

### **Resolution of Geological Issues at the WIPP Site**

The Waste Isolation Pilot Plant (WIPP) is a geological repository in a Permian bedded salt formation for permanent disposal of defense transuranic waste in the United States. Located in southeastern New Mexico, 40 km east of the city of Carlsbad, the repository started receiving radioactive waste in March 1999, after 25 years of geological assessment studies and modeling to predict the future integrity of the repository. Since the repository is designed to rely primarily on salt to encapsulate 175,000 m<sup>3</sup> of radioactive waste with an estimated 13 metric tons of plutonium, a number of geological issues about the integrity of the site had to be resolved. In the early years of site assessment, the issues of deep-seated dissolution of salt; presence and potential future development of breccia pipes; location of brine reservoirs 250 meters below the repository horizon; and the hydrological characteristics of a water-bearing zone overlying the repository were the main issues. As further site characterization resulted in either a resolution or a better understanding of these issues, new issues such as the presence of brine in the host-rock salt; the creep-rate of the repository salt beds; and the influence of the existence of potash, oil and natural gas at and surrounding the site, emerged. Resolution of these issues required a combination of understanding the natural processes through laboratory and fieldwork and probabilistic projections of the future release of radionuclides from the repository. The decision to use WIPP as a repository was made on the basis of its assessment against a set of standards promulgated by the U.S. Environmental Protection Agency.