



Water System Business Plan Guidance

A guide for developing a business plan to demonstrate the viability of existing public water systems

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I. Introduction

On June 26, 1998, the State Primary Drinking Water Regulations (SPDWR) were amended to include provisions for the issuance of operating permits for all public water systems in the state. As part of this new permitting program, the owner of any water system which receives an overall rating of “*unsatisfactory*” on a sanitary survey, must prepare and submit a *business plan* to the South Carolina Department of Health and Environmental Control [R.61-58.1(O)(10) and (12)].

A business plan for a public water system consists of three sub-plans, a “*facilities plan*”, a “*management plan*”, and a “*financial plan*”, which is intended to show how a water system will be operated and maintained as a viable entity. A “*viable water system*” is defined in the SPDWR as a water system that is self-sustaining and has the commitment and the technical, managerial and financial capability to consistently comply with the State Safe SDWA and the SPDWR [R.61-58.(B)].

A facilities plan consists of an assessment of the current and foreseeable water supply needs of a water system’s service area; a detailed description of alternatives considered for meeting those needs; detailed cost estimates for the construction, operation and maintenance of the different alternatives; and the rationale for the alternative selected. For existing systems, the description of alternatives would include, but not be limited to: a detailed description of existing facilities (source, treatment and distribution); description of any upgrade necessary to bring the existing facilities into compliance with the SDWA and the SPDWR; an assessment of the ability of the existing facilities, along with any necessary upgrade, to supply the current and foreseeable water supply needs of the area (including the ability to comply with any foreseeable regulatory changes); and a description of any other alternatives considered for meeting the water supply needs [R.61-58.(B)].

A management plan consists of the identification of a water system’s owner; description of the management structure; an organizational chart; staffing requirements and duties; identification of any outside services and a copy of any service agreements; a copy of the system’s operation and maintenance procedures required by R.61-58.7(B); and a detailed estimate of costs for the operation and maintenance of the system as they relate to the management plan, unless included in the cost estimate for the facilities plan [R.61-58(B)].

A financial plan consists of projections that a water system’s revenues and cash flow will be sufficient for meeting the cost of construction, operation and maintenance for at least five full years. The financial plan must also include assurances deemed necessary for the system to remain viable. Examples of some assurances are: 1) a projection of rates showing a significant coverage ratio; 2) escrow funds; 3) bonding; and, 4) letter of credit.

Although certain systems will be required to prepare a business plan, all water systems would benefit from developing such a plan. If an existing water system has not already developed a business plan, it is encouraged to do so. A business plan can be a useful tool in identifying areas of concern long before they become a problem. Such planning will enable a system to put itself in a better financial position to address areas of concern and keep them from becoming non-compliance problems.

Once a business is developed it is very important that it be kept up-to-date. An out-of-date business plan is about as useful as a 286 computer or an 8 track cassette player.

The purpose of this “Water System Business Plan Guidance” is to provide an outline of information needed to be included in a business plan for an existing public water system. While this document outlines a variety of issues that typically should be addressed, each water system needs to be addressed on a case-by-case basis.

Special Note to the User of this Document

This guide is subject to change due to future revisions of the Federal and State SDWA and SPDWR. The latest version of this document can be found on the South Carolina Department of Health and Environmental Control, Bureau of Water's Web Page at www.state.sc.us/dhec/eqc/water/pubs/business.pdf.

The Department invites suggestions from anyone using this document on how it can be improved. Please submit any suggestions to:

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II. Definitions

The following definitions from the SDWA and the SPDWR are provided for some of the more commonly used terms in this guidance document.

"Certified Laboratory" means a laboratory approved by the Department under Regulation 61-81.

"Community Water System" (CWS) means a public water system which serves at least fifteen service connections used by year-round residents or regularly serves at least twenty-five year-round residents. This may include, but not be limited to, subdivisions, municipalities, mobile home parks, apartments, etc.

"Non-community water system" (NCWS) means a public water system which serves at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year, and does not meet the definition of a community water system.

"Non-transient non-community water system" (NTNCWS) means a public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six months per year.

"Public Water System" means (1) any public or privately owned waterworks system which provides drinking water, whether bottled or piped, for human consumption, including the source of supply whether the source of supply is of surface or subsurface origin; (2) all structures and appurtenances used for the collection, treatment, storage or distribution of drinking water delivered to consumers; (3) any part or portion of the system and including any water treatment facility which in any way alters the physical, chemical, radiological, or bacteriological characteristics of drinking water; provided, that public water system shall not include a drinking water system serving a single private residence or dwelling. A separately owned system with its source of supply from another waterworks system shall be a separate public water system.

"State Water System" (SWS) means any water system that serves less than fifteen (15) service connections or regularly serves an average of less than twenty-five (25) individuals daily.

"Tap" means a service connection, the point at which water is delivered to the consumer (building, dwelling, commercial establishment, camping space, industry, etc.) from a distribution system, whether metered or not and regardless of whether there is a user charge for consumption of the water.

"Transient non-community water system" (TNCWS) means a non-community water system that does not regularly serve at least 25 of the same persons over six months per year.

IV. Facilities Plan

A. Definition

A facilities plan consists of an assessment of the current and foreseeable water supply needs of a water system's service area; a detailed description of alternatives considered for meeting those needs; detailed cost estimates for the construction, operation and maintenance of the different alternatives; and the rationale for the alternative selected. For existing systems, the description of alternatives would include, but not be limited to: a detailed description of existing facilities (source, treatment and distribution); description of any upgrade necessary to bring the existing facilities into compliance with the SDWA and the SPDWR; an assessment of the ability of the existing facilities, along with any necessary upgrade, to supply the current and foreseeable water supply needs of the area (including the ability to comply with any foreseeable regulatory changes); and a description of any other alternatives considered for meeting the water supply needs [R.61-58.(B)].

B. Assessment of the Water Supply Needs

The first step in preparing a facilities plan is to make an assessment of both current and future water supply needs for the water system's service area. This assessment should include the information outlined as follows.

1. Detailed Description of the Water System

Provide a detailed description of the water system. This description should at a minimum include the following information:

- a. A brief narrative of the area or business served by the water system. A few examples are as follows:
 - i. The John Doe Subdivision water system located off of SC Highway 176 in Richland County serves a development which currently consist of 100 single family residences, with an ultimate build out of 500 single family residences on lots ranging from 1 to 2 acres in size.
 - ii. The water system serves the Jane Doe Country Restaurant located on SC Highway 301 approximately 1 mile west of Interstate Highway 26 in Orangeburg county. The restaurant currently employees a total of 20 people working two shifts (10 employees per shift) and has seating for 100 people.
 - iii. The Town of John Doe located in Lexington County currently owns and operates a public water system serving the residences and businesses within the Town limits and one industry which is located just outside of the Town limits.
- b. A detailed description of the system's source, treatment, distribution, and storage facilities. This description should include the type, capacity, size, etc., of each facility. This may be presented in a narrative or tabular form or a combination of the two. A map may be useful in providing this information for the distribution lines (e.g., type length and size).
- c. A map of the systems service area which includes the location of the source, treatment, storage facilities and distribution lines.
- d. The current average daily and maximum daily water demands.

2. Replacement of System Components

Provide a projection of when (the year) existing system components will need to be replaced. This may be accomplished by simply determining when the component was constructed (i.e., distribution piping, wells, ground and elevated storage tanks, structures, etc.) or installed (i.e., pumps, chemical feed equipment, generators, etc.) and the expected life of each component. The expected life of specific equipment may be determined by contacting the manufacture or by referring to industry standards for estimating the average life of similar facilities and equipment. However, in either case, the actual life of the equipment will greatly depend on, the use of the equipment and how well it is being maintained. Therefore, the system's maintenance records should be reviewed when determining the expected life of the system components.

3. Projection of Future Water Demands

Provide a projection of future water demands for at least the next five years. A longer projection period is highly recommended. Using the John Doe subdivision mentioned above as an example, the owner knows that the ultimate build out is 500 homes. The question is just how long will it take to reach ultimate build out of the subdivision? For the Town of John Doe lets, assume that the population as well as the water use has increased at a steady rate of 2 percent a year over the last several years and there is no indication that it will change for the foreseeable future. In preparing the facilities plan, the Developer of the subdivision must project a rate at which new homes will be built. The Town's utility director may simply use historical records (2% increase per year) to project future water demands. Regardless of how these projections are made, the facilities plan must include the information and assumptions used in making the projection. This information will be very useful in updating the business plan in the future.

4. Upgrade of Existing Facilities to Meet Future Water Demands

- a. Based on the projected future water demands and the following requirements of the SPDWR provide a projection as to when (year) and what additional source and treatment (if applicable) facilities. will need to be constructed/installed.
 - i. Section R.61-58.7.C(11) of the SPDWR states that the reliable capacity of a surface water treatment plant shall be based on the lowest capacity in the treatment train. This shall include, but not be limited to, the capacity of the source, capacity of the raw water pump station with the largest pump out of service, capacity of the rapid mix chamber(s), flocculator(s), sedimentation basin(s), clarifier(s) and filters(s) and the capacity of the high service pump station with the largest pump out of service. If the reliable capacity of a plant is exceeded on a consistent basis during the peak water use months, the Department may elect not to issue any construction permits for new water line construction until the reliable capacity of the plant is increased.
 - ii. Section R.61-58.7.C(12) of the SPDWR states that when the average daily demand during any month exceeds eighty (80) percent of the public water system's reliable capacity, as specified in R.61-58.7(C)(11), the system shall submit a preliminary engineering report to the Department within one hundred eighty (180) days addressing in detail any upgrade necessary to keep up with any growth in demand on the system. When the average daily demand during any month exceeds ninety (90) percent of the public water system's reliable capacity as specified in R.61-58.7(C)(11), the system shall submit to the Department plans and specifications along with an application for a permit to construct the upgrade.

- iii. Section R.61-58.7.D(12) of the SPDWR states that The capacity of a public water system which uses groundwater as its only drinking water source, shall be based on all operable wells pumping 16 hours a day or all operable wells minus the largest well pumping 24 hours a day, which ever is less. If the system has an additional source (surface water plant or metered connection from another public water system), the additional capacity from that source shall be used in determining the total capacity of the system. If the capacity of the system is exceeded on a consistent basis during the peak water use months, the system shall submit a preliminary engineering report to the Department within ninety (90) days addressing in detail any upgrade necessary to keep up with any growth in demand on the system. Construction plans and specifications for a new well may be submitted in lieu of the preliminary engineering report. In addition, the Department may elect not to issue any construction permits for new water line construction until the capacity of the system is increased.

Note: Only the yield from wells and other sources (e.g., master metered connections from another water system) used on a full time basis may be used in determining the capacity of the water system. The yield from emergency or standby sources may not be included in determining the capacity of the system.

- b. Will any additional storage be required? If so, specify the type and amount. Refer to section R.61-58.4 of the SPDWR concerning minimum storage requirements. Provide in the facilities plan design calculations used in determining as to whether or not additional storage is needed.
- c. Will the distribution system need upgrading (i.e., larger water lines, looping of water lines, water line extensions, etc.) to meet the projected water demands? Provide in the facilities plan design calculations used in determining the need for any necessary upgrade to the distribution system.

5. Evaluation of the System’s Ability to Comply with Current and Future Regulatory Requirements

Provide an evaluation of the system’s ability to comply with current and future requirements of the SDWA, SPDWR and any other applicable laws and regulations which will affect the operation of the water system (e.g., risk management plans for gas chlorine facilities). Future regulatory requirements are normally established at least one to two years prior to taking effect.

The sanitary survey report provided to the owner following DHEC’s inspection of the system is a good place to begin for determining compliance. Additional means of determining compliance may be accomplished through comprehensive performance evaluations conducted by DHEC and similar inspections conducted by an engineering firm or peer review programs provided through organizations such as the American Water Works Association and the Rural Water Association. The State’s Source Water Assessment Program is another tool which can be used to help evaluate the system ability to comply with current and future regulatory requirements.

Include a copy of all inspection reports used in determining compliance, as an Appendix to the business plan.

6. Upgrade Necessary to Comply with Current and Future Regulatory Requirements

Is the system in full compliance with the current requirements of the SDWA and the SPDWR? Will the system be able to comply with all future requirements of the SDWA and the SPDWR without any upgrade? Is the system in compliance with other applicable laws and regulations? If not, provide a brief description of any upgrade necessary to bring the system into compliance with current and/or future regulatory requirements.

C. Alternatives for Meeting the Water Supply Needs

The second step in preparing a facilities plan is to identify and provide a detailed description of all alternatives available for meeting the water supply needs.

1. Based on the above assessment, the existing water system will fall into one of the following two categories:
 - Category # 1: Systems that meet all current and foreseeable water supply needs.
 - Category # 2: Systems that will need to be upgraded to meet future water demands or to comply with current and future regulatory requirements.

Regardless of which category a system falls under, the following must be considered, evaluated and addressed in the facilities plan:

- a. Local Government Planning Authority

Is there a local government which has potable water planning authority over the area in which the system is located? If so, determine the requirements of the local planning authority. Section R.61-58.1(B)(2)(g) of the SPDWR requires that where such authorities exist, construction permit applications must include a letter from the authority stating that the proposed project is consistent with the water supply service plan for the area. Please note that this may limit the alternatives available for the water system to consider.

For example: The homeowners association of a subdivision determines that it needs an additional source of water to supplement the supply from its existing well. The alternatives available to meet this need are to either drill a second well or connect to one of two existing near-by public water systems (city and public service district). The alternative of drilling another well is ruled out because there is no other location within the subdivision to drill a second well. After contacting the local planning authority, the association finds out that the subdivision is in the city's service area. Therefore, the only option available to meet the additional water supply needs of the subdivision is to connect to the city's water system.

- b. Consolidation or Regionalization

The consolidation or regionalization alternative should always be considered when developing or revising a business plan, especially when a system is faced with replacing or adding a water source, or when replacing, upgrading or adding treatment.

- i. Are there any existing public water systems "near-by"? Provide a list of all near-by water systems. "Near-by" is a relative term; however, as a "rule-of-thumb" the following distances should be considered as "near-by".
 - A. One half (1/2) mile for SWS or TNCWS;
 - B. Two (2) miles for NTNCWS or CWSs serving fewer than fifty (50) taps or fewer than one hundred fifty (150) people;
 - C. three (3) miles for CWS serving between 50 and 299 taps; and,
 - D. for CWS serving 300 or more taps the distance will depend on the size of the system.

- ii. Are any of the near-by water systems able to supply water to the system? A few items that should be considered when determining if a near-by water system is able to supply water are as follows, (there may be others):
 - A. Quantity of Water - Does the near-by water system have enough water to meet the demands of both systems?
 - B. Flow and Pressure Available at the Point of Connection - Is the flow and pressure adequate at the point of connection to meet system demands. The SPDWR requires that a minimum pressure of 25 psi must be maintained in the distribution system during conditions of maximum instantaneous demand and that a minimum pressure of 20 psi must be maintained during unusually heavy flows (i.e., fire flow or flushing flow).
 - C. Overall Rating of the Last Sanitary Survey - The viability of the near-by water system may be in question if the overall rating of the last sanitary survey is “unsatisfactory”, unless steps have been taken to correct the deficiencies.
 - D. Tap Moratorium - Is the near-by water system currently under a “tap moratorium” issued by DHEC?
 - E. Easements - Will either water system be able to obtain the necessary easements to construct and maintain water lines through property not owned by either system?
 - F. Physical Barriers - Are there any physical barriers which would prevent the connection of the system to the near-by water system? For example, although a controlled access highway can be crossed, easements will only be granted to certain entities and special construction techniques must be used and approved by the South Carolina Department of Public Transportation.
 - iii. Are any of the ‘near-by’ water systems which are able to serve, willing to serve the system? If so, list the systems.
 - iv. For those near-by systems which are not able or willing to serve the system, provide in the facilities plan a explanation as to why. Provide a copy of any written correspondence from the near-by water systems concerning their willingness and ability to provide water to the system.
2. Alternatives for Category # 1 Systems
- a. If the assessment indicates that the existing system meets all current and foreseeable water supply needs, the first alternative to consider would be to operate and maintain the system as is.
 - b. Although the existing facilities for this category of systems appears to meet all current and foreseeable water supply needs, there may be a more financially or reliable alternative for meeting the water supply needs of the system (i.e., consolidation or regionalization).
3. Alternatives for Category # 2 Systems
- Identify and provide a detailed description of all alternatives available for meeting future water demands, and current and future regulatory requirements.

D. Detailed Estimate of the Capital Cost of Construction for each Alternative Available for Meeting the Water Supply Needs

The third step in preparing a facilities plan is to estimate the capital cost of improvements for each alternative available for meeting the water supply needs.

1. Replacement of Existing Facilities

For any alternative that includes the operation and maintenance of all or a portion of the existing facilities, the plan must estimate the cost of replacing each of the system components to be retained.

2. Preliminary Engineering Design

In order to develop a detailed cost estimate for any alternative that includes the construction of new facilities (including running water lines to connect to another water system), a preliminary engineering design must be prepared by a professional engineer for each alternative, and included in the facilities plan.

3. Capital Cost of Constructing New Facilities

Develop a **detailed** cost estimate for any construction required for each alternative. Appendix B contains examples of itemized cost estimates for two alternatives (i.e., connecting to an existing water system and the installation of a new well). Due to the complexity of surface water treatment facilities, a table is not provided for estimating the cost of developing such sources. Please note that it is very important that any estimate be detailed enough so as to insure that all costs have been included and that they are realistic. The best way to ensure that the cost estimates are as accurate as possible, is to obtain a quote or bid for the work or use information from recent bids taken on similar type and size jobs in the area where the project is located. **Please note** that it is also very important that the estimates be complete.

If the tables in Appendix B are used, enter "N/A" in the cost column for any item which does not apply. The items listed in each table should be self explanatory; however, some items which may need further explanation are as follows:

- a. Total Coliform Analyses: Total coliform samples must be collected as follows and analyzed by a certified laboratory. A written cost estimate should be obtained from a certified laboratory that would likely conduct these analyses.
 - i. Distribution system: At least two samples, taken 24 hours apart, must be collected from the distribution system.
 - ii. Well: At least two samples, taken 24 hours apart, must be collected from each well.
 - iii. Storage tanks: At least two samples, taken 24 hours apart, must be collected from each storage tank.
- b. Well Head Piping: The cost for well head piping should include the cost of the pipe and all appurtenances required under Section R.61-58.2(B)(16) of the SPDWR (e.g., sanitary seal, casing vent, check valve, sampling tap, blowoff valve, meter, isolation valve, pressure relief valve, etc.)
- c. Treatment Equipment: Provide an itemized list of treatment equipment and cost (including installation cost). Include the total estimated cost in the table for this item.

- d. **Water Quality Analyses:** Water samples must be collected from each well as follows and analyzed by a certified laboratory. A written cost estimate should be obtained from a certified laboratory that would likely conduct these analyses.
 - i. Wells serving SWSs and TNCWSs must be sampled and analyzed for nitrate, nitrite, iron, manganese and any other water quality parameter listed in Appendix D that DHEC deems necessary on a case by case basis, as part of the construction permitting process.
 - ii. Wells serving CWSs and NTNCWSs must be sampled for the water quality parameters listed in Appendix D as part of the construction permitting process.

E. Detailed Cost Estimate of the Operation and Maintenance of Each Alternative Available

The fourth step in preparing a facilities plan is to estimate the operation and maintenance cost of each alternative available for meeting the water supply needs.

Develop a **detailed** cost estimate for the annual operation and maintenance costs of each alternative. Appendix C contains examples of itemized cost estimates for two alternatives (i.e., maintaining a well system, with or without improvements, and connecting to an existing water system). Due to the complexity of surface water treatment facilities, a table is not provided for estimating the annual operation and maintenance cost for such an alternative. **Please note** that it is very important that any estimate be detailed enough so as to insure that all costs have been included and that they are realistic. It is also very important that the estimates be complete. If the tables in Appendix C are used, enter "N/A" in the cost column for any item which does not apply. The following is an explanation of each item listed in the tables provided in Appendix C.

1. **Cost of Water from Existing System:** Estimate the annual cost of water using the average daily demand for the project and the user rates charged by the system. Provide a copy of the user rate charges and calculations for estimating this annual cost.
2. **Testing of Backflow Prevention Device:** Will the owner of the existing system require that a backflow prevention device be installed at the meter? If so, the cost estimate must include the cost of testing the device. Annual testing by a person certified by DHEC is required for each double check valve assembly and reduced pressure backflow prevention device installed. Provide a copy of a quote from a certified tester who may perform this annual test.
3. **DHEC Fee/Water Quality Monitoring if Connecting to an Existing System:** If the system does not plan to sell or treat the water it receives from the existing water system the cost for this item is zero.

However, if the system plans to sell or treat the water it receives from the existing water system, the system will be required to pay an annual DHEC Fee. The amount of the fee is established in the General Appropriations Bill and is subject to change annually. Please contact the Drinking Water Fee Coordinator in the Permit and Data Administration Section of DHEC's Bureau of Water, at (803) 898-4300 for the amount of the annual fee for the type of system in question (i.e., CWS, NTNCWS, TNCWS, and SWS). In return for the fee, DHEC will conduct all monitoring required by the SPDWR except for the bacteriological and disinfectant residual monitoring of the distribution system for CWS and NTNCWSs. Please have the following information available, where applicable, when calling for fee information:

- system type (CWS , NTNCWS, TNCWS and SWS)
- total number of taps served (for CWS and NTNCWS only)

- total population served (for CWS and NTNCWS only)

The frequency and location of the bacteriological monitoring will be based on a written sample siting plan developed by the owner or operator of the system.

If the water from the existing system comes in total or in part from a surface water source, or from a groundwater source under the direct influence of surface water, the system must monitor the disinfectant residual in the water at the same time and location that the bacteriological sample(s) is taken. This requirement applies to both CWS and NCWSs.

These samples must be analyzed by a certified laboratory.

4. **DHEC Fee/Water Quality Monitoring For Systems which have their own Groundwater or Surface Water Source:** The system will be required to pay an annual DHEC Fee. The amount of the fee is established in the General Appropriations Bill and is subject to change annually. Please contact the Drinking Water Fee Coordinator in the Permit and Data Administration Section of DHEC's Bureau of Water, at (803) 898-4300 for the amount of the annual fee for the type of system in question (i.e., CWS, NTNCWS, TNCWS, and SWS). In return for the fee, DHEC will conduct all monitoring required by the SPDWR except for the:

- bacteriological and disinfectant residual monitoring of the distribution system for CWSs and NTNCWSs;
- special monitoring required for new wells located within two hundred feet of a body of water, or constructed such that water is being drawn from less than fifty (50) feet in depth, or constructed such that the filter material extends to less than fifty (50) feet below grade;
- raw water bacteriological monitoring, disinfection contact time, and disinfectant residual monitoring entering the distribution system for surface water sources and ground water sources under the direct influence of surface water;
- water quality parameters required for compliance monitoring under the Lead and Copper Rule; and,
- water quality and process control type monitoring required by the Interim Enhanced Surface Water Treatment Rule and Disinfectants/Disinfection By Products Rule.

Please have the following information available, where applicable, when calling for fee information:

- system type (CWS , NTNCWS, TNCWS and SWS)
- total number of taps served (for CWS and NTNCWS only)
- total population served (for CWS and NTNCWS only)
- number of wells and surface water sources (for CWS and NTNCWS only and does not include master meter connections,)

For the purpose of estimating the cost of self monitoring, the system may assume the following sampling frequencies:

- a. **Bacteriological Monitoring:** (applies to CWS and NCWS) The frequency and location of the bacteriological monitoring will be based on a written sample siting plan developed by the owner or operator of the system.

If the water from the existing system comes in total or in part from a surface water source, or from a groundwater source under the direct influence of surface water, the owner must monitor the disinfectant residual in the water at the same time and location that the bacteriological sample(s) is taken. This requirement applies to both CWS and NCWSs.

- b. **Special Monitoring:** (applies to CWS and NTNCWS)

If a new well is located within two hundred feet of a body of water, or constructed such that water is being drawn from less than fifty (50) feet in depth, or constructed such that the filter material extends to less than fifty (50) feet below grade, must be monitored to determine if the well is under the direct influence of surface water [R.61-58.2(B)(3)(c)]. Refer to Section R.61-58.2(B)(14)(c) for the special monitoring requirements to determine if a well is under the direct influence of surface water.

- c. **Surface Water Treatment Rule and Interim Enhanced Surface Water Treatment Rule:**

Systems which utilizes or plans to utilize surface water source or a groundwater source under the direct influence of surface water, the owner must comply with the requirements of the Surface Water Treatment Rule (R.61-58.10) and the Interim Enhanced Surface Water Treatment Rule which was promulgated by EPA on December 16, 1998. Due to the complexity of these two rules the specific requirements are not included in this guide. Contact the Department's Bureau of Water for information concerning these requirements.

- d. **Disinfectants/Disinfection By-Products:** (applies to CWS and NCWS)

New federal regulations concerning disinfectants and disinfection by-products were promulgated on December 16, 1998. These regulations expand the number of parameters to be monitored as well as the number of systems to be monitored. These requirement apply to:

- CWS and NTNCWS that treat their water with a chemical disinfectant for either primary or residual treatment; and
- TNCWS that apply chlorine dioxide as a disinfectant or oxidant.

For most of the 1980's and 1990's, only CWSs which served more than 10,000 people (including consecutive systems) were required to monitor for Total Trihalomethanes (bromodichloromethane, dibromochloromethane, tribromomethane, and trichloromethane). The new regulations lower the maximum contaminant level (MCL) for Total Trihalomethanes from 0.1 milligrams per liter (mg/l) to 0.08 (mg/l), include additional disinfectant by-products to be monitored for and expands this monitoring to all CWS and NTNCWS that treat their water with a chemical disinfectant. There are also several other MCL's and monitoring and reporting requirements. Due to the complexity of this rule, the specific requirements are not included in this guide. Contact the Department's Bureau of Water for information concerning these requirements.

5. **Chemicals:** If treatment is provided determine the cost of chemicals based on the average daily demand. Provide calculations, including assumptions, for determining the annual cost of chemicals.
6. **Electricity:** Provide calculations for estimating the cost of electricity.

7. **Maintenance:** Describe in detail any routine annual maintenance cost that will be incurred by the system and the basis for determining the cost of such maintenance. For example: A system has established a meter replacement program where 10% of the systems water meters are replace annually. Another example would be a system which has contracted with a tank painting company to inspect and clean its elevated and ground storage tanks on an annual basis.
8. **South Carolina Public Service Commission (PSC):** If the system subject to the requirements of the PSC provide the annual cost associated with complying with any PSC requirements (e.g., bonding, etc).
9. **Operator/Administrative Costs:** Before estimating these costs a management plan must be developed for each alternative. For each management plan develop an itemized list of costs for implementing the plan (e.g., salaries, contractual operations costs, etc.). Enter the total of such costs under this item in each table.
10. **Other Costs:** The following are a few examples of other costs that should be itemized.
 - a. Identify any non-annual operation and maintenance cost for each alternative such as tank painting. Such expenses are only incurred every few year however they can be expensed annually;
 - b. Identify any reoccurring capital out lays for each alternative such as trucks, tractors and other equipment necessary to operate and maintain the system;
 - c. Office expenses, rental; and
 - d. Professional fees for engineer on retainer, CPA, legal.

F. Rationale for Selecting the Alternative for Meeting the Water Supply Needs

Describe in detail the rationale for the alternative selected. Both non-monetary and monetary factors should be addressed in this discussion. Non-monetary factors may include, but are not limited to, environmental effects, implement ability, operability, performance reliability and institutional issues.

The level of detail depends upon the scope and complexity of the project; however, the discussion should present a concise, technically reasonable rationale.

V. Management Plan

A. Definition

The management plan for a water system consists of the identification of a water system's owner; description of the management structure; an organizational chart; staffing requirements and duties; identification of any outside services and a copy of any service agreements; a copy of the system's operation and maintenance procedures required by R.61-58.7(B); and a detailed estimate of costs for the operation and maintenance of the system as they relate to the management plan, unless included in the cost estimate for the facilities plan [R.61-58(B)].

B. Ownership

Provide the name, address, telephone number, fax number of the owner of the system.

C. Management Structure

Describe the management structure and provide the name, address, telephone number, fax number and emergency number of the person responsible for the day-to-day management of the water system, if different from the owner.

Will the management structure remain the same regardless of which alternative is chosen to meet the water needs of the system? If not, explain and provide a description of the management structure for each alternative.

D. Organizational Chart

Provide an organizational chart (i.e., who reports to whom).

Will the organizational chart remain the same regardless of which alternative is chosen to meet the water needs of the system? If not, explain and provide a revised organizational chart for each alternative.

E. Staffing Requirements and Duties

1. Identify and list all job duties necessary to operate and manage the water system (e.g., operate water treatment equipment, meter reading, receptionist, billing, manager, operate heavy equipment, meter installation, meter testing, water line repair, manage spare parts inventory and supplies, etc.)
2. Provide a position description for each person identified in the organizational chart. A position description outlines the purpose of the position, job duties and minimum qualifications for a person hired to fill the position. If a job duty is to operate water treatment equipment, the position description must require that the employee have the appropriate level of operator certification.
3. Evaluate the adequacy of staffing. Is at least one person identified for each of the job duties? When evaluating the adequacy of staffing, management must consider days off, vacation time, sick leave, and the time it takes to perform the job duties. Is someone always available to perform critical job duties? For example, the SPDWR require all groundwater and distribution treatment facilities be monitored by an operator of the appropriate grade, at a frequency to ensure proper operation, but in no case less than once a day (i.e., 7 days a week). Such monitoring may be accomplished through site visits and/or remote monitoring equipment approved by the Department. If an operator is responsible for other water systems, how long does it take him/her at each facility and how long does it take to

travel to each facility? **Please note** that in the future, certified operators will be required for all CWS and NTNCWS.

F. Identification of Outside Services

1. Line breaks and pump failures are inevitable. Does the system have the equipment and personnel to make such repairs? If so, list the equipment and personnel available. If not, provide the name, telephone number and emergency number of a plumbing contractor(s) and well driller(s) who could be called to make repairs to the water system in a timely manner.
2. List any other outside services and provide a copy of any service agreements. For example, the owner of a water system may enter into a contractual agreement with a certified operator, a certified laboratory or management firm. In the case of a system connecting to an existing water system, the owner of the new system may wish to contract with the existing utility to handle both the meter reading and billing functions.

G. Operation and Maintenance Procedures

Section R.61-58.7(B)(2) requires that each public water system have and maintain up-to-date written Standard Operating Procedures for the operation and maintenance of its system.

In lieu of including a copy of the standard operating procedures in the business plan, provide a listing of all standard operating procedures, person responsible for updating each procedure, date of last revision, and where a copy of each procedure is located (e.g., procedures for repairing water lines should be kept in each maintenance vehicle and in the office of the distribution system operator). It is also recommended that a complete up-to-date set of all procedures be maintained in one location.

H. Detailed Cost Estimate for the Operation and Maintenance of the System as it Relates to the Management Plan

1. Provide an itemized list of costs for implementing a management plan for each alternative (e.g., salaries, contractual operations costs, etc.).
2. Provide an explanation of how each cost was derived.

VI. Financial Plan

A. Definition

The financial plan for a water system consists of projections that a water system's revenues and cash flow will be sufficient for meeting the cost of construction, operation and maintenance for at least five full years. The financial plan must also include assurances deemed necessary for the system to remain viable. Examples of assurances are: 1) a projection of rates showing a significant coverage ratio; 2) escrow funds; 3) bonding; and, 4) letter of credit.

B. Identifying Expenses

Using the cost estimates developed in the Facilities Plan and Management Plan, itemize the expected expenses for at least the next five years. Give a brief explanation, including calculation where applicable, justifying how each expense was derived. When projecting recurring operation and maintenance expenses, an inflation factor, as well as historical trends of the system must be used in projecting the expenses.

It is very important that these expenses include a line item for setting aside money in an asset replacement fund. The amount of funds set aside each year should equal the annual depreciation of the system's assets. Fully funding the depreciation of fixed assets, including donated assets, is very important for small water systems. For large water systems it may be more practical to set aside enough money to replace several expensive pieces of equipment which are critical to the systems operation (i.e., raw water pump, high service pump, well, etc.).

In addition to the asset replacement fund, a system should also establish a capital improvements fund to help finance any upgrades and expansions to the system as identified in the facilities plan.

C. Identifying Revenues

List the revenue sources and estimate the expected revenues over at least the next five years. Based on current conditions (rates, historical trends of the system, etc), what are the expected revenues for each of the next five years? Include a brief explanation, including calculation where applicable, justifying how each amount was derived. Business plans that are submitted to the Department for review must include a copy of audited financial statements for the last three years and a budget report for the current year which shows actual revenues and expenses to date as compared to budgeted amounts.

D. Prepare a Budget

Based on current conditions, will the system generate enough revenues to meet the expenses identified above? If not, what actions must be taken to generate the funds necessary to meet the needs of the system? Will the user charge rates need to be increased? Will the system need to borrow money to replace equipment? Will the system need to borrow money to upgrade or expand the system? Can the system afford to borrow the money at current user charge rates? These are just a few questions that must be evaluated when developing a budget for the next year. Once next year's budget has been developed, estimate the revenues and expenses over the next four years. Will the expected revenues exceed expected expenses? The key issue is that future budgets must be developed with the goal that the system will eventually become a self-supporting entity (i.e., a viable entity).

E. Assurances that the System will Remain Viable

Maintaining a budget where revenues exceed expenses is the first and most important assurance that a system can provide to insure that it will remain viable. Additional assurances are:

- Establishing and adequately funding an asset replacement fund. Steps must be taken to insure that the funds are used for what they are intended (e.g., escrow such funds). If money is borrowed from the funds for purposes other than intended, the system must insure that the funds are repaid, with interest, prior to any need for the money.
- Many local governments depend heavily on their public water system to operate at a profit in order to subsidize other governmental operations. This is permissible, provided that the water system comes first (i.e., pay all expenses first, including setting aside money for funding asset replacement and capital improvements).
- For investor owned utilities, establishing and maintaining an adequate performance bond as required by the South Carolina Public Service Commission. is another means of providing financial assurance.

Appendix A

DHEC ENVIRONMENTAL QUALITY CONTROL DISTRICT OFFICES

<i>DHEC District Offices of EQC</i>	
<p>Appalachia I 2402 N. Main Street Anderson, SC 29621 864-260-5569 (fax: 260-4855) <i>Anderson and Oconee Counties</i></p>	<p>Lower Savannah 218 Beaufort Street, NE Aiken, SC 29801 803-641-7670 (fax: 641-7675) <i>Aiken, Allendale, Bamberg, Barnwell, Calhoun and Orangeburg Counties</i></p>
<p>Appalachia II 301 University Ridge, Suite 5800 Greenville, SC 29601 864-241-1090 (fax: 241-1092) <i>Greenville and Pickens Counties</i></p>	<p>Pee Dee 145 E. Cheves Street Florence, SC 29506 843-661-4825 (fax: 661-4858) <i>Chesterfield, Darlington, Dillon, Florence, Marion and Marlboro Counties</i></p>
<p>Appalachia III 975 N. Church Street Spartanburg, SC 29303 864-596-3800 (fax: 596-2136) <i>Cherokee, Spartanburg and Union Counties</i></p>	<p>Trident 1362 McMillan Ave., Suite 300 Charleston, SC 29405 843-740-1590 (fax: 740-1595) <i>Berkeley, Charleston and Dorchester Counties</i></p>
<p>Catawba P.O. Box 100 Fort Lawn, SC 29714 803-285-7461 (fax: 285-5594) <i>Chester, Lancaster and York Counties</i></p>	<p>Upper Savannah 613 South Main Street Greenwood, SC 29646 864-223-0333 (fax: 223-6935) <i>Abbeville, Edgefield, Greenwood, Laurens, McCormick and Saluda Counties</i></p>
<p>Central Midlands P.O. Box 156 State Park, SC 29147 803-935-7015 (fax: 935-6724) <i>Fairfield, Lexington, Newberry and Richland Counties</i></p>	<p>Waccamaw 1705 Oak Street Plaza, Suite #2 Myrtle Beach, SC 29577 843-448-1902 (fax: 946-9390) <i>Georgetown, Horry and Williamsburg Counties</i></p>
<p>Low Country 1313 Thirteenth Street Port Royal, SC 29935 843-522-9097 (fax: 522-8463) <i>Beaufort, Colleton, Hampton and Jasper Counties</i></p>	<p>Wateree 105 Magnolia Street Sumter, SC 29151 803-778-1531 (fax: 773-6366) <i>Clarendon, Kershaw, Lee and Sumter Counties</i></p>

Appendix B

CONSTRUCTION COSTS

ESTIMATE OF CAPITAL COST OF CONNECTING TO AN EXISTING SYSTEM				
NAME OF EXISTING SYSTEM: _____				
ITEM	UNIT	QUANTITY	UNIT COST	COST
Impact Fee				
Tap Fee				
Meter Fee				
Backflow Preventer (type? _____)				
Distribution System Water Lines				
Size and Type: _____				
Size and Type: _____				
Valves in Distribution System				
Size and Type: _____				
Size and Type: _____				
Blowoff(s)				
Size and Type: _____				
Size and Type: _____				
Fire Hydrant (if required by system)				
Bridge/culvert Crossings (complete)				
Bore and Jack Casing (complete)				
Thrust blocking				
Total Coliform Analyses				
Asphalt Repair				
Engineering Consultant Design Fee				
Engineer's Inspection/Certification Fee				
Legal & Administrative				
Land and Right-of-way				
Easement Survey				
Other (attach itemized list of other costs)				
TOTAL COSTS				

ESTIMATE OF THE CAPITAL COST OF CONSTRUCTING A NEW SOURCE (WELL)				
ITEM	UNIT	QUANTITY	UNIT COST	COST
Drilling of Well				
Grout				
Pumping Test				
Water Quality Analyses				
Pump				
Drop Pipe				
Well Head Piping (pipe, pressure gauge, meter, etc)				
Electrical (all wiring, controls, service box, etc.)				
Concrete Pad & Well house				
Storage Tank				
Distribution System Water Lines				
Size and Type: _____				
Size and Type: _____				
Valves in Distribution System				
Size and Type: _____				
Size and Type: _____				
Blowoffs				
Size and Type: _____				
Size and Type: _____				
Thrust Blocking				
Treatment Equipment (provide itemized list of costs)				
Total Coliform Analyses				
Engineering Consultant Design Fee				
Engineer's Inspection/Certification Fee				
Other (attach itemized list of other costs)				
TOTAL COSTS				

Appendix C

ANNUAL OPERATION AND MAINTENANCE

ANNUAL OPERATION AND MAINTENANCE COSTS OF CONNECTING TO AN EXISTING SYSTEM	
NAME OF EXISTING SYSTEM: _____	
ITEM	ANNUAL COST
Cost of Water from Existing System (provide calculations)	
Testing of Backflow Prevention Device(s)	
DHEC Fee/Water Quality Monitoring	
Chemicals	
Maintenance	
South Carolina Public Service Commission	
Operator/Administrative Cost (attach itemized list of cost)	
Other Cost (attach itemized list of other costs)	
TOTAL ANNUAL O & M COSTS	

ANNUAL OPERATION AND MAINTENANCE OF A WELL SYSTEM	
ITEM	ANNUAL COST
DHEC Fee/Water Quality Monitoring	
Electricity	
Chemicals	
Maintenance	
South Carolina Public Service Commission	
Operator /Administrative Cost (attach itemized list of cost)	
Other (attach itemized list of other costs)	
TOTAL ANNUAL O & M COSTS	

Appendix D

**DRINKING WATER QUALITY SAMPLING
OF
NEW PUBLIC WATER SUPPLY WELLS**

**DRINKING WATER QUALITY SAMPLING
OF
NEW PUBLIC WATER SUPPLY WELLS**

All new wells serving “community” and “non-transient non-community” water systems must be sampled and analyzed for the drinking water quality parameters included in Tables 1, 2 and 3 below. The samples must be analyzed by a certified laboratory. The results of these analyses must be included in the follow-up application for a “test well” permit or with the engineer’s certification letter if the well construction project is permitted in one step. Please refer to Section R.61-58.1(B)(8) of the State Primary Drinking Water Regulations concerning the steps involved in the permitting of new groundwater sources.

Unless otherwise specified, the unit of measure for each of the maximum contaminant levels (MCL) listed in the following tables is in milligrams per liter (mg/l).

TABLE 1			
PRIMARY DRINKING WATER PARAMETERS			
INORGANIC CHEMICALS (IOC)			
Contaminant	MCL	Contaminant	MCL
Arsenic	0.05	Fluoride	4.0
Antimony	0.006	Lead	TT ¹
Barium	2.0	Mercury	0.002
Beryllium	0.004	Nickel	0.1
Cadmium	0.005	Nitrate	10.0
Chromium	0.1	Nitrite	1.0
Copper	TT ¹	Selenium	0.05
Cyanide	0.2	Thallium	0.002

PRIMARY DRINKING WATER PARAMETERS (CONTINUED)

SYNTHETIC ORGANIC CHEMICALS (SOC)

Contaminant	MCL	Contaminant	MCL
Alachlor	0.002	Dalapon	0.2
Atrazine	0.003	Di(2-ethylhexyl)adipate	0.4
Carbofuran	0.04	Di(2-ethylhexyl)phthalate	0.006
Chlordane	0.002	Dinoseb	0.007
Dibromochloropropane (DBCP)	0.0002	Diquat	0.02
Ethylene dibromide (EDB)	0.00005	Endothall	0.1
Heptachlor	0.0004	Endrin	0.002
Heptachlor epoxide	0.0002	Glyphosate	0.7
Lindane	0.0002	Hexachlorobenzene	0.001
Methoxychlor	0.04	Hexachlorocyclopentadiene	0.05
PCBs	0.0005	Oxamyl (vydate)	0.2
Pentachlorophenol	0.001	Picloram	0.5
Toxaphene	0.003	Simazine	0.004
Benzo(a)pyrene	0.0002	2,3,7,8-TCDD (Dioxin)	30.0 pg/L ²
		2,4-D	0.07
		2,4,5-TP	0.05

VOLATILE ORGANIC CHEMICALS (VOC)

Contaminant	MCL	Contaminant	MCL
Benzene	0.005	trans-1,2-Dichloroethylene	0.1
Carbon tetrachloride	0.005	Trichloroethylene	0.005
cis-1,2-Dichloroethylene	0.07	Vinyl chloride	0.002
Dichloromethane	0.005	Xylenes (total)	10.0
Ethylbenzene	0.7	1,1-Dichloroethylene	0.007
Monochlorobenzene (chlorobenzene)	0.1	1,1,1-Trichloroethane	0.2
o-Dichlorobenzene	0.6	1,1,2-Trichloroethane	0.005
para-Dichlorobenzene	0.075	1,2-Dichloroethane	0.005
Styrene	0.1	1,2-Dichloropropane	0.005
Tetrachloroethylene	0.005	1,2,4-Trichlorobenzene	0.07
Toluene	1.0		

PRIMARY DRINKING WATER PARAMETERS (CONTINUED)	
NATURALLY OCCURRING RADIONUCLIDES³	
Contaminant	MCL
Radium 226 and Radium 228 Gross Alpha particle activity (including radium-226 but excluding radon and uranium)	5 pCi/l ⁴ 15 pCi/l ⁴
MAN-MADE RADIONUCLIDES³	
Contaminant	MCL
Beta particle and photon activity	4 mrem ⁵
MICROBIOLOGICAL	
Contaminant	MCL
Total Coliform Turbidity	* 6 5.0 NTU ⁷

TABLE 2			
SECONDARY DRINKING WATER PARAMETERS			
Contaminant	MCL	Contaminant	MCL
Aluminum	0.05 to 0.2	Manganese	0.05 ⁸
Chloride	250.0	pH	6.5 - 8.5
Color	15colorunits	Silver	0.1
Copper	1.0	Sulfate	250.0
Fluoride	2.0	Total Dissolved Solids (TDS)	500.0
Iron	0.3 ⁸	Zinc	5.0

TABLE 3**OTHER WATER QUALITY PARAMETERS**

Contaminant	MCL
Alkalinity	None
Calcium Hardness	None
Conductivity	None
Sodium	None ⁹

1. Treatment Technique as outlined in the Lead and Copper Rule (R.61-58.11). Source water treatment for the removal of lead or copper will be required if the lead level in the well water exceeds .015 ml/l or the copper level in the well water exceeds 1.3 mg/l.
2. The unit of measure is in picograms per liter. Monitoring for dioxin may be waived by the Department if the design engineer can certify that the well is not within 1000 feet of a pulp and paper manufacturing facility, wood treatment facility, municipal or industrial waste incineration facility, military installation, and chemical plant or site where 2,4,5 trichlorophenol (Silvex) or hexachlorophene was manufactured and/or disposed of (this would include but not be limited to any municipal or county landfill or disposal site).
3. Radiological testing is required for "community" water systems only.
4. Testing is only required for Type I wells (open hole wells into bedrock aquifers). The unit of measure is in picocuries per liter.
5. The unit of measure is in millirem per year.
6. In accordance with the Total Coliform Rule, no more than 5% of the samples per month may be positive. For systems collecting fewer than 40 samples per month, no more than 1 sample per month may be positive.
7. The water produced by a completed well must have a turbidity of less than 5.0 nephelometric turbidity units (NTU) unless it can be demonstrated that the turbidity is due to the natural water quality of the aquifer.
8. Treatment will be required for all new wells serving community water systems which exceed the MCL.
9. There is no MCL for sodium. However, community water systems are required to monitor for sodium (annually for systems which utilize surface water and every three years for systems utilizing groundwater) and notify the Department of the sodium levels within three months of receiving the results.