

REQUEST FOR ADDITIONAL INFORMATION (RAI)
**Volume 3—Postclosure Chapter 2.2.1.4.3, 1st Set (Compliance with the Separate Ground
Water Protection Standards)**
(1 RAI)
(DEPARTMENT OF ENERGY'S SAFETY ANALYSIS REPORT SECTIONS 2.4.4)

RAI #1

Provide further information that clarifies how the dimensions of the representative volume used to address ground water protection standards were determined. In particular, describe: (1) how the traces of the particle tracks were used to define the dimensions of the cross section perpendicular to the direction of ground water flow, (2) the basis for the distance used for the dimension in the direction of ground water flow, and (3) the effect that climate change, within the first 10,000 years, has on the dimensions of the representative volume.

Basis: The dimensions of the cross section of the representative volume perpendicular to the direction of ground water are defined by particle traces (Section 2.4.4.3.2). However, the license application provides limited discussion regarding the particle traces (e.g., relationship between the number of particle traces and the number of breached waste packages, how the traces were used to determine the dimensions of the cross section, relationship between the traces and concentration in the representative volume). The dimension of the representative volume in the direction of groundwater flow is calculated to be 30 meters, but, there is limited discussion of the basis for this value (e.g., bases for the values used in the calculation).

Figure 2.3.9-14 illustrates particle tracks from beneath the repository to the southern edge of the site-scale saturated zone flow model. Plan and vertical views of these particle tracks in the figure provide limited information related to the areal extent of the plume normal to the flow direction at the accessible environment boundary. The resulting shape of the plume intersecting the accessible environment boundary is described as a rectangle 3000 m long and 200 m deep. However, if the edges, i.e., sides and bottom, of the plume are irregular, a smaller areal extent could be calculated.

The staff needs this information to determine compliance with 10 CFR 63.332, consistent with the definition of *slice of the plume* in 10 CFR 63.302.