Higley et al. Derivation of a screening methodology JER 66

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Derivation of a screening methodology for evaluating radiation dose to aquatic and terrestrial biota
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The United States Department of Energy (DOE) currently has in place a radiation dose standard for the protection of aquatic animals, and is considering additional dose standards for terrestrial biota. These standards are: 10 mGy/d for aquatic animals, 10 mGy/d for terrestrial plants, and, 1 mGy/d for terrestrial animals. Guidance on suitable approaches to the implementation of these standards is needed. A screening methodology, developed through DOE's Biota Dose Assessment Committee (BDAC), serves as the principal element of DOE's graded approach for evaluating radiation doses to aquatic and terrestrial biota. Limiting concentrations of radionuclides in water, soil, and sediment were derived for 23 radionuclides. Four organism types (aquatic animals; riparian animals; terrestrial animals; and terrestrial plants) were selected as the basis for development of the screening method. Internal doses for each organism type were calculated as the product of contaminant concentration, bioaccumulation factor(s) and dose conversion factors. External doses were calculated based on the assumption of immersion of the organism in soil, sediment, or water. The assumptions and default parameters used provide for conservative screening values. The screening methodology within DOE's graded approach should prove useful in demonstrating compliance with biota dose limits and for conducting screening assessments of radioecological impact. It provides a needed evaluation tool that can be employed within a framework for protection of the environment.

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