Baker

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April 5, 2010

U.S. Environmental Protection Agency - Region II
290 Broadway – 22nd Floor
New York, New York 10007-1866

Attn: Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch

Re: Contract N62470-02-D-3052
Navy CLEAN, District III
Contract Task Order (CTO) 108
U.S. Naval Activity Puerto Rico (NAPR)
Final Steps 6 and 7 of the Baseline Ecological
Risk Assessment for SWMU 1
Naval Activity Puerto Rico
RCRA/HSWA Permit No. PR2170027203

Dear Mr. Everett:

Michael Baker Jr., Inc. (Baker), on behalf of the Navy, is pleased to provide you with one hard copy of the replacement pages for the Draft Final Steps 6 and 7 of the Baseline Ecological Risk Assessment for SWMU 1, Naval Activity Puerto Rico, for your review and approval. These replacement pages make up the Final Steps 6 and 7 of the Baseline Ecological Risk Assessment for SWMU 1. Directions for inserting the replacement pages into the Draft Final Steps 6 and 7 of the Baseline Ecological Risk Assessment for SWMU 1 are provided for your use. Also included with the copy of the replacement pages is one electronic copy provided on CD of the Final Steps 6 and 7 of the Baseline Ecological Risk Assessment for SWMU 1, Naval Activity Puerto Rico.

This document is being submitted in accordance with EPA comments dated January 28, 2010. The Navy responses to these comments are attached for your review.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124. Additional distribution has been made as indicated below.

Sincerely,
MICHAEL BAKER JR., INC.

Mark E. Kimes

Mark E. Kimes, P.E.
Activity Coordinator

MEK/vk
Attachments

cc: Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy and 1 CD)
Mr. Pedro Ruiz, NAPR (1 CD)
Mr. Tim Gordon, US EPA Region II (1 hard copy and 1 CD)
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy and 1 CD)
Ms. Bonnie Capito, NAVFAC Atlantic–Code EV42 (1 hard copy for the Administrative Record)
Mr. Felix Lopez, US F&WS (1CD)
Mr. Jonathan Flewelling, TechLaw, Inc. (1 CD)
Ms. Wilmarie Rivera, PREQB (1CD)
Ms. Gloria Toro, PREQB (1 hard copy and 1 CD)
Mr. John Swenfurth, CH2M Hill, Tampa (1 CD)

NAVY RESPONSES TO EPA COMMENTS DATED JANUARY 28, 2010

EPA REVIEW OF THE NAVY RESPONSES TO EPA COMMENTS DATED DECEMBER 1, 2009 ON THE DRAFT STEPS 6 AND 7 OF THE BASELINE ECOLOGICAL RISK ASSESSMENT FOR SWMU 1

(EPA comments are provided in italics, while Navy responses are provided in regular print)

Evaluation of the Response to EPA General Comment 1: *Overall, the executive summary met all of the recommendations provided in General Comment 1. However, a few minor edits are provided below:*

- *Page ES-1: The first bullet under Terrestrial Invertebrates states, "[c]omparison of antimony, cadmium, copper, lead, mercury, tin, zinc, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT in SWMU 1 surface soil to invertebrate-based screening values." It is recommended to add the term "concentrations" after 4,4'-DDT to clarify that chemical concentrations are being compared to the screening values.*

Navy Response: The first bullet item under Terrestrial Invertebrates will be revised to include the term "concentrations".

- *Page ES-4: Explain why antimony, copper, and tin are evaluated since they are not identified as chemicals of concern (COCs) in Step 3A. Note, the explanation provided on Page 2-30 would be sufficient.*

Navy Response: An explanation for evaluating antimony, copper, and tin in the baseline ecological risk assessment (BERA) even though these three metals were not identified as COCs in Step 3a of the ERA process will be added to the text under Terrestrial Avian Omnivore Populations.

- *Table on Page ES-4: Add a footnote detailing that the no observed adverse effect level -hazard quotient (NOAEL-HQs) are based on 95% upper confidence limit (UCL) means of surface soil and earthworm tissue data.*

Navy Response: A footnote will be added to the embedded table on Page ES-4 indicating that NOAEL-based hazard quotient values are based on 95 percent UCL of the mean surface soil and earthworm tissue concentrations.

- *Table on Page ES-5: Add a footnote detailing that the NOAEL-HQs are based on maximum concentrations of surface soil and earthworm tissue data.*

Navy Response: A footnote will be added to the embedded table on Page ES-5 indicating that NOAEL-based hazard quotient values are based on maximum surface soil and earthworm tissue concentrations.

Evaluation of the Response to EPA General Comment 3: *The explanation provided on Page 2-31 stating that the conclusions for the American robin are NOAEL-based because it is a surrogate for the yellow-shouldered blackbird satisfies one of the major concerns identified in General Comment 3. However, the concern regarding the calculation and inclusion of maximum acceptable toxicant concentration (MATC-HQs) and lowest observed adverse effect level (LOAEL-HQs) when modeling for endangered species still remains. It is understood that the risk to the yellow-shoulder blackbird and manatee are only evaluated on the NOAEL-based HQs. This does not ensure, however, that the MATC and LOAEL-based HQs will not influence future risk decisions such as clean-up goals (especially when*

the MATC and/or LOAEL-HQs show a negligible risk in comparison to the NOAEL-HQs). Examples are the pesticide HQs for the American robin (i.e., 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT) where the NOAEL-based HQs ranged from 11.37 to 14.32, whereas the LOAEL-HQs ranged from 1.14 to 1.43. The LOAEL-HQs only marginally exceed one in comparison to the NOAEL-HQs. If the major objective is to be overly protective when modeling for endangered species, then it is not acceptable to assume that the differences between NOAEL-HQ, MATC-HQ, and LOAEL-HQs will not be assessed and potentially incorporated into future risk management decisions. This issue should be further addressed.

Navy Response: As requested in the EPA's original comment letter dated September 17, 2009, hazard quotient calculations based on LOAEL and/or MATC-based ingestion screening values will be removed from Tables 4-19 and 4-25. Reference to LOAEL and MATC-based HQ values also will be removed from Table 2-10 and the text in Sections 2.5.4, 4.2.3.1, 4.2.3.2, and 4.2.4.2.

Evaluation of the Response to EPA Specific Comment 3: *The response to Specific Comment 3 details how the American robin food ingestion rate (FIR) was developed, however additional clarification would be helpful. The development of the American robin FIR should be transparent due to the fact that the American robin is being used as a surrogate for the listed yellow-shoulder blackbird and because the FIR will be used to back-calculate site-specific soil cleanup goals. The response to Specific Comment 3 states that, "[b]ecause the diet of the American robin was assumed to be 90.9 percent earthworms and 9.1 percent soil, the FIR rate used in the BERA (0.00383 kg/day/day-dry weight or 0.33 g/g-day) was weighted to reflect the absence of plant material. Explain how the FIR was adjusted and/or weighted to reflect the absence of plant material. Furthermore, justify how this lower FIR is still protective of the yellow-shouldered blackbird.*

Navy Response: As discussed in the Navy's original response to Specific Comment No. 3 dated December 1, 2009, the food ingestion rate (FIR) for the American robin varies based on the percentage of invertebrates and plants in the total diet. The FIR can be weighted to reflect any assumed proportion of plants and invertebrates using the following formula:

$$FIR_{total} = \left[\left(\frac{PD_{plants}}{PD_{plants} + PD_{worms}}\right)(0.59)\right] + \left[\left(\frac{PD_{worms}}{PD_{worms} + PD_{plants}}\right)(0.31)\right]$$

where:

FIR_{total} = Food ingestion rate (g/g-day; wet weight basis)
PD_{plants} = Proportion of diet composed of plants (unitless)
PD_{worms} = Proportion of diet composed on earthworms (unitless)

In this equation, 0.59 represents the American robin FIR for a plant diet in g/g-day (wet weight), while 0.31 represents the American robin FIR for an invertebrate diet in g/g-day (weight weight) (Levey and Karasov, 1989). Because the assumed diet of the American robin used in the SWMU 1 BERA did not include plant material, a FIR of 0.31 g/g-day (wet weight) is calculated by the above formula. This FIR was converted to units of kg/day (wet weight) by multiplying the FIR by the body weight of the American robin (0.0773 kg), Finally, this wet weight value (0.02396 kg/day) was converted to a dry weight value by multiplying the value by the solids content of earthworms (0.16 [USEPA, 1993]). The solids content of earthworms was used in the conversion from wet weight to dry weight since this invertebrate represents the assumed prey item in the BERA. The methodology used to derive the American robin FIR will be added to the fourth bullet item under Section 2.5.4.

A FIR for yellow-shouldered blackbirds was not located from the literature. Therefore, it cannot be demonstrated by direct comparison that the FIR used in the BERA is protective of yellow-shouldered blackbird dietary exposures. However, Levey and Karasov (1994) reported that frugivorous birds fed an invertebrate diet exhibited lower retention times during digestive processing than insectivorous birds fed an invertebrate diet. For example, American robins (frugivore) fed an invertebrate diet exhibited a mean retention time of 22 ± 2 min/g, whereas house wrens (insectivore) fed an invertebrate diet exhibited a mean retention time of 33 ± 2 min/g. A lower retention time results in a lower proportion of food energy assimilated (Karasov, 1990). Since American robins are more frugivorous than yellow-shouldered blackbirds (arboreal insectivores), it can be concluded that American robins fed an invertebrate diet will consume a larger amount relative to their body weight than yellow-shouldered blackbirds based on a lower retention time and proportion of food energy assimilated during digestive processing. Based on this information, it can be concluded that the American robin FIR based on an invertebrate diet (0.00383 kg/day [dry weight]) is adequately protective of the yellow-shouldered blackbird.

References used in Navy responses to EPA comments:

Karasov, W.H. 1990. Digestion in Birds: Chemical and Physiological Determinants and Ecological Implications. *Studies in Avian Biology*. 13:391-415.

Levey, D.J. and W.H. Karasov. 1994. Gut Passage of Insects by European Starlings and Comparison with Other Species. *Auk*. 111(2):478-481.

Levey, D.J. and W.H. Karasov. 1989. Digestive Responses of Temperate Birds Switched to Fruit or Insect Diets. *Auk*. 106:675-686.

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