

A Dynamic Monitoring Program – Turkey Creek Watershed Case Study

Timothy D. Steele¹, Michael W. Crouse², and Theresa Tiehen³

¹TDS Consulting Inc, 595 West Meadow Road, Evergreen, CO 80439-9745

²Clear Creek Consultants, 2041 Coyote Spur, Golden, CO 80203-7717

³Colorado Department of Transportation, 18500 Colfax Avenue, Aurora, CO 80011

Biographical Sketches of Authors

Dr. Steele's career encompasses nearly 38 years in water-quality hydrology and regional assessments of water resources. He has managed many multidisciplinary projects, hydrologic baseline and modeling studies for water-resources planning and management, and mining-related projects. He has consulted on projects dealing with hydrogeochemical interactions, ground-water contamination, aquifer and lake restoration, tailings disposal, hazardous waste/residuals management, design/evaluation of hydrologic monitoring networks, statistical analysis of hydrologic data, stream/subsurface modeling, use-attainability analyses, stream standards, total maximum daily loads assessments, regional ground-water planning, and international water-resources. He has given expert testimony and litigation support. He has served as a technical consultant to the Colorado Department of Transportation (CDOT) since 1999 regarding hydrologic and water-quality assessment of several highway-improvement construction projects through design and implementation of monitoring programs.

Mr. Crouse has been a professional hydrologist for the past 15 years. His work experience includes project management and principal-hydrologist positions for numerous transportation, mining, and other environmental projects. He also has conducted several water-quality investigations that involve design and implementation of stormwater-runoff monitoring programs to assess non-point sources of pollutants. His responsibilities have included characterization of baseline hydrology and water-quality conditions, design and implementation of monitoring programs, hydrologic analyses, water-quality modeling, and NEPA-document preparation.

Ms. Tiehen has been a transportation/environmental planner for the Colorado Department of Transportation (CDOT) for 20 years, managing the watershed and hazardous-waste programs for Region One. She has had wide experience with highway-related water-quality issues, including those involving NPDES and stormwater permitting, Superfund, and implementation of source controls along major highway corridors. She holds a masters degree from the University of Colorado in Public Administration, specializing in Environmental Policy and Law and specifically focusing on nonpoint-source water pollution.

Abstract

Since 1990, various water-quality monitoring-program components have been operating in the Turkey Creek watershed, located west of the Denver metropolitan area, Colorado. A brief historical perspective of the first two components will be provided. For the 1999-2003 period, a third (and final) monitoring component has been operating specifically to assess effectiveness of best management practices (BMPs) associated with highway-construction improvements along U.S. Highway 285. For each of the last five years of network operations, changes have been made in monitoring sites, constituents analyzed, and, to a lesser extent, scheduling of sampling surveys. During- and post-construction monitoring has demonstrated the dynamics of this somewhat unique monitoring-program network design. Streamflow and water-quality data collected in these monitoring-program components were linked to detailed display and assessment of the resultant data, preparation of annual monitoring reports (with comparison with previous year's data), and presentations before stakeholders and regulatory entities involved in water-quality management in the watershed. Finally, cooperation with concurrent data-collection and hydrologic-analysis investigations in the watershed was promoted.