REVIEWER 4

- Abstract,
 - pg 6 revise the estimated cost for Hudson and for addressing sediments nationally. The last estimate I saw for Hudson put the cost at \$2.25 billion. Gary Klawinski is the EPA program manager and could provide the best estimate and best document to cite. I don't know of any recent national analysis of costs to remediate sediments, but I can think of 3 sites that will likely cost over \$1 billion, many more that will hit several hundred million.
- Section 1 Introduction
 - Writing style/audience friendly This section is appropriate for an audience of remedial contractors and analytical laboratories, and it's a good summary/history of the development of passive samplers.
 - 2. Sufficient information yes
 - 3. Calculation Descriptions These descriptions are well done and as simple as you can make them.
 - 4. Topics to include/exclude -
 - In Section 1.6 .1, HOCs the focus is largely on the relationship to toxicity and bioavailability. Consider adding a paragraph to point out how this information might be used, such is in baseline & long term monitoring, as an input to a fate and transport model, or for design of remedial options. For example, Passive samplers provide a monitoring mechanism that is closely related to uptake by organisms, but are not affected by salinity, temperature, oxygen, non-CERCLA related pollution, etc.
 - Section 1.6.2, Metals This leaves me thinking why bother using DGTs at all. The end of that section states "DGT measured metals provided valuable information on metal speciation, distribution, and flux that is important for quantifying exposure and, more specifically, bioavailable concentrations." I think it would be good to expand on this, perhaps even provide an example of the use of DGT data.
 - 5. Any additional resources The navy has an interactive matrix called ISRAP (<u>http://www.israp.org/</u>) that helps RPMs sort out appropriate monitoring tools for different purposes/environments/contaminants. It covers PE and SPME's, as well as a variety of other monitoring tools. It's a good tool for understanding how passive sampling would fit into a monitoring program. That might be good to have listed somewhere, though maybe an appendix would be the best place.
 - 6. Other comments
 - Table 1.1 probably requires a caveat "mention of company names or trademarks does not constitute an endorsement by EPA..." unless that's included elsewhere.
 - Section 1.7, pg 34. The first two sentences of the following quote are confusing because the preceding text is already discussing the choice of K values to use for this particular method. "Another evolving area for passive sampling is the approach used for calculating the Cfree concentration for the target contaminants. As discussed in Section 8, one can assume that equilibrium has

been achieved between the target contaminants and environmental phases (e.g., water, particulates, colloids), and Cfree can be calculated using a KPS. Another approach, if equilibrium is not assumed, is to use performance reference compound (PRC) data to adjust the non-equilibrium passive sampler concentration (CPS non-eq) data for equilibrium conditions." I would edit this such that it is the beginning of a new paragraph and it begins "A common but evolving approach for passive sampling is to assume that equilibrium has been achieved..."

- Section 7 Extraction and Instrumental Analysis of Target Contaminants from Passive Sampling
 - 1. Writing style/audience friendly good
 - 2. Sufficient information good. The text boxes and tables are particularly useful.
 - 3. Calculation Descriptions for equation 7.1, it's not clear if V_s is the total volume of solvent for the extraction, the volume of solvent injected in the GC, or the volume of solvent after being reduced. Otherwise, it's a good description.
 - 4. Topics to include/exclude none
 - 5. Any additional resources none
 - 6. Other comments
 - Section 7.2.1, pg 74 typos in the text make it illegible.
 - Text box 7.3, pg 78 just looking to clarify the extraction times the first extraction is for >12 hours, the 2nd, 3rd, and 4th extraction are for >10 minutes while agitating? What's the reasoning behind this method? Why not agitate the first extraction, and is 10 minutes enough for the remaining extractions?
- Section 8 Data Analysis: Calculation of C_{free} and C_{DGT}
 - 1. Writing style/audience friendly good
 - 2. Sufficient information yes
 - 3. Calculation Descriptions good
 - 4. Topics to include/exclude -
 - It may be worth discussing the use of two samplers of different thicknesses to determine if equilibrium has been reached. Admittedly, it's easiest to do this ex situ, but it is a simple and robust method to check for equilibrium and it has been done in situ.
 - Also, the intro in section 8.1, pg 86, states "This assumption can be based on previous experience with the passive sampler, the deployment site, or the design of the passive sampler investigation." I might add as an example that one way to appropriately incorporate time to equilibrium in the design would be to do a small time series test.
 - Section 8.2, pg 87 Perhaps we should include a discussion of who is responsible for these calculations. I think many RPMs would assume that the laboratory does it, but I think in many cases this is something that should fall to the contractor. Also, it's implied that the standard analytical QA/QC associated with the EPA methods should be done before anything is calculated, but perhaps it should be explicit that the Cfree calculations come after that.

- Section 8.4, pg 93 any case studies of DGT use? I think that the case studies are sufficiently useful that they should be a chapter of their own, rather than an appendix.
- 5. Any additional resources none
- 6. Other comments
 - Section 8.1, pg 86 We can place the GUI's somewhere on this website: <u>http://www.epa.gov/superfund/health/conmedia/sediment/index.htm</u>. Unfortunately, there were some issues with the recent move to a new web platform, and this site is not fully operational. I can put the GUI's on the list to be added, but it may be a while before we can publish them to the site.
 - Figures 8.1 8.5 are difficult to read due to the pixilation.
 - Explain the pros and cons of forcing the regression through an intercept of 1 (as allowed in the GUI, Figure 8-2).
 - Section 8.3, pg 93 where is Figure 8-17?
- Section 9 Quality Assurance and Quality Control, and Other Considerations
 - 1. Writing style/audience friendly good
 - 2. Sufficient information good
 - 3. Calculation Descriptions none
 - 4. Topics to include/exclude -
 - Sections 9.1.8 9.1.10, pg 96-97 The section on specific QA/QC for POM focuses on the need to use the same type of POM as was used to measure the K_{POM} values that you're using, a thickness of 76um or less, and a solvent of hexane-acetone. Why aren't there similar considerations for PDMS or PE? Are these polymers that much more consistent? I see that appendix A notes some differences between manufacturers of different PDMS. That should be discussed here as well.
 - Section 9.2.2, pg 98 Is there a recommended method for measuring the DBL?
 - 5. Any additional resources none
 - 6. Other comments none
- QAPP Passive Sampling for Persistent Organochlorine Pollutants (POPs) in the Water Column of the Palos Verdes Shelf (2013)
 - This is a useful example. I would add a line to the introductory text stating "This QAPP is for passive sampling of surface water, however it is broadly applicable to porewater sampling as well." Also, it might be useful to have a second example QAPP where passive sampling was used as a dose-metric for toxicity tests, or at least where passive sampling was done ex situ.