Reading Guide

CEEG 340–Introduction to Environmental Engineering
Instructor: Deborah Sills
Reading assigned for Friday 9/27: Textbook, pp.123-136

After completing the reading, you should be able to:

1. Define the terms *conservative compound, zero-order decay, first-order decay*

2. Apply the principle of mass balance to calculate concentrations in a completely mixed flow reator under the following conditions:

    (a) steady state with a conservative chemical,

    (b) steady state with a reactive chemical that degrades according to a first-order rate equation,

    (c) nonsteady state with a reactive chemical that degrades according to a first-order rate equation,

    (d) nonsteady state with a conservative chemical

3. Describe the term retention time in one sentence and define HRT in equation form.

4. Derive an equation for, and draw a graph of concentration out of a completely mix flow reactor (CMFR) as a function of time, and HRT after a pulse (instantaneous) input of a conservative tracer at t=0.

5. Compare and contrast the effects of inlet spikes of a conservative compound for a CMFR and PFR.

6. Describe a batch reactor, and write the equation for a first-order decay reaction in a batch reactor.

7. Compare PFR and CMFR performance for first order reaction (Table 4.2).

8. Describe engineered and natural systems that the plug flow reactor (PFR) is used to model.