Objective:

To collect and test water from the River Meadow Brook in Lowell, MA using a variety of testing methods. The data obtained will then be analyzed and presented in a professional paper that includes a reflective cover letter. These papers will be shared with the Lowell Parks and Conservation Trust (LPCT). The final papers are due April 21st by 5:00pm.

LPCT is a private non-profit land trust located in the city of Lowell, Massachusetts. Their membership supports projects that provide people opportunities to remain connected to the land on which the city was built. It does this in several ways: Providing technical assistance to city agencies, local non-profits, businesses, and neighborhoods to support a healthy, diverse urban forest (urban forestry);

- Protecting land and offering programs, such as whitewater rafting trips, on the Concord River;
- Educating people about their current and historic impact on the natural environment (environmental education);
- Acquiring and protecting conservation lands where nature is left undisturbed (land protection);

The Lowell Parks & Conservation Trust believes that people can be a positive force toward improving the environment in which they live if they feel a connection and responsibility for the land on which they live. We believe that the greatest opportunities for making environmental improvements are in the city.

Methods:

You will be assigned either a sample site, along River Meadow Brook, along Clay Pit Brook or the control (Lowell tap water from Olney Hall.) You will collect the sample and analyze it for the following chemicals—using the following techniques.

- Hanna™ pen meters to test for pH, total dissolved solids, oxidation-reduction potential, and temperature (dissolved oxygen measurements will be taken for River Meadow Brook and Clay Pit Brook only).

- LaMotte™ direct-read titration kits to test for alkalinity, total hardness, calcium (and magnesium indirectly), and chloride.

- LaMotte™ Smartkit colorimeter to test for copper, iron, sulfate, phosphate, and nitrate.
**Cover Letter**

Your paper should include a cover letter reflecting on the experiment. You should discuss, in this cover letter, whether the experiment helped you better understand many of the topics we discussed over the semester. Was it helpful to see geochemistry used in real-world situations? Did this assignment give you a sense of your place within a community? Did it make a difference knowing that you were preparing a report for a third party, not just another paper to be read by the Professor alone? What did you learn from this assignment and did it make you feel more prepared to handle a similar situation in a professional environment?

**Rough Draft**

You are to turn in a rough draft of the paper no later than March 31st. This paper should include your initial analysis, history of the region as well as a list of 5 professional sources.

**Introduction/Overview**

The introduction or overview should include historical information about the brooks as well as the area you were assigned to analyze. If you were assigned control water, what is the significance of this? If you were assigned brook water, what is the significance of the site you were assigned?

**Materials and methods**

How did you retrieve the water you tested and what methods did you use to test the water? This does not need to be so detailed that you include all reagent chemicals, but a discussion on the testing methods would be adequate.

**Results, discussion and conclusion**

What did you find when you tested your water? How does it compare to previous tests as well as those of your classmates? What do the results mean about the health of the brook? How are you evaluating your data? What does this imply about not only the health of River Meadow Brook, and Clay Pit Brook, but also of the city of Lowell? What are some of the tests or projects that should be considered in the future as a result of your findings? Keep in mind that your information should be presented in an objective manner.

**Rubric:**

A well-done, professional paper should show the following:

- Draws conclusions by combining examples, facts and/or theories from more than one perspective
- Applies independent skills, abilities and methodologies gained over the semester to solve difficult problems
- Chooses formats, language and visual representations that enhance meaning and/or theories
- Demonstrates ability and commitment to work within a community to achieve civic goals
- Recognize ethical issues when presented in complex multilayered context
- Provides peer-reviewed journal articles using only non-peer reviewed when necessary and indicating the limitations of such references in the text