**Level III Worksheet**

1.1. Estimate the 25-year return period peak runoff rate from a watershed that is 5x1.96 inches on a map (scale 1 inch=200ft) and located in Greensboro. The watershed has an average slope of 5.5% and a weighted average runoff coefficient of 0.65.

1.2. Estimate the 10-year peak runoff rate, Q10, for a 20-acre construction site watershed near Raleigh with a flow length = 2000 ft and elevation drop = 60 ft. The land uses are half forest and half bare soil. The soil is tight clay.

2.1. Estimate erosion from a 5-acre site in Wilmington during June-October with Cowee soil. The site is 800 ft long with elevation drop of 24 ft.

2.2. Estimate erosion volume from a 2-acre secondary roadway construction during September-October in Catawba County with Helena soil. The road ditch has a slope of 0.02 ft/ft and 1.5:1 side slopes.

4.1. Select a suitable channel liner for a triangular ditch with maximum depth of 1.2 ft and slope of 4.2%.

5.1 For an infiltration basin at a site in eastern NC that has a drainage area of 8 acres and a Rains soil with a permeability of 0.5 in/hr, what is the maximum dewatering time and the design volume?

5.2. Design a Temporary Rock Sediment Dam Type B basin for a site with disturbed area = 0.9 acres and Q10 = 3 cfs. Use interior sideslopes = 1.5:1 and L:W = 3:1

Calculate:

1. Minimum volume and surface area
2. Width and length based on sideslopes
3. Emergency spillway weir length
4. Baffle spacing

5.3. For a 5.5-acre construction site with Q10 = 12 cfs, design a Skimmer Basin to be dewatered in 3 days. Use 1.5:1 interior sideslopes and 3:1 length:width ratio.

Calculate:

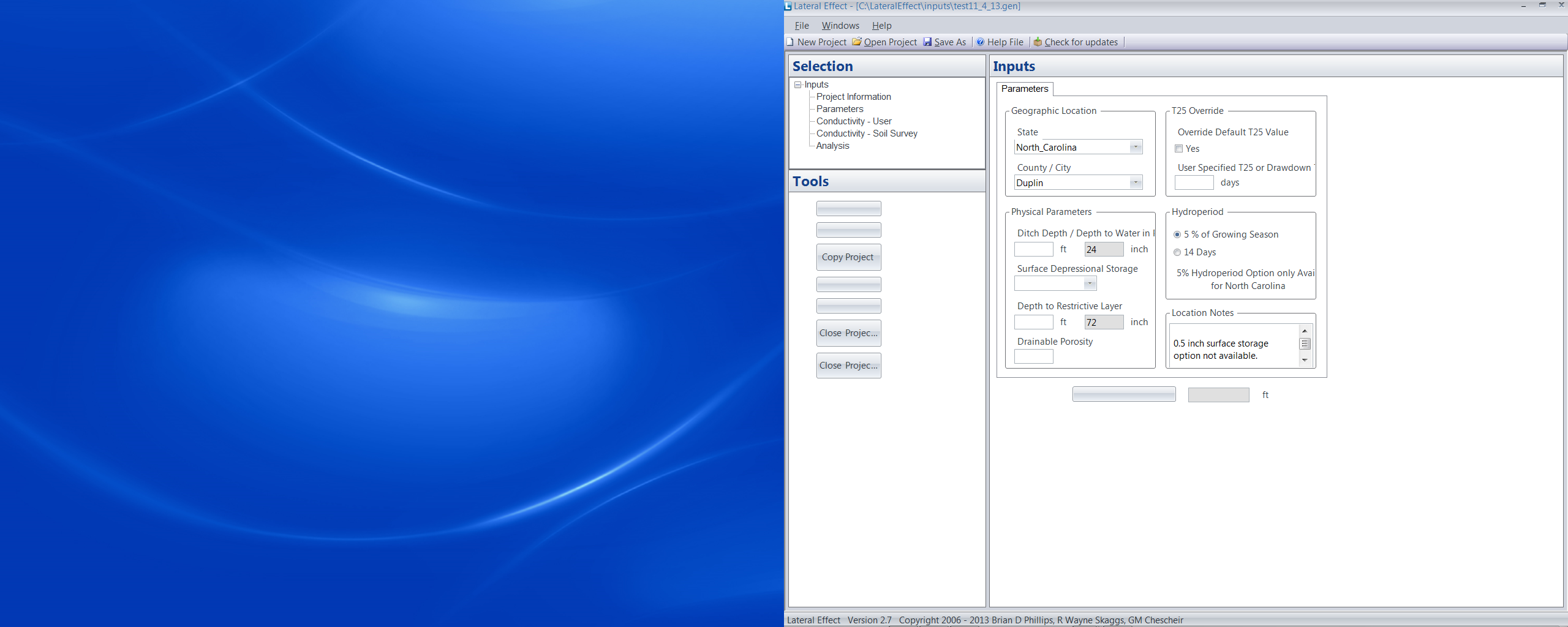
1. Minimum volume and surface area
2. Width and length based on sideslopes
3. Dewatering flow rate (top 2 ft in 3 days)
4. Skimmer size and orifice diameter
5. Primary spillway barrel pipe size
6. Emergency spillway weir length
7. Baffle spacing

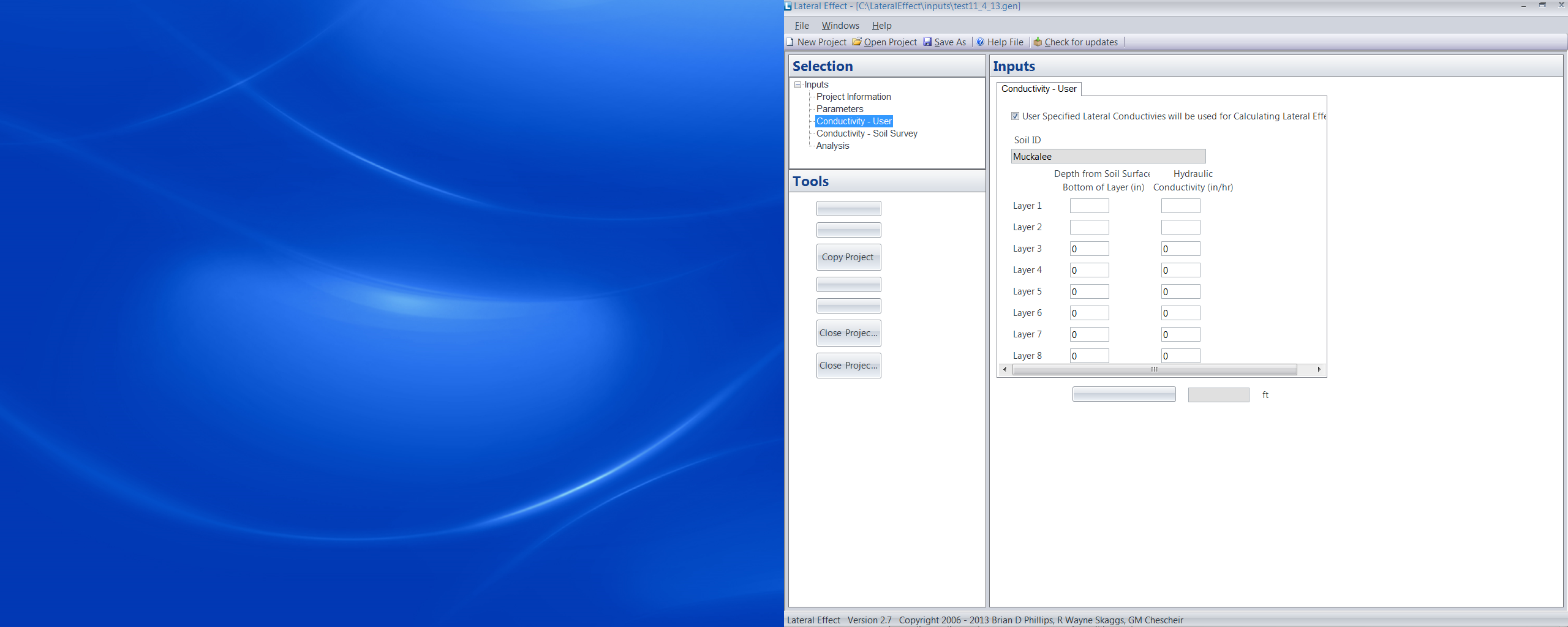
6.1. Design a Borrow Pit Dewatering Basin with 2-hour detention, PAM injection, and pumping rate, Qstill = 1 MGD = 695 gpm. Use L:W ratio of 2:1 and 1:5 to 1 sideslopes.

Calculate:

1. Volume
2. Surface Area
3. Width and length
4. PAM Injection Rate

6.2. For a borrow pit in Pitt County with Emporia soil (K = 6 ft/day = 3 in/hr), depth to impermeable layer = 10 ft, ground surface of wetland area is smooth, fill in the inputs for the Skaggs Method software program.





**a)**

**b)**

**c)**

**d)**

**e)**