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Baker

Baker Environmental, Inc.
Airport Office Park, Building 3
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Coraopolis, Pennsylvania 15108

(412) 269-6000
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June 20, 1994

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

Attn: Mrs. Brenda Norton, P.E.
Code 1822

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0209
Final Terrestrial Receptor Evaluation and
Aquatic Biological Monitoring Position Papers
Naval Weapons Station Yorktown, Yorktown, Virginia

Dear Mrs. Norton:

Baker Environmental (Baker) is pleased to submit final copies of the Aquatic Biological Monitoring and Terrestrial Receptor Evaluation Position Papers for Naval Weapons Station Yorktown, Yorktown, Virginia (WPNSTA Yorktown). A total of four copies have been sent to the U.S. Environmental Protection Agency (USEPA) Region III; two copies have been sent to the Virginia Department of Environmental Quality (VDEQ); and five copies have been sent to WPNSTA Yorktown for placement in appropriate repositories.

Should you have any questions, please do not hesitate to contact me (412) 269-2099.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Richard F. Hoff
Activity Coordinator

RFH/jc

cc: Ms. Jennifer Loftin, WPNSTA Yorktown (5 copies)
Ms. Ollie Glodis, Code 02116 (w/out enclosures)

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(412) 269-6000
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June 20, 1994

U.S Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

Attn: Mr. Robert Thomson, P.E.
Remedial Project Manager (3HW71)

Re: Contract N62470-89-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0209
Final Terrestrial Receptor Evaluation and
Aquatic Biological Monitoring Position Papers
Naval Weapons Station Yorktown, Yorktown, Virginia

Dear Mr. Thomson:

Baker Environmental, Inc. (Baker) is pleased to provide four copies of the Aquatic Biological Monitoring Position and Terrestrial Receptor Evaluation Position Papers. Comments submitted by Mr. Bob Davis, USEPA Region III BTAG Coordinator on June 2, 1994 were considered in both documents.

Should you have any questions concerning this document, please do not hesitate to contact Mrs. Brenda Norton at (804) 322-4778 or me at (412) 269-2099.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Richard F. Hoff
Activity Coordinator

RFH/jc

cc: Ms. Lisa Ellis, VDEQ (2 copies)
Mrs. Brenda Norton, LANTDIV (w/out enclosures)

AQUATIC BIOLOGICAL MONITORING POSITION PAPER
NAVAL WEAPONS STATION YORKTOWN, YORKTOWN, VIRGINIA
JUNE 15, 1994

Purpose

The purpose of this position paper is to present the selected approach for monitoring the aquatic biota at the Naval Weapons Station Yorktown (WPNSTA Yorktown), Yorktown, Virginia as part of the Station's Remedial Investigation and Feasibility Study (RI/FS) program. This aquatic biological monitoring program (ABMP) will be used in conjunction with the ecological risk assessment process to ensure that the selected remedy included in each RI/FS site-specific or operable unit-specific Record of Decision (ROD) meets the statutory requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1986 (SARA). Specifically, Section 121 of CERCLA states that the selected remedy must be protective of the environment, comply with Applicable or Relevant and Appropriate Requirements (ARARs) or justify an ARAR waiver, be cost-effective, utilize permanent solutions and alternative technologies, and reduce toxicity, mobility or volume of the site-related contamination.

Rationale

The technical approach for the evaluation of risks to the aquatic ecosystem at each RI/FS site includes a sampling program to be conducted on a site-specific reach basis. The site-specific reach is defined as the segments of Felgates Creek, Ballard Creek, Indian Field Creek, or King Creek that are associated with each site with the upstream and downstream limits delineated by the location of applicable sampling stations. Each of the RI/FS site sampling programs includes surface water and sediment analyses and biosurveys. The results of these sampling programs will be used in each site-specific ecological risk assessment to evaluate potential risks to aquatic receptors from releases of site-related sources of contamination. Also, this sampling program will provide the necessary information to determine whether there are secondary contaminant sources within the reaches of the creeks. If results from the RI/FS sampling, Phase I, indicate elevated concentrations of constituents of concern and/or possible population stresses, then an

additional round of sampling, Phase II, may be added. Phase II sampling may include bioassays and tissue sampling. EPA Region III representatives will be asked to provide additional guidance if necessary.

The fiscal year (FY) 94-95 site management plan requires that field sampling programs be completed at the identified RI/FS sites by January 1998. Thus, within four years from the start of these investigations, all the RI/FS site-specific reaches of Felgates Creek, Ballard Creek, and Indian Field Creek will be sampled.

In addition to the RI/FS site-specific reaches that will be investigated, the FY 94-95 site management plan requires that surface water and sediment samples be collected as part of the Site Screening Area (SSA) investigations. These investigations will be completed at the identified SSAs by September 1997. Thus, within three years from the start of these investigations, all the SSA-specific reaches of Felgates Creek, Ballard Creek, Indian Field Creek, and King Creek will be sampled.

The RI/FS site investigations and the SSA investigations, along with historical investigations conducted previously and any subsequent new RI/FS site (formerly SSA) investigations, will establish a comprehensive aquatic chemical and biota database at WPNSTA Yorktown. This database will be used as a baseline for the ABMP to ensure that the selected remedy in the ROD meets the statutory requirements of Section 121 of CERCLA.

Approach

An ABMP may be implemented as part of the selected remedy. The program will monitor the integrity of the aquatic ecosystem within the RI/FS site-specific reach to determine what effect the selected remedy, including no-action, will have on the reach. It is recognized that there will be a delay between the final ROD and final design and construction of the selected remedy, and, therefore, the effects of the selected remedy.

The ABMP will include a selected subset of stations from the RI/FS site-specific reach investigations and SSA-specific reach investigations of Felgates Creek, Ballard Creek, Indian

Field Creek, and King Creek. The selection of stations for the ABMP will be based on the results of the baseline database. If the baseline database for a site-specific reach does not indicate either detectable concentrations of contaminants of concern or risks to aquatic receptors, a monitoring station will not be located within this site-specific reach. However, it is recognized that a minimum number of monitoring stations may be necessary for the ABMP.

The ABMP will include sampling of surface water, sediments, and biota at each station. The chemical sampling portion of the ABMP will be limited to those contaminants that were identified as contaminants of concern, were detected in the previous reach investigations, and pose a significant risk to aquatic receptors. The first ABMP sampling event will occur in the summer after the final ROD for Site 12 (due March 1997). Monitoring will be conducted on a triennial basis with all stations sampled concurrently in the months of July and August to ensure temporal compatibility with the existing baseline database. Therefore, as new RODs are finalized and their new stations are incorporated into the monitoring program, as applicable, the sampling of these stations will occur in the subsequent triennial sampling year (i.e. summer, 2000).

The FY 94-95 site management plan requires that the RODs be completed at the identified RI/FS sites by September, 2000. Thus, within seven years from the start of these investigations, all the RI/FS site-specific reaches of Felgates Creek, Ballard Creek, and Indian Field Creek will be sampled at least once as part of the WPNSTA Yorktown aquatic biological monitoring program.

Section 121 of SARA requires a review of the site <u>at least every five years</u> to assure continued protection of human health and the environment if any hazardous substances remain on site following the remedial action. Therefore, every five years, the aquatic biological monitoring program database will be reviewed and the results will be evaluated in an aquatic biological monitoring program report. SARA guidance further states that this requirement extends the post-closure care requirements indefinitely by continuing to test the viability of on-site remedial measures that do not destroy all hazardous substances and to determine whether additional action is appropriate. There is no de minimis exclusion provisions. This requirement for periodic reassessment reflects the preference of SARA for permanent treatment.

TERRESTRIAL RECEPTOR EVALUATION POSITION PAPER
NAVAL WEAPONS STATION YORKTOWN, YORKTOWN, VIRGINIA
JUNE 15, 1994

Purpose

The purpose of this position paper is to present the selected exposure assessment approach that will be used to evaluate the risks to terrestrial receptors (wildlife) at Remedial Investigation and Feasibility Study (RI/FS) sites at the Naval Weapons Station Yorktown (WPNSTA Yorktown), Yorktown, Virginia. This wildlife exposure assessment approach will be used in the ecological risk assessment process to ensure that the selected remedy included in each RI/FS site-specific or Operable Unit-specific Record of Decision (ROD) meets the statutory requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1986 (SARA). Specifically, Section 121 of CERCLA states that the selected remedy must be protective of the environment, comply with Applicable or Relevant and Appropriate Requirements (ARARs) or justify an ARAR waiver, be cost-effective, utilize permanent solutions and alternative technologies, and reduce toxicity, mobility or volume of the site-related contamination.

Rationale

The selection of this methodology is the most cost-effective and appropriate method for characterizing the exposure of wildlife at WPNSTA Yorktown. The RI/FS sampling program will provide the necessary environmental media concentrations of the site-related contaminants for input into the exposure equations. In addition, this wildlife exposure assessment approach follows the same format as the guidance provided by the Superfund program for human health exposure assessments.

The Framework for Ecological Risk Assessment (USEPA, 1992) defines exposure as the co-occurrence of or contact between a stressor and an ecological receptor. Ecological risk assessment guidance similar to that available for human health risk assessments [i.e. Risk Assessment Guidance for Superfund - Volume I, Human Health Evaluation Manual (USEPA,

1989a)] is now available in the Wildlife Exposure Factors Handbook (USEPA, 1993). This guidance provides exposure factors, references, and exposure dose equations for conducting exposure assessments for wildlife species exposed to contaminated environmental media. This guidance significantly improves the conduct of exposure assessments for wildlife and supports the quantification of risk estimates. It is a companion to the Exposure Factors Handbook (USEPA, 1989b), which contains information necessary for quantifying exposure to humans.

Approach

For the wildlife exposure assessments to be conducted at WPNSTA Yorktown, the selected approach is to assess exposure using environmental media contaminant concentrations and exposure factors to estimate contaminant-specific intakes or doses for all the most prevalent ecological receptors. The environmental media include soil, surface water, sediments, and potential food sources. The contaminant concentrations in the dietary food sources will be estimated using bioaccumulation and uptake models. This estimated exposure of wildlife to site-related contaminants and background contaminants will be compared to terrestrial reference toxicity values. These values reference intakes or body burdens that will not cause adverse effects in exposed wildlife. The comparison to background contaminant levels will provide an estimate of the relative risk posed by the site in addition to the magnitude of the site-related risks.

If estimated doses fall far below the terrestrial reference toxicity values associated with adverse effects, especially from chronic exposures, further assessment will be unnecessary. If estimated doses exceed the terrestrial reference toxicity values, it may be necessary to determine appropriate risk management actions on the basis of these estimates.

When an exposure assessment indicates the potential for adverse effects due to the estimated dose and the terrestrial reference toxicity value being approximately equal, additional investigations may be warranted rather than proposing remediation. These investigations may include:

- Refinement of the exposure analysis based on more site-specific data for the species of concern.

- Compilation of observed field data on the incidence of disease, reproductive failure, or death of exposed wildlife.

- Completion of bioassays and/or tissue sampling.

USEPA (United States Environmental Protection Agency) 1989a. Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response. Washington, D.C. EPA/540/1-89/002. December 1989.

USEPA (United States Environmental Protection Agency) 1989b. Exposure Factors Handbook. Office of Health and Environmental Assessment. Washington, D.C. EPA/600/8-89/043. July 1989.

USEPA (United States Environmental Protection Agency) 1992. Framework for Ecological Risk Assessment. Risk Assessment Forum. Washington, D.C. EPA/630/R-92/001. February 1992.

USEPA (United States Environmental Protection Agency) 1993. Wildlife Exposure Factors Handbook Volume I and II. Office of Research and Development. Washington, D.C. EPA/600/R-93/187a. December 1993.