

**A GUIDE FOR FINANCING AND RATE-SETTING
OPTIONS FOR SMALL WATER SYSTEMS**

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EXECUTIVE SUMMARY

Since the inception of the 1996 Safe Drinking Water Act Amendments, water systems have had to prove their ability to continue functioning as technically, managerially, and financially sound systems. Small systems often experience substantial difficulty in meeting SDWA requirements and do not always have the necessary resources available to them in order to achieve viability. While many of these small systems produce a safe, wholesome water supply, many others have deficiencies and lack the capital needed to upgrade their facilities and the revenue needed for day-to-day operation and maintenance. Often, budgets are not prepared, water rates are too low, and records are unorganized if not missing altogether. Such managerial problems interfere with the revenue flow of the system and inhibit acquisition of the necessary funding and assessment of the impacts of such funding on customers and water rates. The lack of financial planning poses a great threat to the system by limiting the capital markets available, especially in times of emergencies or needed upgrades and repairs. Loans and grants generally will not be available to a system without a sufficient operating budget and/or sufficient water rates. Without this needed planning, system capacity development is limited. Lack of general managerial capacity and necessary specialized financial expertise, are the basic reasons why small systems fail to do the needed financial planning.

In an effort to enhance financial evaluation and performance for small water systems, this user-friendly guide presents spreadsheets and detailed instructions on their use for the purposes of evaluating capital improvement financing options and water rate setting. The major objective of this guide and spreadsheet program is to provide assistance that will allow small systems to obtain, organize, and use data necessary to identifying capital needs, budgeting, and setting water rates.

The guide is presented in three modules. Module 1, Estimating Capital Needs, consists of three worksheets, 1A, 1B, and 1C in which the capital improvements to be made within the next five years are entered, the costs adjusted for inflation, and the impact of the various methods of financing presented. Module 2, Budgeting, consists of worksheets 2A, 2B, and 2C in which water revenues for the next budget year are projected, an annual budget of revenues and expenses is completed, and a financial viability analysis summary is performed based on budget information. Module 3, Setting Water Rates, consists of worksheets 3A, 3B, 3C and 3A(2), 3B(2), 3C(2) for residential and commercial water systems, respectively, in which a general customer usage profile is developed, current rates are checked for equity, and new rates are set by the user based on the information presented in the previous modules and local considerations.

This guide provides the needed assistance for small water systems to do the necessary financial planning, presents the resources to obtain necessary data, and simplifies the financial planning process in general. Upon completion of the process outlined in the guide, the system will have a wealth of needed information stored within the spreadsheets and available for future financial planning. Appropriate data updates will also allow the system to continue to assess its financial health over time.

INTRODUCTION

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The guidelines presented in this workbook have been developed to assist small water systems in improving their financial performance. It provides a clear, simple set of spreadsheets and instructions that use accepted techniques of water financial management to help utility managers determine costs of service, assess capital investment needs, evaluate financing mechanisms, and set user charge rates. The spreadsheets contained herein are designed so that these goals can be accomplished using existing utility records and the user's knowledge of the system's operations.

The workbook is aimed primarily at small water utilities. It works best for systems that are metered and have no more than two user classifications. It cannot address every aspect of small water system management, but it attempts to help the user "fill in the gaps" and become familiar enough with the system in order to make educated decisions. Facilities design and costing will still require specialists as well as occasional outside review of rate structures. The workbook is, by necessity, broad in approach.

APPROACH

The workbook incorporates analytical techniques from a wide range of existing resources. Among the most important are the Costing and Rate Setting Workbook for Water and Sewer Utilities (Shinn and Randolph, 1989), Virginia Department of Health Waterworks Permit Application Comprehensive Business Plan Section, and various works from the American Water Works Association and the Rural Community Assistance Project, Inc.

Organization

The workbook is organized into three modules that break down the analytical process into small pieces. Each module consists of three or more detailed spreadsheets and accompanying instructions that walk the user through a given set of steps. Information from one module is frequently needed as input for subsequent modules. The instructions are generally step-by-step and include background information and explanatory figures as necessary. A sample set of completed spreadsheets for a test community is found in Appendix D. The appendices also contain resource information for water systems.

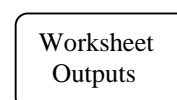
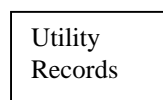
Summary of Modules

Figure 1 shows the purpose of each module and the relationship between modules. It also provides a rough idea of the documents that will be needed and what information will be transferred from one spreadsheet to the next. Modules should be completed in order so that the user can take full advantage of the guidelines presented.

Module 1 helps the user identify capital (construction) needs of the water system. Because each system is different, there is no simple way to assess needs for all systems. Instead, an attempt to provide a framework in which the user can identify the needs has been provided. The inputs for this module are sufficient knowledge of the system and its condition to identify needed projects, their timing, and cost. Sources of this information include previous needs assessments, engineering documents, input from employees and customers, and the judgment of the operator and manager. Module 1 has one spreadsheet that may be used to test different financing alternatives for a variety of projects. It will present the impact on taxes, rates, and assessments for up to four different combinations of financing sources for each project. Once the user has decided how to finance a project, the spreadsheets in this module help to determine the annual cost that results from all of these projects and helps to estimate the effect of the projects on rates. Output from Module 1 is a five-year plan for spending for the system and an estimate of effects of the plan on operating costs and rates.

Module 2 provides an outlay of system revenue and expenses. It assists the user in developing an operating budget and then evaluates the system's present financial viability.

KEY:



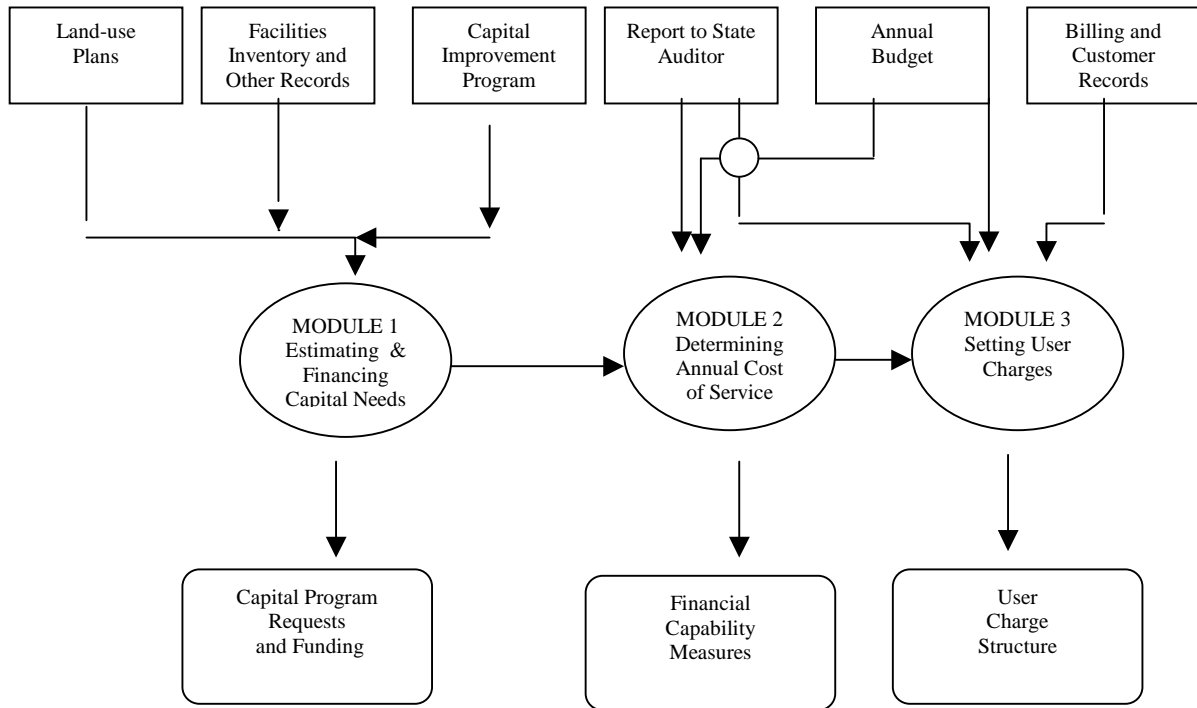


Figure 1. Overview of Data Flow

Source: Derived from Shinn and Randolph, 1989: Figure 1, page 2.

This helps to ensure that the rate system recovers the true cost of providing service to customers. These categories require the user to make some judgments about exactly how the staff, supplies, and facilities are being used, which may require quite a bit of time on the user's part. This, however, is a necessary step before setting up a rate structure in Module 3.

Module 3 helps to develop a rate structure for user charges. The input required for this module comes from Modules 1 and 2, billing records, and general knowledge of the patterns of use for the system. The output is an equitable rate structure that will cover all costs of the utility.

In summary, the user should gather the following before beginning:

- Capital Improvement Plan (if available)
- Previous budgets and bills
- Customer billing records
- Current Rate Structure

General Instructions and Information

Within each module is a written overview, followed by instructions for each spreadsheet in the order in which they should be completed. Some of the spreadsheets cover a period of one year, but others cover multiple years. Because they are designed to yield a five-year financial plan, Modules 1 and 2 require input for each of the next five years. Module 3 is a single-year model to set rates for the upcoming budget year, but the user may alter them to establish rates for later years. Some of the spreadsheets, especially those in Module 1, require that the user enter dollar amounts and other figures in thousands, while others require simple dollar entries.

In order to successfully use this workbook, general knowledge of Microsoft Excel is needed. The ability to move from spreadsheet to spreadsheet and make duplicate sheets when necessary is required. In addition, the user must remember that it is necessary to work together with other employees, and board and council members. The user will need to do his or her best to make valid assumptions and estimates, be willing to use a variety of resources, and most importantly, **DO NOT BE OVERWHELMED!** Completion of these sheets may take several weeks. The more organized the user is upon beginning, the easier it will be to complete the spreadsheets.

Before beginning, save a blank copy of the workbook under another name in case there is a need to start over. Save your work frequently to avoid losing all your information in case of power loss or computer problems.

MODULE 1

ESTIMATING & FINANCING CAPITAL NEEDS

Module Overview

Consisting of three spreadsheets, 1A, 1B and 1C, this module helps identify capital projects needed or desired for a water system. Capital projects consist of construction, rehabilitation, or purchase of equipment that improves the long-term viability of the system by keeping it in good condition, expanding it, or improving its service quality. Examples are installing a new water line, rebuilding a pump station, building a secondary treatment plant, adding a storage tank, developing a new water source, or building a new office and maintenance facility. Routine items like plant maintenance should not be included.

Since it is impossible to develop spreadsheets that universally define the condition of capital needs of water systems, the spreadsheets are designed to provide a framework by which the user can identify the needs. Begin Module 1 by completing spreadsheet 1A, in which all project needs are listed, their estimated cost, and the expected construction dates. This information is used to develop a system-wide estimate of capital costs by year for the next five years. This information is further summarized in spreadsheet 1B. These results will be used in spreadsheet 1C to identify financing needs and the impact on ratepayers of the selected projects.

Information needed to complete this module is a list of project needs and cost. In some cases, this information will have to be estimated. For some projects, earlier needs assessments or engineering reports may be able to be used. For still others, the experience of other utilities can be used to estimate costs. If the system has a capital improvements program, it will provide the basis for the input needed for Module 1. If there is no capital improvement plan and needs assessment has not been conducted, a needs list will have to be developed from scratch. Information is provided in the following paragraphs that will assist the user in the development of the capital needs list.

Table 1 lists project components of Module 1 and their related project examples. Table 2 provides life expectancies of various projects. For the user with limited water system experience, this along with information from facilities inventory and records, as well as other staff will help to determine what the needs of this system will be within the five-year planning range.

Table 1. Water Capital Projects Examples

Capital Project Component	Examples of Projects
Source of Supply	A new reservoir and facilities to pump raw surface or ground water
Production and Treatment	A new or an additional treatment facility; rebuilding an old pump; raw water lines and pumps; treated water pumps/main
Distribution Storage	A new storage tank
Distribution & Transmission	New distribution or transmission mains
Meters and Service	New meters and customer service facilities
Source Protection	Wellhead protection program
Fire Protection	Hydrants and standpipes
Administration	Office buildings; vehicles used by administration; office equipment; projects that do not fit in other categories
Billing	Vehicles for meter reading; computers and software for billing

Source: Derived from Shinn and Randolph, 1989: Figure 5, page 11.

Table 2. Design Periods for Water Supply Components

Component	Design Period (years)
Source: Groundwater	5 +
Surface	20-50
Pipe Lines From Source	25+
Treatment Components	10-15
Pumping Facilities	10
Storage Tanks	20+
Distribution System	20-50

Source: Derived from McGhee, 1991: pp. 16-17.

Other than deterioration of your system's major components, other factors that may affect capital needs that must be evaluated are growth and safe drinking water act requirements. Some questions that the user needs to address when developing a capital needs plan are:

- What system components will need to be replaced?
- What major repairs need to be made?
- What new equipment items are needed that will enable us to provide better service or lower overall operating costs?
- Are there areas needing new water service where we should extend lines?
- Are additions to the system needed to meet greater demand?

At the end of this process, your list will include two things: the capital items themselves and your rationale for determining why each of the capital items is needed or desired. The list of needed improvements can be very long—seeming to be overwhelming or unmanageable. Hasty assumption can be made about the financial capabilities of the system and the user may feel like abandoning the entire planning process. **It is important to resist the temptation to get ahead of the game, and avoid making quick negative decisions.**

The costs associated with such projects can also be determined from previous engineering reports, records, other staff, and other utilities. Capital costs vary depending on the system and the system demands. It would be impractical to attempt to list prices associated with such projects, as the price for one system may not be the same for others. However, once the system's specific needs have been determined, general costs can be gathered from contractors specializing in those components. The American Water Works Association (AWWA), National Rural Water Association (NRWA), and the Rural Community Assistance Project, Inc. (RCAP) offer vendor information and technical assistance that will facilitate capital cost determination as necessary. Appendix A provides a list of resources that may be helpful in providing cost estimates. At this point, "ballpark" estimates are sufficient. Once determined, capital project costs are summarized for the selected planning horizon and adjusted for inflation (when appropriate) on spreadsheets 1A and 1B.

Because cost estimates for projects are normally based on current (uninflated) dollars, it is necessary to inflate future years' capital costs so that financing needs and rate impacts can be estimated in future (inflated) dollars. The user can use prior experience, economic forecasts, or good judgment to estimate inflation in construction costs over the five-year planning period. The user should assume a higher inflation than in a perfect world so as to get a realistic to pessimistic view of the ultimate cost of capital program. For projecting unknown expenses into the future, a **5% inflation** factor is suggested unless the water system documents its own inflation rate.

Looking at the needs list, review the following questions:

1) Relative Importance of the Need: Which projects or improvements are critical needs? What is absolutely essential to undertake and why? Which improvements directly impact the health or safety of the customers? Which improvements have been mandated by the state regulatory agency in Sanitary Surveys or as the result of water quality testing? Are there deadlines the system must meet for mandated projects or improvements? What are the consequences of not undertaking each proposed improvement?

2) Relative Benefits to the System and Customers: Which projects would provide the greatest benefit to the customers in terms of improved quality and/or quantity of water service provided? Which projects would help increase revenues or decrease operating expenses of the system?

3) Relative Cost of Needs or Improvements: Lower cost projects are easier to undertake than high cost projects. Questions such as “Which improvements can be funded in house?” and “Which will require outside financing?” may have to be answered later in Module 1 once financing options begin to be evaluated.

4) Time: The last important factor to consider is time. How urgent is it to meet each capital need or improvement? Is the system under mandated deadlines from regulators, or is there time to accumulate reserves to fund projects? Are the costs to meet particular needs likely to increase over time?

Now, begin to set some priorities to the needs list. *Critical needs* are those projects considered absolutely essential to complete. Consider critical projects as those that have a direct impact on public health, or that can have a great negative impact on the system if they **are not** completed. *Urgent needs* are those that require the system to meet mandated deadlines for completion. Consider projects that have been delayed for a long time. Urgent needs can also be those projects the system is under some pressure to complete, or where the suspected of meeting the need will increase considerably if delayed. Classifying the needs in the following order may then be useful:

- 1) Critical needs that are also Urgent needs (highest priority)
- 2) Critical needs that are not Urgent needs (second highest priority)
- 3) Urgent needs that are not Critical (third highest priority)
- 4) Needs that are neither Critical nor Urgent (fourth highest priority)

Using this type of classification system may help determine capital spending priorities. This is not to say that needs in lowest priority would be considered “not important.” All capital needs should be considered important.

Input Instructions

Follow any additional instructions on each spreadsheet. Any gray shaded areas are input areas. Calculations based on the input data appear throughout the spreadsheet as the data is entered. *The numbers in the cells in column A are for reference use once*

the sheet is printed. In these instructions, cells are referred to by column and/or row numbers assigned by the Excel.

Spreadsheet 1A

- 1) Begin on spreadsheet 1A and enter the project name in cell C-3. (This name can be whatever the user chooses; town, subdivision, or water system name, or anything to remind the user who this capital needs list belongs to.)
- 2) In the gray shaded cells of column C, enter the inflation rate to be used with each capital component. The appropriate inflation factors will automatically appear under the appropriate year.
- 3) Next, decide what project component (s) the project (s) fall under. If, for example, within the next five years, the system will need a new surface water source, indicate “surface water” in cell B-14. List all of the projects under the appropriate component.
- 4) Be sure an inflation factor has been entered in column C for each project component in which projects have been listed.
- 5) In column D enter the Construction Cost in today’s dollars for each project listed. Enter the dollar amounts in \$1000’s. (i.e. \$500,000 would be \$500; \$200 would be \$0.2)
- 6) Now, decide what percent of the project is anticipated being completed in each year. Enter this percentage in the % column (columns F, H, J, L, N) under the appropriate year. If the percentage is zero, leave the space blank. The user will notice that the construction cost is being broken down by the specified percentage and inflated accordingly across the five-year period. Even if a project will not be completed in the five- year period, list the percentages that will be complete under the appropriate years.

Example: A Water Storage Tank that costs \$500,000, with 20% completed in year 4, 50% completed in year 5, and the rest completed in a later year not listed, inflated at 5% would be listed as follows on sheet 1A:

<i>Distribution Storage</i>	<i>Cost</i>	<i>Year 4</i>	<i>Year 5</i>	<i>Total</i>	<i>O&M</i>
Storage Tank	\$500	20%, \$116	50%, \$304	\$420	\$8

Remember that all dollar figures are in 1000’s and notice that 70% of the project will be completed during this planning horizon and a total of \$420,000 will be spent due to inflation. Operation, Maintenance, and Repair (OM&R) increases are projected as 2% of the total inflated construction cost.

- 7) Repeat step 6 for all projects that have been listed. Once this sheet is completed and a total cost associated with each project listed, save this sheet and move on to sheet 1B.

Spreadsheet 1B

8) Sheet 1B creates a summary of the costs of the projects in each project component listed in 1A. Enter the inflation rate again in cell A-21 on this sheet. This will inflate the OM&R costs so the user knows what they are for the first year after that project or group of projects is completed. If the user is only interested in the OM&R increase for a particular project within that component, the user should refer back to sheet 1A and inflate the OM&R amount listed for that project by hand. **Remember that OM&R costs do not begin until the project is completed.** This will be important when entering OM&R costs in spreadsheet 1C. Save the sheet and move on to sheet 1C.

Spreadsheet 1C

9) The user may wish to test a variety of financing options for several projects, and therefore, will need to make duplicates of this sheet before entering any data. The user does not have to finance all of the projects together. Look at individual projects or groups of projects. The user can test up to 4 different financing arrangements on each sheet. Be sure to keep track of what is financed by indicating a project name in cell C-3 for each copy of this spreadsheet used.

10) Review the following information in Table 3 before deciding how to finance the projects. See Appendix B for information on various funding agencies and their requirements.

TABLE 3. Financing Sources

FINANCING SOURCE	PROVIDES FUNDS	REPAYMENT	ADVANTAGES	DISADVANTAGES
Revenue Bonds (or “rate-supported” bonds)	Immediately	By rate payers over 10-30 years	Makes funds available immediately; ties payment to benefits received	Increases rates; high interest costs
Revolving Loans	Immediately	By rate payers over 10-20 years	Makes funds available immediately; ties payment to benefits received; potentially lower interest costs	Increases rates; competition with other local agencies for funds
General Obligation Bonds (or “tax-supported bonds)	Immediately	By taxpayers over 10-30 years	Makes funds available immediately; ties payment to benefits received; potentially lower interest costs	Increases taxes; compete with other local services for limited bond funds; separates payment from benefit
Assessment-supported Bonds	Immediately	By assessed customers over 10-30 years	Makes funds available immediately; matches payment to benefit	Requires legislative approval; not practical for projects that serve all or most customers; assessments can become burdensome to customers
Assessments (Unbonded)	Immediately	By assessed customers at time of construction	Makes funds available immediately; matches payment and benefit	Requires legislative approval; may have serious impact on assessed customers
Capital Fees (hookups, taps, system development or impact fees	Immediately	By new customers immediately	Requires new customers to pay for impacts they place on system	Political problems (viewed as “anti-development”); ineffective where there is little or no growth
Reserves	In future	By rate payers each year until reserve is adequate	Eliminates need for borrowing; improves financial stability of system	Can be politically difficult; difficult to “protect” reserves for intended use; impractical for large projects
User Charges	Immediately	By rate payers immediately	Eliminates need for borrowing or reserves	Impractical for large projects; may make rates erratic from year to year

11) Once the user has decided on which financing options to evaluate, locate the financing mechanism(s) decided on in column B and enter the appropriate amounts in cells 9-16 of columns D,E,F, and G. Enter the appropriate OM&R cost for the project from spreadsheet 1A or 1B in cell 8 of columns D,E,F, and G. The user does not have to evaluate four options. As few or as many options, and many different combinations can be evaluated. For instance, if the user wants to evaluate four different revolving loan

rates and terms, enter the total amount to be financed under each option. (The user would then enter the 4 different interest rates and term factors on Row 27. This step is explained in instruction #14).

12) Total Financing in Row 18 should equal the sum of all financing sources minus any grants being considered. Total capital in Row 19 should equal the total amount of the inflated construction cost of the capital project or group of projects being evaluated.

13) If rate-supported bonds were used in any option, enter the assumed interest rate and bond term in cell C-24. Using the Debt Service Factor Table in Appendix C, locate the factor that corresponds to this term and interest rate. Enter this factor in Row 23 (gray shaded areas) under the option is being are evaluated with this term and interest rate. If evaluating more than one bond term and/or interest rate, be sure to list the other interest rates and bond terms in cell C-24 one after the other, and enter the appropriate factors that correspond to these other terms and rates in the appropriate column. Row 25 will reveal the bond debt service.

14) If revolving loans were used in any option, enter the assumed interest rate and loan term in cell C-28. Using the Debt Service Factor Table in Appendix C, locate the factor that corresponds to this term and interest rate. Enter this factor in Row 27 (gray shaded areas) under the option that is being are evaluated with this term and interest rate. If evaluating more than one loan term and/or interest rate, be sure to list the other interest rates and loan terms in cell C-28 one after the other, and enter the appropriate factors that correspond to these other terms and rates in the appropriate column. Row 29 will reveal the revolving loan debt service.

15) If reserves were used in any option, enter the assumed interest rate and accumulate term (*how long the user plans to save to accumulate a certain amount. Start from present to the time that is planned to construct*) in cell C-32. Using the Sinking Fund Factor Table in Appendix C, locate the factor that corresponds to this term and accumulate rate. Enter this factor in Row 31 (gray shaded areas) under the option that is being evaluated with this term and accumulate rate. If evaluating more than one term and/or accumulate rate, be sure to list the other accumulate rates and terms in cell C-32 one after the other, and enter the appropriate factors that correspond to these other terms and rates in the appropriate column. Row 33 will reveal the annual reserve contribution that must be made to obtain the desired funds within the specified time period or term.

16) Based on the input information thus far, Row 35 presents the Total Annual Increase in rates for the system.

17) Indicate the percent of revenue received from households only in Row 37. This can be determined by looking at billing records and eliminating any commercial, industrial, or non-household accounts and dividing that number by the total accounts.

18) Indicate the total **number of household** connections in Row 38.

- 19) Row 39 presents the Rate Impact on the average annual household cost.
- 20) Gallons consumed by household customers per year in **Millions** are presented in Row 40. (This number assumes 2.5 people per household and a use of 75 gallons per day per person unless otherwise entered by the user.)
- 21) Row 41 presents the Rate Increase per 1000 gallons.
- 22) If tax-supported bonds were used in any option, enter the assumed interest rate and bond term in cell C-44. Using the Debt Service Factor Table in Appendix C, locate the factor that corresponds to this term and interest rate. Enter this factor in Row 43 (gray shaded areas) under the option that is being evaluated with this term and interest rate. If evaluating more than one bond term and/or interest rate, be sure to list the other interest rates and bond terms in cell C-44 one after the other, and enter the appropriate factors that correspond to these other terms and rates in the appropriate column. Row 45 will reveal the tax-supported bond debt service.
- 23) In Row 46, enter the total assessed value of all homes connected to the water system (**in Millions**). This information can be obtained from the tax assessor's office.
- 24) In Row 47, the effect on the Tax Rate per \$1,000 is presented.
- 25) In Row 48, indicate the assessed value of the average home connected to your system in \$1,000's.
- 26) Row 49 presents the Tax Impact on the average household.
- 27) Row 50 present the combined Tax and Rate impact on the average residence.
- 28) If assessed-supported bonds were used in any option, enter the assumed interest rate and bond term in cell C-54. Using the Debt Service Factor Table in Appendix C, locate the factor that corresponds to this term and interest rate. Enter this factor in Row 53 (gray shaded areas) under the option that is being evaluated with this term and interest rate. If evaluating more than one bond term and/or interest rate, be sure to list the other interest rates and bond terms in cell C-54 one after the other, and enter the appropriate factors that correspond to these other terms and rates in the appropriate column. Row 55 will reveal the bond debt service if the assessments are bonded.
- 29) Enter the amount from Row 12 under the appropriate option in Row 56 if the assessments are not bonded.
- 30) In Row 57, enter the number of customers paying the special assessment. (This number usually reflects the customers that will benefit directly from the capital improvement.)
- 31) Row 58 presents the average annual assessment.

32) Row 59 presents the Total Impact of the assessment on the assessed users.

33) Row 60 presents the gallons consumed by the assessed users per year in Millions. (This number assumes 2.5 people per household and a use of 75 gallons per day per person.)

34) Row 61 presents the assessment/surcharge cost per 1000 gallons.

35.) **ALL WORK SHOULD BE SAVED!** Module 1 has been completed. This evaluation should give the user some clear ideas about how to finance capital projects. This information will be useful in a number of ways. The user should keep copies of what has been done. It would be a good idea to print sheets 1A, 1B, and 1C at this point so they can be referred to as necessary as the user progress through the next two modules.

MODULE 2

BUDGETING

Module Overview

A community water system is a business. To be successful, it must be run like one. The board members are responsible for helping to keep the water system's finances running smoothly. Board members are responsible for planning the system's financial future, developing and approving the system's annual expense budget, making sure the system's revenue covers all its expenses, and making sure adequate financial records are kept and reviewing those records monthly. Budgets should be updated, adjusted, and reviewed frequently.

Module 2 consists of three spreadsheets, 2A, 2B and 2C that helps the user project annual revenues, develop an operating budget, and assess present financial viability of the water system. Current water rates are to be used. The user will need to rely on customer billing records to complete this section as well as old budgets, bills, any audit reports and the capital improvements planning that was prepared in Module 1. If the water account is combined with another account, i.e. wastewater or general fund, it is strongly recommended that they be separated into their own accounts. Separate budgets should be done so that the water system can determine what the cost of production is for each gallon of water.

Input Instructions

Follow any additional instructions on each spreadsheet. Any gray shaded areas are input areas. Calculations based on the input data appear throughout the spreadsheet as the data is entered. Sheet 2A allows for two customer classes and two consumption blocks.

Spreadsheet 2A

- 1) Enter the current fiscal year in cell C-4.
- 2) For up to two rate blocks, enter the number of service connections that the system has in Row 11 for each rate block. Cell H-11 should equal the total number of connections the water system has.
- 3) In Row 14, enter the base or minimum charge for each rate block. This is the amount a customer would pay even if they used absolutely no water. If the system is unmetered and charges a flat rate for all customers, enter the flat rate amount and skip to instruction #9.

- 4) In Row 16, enter the number of gallons included in the base charge per month, i.e. the number of gallons a customer would get before the costs increases beyond the base charge. If there are no gallons allotted in the base charge, then enter zero.
- 5) In Row 18, enter the annual projected water sales for each rate block. The user should be able to derive this number from the average monthly meter readings for all customers.
- 6) Row 19 presents the annual gallons in each rate block minus the gallons included in the base charge.
- 7) Row 20 presents the annual water sales for each rate block.
- 8) In Row 22, enter the system's commodity charge or the charge per 1000 gallons. If the system has more than two consumption blocks, enter the least amount charged per 1000 gallons.
- 9) Row 25 presents the total projected water sales revenue based on the input information.
- 10) Row 27 presents the revenue per connection. Save the sheet!

Spreadsheet 2B

Whenever possible, known historical costs should be used when developing a budget. If no historical cost information exists, the user is responsible for estimating annual budget expenses. Any line items not applicable to the specific water system should be left blank. Each instruction provides some explanation about the line. Some lines will require the user to enter amounts while others are just section explanations. **All information is to be entered into Column C, Projected Year 1.** "Fees and Services" and "Other Revenue" amounts for years 2-5 must also be entered. If there is no specific request in the instruction for information to be entered, that instruction line is just an explanation of the lines to follow. The Revenues section is not inflated but instead held constant for the 5-year period so that the user can get an idea of how current water rates may need to be adjusted in the future to meet Expenses. The numbers for the subsequent years will be automatically entered. At any time, the user can manually enter adjusted revenue amounts in the subsequent years on the spreadsheet. It is advisable that the user read through this entire section of instructions before beginning this sheet. This will help the user to better organize the input information, which will make data entry much easier. Gray shaded areas are input areas.

- 11) Begin sheet 2B by entering appropriate inflation rates in Rows 62 and 64. The preset rate is 5%. This number can be adjusted at the user's discretion.

REVENUE: The first section of the operating budget is revenue. Revenue is sources of income to the water system.

12) **Water Sales:** Notice that the total water sales revenue has been transferred from sheet 2A to Row 4 of sheet 2B. The water sales line includes all money received for supplying water service. To forecast total water sales, the user must know the number of service connections and amount of water sold by the water system. Based on user knowledge of the system's water sales, this number can be replaced if the user feels it differs significantly from actual water sales.

13) **Fees and Service:** Include all other miscellaneous fees and charges for service provided other than for water service and connection fees (i.e., bad check fees, reconnect fees, meter analyzing fees, etc.). Initial first time hookup charges (connection fees) would be included in "Special Charges." Because this amount will vary greatly from year to year, the user must decide what value, if any, to input for subsequent years.

14) **Other Revenue:** Include all other revenue that does not apply to the categories above. This line could include savings deposit interest or interest earned on other investments. Because this amount will vary greatly from year to year, the user must decide what value, if any, to input for subsequent years.

15) **Total Revenues:** Row 7 presents the sum of all revenues to be received by the system for each of the five years. As stated earlier, if any increases in revenue will take place in years 2-5, the user can adjust the numbers accordingly. It may be more beneficial for the user to wait until the completion of Module 3 and then do another analysis with Module 2 to see how the new rates will affect the budget. This process will be explained later in Module 3.

EXPENSES: The second major section of an operating budget is the identification of the water system's expenses. Expenses include all those activities or purchases which incur cost or increase assets of the water system. Expenses should be listed using historical costs and escalating them for known and projected changes. An example of a known change would be an increase in labor costs for the budget period due to known or anticipated salary increases.

OPERATING AND MAINTENANCE EXPENSES (Variable Expenses): These expenses items refer to all expenses incurred by the water system in the production and delivery of water to customers; for example, operator salaries, power to operate pumps, chemicals for treating water.

16) **Salaries and Benefits (Operator):** Enter all compensation to the water system's employees when the work is related to the water system operation and maintenance (O&M). This account should not include compensation of officers, directors, or general and administrative staff.

17) **Power and Other Utilities:** Enter the cost of all electric power, water, telephone and any other water system related expenses incurred in producing and delivering water.

18) **Chemicals for Treatment:** Enter the cost of all electric power, water, telephone, and any other waterworks-related expenses incurred in producing and delivering water.

19) **Monitoring:** Enter the cost of all water monitoring costs incurred by the water system. This includes both in-house monitoring and analysis costs, and outside laboratory costs. Recent changes to the SDWA require water systems to significantly increase their monitoring activities for drinking water contaminants that were not previously regulated.

20) **Materials, Supplies, and Parts:** Enter the cost of all materials and supplies used in the O&M of the water system and in producing and delivering water to the customer. Include any repairs or parts needed in producing and delivering water. This would include grease and oil, and minor repairs to equipment. This should not include materials used for administrative purposes such as postage, copying, billing forms, or paper.

21) **Transportation Expenses:** Enter the cost of all expenses related to trucks, automobiles, construction equipment, and other vehicle expense used in producing and delivering water to the customer.

22) **Miscellaneous Expenses:** Enter the cost of all other expenses not included in the previous O&M expenses which were incurred in producing and delivering water.

23) **Total Operation & Maintenance Expenses:** Row 18 presents sum the of the operation and maintenance expenses.

GENERAL AND ADMINISTRATIVE EXPENSES (Fixed Expenses): These expenses are considered overhead and are not directly related to the O&M of the daily production and delivery of water to the customer. This category includes billing and administrative costs incurred by the water system. For example, all meter-reading costs, secretarial cost, postage, publications, reference material, uncollectable debt, insurance, accounting services, and all other overhead items belong in this subsection. These expenses are part of the expenses that a water system would have even if it did not sell any water.

25) **Salaries and Benefits:** Enter the cost of all compensation to the water system's employees in which the work is related to the administration of the water system, such as officers, directors, secretarial, and meter-reading salaries and benefits. This account should not include compensation of operators.

26) **Office Supplies and Postage:** Enter the cost of all materials and supplies used in the administration of the water system. This includes office supplies, postage, copier charges, and paper.

27) **Insurance—Vehicles, Liability, Workers' Compensation:** Enter the cost of all insurance costs associated with the coverage for the vehicles, general liability, worker's compensation insurance, and other insurance costs related to the operation and administration of the water system.

28) **Legal and Accounting:** Enter all salaries and wages associated with legal and accounting functions for the water system. This includes outside legal and accounting assistance.

29) **Engineering and Professional Services:** Enter all engineering and other professional services expenses associated with the planning and design requirement of the water system.

30) **Fees:** Enter all regulatory expenses for zoning and planning approvals. Also include the annual fee for the water system operating permit.

31) **Miscellaneous Expenses:** Enter all other expenses not included in the previous general and administrative expenses. For example, all expenses associated with employee training and operator licensure requirements (class, registration fee, travel, etc.), public relations campaign and public notification may be included in this category.

32) **Total General & Administrative Expenses:** Row 27 presents the sum of the general and administrative expenses.

33) **Depreciation Expense:** *Depreciation only applies to water systems that are currently depreciating assets. Water systems that are already charging a depreciation expense must enter the actual depreciation expense as a separate item here. For a water system that is not currently charging an expense for depreciation for tax purposes, and would like to do so, the water system may want to contact an accountant to generate a legally justifiable depreciation expense. For all other water systems, addressing how existing facilities are eventually going to be replaced is discussed in the Replacement Reserve discussion.*

34) **Total Expenses:** Row 29 presents the sum of **all** water system expenses.

This following section of the budget will not be inflated. The user will be responsible for entering costs for each year on some line items since amounts will increase or decrease from year to year at unsteady rates.

35) **Taxes:** Enter any taxes the water system incurs such as utility tax, business and occupation (B&O) tax, property tax or federal income tax.

36) **Annual Debt Payments—Loans/Bonds (Principal and Interest):** Annual debt payments are the cost associated with the repayment of short-term and /or long-term borrowing. Enter the debt service payments on all outstanding loans and bonds for each year. Remember to take into account any debts incurred for capital projects evaluated in Module 1.

37) **Total Outstanding Debt—Loans/Bonds (Principal and Interest):** Enter the summation of all outstanding debt. This figure will help the water system keep track of

its existing financial condition. The line entry for years 2-5 will change with the annual debt payment installment. If more debt is incurred within the five year period, remember to manually enter the correct amount of outstanding debt and also adjust the annual debt payment on the previous line (Row 32) under the correct year. Remember to take into account any debts incurred for capital projects evaluated in Module 1. These numbers automatically transfer to Row 40--Loan/Bond Funds (see instruction 42).

CAPITAL IMPROVEMENT PROGRAM (CIP) EXPENDITURES: This section of the budget includes facility and non-facility costs related to meeting growth requirements or improving water system infrastructure to provide better service and reliability to existing customers, replacing or renovating existing facilities, or ensuring compliance with drinking water regulations. Non-water revenue from loans, grants, and special charges may act as direct offsets to these capital expenditures. The unfunded difference is the net capital improvement program costs that must come from water revenues. Module 1 should be the source of information for this section.

38) ***New Capital Improvement Facilities:*** Enter all costs incurred to purchase new, or growth-related facilities, excluding major facilities required by the SDWA (see instruction 40). These new or growth-related capital improvements can be for extensions of new service, installing new wells or piping facilities, or new facilities that are not replacing existing facilities (i.e., all new facility cost except replacement facilities). New CIP costs should be consistent with those evaluated in Module 1.

39) ***Renewal and Replacement Facilities:*** Enter all costs for renovating or replacing existing water system facilities. Renewal and replacement costs for capital improvements should be consistent with the water system's improvement program outlined in Module 1.

40) ***Safe Drinking Water Act Facilities:*** Enter all costs which you know or anticipate will be incurred to install major facilities to remain in compliance with the SDWA. SDWA related capital improvements should be consistent with those evaluated in Module 1.

41) ***Non-Facility Costs:*** Enter all costs that are not facility related. For example, costs to implement a conservation program may be included in this line.

CAPITAL SOURCES: The source of monies used to pay for all or part of the capital expenditures identified above ("New CIP", "Renewal or Replacement", "SDWA" capital expenditures, or non-facility costs). Figures should be consistent with those in Module 1.

42) ***Loan & Bond Funds:*** Enter monies received from short-term or long-term debt used to pay capital improvement costs. The loan or borrowed monies are shown under "Loan Funds," and the corresponding debt associated with the borrowing of these monies is shown under "Debt Payments." For every loan/bond outstanding, there should be a corresponding debt payment shown in Row 32.

43) **Grants:** Enter monies received from local, state, or federal agencies that usually do not require repayment. Grants usually require the water system to contribute a portion of the project cost in order to receive the grant funding. Grant monies are scarce and are generally difficult to obtain. For every grant shown, there should be an offsetting dollar amount shown under “New CIP”, “Renewal or Replacement”, “SDWA” capital expenditures, or non-facility costs.

44) **Special Charges:** Enter monies received from customers connecting to your water system for the first time. These special charges are considered a buy-in to the water system. Special charge monies are to be used only for new CIP. They should be collected and accounted for in a separate cash fund. The user should use all special charge monies to pay for new CIP. If there are more special charge monies than new CIP shown in the budget, the difference should be set aside in a separate cash fund (Emergency Reserve) and used during another budget cycle to pay for new CIP. The special charge monies should never be used for daily operating expenses.

45) **Withdrawal from Existing Reserves:** Enter all monies that the water system has previously generated and accumulated specifically for Capital Improvements. These funds could have originated from any of the revenue sources (Rows 4-6). These funds can be taken from the Emergency reserve. If by withdrawing funds from the Emergency reserve, the water system reserve level falls below the cost to replace the most vulnerable facility, the water system should be prepared to reestablish these funds in the reserve within one year.

46) **Net CIP from Rates:** Row 44 subtracts the combined “capital sources” from the combined “capital improvements” and presents the amount of funds over and above capital sources that will have to be generated from water rates to pay for the capital expenditures.

OPERATING CASH RESERVE: The Operating Cash Reserve section of the budget has three separate lines: Minimum Required Balance, Annual Installment and the Running Balance. Because of the potential delay between the time the water system provides a service and when a customer may pay for that service, water systems need to attempt to keep at least 1/8 of their annual operating and maintenance and general and administrative expenses in this type reserve to prevent cash flow problems. These monies are considered “restricted” and should only be used for operation and maintenance (O&M) and general administration (G&A) emergencies. If it is necessary to use some of the funds, they should be replenished within one year of withdrawal.

47) **Minimum Required Balance:** The minimum balance should equal 1/8 the amount of the expenses identified in the “O&M”, Row 18, and “G&A”, Row 27, line items. For each year of the budget, if the O&M and G&A are increased, the minimum required operating cash reserve balance must increase.

48) **Annual Installment:** The annual installment is the dollar amount the water system puts into the reserve for that particular year of the budget. The reserve can be funded

initially with a one-time charge or a transfer of funds from an existing reserve. If a reserve account already exists, change this amount to the annual installment amount currently being deposited by the water system.

49) **Running Balance:** The running balance represents the balance at the end of the planning year and should be the sum of the all funds added to the reserve for that year and the previous year. However, if the water system is required to take funds from the reserve for an emergency, the running balance should temporarily show a decrease until the water system restores the reserve balance. If the running balance amount is more or less due to an unanticipated addition or subtraction, enter the number manually on Row 49.

EMERGENCY RESERVE: The emergency reserve section of the budget also has three separate lines: Minimum Balance, Annual Installment and the Running Balance. This reserve is considered a “restricted” balance and should be accounted for separately from the “Operating Cash Reserve” and the special charge monies discussed above. This reserve is specifically for the replacement of the water system’s most vulnerable (i.e. most prone for failure) facility equipment. Generally, replacement of a production well, a source of supply, the largest pumping equipment, or key transmission lines represents the most vulnerable facility and is used to estimate the minimum Emergency Reserve amount. This reserve can be initially funded with a one-time charge, a transfer of funds from existing reserve, or with an alternative funding source such as a second-party assurance or commitment. This is confirmed in a written agreement. The waterworks may be assessed a fee for establishing a financial assurance alternative, but is only required to utilize and pay back funds if an emergency occurs. Financial assurance alternatives include surety bonds, guarantees, and letter of credit. If used, the reserve should be fully restored within the planning year.

50) **Minimum Required Balance:** Enter the cost to replace the most vulnerable and critical facilities or equipment which may impact the reliability of the water system in cell C-51. Note that for subsequent years, this amount is inflated.

51) **Annual Installment:** The annual installment is the dollar amount the water system puts into the reserve for that particular year of the budget. (See “Emergency Reserve” explanation for ways to initially fund Year 1.) If a reserve account already exists, change this amount to the annual installment amount currently being deposited by the water system.

52) **Running Balance:** The running balance represents the balance at the end of the planning year and should be the sum of the all funds added to the reserve for that year and the previous year. However, if the water system is required to take funds from the reserve for an emergency, the running balance should temporarily show a decrease until the water system restores the reserve balance. If the running balance amount is more or less due to an unanticipated addition or subtraction, enter the number manually on Row 53.

REPLACEMENT RESERVE: The Replacement Reserve section of the budget also has three separate lines. Instead of a Minimum Required Balance, the Replacement Reserve has a Target Balance, an Annual Installment line, and a Running Balance line. Ideally, the water system's owner will have identified a replacement program. Given the barriers and high transaction costs to debt financing that small water systems face, small water system owners are encouraged to start a Replacement Reserve so that they have cash on hand to fund future improvements. There are many benefits that the water system will receive by funding this reserve including:

- accumulated cash will lessen the financial burden of future improvements,
- improved financial strength of the water system which may improve the terms of future debt, and
- existing reserves could provide any required matching funds for loan and grant programs.

53) **Target Balance:** The owner must decide what amount will be contributed to a Replacement Reserve. A simple formula would be to divide the total water system replacement cost (taken from a Preliminary Engineering Report if available), minus the existing amount in the Emergency Reserve, by a 20-year period. Enter this amount in cell C-55. Subsequent years will be inflated automatically.

54) **Annual Installment:** This represents the dollar amount that the water system is planning on generating from revenues committed to the Replacement Reserve for that year. If a reserve account already exists, change this amount to the annual installment amount currently being deposited by the water system.

55) **Running Balance:** The running balance represents the balance at the end of the planning year and should be the sum of the all funds added to the reserve for that year and the previous year. However, if the water system is required to take funds from the reserve for an emergency, the running balance should temporarily show a decrease until the water system restores the reserve balance. If the running balance amount is more or less due to an unanticipated addition or subtraction, enter the number manually on Row 57.

56) **Total Revenue Required:** Row 59 represents the total amount of funds that a water system will have to generate to met all water system costs.

57) **Budget Surplus (Deficit):** The last step of the budget process is to see if the water system is generating sufficient revenues to meet the total revenue required. This is calculated by deducting "Total Revenue Required" from the "Total Revenues" line. There is a budget surplus if the difference is positive and a budget deficit if the difference is negative (number will be shown in parenthesis). If the water system has a deficit, review the expenses and raise the water rates to generate sufficient income or reduce non-essential expenses. If there is a surplus of funds, it is recommended that the surplus funds be put into one of the reserve accounts. Save the worksheet!

Spreadsheet 2C

The analyses presented in sheet 2C demonstrate a certain capacity or ability needed for the successful operation of a water system. Once the budget in sheet 2B is complete, the necessary information will transfer to sheet 2C and provide Yes or No answers to the questions presented in each analysis for each year.

58) Begin by entering the operating and emergency reserve account balances for year 1. The median household income is to be entered on Row 53 and the number of connections for each year in Row 61.

Each analysis is discussed below in detail.

Analysis #1— Is there a budget in place, and are the rates sufficient to cover expenses?

The first analysis requires the water system owner to develop an operating budget that demonstrates sufficient revenue to meet all incurred expenses. The initial operating budget is for a five-year period. Review and updates to the budget should be completed at least every three months. If the answer to this question yields a “NO” response in any year, the water system should consider raising rates or reducing expenses for that year.

Analysis #2—Is the Operating Cash Reserve equal to or greater than 1/8 of the annual O&M + G&A?

The second analysis requires the owner to demonstrate the ability to withstand cashflow fluctuations. There can be a significant length of time between when a water system provides a service and when a customer may pay for that service. A 45-day difference is the generally accepted industry norm. Because of this potential delay in payment, most water systems attempt to keep at least 1/8 of their annual operating and maintenance and general and administrative expenses in an Operating Cash Reserve to prevent cashflow problems. Year 1 beginning balance will be zero and will produce a “NO” response. It can be ignored for this analysis. Years 2-5 should present a “YES” response, if not there may be a need to review the budgeted operating reserve annual installments.

Analysis #3—Is the Emergency Reserve equal to or greater than the cost of the most vulnerable facility?

The third analysis requires the owner to demonstrate the ability to cover the cost of an emergency or failure of its most vulnerable water system component. Year 1 beginning balance will be zero and will produce a “NO” response. It can be ignored for this analysis. Years 2-5 should present a “YES” response, otherwise there may be a need to review the budgeted emergency reserve annual installments.

Analysis #4—Household Income Index—Are water rates less than or equal to 1 ½ percent of the Median Household Income?

The fourth and final analysis has the water system owner measure the rate impact of increased operating and facility expenses on the water system customers. This analysis provides an indication of a residential connection's ability to pay the existing and projected rates. When rates exceed 1 ½ percent of the MHI in any year of the budget, the water system's rates may not be affordable. The median house income can be determined by identifying the county's average annual median household income from the U.S. Census Bureau. If this question yields a "NO" response in any year, the water system may need to explore restructuring or revise its improvement implementation schedule.

DO NOT FORGET TO SAVE THE WORKSHEET!!!!

MODULE 3

SETTING WATER RATES

Module Overview

Upon completion of Module 2, the user should have some general idea now about the sufficiency of the current water rates and the financial health of the water system. Module 3 consists of three spreadsheets, 3A, 3B, and 3C. 3A (2), 3B (2) and 3C (2) are extra sheets that have been included in case the water system charges separate rates for residential and commercial users. If this is not the case, these secondary sheets do not need to be completed. Module 3 will help to determine the fairness of the current rate structure and it will assist the user in developing a new rate structure if the current structure has been determined to be insufficient. Several copies of sheet 3C and 3C (2) may need to be made in order to evaluate different rate alternatives.

There is no way to guarantee wide public support for a rate increase. However, if customers have a clear understanding of the proposed rate structure, can see that the rate structure is necessary in order to operate the system on a financially sound basis, and that each class of customers pay their fair share of the cost, it is easier to gain their support.

Basic Rate Structure Principles:

- A. Rates must be set at a level that cover the full cost of producing, treating, storing, and distributing water to customers. This includes debt service, financial reserves, operation, maintenance, and regulatory compliance costs.
- B. Rates must be fair and equitable. Fair means the rate is high enough to cover the full cost of the system. Equitable means that each class of customers are paying their fair share of the costs.
- C. Water system revenues should not be used to pay for other municipal services. Using revenues for other purposes may be illegal, and it increases the cost of operation in the long run.
- D. Customers should know what the rates are. Make sure they are posted at the water office and consider sending them to customer at least once a year.
- E. The rate structure should be easy to understand. In general, the rate structure for a small system should have no more than 1-3 user classifications and 1-5 consumption blocks.

- F. Remember that water rates have a short life span. The existing rate structure should be examined once a year as part of the budget development process to determine if any adjustments should be made.
- G. Good rate structures are based on good budgets and good customer records. It will be hard to develop a fair and equitable rate structure if the user is not sure what the expenses and revenues have been for the past 2-3 years and how much water is being sold to each customer.
- H. The rate structure should be easy to administer. If it is complex and difficult to administer, chances are it is going to be hard for customers to understand and support.

Table 4 describes the four most common types of rate structures. If the system is not metered and is using a uniform flat rate, it is strongly recommended that meters be installed. If the system is metered, study the remaining three rate structures. To select the one that is right for the system's needs, the user needs to know the system, the customers, and the community.

Table 4. FOUR TYPES OF RATE STRUCTURES

<p>Customer Classifications: Divides customers into groups such as residential, commercial, agricultural, industrial. Some systems classify customer by meter size. Many systems have different rates for each classification of customers.</p> <p>Consumption Block: A preset quantity of water at a stated price. Below is an example of a rate structure with 4 consumption blocks:</p> <p style="text-align: center;"> <i>\$x for the first 2,000 gallons used</i> <i>\$x per 1,000 from 2,000 – 6,000 gallons</i> <i>\$x per 1,000 from 6,001 – 10,000 gallons</i> <i>\$x per 1,000 for everything over 10,000 gallons</i> </p>	
<p>UNIFORM FLAT RATE</p>	<p>SINGLE BLOCK RATE</p>
<p>Customers pay the same amount regardless of quantity of water used. Used in unmetered systems.</p> <p>Example:</p> <p><i>Each customer will be charged a flat rate of \$x per month.</i></p> <p>Advantages: Eliminates cost of installing and reading meters. Disadvantages: Everyone pays too much or too little for what they use. Promotes high consumption. Not recommended.</p>	<p>Customers are charged a constant price per gallon regardless of the amount of water used. Often coupled with a minimum charge for having service available.</p> <p>Example:</p> <p style="text-align: center;"><i>\$x minimum service availability charge (optional) plus \$x per 1,000 gallons used</i></p> <p>Advantages: Easy to administer, may encourage water conservation. Cost to the customer is in direct proportion to amount used. Disadvantages: Could discourage high water consuming industries from locating in the community.</p>
<p>DECREASING BLOCK RATE</p>	<p>INCREASING BLOCK RATE</p>
<p>The price of water declines as the amount used increases. Each succeeding consumption block is cheaper. This structure is based on the assumption that costs decline as consumption goes up.</p> <p>Example:</p> <p style="text-align: center;"> <i>\$14 minimum for the first 2,000 gallons used</i> <i>\$2.50 per 1,000 from 2,000 – 6,000 gallons</i> <i>\$2.00 per 1,000 from 6,001 – 10,000 gallons</i> <i>\$1.00 per 1,000 for everything over 10,000 gallons</i> </p> <p>Advantages: Attractive to agricultural and industrial users.</p>	<p>The price of water increases as the amount used increases. Each succeeding consumption block is more expensive. Structure based on the assumption that water rates should promote water conservation.</p> <p>Example:</p> <p style="text-align: center;"> <i>\$14 minimum for the first 2,000 gallons used</i> <i>\$2.00 per 1,000 from 2,000 – 6,000 gallons</i> <i>\$2.50 per 1,000 from 6,001 – 10,000 gallons</i> <i>\$3.00 per 1,000 for everything over 10,000 gallons</i> </p> <p>Advantages: Promotes water conservation, especially important in areas with limited water supplies or high treatment costs. Less water use means less wastewater and smaller, less expensive wastewater treatment facilities. Provides a reasonable amount of water at a reasonable price and charges a premium for those using more. Disadvantages: Higher costs for high usage may discourage industry from locating within the system’s service area.</p>

Input Instructions

The first step of this module is to collect information. The customer Billing Records or Meter Book will be needed. If the system does not have meters installed, the only method of raising rates will be needed to determine how much additional revenue will be needed to meet the expenses (see Module 2) and divide this amount equally between all customers. This can prove unfair and unequitable, thus it is strongly suggested that meters be installed as soon as feasible. If the system is unmetered, the user can stop at this point.

Spreadsheet 3A & 3A(2)

If the system currently has separate rate schedules for residential and commercial customers, the user will need to complete a separate sheet for each one. Spreadsheet 3A(2) has been included for this purpose.

- 1) First, separate the customer records by month, then by usage category. Enter the number of customers in the usage category for each month.
- 2) Column N will total the numbers in each different usage level.
- 3) Column O will divide each number by 12 and present the average number of customers in each usage category. Cell O-18 will be the sum of Column O.
- 4) For each usage level, Column P will present the percent of total customers represented in each usage category.
- 5) The values shown in this column represent the midpoint of each usage level. Experience is that the midpoint is an accurate estimate for median usage. For the last line (the over 25,000 gallons line), enter the average of all these high usage customers in cell Q-17. To calculate the average usage for these customers, add up all the monthly usages recorded from the customer records for these customers and divide by the total number of customers in this category.
- 6) Column R presents the Average Total Water Use in each usage category. This is accomplished by multiplying the average number of customers (Column O) by the Average Use (Column Q). Cell R-18 presents the sum of all of Column R.
- 7) Column S presents the percentage of use of the total represented by each usage category.
- 8) Column T presents the Target Revenue Average in percent for each usage category. Target Revenue is the percentage of all revenue that will be charged to each user level in a system that spreads costs fairly among all customers. Save the worksheet!

9) Repeat instructions 1-8 and enter information in Spreadsheet 3A(2) if there is a separate rate schedule for commercial customers.

Spreadsheet 3B & 3B(2)

These sheets are used to check the fairness of the current rate structure.

10) The numbers in Column B are transferred from sheet 3A (or 3A(2) if the user is working on sheet 3B(2)) and again represent the average water use for each usage category.

11) In Column C, enter the amount a customer using each of the amounts of water in Column B would be charged.

12) Column D, transferred from sheet 3A (or 3A(2) if the user is working on sheet 3B(2)), represents the average number of customers in each usage category.

13) Column E represents the Total Revenue by Use Class.

14) Column F represents the percentage of Total Average Revenue for each use class.

15) Column G, Target Revenue, is transferred from sheet 3A (or 3A(2) if the user is working on sheet 3B(2)).

16) Column H represents the equity or fairness of the current rates. If the current rate structure spreads the cost of providing water equitably, the numbers in each line of Column H will be between -2% and +2%. If some of the numbers are larger or smaller than -2% or +2%, the customers in that user class are paying too much or too little for their water. (Even if all numbers fall within the -2% to +2% range, this does not mean rates are sufficient to cover expenses. This means that the rates are fair based on usage when compared to all usage groups.)

17) Save the worksheet and repeat instructions 10-16 and enter the information in Spreadsheet 3B(2) if there is a separate rate schedule for commercial customers, otherwise, move on to sheet 3C.

Spreadsheet 3C & 3C(2)

The primary purpose of a rate study is to insure that rates are set high enough to cover both fixed and variable expenses and to ensure the costs are spread fairly among a system's customers. However, local conditions sometime may require that other factors be considered in the ratemaking process. Listed below are examples of local considerations that may require modification of the rate structure.

- A. Limits on the amount of water available to the system may require a rate structure that encourages conservation and charges a premium for wasting water.
- B. Limited treatment and water storage capacity of the system may necessitate a rate structure that encourages conservation.
- C. A community whose wastewater treatment facility is at, or very near, capacity, may choose to modify the water rate structure to discourage water use in order to avoid the expense of expanding its wastewater facility.
- D. There may be state laws which mandate that certain things be considered in setting rates for the water system.
- E. If the system was financed using Revenue Bonds, there may be certain bond requirements (covenants) that must be met.
- F. The owner may want to minimize the cost to low-income/elderly/fixed income customers by shifting a greater portion of the costs to the larger users.
- G. The owner may want to minimize the cost to large commercial/industrial customers in order to attract new businesses to the community and choose to shift a greater portion of the cost to residential customers.

Spreadsheets 3C and 3C (2) allow the user to develop rate breaks and rate blocks for the two use classes based on the local considerations that affect the system's rates. It will be a good idea to make several blank copies of this sheet in order to test several different rate structures without having to erase the work completed on the original sheet. This sheet is divided into two major sections, top and bottom:

- In the top left section is important information about the water system including the: number of customers, Year 2 annual fixed expenses, Year 2 annual budget, etc. In the top right section is a blank rate structure. The user will need to fill in the blanks for each rate alternative that will be tested.
- The bottom section is where most of the work will be done. Each row in the spreadsheet is numbered, and each column is lettered, however, **the manual will refer to row, column, and cells with the numbers and letters assigned by Excel.** These additional row and column headings will be for identification purposes after the sheet is printed. At the bottom of the applicable columns, are spaces for monthly and yearly totals.

18) In cell J-3 enter the number of the rate alternative being tested to keep track of all the tests.

19) The user must now have decided how many thousand gallons, if any, to include in the minimum charge. The minimum or base charge is the amount a customer pays to have

water available on demand. Even if a customer uses no water for the month, a minimum charge will still be assessed. Systems often set the minimum charge to include the first 1000 to 2000 gallons of water used. This will help promote fairness between what is charged for residential customers and what is charged for commercial customers. This water is not free and the minimum charge should be set so that the cost of these allotted gallons are recovered. Enter the minimum charge or a minimum monthly bill amount per customer for this user class in cell E-8. Enter the number of **1000 gallons** to be included in the minimum charge in cell E-9.

20) Enter the annual billable gallon for this class in Cell J-10. This information can be obtained from Sheet 2A.

21) Next, the user will need to enter rate breaks in cells 5-8 of column I and the associated cost per thousand gallons in column K. Cell I-4 contains the number of gallons included in the minimum charge and cell K-4 contains the minimum charge. If the user is unsure where to make the rate breaks, the rate breaks in the current rate structure should be used if they are available, otherwise, the user can test amounts based on increasing block rates and decreasing block rates. Use the customer records and any local considerations to make wise assumptions about appropriate rate breaks. This section is set up to provide the user with four Rate Break lines. A rate break line marks a change in the cost of water from one usage block to the next. The user does not necessarily have to use all four rate break lines.

22) Once the top sections are filled in, go down to the bottom section. The first step is to draw rate break lines, based on the rate structure that was filled in on lines 4-8 of columns I and K. To draw in the rate break lines, look first at row 4 columns I and K. If, for example, they read "First 2,000 gallons at 9.00 (Minimum Bill)", the first rate break line should be entered between rows 20 and 21 on the bottom of the spreadsheet. Starting at the far left margin of the spreadsheet, draw a horizontal line that extends to the right of the spreadsheet between these rows using the borders functions under Format Cells. Draw the other rate break lines the same way.

23) For each rectangle or block in Column B, type in Block 1, Block 2, Block 3, etc. and the associated gallon range. This will help to keep things straight as the user progresses through the rest of the sheet.

24) Columns C-M are automatically calculated in the spreadsheet once the basic information is entered.

25) The next step is for the user to calculate the rate block statistics. In Column N, locate each cell that ends a particular rate block and in that cell enter the sum of the number of customers from Column D within each rate. Column O presents the percentage of customers in each rate block.

26) In Column P, locate each cell that ends a particular rate block and in that cell enter the sum of the usage levels from Column F within each rate block. Column Q presents the percentage of water usage in each rate block.

27) In Column R, locate each cell that ends a particular rate block and in that cell enter the sum of the revenue from Column L within each rate block. Column S presents the percentage of total revenue in each rate block.

28) Finally, compare the amounts shown in cells E-10 and E-11 with the amount generated by the rate structure in cell E-13. The amount in E-13 should be as close as possible to the amount in E-11 but not less than the amount in E-10. The user must also check that the percentages in Column S match the percentages in Column T. It is necessary that rates continue to be adjusted until both the amount in cell E-11 is sufficient and the percentages in Column S closely match the percentages in Column T. This will ensure that the rate structure is fair and equitable.

29) Repeat for sheet 3C(2) if necessary.

30) **SAVE THE WORKSHEET** and move on to the next Rate Alternative.

CONCLUSION

After going through this guide, the user should have enough information to make some very informed decisions about the water system, and to educate others on the needs of the water system. This guide is intended to assist the user to make informed decisions. There may still be political and/or other human factors that this guide cannot address and therefore, the user may still not be successful in making changes. However, there is a wealth of information stored within the spreadsheets documented in this report. If the need arise for the system staff to do a comprehensive business plan, after following the procedures described in this report, enough information will be generated to prepare and to submit a business plan.

This guide can be used as a constant resource and to update the information continuously. The appendices should provide a wide range of resources that the water system staff can depend on for information and assistance.

REFERENCES CITED

McGhee, T. J. 1991. Water Supply and Sewerage, 6th Ed., McGraw Hill.

Shinn, P. and J. Randolph. 1989. Costing and Rate Setting Workbook for Water and Sewer Utilities. Volume 1, Dept. Urban Affairs and Planning, Virginia Tech, Blacksburg, Virginia. 179 pp.

APPENDICIES

APPENDIX A

TECHNICAL ASSISTANCE PROVIDERS and OTHER RESOURCES FOR SMALL WATER SYSTEMS

<p>Rural Community Assistance Program, Inc. 722 East Market Street, Suite 105 Leesburg, VA 20176 (703) 771-8636 (703) 771-8753—fax www.rcap.org rcap@rcap.org</p>	<p>National Rural Water Association 2915 S. 13th Street Duncan, OK 73533 (580) 252-0629 (580) 255-4476—fax www.nrwa.org/vrwa mail@nrwa.org</p>
<p>U.S. Environmental Protection Agency 401 M Street, S.W. Washington, DC 20460 (202) 260-2446 (202) 401-2345—fax www.epa.gov/OGWDW/</p>	<p>U.S. Geological Survey Water Resources Division 509 National Center Reston, VA 20192 1-888-275-8747 water.usgs.gov</p>
<p>National Environmental Services & Training Programs PO Box 6064 West Virginia University Morgantown, WV 26506-6064 (304) 293-4191 (304) 293-3161—fax (800) 624-8301 www.estd.wvu.edu</p>	<p>Association of State Drinking Water Administrators 1120 Connecticut Avenue, NW, Suite 1060 Washington, DC 20036 (202) 293-7655 (202) 293-7656—fax asdwa@erols.com www.asdwa.org</p>
<p>National Ground Water Association 601 Dempsey Road Westerville, OH 43081 (614) 898-7791 (614) 898-7786—fax (800) 551-7379 ngwa@ngwa.org www.ngwa.org</p>	<p>USDA Rural Development Rural Utilities Service Stop 0705, 1400 Independence Avenue Washington, DC 20250-0705 (202) 720-4323 (202) 690-0311—fax www.rurdev.usda.gov</p>
<p>US Department of Housing and Urban Development (HUD) 4451 7th Street, SW Washington, DC 20410 (202) 708-0940 (202) 619-8129—fax www.hud.gov</p>	<p>USABlueBook 3995 Commercial Avenue PO Box 1186 Northbrook, IL 60062 (847) 291-7000 (847) 272-8914—fax catalog@usabluebook.com (water supply catalog)</p>
<p>American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 (303) 794-7711 www.awwa.org</p>	<p>Virginia Water Resources Research Center 10 Sandy Hall Virginia Tech Blacksburg, VA 24061 (540) 231-5624 (540) 231-6673—fax water@vt.edu www.vwrrc.vt.edu/vwrrc/vwrrc.htm</p>

The websites of these agencies also provide links to other valuable resources. Local Planning District Commissions or Council of Governments also provide technical assistance.

APPENDIX B

FINANCING SOURCES FOR SMALL WATER SYSTEMS

RDA LOAN AND GRANT PROGRAM

In 1991, Congress established the Rural Development Administration (RDA) under the U.S. Department of Agriculture, formerly called the Farmers Home Administration. RDA assumed the responsibility for water and wastewater loan/grant program, as well as the Emergency Community Water Assistance Grant fund and the Community Programs Guaranteed Loan fund. RDA funds are available in all 50 states and U.S. territories, and local “matching” funds are not required. Priority for RDA loans is given to preapplications according to a rating system that emphasizes median household income, project need, and population size. Grant funds are generally awarded only in combination with an RDA loan. Grant funds are used to substitute for RDA loan funds if the award of an RDA loan ONLY would make debt repayment so costly that monthly water or sewer bills would be unreasonably high.

Eligible Applicant

RDA financed water systems must serve primarily rural residents. For water facilities, a rural area cannot include any area in any city or town with a population greater than 10,000 residents.

Eligible applicants include:

- Public bodies, such as municipalities, counties, districts, authorities, or other political subdivisions of a state;
- Not-for-profit organizations such as associations, cooperatives, or private corporations; and
- Indian tribes.

Eligible Projects

RDA loan money may be used for the following purposes:

- Purchase of major equipment;
- Purchase of existing facilities when it is necessary to either improve or prevent loss of service;
- Construct or relocate utility lines and other improvements, and to make other necessary improvements for the successful operation of the proposed facility;
- Pay reasonable professional fees such as legal, engineering, architectural, financial advice, etc., related to the project;

- Pay interest on loans until the facility is self-supporting;
- Pay for land, water rights, permits, easements, etc., necessary for successful operation;
- Initial operation expenses (not more than 1 yr.); and
- Refinancing debts.

RDA grants can be used for all of the same purposes *except*:

- Refinancing existing debts;
- Purchasing existing facilities;
- Paying accrued interest during or after construction; and paying initial operating expenses.

Rate and Terms

RDA lends money at three different interest rates. The formula used to determine the rate the borrower will pay is based on income figures from the census that is taken every 10 years.

- **Poverty line rate:** interest charged is not over 5% per year. To be eligible for this rate, the primary purpose of the loan must be to upgrade existing facilities or construct new facilities required to meet health or sanitary standards and the median household income of the service area must be below the poverty line for a family of four or below 80% of the statewide non-metropolitan median household income. If the community qualifies for the poverty line rate, the water system may be eligible for a grant of up to 75% of the cost of the project.
- **Intermediate rate:** is the poverty line interest rate plus $\frac{1}{2}$ of the difference between the poverty line rate (5%) and the market interest rate, not to exceed 7% annually. The intermediate rate will apply to loans that cannot meet the requirements for the poverty line rate, and for which the median household income is below the poverty level or below 100% of the statewide non-metropolitan median income. Communities that qualify for the intermediate rate may be eligible for a grant of up to 55% of the cost of the project.
- **Market rate:** This interest rate is equivalent to whatever the present commercial interest rate is, and applies to any community that does not qualify for either the poverty line rate or the intermediate rate. Communities that pay the market rate are NOT eligible for RDA grants.

RDA loans are available for up to 40 years or the expected life of the facility, whichever is shorter. Payments are usually made monthly. In some cases, principal payments can be deferred for up to 36 months. Loans must be secured with pledges of revenue from the facility, pledges of taxes or assessments, liens on property, or other system assets.

Application Process

- The preapplication and supporting information will be reviewed for eligibility and assigned a priority rating. The RDA will send a response within 45 days of their receipt of the preapplication. This response will indicate whether the preapplication is eligible for RDA financing, and whether funds are available to proceed with a full application. If the preapplication is deemed ineligible, the borrower will be offered the opportunity to appeal the decision.
- If the preapplication is eligible, but priority given the application does not fall within the available funds, RDA will request notification if the water system wants the preapplication maintained in an active file for future consideration.
- If RDA is able to approve the project on the basis of the preapplication submitted, the borrower will receive a Letter of Conditions listing the terms of the loan, the amount of the loan, amount of any grant funds, and other requirements the borrower will have to meet.
- Once the borrower agrees to the Letter of Conditions, RDA will obligate the money for the project. The borrower will generally have 180 days to meet the conditions including preparation of all the legal work, obtaining easements, completing the final engineering design, and approval of plans and specification by the appropriate state regulatory agency.
- A conference between the borrower and RDA will be held at which time the requirements for processing the full loan application will be discussed. At the application conference, the borrower will receive all of the documents needed to complete the full application.
- When all of the documents are completed and reviewed, the borrower will be notified of a loan closing date and given the clearances necessary for bidding construction.
- For preapplication materials and information, contact USDA Rural Development's Washington Office listed in Appendix A.

Borrower obligations

In addition to making loan payments on time, some of the borrower's other responsibilities may include:

- having the bookkeeping and accounting system approved by RDA;
- having the annual budget approved before the start of each fiscal year;
- maintaining all financial records for three years;
- submitting quarterly management reports; and
- having an outside, independent audit of the books each year if more than \$25,000 was borrowed.

There are additional requirements, such as complying with all applicable federal regulations, i.e., civil rights, equal opportunity, and environmental laws. These will be explained to the borrower in the Letter of Conditions.

RDA EMERGENCY GRANTS & GUARANTEED LOANS

The purpose of *Emergency Assistance Grants* is to provide financial assistance to the residents of rural areas who have experienced a *significant decline* in either the *quantity or the quality* of their existing water supply. A “significant decline in quantity” means the present source of water or the water delivery system can no longer supply the needs of the residents. A significant decline is caused by an emergency like a drought, earthquake, flood, or chemical spill. A “significant decline in quality” of water occurs when the present system can no longer meet Safe Drinking Water Act water quality requirements as the result of an emergency like those previously stated.

RDA may make grants of up to \$500,000 to alleviate a significant decline in the quantity/quality of the water supply for rural residents that has occurred within two years prior to making the application. RDA will also grant up to \$75,000 for repairs, partial replacement, or significant maintenance on an established system to correct an acute shortage or significant decline in the quantity/quality of the water supply. For grants to repair, replace or maintain established systems, the situation does not need to have occurred within the last two years.

Eligible Applicants

- RDA’s Emergency Grants are funded by two different federal laws. *Section 306A* (the Disaster Assistance Act of 1989) provides funds for facilities in towns or cities with less than 15,000 people according to the most recent census. *Section 306 B* (the Food, Agriculture, Conservation, and Trade Act of 1990) provides grant funds for facilities in cities or towns with less than 5,000 residents.
- Any public body such as a county, city, incorporated town or village, district, authority, or other subdivision of the state; private non-profit corporations, and Indian tribes may apply for Emergency Assistance Grants.
- The median household income of the customers of the system applying for Emergency Assistance Grants must not be over 100% of the statewide non-metropolitan median household income.
- In order to be eligible for an Emergency Assistance Grant, the system has to be able to document that the decline in the quantity or quality of the water supply occurred within the last two years prior to making application with the exception of those making application for grants for repairs, partial replacement, or significant maintenance on established systems.

Eligible Projects

Grant funds can be used for the following purposes:

- Waterline extensions from existing systems;
- Construction of new waterlines;
- Repairs to an existing system;
- Significant maintenance to an existing system;
- Construction of new wells, reservoirs, transmission lines, treatment plants, and other sources of water;
- Equipment replacement;
- Connection and/or tap fees;
- Pay costs that were incurred within six months of the date on which the application was filed with RDA to correct an emergency situation that would have been eligible for an Emergency Assistance Grant;
- Pay any other appropriate costs like legal fees, engineering fees, environmental impact analysis, and other professional costs;
- Assist rural water systems to comply with the Federal Water Pollution Control Act (FWPCA) and the Safe Drinking Water Act (SDWA) when failure to comply is directly related to a recent decline in the quality of the water.

Application Process

- The preapplication process is eliminated in processing an Emergency Assistance Grant.
- All funding requests will be reviewed by the national office starting November 1 and will continue as long as funds are available. Projects must compete on a national basis, and the national office will allocate funds to regions or states on a project-by-project basis.
- Usually a decision will be made within 60 days of the submission of a completed application and all the necessary materials are submitted to RDA.
- The material submitted with the application should include:
 - The Preliminary Engineering Report;
 - Population and median household income of the area to be served;
 - A description of the project; and
 - An explanation of the emergency that caused the problem being addressed by the project.
- A priority rating will be assigned to each application by the state director.
- When the national office has allocated funds to the state for a project, the state will prepare the grant docket which must include an operating budget showing that the applicant can meet all its obligations and provide the intended services.
- If RDA is not going to make an Emergency Assistance Grant, they will notify the applicant in writing, and provide the reasons why the request was turned down. The applicant can request a review of the decision.

- A certification must be obtained from the state water regulatory agency or EPA stating that the proposed improvements will be in compliance with the SDWA requirements.
- Grants are closed and funds are distributed after the applicant has signed the “Association Water System Grant Agreement.”
- Grant recipients must have an annual audit performed and submitted to RDA.

RDA will *guarantee loans* made by eligible lenders to borrowers in rural areas, and in towns of up to 10,000 residents for developing water facilities. RDA can guarantee up to 90% of a loan under extra ordinary circumstances, but usually guarantees up to 80% of the loan made by an eligible lender. The interest rate and terms will be whatever the borrower is able to negotiate with the lender.

Eligible Lenders

Eligible lenders are those lenders who are subject to credit examination by either a state or federal agency. They include:

- A bank or savings and loan;
- A mortgage company that is part of a bank holding company;
- A farm credit bank of the Federal Land Bank Association;
- An insurance company regulated by the National Association of Insurance Commissioners; and
- Others approved by the RDA Administrator.

Eligible Borrowers

- Public bodies, i.e., a municipality, county, district or authority; private non-profit corporations; and Indian tribes.
- Applicants for the loan must be unable to obtain a loan from commercial lenders without a guarantee at reasonable rates and terms.

Eligible Projects

Funds guaranteed under this program can be used to construct, enlarge, or otherwise improve water facilities. This can include costs to acquire interest in land, leases, and rights-of-way necessary to develop the facility. Funds can also be used for necessary equipment for the operation of the facility.

Application Process

Any RDA office can give basic information about the Guaranteed Loan Program. Application should be made, however, at the RDA District Office. District office staff will discuss the services they offer and help the borrower prepare a written application. Appendix A will provides contact information for USDA Rural Development’s

Washington office. That office or the web site listed will be able to provide local Rural Development contact information.

COMMUNITY DEVELOPMENT BLOCK GRANTS

Community Development Block Grant (CDBG) funds are allocated by the Department of Housing and Urban Development (HUD) to each state according to a population/income formula. Large, metropolitan areas are called “entitlement” areas, and automatically receive CDBG funds directly from HUD on a non-competitive basis. Small and rural communities are called “non-entitlement” areas, and are eligible to compete for funds through the Small Cities Program.

The state agencies develop program objectives and criteria, and award funds to qualified applicants, usually on a competitive basis. Although each state’s program has different requirements, there are three national program objectives. Applicants for CDBG funds must meet at least one of these three:

- The project must benefit low and moderate income persons; or
- The project must aid in the prevention or elimination of slums or blight; or
- The project must meet other community development needs of particular urgency, which represent an immediate threat to the health and safety of residents of the community.

CDBG grants can be used for a variety of purposes such as housing, water/wastewater system development and improvement, and other community development projects. Thus, these grants are extremely competitive (there are usually 5-10 times more dollars requested than dollars available). Grants are evaluated by priorities developed by each state. Most states use a point system to rank applications.

The Washington office of HUD (see Appendix A) can provide the local HUD contact information. The local HUD office can provide the name of the agency that administers the HUD Small Cities Program or CDBG program.

Eligible Applicants

Most units of local government (cities, town, counties, or parishes) are eligible to compete for funds. Some larger communities (entitlement areas) are automatically funded by HUD each year, and are not eligible to apply. A unit of local government (a county or parish in most states) can apply for CDBG grants on behalf of a water district or non-profit water association, but the county or parish is legally responsible for all grant funds.

Eligible Projects

CDBG funds for water projects can be used for the following purposes:

- Installation of new lines;
- Replacement of existing lines when necessary;
- Installation of larger capacity lines;
- Installation of fire hydrants;
- Construction of new intake stations;
- Drilling of new wells;
- Plant expansions or modifications due to increase water demand;
- Plant expansions or modifications due to a change in water quality;
- Replacement of major elements of the system like treatment, storage, lines, etc;
- Construction of elevated or ground storage tanks;
- Acquisition or real property, including easements and rights-of –way;
- The cost of installing service lines and payment of connection fees for low and moderate income persons and households; and
- Engineering, legal, and other professional services necessary for completing the proposed project.

Although these activities are eligible for CDBG assistance, the state must be able to document that at least 70% of the CDBG funds will benefit low and moderate income persons. Low and moderate income is based on the state and/or county nonmetropolitan median household income.

Application Process

Most states specify annual application deadlines. A few accept applications any time during the year. It usually takes 2-3 months for a determination. If the application is not funded, an appeal can be made or reapplication can be made again the next year.

Before an application can be submitted for a CDBG grant, certain requirements must be met:

- It will be necessary to conduct public hearings to provide for citizen input. The number of hearings required differs from state to state but usually at least two will be required.
- Door-to-door surveys may have to be done to establish the income level of the service area. U.S. Census figures may not describe the exact area the project will serve. Census figures can be out-of-date. Because of the competitive nature of the grants, current and accurate figures are a plus. Many states provide instructions and forms for conducting door-to-door income surveys.
- Consultants, such as engineers and attorneys, may need to be hired before an application is made. Federal regulations and state CDBG programs require that these professional services be obtained using the procurement process they specify. If specific procedures required to obtain such services are not followed, CDBG funds may not be used to pay for the professional services if the grant is awarded.
- Before submitting an application to the CDBG office, it may have to be submitted to a regional or state clearinghouse for approval. These clearinghouses review

applications to make sure projects do not duplicate other projects and are consistent with the area and state development plans.

Some initial steps to take when deciding to apply for a CDBG grant are:

- Get a copy of the state program regulations.
- Find the names of 2-3 communities of similar size that *were* funded last year for a water project similar to yours.
- Call these communities and ask for copies of their applications—offer to pay for the cost of the copying.
- Study these successful applications before starting to work on the application.
- Find out if the state will hold training workshops on CDBG, and attend them.
- Find out if the local Planning District Commission (in some states it may be called the Council of Governments or Regional Planning Commission) provides assistance to local governments in writing CDBG applications.
- If the water system is a non-profit water association, talk to the local county (or parish) government and ask if they will apply for funds on the behalf of the water system.

Grantee Obligations

If a CDBG grant is awarded,

- The recipient is legally responsible for the financial management of the grant funds and complying with CDBG administrative procedures.
- There are numerous federal and state laws and regulations to which the grant recipient must comply, i.e., the Civil Rights Act, the Fair Housing Act, labor laws, land acquisition regulations, procurement of services, construction contract regulations, and environmental laws. Compliance must be carefully documented. Most states provide forms to document compliance.
- Because of the complexity of administering a CDBG grant, communities often hire someone to perform this function. However, the applicant is still legally responsible for the correct administration of the grant.

RURAL COMMUNITY ASSISTANCE PROGRAM LOAN FUNDS

The Rural Community Assistance Program is comprised of seven regional agencies that provide on-site technical assistance to address rural drinking water supply needs. Three of these regional agencies, Community Resource Group (CRG), the Southeast Rural Community Assistance Project, Inc. (SE/RCAP), and Rural Community Assistance Corporation (RCAC), have loan programs that provide loan funds for rural water systems in their respective regions.

CRG's Community Loan Fund

CRG's Community Loan Fund (CLF) is financially supported by The Ford Foundation and the Rural Development Administration. It was established specifically to finance small system water projects where a small dollar amount loan is appropriate.

Eligible Applicants

Water systems eligible to apply for a loan from the CLF are units of local government or non-profit corporations that:

- Serve low or moderate income customers, or are located in low or moderate income areas;
- Are located in rural areas or communities of less than 25,000 population;
- Can repay the loan from system revenues;
- Do not have the cash resource to pay for the project; and
- Cannot obtain financing from other sources at a reasonable cost.

Eligible Projects

- Repair, replace, or upgrade existing facilities
- Extend lines to serve additional customers
- Construct service lines for low-income customers in the existing service area;
- Purchase equipment that will improve system operating effectiveness or reduce the cost of operation; and
- Convert privately owned systems to public or community ownership

Terms and Conditions

1. Loans range from \$2,000 to \$75,000
2. Loans are usually for a maximum of 75% of the project cost. Systems serving low-income communities or projects that directly benefit low-income families may qualify for a loan up to 100% of the project cost.
3. Loan terms range from 2 to 7 years. The amount of the loan and the financial capacity of the system are major factors in establishing the loan term.
4. Interest rates range between 5% and 9%. The interest rate depends on the income level of the community and the purpose of the project financed.
5. All loans from the CLF require security.
6. Borrower's costs, which can be included in the amount of the loan, are:
 - a. Origination fee. Currently, this fee is 2% of the amount borrowed (\$100 minimum).
 - b. Recording and filing fees, attorney fees, and bond counsel fees.

Application Process

The CLF uses a two- step application process.

1. Submit a Preliminary Application. The Preliminary Application tells about the project, project costs, benefits from the project, and basic information about the water system.
2. Submit an Application Package. After the CLF evaluates the Preliminary Application, the applicant will be provided with the application information forms.

The CLF processes all loans as quickly as possible. However, some applications require more time than others, so it's difficult to state a specific length of time it will take to get a loan.

For more information contact: Community Resource Group,
2423 East Robinson Avenue
Springdale, AR 72764.
Phone: (501) 756-5583
FAX: (501) 756-1905

SE/RCAP Loan Fund

The SE/RCAP Loan Fund is committed to providing access to safe drinking water facilities for low-income, rural communities at an affordable cost. The Loan Fund provides short- and long-term financing for rural communities in the Southeastern United State. The Loan Fund is a \$2.5 million Program Related Investment of the Ford Foundation and USDA Rural Development.

Eligible Applicants

Local governments, non-profits, public service authorities, and user associations located in Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida are eligible to apply.

Eligible Projects

- Predevelopment: engineering/architecture studies, technical/marketing studies, soil and water tests;
- Upgrades and Rehabilitations: water line extensions, system repairs and improvements, storage tank restorations, infrastructure development, building acquisitions, meter replacements, land purchases; and
- New/Comprehensive Development: new well, local matching funds, economic development, intermediary or gap funds, and contingency/cost overruns.

Term and Conditions

- Amounts: \$1,000 to \$250,000
- Length: 1-10 years

- Interest Rates: 4% to 7%
- Security: flexible, tailored to project situation
- Prepayment: no penalties or fees for pre-paying loan before maturity date
- Fees: 1% loan origination/application fee plus legal fees and filing costs
- Population Determinants: projects must serve populations of 10,000 or less
- Project Area: must be rural in character
- Income Determinants: project must serve a minimum of 30% low-income (at or below 80% of the area's median income)

Application Process

1. Write or call for an application. If there are questions about eligibility requirements, the applicant can call or submit a two-page pre-application for review.
2. Complete application and submit. The staff will review the application and work with the applicant to resolve any deficiencies.
3. The Loan Fund staff will travel to the project area to perform a site visit.
4. The Loan Fund Manager makes basic recommendations concerning the application such as structure of payments, interest rate, etc.
5. A Staff Review Team and Loan Review Committee review the loan application and make recommendations to the agency's Board of Directors.
6. After approval, a commitment letter is issued to the borrower. A commitment letter indicates any conditions that must be met before loan documents are prepared for closing and what conditions can be met in escrow. Borrowers have 30 days to execute and return the commitment letter. Loan commitments remain effective for a maximum period of 60 days unless a specific time period is authorized by the SE/RCAP Board of Directors.
7. If an applicant requests a loan for \$100,000 or more, then a review by the applicant's state clearinghouse must be performed and an environmental assessment must be completed by the applicant.

For more information contact:

Loan Fund Manager
 Southeast Rural Community Assistance Project, Inc
 145 W. Campbell Avenue, SW
 Roanoke, VA 24001-2868
 Phone: (540) 345-1184
 FAX: (540) 342-2932

RCAC's Financial Services

RCAC's loan fund receives support from the California Endowment, the Ford Foundation, the USDA Rural Development, Bank of American, and many other agencies. The primary goal of Financial Services is to serve low- and very low income rural residents. This program includes community facilities lending as well as lending for water improvements.

Eligible Applicants

The primary borrowers from Financial Services are non-profit organizations and municipalities engaged in the development or improvement of small drinking water systems. RCAC provide loans for projects in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah and Washington.

Eligible Projects

Short-term financing (up to 3 years) available for:

- Purchase of unimproved land
- Predevelopment expenses
- System improvement costs

Terms and Conditions

- Generally, a project must be in an area with a population of 50,000 or less.
- Loan terms range from 3-25 years depending on the project type
- Interest rates are typically below current market and adjust according to RCAC's prevailing cost of funds and economic environment.
- Loan amounts range between \$5000 to \$5 million, depending on the type and purpose of the loan. Generally, short-term loans are limited to \$750,000 per project.

Application Process

An application can be submitted at any time for review by the loan committee. RCAC Loan Committee meetings are held on the second and fourth Wednesdays of each month.

For more information contact:

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Sacramento, CA 95818
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GENERAL OBLIGATION AND REVENUE BONDS

Bonds are documents that represent part of the total amount of money an issuer needs. They are sold to private investors and repaid by the issuer with interest over a period of time. The “issuer” is the entity that needs the money. Instead of borrowing one large sum from a bank, the bond issuer “borrows” smaller amounts from several investors.

Bonds can be sold to individual investors or to “institutional” investors, like banks. The benefit to the issuer is a favorable interest rate on the money, and the benefit to the investors is that the interest they receive is exempt from federal income tax, and, in most states, from state income tax. Because bonds are tax-exempt, investors are willing to accept a lower interest rate.

General Obligation Bonds

“General obligation” bonds can be issued by public bodies, such as counties (parishes), cities, and special districts. Public bodies have the authority to levy taxes to pay off bond issues. The bonds are secured by the “full faith and credit” of the issuing government.

The major advantage of general obligation bonds is that they are backed or secured by the taxing ability of the government that issues them. Because this makes them less of a credit risk, the interest rate on the bonds is usually lower.

General obligation bonds do have disadvantages. They require legislative and/or voter approval. This can take time, which delays the project, and there is no assurance that the bond issue will be approved. Also, local governments usually have debt limits set by state law. Financing large capital costs for system improvements can greatly reduce the government’s ability to issue future bonds for other purposes.

Revenue Bonds

Revenue bonds can be issued by most units of government, special districts, and in many states, by non-profit water associations through public facilities boards. With revenue bonds, the interest and principal are paid by the revenue generated by the project or utility. In the case of a water system, this would be the user fees.

Interest rates tend to be higher on revenue bonds because they do not carry the security of a general obligation pledge, and the credit risk is greater.

Revenue bonds usually require the issuer to set up specific reserve funds that provide additional security to the investors. Reserve funds to guarantee adequate money for operation, ongoing capital requirements, and debt service are usually part of the revenue bond “indenture.”

The indenture is the legal document that authorizes the bond issuance and defines the investors' security. It also defines the issuer's responsibilities and what investors can do if the issuer does not comply with those responsibilities.

A trustee, usually a bank, monitors the indenture to ensure that the issuer lives up to the agreement.

The Bond Process

Contact must be made with two or three "investment banking" firms to ask about their experience in bond issuance for similar projects and communities. Investment banking companies have financial advisors who will discuss the advantages and disadvantages of issuing bonds, help determine the financial feasibility of financing the proposed project with a bond issue, and make sure the issuer has the legal authority to issue bonds.

After an engineer has determined the cost of the project, there are a number of steps in issuing bonds. Each step requires the work of professionals. These professionals are paid a fee to prepare the legal opinions, the legal documents, and to sell the bonds. This is necessary regardless of the amount of money needed. For this reason, bond issues for less than \$1 million usually are not a cost-effective way of financing. What would be gained from lower interest rates would be lost paying professional service fees.

RDA requires communities with bond issuance authority to do so, and then RDA buys the entire issue. Because it requires less paperwork and sales work, a bond issue that can be placed with a single local bank or with RDA will usually cost less in professional fees than multiple sales.

The bond underwriter who is part of the investment banking firm chosen is responsible for coordinating all the different aspects of the transaction once the decision to issue bonds is made. The issuer or the bond underwriter will obtain the advice of a "bond counsel", the attorney who prepares the bond indenture and makes sure the transaction complies with state and federal laws.

Next, a "bond broker" sells the bonds. Bonds might be purchased by individual investors, banks, insurance companies, etc. Once the bonds have been sold, the underwriter deposits the money from the sale with a "trustee". The trustee is generally a bank that pays out the money to the issuer so the project can proceed. In turn, the issuer deposits money with the trustee to cover the cost of repaying the principal and interest to the investors.

Rates and Terms

Bond issues generally range from 15 to 25 years, although they can be for shorter and longer periods. The interest rate paid on the bonds will depend on the credit rating, security, and the current market rate.

If the issuer has issued less than \$10 million in bonds in the present calendar year, the bond issue is called “bank qualified”. If more than that has been issued, the bonds have to be “rated”. The better a bond is rated, the safer the investment is considered to be. There are three organizations that rate bonds. The bond rating criteria used by these organizations are a good guideline to follow before making the decision to go into debt for large amounts of money to accomplish capital improvements. Below are some of the questions and criteria lenders and investors will consider when deciding how safe a credit risk and issuer are:

- **Legal Provisions:** System revenues must be sufficient to cover both the debt service of the bonds and operating and maintenance expenses. Rates should generate an additional 25% of the annual debt service as a reserve so that bondholders are protected in case there is an unforeseeable decline in system revenue. How much other debt does the issuer have and what position will a new creditor have for being repaid? The lien position defines the payment priorities of the debt service in relation to other loans or bond issues. Prior lien means debt service is paid before subordinate liens.
- **Economic Factors:** What is the economic stability of the area? Is it a mix of residential and industrial? What are the trends in the population, employment, and income level? If an industry is a major rate payer, is that industry committed to the community and financially stable?
- **Operating Factors:** How stable is the governing body and operating staff? Is the system well run? Are the existing facilities in good shape? How good is the compliance record of the system? How well will the system be able to meet future demand? What is the current rate structure? Can rates be raised quickly and effectively to meet unforeseen financial shortfalls?
- **Financial Factors:** How well has the system performed financially in the past? Are reserve funds adequate? Does a capital improvement plan exist and how much is going to have to be spent in the future for expansion and improvements to meet regulations? Are accounts up-to-date?

These are a few of the questions lenders/investors will want to know about the system’s overall ability to repay any debt. If most of the questions cannot be answered favorably, the issuer will have a good idea what areas to improve. There is not much that can be done about the economic environment of the community, but the issuer can enhance management, operational, and financial performance.

APPENDIX C

INTEREST FACTOR TABLES

Debt Service Factor Table

Inflation Rate	Term (in Years)					
	5	10	15	20	25	30
0%	0.000	0.000	0.000	0.000	0.000	0.000
2%	0.212	0.111	0.078	0.061	0.051	0.045
4%	0.225	0.123	0.090	0.074	0.064	0.058
5%	0.231	0.130	0.096	0.080	0.071	0.065
6%	0.237	0.136	0.103	0.087	0.078	0.073
7%	0.244	0.142	0.110	0.094	0.086	0.081
8%	0.250	0.149	0.117	0.102	0.094	0.089
9%	0.257	0.156	0.124	0.110	0.102	0.097
10%	0.264	0.163	0.131	0.117	0.110	0.103
11%	0.271	0.170	0.139	0.126	0.119	0.115
12%	0.277	0.177	0.147	0.134	0.127	0.124

Sinking Fund Factor Table

Assumed Interest Earnings Rate	Inflation Rate				
	Year 1	Year 2	Year 3	Year 4	Year 5
4%	1.000	0.462	0.308	0.231	0.185
6%	1.000	0.445	0.297	0.222	0.178
8%	1.000	0.429	0.286	0.214	0.171
10%	1.000	0.413	0.275	0.207	0.165
12%	1.000	0.399	0.266	0.199	0.159

APPENDIX D

EXAMPLE SYSTEM

In order to demonstrate the use of the spreadsheets, a generic small water system was developed and real data from two separate water systems was combined and used.

Background Information

The sample system used in this example System has 124 total connections, 68 residential and 56 commercial. The system sells approximately 20 million gallons of water per year. The water system is owned and operated by a small town with a population of 250. The water system began violating the Lead and Copper rule in 1997 and was ordered by the Virginia Department of Health to install a corrosion control treatment system. The water system currently has outstanding debt in the amount of \$75,000. Reserve accounts have been established. The median household income for this community is \$26,086.

Estimating Capital Need

From a Preliminary Engineering Report (PER) for the water system, it was determined that in addition to the corrosion control treatment system, the water system would also need 1300 linear feet of 2-inch waterline, and repairs made to the 6,000 gallon storage tank. Bids were solicited and the low bid price for these items were:

Corrosion Control	\$10,162
1300' of 2" waterline	\$ 8,500
storage tank repair	<u>\$ 6,100</u>
Total	\$24,762

Construction would begin upon the health department's approval of the plans and specifications submitted. Completion was estimated to be approximately 60 days from the start. Spreadsheets 1A and 1B were completed using the above information. Spreadsheet 1C was then used to evaluate revolving loans at 3% interest for 10 years, 5% interest for 10 years, 7% interest for 10 and 20 years with the following in mind:

- ◆ This community was likely to be eligible for a loan from the SE/RCAP loan fund (loan amounts range from \$1,000 to \$250,000 and interest ranges from 4%-7%)
- ◆ This community may be eligible for a bank loan or an RDA loan
- ◆ This community may qualify as a disadvantaged waterworks and be eligible for a forgivable loan (grant) from the Drinking Water State Revolving Fund Program (SRF)

In Spreadsheet 1C, all projects were grouped as one project and the amount of \$35,000 was evaluated which would include funds for contingency as well as the \$500 first year additional operation, maintenance, and repair expense (see Spreadsheet 1B). Thus there was no need to enter this \$500 in Line 1 of Spreadsheet 1C. From the results, the system can attempt to negotiate the loan terms that impact households the least.

Budgeting

Spreadsheet 2A used the current rate structure and the projected annual water sales to determine the revenue generated by the current rate structure. Spreadsheet 2B presents the budget for the system. Capital Improvements were assumed to have been funded using \$35,000 in loans. This amount was added to the already outstanding amount of \$75,000, thus creating a total outstanding debt of \$110,000. Annual debt payments on all loans total \$5,000. The \$35,000 loan provided a surplus of funds in year one in the amount of \$10, 238. Should these funds not be used for contingencies, they could be used to make additional deposits into the reserve accounts.

Spreadsheets 2B and 2C show that in this case, current revenue is sufficient to meet expenditures in year one (because of the surplus loan funds) but not in subsequent years. From customer usage information, Spreadsheet 3A and 3A(2) shows the general customer usage profile for residential and commercial users, respectively. Spreadsheets 3B and 3B(2) present the fairness of the current rate structure for both residential and commercial users, respectively. The current rate structure spreads the cost of providing water equitably since the number in each line of column H (Revenue % Difference) falls within the +2 to -2 range.

Spreadsheets 3C and 3C(2) present equitable rate structures for residential and commercial customers, respectively that will meet Year 2 expenditures. The structure is as follows:

Residential:

\$13.00 base charge with 1500 gallons included and \$2.00 per thousand gallons over 1500 gallons.

Commercial:

\$25.00 base charge with 1500 gallons included and \$1.10 per thousand gallons over 1500 gallons.

APPENDIX E

BLANK SPREADSHEETS