levels are generally preferred to lowest effects levels) and extrapolates from a toxicity benchmark for the test species to a toxicity benchmark for the desired species. However, the procedures used to develop benchmarks (i.e., RfDs) for the protection for human health establish an acceptable daily dose for all individuals (including sensitive sub-populations) while the development of ecological benchmarks for this analysis establish a level that will sustain the reproductive fitness in a local population. Consequently, benchmarks for birds and mammals were established using three key guidelines. First, because the reproducing population was selected as the assessment endpoint, the benchmarks were developed from measures of reproductive success or, if unavailable, other effects that could conceivably impair the maintenance of the population.

Second, the taxon of the test species was matched to the taxon of the wildlife species to the greatest extent possible. The evolutionary processes that result in obvious differences in taxa (e.g., morphology) also result in differences in the physiological processes that govern chemical response. Moreover, taxonomic similarities are generally associated with similarities in feeding habits, physiology, and chemical sensitivity at the family classification and, to a lesser extent, the order classification. For example, herbivores are generally more resistant to toxicants than predators because they are exposed to plant toxins, and the enzymatic system that detoxifies plant toxins also detoxifies pesticides and other organic chemicals.

Third, a default safety factor of 10 was adopted only for extrapolating from an lowest-observed-effects level (LOEL) to a no-effects level (NOEL). A ten-fold safety factor was not applied to sub-chronic studies since reproductive and developmental toxicity studies are frequently short-term. Even among target organ toxicity studies, there are many instances where sub-chronic studies are actually more sensitive than chronic studies carried out on the same substance. Also, for mammals and birds, differences in interspecies uncertainty were indirectly addressed through the use of the species-scaling equation described in Section 4 of the ''Technical Support Document for the Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors.'' The Agency requests comment on the use a safety factor of 10 when extrapolating from a LOEL to a NOEL. The Agency also requests comment on the use of a scaling approach to address interspecies uncertainty as described above. Furthermore, the Agency seeks comment on the inability of the Risk Assessment to evaluate the inhalation and dermal routes of exposure for birds and mammals.

For the terrestrial plants, the approach used to establish toxicological benchmarks was adapted from the Effects Range Low (ER-L) approach developed by the National Oceanographic and Atmospheric Administration (NOAA). The NOAA ER-L approach estimates a percentile of the distribution of various toxic effects thresholds. The measurement endpoints were generally limited to growth and yield parameters because (1) they are the most common class of response reported in phytotoxicity studies and, therefore, will allow for benchmark calculations for a large number of constituents, and (2) they are ecologically significant responses both in terms of plant populations and, by extension, the ability of producers to support higher trophic levels. It should be noted that these benchmarks were limited to soil concentrations and do not explicitly consider the adverse impacts on plants from ambient contaminant concentrations in the air. Further details can be found in section 4.3.3 of the ''Technical Support Document for the Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors.'' The Agency solicits comment on the overall approach taken to develop benchmarks for the terrestrial plant community.

For the soil fauna, the toxicological benchmarks were established based on methods developed by the Dutch National Institute of Public Health and Environmental Protection (RIVM). The RIVM approach estimates a confidence interval containing the concentration at which the no observed effects concentration (NOEC) for p percent (95th percentile was selected) of the species within the community is not exceeded 50% of the time. A minimum data set was established in which key structural and functional components of the soil community (e.g., decomposer and grazing organisms) encompassing different sizes of organisms (i.e., microfauna, mesofauna, macrofauna) were represented. As with the Ambient Water Quality Criteria, measurement endpoints included reproductive effects as well as measures of growth, survival, mortality. The Agency requests comment on the use of the RIVM methodology, and protecting 95 percent of the community 50 percent of the time. The Agency also requests comment on its inability to fully quantify the effect of soil characteristics on toxicity of constituents to soil organisms.

For populations of fish and aquatic invertebrates (represented by daphnids), a hierarchical approach was taken for use of data sources in deriving benchmarks. The first choice was final chronic values (FCVs) from the Sediment Quality Criteria effort by the EPA Office of Water, followed by values from the Great Lakes Initiative (GLI) effort, and finally, the Ambient Water Quality Criteria (AWQC). If these benchmarks were not available, then a benchmark was developed using AWQC procedures or, if data were inadequate, the GLI Tier II procedures for establishing chronic values (termed secondary chronic values—SCVs). The AWQC ranked third since many years have passed since their establishment and the SQC and GLI efforts re-evaluated the toxicity data sets of several of these. The Agency solicits comment on the hierarchical approach described above for deriving toxicity benchmarks.

For aquatic plants, the approach used to establish toxicological benchmarks was adapted from the ER-L approach developed by NOAA. The NOAA ER-L approach estimates a percentile of the distribution of various toxic effects thresholds. However, due to the general lack of toxicity data, the default ER-L approach was used wherein the lowest LOEC for either vascular plants or algae was used. The Agency solicits comment on the overall approach taken to develop benchmarks for aquatic plants.

For the sediment organisms, the approach used to establish toxicological benchmarks for non-ionic, hydrophobic organic chemicals was based on sediment quality criteria methods for non-ionic constituents. Two key assumptions form the basis for the proposed sediment quality criteria. First, benthic species, defined as either epibenthic or infaunal species, have a similar toxicological sensitivity as water column species. As a result, FCVs (or SCVs) developed for the fish and aquatic invertebrates can be used for the benthic community. Second, pore water and sediment carbon are assumed to be in equilibrium and the concentrations are related by a partition coefficient, Koc. This assumption, described as equilibrium partitioning (EqP), provides the rationale for the equality of water-only and sediment-exposure-effects concentrations on a pore water basis: The sediment-pore water equilibrium system results in the same effects as a water-only exposure. The Agency requests comment on the use of this approach in support of today's proposal. In some cases, protecting these