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*Hazard/Risk Assessment*

# EVALUATING BEST MANAGEMENT PRACTICES AT AN URBAN GOLF COURSE

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**Abstract**—This three-year study evaluated the effects of best management practices (BMPs) in reducing surface water contamination at an urban golf course. Water samples were collected before BMP implementation from two ponds on Braeburn Golf Course (Wichita, KS, USA). The pesticides 2,4-dicholorodiphenoxyacetic acid (2,4-D) and simazine were periodically found at concentrations above recommended water quality criteria. Excessive nutrients in the form of nitrates and total phosphorus were also measured. In addition, an assessment of macroinvertebrate populations revealed only a few tolerant species. Beginning in year 2, recommendations to alter chemical applications on the course were implemented as part of the BMPs. Surface water sampling during year 2 showed significant declines in nitrate and total phosphorus levels; however, seasonal contamination from pesticides continued to occur. Beginning in year 3, structural changes to the golf course were made as part of the BMPs. Subsequent water sampling indicated further reductions of nitrates (80%) and total phosphorus (40 and 60% in the two ponds, respectively), and elimination of contamination from spring applications of 2,4-D and simazine. Finally, an assessment of macroinvertebrate populations indicated an improvement in taxa richness, as well as repopulation by less tolerant organisms. Results of this study can be used to develop and refine golf course management procedures to protect aquatic environments.

**Keywords**—Golf courses Best management practices Runoff Pesticides Nutrients