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LETTER AND COMMENTS FROM UNIVERSITY OF FLORIDA REGARDING REVIEW OF FINAL REMEDIAL INVESTIGATION REPORT ADDENDUM 1 AND 2 SITE 40 NAS PENSACOLA FL
11/4/2002
UNIVERSITY OF FLORIDA

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November 4, 2002

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
Room 471A, Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399

Dear Ms. Mora-Applegate:

At your request, we have reviewed the 2002 Addendum I (Human Health) and Addendum II (Ecological) of the *Final Remedial Investigation Report – Site 40 – Bayou Grande, Naval Air Station, Pensacola, Florida* prepared by Ensafe Inc. (Ensafe). Addendum I presents a site-specific risk assessment for the fish-ingestion exposure pathway for cancer risks associated with fish concentrations of DDD, DDE, aldrin, PCBs (Aroclor-1260), dieldrin, lindane (gama-hexachlorocyclohexane), and chlordane; and non-cancer hazards associated with mercury fish concentrations. Addendum II presents results from an investigation of mercury contamination in forage fish collected from Bayou Grande to determine the significance of potential ecological risks posed to the predatory fish Red Drum (*Sciaenops ocellatus*).

Addendum I

In 1998, prey fish (Pinfish and Killifish) were collected from Site 40. A baseline risk assessment prepared using these data identified DDD, DDE, aldrin, PCBs (Aroclor-1260), dieldrin, lindane, and gamma-chlordane as compounds that pose a potential risk to subsistence fishermen. Addendum I of the Remedial Investigation Report presents a site-specific risk assessment of these compounds and mercury. The report concludes that carcinogenic risks associated with the ingestion of contaminated fish at Site 40 are within acceptable limits, and that mercury does not pose a significant health hazard. However, the rationale for selection of fish ingestion rates and the concentrations of contaminants in fish used by EnSafe to calculate risks is flawed. When more appropriate values are used, higher risks are obtained, including some values above acceptable limits for both the U.S. EPA and FDEP. This is explained in the following comments.

1. The downward revision of recreational fisher fish consumption rates is not justified and needs to be revised. The report states on page 7 that fish ingestion rates used in the analysis are those presented in the 1997 USEPA's *Exposure Factors Handbook* (EFH) as representative of recreational fishermen in the Gulf of Mexico (26.1 g/day, corresponding to the 95th percentile; and 7.2 g/day, corresponding to the mean). However, a discussion presented in page 8 corrects these values downward by factors of 3 and 2 (a combined factor of 6), and calculates fish consumption values of 4.3 and 1.2 g/day for the 95th percentile and mean values, respectively. Ensafe justifies these adjustments by asserting that "The USEPA EFH also states that only 33% of the fish consumed by recreational fishermen is actually caught locally. The rest is bought commercially." In addition it contends, "... the USEPA reports that only between 25 to 50% of whole fish is edible." Our review of the EFH reveals that indeed these factors are discussed, but that they are already considered in the recommended values of 26.1 and 7.2 g/day. These fish consumption estimates were developed using data from the National Marine Fisheries Service. They are based on interviews of recreational fishermen who had just completed their fishing trip and whose catch was then weighed. As a consequence, they are solely based on fish recreationally caught and dividing them by 3 is therefore not required. These

data are then used by the USEPA to derive the fish consumption estimates. The USEPA calculates a daily fish consumption rate for recreationally caught fish by inputting the fishing frequency reported by the angler, by assuming the angler will be sharing the catch with other people (dividing by a factor of 2.5), and by assuming the edible part constitutes only 50% of the fish weight. This last adjustment obviates the need for dividing the fish consumption estimate by 2, the other downward revision proposed by Ensafe. Therefore, the values of 26.1 and 7.2 g/day should be used, without revision, to estimate RME and central tendency exposure scenarios for recreational fishers.

2. Fish consumption rates for subsistence fishers should also be revised. In Section 4.2 of the report, Ensafe acknowledges the recommended fish ingestion value for subsistence fishers presented in the EFH (170 g/day for the 95th percentile), but points out that this value is based on survey data from Native American subsistence fishers in the Pacific Northwest. EnSafe argues that these values are not representative of Native American fishers in general, and on this basis rejects the value. They cite studies indicating that Native American recreational fishers have 50 to 100% higher fish intake rates than other anglers, and use this information to estimate a subsistence fisher fish consumption rate of 26 g/day x 2 = 52 g/day. Again, Ensafe incorrectly adjusts this value by dividing it by 2 to reflect the proportion of edible fish, ending up with a value of 26 g/day. EnSafe appears to have confused the objective of developing an intake value for subsistence fishers with developing a value for recreational Native American fishers. Unless there is some reason why subsistence fishers in the vicinity of this site (regardless of ethnicity) are expected to have a different fish ingestion rate than that presented in the EFH, the EFH assumption (170 g/day) should be used when assessing risks to these receptors.

3. Ensafe has assumed that fish caught by fishermen are equally exposed to contaminants in the whole extension of Bayou Grande, of which Site 40 represents only 32%. Other reviewers have commented on the lack of data to support an assumption that fish use different areas of the Bayou equally; and pointed out that Site 40 may in fact attract fish. This is a source of uncertainty that can only be addressed by direct sampling of sport fish species. In lieu of those data, the only defensible approach is to assume fish spend 100% of the time at Site 40.

4. The document suggests the PCB contamination at the site is not due to Site 40, but to conditions prevalent in the general area around Site 40. This assertion may be supported by background PCB data from a nearby area unaffected by other known or potential point sources. We do not concur with the USEPA recommendation that data from South Carolina be used as a site-specific background PCB concentration for Site 40.

We have recalculated risks using the modifications proposed above and found that Site 40 cumulative cancer risks to recreational fishers are 1.22E-4 and 3.38E-5 assuming 95th percentile and mean fish consumption rates, respectively. Cumulative risks exceed the 1.0E-6 threshold for these two fish consumption levels even if no PCBs are assumed to be present. For subsistence fishers, cumulative cancer risks are 7.98E-4. For mercury, the hazard quotient exceeds 1.0 only for the subsistence fisher scenario (HQ = 6.05). We note that contaminant concentrations in edible fish were calculated using the maximum concentration measured in prey fish. For the purposes of this assessment, the average (or rather, an upper confidence limit estimate of the average) of concentrations in prey fish may be more appropriate for estimating edible fish concentrations. Information on the number of prey fish samples and the distribution of contaminant concentration values was not included in the report, and therefore we were unable to evaluate how the use of average versus maximum prey fish concentrations might affect the risk estimates.

Addendum II

Sampling of sediments at Bayou Grande conducted in 1996 demonstrated mercury concentrations above the ecological screening value of 0.13 mg/kg in five of seven samples collected, with a maximum hazard quotient (HQ) of 16.9. The use of these sediment data in the Red Drum model derived as part of

an ecological risk assessment for a Superfund site in Texas predicted significant risks for predatory fish from mercury. The data presented in Addendum II of the Remedial Investigation Report show that sediment concentrations measured during the 2001 sampling event are lower than those measured in 1996, and that, as a result, four samples for which HQs in 1996 were higher than 1.0, are now below this threshold value. In addition, mercury concentration data from forage fish (small-sized Pinfish and Striped Mullet), when used as input for the Red Drum model, predicts that HQs will be below 1.72 for the site, and 3.34 for an offsite location.

We found that the data analysis and presentation of results support the overall conclusion that mercury concentrations in Bayou Grande have decreased since 1996, and that predicted risks are low for the Red Drum. This conclusion may warrant a decision of no further action with respect to risks to predatory fish inhabiting Bayou Grande. However, the discussion of uncertainties should be revised with respect to the following points:

1. As mentioned in comments provided by NOAA and EPA, there are several sites within NAS Pensacola where mercury has been identified as a contaminant of potential concern. Therefore, the statement that mercury contamination of Bayou Grande sediments "is not attributable to any Installation Restoration Program at NAS Pensacola" is not warranted, in our opinion.

2. With respect to the modeling of Red Drum tissue concentrations, the uncertainty section states, "this model assumes that red drum forages in Site 40 area of Bayou Grande for its entire life." This statement is not accurate. The model only assumes that mercury within Red Drum tissues has reached steady-state with mercury in sediments and/or prey. This steady-state certainly does not require lifetime exposure. In addition, mercury does not require lifetime exposure to induce chronic toxicity. In fact, studies used to develop the NOAEL and LOAEL tissue concentrations are based in large part on studies exposing fish only while fry.

3. The discussion of uncertainties should also include a statement on the conservativeness, or lack thereof, of assuming diet as the sole avenue of mercury intake for the Red Drum. It has been shown that fish bioconcentrate mercury not only through the diet, but also directly from the gills, and that the relative contribution of each pathway varies with fish species (For a review, see U.S. EPA, 2000).

4. The uncertainty section should also discuss the fact that samples from only seven locations are being used to represent the mercury concentrations over a large area.

We hope these comments are useful in your evaluation of this Site. Please do not hesitate to contact us if you have any other questions.

Sincerely,

Hugo, G. Ochoa, D.V.M., Ph.D.

Stephen M. Roberts, Ph.D.

References

U.S. EPA. 2000. Appendix to Bioaccumulation Testing and Interpretation for Purpose of Sediment Quality Assessment: Status and Needs. EPA-823-R-00-002.

Responses to FDEP Comments Dated November 4, 2002 on *Addendum I (Human Health) of the Final Remedial Investigation Report – Site 40 – Bayou Grande, Naval Air Station, Pensacola, Florida.*

Response to Comment 1:
A technical memorandum (attached) was written to show RME calculations for the recreational fishing scenario based on revised ingestion rates and other revisions to the exposure calculations. The ingestion rate of 26 g/day was used to estimate tissue intake for recreational fishermen, based on EPA's 1997 Exposure Factors Handbook.

Response to Comment 2:
Ingestion rates were revised in the technical memorandum. Subsistence fishing scenarios were not included in the memorandum.

Response to Comment 3:
The site foraging factor was revised in the technical memorandum. Fish were assumed to be more attracted to the Site 40 area, so the site foraging factor was doubled. A value of 0.64 was used instead of 0.32. See Section 3 and Table 3 in the technical memorandum.

Response to Comment 4:
A literature search was performed to obtain PCB fish tissue data from reference areas. This information was summarized in the technical memorandum (See Section 2). PCBs in fish tissue collected near Site 40 were higher than PCBs in tissue collected from reference areas.