

based on soil radionuclide concentrations. Equation 2.6, obtained from Section 5 (Equation 5.5) of NUREG/CR-5512, will be used to calculate vegetable concentration factors as follows:

$$C_{svhj} = 1000(ML_v + B_{JV})W_v \{AC_{sj}, t_{gv}\} / C_{sj} \quad (\text{Equation 2.6})$$

Where:

- C_{svhj} = concentration factor for radionuclide j in plant v at harvest from an initial unit concentration of parent radionuclide i in soil (pCi/kg wet-weight plant per pCi/g dry-weight soil)
- B_{JV} = concentration factor for uptake of radionuclide j from the soil in plant v (pCi/kg dry-weight plant per pCi/g dry-weight soil)
- ML_v = plant soil mass-loading factor for resuspension of soil to plant v (pCi/kg dry-weight plant per pCi/g dry-weight soil)
- W_v = dry to wet-weight conversion factor (unitless)
- $\{AC_{sj}, t_{gv}\}$ = decay operator notation used to develop the concentration of radionuclide j in soil at the end of the crop growing period t_{gv} (pCi/g dry-weight)
- C_{sj} = concentration of radionuclide j in soil during the growing period (pCi/g dry-weight)
- $C_{sj}(0)$ = initial concentration of radionuclide j in soil during the growing period (pCi/g dry-weight)
- t_{gv} = growing period for food crop (d)
- 1000 = unit conversion factor (g/kg)

The radionuclides recommended for analysis in vegetation in RG 4.14 are natural uranium, thorium-230, radium-226, lead-210, and polonium-210. These radionuclides, with the exception of polonium-210, have long half-lives when compared to the growing season; therefore, the decay correction during the growing season can be ignored for these parameters. For polonium-210, the initial soil concentration and soil concentration during the growing season will be assumed identical. This assumption will allow simplification of Equation 2.6 to Equation 2.7.

$$C_{svhj} = 1000(ML_v + B_{JV})W_v \quad (\text{Equation 2.7})$$

Table 2.9-21 presents the parameters that will be used to estimate wet-weight vegetable concentrations from dry-weight soil concentrations.