

Appendix D. Water-Chemistry Data

Water Chemistry of Thief Samples

Water samples were collected from USGS 136 after coring the initial hole to over 1,000 ft to examine whether or not wastewater discharged into the TRA disposal well from 1964 to 1982 (Davis, 2010, p. 19) may be present in deeper parts of the aquifer downgradient of the Advanced Test Reactor Complex (ATRC). Samples were collected while drill pipe was being removed from the well so that each depth a thief sample was collected could only represent water from the deeper sections of the aquifer. Neutron logs were examined to determine depths of high aquifer hydrologic productivity to select sample depths (see appendix B).

Samples were collected from 965, 710, and 573 ft below land surface (BLS) and analyzed for chloride, chromium, sodium, sulfate, ammonia as nitrogen (N), nitrite as N, nitrate plus nitrite as N, orthophosphate as phosphorus (P), tritium, strontium-90, and gross gamma.

Inorganic Chemistry Data

Water samples collected in May from borehole USGS 136 at 965, 710, and 573 ft BLS were sent to the USGS National Water Quality Laboratory (NWQL) to be analyzed for dissolved concentrations of sodium, chloride, sulfate, and chromium. In addition, samples were collected and sent to the NWQL to be analyzed for dissolved concentrations of ammonia as N, nitrite as N, nitrate plus nitrite as N, and orthophosphate as P (table 5). Concentrations of all the inorganic constituents sampled were at or near background levels for the aquifer (Robertson and other, 1974; Knobel and others, 1992) in the vicinity of the ATRC (table 5), so wastewater disposal at the ATRC is probably not affecting the deeper parts of the aquifer at this borehole location.

Radionuclide Data

Water samples collected in May from USGS 136 at 965, 710, and 573 ft BLS were analyzed for tritium, strontium-90, and gamma radioactivity at the Radiological and Environmental Sciences Laboratory (RESL). All the samples had concentrations below the reporting level, so there is no evidence to indicate that wastewater disposal at the ATRC is affecting the deeper parts of the aquifer at this well location.