

## BRIEF SUMMARY OF HEALTH HAZARDS ASSOCIATED WITH ISL URANIUM MINING

The settling-pond accumulation, surface spraying, intra-aquifer injection, and processing of metallic-ion-enriched fluids (in this case including radionuclides) poses definite public-health issues related to atmospheric (evaporative and particulate) dissemination, soil/crop/livestock incorporation, and aquifer contamination.

Regarding low-level radiation hazards, various authorities have attempted to determine a "safe" dose of human radiation exposure above background levels. Despite such efforts, there are strong arguments concluding that any increase above background creates a linearly-increased risk of biologic injury, i.e., there is no harmless increase in radiation exposure. While the quantifiable risk to the human population in a mining region may be small, probability dictates that an increased incidence of disease and death will occur. Radiation-induced abnormalities are largely due to cumulative mutagenic damage to chromosomal DNA, resulting in various abnormalities in fetal development as well as later-life disease states. Women and children have been shown to have special sensitivity to the effects of ionizing radiation.

The so-called heavy metals, (including such ions as arsenic, selenium, vanadium and others in addition to uranium) are liberated by the lixiviant solution in ISL

mining. In some cases, the toxic effects of particular metallic elements are distinctive (e.g., the skin effects of arsenic, or uranium-induced renal disease), but these substances generally show detrimental effects on multiple body systems, often including carcinogenesis in various tissues, and adverse effects on the development and function of the neurologic system. Bioaccumulation of these elements through the food web can result in higher concentrations in animal products.