PONDS 3.2 TECHNICAL MEMO

Date: September 25, 2006
Re: **Composite Curve Numbers and DCIA, etc., in PONDS SCS Hydrograph**

The input data for the PONDS SCS Hydrograph input data includes the following:

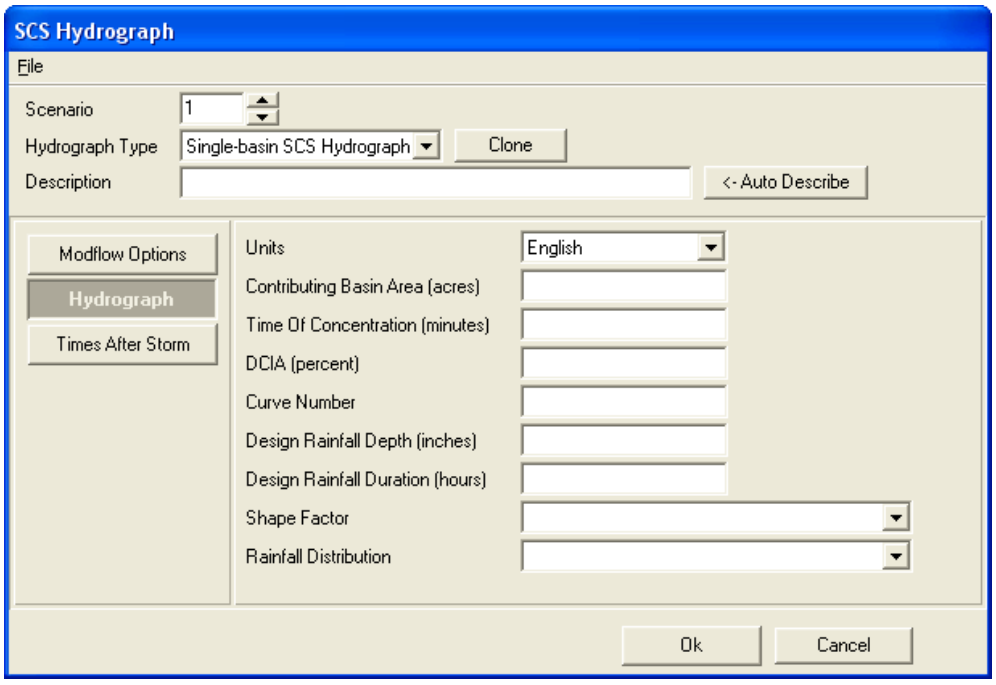

Exhibit 1. Screen dump of SCS Hydrograph input

Generally speaking, there are two approaches which users commonly use in regards to inputting curve numbers and DCIA, as described below.

Case 1:

- A composite curve number is entered which takes into account both the DCIA and non-DCIA areas.

- The DCIA percent is entered as zero, since it is already included in the composite curve number.

- The runoff is calculated based on the composite curve number, which is applied to the entire basin area, since the DCIA is zero.

Case 2

- A curve number is entered for which takes into account only the non-DCIA area.

- The DCIA as a percentage of the total basin area is entered.

- The runoff from the DCIA and non-DCIA are calculated separately based on the percentage of the total basin area contributing to each (as determined by the percentage of DCIA entered). The DCIA and non-DCIA runoff are then summed together.

- PONDS assumes a curve number of 98 for the DCIA.

Example

Consider a runoff basin with the following parameters

- Contributing basin area = 10 acres
- Time of concentration = 30 minutes
- DCIA = 40% (i.e., 4 acres in this example)
- Non-DCIA curve number = 60
- Design rainfall depth = 6 inches
- Design rainfall duration = 24 hrs
- Shape factor: UHG 323
- Rainfall distribution: Orange County 10 Year - 24 Hour

Case 1 uses a weighted average curve number which considers both the DCIA and non-DCIA, and the percentage of DCIA is zero.

Case 2 uses a curve number for non-DCIA only, and the percentage of DCIA is entered (non-zero).

Calculation of the composite curve number for Case 1 is shown in Table 1, and the hydrograph input data for both Case 1 and Case 2 are shown in Table 2, below.

Table 1. Weighted Average Curve Number Calculation for Example, Case 1

Description	Area, A (acres)	Curve Number, CN	A x CN
DCIA	4	98	392
non-DCIA	6	60	360
Total	10		752
Weighted Avg CN		**75.20**	

Table 2. SCS Hydrograph Input Data for Example Problem

	Case 1	Case 2
Contributing basin area (acres)	10	10
Time of concentration (minutes)	30	30
DCIA (%)	0	40
Curve Number	75.20	60
Design rainfall depth (inches)	6	6
Design rainfall duration (hrs)	24	24
Shape factor	UHG 323	UHG 323
Rainfall distribution	Orange County 10 yr- 24 hr	Orange County 10 yr- 24 hr

The resulting inflow hydrographs for this example, as well as summary statistics, are shown in Exhibit 2 below. Notice that the results are similar though not identical.

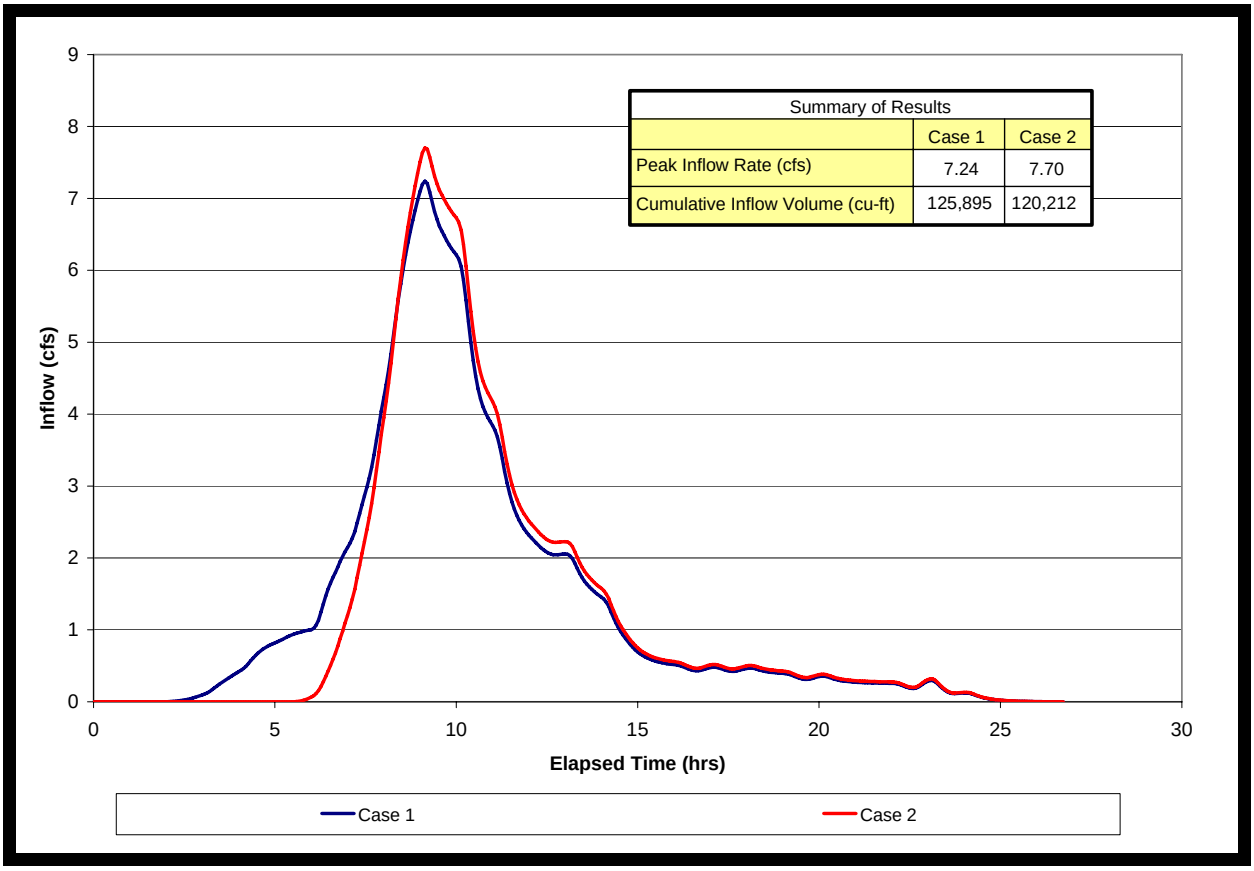

Exhibit 2. Inflow hydrographs for example, Case 1 and Case 2