AGSM 335  
Homework #9  
Assignment Date: September 29, 2014  
Due Date: October 6, 2014  
Assignment = 15 points

You are a consulting engineer for a land development firm. A large orchard is planned for installation in the watershed shown in Figures 1 and 2. This watershed is very close to St. Louis, MO. Your job is to determine the pre-development peak flow rate ($q_p$) for the watershed using the Rational Method for a 25-yr design storm.

**Given:**

1. A watershed map with hydrologic soil groups located (Figure 1).
2. A watershed map with land use classifications labeled (Figure 2).
3. Time of concentration for the watershed = 40 minutes.
4. Rainfall rate – duration – frequency distribution curves for St. Louis, MO.
5. Return period of the storm is 25 years.

**Note:** Figures 1 and 2 will be given out in class.

**Required:**

1. Find the area of the watershed in acres.
2. Find the area weighted runoff coefficient (C). Show all calculations.
3. What is the rainfall intensity ($i$) for this 50-yr storm?
4. Determine the peak flow rate ($q_p$) using the Rational Method.

**Note:** Reference all values used in the solution.
Figure 2.17. Rainfall rate-duration-frequency distribution for St. Louis, Missouri (Hershfield, 1961 and Weiss, 1962).