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## Development of a Biosphere Model for Waste Incidental to Reprocessing and Non-High-Level Waste Consultations

J.W. Mancillas, A.A. Simpkins, L.D. Howard, P.A. LaPlante, O. Pensado (Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas); A. Turner Gray (U.S. Nuclear Regulatory Commission, Washington, DC)

A radiological dose model has been developed in the GoldSim (registered trademark of GoldSim Technology Group, LLC) modeling environment to be used as a tool for the U.S. Nuclear Regulatory Commission (NRC) and Center for Nuclear Waste Regulatory Analyses (CNWRA) staffs to review U.S. Department of Energy (DOE) non-high-level waste determinations for compliance with the appropriate performance objectives. The model uses a groundwater source to probabilistically evaluate radionuclide partitioning into intake pathways and evaluates dose histories for multiple receptor groups. Exposure pathways include direct exposure, inhalation, and ingestion. This validated model was constructed using basic GoldSim elements and elements of the Contaminant Transport (CT) module. The model was developed with the intent of being used as an adaptable radiological dose module employing ICRP-72 and Federal Guidance dose coefficients in conjunction with site-specific parameters (i.e., consumption rates, exposure times) to estimate local population exposure. Model development was funded by NRC to support the requirement of the Ronald W. Reagan National Defense Authorization Act of fiscal year 2005 that the NRC consults on non-high-level waste determinations prepared by DOE for sites in South Carolina and Idaho.

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