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## 3.0 Vadose Zone

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At the Hanford Site, radioactive and hazardous waste in the soil column from past intentional liquid waste disposal, unplanned leaks, solid waste burial grounds, and underground tanks are potential sources of continuing and future vadose zone and groundwater contamination. Characterization of the subsurface and vadose zone monitoring were conducted during fiscal year (FY) 2004 to better understand the distribution of subsurface contaminants and to track the movement of vadose zone contamination. Also, several technical studies were completed; the results of these studies could lead to new understandings of moisture and contaminant movement in the vadose zone, contaminant interactions with the soil column, and new and improved methods to characterize and monitor the vadose zone. Finally, vadose zone characterization to assess remediation and post-remediation contamination was performed in FY 2004 as part of cleanup efforts at the Hanford Site.

This chapter summarizes major findings from those efforts, focused primarily on vadose zone soil contamination associated with past single-shell tank leaks and liquid disposal to ground as a result of spent fuel processing.

An overview of the major soil sources of groundwater contamination is provided in PNNL-13080. This chapter discusses vadose zone contamination that could affect groundwater in the future. An overall evaluation depends, to a large degree, on integration of vadose zone and groundwater monitoring and characterization data to present a comprehensive picture of contaminant fate and transport. Significant FY 2004 vadose zone results are summarized here. However, the bulk of the data interpretation on the effect to groundwater is presented and discussed in Chapter 2 of this document.