



Desktop Water Balance Worksheet Instructions

These instructions are for the desktop water balance worksheets available for either a two, three, or four cell system. Facilities with more than four cells will have to customize the worksheets specific to their system.

The desktop water balance worksheets are intended to be simple tools for tracking the credibility of flow monitoring data. The calculation is based on Discharge Monitoring Report (DMR) information and compares the difference between influent and effluent flow to changes in pond water elevation. A calculation of the seepage rate is made, but it is only an indicator to aid in evaluating overall pond system performance. It is not an actual seepage rate and does not take into account all of the variables that may influence the data. It is recommended that a desktop water balance evaluation be completed routinely to look at changes over time and help identify potential issues before they become problems.

A complete desktop evaluation should evaluate at least three years of data. If the results do not seem reasonable, recheck the data entered. If it still does not seem correct, you should look at how flow and depth are measured to check if flow monitoring data is correct. If there were unusual weather conditions (i.e. drought, or large storms) you may want to look at different seasonal periods.

1. Select the form relating to number of pond cells; i.e. two, three, or four cell system.
2. The various colored boxes are as follows:
 - a. Yellow – input numbers
 - b. Green – output calculations (locked, cannot be changed)
 - c. Orange – final answer (locked, cannot be changed)
3. Fill in facility name and date.
4. Decide what time period you are doing the water balance for; i.e. entire year, summer months, or over the winter months.

Things to consider when selecting time period:

- a. If for the entire year, rainfall can be measured in a rain gauge, but cannot be accounted for as far as an increase in pond depth. Evaporation also cannot be accounted for in any loss of pond depth.
 - b. If for summer only, select the time period from just after the last discharge in the spring to just before the first discharge in the fall. Here again, you cannot easily account for changes in pond depth due to rainfall and evaporation.
 - c. The time period with the least variables impacting pond depth is over the winter months. For this time period, start after completion of the fall discharge until just before the beginning of the spring discharge.
5. For "Month/year", enter the month/year in noted column. For example, enter either May 2013 or 5/1/13. This will show up as "May – 13".

6. For "Influent", enter the total monthly influent flow in million gallons (MG) for each month. You must record the influent flow for each month of the selected time period for the calculations to work.
7. For "Effluent", enter total monthly effluent flow in MG for the month(s) during the time period selected.
8. For "Rain or Snow", enter total monthly rainfall and snowfall in inches. This will not affect the overall calculation. This is only for information purposes.
9. For "Pond Depths", enter pond depth in **tenths of a foot** from the discharge monitoring supplemental reports (you will have to convert the reported depths in inches to feet). For the first row you would enter the pond depth for the earliest date for the month when you started the water balance. For the last row, you enter the latest monthly pond depth reading closest to when you completed the water balance. **You must have a pond depth reading in both the first row and the last row. This spreadsheet will not work without these two pond depth readings. You do not need pond depth readings for the months between the first and last row.** It is okay to have them entered, but they do not enter into the overall calculation.
 - a. For a summer time period, enter the first pond depth **after** completion of the spring discharge in the first row. In the last row, enter the pond depth from the week just **before** the first discharge in the fall.
 - b. For a winter time period, enter the first pond depth from the first week **after** the pond is discharged in the fall in the first row. In the last row, enter the pond depth from a week **before** the spring discharge. To avoid possible uncertainties because of excessive inflow/infiltration, pick a week before the influent flow shows a large increase.
10. Under "Acres", enter the acres for each of the pond cells. Use the acres noted in the National Pollutant Discharge Elimination System (NPDES) permit. The sizes should be at mid-depth. The permit may or may not indicate this.
11. Under "Total Days", enter the total days between the first pond depth and last pond depth reading.
12. Enter the design average wet weather flow noted in the NPDES permit. This is only for information purposes and does not enter into any of the calculations.
13. The estimated seepage rate is noted at the bottom left corner in both MG per acre per day or gallons per acre per day. The allowable seepage rate for pond systems constructed before May 15, 1975, is 3,500 gallons per acre per day and after that date, 500 gallons per acre per day. **However, the answer shown is only an estimate and is not to be used as an actual seepage rate.** The actual seepage rate can only be arrived at with an actual water balance test in accordance with the "Prefill and Water Balance Criteria" found at <http://www.pca.state.mn.us/index.php/view-document.html?gid=15336>.