

Environmental Stewardship Concepts, LLC

Comments on:

**Task 1.4 Engineering Evaluation/Cost Analysis for Early Response Action to
Address Potential Acute or Near Term Exposure Risks**

The Tittabawassee River/Saginaw River & Bay Site

For: Lone Tree Council

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Introduction

The regulation of dioxin has received the attention of environmental experts for many years and the Environmental Protection Agency (EPA) began the most recent reassessment of the health risks of dioxin (2,3,7,8 tetrachlorodibenzo-p-dioxin) in the spring of 1991. Dioxin regulations have largely been put on hold since the year 2000, as the dioxin reassessment was being drafted and revised. Thus, the preliminary remediation goal (PRG) for dioxin was set decades ago at 1000 parts per trillion (ppt), and has not been updated to account for new scientific information and analysis. PRGs are chemical specific, non-binding cleanup numbers for soils that are contaminated.

However, in early 2010, the EPA proposed updating the PRGs for dioxin and dioxin-like compounds. According to the EPA, to prevent cancer risks greater than one in a million, soil dioxin should not exceed 3.7 parts per trillion (ppt) in residential soil. To prevent non-cancer health effects, the soil levels should not exceed 72 ppt, although this number is based on a non-standard assumption that all of the dioxin comes from the contaminated site (US EPA 2010a,b,c). Although not approved and finalized by the EPA yet, these dioxin PRGs will be the most protective of human health of any of the current dioxin standards.

General Comments

The Engineering Evaluation/Cost Analysis (EE/CA) for Early Response Action to Address Potential Acute or Near Term Exposure Risks does not adequately address acute or short-term dioxin exposure. For these high-use areas with high levels of dioxin, there is no "potential" for acute exposure - acute exposure has been and is occurring now, and the cleanup alternatives should reflect that exposure. The EE/CA has the ability to create criteria for relocation of the most vulnerable residents, which includes children and those with chronic health conditions, based on contaminated soil concentrations, age, and health parameters.

Specific Comments

1. Inadequate Floodplain Area

The EE/CA is based on an 8-year floodplain that is defined by the March 2004 flood event and the EE/CA “priority areas” are where the floodwater touched residential properties. These areas are further broken down into Priorities 1 and 2 based on proximity of the flood water to structures. An 8-year floodplain is an extremely limited scope, even for an Early Response Action, and greatly underestimates the number of people and area of land affected by dioxin contamination. The 100-year floodplain should be proposed for these Early Response Actions.

- The Michigan Department of Environmental Quality used a 100-year floodplain in the Phase II Sampling Program of their Tittabawassee/Saginaw River Flood Plain Environmental Assessment. Even at these distances from the river, a soil sample just within the 100-year flood plain “showed a tenfold increase in dioxin concentrations” compared to concentrations consistent with statewide background concentrations (MDEQ 2002). Sampling indicated that it is likely that the entire 100-year flood plain is contaminated and contains significant concentrations of dioxins (MDEQ 2003).
- In an investigation of dioxin exposure in adults in the flood plain, the Michigan Department of Community Health also looked at the 100-year flood plain and stated that “repeated annual flooding within the 100-year flood plain has carried dioxin-laden wastes down the Tittabawassee River and has resulted in the deposition of contaminated soil and sediment onto upland property” (MDCH 2004).
- If the Early Response Action uses an 8-year floodplain, any measures taken now will have to be redone with the expansion to a 100-year floodplain, or greater area, during the Task 8 Treatment. This equates to wasted time and resources.

2. Alternative 2 Barrier Controls: Bare Soil Only?

The EE/CA only targets bare soil for remediation in the Early Response Action. Soils capable of exposing humans, pets and wildlife to high concentrations of dioxins do not only include bare soils. Vegetated soils are not a barrier to the soil exposure pathway for dioxin. Included should be residential yards that can expose home-owners while they are engaged in their maintenance and upkeep. Also, children and pets, through normal activities and their proximity to the ground surface, will be the most vulnerable and unable to recognize what “remediated” areas to stay away from or to be cautious of. The vulnerable populations also include the multitude of wildlife in the area that would make use of the non-remediated surfaces in everyday activities that include consumption of the vegetation and ground surfaces. Floodplain water and surface water runoff contaminated with dioxin reaches every kind of soil, indicating that

remediation of bare soil only is entirely inadequate. Consideration of other surfaces should be made in the Early Response Action.

- The University of Michigan Dioxin Study that EPA reviewed in 2009 found that soils and sediments are recognized reservoirs for dioxins that result in ongoing impacts to the food chain, especially those eating products raised in these soils (US EPA 2009).

3. Alternative 3 Movement of Land-use Features: Inadequate and Limited in Scope

The EE/CA discusses removal of certain land-use features out of the 8-year floodplain but does not indicate where they will be moved, other than to say that removal will reduce exposure to dioxin. Movement of land-use features out of the 8-year flood plain still leaves them within the 100-year floodplain, which will ultimately have to be remediated/removed once again. The only Applicable or Relevant and Appropriate Requirement (ARAR) being considered is location; the Early Response Action doesn't look to reduce toxicity or volume because there is no treatment, but only to reduce mobility by isolation of the affected soils. Alternative 3 certainly offers no long-term effectiveness, but even the short-term effectiveness is inadequate. Until such time as Task 8 Treatment is commenced in the future, a more long-term, inclusive plan to deal with land-use features must be considered.

- The University of Michigan Dioxin study reviewed by EPA in 2009 found that indoor dust dioxin levels were higher than levels of dioxins in soil around the houses in the Midland/Saginaw study area. Higher concentrations of dioxins were found in the blood serum of residents living within the Midland/Saginaw study area as compared to residents living in a reference site, the Jackson and Calhoun counties (US EPA 2009).
- The University of Michigan Dioxin Study also found that age is positively associated with blood serum dioxin levels and that living in the Midland/Saginaw region during the mid-1900s was also associated with elevated blood serum dioxin levels (US EPA 2009). Long-term residents of the area have been exposed to dioxin in their homes, not just their lawns, garden beds, or other land-use features.

4. Removal of Soils the Only Proven Technology for Dioxin

As dioxin is the most toxic chemical known to man, its complete removal should be a part of the Early Response Action cleanup. In a report by the Office of Technology Assessment on the implementation of Superfund cleanup (1988), an EPA contractor stated that "The only treatment method which would meet the environmental protection goal (of permanent removal or detoxification of contaminants), and therefore the only method likely to gain public acceptance, is excavation followed by soil treatment." This observation remains true, no matter the clean up standard for dioxin. The Early

Response Actions include the highest dioxin levels found in the highest-use areas and as such, present the highest risk of acute exposure to humans and wildlife.

5. Lacking Consideration of Dioxin at Depth

The EE/CA states that physical isolation of the bare floodplain soils would limit contact with potentially affected underlying soil. The control barrier would only consist of *two* inches of gravel/stone, wood chips or possibly soil. During a flooding event, these larger, heavier materials will remain while finer sediment will continue to travel the path of the surface water flow.

- In sampling conducted by MDEQ, soil samples were taken at three depths; 1-3 inches, 3-6 inches, and 12-15 inches. Exceedances of the residential direct contact criterion of 90 ppt dioxin TEQ established under Michigan's Natural Resources and Environmental Protection Act occur throughout the different sampling depths. Dioxin TEQ concentrations ranged up to 3,400 ppt and the highest concentrations were found in the 3-6 and 12-15 inch samples. Dioxin TEQs were detected up to 780 ppt in the 1-3 inch samples and up to 1,400 ppt in the 3-6 inch samples (MDEQ 2003). Contamination depth as well as width should be addressed in the EE/CA.

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