

Clarifications and Corrections in Response to Supplemental Comments from USEPA Region II BTAG to August 2010 Version of the Koppers Pond ERAGS Steps 3-5 Report

Preface

The U.S. Environmental Protection Agency (USEPA) Region II Biological Technical Assistance Group (BTAG) provided supplemental comments to the "Ecological Risk Assessment Steps 3 Through 5 Koppers Pond," dated August 10, 2010 and prepared by Integral Consulting, Inc. for the Kentucky Avenue Wellfield Site, OU 4 located in Horseheads, New York. These comments included input from the U.S. Fish and Wildlife Service.

A conference call was held with USEPA representatives on 29 September 2010 to discuss these comments. The following clarifications and corrections reflect the results of this conversation.

Enumerated Comments and Responses

1. Section 3.1 Supplemental Screening of COPECs, page 3-1: In the third bullet note that surface water concentrations will be compared to surface water benchmarks.
 - We concur. We may also consider use of other criteria (e.g., ORNL aquatic benchmarks) for evaluating surface water in the Supplemental Baseline Ecological Risk Assessment (BERA).
2. Section 3.1 Supplemental Screening of COPECs, page 3-2: In the first bullet please note whether these essential nutrients will be removed as contaminants of concern for fish tissue.
 - We concur. These chemicals were screened out based on this.
3. Section 3.1.1 Refined Surface Water COPEC Screening, page 3-2: It is unclear why magnesium is discussed as a COPEC in this section, but was not included in Section 2.4 Summary of SLERA Screening Conclusions (page 2-6). Please ensure that these two sections are consistent.
 - This section re-introduced the SLERA COPECs for Surface Water, and then performed the screening. We agree that the text was not perfectly clear in this section, but magnesium is shown as a SLERA COPEC on Table 2-1 and drops out in the refined screening summarized in Table 3-2.
4. Section 3.1.2 Refined Sediment COPEC Screening, Sediment Inorganics, Iron, page 3-6: As iron concentrations in the outlet channel sediments exceeded the refined ESV of 20,000 mg/kg, iron should be retained based upon the exceedance of this screening value.
 - We agree that the text was not perfectly clear in this section. Iron was retained after the refined COPEC screening (See Table 3-2).



5. Section 3.1.2 Refined Sediment COPEC Screening, Sediment Inorganics, Nickel, page 3-7: The use of the USGS watershed sediment database as a source of screening values has not been approved by the Agency. An alternate reference should be selected.

- We identified several sources for alternate sediment screening values in Table 3-1b and should have used an alternate instead of the average of the USGS dataset (34 mg/kg). Alternates include the NYSDEC value (16 mg/kg; this was used for the SLERA screening) or the NOAA SQRT value (22.7 mg/kg). If either of these is used instead of the USGS, nickel is still retained as a COPEC after the refined screening.

6. Figure 3-1 Conceptual Site Model for Koppers Pond and Outlet Channels: It is unclear why the exposure route is different for the direct exposure "surface water" and the re-dissolution bioturbation "surface water." Please clarify.

- We concur with this comment. A dashed line has been added to the CSM from the bioturbation pathway to the direct contact line. The CSM was also modified to change the "incomplete exposure pathway" symbols to "secondary or minor exposure pathway" symbols to reflect the potential exposure route if fish or crayfish are collected during the 2010 field effort. The updated CSM has been attached, as requested by USEPA during our 29 September 2010 conference call.

7. Section 3.2 Developing A Refined Conceptual Site Model, page 3-10 and Figure 3-1: As discussed in the May 11, 2010 BTAG memorandum, it is unclear why the outlet channels and mudflat sediments are considered incomplete exposure pathways. This area may be considered habitat for amphibians, avian piscivores, avian herbivores, and herbivorous and omnivorous mammals. Further, these channels may also be appropriate habitat for invertivore. Information should be included regarding what receptors will be using this area. Section 2.2.5, Wildlife, notes that "Unidentified minnow-sized fish have been observed in the outlet streams, but not during the 2008 field investigation" and Section 3.5 Selecting Representative Receptors To Be Evaluated In The ERA notes that "semi-aquatic (e.g. amphibians, avian piscivores) and aquatic (e.g. fish) receptors will be evaluated that have a propensity to inhabit Koppers Pond and the outlet streams."

- Further, the discussion of plant collection in Section 4.1.3 Collection of Additional Biota Samples (pages 4-5 - 4-6) notes the presence of grass/leafy vegetation which could be used as "forage for some of the evaluated receptors." Therefore it is appropriate to consider the outlet channels and mudflat sediments as exposure pathways.

- We concur with this comment. We agree that the outlet channel can include some of the receptors that will be evaluated in the supplemental BERA (e.g., amphibians). However, most of the area is well-vegetated and the outlets are fairly shallow, so they do not represent ideal forage habitat for avian receptors - although these species may traverse these areas (e.g., herons).

The updated CSM has been attached, as requested by USEPA during our 29 September 2010 conference call.

- As a clarification, we are planning on assessing the outlet channel area separately from Koppers Pond, and also possibly combined with Koppers Pond if forage fish are collected from the outlets in October 2010. Although forage fish were not present in the outlets during the May 2008 sampling effort, we planning on taking several sweeps of the outlet channels with electroshock backpacks during the 2010 field effort to see if any fish are present. If forage fish are present, they will be collected for chemical analyses.
8. Section 3.3 Identifying Assessment and Measurement Endpoints To Frame The Evaluation, Assessment Endpoint, page 3-10: Prior to the submittal of the BERA, a BERA technical memorandum should be provided to BTAG outlining the TRVs to be used in assessing the toxicity of contaminants to all receptors, along with a narrative detailing the source of these values and how they were derived.
- Agreed. During our 29 September 2010 conference call, USEPA confirmed that we can proceed with the October 2010 field sampling and submit the TRV memorandum prior to submitting the draft Supplemental BERA for agency review.
9. Section 3.3 Identifying Assessment and Measurement Endpoints To Frame The Evaluation, page 3-11: In the first sentence under Assessment Endpoint No. 1 Box, the text "local amphibian and reptile populations" should be changed to "enthic macroinvertebrates."
- We concur with this comment concerning the typographical error.
10. Section 3.3 Identifying Assessment and Measurement Endpoints to Frame the Evaluation, Assessment Endpoint No. 4 -8, Measurement Endpoint No. 4-2, 5-2, 6-2, 7-2 & 8-2, pages 3-12 -3-14: The measurement endpoint indicates that "an assessment to determine whether there is any potential relationship between COPEC residues in sediments and the integrity of local [avian, mammalian] populations based on review of the published literature" will be conducted. Additional information regarding this endpoint should be provided.
- This was briefly discussed with USEPA during an earlier conference call after the comments to the draft ERAGS Steps 3-5 report (dated 9 February 2010) were received. Basically, prior to submitting the Supplemental BERA if we identify a paper/report that evaluates the relationship between the concentrations of COPECs that are present in Koppers Pond and receptor fitness and fecundity we would like to include it in our risk characterization discussion. We cannot specify what these paper(s) may be at this time since the relevant literature review has not been performed at this point.
 - As an option, some additional detail regarding this literature review could be included in the TRV memo, although we may not necessarily use these studies to derive TRVs *per se* (unless they prove suitable as TRVs).

11. Section 3.5.3 Recommended Supplemental BERA Receptors, Assessment Endpoint No. 2 - Amphibians and Reptiles, page 3-17: Please indicate that these receptors will be evaluated quantitatively.

- Agreed, and although the text was unclear on this we are planning on evaluating amphibians and reptiles quantitatively in the supplemental BERA.

12. Section 3.5.3 Recommended Supplemental BERA Receptors, Assessment Endpoint No. 3 - Fish, page 3-17: Although the measured concentrations in fish may be used to evaluate risk to piscivores, the concentrations will also be used to evaluate the “potential for adverse effects to fish species resulting from exposure to COPECs in surface water and sediment” (page 3-12).

- Agreed, and although the text was unclear on this we are planning on evaluating tissue-based (body burden) concentrations in the fish.
- Tissue-based (body burden) TRVs for fish may not be available for all of the COPECs. NYSDEC (1994) includes some tissue-based TRVs, and there is other information available in the published and gray literature (e.g., USEPA TOXRES database, USACE ERED database), which were briefly discussed during our 29 September 2010 conference call with USEPA.

13. Section 3.5.4 Exposure Calculations and Preliminary Exposure Assessments for Supplemental BERA Receptors, page 3-18: It is noted that for receptors for Assessment Endpoints 1 - 3 (benthic invertebrate, amphibian/reptiles, and fish) a ratio approach will be used to compare the media concentrations to benchmarks. This should be clearly noted for Assessment Endpoint 3 (amphibian/reptiles) in Section 3.3.

- Agreed, and although the text was unclear on this we are planning on evaluating amphibians and reptiles quantitatively in the supplemental BERA

14. Section 3.5.4 Exposure Calculations and Preliminary Exposure Assessments for Supplemental BERA Receptors, Area Use Factor, page 3-19: The wording in this Section is confusing, as it appears that the area use factor will consider the reference pond and Koppers Pond together. If it is determined that a receptor will not be using the entire pond, then an explanation should be provided. It is unclear why the outlet channels will be considered separately. Tables 3-4a - 3-4e (exposure assumptions) all indicate that the outlet channels will not be used by any receptor due to lack of standing water. As previously discussed, the outlet channels have minnows, and may be used by aquatic and semi-aquatic receptors. Therefore the area use factor for Koppers Pond should include the outlet channels.

- That was not the intent. The reference pond will be evaluated separately from Koppers Pond.

- In addition, if the receptor home range information is based on shoreline length (as opposed to area), the AUF may be developed based on the extent of shoreline in the reference pond or Koppers Pond.
- We are also planning to confirm if minnows are present in the outlet channels t by taking several sweeps of the outlet channels with electroshock backpacks during the 2010 field effort. If present, samples of these fish will collected for chemical analyses.

15. Section 4.1.3 Collection of Additional Biota Samples, page 4-5: As discussed in the May 12, 2010 BTAG memorandum, sediment samples should be collocated with biota samples, and ideally the samples should represent a concentration gradient to gain a better understanding of contaminant bioavailability.

- We identified the candidate biota sample locations based on the proximity to existing sediment data, but agree to consider collecting co-located samples at the very least for the cattails.
- It may be difficult to collect associated sediments for the duckweed since there may be the potential to sweep a fairly large area to collect sufficient plant mass for chemical analysis.

16. Section 4.1.3 Collection of Additional Biota Samples, Aquatic Invertebrate Collections, page 4-5: Please include a site figure which shows the location where aquatic invertebrate will be collected. It is recommended that at a minimum, crayfish also be collected from the outlet channel area. As two crayfish composite samples will be collected from the reference pond, (Section 4.1.6, page 4-8), a minimum of two crayfish composite samples should be collected from Koppers Pond.

- We agree with the number of crayfish composites, although this may be difficult to obtain for the outlet channels (also unsure about the reference pond at this point).
- We did not specify the locations within Koppers Pond or the reference pond for crayfish sampling to provide the field team some flexibility in selecting these areas based on their visual assessment of the suitability of the substrate habitat (non-mucky bottoms).
- Initial areas that will be checked for crayfish include near Sed08-01 (juncture of Koppers Pond and the Industrial Drainageway), the eastern arm of the pond (sediments are sandier in this area) and near the outlet channels (see Figure 4-1 of the ERAGS Steps 3-5 Report).
- We will also attempt to collect crayfish from the outlet channels. We were already planning to sweep the outlet channels with the electroshock unit to evaluate whether any minnow-sized fish are present. This method can also be used to collect crayfish.

The water depths will likely not be sufficient for using minnow traps in the outlet channels.

- During the 29 September 2010 conference call with USEPA, a backup plan was discussed if we are unsuccessful at collecting crayfish after a concerted effort (i.e., overnight minnow trap sets, sweeps in multiple areas with the electroshock unit over several field days). It was agreed to attempt to collect aquatic worms from the same areas where the plant roots or rhizomes are collected. Depending on the actual locations, a co-located sediment sample may also be collected.

If neither crayfish nor sufficient numbers (or masses) of aquatic worms are collected during 2010 field program, we will use literature values to estimate the tissue COPEC concentrations in invertebrates based on the sediment concentrations for the supplemental BERA.

17. Section 4.1.3 Collection of Additional Biota Samples, Plant Roots or Rhizomes, page 4-6: Please clearly indicate whether one composite sample will be collected or two samples will be collected from the “juncture of the Industrial Drainageway and Koppers Pond and along the southern perimeter of Koppers Pond between the two outlets.” As discussed above, sediment samples should be collocated with all biota collection.

- See response to #15.

18. Section 4.1.5 Collection of Sediment for Toxicity Testing, page 4-7 and Appendix D: Please clearly indicate that all samples which are collected for toxicity testing will also undergo a complete TCL and TAL analysis. Also, note whether sample locations selected represent a concentration gradient for the contaminants of concern.

- Our plan is for the sediment toxicity testing laboratory (ASI) to take samples of the pre-test sediment (after homogenization and sieving) and ship them to the chemical laboratory for chemical analysis.
- It is preferable to run the refined COPECs only for these samples – TCL SVOCs, TAL metals, PCBs. We will also add total organic carbon (TOC) to the list of analyses.

19. Section 4.1.6 Collection of Sediment and Biota Samples from a Reference Pond, page 4-8: As previously discussed, sediment collected for the toxicity tests should undergo a complete TCL and TAL analysis.

- Same as #18 above.

20. Section 5.2 Site Visit To Evaluate Feasibility of Sampling, Collection of Sediments and Biota from a Reference Pond, page 5-2: The last sentence in this section indicates “that field samples will be collected from the reference pond in late spring of 2010.” Please note whether field samples were collected, and if so, include the results.

- This was a typographical error carried over from the draft version of the report. Sampling will occur in the second or third week in October 2010, depending on securing access agreements and staff scheduling.

21. Table 3-4b Exposure Assumptions for the Piscivorous Avian Species – Great Blue Heron: Please check the calculations for the food ingestion rate.

- The equation shown (Excel equation form: $= (10^{(0.966 * \text{LOG}(2336) - 0.64)}) * 0.3$) yields the value shown in the descriptor column.
 - The value of 0.3 at the end is to convert from wet weight to dry weight. The dry weight ingestion rate will be lower than the wet weight ingestion rate.
 - If you exclude the value of 0.3, the equation yields a wet weight value of 0.411 kg_{ww}/day, which is similar to that reported in the *Wildlife Exposure Factors Handbook* (0.42 kg_{ww}/d; calculated as product of 0.18 g_{ww}/g_{bw}-d X avg body weight of 2336 g). The conversion to dry weight basis is shown below.

$$\frac{0.411 \text{ kg}_{ww}}{\text{day}} \times \frac{0.3 \text{ kg}_{dw}}{\text{kg}_{ww}} = \frac{0.123 \text{ kg}_{dw}}{\text{day}}$$

22. Table 3-4c Exposure Assumptions for the Herbivorous Mammalian Species – Muskrat: Based upon the equation and values provided, the sediment ingestion rate should be 9.58 g/d rather than 9.2 g/d.

- Our Excel equation dropped the "4" from the sediment ingestion calculation (0.94 x food ingestion rate). When reinserted, this yields the value of 9.6 g/d, as noted in the comment. We corrected this in our file copy and will use the corrected ingestion rate for the Supplemental BERA.

23. Appendix C Aquatic and Semi-Aquatic Plant Collection Methodology: It is noted that the proposed sampling follows the protocol developed by USEPA (2007). The reference to this protocol should be contained in the reference section. Further, as discussed above, collocated sediment samples should be collected from the locations where plants are being collected.

- The USEPA (2007) citation and associated text was a carry-over from a draft version of the SOP (not related to plant sampling) and should have been deleted from this SOP.
- We identified the candidate sample locations based on the proximity to existing sediment data, but agree that it would be a good idea to collect co-located samples at the very least for the cattails. This will be more problematic for the duckweed since a

large area of the pond may need to be swept to collect sufficient plant mass for chemical analysis.

- Per our discussion during the 29 September 2010 conference call, sediment samples (for chemistry and possibly toxicity testing) may also be needed from the areas where crayfish are collecting if these areas are not close by (say, within 100 feet) of the existing 2008 sediment locations.

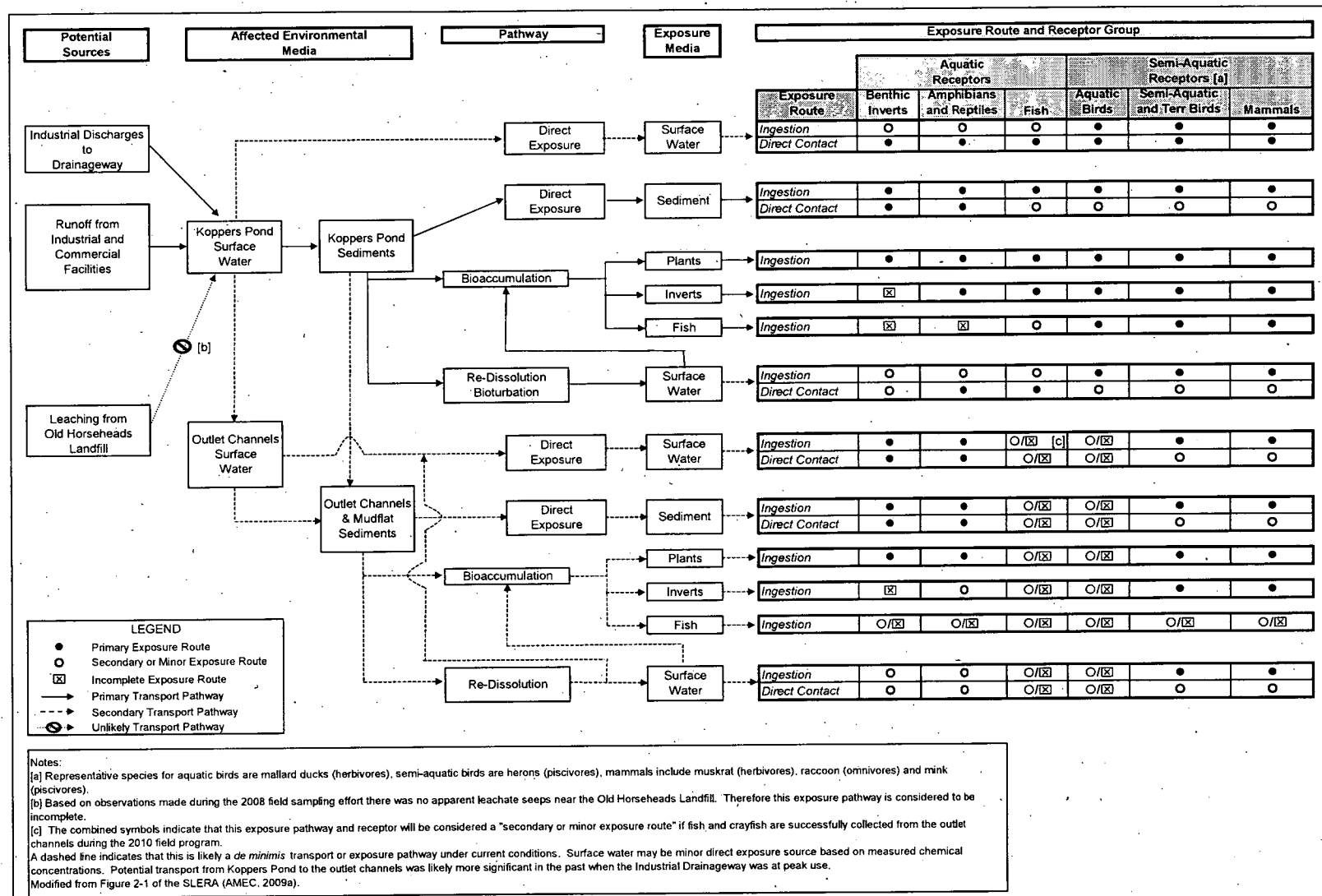


Figure 3-1. Conceptual Site Model for Koppers Pond and Outlet Channels
Kentucky Avenue Wellfield OU4 - Koppers Pond, Horseheads, NY