Comments on HESS-2021-143

General comments

This article deals with the sources and pathways of some biocides and their transformation products from building runoff in a 2 ha urban district. The manuscript is overall of good quality, well written and presenting interesting data with original sampling campaigns to study the biocide emissions from a small urban districts.

My main reservation is with the section “Estimation of biocide emissions over two years”. The description of the method (paragraph 2.5) and the conclusion on this subject must be qualified. The method gave a rough estimate (even if interesting) but the comparison to the literature is only informative and does not bring proof of the accuracy of the evaluation, the initial stock of biocides not being necessarily the same. The presentation of the results of this part is however honest (paragraph 3.2.3).

The paper is recommended for publication with some minor revisions.

Specific comments

Title: Perhaps specify in the title that it deals with stormwater

Abstract: The last sentence of the abstract present obvious conclusions and not informative. It seems logical that by sampling in a targeted way, a better identification of the sources is obtained. Perhaps you can refine this conclusion and add some more concrete and precise results.

Line 57: Please explain the choice of the TPs, why just these 3 compounds?

Paragraph 2.1: the tow-step approach is well presented and convincing, but the long period between the first campaign (step 1 in 2015-2017) et the last one (step 2 in 2019-2020) raises the question of the comparability of the campaigns between them. Why did you not sample the swale system during the second campaign in 2019-2020 to verify the stability of the concentrations in the swale? Justify this point.

Line 117: you said that the last paint was in 2007 and after it is indicated that a façade was painted in 2018 (line 223). It is unclear.

Line 121: Is there always water in the swale or is it dry during dry weather?

Line 153: how are sampled the roof, façade and pipe samples? Are they representative of the entire rain events? What about the first flush? You should add details about the sampling and its representativeness.

Line 153: how the water is sampled? You said during the sample, why not at the end of the sample?

Line 163-165: did you analyse the representativeness of the sampled events in relation to the classical pluviometry?

Figure 4: I am not sure that this figure is really informative since we are not able to read the rainfall for each sampled event. Perhaps put it in supplementary materials

Line 176: why did you not test solar panel elution? Do you think that they could emit biocides?

Line 177-178: n=1 seems insufficient to conclude.

Chemical analysis: I would recommend to present the analytical validations (as extraction recoveries) and the analytical uncertainties to validate the SPE extractions and the quantification.

Paragraph 2.5: I am not really convinced by the methodology presented by this paragraph because the concentration used does not take into account the temporal evolution of emitted concentrations over time due to ageing or depletion of the stock in the material, or does not present an argument from the literature to overcome this. What verification have you implemented to justify the word "efficiently" in line 222. Justify the use of an average biocide concentrations to calculate BE. Moreover, why the used samples were not described in the 2.3 section? What is the number of the samples and the representativity? What is the sampling frequency? What is the variability of the measured concentrations? Does the concentration vary in time? Decrease? To prevent the reader's doubts, a part of the explanation from line 349 to 355 could be used in the methodology presentation and the fact that the estimated BE will be compared to the literature.

Paragraph 3.1: I am wondering if 4 sampled events are sufficient to assess the variability of the concentrations in the swale, especially since only one PNEC exceedance is observed to justify the continuation of the study. Why don't you continue to sample the swale in the second part of the study?

Line 298: You said that you sampled an additional pipe (R4-2) because R4-1 exceeded R1 and R2 by an order of magnitude but you have no result for R1 and R2 before the first sampling of R4? I don't understand.

Figure 8: Precise if it is mean or median values in the legend

Line 320 and following: It is not clear if the difference of concentrations is due to the new paint or to the exposition.

Line 363/364: you explain that OIT was not detected due to its degradation in soil but for S9 (surface water pipe), water is not percolated through the soil? How do you explain to not found OIT in S9 samples?

Line 413: you have to qualify this sentence because your method gave a rough and short term estimate (even if interesting). the comparison to the literature is only informative and does not bring proof of the accuracy of the evaluation, the initial stock of biocides not being necessarily the same.

Technical corrections

Figure 1: Step 2: perhaps precise "Elution and leaching test experiments"

Line 97: two -s at "sselected"

Line 114: The capital letter at "Area" is unnecessary

Line 118: perhaps add a -s at "diverse use"?

Line 134: I find that "surface water pipe" do not describe well the type of water sampled. It looks like surface water that has been sampled. Perhaps "surface runoff pipe" would be more meaningful

Figure 5: you could cut the ordinate-axis to better present the lowest concentrations

Line 246: space is missing between below and 4

Line 245, 246 and 247: the sentence is not simple to understand

Line 254: substanceS

Line 296: perhaps add a coma after “in all rain downpipes”

Figure 7 (d): perhaps precise “non sampled event”. The use of one single scale is understandable but does not allow to read the concentrations for R1 and R2

Line 321: due “to”?

Line 579: “TEXTE”?