

## **Financial Toolbox for Small Water and Wastewater Systems -- v10.1 Basic Instructions**

Welcome to the “Financial Toolbox”! For questions or comments, please contact RCAC at 916/447-2854 or at [www.rcac.org](http://www.rcac.org). These instructions are designed for Technical Assistance Providers but do not explain all the options possible in the spreadsheets. Once data has been entered, typically I provide workshops to the decision makers and explain the worksheets.

This program has been developed to assist small water and wastewater systems in constructing a working budget and then selecting a rate structure which achieves the budget target and apportions costs to customers based upon utility policy. As in all spreadsheets, accurate information and correct entry is important. There are numerous color coded “backgrounds” which will alert the user to possible errors. Even with limited data, the toolbox should provide a very good estimate of revenues using differing rate structures.

The general philosophy is as follows: Establish a budget based on projected needs first, and then establish a rate structure which returns the budget target. Establishing the budget is usually the hardest part, and care should be taken to accurately determine future needs of the water system. The spreadsheets will help you do this.

The toolbox consists of four parts, as noted by the tabs at the bottom of the worksheets.

In all the worksheets the color coding is: Blue, Green or Rose = manual entry of data; **Red = errors of various kinds....may sure there are NO red backgrounds when you are finished working in a column!**; Yellow = computed information; Violet = “Do you really want to do this?”... (information that should be checked for accuracy)

Some of the worksheets have “panes” set, which makes some rows or columns “freeze”, to make data entry easier. To remove, click on “Window”, and then “Unfreeze Panes”.

Each of the worksheets will now be described:

### **Budget**

1. The budget worksheet can be viewed by clicking on the bottom yellow tab marked “BUDGET”. Cells in yellow are calculated, and all other cells are for manual entry of data. The spreadsheet is not code protected and you may unprotect the sheet. If you wish to add rows or columns please call for assistance. Unfortunately, when using EXCEL, DO NOT “drag” or “cut” cell entries!
2. Entries are pretty much self-explanatory and line item titles may be changed. **All line items should be worded plainly so that customers and staff easily understand the intent.** The budget also provides an additional five-year projection as this is a common requirement to apply for many state sponsored loans.

3. You should enter the predicted annual inflation percentages for sub-accounts and note that at cells H91 and I91 the total amount of the budget subject to inflation and the inflation percentage (for the next year only) will be shown. In this version, you should look at the “Budget Graphs” worksheet and determine in the succeeding years if you want to pay for inflation out of existing revenues or raise rates to meet his expense. If you raise rates in any cell from K126-O126, the average rate increase will be shown in K130-O130 respectively.
4. This is a basic budget that has some unique properties in that it predicts future cash-on-hand, needed revenue increases, and also indicates when expenditures from the reserve funds will occur.
5. Inflation is always somewhat of a guess. I recommend a minimum of 2.0 - 2.5% for most line items. Many communities use various Consumer Price Index (CPI) inflators. Many line items may carry higher or lower inflators for that particular item. You could call local vendors or contractors and ask what the trend is for prices for services.
6. In the State of Washington, a line item for an “SRF Loan Annual Payment” will carry a *negative* percentage (*-0.9% seems to work*) in the “Annual Inflation” column because of the way the loan is amortized. Payments actually decrease with the length of the loan. Any negative numbers will be displayed in red. For help on an SRF or other loan source please call RCAC.
7. The “Allocated Funds” for reserves seen at budget line E94 is from the “Reserve Fund Calculator” worksheet, however this amount and the non-operating revenue from budget line E125, less any revenue deficit from the rate calculator, must be re-entered in either one, or several cash accounts. These accounts should be envisioned as showing where reserves are *committed, as per the title “TO RESERVES.”* **Please Note:** There is also a calculator on spreadsheet in cell E93 that helps you determine the value of the remaining funds to be entered; this calculator should equal zero with no red background anywhere in the column when the budget is balanced without spending reserves against the budget.
8. The “RESERVE FUND EXPENDITURES” section, budget lines 105-114, should indicate the amount from the committed section that is to be *actually spent* in a given year.
9. This latest version has changes that allow operating at a deficit from rates and making up the difference from non-operating revenues. Cell E-93 is in place so that a hand calculator is not necessary to determine remaining dollar amounts to be entered into reserve funds. In all cases, the cell must be eventually “zeroed” for the program to work correctly. When this cell is reading zero, and there are no red backgrounds in that column, that year’s budget is balanced with no reserve expenditures.
10. The cell entitled “Revenues Needed from Rate Calculator” at E128 should be manually transferred to the “Rate Calculator” in the cell so marked.

## INFLATION GRAPH

This shows the total *cumulative* cost of inflation over the next five years. This is an interesting graph as most utilities greatly underestimate what inflation costs really are. The graph generally strongly supports annual rate increases.

## RESERVE FUND

This worksheet is used to determine savings for *any future cash expense*. Larger utilities may break out equipment replacement (depreciation), new construction (capital improvements) and other reserves into separate accounts, but for small systems this is not necessary. Showing the funds needed for future costs on one worksheet makes explaining to your customers why the utility must save money, much easier.

The methodology is as follows: Sit down and make a list of what you need to replace, any new construction and any cash accounts you'd like to have. You will need to review records to determine when equipment was installed and exactly what kind you have. You then determine when it must be replaced. Once this is done, contact a vendor and get a price estimate of what it would cost *today*. Enter this amount, the years to be replaced, and the other data, and the worksheet will provide the annual amount needed to go into the budget. There is an information bar at the bottom that will guide you on entries.

The Reserve Calculator is unique in that it calculates a *minimum*, stable reserve component to be added annually to your budget. Most "depreciation" calculators divide an item's cost by the years to be replaced and then add them all together. This method is inaccurate at best and actually "wrong" often. The cost derived using "straight-line depreciation" is often very much more than necessary. The calculator will show you the minimum needed to meet your goals. As an example, the annual contribution to fund an item costing \$14,126 in ten years and another item costing \$6,054 in 3 years is \$2,018 per year for ten years. Straight-line depreciation would produce a result of \$3,341 per year: a considerable difference.

**If you have cash on-hand you'd like to apply to reserve funds** enter the amount and the cells in green will indicate some or all of that item's cost is paid with this cash. The worksheet will then calculate costs for the other entries.

This worksheet is code protected and may not be accessed by the user, other than formatting cells, columns and rows.

1. **Make sure the worksheet has correct information entered! If the spreadsheet shows "error" entries, or red backgrounds, there is incorrect, missing or partial data.** Enter number of connections or ERUs. Enter entries in descending order of the life expectancy (depreciation schedule) of the equipment or reserve fund. It's OK if there are entries with the same "**Years to Replace.**" Tenths of years may be entered also (ex: 1.5 years)

Unfortunately, you may not drag, cut or move data entries. **You may leave blank lines between Items to allow for later additional entries.** The information bar will guide you through this. In other words, if you had two items, one at ten years and another at five years, you could enter the ten year item, then leave blank rows, and enter the 5 year item. The calculator will require you to enter numbers in “Years to Replace”. This allows you to make entries without typing the whole list again.

**Note: IF you have a later version of Excel,** you may disregard the color coding when making initial entries or when adding in lines that are not in descending order. You may then “Sort” the entries by highlighting the lines entered, starting with the “Item” cell at C11, click on “Data” at the top of the screen, and then on “Sort”. Select the “Years to Replace” column and **descending sort.** **Note:** You cannot sort across protected (yellow) cells.

2. In the event of a large payment for an expensive item due in a short period of time, it’s possible to produce revenues greater than the needed cost of listed items. If this occurs, text will appear indicating the overage you would have without a rate reduction, possible total rate reduction, and the amount and year the first reduction might be applied. It is possible that a line item may need to be funded through a time-limited assessment, or that rates should be reduced at some point, if the excess revenues are substantial.

Another option would be to readjust the “Years to Replace” and accrue that amount sooner.

3. The “**Annual Transfer to Budget**” line item is the amount that would be entered into the budget reserve account to accrue the needed cash reserves. The total years that this amount would be entered in the budget is the same number of years corresponding to the longest maturity date (“Years to Replace”), which will be found in the first line item.
4. The “**Monthly Payment**” is per ERU, or connection, and is useful in explaining the portion of the monthly service charge that supports the reserve fund in the budget.

## Rate Calculator

The user may select all or some of “Cubic Feet?”, “Add (Additional) Customers?” and “Wastewater” on the Rate Calculator by clicking on those cells. Below is the description for what this tool may provide:

1. Using flat, increasing or decreasing rates, the worksheet can perform the following:
  - Calculate revenues based on a flat rate for customers.
  - Calculate revenues based on a service charge and a single, two or three tiered rate structure **for water systems and wastewater systems**; add customers with different service charges and differing commodity rates; compute additional ERUs for **wastewater strength.**
  - Calculate a single customer’s bill for monthly or other billing cycles.
  - Show the revenue percentage recovered for above average water or wastewater use.

- Show a customer's, or group of customers "revenues" vs. "use" ratio; this indicates where subsidies may exist or where conservation rates are set.
  - Indicate via "Error" or "Note" messages incorrect entries or issues that may need to be reviewed further.
2. The worksheet has been developed for the vast majority of small water or wastewater systems that have uniformly applied commodity rates. If the rate structure desired has different commodity rates for customer classes, technical assistance is probably necessary. The spreadsheet may be used to set rates for individual classes but budget revenue targets would need to be established for each class and cost/causative analysis may be in order. This may be accomplished by pasting additional Rate Calculators to the spreadsheet for differing classes. Call for assistance.
  3. Similar to establishing different class structures, seasonal rates may be set to meet various goals. The seasonal water use and appropriate data is entered and projections noted, the remainder of the year is then additionally calculated. The *totals* of the two revenues should then equal the annual budget target.
  4. The training message is this: Set the budget *first!* This requires determining financial needs and planning. Then, answer this question: "If a customer uses twice as much water or wastewater as the average user, what should they pay for each additional ERU?" I recommended 50-70% as probably optimum for most water utilities, but this is not a legal requirement. Conservation rates may be well above 100%, and you might also elect to subsidize certain customer classes. Wastewater is similar theory but recovery is higher in the 60-80% range per additional ERU. Wastewater charges may be incurred for **BOTH volume and strength**.
  5. Selecting the cell marked "Billing Unit" triggers a popup allowing you to select "ERU Volume", or "Volume + Strength". Selecting the latter illuminates hidden cells to the right of the spreadsheet where you enter wastewater strength data. You will need to establish ERU strength limits, typically 250-300 mg/L for BOD and TSS, 50-100 mg/L FOG, and 30-50 mg/L for Ammonia. Entering the actual tested strength of the customer allows for the calculation.
  6. In either water or wastewater applications, the **"Add Vol charge %" applies only to volume**. Wastewater Extra Strength Charges must be manually added to the volume charge and the result entered into the "Different Svc. Charge" column.
  7. If water tiers are set widely, the maximum percentage for additional ERU/EDU may be well above that shown for the "2X ERU/EDU Cost %" and will be shown in the "Max ERU/EDU Cost %" cell.
  8. Set a rate structure to achieve goals. Data entry is trial and error until goals are achieved. The "Revenues Needed" amount is manually entered as a reminder.

9. The spreadsheet can be checked with a common calculator but the following “errors” or limitations may be encountered:

- When checking with a calculator, “Rate Revenues” may be off by just a few dollars, usually when working with cubic feet and large volumes. The reason is rounding within the formulas, which are in fact, correct.
- Water use within tiers, or “included” water, will be calculated as used by each customer, unless actual use is entered. “Actual Billed Water” may be entered in the rate structure selected and will produce accurate data. If actual use data is not entered, the calculator will predict generally lower revenues than will be returned as typically there are customers who do not use allotted water, “included” or otherwise, within the lower tiers, and thus the actual use is in the higher tiers, at a higher rate. This is particularly so for summertime seasonal users. This is a good feature in that the budget revenue needed will always be achieved if the prediction is correct.
- Care must be taken to note seasonal customer impact when assigning included water and/or using multiple tiers. As an example, if numerous customers or even one significant customer uses large amounts of water during only three months, and no water is used in the remaining months, the spreadsheet cannot accurately project revenue results because it calculates the included water as used on a monthly basis. Therefore the revenue predictions will be very low. In this case, the actual water used in each tier *must* be entered.
- Although a technically correct rate structure may be determined, the actual impact on individual customers needs further review. Large water users who have been subsidized by current rates may need a specific public relations effort to explain their rate increases. Significant rate changes should generally be “phased in” over time.

10. Please note the two selections of “Cubic Feet?” and “Add Customers?” under the “Use Information” section. Checking these blocks makes changes in formatting and text, depending on data entered and the blocks selected.

11. The “Additional Customer” spreadsheet is fairly self-explanatory. If you ***do not enter use data***, the spreadsheet assumes the customer **is included** in the “Residential Connections” entry. If you *do* enter use data, the “Total Connections” and “Total Gallons/Cubic Feet Used” will change. In either case, you may identify customers with different service charges. If you have customers without any water or wastewater usage, such as undeveloped lots or empty buildings, but who incur a monthly service charge, enter the numbers of these customers, their service charge, and “X” in the “Gallons/Cubic Feet in Period”. This ensures the ERU/EDU calculations are representative of use. There is a note at the bottom of the section to remind you of this.

12. There is an indicator in this section entitled “Revenue / Use Factor”. This is the percent of revenue generated by a customer, or group of customers divided by the percentage of overall water use, multiplied by 100. Utility policy will dictate the desired figure, but I recommend 80 as a *minimum* factor for most large, commercial customers, and a factor of 100-120 might be

typical for residential customers. I think as commercial water use rises, the RU factor should close in on the median 100 number.

13. Most of the cells are protected and you can't hurt the spreadsheet accidentally. Selecting a protected cell for data entry will trigger a "popup" which may be removed by pressing the "ESC" key on your keyboard.

14. There are numerous conditional formats with colored backgrounds indicating errors, or informational depictions of various kinds. These are designed to help the user figure out mistakes. Any background in "red" indicates an error in that data block, and the entire spreadsheet should be viewed as ***incorrect***. You can "confuse" the calculator into producing some incorrect computations, but there should always be a red background to illustrate this. For most mistakes, there will be text on the "error bar" explaining the mistake.

15. The "light purple" background should be reviewed as an indicator that data might be "misinterpreted", or has changed, or needs review to ensure it is correct, such as "Actual Billed Water" within tiers or "included" water. Ask yourself, "Do I really want to do this?" Please, read the color coding at the top-right of the spreadsheet.

16. Mostly, the rate structures are obvious, but there are a few options that may need instruction. Most common rate structures take only 10-15 minutes to analyze once the data has been entered.

17. Finally, when the rate structure is approved, it must be codified correctly, depending on the type of utility, and evenly applied to all customers affected.