Lock Haven University
GEOS 360 – Hydrogeology, Fall 2009
Study Guide for Test #1 (to be held on October 2, 2009)

There will be 10 definitions (5 points each), and two short answer questions (10 points each) and an essay question (30 points) in the test. You will not have to memorize all equations that we learnt in the class (oh what a relief!), but you will have to know what parameters are involved in the equations and how they are related to each other. You are welcome to use the equations to shorten your explanations. Sketches, maps, and other illustrations will be helpful in answering some of the questions.

Know the following terms:

Hydrology, hydrogeology, hydrologic cycle, water budget, Effective Uniform Depth (EUD), ineterflow, baseflow, environmental flow, runoff, evapotranspiration, watershed, continental divide, influent vs. effluent rivers, hydrograph, rating curve, frequency curve, duration curve, weirs and flumes, curve number for watersheds, time of concentration, peak time, base time, lag time, 100-year flood, flood routing, translation time, inflow and outflow hydrographs, retention basin, and point vs. non-point sources of pollution, Combined Sewage Overflow (CSO), Global Climate Models (GCM), Best Management Practices (BMPs), Least Impact Development (LID), and Total Maximum Daily Loads (TMDL).

Short answer questions:

** Know various components of the hydrologic cycle with an emphasis on Pennsylvania water resources.
** Know the common occurrences of water on Earth. What are the major uses of water in the US? What are the most common domestic uses of water in the US?
** What are some career options for hydrogeologists?
** What is the general water budget equation? How is it different for a specific situation, such as for a lake?
** What are the three methods to determine an effective uniform depth of precipitation? What are some pros and cons of each of these methods?
** What factors influence evapotranspiration in an area. What methods are used to determine evaporation and transpiration or both?
** What is the Rational Equation (i.e. what parameters are involved in this equation)? How can you use this equation to determine environmental impact of any development on hydrologic characteristics of an watershed?
** What are some common methods of determining velocity of flow in rivers, streams, and industrial discharges? Which of these methods are most accurate?
** What factors control the amount of runoff that results from precipitation in a watershed? How can you determine or characterize these factors?
** What is a hydrograph? What are different components of a hydrograph? How can you separate the baseflow from a storm hydrograph? What are some uses of various types of hydrographs in everyday life?

** What information do you need to construct a prediction hydrograph using single triangular method or incremental method? What components of such hydrograph do you need to calculate? What is the usefulness of such hydrograph?
** What is a curve number? What factors control a curve number? Why is it important to determine a composite curve number? What can one use of these curve numbers?
** What is flood? What the most important parameters that affect flooding propensity? What are some long-term causes of increased magnitude, frequency, and duration flood occurrences throughout the world? How can you predict the return period and probability of occurrence of a flood of certain magnitude? How accurate and useful are those predictions?
** What are the adverse impacts of urbanization on flooding? What are some Best Management Practices (BMPs) that people can exercise to reduce flooding propensity?
** What are some common engineering methods used to "control" floods? What are the pros and cons of each of these methods?

The essay question: you will have to be able to synthesize information from various topics to answer this question. To best answer this question, formulate an outline in your head before you attempt to elaborate. At the very least, you should have a bulleted outline that summarizes your thoughts on the topic.