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June 29, 2000

U. S. Environmental Protection Agency
Region II Headquarters
Chief, RCRA Caribbean Section
290 Broadway - 22nd Floor
New York, NY 10007-1866

Attn: Ms. Nicoletta DiForte

Re: Contract N62470-95-D-6007
Navy CLEAN, District III
Contract Task Order (CTO) 0033
U.S. Naval Station Roosevelt Roads, Puerto Rico
RCRA Corrective Action Program
RCRA/HSWA Permit No. PR2170027203
Response to Comments Received in EPA Letter Dated January 21, 2000
Regarding the Revised Corrective Measures Study (CMS) Task I Report
for Tow Way Fuel Farm (SWMUs #7 & #8)

Dear Ms. DiForte:

Baker Environmental, Inc. (Baker) on behalf of the Navy is providing you this letter in response to your comment letter dated May 4, 2000. The Navy has reviewed EPA's comments in regards to the Revised Corrective Measures Study (CMS) Task I Report for the Tow Way Fuel Farm (SWMUs #7 & #8) dated January 21, 2000. This letter provides the Navy's responses to USEPA comments and discusses how the Navy proposes to address the comments given in Enclosure 1 (March 15th Technical Review) of your letter. The Navy will not incorporate these comments in draft CMS Final Report until EPA provides notification that these responses are acceptable. Please note that the EPA comments are included in Italics before each response for ease of review.

Please do not hesitate to call me at (412) 269-2009 or Mr. Christopher T. Penny at (757) 322-4815 if you have any questions or desire further clarification of any of the points discussed in the enclosed response to comments.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Mark E. Kimes, P.E.

MEK/lp

cc: Mr. Tim Gordon, US EPA Region II
Ms. Madeline Rivera - NSRR
Ms. Luz A. Muriel Diaz – PREQB
Mr. Christopher T. Penny – LANTDIV (Code 18231)
Mr. John Tomik, CH2M Hill
Mr. Carl Soderberg, US EPA Carribean Office
Ms. Connie Crossley, Booz Alen & Hamilton

bcc: CF; PRGM F; MEKimes/PJT F;
JCEdel; KTWood; Daily File
S.O. 26007-033-0000-SRN
Subfile#
Initials JCE

US NAVY RESPONSES TO USEPA COMMENTS (Dated May 4, 2000) ON THE CORRECTIVE MEASURES STUDY TASK 1 REPORT, TOW WAY FUEL FARM, NAVAL STATION ROOSEVELT ROADS ,CEIBA, PUERTO RICO, JANUARY 21, 2000.

USEPA GENERAL COMMENT
Revised CMS Task 1 Report for Tow Way Fuel Farm

EPA requested our contractor, Booz Allen & Hamilton to review the revised CMS Task 1 Report as well as Baker Environmental's letter of January 21, 2000 regarding Responses to EPA's letter of June 30, 1999 on the CMS Task 1 Report. Based on those reviews and reviews by EPA Region 2 staff, EPA finds the responses in Baker Environmental's January 21, 2000 letter to generally be adequate, but not in all cases. Although Booz Allen in its review concluded that the CMS Task 1 report "identifies an appropriate technical approach to address releases to soil and groundwater at the Tow Way Fuel Farm site"; they had deficiency comments on the Task 1 report, as well as on Baker Environmental's January 21, 2000 letter. Based on those comments, which are given in the enclosed March 15, 2000 Technical Review (Enclosure 1), and reviews by EPA Region 2 staff, EPA cannot fully approve the submitted Task 1 report.

Rather than submitting a revised Task 1 report at this stage, EPA requests that, within 45 days of your receipt of this letter, the Navy submit a "response to comments" letter discussing how the Navy proposes to address the comments given in the enclosed March 15°' Technical Review (Enclosure 1). If acceptable to EPA, those responses [to comments given in the enclosed March 15'x' Technical Review] would then be incorporated/reflected in the draft CMS Final report for Tow Way Fuel Farm, when submitted. However, since pilot-testing of several remedial alternatives for cleaning-up Tow Way Fuel Farm is still on-going, a firm date for submission of the draft CMS Final report has not yet been set.

Navy Response:

This document provides the responses to the Technical Review performed by Booz Allen & Hamilton as provided below.

USEPA CONSULTANT COMMENTS:
BOOZ ALLEN & HAMILTON COMMENTS ON THE CORRECTIVE MEASURES STUDY TASK 1 REPORT, TOW WAY FUEL FARM, NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO, JANUARY 21, 2000.

GENERAL COMMENTS

1. *Overall, the Revised Draft Corrective Measures Study Task 1 Report for Tow Way Fuel Farm (CMS Task Report) identifies an appropriate technical approach to address releases to soil and groundwater at the Two Way Fuel Farm site. The CMS Task 1 Report provides sufficient documentation to support the selection of soil cleanup levels based on the protection of commercial/industrial workers, and sufficient documentation to support selection of groundwater cleanup levels (except for benzene) based on the protection of construction workers involved in*

excavation activities, given that institutional controls will be in place to prohibit future military residential property development at the site. However, despite the overall acceptability of the approach proposed in the CMS Task 1 Report, the CMS Task 1 Report still lacks certain details necessary to verify the adequacy of all selected cleanup levels. For example, the text on page 3-11 states that cleanup goals based on construction worker exposures to groundwater are more conservative than those based on residential exposures to nonpotable groundwater, although Table 3-9 shows a more conservative groundwater residential cleanup goal for benzene. In addition, the text does not discuss how institutional controls will be used to prevent future residential exposures to contaminants in groundwater during nonpotable groundwater use, if any.

NAVY Response:

With the exception of benzene, the groundwater cleanup goals based on construction worker exposures are more conservative. This is because benzene is a carcinogen, and therefore, its cleanup goal is calculated with an Averaging Time (AT) of 25,550 days for both the military resident and construction worker. The remaining groundwater COCs (ethylbenzene, toluene, and xylene) are classified as noncarcinogens and their cleanup goals are calculated with AT values of 1,460 and 365 days for military residents and construction workers, respectively. Therefore, the more conservative cleanup goals based on construction worker exposures for the noncarcinogenic COCs are a function of the more concentrated exposure parameters (i.e., 8 hours/day for 180 days/year for a 1 year period) used in the calculation of noncarcinogenic cleanup goals. In addition, it is stressed in the CMS that cleanup goals be calculated based on the most reasonable scenario when considering likely current and future land use. Therefore, in combination with proposed institutional control (i.e., groundwater restriction), this provides a more consistent application of the corrective action objectives, which are intended to protect human health under current use and most likely future land use scenarios. Based on these arguments, the statement on page 3-11 of the CMS Task 1 Report is referring to this more "overall" conservative nature of cleanup goals based on the construction worker scenario. The wording of the sentence on page 3-11 of the CMS Task 1 Report cited in the comment will be revised to more clearly state intent.

The proposed institutional control is to implement a potable groundwater restriction thereby eliminating potential future residential exposures to groundwater. The land use/potable groundwater restrictions will be implemented, i.e. through the base wide land use development plan or similar documentation yet to be determined. This is reasonable given that there is currently a dedicated source of water at the TWFF that meets current and future needs. Also, low groundwater yield (i.e., yields of less than 150 gallons per day) can be used as a criterion for classifying aquifers as non-potable (USEPA, 1988). In general, relatively poor groundwater quality at NSRR results in the use of surface water bodies as potable supplies. This discussion will be added to the text of the CMS.

USEPA CONSULTANT COMMENTS (BAH) 1.(cont.)

In addition, the CMS Task 1 Report does not adequately support the limited evaluation of construction worker exposures to only subsurface soil, rather than exposures to combined surface soil and subsurface soil.

NAVY Response:

Evaluation of construction worker exposure was limited to subsurface soil in the RFI because potential exposure to subsurface soil would be much more significant to the construction worker than surface soil exposure during excavation activities. Surface soil samples are collected from only the 0 to 6-inch interval, while subsurface soil samples are collected from intervals 6 inches

to 42 feet below ground surface. Also, as shown in the COPC tables presented in Appendix A, the subsurface soil data set is much larger than the surface soil data set (i.e., subsurface soil data set statistically more powerful than surface soil data set). It is important to note that the human health risk evaluation provided for the establishment of corrective action objectives in this CMS was conducted in a manner that was consistent with the baseline risk assessment. Furthermore, cleanup goals were calculated based on the construction worker scenario for COCs identified in both surface and subsurface soil and were intended to be protective of exposure to both. Therefore, the CMS is not deficient in its evaluation of potential exposures to the construction worker. This discussion will be added to the text of Section 3.0.

USEPA CONSULTANT COMMENTS (BAH) 1.(cont.)

Finally, several deficiencies were identified in the equations, parameters, and toxicity criteria used to calculate the proposed cleanup goals. These and other issues further discussed in the comments below must be addressed before the CMS Task 1 Report can be deemed acceptable.

NAVY Response:

The deficiencies identified in the equations, parameters, and toxicity criteria used to calculate the proposed cleanup goals will be corrected as stated in the responses to comments 9 through 15.

USEPA CONSULTANT COMMENTS (BAH) 2.

The CMS Task 1 Report does not provide a discussion of data quality or validation as indicated in the Navy's [Baker Environmental's] January 21, 2000 Response to EPA's [and Booz Allen enclosure] June 30, 1999 Comments (specifically the response to Booz Allen's general comment 2A). A discussion of sample quantitation limits (SQLs) and treatment of elevated detection limits is still not provided in Section 3.0. Without an effective discussion of the data treatment it is not possible to determine whether contaminants of potential concern (COPCs) have been adequately and accurately identified.

NAVY Response:

As stated in January 21, 2000 Response to Comments, a section will be added to Section 3.0 to discuss the analytical methods, data quality and quantitation limits of the reported data.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 1

Section 3.2 Identification of Media of Concern / Contaminants of Concern (COCs) as Determined by the Human Health Risk Assessment, page 3-4

1. *This section does not include an evaluation of total (unfiltered) and dissolved inorganic groundwater concentrations. In addition, data for total and dissolved inorganics are not provided in the CMS Task 1 Report as indicated in the Navy's June 30, 1999, Response to Comments*

(specifically the response to Booz Allen's Specific Comment 1). Finally, the text does not discuss the use of total groundwater data preferentially in the assessment of risk and cleanup goal calculations. EPA has clearly recommended the use of unfiltered groundwater data for the evaluation of inorganics in risk assessment (Draft Guidance on Selecting Analytical Metal Results from Monitoring Well Samples for the Quantitative Assessment of Risk, August 1992).

NAVY Response:

This section includes the COPC selection tables from the RFI in Appendix A of this CMS Task 1 Report. These tables include positive detections of constituents in surface soil, subsurface soil, and groundwater, as well as the minimum and maximum detection of each constituent. Should further information be required, tabulated data results can be found in the Revised Draft RFI Report for OU 2 (SWMU 7/8) (Baker, 1997). Both total and dissolved groundwater data were evaluated in the RFI. Total lead and dissolved arsenic, barium, and cadmium were retained as groundwater COPCs in the RFI. Dissolved barium and cadmium were eliminated from further evaluation in the CMS because they pose no unacceptable human health risk. Dissolved arsenic was eliminated as a COC because it contributed only 14% of carcinogenic risk to future residential receptors, and as explained on page 3-4 of the CMS Task 1 Report, it is most likely naturally occurring and not the result of site activities. It should also be noted that the dissolved arsenic was only detected in one of the wells at the site. This well is not located in an area impacted by site operations. Discussion concerning total inorganics in groundwater will be added to the text. Within the CMS, the BTEX compounds in groundwater were chosen as COCs based on toxicity, potential exposure scenarios, site activities, and RFI risk assessment results.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 2

Section 3.3 Exposure Routes and Receptors, page 3-4

2. The CMS Task 1 Report should reevaluate the sole use of subsurface soil data to assess construction worker exposures. The use of subsurface soil data is based upon the assumption that contaminant concentrations "appear to be more significant at depth" (Navy's June 30, 1999 Response to Comments). While it may be true that most soil contaminant concentrations increase with depth, it is not universally true. Particularly noteworthy are the concentrations of the carcinogenic poly aromatic hydrocarbon (cPAH) compounds benzo(a)pyrene and benzo(a)anthracene, which are much greater at the surface (17 and 23 mg/kg, respectively) than at depth. For example, the concentration of benzo(a)anthracene is approximately 23 times greater in surface soils than in subsurface soils (Section 3.2, page 3). These concentrations are potentially significant considering that the EPA Region III risk-based levels for these two compounds (based upon industrial exposure) are 0.78 and 7.8 mg/kg.

   Future construction activities would likely lead to exposure to both surface and subsurface soils. Consequently, a reevaluation of the construction worker scenario based upon exposure to a composite of surface and subsurface soils should be provided.

NAVY Response:

The cleanup goals calculated for the CMS are intended to be protective of exposure to surface soil as well as subsurface soil. Benzo(a)pyrene and benzo(a)anthracene were retained as COCs in soil for further evaluation in this CMS. A cleanup goal of 5.0 mg/kg is proposed for total cPAHs as a

for benzo(a)pyrene and benzo(a)anthracene, respectively). Therefore, it is unnecessary to re-evaluate the construction worker scenario based upon exposure to a composite of surface and subsurface soils.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 3

Section 3.4.2 Human Health Risk-Based Cleanup Goals, page 3-9

3. The text does not discuss the inhalation of particulates from surface and subsurface soil by military residents, construction workers, and commercial workers. If these exposures were determined to be insignificant, then the methodology used and the results of this determination should be included. If these exposures were not evaluated, they need to be. EPA's *Risk Assessment Guidance for Superfund, Volume I, Part B (USEPA, 1991)* describes the current methodology used to assess these exposures.

NAVY Response:

As stated in the January 21, 2000 Response to Comments letter, the inhalation pathway produced no unacceptable human health risks in the baseline risk assessment. The evaluation of inhalation of particulates from soils, as well as inhalation of volatiles, was included in the baseline risk assessment found in the Revised Draft RFI Report for OU 2 (SWMU 7/8) (Baker, 1997). The methodologies used for evaluating risk from the inhalation exposure pathway were taken from RAGS, Part A (USEPA, 1989), as cited in the RFI. The evaluation of the inhalation of volatiles using the Farmer Model (Farmer et al., 1980) was provided in the CMS in addition to the more conventional evaluation in the baseline risk assessment as supporting data that the inhalation pathway produces no unacceptable human health risks. Therefore, the development of cleanup goals in this CMS focused on the exposure pathways that posed an unacceptable risk (i.e., ingestion and dermal contact), which were assessed following EPA's RAGS, Volume I, Part B (USEPA, 1991). This explanation will be added to the text.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 4

4. *The text does not explain why the inhalation of volatiles from soil and groundwater pathways for military residents, commercial workers, and construction workers was evaluated using only benzene data. The CMS Task 1 Report should include text explaining why ethylbenzene, toluene, and xylene were excluded from the evaluation, or they should be included.*

NAVY Response:

Ethylbenzene, toluene, and xylene will be evaluated using the Farmer Model and the results will be presented in the CMS.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 5

5. *The reference used for the volatilization model for sorbed contaminants from soil and shallow groundwater (USEPA, 1986) is not located in the reference section. This document should be included to aid in independent verification of the model.*

NAVY Response:

The reference will be added.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 6

Section 3.4.3 Selection of Cleanup Levels, page 3-10

6. *The text of the CMS Task 1 Report does not specifically address or clarify the selection of the benzene groundwater cleanup goal as indicated in the Navy's [Baker Environmental's] January 21, 2000, Response to EPA's June 30, 1999 Comments (i.e., Specifically the response to EPA Comment 1 b). Although a deed restriction prohibiting future residential development of the property is mentioned, this restriction is not discussed in relation to potential health risks from exposure to benzene in groundwater during nonpotable use (e.g., lawn watering, car washing).*

NAVY Response:

The CMS report details the selection of cleanup goals based on the construction worker exposure scenario. Please refer to Response to General Comment No. 1 in this letter for a detailed explanation of the selection of benzene cleanup goal based on the construction worker scenario. Text regarding the institutional controls for groundwater restriction in relation to potential health risks from exposure to volatiles in the groundwater during nonpotable use will be added to Section 3.0.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 7

Section 3.4.3 Selection of Cleanup Levels, page 3-11

7. *The CMS Task 1 Report maintains that the future residual risk to military residents ($2x10^{-6}$) is not significantly increased when exposure to benzene through volatilization and inhalation is considered. However, the text does not provide the risk values for the inhalation pathway and, therefore, the validity of that statement is not known.*

NAVY Response:

Risk values are provided in the Farmer Models in Appendix A. Specific references to these models will be added to the text to support the statement that residual risk to military residents is not significantly increased by exposures through volatilization and inhalation.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 8

8. *The CMS Task 1 Report indicates that the proposed cleanup levels for groundwater were developed based on construction worker exposures to groundwater while performing excavation activities. In addition, the text on page 3-11 states, "construction worker cleanup goals are more conservative than residential, nonpotable groundwater use cleanup goals. This is not completely true. Instead it is reflective of the modeled length of potential exposures by construction workers (180 days per year for a 1-year period) and the duration of potential exposure to contaminated groundwater (1 hour per day)." However, in Table 3-9, the cleanup goal for benzene based on residential exposure to nonpotable groundwater (800 ug/L) is more conservative than the cleanup goal for benzene based on construction worker exposures to groundwater (2,100 ug/L). Therefore, the CMS must be revised to explain/justify why the less conservative construction worker cleanup goal for benzene in Table 3-10 was selected as the proposed cleanup goal for benzene at the site.*

NAVY Response:

Please refer to Response to General Comment No. 1 in this letter for a detailed explanation of the selection of benzene cleanup goal based on the construction worker scenario. The wording of sentence on page 3-11 of the CMS Task 1 Report cited in the comment will be revised to more clearly state intent.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH)

As discussed in Comment No. 6, if a deed restriction prohibiting future residential development of the property is intended to prevent residential exposures to nonpotable groundwater, this restriction should be noted in the cleanup level discussion. The CMS Task 1 Report should clearly indicate that the residential use of either potable or nonpotable groundwater will be prevented by some type of institutional control.

NAVY Response:

The land use/potable groundwater restriction will be discussed in detail in the CMS Final Report. It should be noted that the actual land use/potable groundwater restriction process is still in the developmental stage.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 9

Table 3-1

9. *The total hazard index (HI) for future construction workers is presented as "029." This should be corrected with the appropriate decimal place.*

NAVY Response:

The table entry will be corrected to read "0.29".

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 10

Tables 3-2 and 3-3

10. *Table 3-2 presents the incremental lifetime cancer risks (ILCRs) and HIs for "current on-site workers." This population description does not agree with the text and it is not clear whether these are the totals for construction workers or commercial/industrial workers. Further, only two summary risk tables are presented (i.e., Table 3-2 for current onsite workers and Table 3-3 for future residents). Consequently, one exposure population's summary ILCRs and HIs are not presented (i.e., either construction workers or commercial workers).*

NAVY Response:

The title of Table 3-2 will be changed from "current on-site workers" to "on-site commercial/utility workers." Risk summary tables are presented for only those scenarios that resulted in risk in the RFI (i.e., the future residents and on-site commercial/utility workers). As shown in Table 3-1, no unacceptable risks or hazard levels were calculated for the future construction worker. This explanation will be added to the text.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 11

11. The population description in Table 3-3, "future residents," should be changed to read "future military residents" in order to agree with the text and emphasize that these risk values were based upon a modified four year residential scenario and not the standard 30 year resident. This distinction is significant in that the ICLRs and HIs for even this modified, short-term "military resident" exceeded EPA's upper limits for carcinogenic and noncarcinogenic risks (i.e., 1x10-4 and 1.0, respectively), and therefore, institutional controls are required even under that limited duration exposure scenario.

NAVY Response:

The population description in Table 3-3, "future residents," will be changed to "future military residents and this distinction and need for institutional controls will be included in the text."

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 12

Table 3-5

12. The term "Ingestion Rate" on Table 3-5 should be modified to reflect that this is an "accidental" ingestion rate associated with groundwater used for nonpotable purposes, such as watering lawns and washing cars, rather than a drinking water ingestion rate.

NAVY Response:

The term "Ingestion Rate" on Table 3-5 will be changed to "Accidental Ingestion Rate" and the definition will be provided in the text.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 13

Table 3-6

13. Table 3-6 lists only one outdated and nonconservative respiration rate (1.25 M^3/hr) for two very different exposure populations. The inhalation of soil vapors and particulates should be reevaluated for construction Workers and commercial/industrial workers using current guidance found in EPA's Exposure Factors Handbook, Volume I.- General Factors (USEPA 1997). The current respiration rate recommended for outdoor workers engaged in heavy activities (i.e., construction workers) is 2.5 m^3/hour. The indoor respiration rate for adult males age 19 to 65 years (i.e., a conservative estimate of commercial/industrial workers) is 15 M^3/day.

NAVY Response:

The inhalation rates will be changed to 2.5 m^3/hour for construction workers and 15 m^3/day for commercial/industrial worker and the re-calculated results will be presented in the text.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 14

Table 3-7

14. Table 3-7 lists the exposure frequency for construction workers as 108 days/year instead of the 180 days/year listed in Table 3-6. The exposure frequency of construction workers should be consistent for both soil and groundwater media (i.e., 180 days/year). In addition, the respiration rate listed in Table 3-7 is antiquated and nonconservative. As previously stated, the current recommended value is 2.5 m3/hour (see Specific Comment 12).

NAVY Response:

The exposure frequency of 108 days/year is a typo and will be corrected to 180 days/year.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 15

Table 3-8

15. Table 3-8 presents the toxicity criteria used in the calculating cleanup levels. This table also presents the absolute oral absorption factors used to modify oral toxicity criteria to evaluate the dermal route of exposure. Table 3-8 and the associated text should be modified to cite the source of the absolute oral absorption factors used to adjust the oral toxicity criteria for each COPC. In cases where these factors were obtained from sources other than ATSDR or NCEA, the CMS Task 1 Report should indicate why the selected source was used. If adequate justification can not be provided for the selection of alternative absolute oral absorption factors, the following values should be used in the CMS report:

Benzene - ATSDR 1995; Absolute Oral Absorption Factor = 100%
Ethylbenzene - ATSDR 1990; Absolute Oral Absorption Factor = 92%
Toluene - NCEA 1991; Absolute Oral Absorption factor = 99%
Total Xylene - ATSDR 1990; Absolute Oral Absorption factor = 92%
Benzo(a)pyrene - Default Value 100%

NAVY Response:

The oral absorption factors will be changed to the values cited in the comment and the cleanup levels will be re-evaluated. The values in Table 3-8 are Region IV default values.

USEPA CONSULTANT SPECIFIC COMMENTS (BAH) 16

Table 3-9

15. Table 3-9 does not appear to incorporate the inhalation pathway into the cleanup levels calculated for soil and groundwater. Instead, a separate empty column is added for air [impacts based on soil clean-up concentrations), an approach which is not explained and is not acceptable. The purpose of assessing the indirect inhalation pathway is to ensure that the cleanup levels of sorbed or dissolved contaminants in other media (i.e., soil and groundwater) will be set low enough to protect receptors from the cumulative exposures possible from each media. Soil and groundwater clean-up levels should be based upon dermal contact with, inhalation of volatiles and particulates from, and incidental ingestion of both media.

NAVY Response:

The empty column will be removed from Table 3-9. Text will be added discussing how the inhalation pathway was considered in the evaluation of cleanup goals.