**Comments on the University of Michigan Dioxin Exposure Study-
Study Protocol, April 16, 2004 Draft**

General comments:

The term dioxin is not used consistently; in some cases it is used as the singular (implying TCDD) and in some cases as the plural (implying all polychlorinated dibenzodioxins). Given the fact that the analysis will be measuring dioxins, furans, and co-planar PCBs, all dioxin-like compounds will be evaluated. This is an important issue, since a majority of the TEQ in soil and sediment in the floodplain are contributed by the dibenzofurans, rather than dibenzodioxins. This issue could be addressed either by defining the term dioxins in the text as inclusive of all dioxin-like compounds, or selecting a more inclusive term or phrase.

The term "probability sample" is used, which appears to be the same as the more recognized term, "random sample". If randomness describes the selection process, then it would be more clear to use this term.

Specific comments:

Section 4.1 Study Population (Research Plan):

p. 7 paragraph 1, last sentence: There is a statement that there are no fish advisories for *dioxin* contamination in these counties. However, the evaluation of exposure will also include co-planar PCBs in serum. In Calhoun County, the Kalamazoo River from the Ceresco Impoundment has an advisory for PCBs, which could include dioxin-like PCBs. Also, the St. Joseph River (which appears to run through Calhoun County) has an advisory for some portions for PCBs. While it is not clear whether these areas are significant fishing areas, the statement that these counties do not have fish advisories for the dioxin-like compounds that will be part of this study needs to be re-evaluated.

p.7 paragraph 2: The description of population sampling using "probability proportionate to size" and "probabilities inversely proportionate to size" could use some additional clarity. It is assumed that this is referring to the number of individuals in a household, but this description could be more explicit.

Section 4.3 Blood Collection and Analysis:

p.8 paragraph 2: There is a statement that 10% of the samples will be split for NCEH/CDC analysis. While the concept of independent verification of analytical samples is certainly valid, splitting the 80 ml sample is likely to reduce the detection limits. As a result, there may be a concern that this could compromise the ability to compare the split samples with the rest of the dataset.

Section 4.5 Soil Sampling and Analysis:

p. 13, paragraph 2: How many replicates per sample will be used for the luciferase assay? Given potential interferences in soil and sediment extractions, it will be important to have sufficient replicates in order to characterize the variability in the assay.

p.13, paragraph 4 and Figure 2: Using the strategy of HPGC/HPMS analysis of only the top 1 inch of the perimeter and floodplain composites as a screening tool will certainly reduce the cost of the analysis. However, using this approach as an indicator of the level of contamination of the property or a measure of potential magnitude of exposure is questionable. First, while the 8 ppt level may be sufficiently low as a screening criteria for background, the 1 inch sampling results may not be an accurate indicator of dioxin levels at lower depths were exposure may still occur. Second, the justification of using the top 1 inch of soil in a residential property as a measure of exposure is not provided. It would be useful to know if this screening approach been used as other investigations and found to be useful for assessing exposure. It may certainly be an issue with the community if it is perceived that the assessment of their exposure is being compromised in the interest of saving costs.

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