj: MEDICAL REVIEW OF INSTALLATION RESTORATION PROGRAM
DOCUMENTS FOR MARINE CORPS BASE, CAMP LEJEUNE, NC

Ref: (a) Baker Environmental, Inc., Transmittal ltr
of 27 Oct 93

Encl: (1) Medical Review of Draft Final Remedial Investigation/
Feasibility Study Work Plan and Sampling and Analysis
Plan for Operable Unit 7 (Sites 1, 28, and 30),
Marine Corps Base, Camp LeJeune, North Carolina

1. As requested by reference (a), we completed a medical review of the forwarded documents ("Draft Final Remedial Investigation/Feasibility Study Work Plan for Operable Unit No. 7 (Sites 1, 28, and 30)..." and "Draft Final Remedial Investigation/Feasibility Study Sampling and Analysis Plan for Operable Unit No. 7 (Sites 1, 28, and 30), Marine Corps Base, Camp Lejeune, North Carolina," dated October 1993). Our comments and recommendations are provided in enclosure (1).

2. The technical point of contact is noted in the enclosure. We are available to discuss the enclosed information by telephone with you and, if desired, with you and your contractor. We are also available to provide health-related review for future documents associated with this site.

3. If you require additional assistance, please call Ms. Sheila A. Berglund, P.E., Head, Installation Restoration Program Support Department at 444-7575, extension 430.


J. H. ZIMMERMAN
By direction

**MEDICAL REVIEW OF DRAFT FINAL REMEDIAL INVESTIGATION/
FEASIBILITY STUDY WORK PLAN AND SAMPLING AND ANALYSIS PLAN
FOR OPERABLE UNIT 7 (SITES 1, 28, AND 30)
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA**

- References:**
- (a) "Supplemental Region IV Risk Assessment Guidance," U.S. EPA Region IV memo, dtd March 26, 1991
 - (b) *Standard Operating Procedures and Quality Assurance Manual* (February 1, 1991), U.S. EPA Region IV, Environmental Compliance Branch)
 - (c) *Assessing Human Health Risks from Chemically Contaminated Fish and Shellfish* (EPA 503/8-89-002, September 1989)
 - (d) "New Interim Region IV Guidance," U.S. EPA Region IV memo dtd February 11, 1992

General Comments:

1. The draft documents entitled "Draft Final Remedial Investigation/Feasibility Study Work Plan for Operable Unit No. 7 (Sites 1, 28, and 30)..." and "Draft Final Remedial Investigation/Feasibility Study Sampling and Analysis Plan for Operable Unit No. 7 (Sites 1, 28, and 30), Marine Corps Base, Camp Lejeune, North Carolina," dated October 1993, were provided to the Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 28 October 1993. The reports were prepared for Atlantic Division, Naval Facilities Engineering Command by Baker Environmental, Inc.
2. The information presented in the work plan (WP) and field sampling and analysis plan (SAAP) is generally in accordance with guidance provided in pertinent Environmental Protection Agency (EPA) documents such as *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (October 1988)*. However, there is a need for more specific information to be included in the plans. Our primary concern is that neither the WP nor the SAAP includes a detailed, site-specific risk assessment methodology section. The review comments and recommendations provided below address the need to include additional and more specific health information.
3. Some sections of the text refer the reader to a "Base Master Plan" to obtain additional site-specific information. Since we do not have a copy of the Base Master Plan, we do not know the extent to which it addresses each site. However, Base Master Plans that we have reviewed for other facilities and sites have all been less site-specific than the site work plan. Also, the relationship of the "Base Master Plan" to the WP and SAPP is not addressed in the text. The extent to which each site is

Enclosure (1)

addressed in the Master Plan, its contents and relation to the WP, SAPP, and other Remedial Investigation/Feasibility Study (RI/FS) documents should be addressed in the "Introduction" sections of these documents.

4. The technical point of contact for this review of the RI/FS WP and field SAAP is Ms. Andrea Lunsford, Head, Health Risk Assessment Department, Environmental Programs Directorate, NAVENVIRHLTHCEN, who may be contacted at 444-7575, extension 402.

Review Comments and Recommendations:

Sampling and Analysis Plan

1. Page 3-3, Section 3.1.2 (Soil Investigation [Site 1-French Creek]), subsection 3.1.2.1 (Acid and POL Disposal Area Grid 1-S); page 3-15, section 3.2.2 (Soil Investigation [Site 28]), subsection 3.2.2.1 (Sampling Locations), paragraph 2; and page 3-26, section 3.3.2 Soil Investigation [Site 30]), subsections 3.3.2.1 (Sample Locations), paragraph 3 and 3.3.2.2 (Analytical Requirements)

Comments:

a. Surface samples at all sites reportedly will be collected at 0 to 12 inch depths. For example, section 3.1.2.1 states that "samples will be collected from the surface (top 12-inches from ground surface or below asphalt/concrete/base course surface), then at continuous 2-foot intervals"; and sections 3.2.2.1 and 3.3.2.1 state that "samples will be collected from the ground surface (top 12 inches) then at continuous 2-foot intervals."

(1) Collecting surface soil samples at depths of 0 to 12 inches is inconsistent with EPA guidance as presented in documents such as the *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A, December 1989* (RAGS manual). The RAGS manual recommends 0 to 6 inch depths for surface soil sample collection. The manual also states that surface soil samples should be collected "at the shallowest depth practical" in order to accurately reflect the potential surface soil exposure pathway.

(2) The sampling protocol described is also inconsistent with the Agency for Toxic Substances and Disease Registry (ATSDR) guidance. *ATSDR's Public Health Assessment Guidance Manual* (PHA manual) defines surface soil samples as soil samples taken from depths of 0 to 3 inches. This reflects ATSDR's position that depths greater than three inches do not accurately reflect surface soil conditions.

(3) Under the Comprehensive Environmental Response, Compensation and Liability Act, ATSDR is mandated to perform a public health assessment (PHA) of any site which is placed on the National Priorities List. In developing PHAs at Department of Defense facilities, ATSDR uses environmental data collected during installation restoration program (IRP) investigations. ATSDR summaries may reflect "no samples" taken for surface soil based on the fact that samples were taken at depth intervals greater than three inches.

(4) To facilitate correlation between PHAs and health risk assessments, and to minimize costs associated with redundant sample collection and analysis, we encourage the adoption of "0 to 3 inches" as the norm for surface soil sample collection. This depth interval is consistent with both EPA and ATSDR guidance.

b. The section 3.1.2.1 statement that "samples will be collected from the surface (top 12-inches from ground surface or below asphalt/concrete/base course surface)..." is inconsistent with EPA guidance and, if followed, would yield unrealistically conservative risk estimates for surface soil exposure pathways.

(1) Health risk assessments for surface soil exposure pathways presume daily contact with surface soils. Where there is asphalt, or concrete, or other base course surfacing, such contact will not occur. There is no EPA guidance which suggests that surface soil pathways should be considered when a surface soil pathway does not exist.

(2) Appendix A to 40 CFR Part 300 ("Environmental Protection Agency, Hazard Ranking System, Final Rule," published in the Federal Register, Vol. 55, No. 241, December 14, 1990) contains the only explicit guidance on sampling/nonsampling of asphalt/concrete/base course surfaces that we are aware of. The fourth paragraph of Section 5.0 ("Soil Exposure Pathway"), subsection 5.0.1 ("General Considerations") states:

"If an area of observed contamination (or portion of such an area) is covered by a permanent, or otherwise maintained, essentially impermeable material (for example, asphalt) that is not more than two feet thick, exclude that area (or portion of that area) in evaluating the soil exposure pathway."

(3) In June, 1993 we confirmed, with the EPA's Environmental Criteria Assessment Office (ECAO) that it is inappropriate to collect "surface soil" samples from soil located beneath asphalt or other essentially impermeable base course surfaces.

(4) Soil samples collected below the surface should always be considered subsurface soil samples. Although

subsurface soil results should not be used in calculations of surface soil exposure pathways, they can be used in a health risk assessment (HRA) to estimate risk for potential future construction scenarios, which might entail subsurface soil disturbance. When this is done, the report should clearly state that subsurface soil results are being used to estimate potential future scenarios.

Recommendations:

- a. Plan to collect surface soil samples at 0 to 3 inch depths. Specify in the WP and SAAP that the maximum depth at which surface soil samples will be collected is 6 inches, when 3 inch maximum depths are not achievable or practical.
- b. Specify in the WP and SAAP that subsurface soil samples may be collected from areas with essentially impermeable surfaces (e.g., asphalt), but surface soil sampling in such areas would be inappropriate, and therefore will not be conducted.
- c. Specify that subsurface soil results will be used only to calculate risk for appropriate exposure scenarios; specify the appropriate exposure scenarios (e.g., potential future construction exposures).

2. Page 5-15, section 5.3 (Groundwater Sample Collection), subsection 5.3.1 (Groundwater Samples Collected from Monitoring Wells), Step #9

Comments:

a. The text states that ground water samples collected for dissolved metals analysis will be "filtered in the field" prior to being submitted for analysis. Neither the SAAP nor the WP state whether these samples are to be used for assessing human health risks. Reference (a) states that "unfiltered groundwater data should be used to determine the exposure point concentration [for risk assessments]." The text should specifically state that unfiltered ground water should be used to determine the exposure point concentrations used in risk assessment calculations.

b. When feasible, we recommend the collection of both filtered and unfiltered ground water samples. While the EPA requires that unfiltered samples be used in the quantitative risk assessment, if risk estimates for both filtered and unfiltered samples are developed, both values can be discussed in the HRA. Since some heavy metals absorb strongly to soil/sediment particles, the differences between the resultant risk estimates from filtered and unfiltered sampling results can be large. Providing comparison values can therefore be very useful in demonstrating that the risk estimates from unfiltered ground water samples is overly conservative.

Recommendations:

a. Specifically state that unfiltered ground water will be collected and used to determine the exposure point concentration, for the HRA calculations.

b. If feasible, collect both unfiltered and filtered ground water samples, develop risk estimates for both, and discuss both values in the HRA.

3. Page 5-17, section 5.4 (Surface Sample Collection), paragraph 4

Comments:

a. The text states that "Care will be taken when collecting samples for analysis of volatile organic compounds (VOCs) to avoid excessive agitation that could result in loss of VOCs." It then states that VOC samples "will be taken prior to the collection of samples for analysis of other parameters" and that "sample bottles will be filled in the same order at all sample locations."

b. Section 4.2.1.1 ("Purgeable Organic Compounds Sampling (VOA)") of reference (b) provides specific guidance regarding the type of vial (i.e., 40 milliliter septum vial); type of cap (i.e., screw-on cap with teflon-silicon disk); the filling procedure (i.e., to fill the vial by pouring down the side and to completely fill the container leaving no head space); and the need to perform a bubble check when collecting surface water samples. These procedures are not stated in the SAAP.

Recommendation: Specifically state that the Region IV procedures, listed above, will be adhered to for surface water sample collection for VOC analyses.

4. Page 5-23, section 5.6 (Biological and Fish Sample Collection), subsection 5.6.2 (Fish Collection)

Comment: The first paragraph states that fish will be collected at "designated stations." Selection procedures for the "designated stations" are not provided. The text does not state whether the designated stations are known harvest areas. Reference (c) states "Sampling stations should generally be located in known harvest areas." If planned sampling locations are known harvest areas, it should be specifically stated. If they are not, other locations should be considered.

Recommendation: State whether or not the selected fish sampling areas are known harvest areas. If they are not known harvest areas, select alternate areas.

5. Page 5-23, section 5.6 (Biological and Fish Sample Collection), subsection 5.6.2 (Fish Collection)

Comments:

a. Section 5.6.2.1 states that "at least ten individuals from each species, if available, will be composited and analyzed for wholebody burdens of chemicals. In addition, fillets of at least ten individuals, if available, from each edible species will be composited and analyzed for chemical constituents. If adequate individuals from each species are not collected for whole-body analysis and fillet analysis, only the fillets will be analyzed."

b. Reference (c) states that composite sampling has certain advantages over single samples, such as cost-effectiveness and a more efficient estimate of the mean; however, compositing samples from several fish to a single sample precludes statistical analysis. The guidance manual further states "The benefits of compositing individual samples from a single station within a given sampling period often outweigh the disadvantages just discussed."

c. We understand that the number of samples collected depends primarily on the fishing success rate; however, we are justifiably concerned that sufficient samples be collected from which to make any type of risk-based decision. We have recently reviewed several fish studies in which an insufficient number of composite samples was collected to make any type of risk-based decision.

d. Neither the WF nor the sampling and analysis plan state that fish control samples/background samples will be collected.

(1) The "Exposure Assessment" chapter of reference (c) recommends background sampling to facilitate comparison. The guidance states: "Include samples from a relatively uncontaminated reference or control area to help define local contamination problems."

(2) Background sampling is also recommended and discussed in the RAGS manual. It states that "reference stations should closely match the characteristics of known harvest areas."

e. The ATSDR published notice of a draft guidance document entitled *Environmental Data Needed for Public Health Assessments* in the March 3, 1993 Code of Federal Regulations (58 FR 12306 No. 40). The ATSDR guidance recommends the following when biota studies are performed:

(1) A sample size of "at least 20 individuals per species, per episode."

- (2) Analysis of edible portions only.
- (3) Analysis of individual ("grab") rather than composite samples.
- (4) A control population of at least 20 individuals from a comparable uncontaminated location, for background levels.
- (5) A copy of the protocol used, including how each species was harvested; how representative samples were selected; what portions were sampled and analyzed; special specimen handling procedures; contaminants analyzed for; methods used and their detection limits; etc.

Recommendations:

- a. Ensure that a sufficient number of composite and/or single samples are collected so that a risk management decision can be reached.
- b. Include sampling in a relatively uncontaminated or reference control area. If reference stations(s) are not available (i.e., if reference stations closely matching the known characteristics of the known harvest areas do not exist), it should be so stated.
- c. In developing sampling plans, address ATSDR environmental data needs.

6. Page 5-25, section 5.6 (Biological and Fish Sample Collection), subsection 5.6.2.1 (Analysis of Fish Species)

- a. The last paragraph of this section states that "fish fillet and whole-body analysis will be performed if adequate individuals from each species are caught." Neither the WP nor the SAAP address the fish parts that will be used to assess "whole body" analysis (i.e., whether only the edible portions of the fish will be used or whether whole fish, including viscera, will be used).
- b. Neither the WP nor the SAAP provide a characterization of the potentially exposed population with respect to general method(s) of food preparation and parts of fish eaten. The majority of MCB, Camp Lejeune and/or local fish consumers likely consume only the fish fillet. However, this should be determined. There are populations that consume all edible portions of the fish, or prepare fish in such a way that contaminants in other portions of the fish are of concern (e.g., some populations remove the viscera and boil the rest of the fish). Another issue that should be determined is whether or not the skin is taken off, or left on, the fillets.

c. ATSDR's PHA manual states that PHAs should be based on measurements of the contamination in the "edible portions" of the relevant aquatic species. However, the manual also states that the assessor should consider the specific dietary habits of the potentially affected population and notes that "if that information is not available, the assessor should state that an attempt will be made to determine if this exposure pathway cannot be made without the information." Although the term "fillets" is not specifically defined, the general discussion in the manual indicates that this is eviscerated fish, as opposed to fish fillets.

.....
determined.

Recommendations:

- a. Further define the fish parts that will be included in the "whole body" samples.
- b. Characterize the potentially exposed populations with respect to methods of food preparation and parts of fish eaten.
- c. If feasible, collect and analyze both "edible portions" and "fillets" of the fish.

Work Plan

- 7. 2.2.5.4 (Surface Water and Sediment Investigation {site 1})

Comments:

a. Section 2.2.5.3 indicates that ground water was sampled for chromium (Cr_{total}) and hexavalent chromium (Cr⁺⁶) in 1986, and section 2.2.5.4 indicates that sediment was sampled for Cr_{total} and Cr⁺⁶. However, the Cr⁺⁶ results are neither provided in these sections nor in Appendix A. The text and Appendix A only list results for "chromium."

b. The carcinogenic and non-carcinogenic toxicity values for Cr⁺⁶ are significantly greater than those for trivalent chromium (Cr⁺³); therefore, speciation of chromium is important. Generally, sampling protocols do not require speciation for chromium analysis. As a result, the most conservative toxicity values (i.e., the values for Cr⁺⁶) are used to assess chromium risks. This often results in an overestimation of risk.

Recommendations:

a. Present ground water and sediment sampling results for hexavalent chromium in Appendix A. Discuss the results in the text.

b. If feasible, require speciation for chromium analyses in the WP and SAPP.

8. Pages 3-1 to 3-11, sections 3.1.2, 3.2.2 and 3.3.2 (Potential Exposure Pathways) and section 4.0 (Remedial Investigation/ Feasibility Study Objectives), Tables 4-1 through 4-3, (...RI/FS Objectives)

Comments:

a. The seventh bullet of the section 3.1.2 and 3.2.2 "exposure pathways" lists include human exposure to contaminants due to ingestion of contaminated aquatic organisms and terrestrial wildlife. Characterization of specific hunting activities at Marine Corps Base (MCB), Camp Lejeune is neither addressed in the SAAP nor in the WP. The text does not specifically state whether exposure pathways to be included in the human health risk assessment will include human exposures resulting from consumption of wild fowl and/or other wildlife.

b. Bob White quail, turkey, and deer are hunted on base. Hunting activities may or may not extend into the site. Evaluation of this pathway may not significantly impact the risk assessment; however, risks should be calculated for all completed pathways. If hunting activities are impacted by the site under investigation, risks from the consumption of wild animals should be assessed for all individuals who hunt at MCB, Camp Lejeune.

c. The section 4.0 ("RI/FS Objectives") for Sites 1 and 28 do not list any objectives for assessing potential exposures resulting from the consumption of aquatic or terrestrial wildlife. Justification for not including this objective for Site 1 appears to be given in Section 3.1.6.5, which states that "surface water and sediment data should be evaluated first to determine if aquatic life is being impacted." It is not clear why Site 28 objectives do not include consumption of wildlife.

Recommendations:

a. Discuss hunting activities on or around this site. If appropriate, assess risks related to the consumption of wild animals.

b. Include the assessment of potential exposure resulting from the consumption of aquatic or terrestrial wildlife in Tables 4-1 to 4-3.

9. Pages 3-1 to 3-11, sections 3.1.2, 3.2.2 and 3.3.2 (Potential Exposure Pathways) and section 4.0 (Remedial Investigation/ Feasibility Study Objectives)

Comment: Sections 3.1.2, 3.2.2 and 3.3.2 list "airborne fugitive particles released from potentially contaminated surface soil" as a potential exposure pathway. Air pathways involving exposure to volatile organic hydrocarbons (VOCs) are not listed in any of these three sections. Section 3.2.2 lists dermal contact and ingestion pathways for VOCs; however, an air pathway is not identified. Section 3.2.3 lists a potential exposure pathway as "human exposure to VOCs due to volatilization from groundwater and surface water." It is not known, but the intention may be to include the air pathway.

b. Since many of the spills that are being investigated are related to fuels, the air pathway may substantially contribute to human health risks. Contaminants of potential concern include volatiles and semivolatiles as well as organics (i.e., in fugitive dust pathways). Reference (a) states that semivolatiles and inorganics should be assumed to be airborne via suspended dust particles; it is not clear whether this has been considered.

c. During remediation efforts, air concentrations may be a substantial concern. The SAAP and the WP should include VOC emissions in the exposure assessment for airborne chemicals. If volatiles are not to be evaluated in the risk assessment, justification for their omission should be substantiated in the text.

Recommendations:

a. Evaluate all potential air pathways in the baseline risk assessment (e.g., volatiles and dust) or provide sufficient justification for their elimination.

b. Include volatiles and semivolatiles in the airborne pathway.

10. Page 5-46, section 5.7.1 (Human Health Evaluation Process), subsection 5.7.1.4 (Exposure Assessment [Identification of Potential Exposure Scenarios Under Current and Future Land Use]); and page 2-10, section 2.1.9 (Land Use)

Comments:

a. The first paragraph states that exposure scenarios will be developed "after consulting with the Base Master Plan, EPA and the State of North Carolina."

(1) We do not have a copy of the Base Master Plan; therefore, we cannot determine the extent to which each site is addressed in that plan. However, Base Master Plans that we have reviewed for other sites have been considerably less site-specific than the site work plans.

(2) Contacting the EPA or the state of North Carolina does not seem necessary prior to developing potential current and future exposure scenarios. A preliminary conceptual site model that notes pathways and receptors should be presented in the work plan.

b. Preliminary, generic exposure pathways are listed in bullet form. The exposure scenarios listed do not distinguish between current and future exposures. Since exposure pathways for these two scenarios (i.e., current and future) are not separated, we cannot conclusively agree with their existence. For example, a "residential scenario" is listed for soil pathways. This scenario is likely of concern only for potential future residents since the three sites addressed in this work plan are not currently used as residential areas; however, it is not clear. Current and future scenario pathway models should be presented separately, based on information known about the sites.

c. Section 2.1.9 presents information concerning current land use; however, information regarding potential future land uses is not provided. Although a subtitle within section 5.7.1.4 ("Exposure Assessment") is "Identification of Potential Exposure Scenarios Under Current and Future Land Uses," which implies that future land use will be addressed, it is not known whether future land use is being considered for the risk assessment.

d. Additionally, this and other sections of the WP address exposed populations as "worker, resident and recreational users." Section 2.1.9 addresses land use demographics for Camp Lejeune; however, not in terms of the sites under investigation. Site-specific information to characterize potentially exposed populations with regard to size and characteristics is not provided. Characterization of sensitive populations (e.g., infants and children, elderly people, hospital patients, etc.) and their locations in reference to the specific sites (e.g., nursing homes and child care facilities) are not addressed.

Recommendations:

a. Present a preliminary conceptual site model that notes pathways and receptors in the work plan.

b. Separately list the exposure pathways applicable to current and future exposure scenarios.

c. Address future land uses for each of the sites.

d. Provide site-specific information to characterize exposed populations with respect to location relative to the sites, activity patterns, and the presence of sensitive populations. Also identify any distant exposed populations, such as public water supply consumers and consumers of fish, shellfish or agricultural products impacted by the site.

11. Page 5-46, section 5.7.1 (Human Health Evaluation Process), subsection 5.7.1.5 (Toxicity Assessment)

Comment: This section states that "toxicity values will be derived for those chemicals for which none exist. A narrative summary will be provided in the risk assessment review concerning their derivation." The text does not state that toxicity profiles will be provided for all of the chemicals that are carried through the risk assessment. Section 7.7.1 of the RAGS manual states that a short description of the toxic effects of each chemical carried through the assessment, in non-technical language, should be prepared for inclusion in the main body of the risk assessment.

Recommendation: Specifically state that a short description of the toxic effects of each chemical carried through the risk assessment, in non-technical language, will be prepared for inclusion in the main body of the risk assessment.

9.2 Pages 5-41 to 5-59, section 5.7.1 (Human Health Evaluation Process)

Comments:

a. These pages provide short, generic discussions regarding exposure assessment, toxicity assessment, and risk characterization. The text basically states that guidelines presented in risk assessment documents, such as the RAGS manual, "will be followed." However, specific information is lacking.

b. Work plans should contain a separate human health risk assessment section which specifically describes the type of information that will be included in the risk assessment. Some of the types of information that should be included are:

(1) Identification of all potentially exposed populations; site-specific descriptions of tasks related to exposure pathways; present and potential future land uses; media that are or may be contaminated; locations of actual and potential exposure and present concentrations at appropriate exposure points.

(2) The equations, calculations, and default

assumptions used to determine exposures for all exposure scenarios (e.g., off-base, on-base, children, adults, current land use, future land use, etc.); to estimate exposure point concentrations (e.g., arithmetic mean, geometric mean, 95th percentile, etc.); to determine risk estimates (e.g., hazard quotients, and carcinogenic risk estimates).

(3) The reference doses (RFDs) and cancer slope factors (CSFs) used to determine contaminant toxicity values for exposure calculations.

(4) A discussion concerning the selection of data to be used for the risk assessment (e.g., the use and nonuse of "U", "J", and "UJ" qualified data).

(5) The selection criteria used to determine "compounds of concern" (e.g., comparison to background and frequency of detection statistics).

(6) An "uncertainty" section that addresses significant differences between actual site conditions and required default assumptions to determine risk (For example, to discuss the risk associated with a potential shallow ground water ingestion scenario; or the risk associated with proxy values being used for non-detection data).

(7) A discussion of the toxicity factors to be used to calculate risks for polycyclic aromatic hydrocarbons (PAHs). Note that reference (d) states that Region IV has adopted a toxicity equivalency factor (TEF) methodology for carcinogenic PAHs, based on each compound's relative potency to the potency of benzo(a)pyrene. The TEFs to be used for specific compounds are presented in reference (d).

(8) A description of the absorption factors to be used in determining risks associated with dermal exposure to contaminated soils. Reference (d) states that 1.0% should be used for organics and 0.1% should be used for inorganics.

(9) Presentation of the soil-to-skin adherence factors to be used to assess risks associated with dermal exposure. Reference (d) states that guidance provided in the RAGS manual (i.e., 1.45 to 2.77 milligram per square centimeter (mg/cm²)) should be changed to 0.2 to 1.0 mg/cm².

Recommendation: Discuss and/or present the information addressed above.

13
12. Pages 5-41 to 5-59, section 5.7.1 (Human Health Evaluation Process)

Comment: In addition to the information discussed above, the risk assessment section of the work plan should provide specific information on the presentation of results. (Data presentation in some of the documents we have reviewed effectively precludes analytical review.) Section 5.7.1.3 ("Data Summary") states that tables will be developed for each medium sampled, and data will be grouped according to organic and inorganic species within each table. More specific information should be provided:

(a) The format of the data summary tables should be specified in advance (e.g., the summary tables should list sampling numbers on the horizontal axis and provide the results for all TCL and TAL compounds analyzed on the vertical axis). This section could reference an appendix which provides the specific format of the tables.

(1) Exhibit 9-1 ("Suggested Outline for a Baseline Risk Assessment Report") of the RAGS manual (pages 9-4 to 9-8) should be used as a guide for the health risk assessment (HRA) report format. Exhibit 9-1 is fairly extensive and indicates the need to incorporate a considerable amount of specific information in the report.

(2) Exhibit 9-2 ("Example of Table Format for Cancer Risk Estimates") and Table 8-3 ("Example of Table Format for Chronic Hazard Index Estimates") of the RAGS manual illustrate specific formats for data presentation. The use of these formats enables reviewers to easily compare the variables in risk assessment equations.

(b) Reference (a) states that tables should contain the "frequency of detection, range of detects, average concentration and background concentration. The non-detects should not be incorporated into the average concentrations." The upper 95th percent confidence limits for each chemical detected in each medium should also be indicated.

(c) The method by which proxy values will be annotated on the data summary tables should be described (e.g., the use of 1/2 the SQL is generally adopted as the proxy value for non-detects). These data should be specifically annotated. Parentheses may be used to indicate substitute values (i.e., in addition to a "U" validation qualifier).

(d) The methodology and the specific sampling results used to "group" data (e.g., to derive average and upper-limit concentration values) should be clearly identified and/or shown on individual tables in the RI report; this section should state

that this information will be provided.

(e) The text should specify that all equations used to derive intermediate parameters of the risk equations will be provided; and that all default assumptions used in the individual risk equations will be provided/listed.

(f) The text should state that the risk summary tables will be presented in the format recommended in the RAGS manual (e.g., see Exhibits 8-3 and 8-4 on pages 8-8 and 8-9 of the RAGS manual.

Recommendation: Expand this section to include the specific information suggested in (a) through (f), above.

13. Page 5-50, section 5.7.1 (Human Health Evaluation Process), subsection 5.7.1.7 (Uncertainty Analysis), paragraph 2

Comments: The text discusses the development of Preliminary Remediation Goals (PRGs). The last sentence of the second paragraph states that "...a risk-based PRG will be considered a final remediation level only after appropriate analysis in the RI/FS and ROD [record of decision]. The statement is misleading:

a. It misstates EPA guidance, as presented in the *Risk Assessment Guidance for Superfund, Volume 1, Part B: Development of Risk-Based Preliminary Remediation Goals* (EPA/540/R-92/003, December 1991) (PRG manual). The PRG manual emphasizes that PRGs are based on default exposure assumptions, are therefore very conservative, and should be revised as site data are collected.

b. The current phraseology suggests that the initial PRGs will only be "appropriately analyzed" during the RI/FS. This is not equivalent to stating that the initial PRGs "will be revised as site specific data are acquired."

c. As is stated in the previous paragraph of section 5.7.1.7, risk-based PRGs are initial values, and do not establish that cleanup to meet these goals is warranted.

Recommendation: Rephrase the statement concerning PRGs to accurately reflect EPA guidance.

Attachment B
LANTDIV Comments and Responses on the
Draft Final RI/FS Project Plans for
Sites 1, 28, and 30 (Operable Unit No. 7)

ATTACHMENT B

**Response to Comments Submitted by LANTDIV
on the Draft Final RI/FS Project Plans for Sites 1, 28, and 30
(Operable Unit No. 7),
MCB Camp Lejeune, North Carolina
Comment Letter by Mr. William Mullen, P.G.,
Received by Baker Environmental, Inc. via Fax on 12-6-93**

Response to Specific Comments - Work Plan (Comments 1 through 28)

- 1) The first sentence in Section 2.2.3 will be revised from "have been utilized" to "were used", and "since" to "from".

The reference to military units will be revised.

- 2) No changes to the text is required - Six shallow monitoring wells were installed and sampled during the Confirmation Study at Site 1. Additionally a near-by potable water supply well, HP-636, was also sampled during the investigation. According to a USGS Report for MCB Camp Lejeune (Harned, et al. 1989), well HP-636 is 227 feet in depth and was drilled in 1959. Information regarding the construction method is not provided in the document, but it was most likely installed using mud rotary or cable tool drilling.
- 3) The depth to water described in the paragraph is presented as range and not as two different depths. Accordingly, the values presented in the text are correct.
- 4) The word "show" will be deleted from the text.
- 5) The word "contamination" will be replaced with the word "concentration".
- 6) No changes to the text required - Chloroform is the main chlorinated hydrocarbon produced during chlorination of "tap" water, and thus is present in small but definite amounts. The presence of low concentrations of this chemical in environmental samples is often attributable to laboratory analysis. During part of the analytical procedure, a syringe is used to introduce a volume of sample into a purging unit. The syringe and purging chamber are rinsed between samples with water, which requires reagent water, to prevent carry-over contamination. The "reagent" water used by some laboratories may be carbon treated deionized water (CTDI). If this practice is performed by the laboratory, removal of all organic contaminants may not be accomplished.

No changes to the text required - The laboratory water used for rinsing may not necessarily be in the water used to perform the laboratory blank. Additionally, common laboratory contaminants, or contaminants which are detected infrequently at low concentrations may be inherent to conditions at the time of analysis, and cannot be directly explained through examination of laboratory blanks.

- 7) Sample identification in the legend for the proposed background sampling locations will be added to Figure 5-1. In addition, please refer to the Field Sampling and Analysis Plan (FSAP) for a description of the analysis for these background samples.

The approximate groundwater flow direction defined on the figures is based on previous investigation data. This information will be included in the text.

- 8) No changes to the text required - The exploratory borings referenced in this paragraph are for soil classification purposes only and will only be drilled if fill material is encountered at the site. The purpose of these borings is to confirm the thickness of the fill material, if present, so that the samples collected for analytical testing represent native soils and not fill. Note that borings are proposed at the site for the collection of soil samples for analytical testing.
- 9) No changes to the text required - The total number of samples to undergo quick turnaround are specified in the FSAP. Please refer to the figures in Section 3.0 for the turnaround times.
- 10) No changes to the text required - The proposed control soil samples are not expected to be impacted by activities at the wash rack areas since the wash racks are situated approximately 700 feet away.
- 11) No changes to the text required - As stated in response number 8, the proposed exploratory borings will only be performed if fill material is encountered during the initial borings for sample collection. If the fill material is encountered, the exploratory borings will be drilled to confirm the thickness. Once the thickness is confirmed, the remaining borings will be drilled from which samples will be collected for analytical testing.
- 12) No changes to the text required - Please refer to response number 11.
- 13) The text was revised to state that 3550/5030 are extraction methods and the analysis will be performed by EPA Method 8015.
- 14) No changes to the text required - During the Baker groundwater sampling activities (May 1992), it was determined that monitoring well 1GW5 was damaged and could not be sampled. An attempt will be made during the RI to sample this well. If it is not possible to sample this well a new well, proposed well 1GW7, will be installed in its place. Please refer to Figure 5-2 for the location of well 1GW7.
- 15) The boundaries of the disposal areas will be added to Figure 5-2.

No changes to the text required - A groundwater contour map is shown in the Final Site Summary Report which is provided in Appendix A.1.

No changes to the text required - The text will be revised to explain the existence of wells 1GW14 and 1GW15.

No changes to the text required - The waste storage area was noted during the site visit along with three unknown monitoring wells in the area. Specific information on these wells could not be obtained through MCB Camp Lejeune EMD personnel. These wells are presumed to have been installed for monitoring the waste area. Since the wells are situated near the suspected disposal area (i.e., POL area), one of the wells will be resampled rather installing a new well.

- 16) No changes to the text required - The monitoring wells will be installed to account for seasonal fluctuations in the water table. At the time of well installation for these sites, which is expected to be in January and February, the water table is

generally at its seasonal low. Accordingly, the well screens will be installed three to four feet above the encountered water table to compensate for the seasonal high water table which typically occurs in the late spring to early summer.

No changes to the text required - The shallow wells to be installed, as part of the clusters, will be screened using the same criteria as other proposed shallow wells (i.e., installed approximately 12 to 15 feet below the top of the water table with a 15-foot screen). The placement of the well screen at this depth will allow for monitoring groundwater quality within the upper portion of the surficial water table aquifer. The deep monitoring wells will be screened within the upper portion of the Castle Hayne aquifer which is the main water supply aquifer for MCB Camp Lejeune. Accordingly, the purpose of setting the screen within the upper portion of the Castle Hayne is to determine whether the groundwater quality of the main water supply aquifer has been impacted by contamination due to site related activities.

No changes to the text required - The selection of no. 10 slot screen is based on past experience at MCB Camp Lejeune as well as inspection of grain size analysis. A no.1 sand will be used for the sand pack around the screen. Please refer to the FSAP for this information.

The "unknown wells" will be redeveloped prior to groundwater sampling activities. This information will be added to the text. The wells will be developed by using a combination pumping (centrifugal pump) and surging. Surging will be performed periodically during development by using a 1-inch PVC rod equipped with a stainless steel cap at the end.

- 17) No changes to the text required - Information regarding aquifer hydraulic characteristics, for both the shallow and deep aquifers, is available from previous aquifer tests which have been conducted near OU No. 7. These tests have included pump and recovery tests (performed by Baker at Hadnot Point) and slug tests performed within the surficial water table aquifer, and well performance tests which have been conducted at the water supply wells (installed within the deeper Castle Hayne aquifer).
- 18) During the surface water/sediment investigation, samples will be collected from upstream sampling stations first followed by downstream stations. This information will be added to the text.
- 19) MCB Camp Lejeune personnel will also be consulted prior to collecting additional samples during the investigation. This information will be added to the text.
- 20) The word "will" will be replaced with the word "may". Please refer to comment number 8 for additional information.

No changes to the text required - The total number of samples to undergo quick turnaround are specified in the FSAP. Please refer to the figures in Section 3.0 for the turnaround times.

No changes to the text required - Continuous split-spoon samples will be collected during drilling, however, not all of these samples will be submitted for laboratory analysis. Typically, a surface sample and the sample from just above the water table will be submitted for analysis. If, however, any residual waste material is

encountered during the soil investigation at Site 28, it will also be submitted for laboratory analysis.

As stated in the text, samples which appear to be the residual waste material will be submitted for analysis. Accordingly, if the material is noted within the split-spoon, it will be placed in the appropriate laboratory container.

- 21) The word "moreover" will be deleted from the text.
- 22) The words "more fully" will be deleted from the text.
- 23) The purpose of the test pits would be to further determine the thickness and extent of the waste material since information is currently unknown. Test pits may provide more detailed information compared to performing just soil test borings.

The samples obtained from the test pits will be collected directly from a backhoe bucket. The analysis to be performed will include full TCLP (metals and organics) and RCRA hazardous waste characteristics (i.e., corrosivity, ignitability, and reactivity). The text states that the width of the trenches will be dictated by the need for "visual examination" of the soils. A visual examination of the soils will be performed by the site geologist and will include soil classification (i.e., grain size, soil type, etc. and a description of the waste material). This information will be added to the text.

As mentioned above the samples will be collected from the backhoe bucket and, therefore, Baker personnel will not enter the test pit. This information will be added to the text.

The test pits will be backfilled and graded at the end of each day. This information will be added to the text.

- 24) Monitoring well 28GW6 should be a downgradient well and not an upgradient well as stated on Table 5-3. This change will be made on the table.
- 25) No changes to the text required. The deep monitoring wells will be installed within the upper portion of the Castle Hayne aquifer. The depth to the upper portion of the aquifer near OU No. 7 is estimated to be 100 feet below ground surface. As stated in the text, however, the final depth of the wells will be based several criteria which will be evaluated in the field.

Volatile organic levels - Split-spoon soil samples will be screened with an Hnu meter to measure for the presence or absence of volatile organic vapor. Subsequently, the well will be installed at a depth where the vertical extent of contamination is delineated based on the HNu readings.

Depth of the Castle Hayne aquifer - As mentioned above, the deep wells will be installed within the upper portion of the Castle Hayne aquifer, which is the main water supply aquifer for MCB Camp Lejeune. The upper portion of the Castle Hayne formation, from which the Castle Hayne aquifer is situated within, consists of a sandy limestone according a USGS Report for MCB Camp Lejeune. Split-spoon samples will be collected and the site geologist will note where this formation is encountered. Accordingly, the deep wells will be installed at a depth to sufficiently screen the upper portion of the Castle Hayne aquifer. Note that the length of the screen (estimated to be 10 to 20 feet in length) will depend on the

thickness of the sandy limestone encountered. By screening the sandy limestone, which is a fairly high transmissive unit, a sufficient volume of groundwater can be obtained for the environmental samples.

- The term "impede" is used to define a layer which may limit the movement of groundwater vertically. The determination of such a layer will be based on visual soil classification (using the Unified Soil Classification System as a reference) by the on-site geologist. If it is determined, through continuous split-spoon sampling, that a potential confining layer is present separating the two aquifers (surficial and Castle Hayne), and that the layer is at least three feet in thickness, then the layer will be cased-off and a Type III well will be installed. Subsequently, a screen will be set just below the confining layer so that the upper portion of the aquifer can be sampled. Setting the screen just below the clay will allow for the collection of a groundwater sample within the upper portion of the drinking water aquifer.

26) No changes to the text required - Baker is attempting to collect background soil samples at MCB Camp Lejeune for establishing base-specific background levels, particularly for inorganic constituents. A database is currently being generated, using background soil analytical data from sites investigated by Baker at MCB Camp Lejeune, to assist in future investigations. The area east of Site 30 is not used for industrial activities nor is it suspected of being impacted by contaminants. Furthermore, Site 30 is situated in one of the few areas to be investigated at MCB Camp Lejeune which is not located near an industrial setting. Subsequently, the five proposed background soil borings will be used to establish site-specific background levels, and will also assist in further developing base-specific background levels.

27) No changes to the text required - The approximate groundwater flow direction was estimated based on the assumption that groundwater near the site is flowing in the direction of French Creek (located west of the site). Accordingly, well 30GW3 would be upgradient from the suspected disposal area.

No changes to the text required - Lead was identified in both the downgradient well (30GW2) and the well near the source area (30GW1) in 1986 and 1993. Please refer to Figure 2-8 for the results of these sampling events.

No changes to the text required - Elemental metals are not highly soluble under normal groundwater conditions (i.e., pH, temperature), but particles of elemental metal may pose problems. The mobility of a metal as a hydrated ionic salt is dependent on cationic/anionic solubility relationships. As far as lead is concerned, the chloride (Cl^-), bromide (${}^7\text{Br}^-$), iodide (${}^7\text{I}^-$), and sulfate (SO_4) are not soluble thus reducing its mobility.

28) The statement "the samples will be analyzed within the maximum allowable holding times" will be deleted.

No changes to the text required - The appropriate samples will be collected and analyzed during the pre-design study if it determined, through the RI sampling investigation, that the groundwater is contaminated and will require remediation.

Response to Specific Comments - Field Sampling and Analysis Plan

No comments were received from LANTDIV on the Draft Final FSAP.

Response to Specific Comments - Quality Assurance Project Plan

No comments were received from LANTDIV on the Draft Final Quality Assurance Project Plan.

Response to Specific Comments - Site Health and Safety Plan

No comments were received from LANTDIV on the Draft Final Site Health and Safety Plan.

Comments to:

**Draft Final Remedial Investigation/Feasibility Study Work Plan for Operable Unit
No. 7 (Sites 1, 28, and 30)
Marine Corps Base, Camp Lejeune North Carolina**

For: Katherine Landman
Remedial Program Manager
Atlantic Division, Code 1823

By: William Mullen, P.G.
Technical Remedial Manager
Atlantic Division, Code 1824

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 6
To DAN BOWK	From WF Mullen	
Co. BAKER SNU.	Co. LANTDIV	
Dept.	Phone # 1-804-322-4588	
Fax # 1-412-269-2002	Fax #	

1. Page 2-13, Section 2.2.3. 1st sentence. Sentence "Both Sites 1-N and 1-S have been utilized by different Marine organizations since the late 1940s to the mid-1970s." is worded poorly. Change "have been utilized" to "were used", and change "since" to "from".
 - In the second sentence the reference to military units is incorrectly used. Armored personnel carriers (APCs) are *not military units*. Normally a military unit comprised mostly of APCs is called a *mechanized unit*, and a tank battalion is termed an *armored unit*.
2. Page 2-14, Section 2.2.5.3. Wording is poor in the first paragraph. The writing is not clear with respect to the sampling wells. Are there six shallow wells and a water supply well (HP-636) in the vicinity of the site? Was the water supply well sampled? If so, when was the well installed, and what well construction methods were used?
3. Page 2-20, Section 2.3.4. Different depth to water below ground surface distances are discussed in the last paragraph. Please clarify what levels are actually the correct ones.
4. Page 2-21 and 2-22, Section 2.3.5 Monitoring wells are inanimate objects and cannot "show" volatiles, contamination, or slides of their most recent vacation. Please change text.
5. Page 2-22, Section 2.3.5 last line of first paragraph. Should the word be "contamination" actually be *concentration*?
6. Page 2-28, Section 2.4.5.1. last paragraph. Statement is made that infers the presence of chloroform is attributable due to tap water.
 - Please describe how an EPA CLP laboratory would be using "tap water" during sample preparation?

- **If the presence of chlorine in lab water is due to laboratory contamination, the lab blank should also show a similar concentration. In addition, if other samples were analyzed in the same batch, then the results of the analysis would also indicate chloroform present in the other samples as well.**

7. Figure 5-1.

- Please add sample identifiers to proposed background sampling locations and define in the text which information/analysis will be collected at each background location.
- Please identify source of "approximate groundwater flow direction" arrows used on this figure. Were these from watertable elevations from monitoring wells at the site or based on other site/regional information?

8. Page 5-4, Section 5.4.1.2. Wording in third paragraph suggests that there is only the possibility of sample collection. Please clarify why the word "*may*" is used in association with exploratory test borings and soil sample collection. **If conditions exist which would prohibit test boring installation and sample collection, what plans exist to collect the required information using different methods?**

9. Page 5-4, Section 5.4.1.2. **Please specify the total number of quick turn-around samples to be collected and analyzed.**

10. Page 5-5, Section 5.4.1.2. Control samples are planned to be collected near fuel wash racks. Since POL are contaminants-of-concern for this site, how will potential contamination from operations in and around the wash rack be differentiated from contamination associated with past disposal practises? **Are any other potential sample locations available which would provide the necessary control information and reduce the potential for positive analytical results which are not associated with the investigation of past disposal practises?**

11. Page 5-4 and 5-5, Section 5.4.1.2. Continued use of the word "*may*" where others, such as 'will' or 'can' implies that *a significant chance exists for various tasks to not occur*. **If the proposed investigation can be changed by conditions encountered in the field, please outline how Baker intends on accomplishing all required tasks and collecting all required information.**

12. Page 5-6, POL and Acid and POL Disposal Areas Grind 1-N. Same comment as for Page 5-4.

X 13. Page 5-11, Section 5.4.1.2. Analytical Requirements, 1st sentence. The sentence "Samples will also be analyzed for TPH (EPA Methods 3550/5030)." implies that 3550 and 5030 are analytical methods. **THEY ARE NOT.** Method 3550 is a procedure for *extracting non-volatile and semi-volatile compounds from solids by sonication* and Method 5030 is a procedure for *extracting volatile compounds by purge and trap*. EPA Method 8015 is an analytical method that determines the concentration of

nonhalogenated volatile organic compounds by gc/ms. Using this analytical method is preferred over others since quantification of the components of TPH can be made and concentrations of nonhalogenated VOCs in soils can be correlated with similar results from the groundwater and surface water sample results. Please revise text accordingly.

14. Page 5-13, Section 5.4.1.3. If monitoring well 1GW5 is damaged, then it should either be repaired and sampled or abandoned. If the monitoring location is important to maintain data acquisition, then the well should be replaced. Please assess the value of the sampling point and the damage. **The well (1GW5) is of no value to MCB Camp Lejeune as it exists now.**

15. Figure 5-2.

- Why weren't the boundaries (as currently understood) of the disposal areas outlined on this figure to indicate the association of sampling locations and monitoring wells to be installed and sampled.
- Groundwater elevation data from previous studies should have been included with contours to present the logic behind the sampling locations selected.
- Please revise text to explain existence of wells 1GW14 and 15. Are these wells those described as unknown? **If not, where are the unknown wells located on Figure 5-2?**
- Is the waste storage area noted in the first paragraph related to past disposal operations, or is it a RCRA site with current monitoring? Please identify the history of the waste storage area, if possible, with respect to usage and status. **There is no need to sample a well installed in response to a release noted from that operation if it is not related to the present site investigation.**

Page 5-13, Section 5.4.1.3.

16. • Well construction descriptions for shallow monitoring wells indicates that the screened interval will split the water table with 12-15 feet below the watertable. And construction descriptions indicate that the well screens will be 15 feet in length, this means that up to 3 feet of screened interval will be set above the water table.. If the well screen length and placement are to *"allow for seasonal fluctuations in the water table which are known to vary from 2 to 4 feet at Camp Lejeune"*, **please explain how the proposed well construction does this.** If between 3 feet to 0 feet of the screened interval are set above the water table, and the water table fluctuates up to 4 feet, then at the seasonable high water table will be above **EVERY WELL SCREEN** for some time during the year! If wells are sampled during this time, potential bias sampling results could result.
- ✓ Please explain the idea behind well screen placement for the cluster wells (both shallow and deep wells).

- Please explain the well screen slot selection. Is there grain size analysis for this site to justify using 10 slot screen? Also, please identify what sand pack grain size.
 - Several wells are defined as unknown with respect to construction details. Are these wells going to be redeveloped prior to sampling? If not, why not, and if so, please provide proposed well development methods.
17. Page 5-16, Section 5.4.1.4. In describing data collection, **no plan for characterization of aquifer characteristics is mentioned**. Is this data already available?
18. Page 5-18, Section 5.4.1.5. Collection of sediment/surface water samples should be conducted from areas where lowest contamination levels are expected. Therefore, upgradient (background) sampling location should be sampled prior to the most downgradient sampling location.
19. Page 5-18, Section 5.4.1.5. Consultation for additional sampling requirements should include MCB Camp Lejeune personnel in addition to those listed.
20. Page 5-20, Section 5.4.2.2.
- 1st and second to last sentence of 1st full paragraph do not agree. Please change text.
 - Please specify the total number of quick turn-around samples to be collected and analyzed.
 - Last sentence of last paragraph implies two samples to be collected, one from the "burned zone" and one from the bottom of borehole. However, 1st sentence implies that continuous sampling (below 12" or asphalt) will be collected. **Please clarify.**
 - Please clarify how many of these samples will be sent for laboratory analysis. **Will sample handling practises allow for sample retention until the end of the boring before determination of which samples will be analyzed by the laboratory? This would allow a complete visual characterization of the extent of waste material within the boring.**
21. Page 5-22, Section 5.4.2.2. 1st paragraph, delete word "*Moreover*".
22. Page 5-22, Section 5.4.2.2. 2nd paragraph, delete words "*more fully*". These words imply that samples may have been "*less fully characterized*" elsewhere. Also, would ***MOST FULLY*** be used to describe those samples to undergo TCLP analysis since that analysis will be in addition to that described as more fully?
23. Page 5-22, Section 5.4.2.2. Last paragraph. Test pits are described as an optional service. However, no sampling task is identified with the test pits. **PLEASE** define sampling purpose for digging the test pits.

- How are samples to be collected from the test pits and what analysis is to be run on them? The text infers that visual characterization may be required of the waste material, how will this be achieved?.
 - If there is a slip/trip potential for entering the test pit, please insure that adequate safety measures are in place to limit potential hazard.
 - How long will the test pits be open and waste material exposed prior to backfilling?
24. Page 5-25 Table 5-3. Why are two additional shallow monitoring wells required to monitoring upgradient locations? Is this table wrong?
25. Page 5-26, Section 5.4.2.3. Please explain the section regarding deep monitoring well screen length with respect to well screen placement and screen length.
- Does this section mean that monitoring wells defined as deep wells may be installed above the Castle Hayne aquifer?
 - Is the term "impede" used to mean limit groundwater movement or limit contamination movement within groundwater?
 - If so, how will determination of confining layers within the sediments overlying the Castle Hayne aquifer be made. What type of geotechnical tests will be run on these potential confining layers? Please define hydrogeologic investigation which will characterized the hydraulic and contamination characteristics of the sediments underlying the site down to, and including, the upper portion of the Castle Hayne aquifer.
26. Page 5-34 Section 5.4.3.2 What reason is there for conducting 5 background soil borings? This represents almost 50 percent of the number of site specific soil borings (11). Please reduce the number or explain the logic behind requiring so much background data.
27. Page 5-36 Section 5.4.3.2. Two existing monitoring wells have been presented (Figure 5-7), groundwater flow *direction* cannot be estimated from two points. Two points define a line not the planar surface of groundwater. How was sampling location 30GW3 selected?
- Was lead identified in both the source and down gradient wells and during all sampling events?
 - The mobility of metals in groundwater is related to many factors, predominately groundwater chemistry. What evaluation has been conducted to determine that the migration potential of lead in groundwater is low at this site, either vertically and horizontally ?

28. Page 5-39 Section 5.4.3.2. The sentence *"The samples will be analyzed within the maximum allowable holding times."* is redundant and should be deleted since *samples must conform to CLP standards, which include holding time specifications.*
- Engineering parameters defined do not include aquifer characteristics required if any form of groundwater recovery or plume containment is needed. What analysis is going to be conducted to define characteristics to recover contaminated groundwater prior to treatment?

Attachment C
EPA Region IV Comments and Responses on the
Draft Final RI/FS Project Plans for
Sites 1, 28, and 30 (Operable Unit No. 7)

ATTACHMENT C

**Response to Comments Submitted by the
U.S. Environmental Protection Agency, Region IV
~~Risk Assessment Section~~
on the Draft Final RI/FS Project Plans for Sites 1, 28, and 30
(Operable Unit No. 7), MCB Camp Lejeune, North Carolina
Comment Letter by Ms. Gena Townsend,
Received by Baker Environmental, Inc. via Fax on 11-23-93**

Response to Specific Comments - Work Plan

No comments were received from EPA Region IV on the Draft Final Work Plan.

Response to Specific Comments - Field Sampling and Analysis Plan

The decontamination procedures for stainless steel sampling equipment to be used for the collection of soil samples (organic compounds and trace metals analyses) will be revised in the FSAP to concur with Section B.8.3 of the ECBSOP.

Response to Specific Comments - Site Health and Safety Plan

No comments were received from EPA Region IV on the Draft Final Site Health and Safety Plan.

Response to Specific Comments - Quality Assurance Project Plan

No comments were received from EPA Region IV on the Draft Final Quality Assurance Plan.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

NOV 16 1993

4WD-FFB

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Katherine Landman
Department of the Navy - Atlantic Division
Naval Facilities Engineering Command
Code 1823
Norfolk, Virginia 23511-6287

Re: Draft Final Remedial Investigation/Feasibility Study
Work Plan and Sampling & Analysis Plan - OU7

Dear Ms. Landman:

The Environmental Protection Agency (EPA) has reviewed the above referenced document dated October, 1993. EPA concurs with the document as submitted with one exception.

The comment addressing decontamination procedures of sampling equipment (#51), letter dated 8-24-93 to Ms. Linda Berry from Gena D. Townsend, referenced the proper procedures to follow as Section B.7 and B.8 of the ECB Standard Operating Procedure Manual (ECBSOP). The "response to comment", identified the proper procedure as Section B.3 of the ECBSOP.

Section B.7 and/or B.8 are the recommended procedures to follow when decontaminating equipment in the field. The procedures are more efficient and less time consuming in an uncontrollable (field) environment. Section B.3, which includes the use of Nitric Acid, is intended to be used in a control environment (laboratory).

If you have any questions or comments, please call me at (404) 347-3016.

Sincerely,

Gena D. Townsend
Senior Project Manager

cc: Mr. Patrick Watters, NCDEHNR
Neal Paul, MCB Camp Lejeune

Post-It™ brand fax transmittal memo 7671		# of pages	1
To	DAN BOK	From	KATE LANDMAN
Co.	BAKER	Co.	LANTDIV
Depl.		Phone #	(804) 322-4818
Fax #	(412) 264-2002	Fax #	(804) 322-4805

Attachment D
NC DEHNR Comments and Responses on the
Draft Final RI/FS Project Plans for
Sites 1, 28, and 30 (Operable Unit No. 7)

ATTACHMENT D

**Response to Comments Submitted by the
State of North Carolina DEHNR - Division of Solid Waste Management
on the Draft Final RI/FS Project Plans for
Sites 1, 28, and 30
(Operable Unit No. 7), MCB Camp Lejeune, North Carolina
Comment Letter by Mr. Patrick Watters,
Received by Baker Environmental, Inc. via Fax on 10-23-93**

Response to the General Comment

- 1) Per our telephone conversation on November 9, 1993, surface water/sediment samples collected in a nearby downgradient stream will be used to confirm the presence or absence of the suspected source area. In addition, quick turnaround soil samples (seven day turnaround) will also be used to evaluate the extent of contamination downgradient. If indications of contamination are present in the quick turnaround soil samples, the grid will be expanded and additional soil samples will be collected to further delineate the extent of contamination. Moreover, additional shallow monitoring wells may also be installed.

Response to Specific Comments - Work Plan (Comments 1 through 3)

- 1) The reference to the HIPA in the third sentence will be changed FCLDA.
- 2) Test pit excavations will be performed if the suspected waste material is noted within the first five feet below ground surface during drilling activities. Five feet was selected due to the high water table in the area which would limit the use of a backhoe for the excavations. This statement will be added to the Work Plan and FSAP.
- 3) The well identified as 1GW1 will be changed to 28GW1.

Response to Specific Comments - Field Sampling and Analysis Plan (Comments 4 through 10)

- 4) The term mitigation will be changed to migration. Additionally, airborne fugitive particles from contaminated surface soil will be added to the Exposure Pathways list.
- 5) Table 2-1 will be revised to include Sites 28 and 30.
- 6) The actual number of shallow wells to be installed is nine. These include 1GW7 through 1GW13, 1GW16S, and 1GW17S. Wells 1GW16S and 1GW17S will be installed as paired well clusters with deep wells. These changes will be made in the Final Work Plan and FSAP.
- 7) Supply Well HP-636 will be added to Table 3-2 in the FASP.
- 8) Section 3.2.3.3 will be renumbered as 3.2.2.3.

- 9) Well 1GW1 will be replaced with 28GW1.
- 10) Well 30GW1 will be sampled for engineering parameters. This change will be made in the FASP.

**Response to Specific Comments - Site Health and Safety Plan
(Comments 1 through 4)**

- 1) Page 5-2 - This radiation meter has two separate probes. The external probe is the Scintillator tube which has a setting for milliroentgen (m/R) per hour scale. This probe is used for higher energy gamma sources. Whereas, the GM Pancake internal probe is a different probe used with a separate setting on the instrument. The internal probe measures beta and lower energy gamma and registers as counts per minute.
- 2) The determination of protection levels and work stop scenarios based on air monitoring results are the result of reviewing and considering various factors, such as:
 - Previous work experience conducting these types of work tasks with the anticipated potential chemical concerns
 - The low concentration levels of contaminants determined from previous analytical results
 - These chemicals have been diluted in the various media and are not being handled in a pure form
 - The limited amount of time individuals are actually in situations where volatilization can occur
 - The rapid dispersion of a contaminant outdoors.

Based on these factors and the fact that conservative air monitoring results would trigger protection upgrades or work stoppage, the protection levels assigned are safe.
- 3) The revised HASP states that "if vinyl chloride is detected in the breathing zone with Drager tubes, work will stop, and the Project Health and Safety Officer will then be consulted".
- 4) Based on previous analytical results, the site history, and work tasks planned, the established personal protection levels and work stoppage situations presented in Section 5.1 are safe.

Response to Specific Comments - Quality Assurance Project Plan

No comments were received from NC DEHNR on the Draft Final Quality Assurance Project Plans.

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary



November 23, 1993

Commander, Atlantic Division
Naval Facilities Engineering Command
Code 1823-2
Attention: MCB Camp Lejeune, RPM
Ms. Katherine Landman
Norfolk, Virginia 23511-6287

Commanding General
Attention: AC/S, Environmental Management
Building 67, Marine Corps Base
Camp Lejeune, NC 28542-5001

RE: Draft Final Remedial Investigation Feasibility
Study Work Plan, Sampling and Analysis Plan, and
Health and Safety Plan for Operable Unit #7 (sites
1, 28, and 30)

Dear Ms. Landman:

The referenced documents have been received and reviewed by
the North Carolina Superfund Section.

Our comments are attached. Comments on the Health and Safety
Plan are attached as a memorandum from David Lilley, our Industrial
Hygienist, to myself. Note also that the Health and Safety Plan
comments were also provided on the draft version of the document.
Please call me at (919) 733-2801 if you have any questions about
this.

Sincerely,

Patrick Watters

Patrick Watters
Environmental Engineer
Superfund Section

Attachment

cc: Gina Townsend, US EPA Region IV
Neal Paul, MCB Camp Lejeune
Bruce Reed, DEHNR - Wilmington Regional Office

North Carolina Superfund Comments
Camp Lejeune MCB Operable Unit 7 RI/FS Project Plans

General

It was noted in the Work Plan and the Sampling and Analysis Plan that only 1 well is planned to be used to evaluate shallow groundwater downgradient of the suspected source area for Site 30. Recent discussions with LANTDIV and Baker Environmental indicated that this would be acceptable due to the use of the surface water/sediment samples at the nearby stream and because there is considerable uncertainty as to whether or not this is the real source area. It was indicated that a statement would be added to the Final version of these plans to consider additional groundwater monitoring if warranted based on the results of the soil sampling program.

RI/FS Work Plan Specific Comments

1. Page 3-2, Section 3.1.4.1
The reference to the HPIA in the third sentence should be FCLDA.
2. Page 5-22, Section 5.4.2.2
Regarding the need for trenching, the Work Plan is not clear when this would be used. This section indicates that trenching would be used to further characterize the nature of the waste material, if present. Clarify how the presence of waste material is to be determined (i.e. analytical results, visual inspection of the samples, etc.).
3. Page 5-27, Section 5.4.2.3
The well identified as 1GW1 should be 28GW1.

RI/FS Sampling and Analysis Plan (S&AP)

4. Page 1-28 and 1-29, Section 1.2.3.2
The use of the term "mitigation" should be "migration". Also, the Exposure Pathways list does not include the airborne fugitive particles from contaminated surface soil as a potential pathway as noted on Page 3-10 of the Work Plan.
5. Page 2-2, Table 2-1
This table does not include the RI/FS objectives for Sites 28 and 30 (see Table 4-1 of the Work Plan).
6. Page 3-8, Section 3.1.3.1
The description of the monitoring wells for Site 1 indicates that at least 7 shallow wells will be installed during the RI. The Work Plan indicates at least 8 will be used.
7. Page 3-9, Table 3-2
The HP-636 supply well is included in Table 5-2 of the Work plan but not in Table 3-2.

8. Page 3-17, Section 3.2.3.3
This section should be numbered 3.2.2.3.
9. Page 3-21, Section 3.2.3.2
The well identified as 1GW1 should be 28GW1.
10. Page 3-29, Section 3.3.3.2
This section indicates that one groundwater sample from 30GW3 will be analyzed for engineering parameters. The Work Plan indicates that well 30GW1 will be used for the engineering parameters sample.

November 8, 1993

TO: Patrick Watters

FROM: David Lilley

DBL

RE: Comments prepared on the Draft Final Remedial Investigation/Feasibility Study Health and Safety Plan for Operable Unit No. 7 (Sites 1, 28, and 30), MCB Camp Lejeune, NC

After reviewing the above mentioned document, I offer the following comments:

1. Page 5-2: It is unclear to the reader what information is being conveyed by differentiating between external and internal probes for radiation survey meters.
2. Cartridge respirators are not recommended for use on site 1 because 1,1,2,2-tetrachloroethane has inadequate warning properties.
3. Cartridge respirators are not recommended for use on site 28 because manufacturer's literature states that cartridge respirators should never be used to protect against vinyl chloride.
4. Page 5-1: How sure are you that the chemicals listed on Table 3-1 are the only chemical contaminants present on site 30? If the site has been extensively sampled and you are very sure these are the only contaminants present, level C protection may be appropriate. If not, level C will not be appropriate.

DL/dl/wpcommen.doc/21

Attachment E
MCB Camp Lejeune EMD Comments and
Responses on the Draft Final RI/FS Project
Plans for Sites 1, 28, and 30
(Operable Unit No. 7)

ATTACHMENT E

**Response to Comments Submitted by the
Marine Corps Base, Camp Lejeune
Environmental Management Department
on the Draft Final RI/FS Project Plans for Sites 1, 28, and 30,
(Operable Unit No. 7), MCB Camp Lejeune, North Carolina
Comment Letter by Ms. Kate Landman Code 1823,
Received by Baker Environmental, Inc. via Fax on 11-18-93**

Response to Specific Comments - Work Plans

No comments were received from the Activity on the Draft Final Work Plan.

Response to Specific Comments - Field Sampling and Analysis Plan

- 1) The title "Field Sampling and Analysis Plan" will be added to the spine of the document.
- 2) A sentence will be added in the section describing well construction details that states that the four protective bollards will be installed outside the concrete pads. This information will also be added to Figures 5-1 and 5-2.

Response to Specific Comments - Site Health and Safety Plan

No comments were received from the Activity on the Draft Final Site Health and Safety Plan.

Response to Specific Comments - Quality Assurance Project Plan

No comments were received from the Activity on the Draft Final Quality Assurance Project Plan.

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 1
To WACT HAVEN	From KATE LANDMAN	
Co. CAMP LEJEUNE	Co. LANTDIV	
Dept. EMD	Phone # (804) 322-4818	
Fax # 910-451-1164	Fax # (804) 322-4805	

WACT- 2/1/94
I'M NOT SURE IF I EVER
FAXED THESE RESPONSES ON
YOUR COMMENTS TO YOU —
SORRY FOR THE DELAY.

- KATE



INSTALLATION RESTORATION



UNITED STATES MARINE CORPS
ENVIRONMENTAL MANAGEMENT DEPARTMENT
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

Post-It™ brand fax transmittal memo 7671		# of pages > 14
To DAN BOK	From KATE LANDMAN	
Co. BAKER	Co. LANTDIV	
Dept.	Phone # 804-322-4818	
Fax # 412-269-2002	Fax # 804-322-4805	

1) 322-4805

FROM: WALTER T. HAVEN (GEOLOGIST)

COMMENTS: ENCLOSED ARE COMMENTS FROM THE OU # 10 RI/FS HASP, SAP, AND WORK PLAN. IN ADDITION, COMMENTS FROM THE OU # 7 RI/FS SAP ARE ENCLOSED AS WELL. WE HAVE REVIEWED THE OU # 7 RI/FS HASP AND WORK PLAN AND HAVE NO COMMENTS. - THANKS - WALT.

DAN-
I GOT YOUR TUES. FAX ABOUT CTD-160. I THINK I CAN TAKE CARE OF IT FROM THIS END. I'LL CALL YOU IF I NEED MORE...

M WITH THIS TRANSMISSION, PLEASE CALL (919) 04 (DSN 484-5063). OUR FAX NUMBER IS (919) 451-1164 (DSN 484-1164).

THANKS,
- KATE

PAGE 1 OF 14 PAGES

11/18/93

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P.12

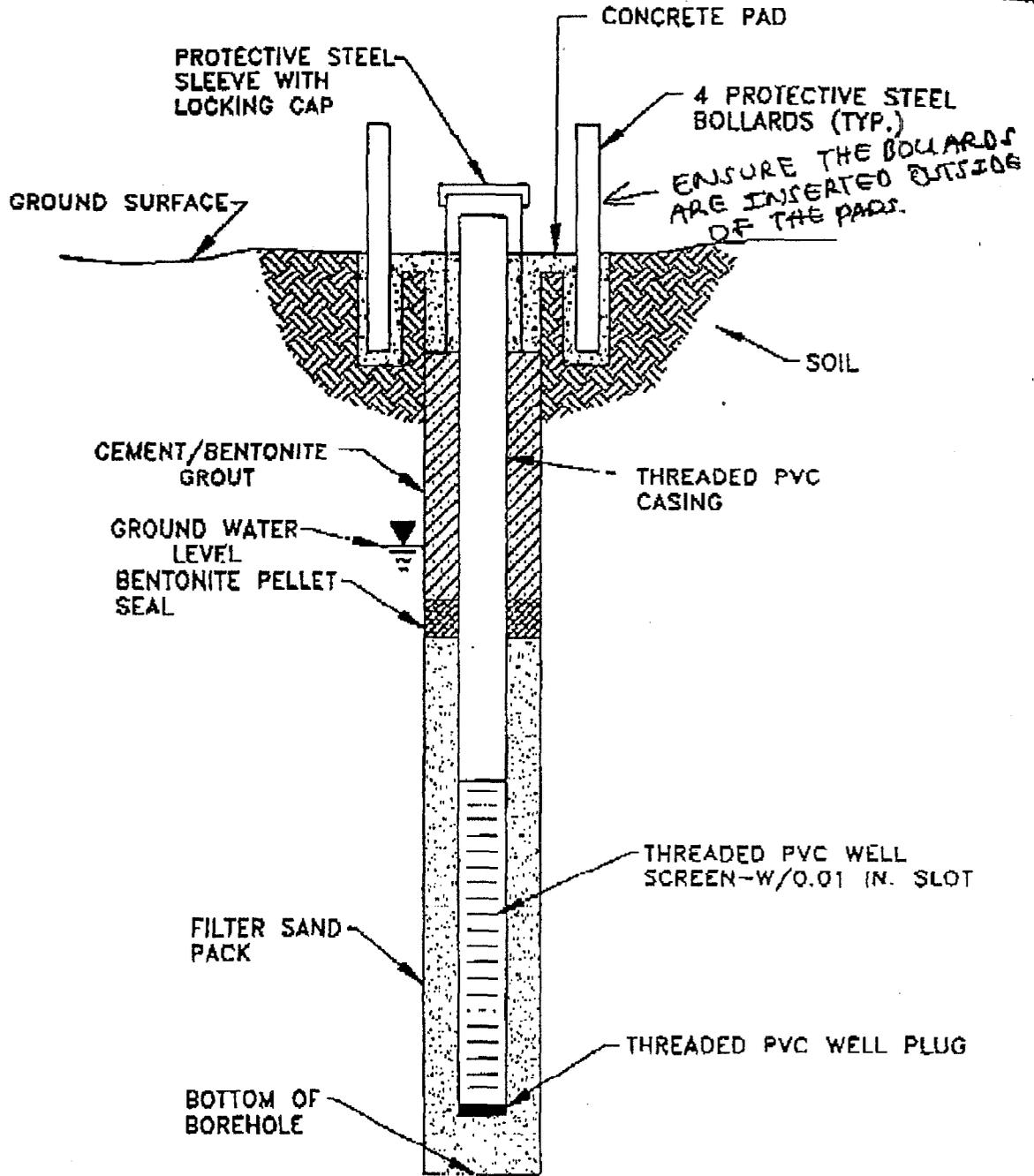


Draft Final
Remedial Investigation / Feasibility Study
for Operable Unit No. 7
(Sites 1, 28, and 30)
Marine Corps Base, Camp Lejeune,
North Carolina
SAMPLING AND ANALYSIS PLAN



FOSTER WHEELER
ENVIRONMENTAL CONSULTANTS, INC.





N.T.S.



FIGURE 5-1
 TYPICAL SHALLOW AND DEEP ABOVE GRADE TYPE II GROUNDWATER
 MONITORING WELL CONSTRUCTION DIAGRAM
 SITES 1, 28, AND 30

MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

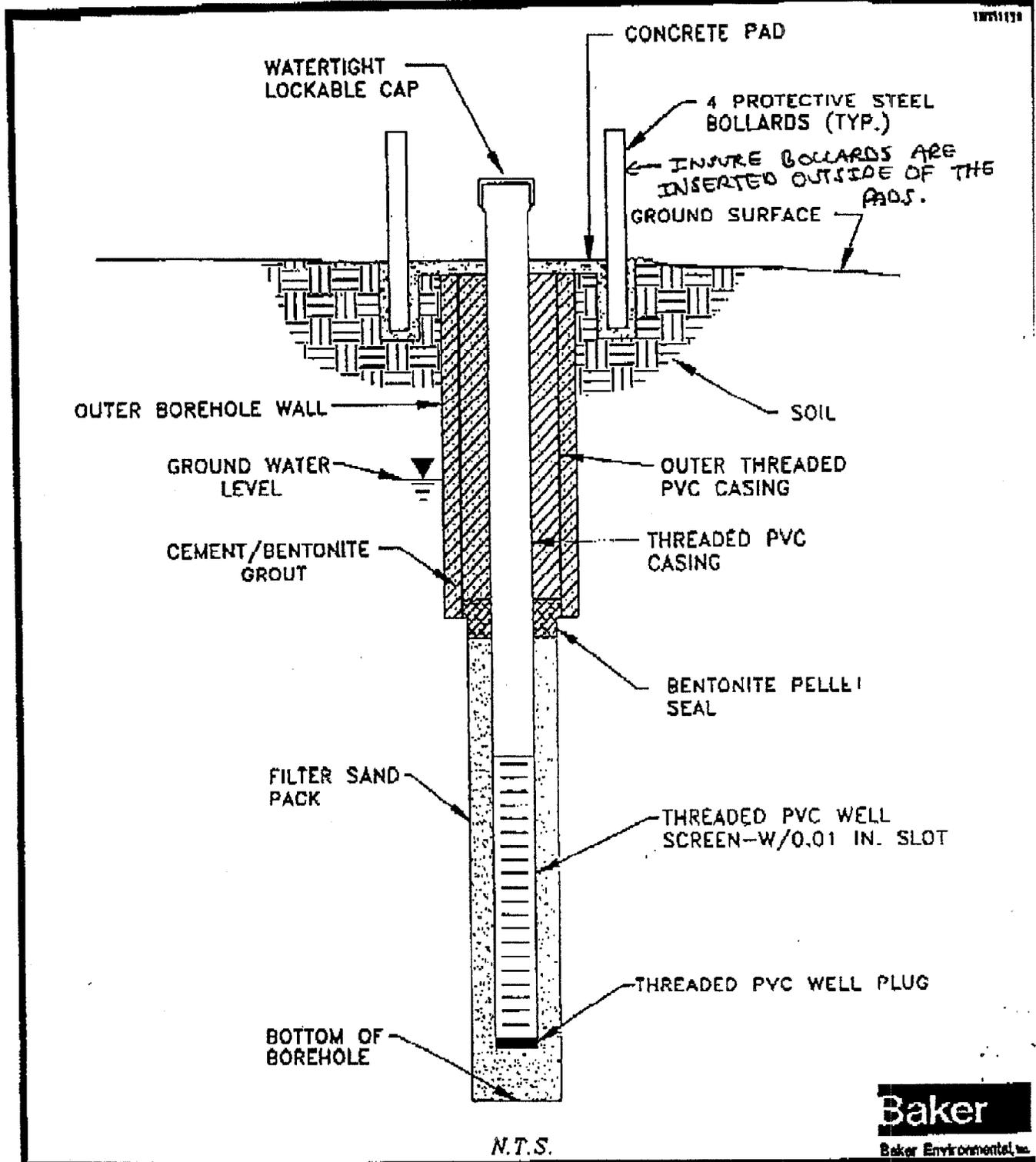


FIGURE 5-2
 TYPICAL DEEP ABOVE GRADE TYPE III GROUNDWATER
 MONITORING WELL CONSTRUCTION DIAGRAM
 SITES 1, 28 AND 30

MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA