PENNSYLVANIA WATER SYSTEM SELF-ASSESSMENT GUIDE

AND

BUDGETING WORKSHEETS

FOR

MOBILE HOME PARK-OWNED SYSTEMS

Pennsylvania Department of Environmental Protection
Bureau of Water Supply Management
September 1998

TABLE OF CONTENTS

Page

I. INTRODUCTION

A. The Need to "Operate Like A Business"

A water system should be "operated like a business." This phrase is used often. But, what does it mean? Here's one useful way to think about what it means to operate like a business:

> *A successful business manager must always be aware of changes taking place in the environment in which the business operates. It is necessary to constantly look to the future in order to be prepared:*
>
> *1) To cope with any **threats** to the survival of the business; and*
>
> *2) To take advantage of **opportunities** to improve the performance of the business.*

When an investor purchases a share of stock in a business, the value of the investment is based entirely on the future prospects of the business -- the future is everything in the business world.

The future value of a water system to a community should be regarded in the same manner. Owners and customers of water systems may face the prospect of making substantial investments in the foreseeable future and should seek to assure themselves that the plan for operating this business is the best that it can be.

Many water systems were formed at a time when the costs of providing water service were low and sources of change were few. Without significant costs or other pressures, there was little incentive to focus on the business aspects of the operation. However, the future now holds the prospect of significant changes that have prompted the development of this guide.

B. Business Planning: Getting to Your "Bottom Line"

In a changing world, the only means of demonstrating that a business will be capable of surviving in the future is through a forward-looking "business plan."

> *A business plan presents a two-sided analysis. It consists of a plan for spending money to produce a product or service; and a plan for recovering sufficient revenues from sales to pay for periodic capital investments and routine operating expenditures. The "bottom line" question is a fundamental budget question -- whether the "inflows" can be assured to match the "outgoes," given the challenges of the future.*

A business may not be capable of surviving when there is no plan to put forward that allows the business to meet the revenue and capital requirements it faces in the future. In such circumstances, businesses are often "restructured" in some manner to change their costs or their access to capital, resulting in a more sound business plan.

Alternatively, businesses which are not capable of making a profit while complying with all applicable laws and regulations simply go out of business. This is a frequent occurrence in our dynamic economic system. However, it is not so simple when the business involves provision of public water supply that is vital to a community.

As a result of the changing business environment, there is a large "gray area" occupied by water systems that may or may not be capable of meeting the Safe Drinking Water Act (SDWA) requirements in the future. A business plan is a best management practice that can benefit all water systems. This self-assessment guide is intended to help water systems get started in the process of finding their way out of the "gray area."

C. Self-Assessment: How To Use This Book

Assessing Capital and Operating Costs

This self-assessment guide presents a structured series of yes/no questions which follow the major elements of a complete business plan: a facilities plan (Section II), a management plan (Section III), and a financial plan (Section IV). The questions are intended to help you identify major capital and operating costs that could arise in the future operation of your system -- things that will impact your "bottom line."

> *Within each section of the guide, the questions are grouped according to overall topic areas. Each topic represents an important area where there may be hidden costs in your future. The individual yes/no questions under each topic are intended to stimulate your thinking about the topic in general. In going through them you should keep the general topic in mind and ask yourself: "Is there anything to worry about here?" "Is there anything that could surprise us and cost a lot of money?"*

The questions are all structured such that a "yes" answer means that cost surprises are unlikely and a "no" answer means some potential for cost surprises exists. There are questions covering every major category of capital and operating costs. So when you get to the end of the guide, you will have thought about all the major areas where there could be threats to your water system.

When answering the yes/no questions, be honest with yourself. If you don't know the answer, take the time to do the research. In order to answer some of the questions, you may need to look at some records or find someone to help you understand the topic a little better. When you come upon such questions, leave them blank and get what you need to complete them later. Let the blank spaces serve as your reminder.

Some questions may not apply to your circumstances. For example, surface water questions do not apply to groundwater systems. When you encounter such questions, simply cross them out and mark "NA" in the margin next to them, so you will remember to ignore those sections.

> *How do you use the results of this self-assessment to tell if your water system is going to be a business capable of meeting all SDWA requirements in the future?*

There is no standard scoring system that can be used to interpret your answers to the yes/no questions. If you have relatively few "no" answers, the potential for cost surprises in your future is probably less than if you have several "no" answers. However, it is important for you to think carefully about each "no". Consider what can be done to reduce your liability in each instance and make an estimate about what each "no" might cost you. The "bottom line" is -- "What do all the "no" answers add up to?" Is it a cost you can afford?

Assessing Revenue Requirements and Revenue Sources

Once you have completed the self-assessment of potential cost concerns, the next step in business planning is to examine the other side of the ledger to see what your potential cost scenarios mean in terms of revenue requirements and customer rates. Budgeting worksheets that can assist in using your estimates of future costs to develop an assessment of projected revenue requirements and customer rates, are included as an appendix to this document. The Pennsylvania Department of Environmental Protection (DEP) has self-assessment guides with budgeting worksheets for mobile home park-owned systems; authority-owned and municipality-owned systems (using utility-basis accounting); homeowner association-owned and municipality-owned systems (using cash-basis accounting); and, investor owned systems.

The worksheets are designed as a "what-if" budgeting exercise. They will give a glimpse of the future. Once you have begun to examine your future in this explicit "business-like" manner, your journey out of the "gray zone" will be fully launched and the key factors involved in operating your system as a business should become very plain.

II. ASSESSING YOUR FACILITIES

A. Supply Sources and Facilities

Availability and Adequacy of Supply Sources

For many water systems, obtaining sufficient quantity of water supply on a reliable basis is a challenge. In some systems, it is the paramount concern. By contrast, other systems have been pumping from the same well for many years with never a hint of problems. Even if the quantity of water available has never been a problem, it is worthwhile to "consider the source" in looking to the future. The more frequently you answer "yes" to the following questions, indicates degree to which you have considered the major factors that are important in assessing future source availability. For questions where your answer is "no," it should be relatively clear from the context and the statement of the question what steps you might take to obtain a better assessment of the issue involved.

Can existing sources of supply meet existing demands?

√YES ☐ NO ☐ Do you know how much water you pump on an average day?
If yes, how many gallons? _____ gallons

√YES ☐ NO ☐ Do you know how much water you pump on a peak day?
If yes, how many gallons? _____ gallons

√YES ☐ NO ☐ Do you know your source capacity in gallons per day (gpd)?
If yes, how many gpd? _____ gpd

√YES ☐ NO ☐ Is your source capacity higher than your peak day demand by an appropriate margin?

√YES ☐ NO ☐ Can you meet peak demand without pumping at peak capacity for extended periods?

√YES ☐ NO ☐ Have you been able to provide adequate volumes of water during recent droughts?

√YES ☐ NO ☐ Do you have an Emergency Response Plan that will allow you to meet system demand during a drought or shortage, such as the loss of the largest unit?

Do you know how your demand is changing?

√YES ☐ NO ☐0 Do you know whether your system demand will be growing, declining or remaining stable over the next 10 years?

√YES ☐ NO ☐ If you have large commercial, industrial, or irrigation users, do you know their long-term plans and understand their needs?

If you purchase water, do you fully understand the purchasing arrangement?

√YES ☐ NO ☐ If you purchase water from another system or a wholesaler, do you know their long-term plans?

√YES ☐ NO ☐ Do you have a contract to purchase water?

√YES ☐ NO ☐ Do you know the terms affecting your supply during drought conditions?

Are you aware of competing uses of water that may impact availability?

√YES ☐ NO ☐ Are you knowledgeable about other demands being placed on the same water source that you are using?

√YES ☐ NO ☐ Do you know who the other users are and do you understand their future plans?

√YES ☐ NO ☐ Do you fully understand your legal rights to the water?

Is your current source the best choice for the long-term?

√YES ☐ NO ☐ Are alternative water sources possibly available to you?

√YES ☐ NO ☐ Are you knowledgeable of the characteristics and costs of using alternative sources?

Vulnerability of Supply Sources to Contamination

It is better to protect water supply sources from being contaminated in the first place, than it is to try to clean them up afterwards with expensive treatment technologies. The first step towards effective pollution prevention is knowledge. Water suppliers need to become informed about the potential sources of contamination that exist within the areas that may influence their source waters. Armed with such knowledge, you can assess whether your source water is vulnerable to contamination which may result in additional treatment expenditures.

Do you know where your water comes from?

√YES ☐ NO ☐ Can you draw on a map the boundaries of the land area from which your source waters emanate?

√YES ☐ NO ☐ Do you know the boundaries of your watershed or the "zone of contribution" of your well?

√YES ☐ NO ☐ Do you know the depth of your well?

√YES ☐ NO ☐ Do you know the geological name of the aquifer system from which your water is drawn?

What potential sources of contamination exist in your watershed area or "zone of contribution?"

√YES ☐ NO ☐ Is your watershed area or "zone of contribution" free from discharges from either human wastewater treatment facilities or agricultural feedlot waste treatment facilities?

√YES ☐ NO ☐ Is your watershed area or "zone of contribution" free from any facilities engaged in the production, storage or handling of agricultural chemicals such as manufacturing plants, warehouses or farm supply stores?

√YES ☐ NO ☐ Is your watershed area or "zone of contribution" free from any golf courses, corporate or institutional campuses or intensively landscaped residential developments?

√YES ☐ NO ☐ Is your watershed area or "zone of contribution" free from any industrial or commercial establishments engaged in significant uses of organic (e.g. solvents) and inorganic (mining, metallurgy, chemical production, etc.) chemicals as part of production processes?

√YES ☐ NO ☐ Do you know what crops are grown within your watershed area or zone of contribution?

√YES ☐ NO ☐ Do you know what agricultural chemicals are in most prevalent use for these crops?

√YES ☐ NO ☐ Do you know what the seasonal patterns of agricultural chemical application are for these crops?

√YES ☐ NO ☐ Have you asked the county agricultural extension agent about cultivating practices in your area?

B. Treatment

Treatment: Microbiological Contamination

Protecting water supplies from microbiological contamination is a critical utility function. This requires vigilant efforts in source protection, treatment, storage and distribution. The key is "the multiple barriers approach." In its most elaborate form, this consists of first protecting supplies from coming into contact with sources of contamination, and then providing several levels of monitoring and treatment, as well as back-up treatment, to assure inactivation of disease-causing micro-organisms. New regulations forthcoming under the SDWA will increase the treatment requirements for protection from microbial contamination in both surface waters and groundwaters.

Your treatment may have to change even if you have never had problems with microbiological contamination. Considerations are different for surface water than for groundwater. There are also new considerations for maintaining treated water quality in the distribution system. "No" answers to the following questions may imply the potential for increased treatment costs.

Surface Water Systems and Systems Using Groundwater Under the Influence of Surface Water

Is your filtration plant in good condition?

√YES ☐ NO ☐ Is your filter plant well maintained, free from spalding concrete and peeling paint?

√YES ☐ NO ☐ Are repair parts available?

√YES ☐ NO ☐ Do you have redundancy for all units that have an effect on health?

√YES ☐ NO ☐ Can your plant achieve a filtered water turbidity of 0.1 NTU 95 percent of the time?

√YES ☐ NO ☐ Do you have the capability to add coagulant before the filter?

√YES ☐ NO ☐ Can your plant meet the current "CT" requirements with a comfortable margin? "CT" refers to the product of residual disinfectant concentration (C) measured in mg/L in a representative sample of water prior to the first customer, and disinfectant contact time (T).

√YES ☐ NO ☐ Has DEP performed a "sanitary survey" or "performance evaluation" of your plant recently with satisfactory results?

Groundwater Systems

Are you sure it's groundwater?

√YES ☐ NO ☐ Based on Surface Water Identification Protocol (SWIP) testing, are you sure your water supply is really "groundwater" and not groundwater under the direct influence of surface water?

√YES ☐ NO ☐ Is your well more than 100 feet deep?

√YES ☐ NO ☐ Is your well located outside the zone of influence of nearby streams or rivers?

√YES ☐ NO ☐ Is your water free from variations in turbidity and temperature in the period after storm events?

Is well construction and protection adequate to maintain current source water quality?

√YES ☐ NO ☐ Was your well site approved by DEP?

√YES ☐ NO ☐ Was your well constructed under a permit issued by DEP, or does the construction conform to current standards for siting and constructing a well?

√YES ☐ NO ☐ Is your well shaft encased and is the casing intact?

√YES ☐ NO ☐ Is your wellhead capped with a pitless adapter that is in good enough shape to prevent contamination from surface water?

√YES ☐ NO ☐ Has DEP performed a "sanitary survey" of your system recently with satisfactory results?

Is your current groundwater disinfection practice providing adequate treatment?

√YES ☐ NO ☐ Do you regularly inspect and maintain your chlorine dosing equipment?

√YES ☐ NO ☐ Do you have back-up equipment?

√YES ☐ NO ☐ Do you have adequate contact time following disinfection and before the first user in the distribution system?

√YES ☐ NO ☐ Can you detect a chlorine residual at taps throughout the distribution system?

Distribution Systems

Are you free from the risk of having hidden problems arise during distribution?

√YES ☐ NO ☐ Have you ever encountered compliance problems with the Coliform Standard?

√YES ☐ NO ☐ Do you receive no more than a typical level of complaints regarding the taste and odor of chlorine?

√YES ☐ NO ☐ Future requirements may place an upper limit on chlorine concentrations in finished water of 4.0 mg/L. Are your residuals comfortably below this level?

√YES ☐ NO ☐ Can you maintain adequate pressure in the distribution system under all conditions of flow?

Treatment: Disinfection By-Products

The public health benefits of chemical disinfection are beyond question. However, there have recently been questions raised about the potential long-term health effects of various chemical by-products formed by popular disinfectants such as chlorine. As a result, new SDWA regulations will cause small water systems to begin controlling for by-products of disinfection such as "trihalomethanes" in the early part of the next century.

Are you likely to have to change treatment to control for disinfection by-products?

√YES ☐ NO ☐ Are your trihalomethane levels comfortably below 80 µg/L when averaged over the annual cycle?

√YES ☐ NO ☐ If you treat surface water, are you already practicing or could you adopt "enhanced coagulation" in your current plant?

√YES ☐ NO ☐ If you treat surface water, could you still meet current CT requirements if disinfection were not allowed before sedimentation?

Treatment: Corrosion Control

One source of lead and copper contamination in tap water is the corrosion of pipe materials and plumbing fixtures. The allowable concentrations of these metals are governed by "The Lead and Copper Rule." There is going to be a continuing need for careful fine-tuning and adjustment of corrosion control treatment, consisting of pH and alkalinity adjustment and/or addition of chemical additives that act as corrosion inhibitors. While this does not require great capital expenditures, it requires operator diligence and entails chemical costs.

Are you likely to have to change treatment to control for corrosion by-products?

√YES ☐ NO ☐ Have your first draw monitoring results been comfortably below 15 µg/L for lead and 1.3 mg/L for copper?

√YES ☐ NO ☐ Does your treated water have a pH greater than 8 and an alkalinity greater than 50 mg/L?

Treatment: Radionuclides

Naturally occurring radiologic materials are present in ground and surface waters as a result of gradual weathering of geologic materials. SDWA regulations governing contamination with radionuclides are still being actively debated and it may be a while before they are finally settled. However, it may be worthwhile to assess the potential susceptibility of your water source to this type of contamination in order to get an advance notice of possible compliance liabilities.

Radon gas is present in groundwaters throughout the United States. It is not present in surface waters because they are naturally aerated. When radon gas is vented to the atmosphere, it quickly becomes indistinguishable from background radiation and no longer poses a health threat because the levels are so low, relative to the background. The pattern of occurrence in groundwaters is sporadic. There can be wide variability in the levels detected between directly adjacent wells and within the same well under different pumping and drawdown conditions. Therefore, the only means of knowing for certain is to monitor your well supply.

Are you likely to have to change treatment to control for Radon?

√YES ☐ NO ☐ Have you monitored for radon in your well?

√YES ☐ NO ☐ Do you know if your levels are in the high (> 1000 pCi/L), medium (300 to 1000 pCi/L), or low (< 300 pCi/L) range?

If there is no radon detected in your well, it is likely you have no compliance liability here. If there is substantially more than 1000 pCi/L of radon in your well, aeration or other treatment may lie in your future. If there is radon present at levels below 1000 pCi/L, the need for treatment will remain unknown for several years until standards are set.

Are you likely to have to change treatment to control for Radium?

√YES ☐ NO ☐ Are levels of radium (226 and 228 combined) in your water comfortably below 5 pCi/L?

√YES ☐ NO ☐ Are levels of Gross Alpha (including radium 226, excluding radon and uranium) comfortably below 15 pCi/L?

If you are above these levels, you will be required to lower the level to below the Maximum Contamination Level (MCL). One of the options may be to install treatment equipment to remove radium. Treatment consists of lime softening, ion exchange and reverse osmosis.

Treatment: Inorganic Contaminants

Arsenic has very active and complex chemistry. As a result, it exists in a variety of chemical forms and is widely distributed in the environment at trace levels. It is associated with a variety of health effects. Treatment choices include coagulation/filtration, lime softening and ion exchange.

Are you likely to have to change treatment to control for Arsenic?

√YES ☐ NO ☐ Are your levels of arsenic comfortably below 0.05 mg/L? If not, you may have to treat for arsenic.

Nitrate is naturally occurring, but elevated levels of nitrate are a problem in agricultural areas. The health issues associated with nitrate involve acute effects on children, causing it to warrant serious attention.

Are you likely to have to change treatment to control for Nitrate?

√YES ☐ NO ☐ Are your levels of nitrate comfortably below 10 mg/L?

Treatment: Pesticides and Herbicides

Removal of organic chemicals used as pesticides and herbicides can involve expensive treatment employing granular activated carbon (GAC). Fortunately, only a small percentage of water systems are expected to have levels of contamination that exceed the SDWA standards for these contaminants. However, the presence of these chemicals indicates the existence of an active transport pathway from a farmer's field, a golf course, or another cultivated or landscaped area to the river or aquifer from which your supply is withdrawn. "No" answers to the following questions may imply that your water system may have to treat to remove these contaminants.

Will you need to change treatment to control for pesticides and herbicides?

√YES ☐ NO ☐ Are your compliance monitoring results well below the Maximum Contamination Levels (MCLs) for regulated pesticides and herbicides?

√YES ☐ NO ☐ Have you been granted a monitoring waiver for all pesticides and herbicides?

Treatment: Industrial/Commercial Chemicals

The organic and inorganic chemicals typically associated with news stories about hazardous waste disposal sites are covered by Phase I, Phase II and Phase V of the SDWA regulations. Most wells and surface intakes are not adjacent to hazardous waste sites and most will not exhibit this sort of contamination except at very low trace levels.

The Phase I SDWA regulations cover volatile organic compounds (VOCs) used as solvents for a multitude of industrial and commercial applications. Although as many as 20 percent of wells may have traces of VOCs present, less than one percent have concentrations high enough to require treatment. The typical treatment for these VOCs is aeration. VOCs are primarily a groundwater contaminant because they are volatized from surface waters through natural aeration. VOCs are valuable as an indicator chemical. Since they are organic solvents, they are very mobile through soils and groundwater formations. Thus, if you have wells that have tested positive for VOCs -- even if at very low levels -- it is evident that there is a transport pathway from the source of the pollution to your well. Where there are VOCs, there are often other organic and inorganic contaminants as well. Whereas removal of VOCs via aeration may be relatively inexpensive, treatment to remove other organics and inorganics may entail much more expensive technologies such as GAC or ion exchange.

Are you likely to have to change treatment to control for industrial/commercial chemicals?

√YES ☐ NO ☐ Are your monitoring results free of VOCs?

√YES ☐ NO ☐ Are your monitoring results comfortably below the MCLs for regulated organic and inorganic chemicals?

C. Infrastructure

Infrastructure: Pumping

Pumping is one of the most critical functions in operating small and individual water distribution systems. Some of the most common centrifugal or jet pump problems have symptoms that are easily recognizable by experienced operators and can be corrected relatively easily. Some of the problems are minor in nature and can be avoided entirely if a preventative maintenance program is established and adhered to over the long-term.

Is your pumping equipment maintained in good condition?

√YES ☐ NO ☐ Do you routinely trouble-shoot for signs of pump or pump motor problems?

√YES ☐ NO ☐ Once diagnosed, are problems corrected in a timely manner to avoid crisis financing, costly repairs and unscheduled downtime?

√YES ☐ NO ☐ Do you hire a qualified pump contractor to perform an inspection of all pumping equipment, identify potential problems, and perform maintenance, on an annual basis?

Do you have adequate standby/emergency power equipment and preparedness?

√YES ☐ NO ☐ Is there sufficient standby/emergency power capacity to supply 100 percent of the average daily demand of the system (excluding fire demands)?

√YES ☐ NO ☐ Are any existing standby/emergency power equipment, controls and switches tested or exercised routinely under load conditions, for at least 30 minutes at a time?

√YES ☐ NO ☐ Has the local electric utility been made aware of the standby/emergency power provisions made by the water system, so that they can reinforce and safeguard the electrical facilities serving the water operations?

Infrastructure: Storage

Storage tanks are primarily used to meet peak water demands or provide a reserve capacity for fire protection. Elevated storage and ground-level tanks operate as integral parts of the system of pumps, pipes and connected pressure loads. In operation, all the parts respond to pressure changes as the system follows the daily and seasonal demands. The following questions are designed to help determine if there are problems in the storage facilities that could become major capital outlays to correct.

Is there adequate storage to meet system needs?

√YES ☐ NO ☐ Does the system have sufficient gravity-flow (non-pumped) distribution storage to provide safe and adequate service for up to 24 hours without power?

√YES ☐ NO ☐ Is there reserve capacity in the tank for fire protection support?

Are security measures adequate?

√YES ☐ NO ☐ Are any openings, such as vent pipes, screened to protect against the entrance of small animals, mosquitoes, flies and other small insects?

√YES ☐ NO ☐ Is there an entry hatch to allow access for cleaning and painting of the interior of the tank?

√YES ☐ NO ☐ Is there a filler pipe or hydrant to provide for water to be trucked in?

√YES ☐ NO ☐ Is the filler pipe capped and locked?

√YES ☐ NO ☐ Is the tank and the immediate surrounding area fenced in?

Are control systems adequate?

√YES ☐ NO ☐ Is there a high and low water level signal system to control the pumps?

√YES ☐ NO ☐ Is there an altitude valve, to preclude the tank from overflowing?

√YES ☐ NO ☐ Is there a drain valve or hydrant to allow draining of the tank?

√YES ☐ NO ☐ Is there an approved method for draining the tank, including any required discharge permits?

Are tanks maintained in good condition?

√YES ☐ NO ☐ Is the tank inspected at least every three years by a qualified tank contractor for evidence of corrosion or pitting and structural weakness?

√YES ☐ NO ☐ Is the tank contractor capable of analyzing the coatings of paint on the interior and exterior surfaces of the tank to determine if it contains lead or other hazardous materials?

√YES ☐ NO ☐ Is the operator aware of all deficiencies and how much it would cost to bring the tank into compliance with current standards and regulatory requirements? If the tank was erected some time ago, the applicable safety, sanitary and operational requirements may have changed.

Infrastructure: Distribution

The increasing cost of water has had implications on the distribution functions of water utilities. The break-even point for replacing leaking mains versus tolerating some water loss has shifted. Reducing overall unaccounted-for water loss has become an important objective. The proper management of a utility's transmission and distribution systems includes maintenance, system upgrade, hydrant and meter testing, and repair and replacement of mains. The distribution facilities of a water utility are a measure of its service flexibility and growth potential. The following series of questions are designed to assist in identifying potential operational and maintenance problems in the distribution and transmission systems.

Is the system being maintained in good condition?

√YES ☐ NO ☐ Does the operator routinely flush, test and maintain the hydrants in the system?

√YES ☐ NO ☐ Are the location of valves in the mains and curb stops on the service lines precisely known?

√YES ☐ NO ☐ Are histories, locations, size and type of service lines and mains detailed on records in a secure area?

√YES ☐ NO ☐ Are all valves exercised and lubricated periodically?

√YES ☐ NO ☐ Is the system free of severe "water hammer problems?"

√YES ☐ NO ☐ Are meter pits, pressure regulating valves, altitude valves, blow-offs and other appurtenances maintained on a regular basis?

Is unaccounted-for water being addressed and minimized?

√YES ☐ NO ☐ Is unaccounted-for water in the water system monitored and analyzed each month?

√YES ☐ NO ☐ Is the unaccounted-for water less than 20 percent of the total water delivered to the mains?

√YES ☐ NO ☐ Are the normal operating pressures in the distribution system between 25 psi and 125 psi?

√YES ☐ NO ☐ Do you have a routine leak detection and repair program?

√YES ☐ NO ☐ Are all sources of supply metered?

√YES ☐ NO ☐ Are all service connections metered?

√YES ☐ NO ☐ Are the meters calibrated and tested routinely to assure their accuracy and reliability?

Are water quality aspects of distribution receiving needed attention?

√YES ☐ NO ☐ Is an annual inspection for cross-connection performed by the system operator?

√YES ☐ NO ☐ Is there a program for installing and testing backflow prevention devices where potential contamination is present?

√YES ☐ NO ☐ Is there a program to eliminate “dead ends” in the mains, where feasible?

Are there acceptable standards governing modifications and new construction?

√YES ☐ NO ☐ Is there a low percentage of mains less than 6” in diameter in the water system?

√YES ☐ NO ☐ Is there a program to gradually replace sub-standard sized mains?

√YES ☐ NO ☐ Are there suitable rights-of-way and easements provided to the water system for expansion, maintenance and replacement of mains and services?

√YES ☐ NO ☐ Is there sufficient earth cover to protect the mains from frost damage or heavy loads, if driven over?

√YES ☐ NO ☐ Are materials of mains designed and selected to resist corrosion, electrolysis and deterioration?

√YES ☐ NO ☐ Do you meet the required fire flow rates and time durations prescribed by the Insurance Services Office for your system?

III. ASSESSING YOUR MANAGEMENT CAPABILITIES

A. Operation & Maintenance

Historically, the major element in a small water system was the distribution system. Source development and treatment costs were trivially small -- all that was required in many circumstances was a well, a pump, a tank and perhaps a chlorinator. Operational demands were correspondingly very limited. With the combination of a backlog of deferred infrastructure rehabilitation needs and new SDWA performance requirements, the operational demands placed on small systems are rising to unprecedented levels. Some indication of whether these operational needs can be met is provided through consideration of the following series of questions. "No" answers to the following questions are indicative that the water system's future operational needs may not be fully met.

Does your operations staff have the right training and credentials?

√YES ☐ NO ☐ Does the person operating your system have current water treatment plant operator certification credentials from DEP?

√YES ☐ NO ☐ Does your operator receive additional training on an ongoing basis to keep abreast of current developments in the field?

Does your staff fully understand and meet all current monitoring requirements?

√YES ☐ NO ☐ Is your track record free of repeated episodes of monitoring violations?

√YES ☐ NO ☐ Are you aware of and do you understand provisions for obtaining waivers from monitoring requirements and the role of vulnerability assessment?

Are you confident you understand what it will take to meet future operational demands?

√YES ☐ NO ☐ Can you make an appraisal of the additional operational requirements on your water system based on the categories of questions presented above regarding the extent of your potential water quantity, water quality and infrastructure liabilities? These questions may begin to give you an idea of how your current water system must change to meet your future needs. (Do you know how this forecast matches up against your current level of operational capability?)

√YES ☐ NO ☐ Does your water system obtain any regular or occasional technical assistance from outside sources, such as DEP, your engineer, other utilities, or organizations specifically dedicated to providing technical assistance?

B. Management & Administration

As the list of quantity, quality and infrastructure needs implied by all of the above questions grows larger and larger, the extent of management systems needed to meet all these needs also grows. The following questions highlight the general types of management systems that should exist in some form. Although some of these items may sound sophisticated, they can exist in very simple forms and get the job done very effectively. As a general rule, they need be no more sophisticated than necessary to meet the needs of the system. The important issue is that the need for management systems is recognized and is being met. "No" answers to the following questions imply that your water system may have inadequate management systems.

Is it clear who's in charge of what?

√YES ☐ NO ☐ Is there a clear plan of organization and control among the people responsible for management and operation of the system?

√YES ☐ NO ☐ Are the limits of the operator's authority clearly known?

√YES ☐ NO ☐ Are all the specific functional areas of operations and management assigned?

√YES ☐ NO ☐ Does everyone involved in operations know who is responsible for each area?

√YES ☐ NO ☐ Is someone responsible for scheduling work?

Are there clear rules and standards?

√YES ☐ NO ☐ Do you have explicit rules and standards for system modifications?

√YES ☐ NO ☐ Do you have rules governing new hook-ups?

√YES ☐ NO ☐ Do you have a main extension policy?

√YES ☐ NO ☐ Do you have standard construction specifications to follow?

√YES ☐ NO ☐ Do you have measures to assure cross-connection control and backflow prevention?

√YES ☐ NO ☐ Do you have policies or rules describing customer rights and responsibilities?

Do you have a deliberately organized regulatory compliance program?

√YES ☐ NO ☐ Do you fully understand monitoring requirements and have a scheduling mechanism to assure compliance?

√YES ☐ NO ☐ Do you have a mechanism to obtain the most recent information on regulatory requirements?

√YES ☐ NO ☐ Do you know how to obtain clarification or explanation of requirements?

√YES ☐ NO ☐ Do you maintain adequate records to document compliance?

√YES ☐ NO ☐ Do you know what to do in the event of a violation?

Are you prepared to handle emergencies?

√YES ☐ NO ☐ Do you have an Emergency Response Plan?

√YES ☐ NO ☐ Is there a contingency for making emergency interconnections to neighboring systems?

√YES ☐ NO ☐ Will the emergency interconnections work when needed?

√YES ☐ NO ☐ Does everyone involved in operations know what they are to do in the event of contamination from a toxic or hazardous waste spill in your source water, or a main break or tank failure?

√YES ☐ NO ☐ Do you have a clear chain-of-command protocol for emergency action?

√YES ☐ NO ☐ Is someone responsible for emergency operations, for communications with state regulators, for customer relations, for media relations?

Are your operations conducted safely?

√YES ☐ NO ☐ Do you have a safety program defining measures to take if someone gets hurt?

√YES ☐ NO ☐ Does everyone understand the risks and safety measures involved in handling water treatment chemicals?

√YES ☐ NO ☐ Do you have written operating procedures for both routine and emergency system operations?

√YES ☐ NO ☐ Are you fully aware of Occupational Safety and Health Administration (OSHA) confined space regulations?

Do you have an organized approach to maintenance?

√YES ☐ NO ☐ Do you have an operation and maintenance plan as described in Section 109.702 of the Pennsylvania Safe Drinking Water Regulation (25 Pa. Chapter 109) and DEP's Public Water Supply Manual?

√YES ☐ NO ☐ Do you have a planned maintenance management system -- a system for scheduling routine preventive maintenance?

√YES ☐ NO ☐ Do you have a system for assuring adequate inventory of essential spare parts and back-up equipment?

√YES ☐ NO ☐ Do you have relationships with contractors and equipment vendors to assure prompt priority service?

√YES ☐ NO ☐ Do you have records and data management systems for system operating and maintenance data, for regulatory compliance data, and for system management and administration?

Is your management capability complete?

√YES ☐ NO ☐ Are you getting the outside services you need, such as technical assistance, adequate legal counsel, insurance, engineering advice, technical/operations assistance, rate case preparation and financial advice?

IV. ASSESSING YOUR FINANCES

The answers to all of the above questions may have alerted you to the potential for higher levels of both capital and operating costs. Any system that can show it has anticipated all its needs and is prepared to charge a rate sufficient to meet the annual revenue requirement implied by those needs, is a system that can obtain capital financing and can pay its bills. The following questions illustrate some features of "good" financial planning and management to serve as points of comparison for self-assessment. Although every system cannot achieve perfection, the more "yes" answers you have the better. Budgeting worksheets that a system can use to actually undertake a quantitative assessment of financial prospects in terms of projected costs, financing, and revenue requirements are included as an appendix to this document.

Are current financial planning mechanisms adequate?

√YES ☐ NO ☐ Do you have an annual budget?

√YES ☐ NO ☐ Does your budget process provide for depreciation of existing plant or funding of reserves?

√YES ☐ NO ☐ Do you use the budgeting process to determine your annual revenue requirement via either the cash needs approach or the utility approach, as described in the American Water Works Association (AWWA) Revenue Requirements Manual (M35)?

√YES ☐ NO ☐ Do you regularly review your rates?

√YES ☐ NO ☐ Do you have a capital budget or capital improvement plan that projects future capital investment needs some distance (at least five years) into the future?

√YES ☐ NO ☐ Do you have a process for scheduling and committing to capital projects?

√YES ☐ NO ☐ Does your planning process take account of all the potential capital needs suggested by all of the preceding questions in this manual?

√YES ☐ NO ☐ Does your long-term planning incorporate analysis of alternative strategies that might offer cost savings to customers, such as consolidation with other nearby systems or sharing of operations and management expenses with other nearby systems?

Are current financial management mechanisms adequate?

√YES ☐ NO ☐ Does your water system presently receive sufficient revenue to cover the full cost of providing water service?

√YES ☐ NO ☐ Does the water system keep all the water revenues?

√YES ☐ NO ☐ Do you employ standardized accounting and tracking systems?

√YES ☐ NO ☐ Do you track budget performance?

√YES ☐ NO ☐ Do you have procedures for billing and collection?

√YES ☐ NO ☐ Do you keep records to substantiate depreciation of fixed assets and accounting for reserve funds?

√YES ☐ NO ☐ Are financial management recordkeeping systems organized?

√YES ☐ NO ☐ Are controls exercised over expenditures?

√YES ☐ NO ☐ Are controls exercised to keep from exceeding your budget?

√YES ☐ NO ☐ Are there purchasing procedures?

√YES ☐ NO ☐ Are there procedures for selection of outside contractors and suppliers?

V. PUTTING IT ALL TOGETHER: WHAT'S YOUR PLAN TO MEET THE FUTURE?

After progressing through all of the questions in this self-assessment guide, you should be able to summarize the status of your water system.

- First, you should have accumulated a list of items that you need to research or investigate more in order to fully answer the question, or to reverse your answer from "no" to "yes."
- Second, you should be able to make a qualitative summary of what you learned by taking a clean sheet of paper and filling in the most important things that come to mind -- reflecting on the issues raised in this manual -- under the following (SWOT) headings:
    - strengths
    - weaknesses
    - opportunities
    - threats
- Third, with some additional research -- or with the right assistance -- you may be closer to beginning the more quantitative form of business planning outlined in the budget and revenue planning worksheets.

Finally, customer awareness is the true foundation of a system which will be capable of meeting all SDWA requirements over time. Getting customers to fully appreciate what it takes to operate and maintain a water system is integral to assuring needed support for new capital investment and higher water rates. Further, the more customers know about the prospective costs of running a proper water system in the future, the more open-minded they will be in considering alternative strategies for providing water service, conceivably at lower costs. Nothing focuses the mind like cost estimates. Once you have performed an analysis of prospective future liabilities and costs following the questions in this guide, you will have the information needed to get people to focus on the choices involved in determining your future.

The final question to ask yourself is: ***How much of all this is known and understood by the customers; and how would this change their attitudes about the future?***

PENNSYLVANIA WATER SYSTEM BUDGETING WORKSHEETS

FOR

MOBILE HOME PARK-OWNED SYSTEMS

Each of the following budget worksheets provides space for budget data from the prior year, current year and four years into the future. If you do not have access to historical data, fill in only what is known. However, it is important to be as complete as possible. Worksheet A is an expense budget, Worksheet B is a capital budget and Worksheet C is a reserve budget. These first three worksheets (A, B, and C) lead into Worksheet D which compares total revenue sources with the total revenue requirement of the water system. Together, these four worksheets provide you with a tool by which you can project the future financial needs of the system and your availability to meet these needs -- or the system's financial capability.

WORKSHEET A - EXPENSE BUDGET

Expenses

Personnel costs. Enter the cost of salaries and benefits of the water system's operators and administrative employees.

Utilities. Enter the annual utility bill of the water system. Utilities include any power supply, including gas and electric, water supply, sewage treatment and telephone/fax bills among others.

Outside services. Enter the total cost of any services performed by another company or individual hired by the water system. These services can include, but are not limited to, the provision of insurance, external auditors and other accounting services, legal services, architects, engineers, consultants, etc.

Small equipment, materials and parts. Enter the total annual cost of any equipment, materials, and parts that are purchased to make repairs or otherwise maintain the water system. Only enter those items which will be paid for in a single year. Other items that have a long life (10 or 15 years at a minimum), have a high cost that must be paid for over time, and are nonrecurrent, should be added to capital outlays on Worksheet B.

Purchased water. Enter the total annual cost of any water that the water system purchases from other sources and then redistributes to the customers of the water system.

Chemicals, treatment and monitoring. Enter the total annual cost of water treatment chemicals, other costs associated with treating the water, and the cost of monitoring water quality, including the cost of all monitoring and testing equipment.

Transportation. Enter the costs that the water system incurs for transportation-related expenses. Among others, these include the direct cost of vehicles and vehicle maintenance and repair.

Office supplies. Enter the cost of supplies that are used in administrative work. These supplies include paper, pens, etc.

Customer billing and collection. Enter the expenses that the water system incurs in sending out customer bills and collecting payments (do not include the associated costs of personnel nor outside services).

Other. Several blank lines are available to enter other expenses not included above that the water system may incur.

Total Expenses. Enter the sum of the expenses listed above.

WORKSHEET A - EXPENSE BUDGET								
			Prior Year	Current Year	Year 1	Year 2	Year 3	Year 4
			Actual Budget	Annual Budget	Projected Budget			
1A	Expenses							
2A		Personnel Costs						
3A		Utilities						
4A		Outside Services						
5A		Small Equipment, Materials, and Parts						
6A		Purchased Water						
7A		Chemicals, Treatment, and Monitoring						
8A		Transportation						
9A		Office Supplies						
10A		Customer Billing and Collection						
11A								
12A								
13A								
14A								
15A								
16A								
17A	*Total Expenses (total lines 2A to 16A)*		$	$	$	$	$	$

WORKSHEET B - CAPITAL BUDGET

Capital Outlays

New Capital Facilities. Enter the sum of all costs that are associated with purchasing or constructing new facilities for the water system whose costs involve multiple-year commitments. These items may include the pumping station, distribution pipes, storage tanks, treatment plant, and other buildings and equipment.

Renewal and Replacement Facilities. Enter the sum of all costs that are associated with purchasing or constructing renewal or replacement facilities for the water system that involve multiple-year commitments.

Other. Several blank lines are available to enter capital outlays of the system that are not included in the two previous categories.

Total Capital Outlays. Enter the sum of the capital outlays listed above.

Capital Sources

Loan/Bond Proceeds. Enter the amount of money the water system obtains through borrowing, including bank loans, the issuing of bonds, etc.

Grant Proceeds. Enter the amount of funds that the water system receives in the form of grants from either the federal, state or local government or nonprofit organizations.

Contributions/Connection Fees. Enter the sum of funds that the water system receives from construction assistance contributions or from the imposition of fees on the extension of services.

Draw from Replacement Reserve. Enter the amount of money that the water system uses from its replacement reserve to finance capital projects.

Other. Several blank lines are available to enter capital sources of the system that are not included in the previous categories.

Total Capital Sources. Enter the sum of the capital sources noted above.

Net Capital. Subtract total capital sources from total capital outlays. Ideally, the net capital of the water system should equal zero. The goal should be to balance the flows of capital outlays and capital sources. If the net capital figure is positive, the water system has inadequate capital sources to meet its capital outlays. If net capital is negative, the water system has more funds than necessary to finance capital improvements. It is important to note that in a given year net capital may vary significantly due to the timing of cash flows. For example, the year in which a large bond issue is made, to pay for a multi-year construction project, capital sources may outweigh capital outlays significantly.

Capital Financing

Principal and Interest Debt Payments. Enter the amount that the water system repays annually on all debt incurred to finance capital projects, including both principal and interest payments.

Other. Several blank lines are available to enter other capital financing of the system that is not included in the previous category.

Total Capital Financing. Enter the sum of all capital financing of the water system listed above.

WORKSHEET B - CAPITAL BUDGET								
			Prior Year Actual Budget	Current Year Annual Budget	Year 1	Year 2	Year 3	Year 4
					Projected Budget			
1B	**Capital Outlays**							
2B		New Capital Facilities						
3B		Renewal and Replacement Facilities						
4B								
5B								
6B								
7B								
8B		*Total Capital Outlays (total lines 2B to 7B)*	$	$	$	$	$	$
9B	**Capital Sources**							
10B		Loan/Bond Proceeds						
11B		Equity						
12B		Contributions/Connection Fees						
13B		Draw from Replacement Reserve						
14B								
15B								
16B								
17B								
18B		*Total Capital Sources (total lines 10B to 17B)*	$	$	$	$	$	$
19B	**NET CAPITAL OUTLAYS (line 8B less line 18B)**		$	$	$	$	$	$
20B	**Capital Financing**							
21B		Principal, Interest, and Return on Equity						
22B								
23B								
24B								
25B	*Total Capital Financing (total lines 21B to 24B)*		$	$	$	$	$	$

WORKSHEET C - RESERVES BUDGET

Reserve for _____. Lines 1C, 5C, 9C, and 13C are available to enter the reserve accounts that the water system uses. Examples of reserve accounts include:

- ***Operating Cash Reserve;***
- ***Replacement/Depreciation Reserve;***
- ***Emergency Reserve; and***
- ***Debt Service Reserve.***

The annual installment to the reserve account should equal the desired balance of the reserve divided by the number of years before that balance needs to be reached. The desired or target balance should be sufficient to replace depreciated equipment, address the worst emergency situation, or support the issuance of debt. The amount that is desired or targeted for future needs should be noted on lines 4C, 8C, 12C, and 16C. Also, denote the current running balance of each reserve account (on lines 3C, 7C, 11C, and 15C).

Total Annual Reserve Installments. Denote the total amount of money that the water system allocates to all reserve accounts annually.

Total Running Balance. Denote the total amount of money in all reserve accounts.

Total Target Balance. Denote the total desired or targeted balance of all reserve accounts.

WORKSHEET C - RESERVES BUDGET							
		Prior Year	Current Year	Year 1	Year 2	Year 3	Year 4
		Actual Budget	Annual Budget	Projected Budget			
1C	**Reserve for**						
2C	Annual Installment						
3C	Running Balance						
4C	Target Balance						
5C	**Reserve for**						
6C	Annual Installment						
7C	Running Balance						
8C	Target Balance						
9C	**Reserve for**						
10C	Annual Installment						
11C	Running Balance						
12C	Target Balance						
13C	**Reserve for**						
14C	Annual Installment						
15C	Running Balance						
16C	Target Balance						
17C	**TOTAL ANNUAL RESERVE INSTALLMENTS** (total lines 2C, 6C, 10C, 14C)	$	$	$	$	$	$
18C	**TOTAL RUNNING BALANCE** (total lines 3C, 7C, 11C, 15C)	$	$	$	$	$	$
19C	**TOTAL TARGET BALANCE** (total lines 4C, 8C, 12C, 16C)	$	$	$	$	$	$

WORKSHEET D - REVENUE ANALYSIS

Revenue Requirements

Enter the value of total expenses, net capital, total capital financing and total annual reserve installments from the previous forms as noted.

Total Revenue Requirement. Together, the items mentioned above encompass the revenue requirement of the water system. Enter the total of these items here.

Number of Connections. Enter the number of connections that the water system serves or expects to serve in future years.

(000's) Gallons Sold. In thousands, enter the total number of gallons of water the water system sells or expects to sell annually.

Revenue Requirement per Number of Connections. Divide the total revenue requirement by the number of connections.

Revenue Requirement per Thousand Gallons Sold. Divide the total revenue requirement by the gallons sold in thousands.

Current Revenue[1]

Rate Revenue. Enter the total amount of revenue that the water system collects through the levying of rates on water usage.

Other. Blank lines are available to enter other sources of revenue. These sources may include, but are not limited to, the following:

- **Bulk Water Rates;**
- **Fire Protection; and**
- **Fees and Charges (bad check fees, reconnect fees, meter testing fees, late payment charges).**

If the water system has more sources of revenue than available blank lines, group similar revenues together into broader categories and note these groupings for future reference.

Total Revenue. Enter the sum of all revenue collected by the water system.

Budget Surplus (Deficit). Subtract the water system's total revenue requirement from its total revenue.

Total Revenue per Number of Connections. Divide the total revenue by the number of connections.

Total Revenue per Thousand Gallons Sold. Divide the total revenue by the gallons sold in thousands.

[1] NOTE: Future revenues are difficult to predict. Enter revenue values for years 1 to 4 only if the water system has the capability to accurately forecast these values.

WORKSHEET D - REVENUE ANALYSIS							
		Prior Year	Current Year	Year 1	Year 2	Year 3	Year 4
		Actual Budget	Annual Budget	Projected Budget			
1D	**Revenue Requirements**						
2D	Total Expenses (line 17A)	$	$	$	$	$	$
3D	Net Capital Outlays (line 19B)	$	$	$	$	$	$
4D	Total Capital Financing (line 25B)	$	$	$	$	$	$
5D	Total Annual Reserve Installments (line 17C)	$	$	$	$	$	$
6D	**TOTAL REVENUE REQUIREMENT (total lines 2D to 5D)**	$	$	$	$	$	$
7D	Number of Connections						
8D	(000's) Gallons Sold						
9D	*Revenue Requirement per Number of Connections (line 6D/line 7D)*						
10D	*Revenue Requirement per (000's) Gallons Sold (line 6D/line 8D)*						
11D	**Revenue Sources**						
12D	Rate Revenue						
13D							
14D							
15D							
16D	**TOTAL REVENUE (total lines 12D to 15D)**	$	$	$	$	$	$
17D	**BUDGET SURPLUS (DEFICIT) (lines 16D less line 6D)**	$	$	$	$	$	$
18D	*Total Revenue per Number of Connections (line 16D/Line 7D)*						
19D	*Total Revenue per (000's) Gallons Sold (line 16D/line 8D)*						

BUREAU OF WATER SUPPLY MANAGEMENT
LIST OF REGIONAL DEP OFFICES AND COUNTIES SERVED

Southeast Regional Office Lee Park, Suite 6010 555 N. Lane Conshohocken, PA 19428 Telephone: 610-832-6000	Bucks, Chester, Delaware, Montgomery and Philadelphia
Northeast Regional Office 2 Public Square Wilkes-Barre, PA 18711-0790 Telephone: 717-826-2511	Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming
Southcentral Regional Office 909 Elmerton Avenue Harrisburg, PA 17110-8200 Telephone: 717-705-4700	Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York
Northcentral Regional Office 208 W. Third Street, Suite 101 Williamsport, PA 17701 Telephone: 717-327-3675	Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union
Southwest Regional Office 400 Waterfront Drive Pittsburgh, PA 15222-4745 Telephone: 412-442-4217	Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland
Northwest Regional Office 230 Chestnut Street Meadville, PA 16335-3481 Telephone: 814-332-6899	Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren

Commonwealth of Pennsylvania
Tom Ridge, Governor

Department of Environmental Protection
James M. Seif, Secretary

Bureau of Water Supply Management
P. O. Box 8467
Harrisburg, PA 17105-8467

For more information, visit us through the Pennsylvania homepage at www.state.pa.us or visit DEP directly at www.dep.state.pa.us (choose Subjects/Water Management).

3800-BK-DEP2161 Rev. 9/98