TABLE 2
Intended Learning Outcomes

Skills: Students will gain the ability to
◗ Conduct scientific research, starting with well-defined protocols and progressing to open-ended research projects
◗ Define a research question related to watershed science, then plan and carry out a study to address this question using protocols, field investigations, or other types of studies
◗ Work collaboratively to design experiments and devices, interpret results, and critically analyze ideas and conclusions
◗ Engage in engineering design: plan, construct, and test a device; assess its cost; and then present and critique the results with fellow students
◗ Analyze data and draw conclusions about watershed processes
◗ Write a concise and accurate summary of methods, results, and conclusions
◗ Engage in peer review to exchange constructive criticism of fellow students' data analyses, interpretations, and conclusions
◗ Use commentary from fellow students to revise or justify research reports and presentations
Concepts: Students will gain the understanding that
◗ Watershed dynamics concerns the study and management of the complex interactions among water, land, atmosphere, and the organisms living within the drainage area of a river, stream, or other water body·
◗ The management of watersheds is a complex process that involves communication between people with many different ideas, values, needs, and resources
◗ Watershed science is multidisciplinary, related to societal concerns, and has important impacts on how water is used by humans, plants, animals, and other organisms living in watersheds
◗ Concerned students, citizens, and organizations can play important roles in watershed science and watershed management
◗ Field studies, remote sensing, computer modeling, and laboratory experiments all contribute to our understandings of ecological systems and how they respond to change
◗ Remote sensing and computer modeling provide useful tools for assessing land uses and evaluating the impact of various management practices
◗ Land uses and management practices affect stormwater runoff characteristics such as pH, dissolved oxygen, and nutrient concentrations, and consequently have important effects on streamwater quality and aquatic habitats

- Scientists and engineers work both individually and collaboratively, reviewing each other's work to provide feedback on experimental design and interpretation of results
- Scientific understandings are tentative and subject to change with new discoveries. Peer review among scientists helps sort genuine discoveries from incomplete or faulty work
- Aquatic organisms have species-specific habitat requirements concerning chemical, physical, and biological properties
- The living and nonliving components of ecosystems change over time and respond to disturbances
- The diversity and abundance of stream invertebrates can often be used to assess water quality