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LETTER AND COMMENTS FROM U S DEPARTMENT OF THE INTERIOR REGARDING DRAFT TIER 3 ECOLOGICAL RISK EVALUATION STEPS 1 THROUGH 3 FOR OFF BASE CONTAMINATION SITE 8 NCBC GULFPORT MS
7/30/2004
U S DEPARTMENT OF THE INTERIOR

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

July 30, 2004

Commander, Southern Division
Naval Facilities Engineering Command
ATTN: Art Conrad (Code ES32)
2155 Eagle Drive
North Charleston, SC 29406

Dear Mr. Conrad:

This concerns a document that was transmitted to us by TETRA TECH NUS, INC. The document was entitled "Draft Tier 3 Ecological Risk Evaluation Steps 1 through 3 for Off-base Area of Contamination Associated with Site 8 at Naval Construction Battalion Center, Gulfport, Mississippi". We have reviewed the document and have the following comments in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661 – 667e).

Page 2-7, paragraph 2, sentence 2. The sentence states that permanent fish populations are absent on the off-base area of concern (AOC) because no permanent surface water bodies occur on the area. A representative from this office participated in a field inspection trip of the off-base AOC during October or November 2003. He and other members of the team observed two ponds on the off-base area that varied from over one-eighth to about one-half acre in size. Both ponds contained an abundance of minnows. In the smaller pond, we observed a fish measuring over fourteen inches and what appeared to be largemouth bass measuring over four inches. The smaller pond was actually a pool within the stream that was located on the lower end of the off-base AOC. The larger pond was situated further north on the off-base AOC. As a result, fish may be present in the area year round

Page 2-12, paragraph 4. It is concluded that the drinking water exposure route is probably minimal at the off-base AOC because of the lack of surface water on the area. As mentioned above, the two ponds may supply surface water year round. As these ponds concentrate fish in relatively small areas, the fish eating birds and mammals would spend much of their time at these areas. We believe that the drinking water exposure route is an important route of exposure.

Page 2-12, paragraph 1. The last sentence of the text has a reference to EPA 1993 with no a, b, or c.

Page 2-16, paragraph 1. The statement is made that omnivores (e.g., opossum, raccoon, eastern wood rat, rice rat) will be protected by protecting vermivores. It is our understanding that vermivores are worm eating species. The only place where a vermivore is addressed is the shrew and this is in the section associated with uncertainties. We would appreciate that the shrew, or a worm eating bird (e.g., woodcock), be addressed as a species to evaluate regarding the risk associated to vermivores and ultimately omnivores.

Section 3.2.2.1.1. It is possible that we should consider the female mink as being the most sensitive receptor and use the females body weight in the calculations rather than the average between the male and female. The other option is to calculate the hazards both ways.

Page 3-8, paragraph 2. The paragraph concludes by stating that sediment ingestion by the green heron is negligible. The green heron uses a spearing motion when feeding. As a result, the beak would enter the sediment and soil when feeding and ingest sediment or soil. The green heron could ingest a significant amount of sediment when feeding on animals such as small snakes, frogs, lizards, and sediment invertebrates.

Page 3-12, paragraph 2. This paragraph provides toxicity data for rats to approximate the effects of dioxin on mink. Toxicity data for rats should not be used for mink when information is available in the literature for mink. The toxicity data available for mink indicate that dioxin is much more sensitive to minks than rats. Isler (2000) summarizes information on mink diets containing 2,3,7,8-TCDD. Adult minks fed diets containing 1.0 to 80.8 ng/kg for 85 days prior to and throughout the reproductive period had impaired reproduction with reduced body weights and survival in a dose-dependent manner (Heaton et al.1995). Females in the highest dose group whelped the fewest number of kits, all of which were stillborn or died with in 24 hours. For adult females, a value of 3.6 ng/kg of body weight daily was determined for the lowest observable adverse effect level (Heaton et al. 1995).

Also, the results of the study by Tillitt et al. (see attached report) should be considered for use in the risk assessment. The study confirms that mink are among the most, if not the most, sensitive mammalian species to the reproductive toxicity of TCDD and related compounds. The estimated dietary threshold is 1.9 pg/g TEQ and the estimated TEQ liver (organ for effects of TCDD) concentration when using the BSAF/BMF approach for risk assessment is 60/g.

Page 3-12, paragraph 3. This paragraph uses oral toxicity reference values (TRVs) for ring-necked pheasants to estimate the effects of dioxin on the belted kingfisher and green heron. It concludes by stating that the NOAEL for the pheasant is 0.000014 mg/kg/day, and the LOAEL is 0.00014 mg/kg/day. We found other information that should be considered for TRVs for the belted kingfisher and the green heron. A study summarized in Isler (2000) states that adverse effects are seen in domestic chickens when diets contain dioxin concentrations of 1.0 ng/kg body weight daily. Another study concluded adverse effects occurred in woodcock when diets containing dioxin concentrations of

greater than 6 ng/kg body weight daily, and half time persistence of 7.2 days. Woodcocks likely occur on the off-base AOC and would feed heavily on the soil and sediment invertebrates.

Page 3-12. Toxicity information for dioxin is expressed in mg/kg which is parts per million. We believe it would be more appropriate to express dioxin concentrations in ng/kg which is parts per trillion.

Tables 3-3 through 3-8. It should be discussed in the tables how dose, NOAEL, LOAEL, and HQs were determined. Please provide the equation, if one was used.

Pages 4-4 to 4-6. These pages discuss remedial goals for dioxin cleanup of 86 ng/kg for mink, 162 ng/kg for belted kingfisher, and 125 ng/kg for green heron. The discussion concludes that the remedial goal for humans of 38 ng/kg would also be protective for wildlife. Much of the discussion in this section is very ambiguous and cannot be under stood. The discussion should clearly explain how these remedial goals for wildlife were calculated.

Page 4-3, paragraph 3. It is stated that in a study summarized by Eisler (2000), two species of earthworms showed no adverse effects when held for 85 days in soils containing as much as 5 mg/kg of 2,3,7,8-TCDD in soil. The paragraph further states that all sediment concentrations at the off-base AOC are significantly less than these values, suggesting that dioxin concentrations pose no potential risk to soil invertebrates at the off-base AOC. Ashley et al. (1996) reported a 2,3,7,8-TCDD LD50 of 30-100 ug/kg (ppb) for the freshwater crayfish *(Pacifastacus leniusculus)* with delayed mortality typically 15-40 days after dosing, and anergia. These authors reported that treatment of crayfish with 3 ug/kg significantly induced cytochrome P450, as measured spectrally, and that induction and delayed onset of mortality suggests the presence of a receptor-mediated mechanism of TCDD toxicity in crayfish. These findings suggests that sediment concentrations on the AOC may pose some risk to sediment invertebrates.

Page 4-5, paragraph 1, last sentence. This sentence states that a sediment remedial goal of 86 ng/kg would be protective of piscivorous receptors represented by the mink, assuming the mink derived one-third of its diet from the off-base AOC. We disagree that the mink derive one-third of its diet from the off-base AOC. The mink probably derives almost 100 percent of its diet from the off-base area. Our conclusion is based on the fact that mink forages in the previously mentioned permanent ponds that occur on the off-base area. Since the ponds concentrate fish in relatively small areas, the mink would not expend much energy to obtain food and would prefer to feed in areas such as these. Also, the document mentioned earlier that the groundwater levels in the off-base AOC remain at or near the surface for much of the year. As a result, the sediment and soil invertebrates would be available to the mink much of the year.

Table 3-2. This table provides toxic equivalency factors (TEFs) for fish collected from the project area. Van den Berg et al. (1998) present TEQs for PCBs, PCDDs, and PCDFs for humans and wildlife (see attached report). These TEQs were developed by scientists

from around the world at a meeting organized by the World Health Organization and held in Stockholm, Sweden on June 15-18, 1997. As a result, these TEQs should be considered for use in the risk assessment.

References. There are two citations in the References that we could not find in the text. They are Hamas, M. J. (1994) and USEPA (1993d).

We appreciate the opportunity to provide comments on the Ecological Risk Evaluation for the Off-Base Area. Please keep us informed of actions being taken on our comments.

Sincerely,

Lloyd E. Inmon

Lloyd E. Inmon
Contaminant Specialist

Literature Cited

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