As a sludge disposal technique, land application of sewage sludge has been practiced for many years in this country and overseas. Only in recent years, however, have the necessary research and monitoring studies been undertaken to develop sound design guidelines for recycling sludge on the land. Appropriate management practices have been developed to allow many land application systems to be properly designed and operated from a public health and environmental impacts standpoint, while protecting the long-term productivity of the sites to which the sludge is applied. A number of projects using these practices have been closely monitored and carefully evaluated for extended periods of time. The results of these and other studies have lead to the publication of numerous scientific reports and state-of-the-art symposium proceedings (Page et al., 1983; Sopper et al., 1982; Cole et al., 1986). A number of universities, State and Federal agencies have issued detailed guidance and/or requirements covering many land application practices (MDNR, 1985; PSU, 1985; Hornick et al., 1984; Simpson et al., 1984; EPA, 1983, 1979, 1978, 1977; IEPA, 1983; WDOE, 1982; OSU, 1982; EPA/FDA/USDA, 1981; Sommers et al., 1980). Design guidance and recommended management practices have been developed that will allow most sludges to be land applied in one manner or another if proper controls are implemented (Reed and Crites, 1984; EPA, 1983; Parr et al., 1983; Overcash and Pal, 1979).

Land Application and Related Practices for Sludge Management

A wide range of land application practices for recycling sewage sludge have been investigated and employed to date, including application to cropland, rangeland and forest lands, parks, golf courses, and a variety of disturbed and marginally productive areas. In addition, a number of systems have been developed to dispose of sewage sludge using high rate land application practices which include no efforts to beneficially recycle the nutrients and organic matter contained in the sludge. Land application projects are underway in many large metropolitan areas, including Washington, D.C., Philadelphia, Baltimore, Chicago, Milwaukee, Denver, San Diego, Sacramento and Seattle, as well as in thousands of smaller cities and towns across the country, especially in the Midwest. Many of these systems are prime examples of the basic land treatment, recycle/reuse concepts that have been strongly encouraged by Congress and EPA. The research and