Sensitivity of Surficial Aquifers to Pollution

Tritium was detected in wells at varying depths depending on geologic and hydrogeologic areas defined by natural features where there is significant risk of ground-water degradation from activities conducted at the land surface. The natural features are the geologic conditions in the area. This approach is called intrinsic or geologic sensitivity.

The water table exists throughout the study area and typically occurs within 20 feet below the land surface. Surficial (water table) aquifers occur in about 30 percent of the area. Buried aquifers are present in the upper part of the near-surface ground-water systems, whether a surficial or shallow buried aquifer is present or not.

The evaluation of geologic sensitivity to pollution for the southern Red River valley study area indicates residence time based on tritium age, as shown below.

**MAP PREPARATION**

The map was developed by applying the decision criteria and following the general procedures outlined by Winter et al. (1994) and Hadler (1989), with map units and general map preparation procedures similar to Hydrologic Investigations of the U.S. Geological Survey. The map was derived from field mapped units by Michael Trojan for the development of Plate 3. The assistance of Julie Ekman in the preparation of modified maps, and the contributions of Jon Tenney, T.C. Bidwell, and R.W. Maclay who reviewed the draft plate and provided many thoughtful comments and suggestions, are appreciated. This information is available in an alternative format upon request.

**ACKNOWLEDGMENTS**

Our appreciation is extended to those who provided the time, effort, and assistance to develop this map. The assistance of Julie Ekman in the preparation of modified maps and the contributions of Jon Tenney, T.C. Bidwell, and R.W. Maclay who reviewed the draft plate and provided many thoughtful comments and suggestions are appreciated. This information is available in an alternative format upon request.

**REFERENCES CITED**


The Department of Natural Resources thanks those who provided assistance and comments: the U.S. Geological Survey (source scale, 1:100,000). Shaded topographic relief derived from the 90-meter digital elevation model provided by the National Elevation Dataset for the Minnesota Department of Natural Resources. The Department of Natural Resources compiled the map at a scale of 1:200,000.

The U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, provided funding under the Superfund program for the development of this map.

The map provides an overview of the ground-water systems in the southern Red River valley, Minnesota. The map is based on field data collected from 1990 to 1992 as part of the Department of Natural Resources’ Regional Hydrogeologic Assessment. This information is available in an alternative format upon request.