Memorandum

Date: January 21, 2009

From: Chau Vu, Human Health Risk Assessor, Technical Support & Site Assessment

To: Dan Keefe, RPM, MA Superfund Section

Subj: Responses to the Technical Memorandum by Exponent on the Review of the Human Health Risk Assessment (HHRA) for Nyanza OU 4 (dated December 5, 2008)

In general, EPA Region I acknowledges most of the comments in the Technical Memorandum about the possibility that the assumptions used in the HHRA might be too conservative and the calculated risks may be overestimated. However, EPA used standard default assumptions in the HHRA where site-specific information was not available and it is standard practice to be conservative. The responses below to Exponent's comments are mostly for clarifying purposes and are focused especially on Section 2 of their Technical Memorandum.

Section 1, page 2, 4th bullet

EPA agrees with the comment that there is some considerable uncertainty with the exposure assumptions for subsistence and ethnic angler scenarios. Section 6.1 of the 2006 Nyanza HHRA acknowledges that subsistence fishing on the Sudbury River is unsubstantiated. The fish ingestion rate of 142.4 g/day for subsistence angler was cited from the 2002 report Fish Consumption and Environmental Justice by the National Environmental Justice Advisory Council (NEJAC). This fish ingestion rate for subsistence angler reflects the 99th percentile value of 142.41 g/day for freshwater and estuarine ingestion by adults, taken from the USDA's Continuing Survey of Food Intakes by Individuals (CSFII) Survey for the years 1994 to 1996. In this report, EPA states that it believes that the assumption of 142.4 g/day is within the range of average consumption estimates by subsistence angler based on the studies reviewed. This is the link to the NEJAC fish consumption rates report for more information on this default value used http://www.epa.gov/compliance/resources/publications/ej/fish_consump_report_1102.pdf
EPA agrees that using this fish ingestion rate for both subsistence angler inclusive of an "ethnic angler" may overestimate the actual risks from ingestion fish from the site. However, since there is no site-specific information on fish ingestion rates for these anecdotal receptors, EPA believes it is appropriate to use the recommended default fish ingestion rate for the HHRA.

Section 1, page 3, 1st bullet

EPA agrees with the comment that an Executive Summary identifying key issues with the HHRA and summarizing a comparison of risks at the site to risks from reference locations would have made the HHRA report easier to review.

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Section 2, page 6, 1st paragraph
EPA agrees with the comment that application of the "All Waters" category from the 1993 Ebert et al. creel survey to some reaches of the site, especially Reaches 2 and 9, might overestimate exposures. Hence, EPA has (prior to receipt of Exponent's comments) re-evaluated hazards from consuming contaminated fish at Reaches 2 and 9 separately for the flowing segments and standing water segments for current/future adult and child recreational angler, using the "flowing" and "standing water" fish ingestion rates, respectively for flowing and standing waters. For more information on this re-evaluation for Reaches 2 and 9, please see Memorandum by Chau Vu (EPA) dated October 29, 2008.

Task 4, page 12
The 2006 HHRA is consistent with EPA guidance in calculating the fish exposure point concentrations (EPCs). For the reasonable maximum exposure (RME) evaluation, EPCs are calculated based on the 95% upper confidence limit (95% UCL) of the mean concentration, using EPA's ProUCL version 3.0, which was available at the time the HHRA was prepared (2004). When the sample size is less than 3, it is not appropriate to use ProUCL to calculate EPCs. In that situation, the maximum and mean concentrations would be used as EPCs for RME and CTE, respectively.

Task 5, page 13, 1st paragraph
The HHRA does provide descriptions of the Sudbury River reaches on pages 1-5 and 1-6 as rationale for the designation of flow regimes for all the reaches on page 4-10.

Task 5, page 13, 2nd paragraph
Since there is a lack of site-specific information on the preferred species that anglers at the site catch and consume, the aggregate EPC approach was used with the assumption that an individual consumes all species caught at the site at an equal rate. Section 6.3 of the HHRA has a discussion comparing the hazard quotients calculated by using this approach to those calculated for each individual species. Please see this section for more details.

Section 3, page 14
In the 2003 EPA Office of Solid Waste and Emergency Response (OSWER) directive on the hierarchy of using human health toxicity values in risk assessment, EPA recommends using values from EPA's Integrated Risk Information System (IRIS) as Tier 1 before considering other sources if IRIS values do not exist. ATSDR values are considered Tier 3 in the hierarchy. Since an IRIS toxicity value is available for methyl mercury, it is used in the 2006 HHRA instead of the ATSDR value. This is the link to the hierarchy directive for more information http://rais.ornl.gov/homepage/hhmemo.pdf.