Errata 2011-10

SKB R-10-28

Chemistry data from surface ecosystems in Forsmark and Laxemar-Simpevarp

Site specific data used for estimation of CR and K_d values in SR-Site

In the earlier distributed report, there are errors that have now been corrected. The corrected page 109 is enclosed. The changed text is marked with a vertical line in the page margin. An updated pdf version of the report, dated 2011-10, can be found at www.skb.se/publications.

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The selection of representative vegetation and fungi data is based on the assumptions below. For vegetation and fungi samples, the same selection was used as for the Ter_cR_pp and cR_soilToMush parameters described above.

- For plants, this means that it was assumed that herbivores mainly consume vegetation from the field and shrub layer as well as green parts of the trees. As a simplification, they are assumed not to consume mosses or wood (cf. Table 4-8 in /Truvé and Cederlund 2005/ who states that the herbivore diet also includes wood from deciduous tree species). The exclusion of wood samples potentially leads to an underestimation of the uptake of e.g. Sr, Ni and Zr whereas the uptake of e.g. Cl may be somewhat overestimated (cf. Section 3.4.1).
- For fungi, it was assumed that all species are included in the diet equally.
- Furthermore, it was assumed that the diet of herbivores in the Forsmark area contain 6% fruit bodies of fungi and 94% green vegetation as a weighted average /Nordén et al. 2010/. In case of missing fungi data (this data set included fewer elements), it was assumed that the food consisted of 100% green vegetation. This may lead to a slight underestimation of uptake for elements which occur at higher concentrations in fungi. The element concentrations in fungi and green vegetation are compared for a restricted number of elements in Section 3.4.2. It is concluded that some metals (e.g. Cd, Hg, Cu and Zn) and also some nutrients (N, P, K) as well as Cs and Rb occur at higher concentrations in fungi, whereas Ca and Sr occur at higher levels in vegetation.

The selection of representative herbivore data is based on the following assumptions:

- In the dose model the terrestrial herbivore compartment reflects large herbivores such as moose and roe deer which are consumed by humans today. Since there is very little variation in composition among all animal samples (cf. Section 3.4.1), it was assumed appropriate to use chemistry data from all herbivores for this parameter (including small animals as rodents, but with omnivores and carnivores excluded).
- It was also assumed appropriate to use herbivore data from both sites. According to Section 3.4.4 there is no general difference in chemical composition among animals when the Forsmark and Simpevarp areas are compared, even though small differences can be seen for a limited number of elements. This indicates that it is reasonable to treat data from both sites as one data set.

Plant and herbivore data selected are marked in Figure 4-3. All fungi species sampled were selected for this parameter (cf. Figure 3-17). A compilation of data selected for this parameter is found in Appendix 2.

4.3 Concentration ratios for aquatic biota (CR)

Concentration ratios for aquatic biota are used in SR-Site to model uptake and distribution of elements between water, primary producers and consumers. The uptake in primary producers is part of the processes describing the turnover of radionuclides in the ecosystems, whereas uptake in edible fauna in the model is used for estimation of exposure to humans. The primary producers were divided into three different types; phytoplankton, microphytobenthos and macrophytes/macroalgae (for definitions see /Andersson 2010/ (freshwater ecosystems) and /Aquilonius 2010/ (marine ecosystems). Vegetation parts present below the sediment surface were not included when estimating the CRs. The edible fauna considered in the model are fish and crayfish from freshwater environments and fish and mussels from marine environments. The element concentrations in soft tissues were used when estimating the CRs for these fauna types.

4.3.1 Selected site data for freshwater primary producers: *Lake_cR_pp_plank, Lake_cR_pp_ubent* and *Lake_cR_pp_macro*

Site specific data of the chemical composition of freshwater primary producers and corresponding water concentration data were used to estimate CR ratios for water and limnic primary producers. Limnic primary producers were divided into three categories; phytoplankton, microphytobenthos and macrophytes/macroalgae, abbreviated Lake_cR_pp_plank, Lake_cR_pp_ubent and Lake_cR_pp_macro, respectively.