

**STATE OF RHODE ISLAND
AND PROVIDENCE PLANTATIONS**

RI WATER RESOURCES BOARD

**Rules and Procedures for
WATER SUPPLY SYSTEM MANAGEMENT PLANNING**

OCTOBER 1998

AUTHORITY: These regulations are adopted in accordance with Chapter 42-35 pursuant to Chapter 46-15.3 of the Rhode Island General Laws (1997).

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SECTION 1.00 PURPOSE AND GOALS

1.01 The purpose of these regulations is to implement the provisions of Chapter 46 - 15.3 of Rhode Island General Laws (RIGL), as amended, to ensure: (1) Water Supply Systems Management Plans (WSSMP), including emergency management and contingency plans, are prepared, maintained, and carried out by each entity engaged in or authorized to engage in the supply, treatment, transmission or distribution of drinking water; (2) that the WSSMPs are consistent with policy set forth in State Guide Plan Elements; (3) that the plans and their execution achieve effective conservation, development, utilization, and protection of this finite natural resource in ways that meet the present and future needs of the state and its people; (4) that Water Quality Protection Plans (WQPP) are incorporated as components of WSSMPs; (5) that the WQPP component includes strategies for well-head and watershed protection required by statute and for drinking water quality improvements; (6) that policies and procedures for collecting and administering the Water Quality Protection Fund are implemented consistent with the intent of applicable Rhode Island General Laws, bonding agreements, and public interest.

1.02 The Board recognizes that compliance with these requirements may occur over time and that preparation of the plans called for by these rules initiates a process whereby the objectives of RIGL Chapter 46-15.3 are met. The Board expects water suppliers to comply with these rules as expeditiously as possible. Where applicable, plans shall include schedules for the completion of work required by these rules.

1.03 In accordance with policy, planning efforts shall ensure that existing sources of supply be maintained as long as their use or reactivation is feasible. Feasibility includes, but is not limited to, consideration of the quality of the source, the safe yield, the costs of operating and maintaining the source, and other statutory and nonfinancial constraints.

1.04 The principal goals of these rules are to produce a management plan for each water supply system that will: (1) meet all statutory requirements; (2) carry out applicable policies and recommendations of the State Guide Plan; (3) assist water suppliers in the development, operation, and maintenance of their systems; (4) gain and maintain the eligibility of water suppliers to obtain financial assistance available for protection of water quality or for any other purpose related to management of water supply systems; and (5) give local governments, state agencies, and the public information needed to assess the current and future needs of water supply systems in relation to community and state development so that they can assist water suppliers in meeting these needs.

SECTION 2.00 LEGISLATIVE AUTHORITY

These rules and procedures are promulgated pursuant to the requirements and provisions of RIGL Chapter 46-15.3, Water Supply System Management Planning Act, as amended.

SECTION 3.00 LIBERAL APPLICATION

The terms and provisions of these rules and procedures shall be liberally construed to allow the

Board to effectuate the purposes of state law, goals and policies consistent with the Water Supply System Management Planning Act, RIGL Chapter 46-15.3 as amended.

SECTION 4.00 SEVERABILITY

If any provision of these rules and procedures or the application thereof to any person or circumstances is held invalid by a court of competent jurisdiction, the remainder of the rules and procedures shall not be affected thereby. The invalidity of any section or sections or of parts of any section or sections shall not affect the validity of the remainder of these rules and procedures.

SECTION 5.00 CONFORMITY WITH OTHER LEGISLATION

The water supply systems management plans shall conform to all applicable provisions of state and federal laws including the federal Safe Drinking Water Act (42 USC 300f *et seq.*); RIGL Chapter 46-13, Public Drinking Water Supply; and Chapter 46-14, Contamination of Drinking Water, as administered by the RI Department of Health.

SECTION 6.00 DEFINITIONS

For the purposes of these regulations, the following terms shall have the following meanings:

- 1) **Abandoned water supply sources** shall mean the sources that are no longer used or maintained, such as permanently disconnected surface waters or wells.
- 2) **Act** shall mean the Water Supply Systems Management Act.
- 3) **Active water supply sources** shall mean RI Department of Health-approved sources of supply connected to a water supply system and available for distribution; these sources may be surface waters or wells, residential or other uses.
- 4) **Aquifer** shall mean a geological formation, groups of formations, or part of a formation capable of yielding a significant amount of groundwater to wells, springs, or surface water.
- 5) **Available water** shall mean the maximum amount of water that can dependably be supplied, taking into account limitations imposed by hydraulic or other considerations. In determining the available water, estimates of the safe yield of surface reservoirs and/or well capacity of groundwater sources shall be utilized as appropriate. Water committed by another water supplier through interconnections may be included in the determination of available water. Once accounted for in a water system's calculation of available water, the same volume of water may not be accounted for in another supplier's calculation of available water. Temporarily inactive, abandoned, and emergency water supply sources shall not be included unless approved by the Board. System storage shall not be included in the calculation of available water.
- 6) **Board** shall mean the Rhode Island Water Resources Board as established by Title 46, RIGL

Chapters 15 and 15.1.

7) **Commercial agriculture producers** shall mean producers with gross income from sale of agricultural commodities of \$2500.00 or more during a calendar year.

8) **Commission** shall mean Public Utilities Commission.

9) **Comprehensive Plans** shall mean local comprehensive plans as required by RIGL Chapter 45-22.2.

10) **Conservation** shall mean methods, procedures, and devices designed to promote efficient use of water and to eliminate waste of water.

11) **Consumption** shall mean all water delivered by water suppliers for its intended use for industrial, commercial, agricultural, residential or other uses.

12) **Demand, average daily** shall mean the total volume of water supplied to the system including changes in storage over the representative period divided by the number of days in that representative period. The most recent representative period of record shall be utilized and shall not be affected by unusual demand conditions such as drought or a significant temporary increase in demand.

13) **Demand management** shall mean any conscious effort to modify water use for efficient utilization of available supply.

14) **Demand, maximum daily** shall mean the maximum one day rate of water supplied to the system including changes in storage experienced over the most recent year not affected by unusual demand conditions, such as drought or a significant temporary increase in demand.

15) **Demand, peak hourly** shall mean the maximum one-hour rate of water supplied to the system including changes in storage experienced over the most recent year.

16) **Distribution facilities** shall mean the pipes and appurtenant facilities employed specifically to deliver, to dispense, to render or to circulate potable water directly to the consumer.

17) **Drought** shall mean a condition of dryness due to lower than normal precipitation. For water supply purposes drought is associated with safe yield especially for conditions where a system cannot be replenished and failure is anticipated.

8) **Eligible expenditure** shall mean the acquisition of a fee simple interest or of a conservation restriction, as that term is defined in RIGL Title 34, Chapter 39-Paragraph 2 (a) or other interest in watershed lands including, but not limited to, costs and expenses relating to the improvement of such lands or interests therein, maintenance of the lands or roads or interests therein, and taxes thereon, and the costs of preparation of Water Quality Protection Plan (WQPP) components and updates, and related property surveys and appraisals, or the funding of the construction of physical improvements that directly protect water supply. Watershed lands eligible for protection may be located in or out of state. No funds shall be used to extend service lines or expand system

capacity.

19) **Emergency water supply sources** shall mean not regular sources of supply but supplies held in reserve for use in emergencies. The use of emergency water supply sources must be approved by the RI Department of Health; these may be surface waters or wells.

20) **Fund** shall mean the Water Quality Protection Fund according to RIGL 46-15.3-5 and 46-15.3-9.

21) **Groundwater recharge** shall mean the process of addition of water to the zone of saturation, that is, the zone beneath the water table.

22) **Institutional water supplier** shall mean any public water system as defined in the rules and regulations pertaining to public drinking water under RIGL 46-13, which does not sell water but supplies more than 50 million gallons per year of drinking water and is governmental or quasi-governmental in nature.

23) **Major user** shall mean any public or private organization or entity using more than 3 million gallons of water per year (a water system may use a lower threshold).

24) **Master meter** shall mean a meter that measures water from a source of supply or from other water suppliers.

25) **Metered supply** shall mean the quantity of water measured at the points of entry into the transmission and distribution system.

26) **Non-account water** shall mean the difference between the metered supply and the metered consumption for a specific period including an allowance for fire fighting.

27) **Raw water** shall mean water in its natural state prior to any treatment.

28) **Recharge area** shall mean the land surface from which water is added to the zone of saturation. The recharge area for a particular well or aquifer, for instance, is that land surface from which water moves to the well or aquifer or may move to the well or aquifer under certain hydraulic conditions.

29) **Safe Drinking Water Act (SDWA)** shall mean the federal legislation of 1974, amended in 1986, and reauthorized in 1996, to establish standards for drinking water safety.

30) **Safe yield (surface water)** shall mean a sustainable withdrawal that can be continuously supplied from a surface water supply source without adverse effects throughout a critical dry period with a 1% chance of occurrence, or one that is equivalent to the drought of record, whichever is more severe.

31) **Safe yield (aquifer or well)** shall mean the rate at which groundwater can be withdrawn without producing unacceptable or undesirable effects such as drawdowns or changes in water quality.

32) **Saturated thickness** shall mean the thickness of an aquifer measured from the water table to an essentially impermeable boundary; such boundary is typically taken to be the top of the bedrock surface.

33) **Service area** shall mean the geographic boundary within which service connections to customers of a water supply system are committed by charter of the water commission, board, or authority.

34) **Source** shall mean the raw water upon which a public water supply system depends, and refers to both groundwater and surface water.

35) **Specific capacity** shall mean the discharge of a well per unit of drawdown.

36) **Susceptibility determination** shall mean an analysis of the potential for a water supplier to draw water contaminated by inventoried sources at concentrations that would pose concern. Such a determination, therefore, would likely take into account hydrologic and hydrogeologic factors, inherent characteristics of the contaminants (e.g., toxicity, environmental fate and transport); and characteristics of the potential source of the contaminant (location, likelihood of release, effectiveness of mitigation measures). In small source water protection areas, where differences in distances between sources and intake are small, and hydrologic and hydrogeologic factors are relatively constant, susceptibility of a water supply is related to the likelihood of a significant release and the inherent characteristics of the source (e.g., toxicity, fate and transport, etc.).

37) **Total reservoir storage capacity** shall mean the reservoir volume at the normal full pool level or spillway elevation.

38) **Transmission facilities** shall mean the pipes, pumping stations, and storage facilities required to carry high volumes of potable water from a water source to distribution facilities, or throughout an area for the purpose of supplying water to the general population, or wholesale customs.

39) **Transmissivity** shall mean a measure of the ability of an aquifer to transmit a fluid. It can be quantified as the hydraulic conductivity multiplied by the saturated thickness.

40) **Useable reservoir storage capacity** shall mean the difference between the total reservoir storage capacity and the volume at the minimum reservoir storage level as determined by the intake pipe elevation or the water elevation below which water cannot be treated to meet water quality standards.

41) **User category** shall mean metered single-family residential, multi-residential, commercial, industrial, or wholesale purchaser (for example, another water supplier), metered water system usage, water used for fire fighting purposes and non-account water

Multi-residential shall include apartments, condominiums, nursing homes, college dormitories, correctional facilities and any other commercial or institutional entity, which provides non-transitory housing and are not metered separately.

Commercial shall include non-governmental institutions and entities identified by the following Standard Industrial Classification (SIC) two-digit major group codes:

Agriculture, etc. - Major Groups 01 - 09

Construction - Major Group 15 - 17

Transportation, communications, electric, gas, etc - Major Groups 40 - 48

Wholesale Trade - Major Groups 50, 51

Retail Trade - Major Group 52 - 59

Finance, Insurance, etc. - Major Groups 60 - 67

Services - Major Groups 70 - 89

Industrial shall include entities identified by the following SIC two-digit major group codes:

Mining - Major Group 14

Manufacturing - Major Groups 20, 22 - 39

Transportation, communication, electric, gas, etc. - Major Group 49

Metered governmental shall include an estimate of water used for fire fighting purposes and those entities identified by the following SIC two-digit major group codes:

Public Administration - Major Groups 91 - 97

Non-account water may include unmetered water usage, leaks, theft, etc.

42) **Watershed** shall mean those land areas, which because of their topography, subsurface characteristics, and drainage patterns, act as collectors of raw water, which replenish or recharge surface and ground water supply sources.

43) **Water supplier** shall mean any municipality, municipal department, agency, district, authority, or other entity engaged in or authorized to engage in the supply, treatment, transmission or distribution of drinking water on a wholesale or retail sales basis.

44) **Water supply emergency** shall include, but not be limited to, one or a combination of the following situations:

(1) Mechanical failure or similar type of emergency including loss of power, loss of pumping capacity, loss of storage capability or major breaks or leaks which result in an inability to meet average daily or maximum daily demand for water.

(2) Water quality emergencies due to contamination of the water supply, the distribution system or storage tanks which result in an inability to meet average daily and maximum daily demand with remaining public water supplies.

(3) Seasonal water shortages or inadequacy of source, distribution system or storage capacity to meet water supply needs.

45) **Water supply sources temporarily inactive** are seasonal sources of supply or sources temporarily not in use due to mechanical or quality problems or lack of demand. These sources may be surface waters or wells and, depending upon the reason for the "temporarily inactive" status, have RI Department of Health approval or must be approved by the RI Department of Health prior to use.

46) **Water system** shall mean any combination of interconnected sources and facilities used for

supplying potable water. Water systems are owned and operated by water suppliers.

47) **Wellhead Protection Area (WPA)** shall mean the surface and subsurface area surrounding a public drinking water well through which contaminants are reasonably likely to move toward and reach the wellhead. Commonly called "well field" or "recharge area".

SECTION 7.00 APPLICABILITY - PREPARATION OF PLANS

All water suppliers and institutional water suppliers which obtain, transport, purchase, or sell more than 50,000,000 gallons of water per year shall be required to prepare, maintain, and carry out a Water Supply Systems Management Plan (WSSMP) as described by these procedures. A supplier that bills 50 million gallons or less of public drinking water per calendar year shall be exempt from the implementation of the Act under the Board's application of "de minimis no carat lex". In order to continue to qualify for said de minimis exemption the supplier must report annually in January of each year the total amount of water produced or total amount of water billed for the preceding calendar year. Any supplier exceeding the 50 million-gallon threshold for the prior calendar year shall be subject to this Act, these rules, and the imposition of water quality charges starting March 1st following the calendar year in which billings exceeded the 50 million-gallon threshold. Once a de minimis supplier becomes subject to imposition of the charge under these rules, even though such supplier may subsequently fall below the 50 million gallon per year threshold, said supplier shall continue to be subject to the Act. Institutional water systems, which exceed the 50 million-gallon threshold, shall be subject to this act. Pumping records on a calendar year basis shall be utilized as the indicator for this eligibility.

SECTION 8.00 PLAN CONTENTS

Water Supply System Management Plans shall address each of the topics listed in this section, to the extent that each is relevant to the water supplier, the water source(s), the water system(s), and the area served or eligible to be served. The plan shall include an Executive Summary highlighting the elements of the plan.

8.01 Goals Statement

(a) Stated goals shall promote the effective and efficient conservation, development, utilization, and protection of the states' surface and ground water resources.

(b) Goal statements shall be consistent with the comprehensive plan of the municipality or municipalities in which the service area is, or is planned to be, located and with State Guide Plan Element 721, "Water Supply Policies for Rhode Island."

8.02 Water Supply System Description

(a) Organization and Legal Structure: The organization and legal structure of the water supply system shall be described. The plan shall state the owner of the water supply system; the name of

the chief executive officer, director or agency head, and board of directors shall be included. A chart of the organizational structure showing all aspects of water system management and operation shall be provided. Major responsibilities for each management position shown on the organizational chart shall be described. The water supply system's legal basis shall be described.

(b) System Overview: The description of the water system shall include a system overview, which generally describes all system components, the functions and relationships of each and any recent improvements thereto. A schematic drawing of water supply sources and infrastructure components including all transmission lines, treatment and storage facilities, pump stations, and system interconnections shall be provided.

(c) Supply Sources: All water supply sources shall be listed and mapped and a description of each provided. This shall include all surface and groundwater supplies owned or operated by the water supplier or available through contractual agreements. The operating status of each water supply source shall be noted as abandoned, active, emergency, or temporarily inactive, as defined herein. A general discussion of the reason for the temporarily inactive or abandoned status of any water source shall be provided. The description of abandoned sources shall rely upon existing information, no additional information or field verification of information shall be required.

(1) Surface Water Sources: The location of each source, of intake structures, of impoundment and watershed, and water supplier-owned lands shall be mapped at an appropriate scale for each surface water supply. The description of each surface impoundment shall include the surface area of the impoundment, size and elevation of intakes, stage storage curve or table, total and useable storage capacity, and the acreage of the watershed. Also, include any existing or proposed, minimum downstream discharge rates imposed by a permitting agency or other lawfully imposed requirement shall be described. For systems with multiple impoundments, the function of each reservoir shall be noted as distribution or storage with a description of the relation of all components of the system.

(2) Groundwater Sources: The location of wells, principal aquifers, recharge areas, and water supplier-owned lands shall be shown for each groundwater source. The description of each groundwater source shall include the type and location of the well, its depth and diameter; the type of pump, age, remaining useful life, and its rated capacity and head, screen length and depth of screen from the surface, slot size, and casing material. The existing monitoring program shall also be described including sampling locations, the location of monitoring wells, the type of data collected (include qualitative and/or quantitative parameters measured), and frequency of monitoring.

(d) Infrastructure Components: All infrastructure components, including treatment and storage facilities, transmission lines, and pumping stations shall be listed and mapped and a description of each provided. Pressure zones shall be depicted on the map of infrastructure components. Transmission facilities shall not include distribution facilities.

(1) Treatment Facilities: The name and location of water treatment facilities, the source(s) that are treated, and the treatment available shall be described. The design flow and emergency provisions such as, standby generators, chemical feed equipment and bypasses shall also be described for each facility. Techniques for disposal of filter back wash and treatment tank sludge

including the disposal site or discharge location shall be described.

(2) Storage Facilities: The name, location and total useable volume of each storage facility (including clearwells) shall be described. The age and condition of the facility and date of last inspection shall be described. The description of all new storage facilities shall include the material it is constructed of, the interior paint coating or lining, and whether cathodic protection is provided. This information should also be included for existing facilities, if available.

(3) Pump Stations: The name, location, capacity, and number of pump stations and related capacities shall be described. If applicable, a description of any hydropneumatic storage tank(s) associated with each pumping facility should also be provided. Emergency power provisions that are available at each facility shall be included.

(4) Transmission Facilities: The description of the transmission system shall include the type of pipe, length, diameter, age and condition as available through routine operation and maintenance. The description should also include a leakage and repair history, where available. Age should be provided as the actual year the pipe was installed, if known, or to the nearest 10-year increment.

(e) Interconnections: All available interconnections with other water supply systems including connections for emergency purposes, whether for sale or purchase of water, shall be listed and mapped and a description of each provided. The operational parameters of the interconnections shall be explained indicating the quantity and frequency of water delivered. The capacity and condition of the transmission main and any pumping facilities shall be described. Legal, technical and financial requirements for interconnection use shall be specified and any source, hydraulic or contractual limitations to use described. A summary of any contracts for purchase or sale of water shall be included.

(f) Service Area: The present service area and any planned extensions thereto shall be described and mapped. The description shall include:

(1) The geographic extent of the defined boundary including the areas served by the water supply and any areas within the service area not currently served but eligible to be served;

(2) The present and historic number of water services;

(3) The present population served and the population not currently served but eligible to be served; and

(4) Population distribution patterns, economic status of users and other population demographics as available from applicable local comprehensive plans and/or the RI Department of Administration, Statewide Planning Program.

(g) Meters: The extent of source and distribution metering and programs for meter reading, testing, calibration and repair/replacement shall be described. The description shall include the location, size, ownership, and age of master meters and meters at system interconnections. The location of master meters shall be included on the map of treatment and transmission facilities described in Section 8.02(d). The description shall also include the extent of distribution metering expressed

as a percentage of total service connections. Major users and the age of their meters shall also be provided. Current programs for reading, testing, calibration, repair, and replacement of major users' meters shall be described. System specific characteristics, which affect the longevity of meters, should be described.

(h) System Production Data: Current, and as available, historic system production data shall be provided. If the system has changed substantially over time, for example, an additional well added or taken out of service permanently, a description of the changes and when they occurred shall be included. The volume of water withdrawn from each source and for the total system and the volume of water bought from or sold to another water supplier, expressed in gallons, shall be reported on at least a monthly and annual basis for the current year and on an annual basis for the historic data.

(i) Water Use Data: Current and historic water use data shall be provided. If water use has changed significantly over time, a description of the changes and when they occurred shall be included. The water use data shall include at least the following:

(1) System-wide and per capita water use expressed as; (i) average daily demand on an annual and monthly basis, (ii) maximum daily demand; and (iii) other pertinent data, such as peak hour demand, if available. For historic data, the reporting of data on an annual basis shall be sufficient. The peaking factor (maximum daily demand divided by average daily demand on an annual basis) shall also be provided;

(2) Water use analyzed by user category and sub-category (by SIC code) presented as total water use expressed in millions of gallons per year, and as average daily demand on a monthly and annual basis;

(3) A list of major users and their water use on an annual basis;

(4) Reasonable estimation and evaluation of water used for firefighting purposes, non-account water including but not limited to water supply system use, other unmetered public uses, metering inaccuracies and identified major leaks on an annual basis and as percentage of water produced;

(5) Water conservation programs currently practiced by the water supplier shall be outlined and the impact of water saving device installation upon per capita or user category described; all assumptions and the methodology utilized in estimating impacts shall be provided.

(j) Significant water supply system deficiencies and needed improvements shall be summarized based upon a review of the information compiled above.

SECTION 8.03 Requirements of the Water Quality Protection Component

(a) If a water quality protection component meeting the criteria of previous applicable rules has not been completed, every water supplier that sells more than 50 million gallons per year shall prior to disbursement of bond proceeds to such supplier, complete a water quality protection

component which at a minimum includes:

(1) Delineation of Source Water Protection Areas: A determination of the boundaries of the watersheds of reservoirs serving the supplier or of the aquifers serving the supplier or of the aquifers serving public wells.

(i) Groundwater Systems: For water suppliers relying on ground water, the delineation of source water protection areas will be in accordance with accepted methods under the state's approved Wellhead Protection Program. In cases where a protection area contiguous to the well or wellfield would alone be inadequate to provide for the protection and benefit of the public water suppliers need to delineate recharge areas that are not adjacent to or surrounding the well.

(ii) Surface Water Systems: For water suppliers relying on surface water, the delineation of the source water protection area must include the entire watershed area upstream of the intake structure. The delineation of the source water protection area for these public water supplies would be the topographic boundary. Where water is diverted into this area from another watershed(s), the watershed area(s) upstream of each diversion structure would also need to be delineated in a similar manner.

(iii) Groundwater/Surface Water Interface: Water suppliers should consider the impacts of groundwater on surface water when delineating source water protection areas for water suppliers based mostly on surface water contribution areas and zones of groundwater contribution to public surface water supplies. Water suppliers should also consider the impacts of surface water on public water wells when delineating certain systems based mostly on ground water. These source water protection areas may include surface water contribution areas in addition to the zones of groundwater contribution to the supply.

(2) Inventory of significant potential sources of contaminants of concern in each source water protection area.

(i) Contaminants of Concern: The contaminants of concern must include those raw water contaminants regulated under the Safe Drinking Water Act, contaminants with a maximum contaminant level (MCL), contaminants regulated under the Surface Water Treatment Rule (SWTR), and the microorganism *Cryptosporidium*. In addition, inventories will also include those contaminants that are not federally regulated under the Safe Drinking Water Act but which the Department of Health has determined may present a threat to public health.

(ii) Significant Potential Sources: The inventory needs to include a clear description of the sources of contamination (or categories of sources) by location either specific or by area. A significant potential source of contamination includes any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants to the environment at levels that could contribute significantly to the concentration of these contaminants in the source waters of the public water supply.

(iii) For known or potential sources of contamination that are isolated to a limited number of locations, identify the names and address of these sources of contamination. For known or potential sources of contamination that cover large areas and multiple land owners, identify the geographic area where they are located. Identified sources of contamination shall be mapped on the water supply source map(s). Water supply source maps shall also identify current zoning and land use.

If copper sulfate or other algicide is applied to water supply reservoirs, their tributaries, frequency, and amount of applications shall be described.

3) Determination of Source Water Susceptibility.

(i) A susceptibility determination can be conducted by the water supplier or by the Rhode Island Department of Health. Plan updates shall require a susceptibility determination of all new sources of contamination to the water source.

(ii) A susceptibility determination shall describe how the results of the analysis identify sources of contamination of the public water supply, how significant the threat is, and the relative threat of contamination between sources within the source water protection area. The analysis will be the means for the water system to make the inventory useful for decision-making regarding source water protection.

(4) Description of present and past efforts to protect water quality, both regulatory and non-regulatory. Included in this description shall be public education initiatives, land acquisitions, acquisition of buffer zones, diversion and/or treatment of storm water or spills, and desirable land use control regulations.

(5) Identification of protection strategies determined to be most appropriate for protecting surface or groundwater quality within the source water protection area(s), which at a minimum shall include a strategy for public education that fosters water quality protection.

(6) An implementation approach for each protection strategy identified above including, but not limited to, a discussion of problems that may be encountered and how they will be resolved. A priority list of actions for implementing measures over a 5 year implementation schedule which includes a description of ongoing efforts to implement measures.

(7) Efforts to coordinate implementation of recommendations with municipal officials or boards governing land use activities within the water supply sources, watershed, or recharge area shall be documented.

(8) An approved Wellhead Protection Plan, as required by the federal Safe Drinking Water Act and RIDEM's Rules and Regulations for Groundwater Quality which meet the minimum requirements of these regulations may be referenced.

(9) Those items listed as 2(ii), 2(iii) and 3(ii) are required in the water quality protection component of the initial water supply system management plan but are optional in any update

requirements. However, all plan updates shall require a complete susceptibility determination of all new sources of contamination to the water source.

8.04 Supply Management

Description of supply management measures necessary to insure present and future availability of drinking water in adequate quantity and quality to meet existing and projected demands for the 5 and 20 year planning periods shall include but not be limited to the following:

8.04.1 Anticipated Future Demand

Anticipated future demand for the 5-year and 20-year planning periods shall be described, including but not limited to:

(a) Estimates of changes in population and economic development within existing and planned future extensions to service areas;

(1) Population changes shall be based upon an analysis of existing and potential land uses consistent with relevant Comprehensive Community Plans and population projections provided by the RI Statewide Planning Program. If water supplier's population growth projections differ by more than 10% from estimates developed by the relevant municipality(ies), the water supplier shall provide explanation for the differences;

(2) The assessment shall include estimates of future wholesale customers and any system expansions resulting from the agreed upon merger of water supply systems;

(b) Any legal obligations to provide water including a description of the intended users, the amounts required and the duration of the contract;

(c) To the extent possible, projected future water use or demand by user category including total water use expressed as millions of gallons per year, average daily demand on an annual basis, maximum daily demand, and assessment of the impact of proposed conservation measures on future demand;

(d) Projected future water use by major users on an annual basis;

(e) Reasonable estimation and evaluation of water used for fire fighting purposes and non-account water including water supply system use; other unmetered public uses, metering inaccuracies and major leaks, expressed as millions of gallons per day; and

(f) Consideration should be given to the potential for matching the end uses of water to the quality necessary for that purpose. Any plan to utilize non-potable water must also describe a cross-connection control program.

8.04.2 Available Water

An analysis of the ability to provide an adequate supply of potable water to existing and projected customers for the 5-year and 20-year planning periods and as necessary, identification of timing and quantity of additional supplies and facilities required to meet anticipated needs, shall be provided as specified below.

(a) General policies:

(1) The safe yield of surface water sources shall be determined using a mass balance analysis based on a critical dry period with a 1% probability of occurrence or drought of record, whichever is worse.

(2) Water suppliers who, for operational purposes, utilize a safe yield definition based upon a critical dry period with a probability of occurrence greater than 1%, must state the reasons for utilizing such an approach and document proposed or implemented measures to safely manage the higher level of risk. In no case will a safe yield analysis based upon a critical dry period with a probability of occurrence greater than 5% be considered acceptable.

(3) Safe yield analyses previously performed that substantially meet the requirements of this section may be submitted in lieu of the study required herein and shall be reviewed on a case-by-case basis.

(4) Water suppliers operating under a safe yield based upon a critical dry period with a probability of occurrence greater than 1% shall undertake demand, supply, system and emergency management measures to effectively reduce the system's level of risk.

(5) Water suppliers, whose average daily demand for the most recent year exceeds the available water, shall immediately initiate demand, supply, and system management measures as appropriate.

(b) Determination of safe yield for surface water supplies shall be based on the general mass balance equation such that:

$$SI - SO = S \text{ where;}$$

SI = summation of all different forms of inflow to the reservoir.

SO = summation of all different forms of outflow from the reservoir.

S = net change of storage within the reservoir.

The methodology for determining the safe yield of surface water supplies shall include but not be limited to the following:

(1) Gauged stream data collected from within the watershed shall be used for determining stream flow into a reservoir. Where such data are not available gauge data from another watershed (external) which closely approximates the watershed of interest may be used. Factors to

consider when selecting the external gauging station shall include location, percent stratified drift, vegetation, slope, flow regulation, upstream land uses and drainage area size.

(2) Runoff information must be related to stream gauging records.

(3) Direct precipitation and evaporation related to surface area of the reservoir shall be included in the mass balance analysis. Rainfall and evaporation data shall be based on an interval no greater than one month and may be combined for a net impact to the reservoir.

(4) Diversions of water into or out of the watershed must be included in the analysis, as well as the operating characteristics of the diversion, flow capacity of the diversion and the runoff to the point of diversion. Existing as well as proposed diversions will be analyzed.

(5) Consumptive losses to the watershed shall be evaluated.

(6) The physical characteristics of the reservoir shall be described. At minimum, this will include the total reservoir storage capacity and useable reservoir storage capacity. It will also describe whether flashboards are used and any other pertinent information necessary to describe the physical characteristics of the reservoir. Top and bottom elevation of the reservoir shall be provided using the mean sea level as a datum.

(7) Reservoirs with less than 150 million gallons of storage per square mile of watershed area shall evaluate yield based on short and long duration droughts (respectively, less than and greater than 1 year) and use the worst case for analysis. In no case shall the analysis be based on a critical dry period with less than a 1% occurrence.

(8) The operating characteristics (rules) of the reservoirs shall be described.

(9) Releases shall be described as required by federal and state law.

(10) The amount of leakage through the dam shall be estimated.

(11) The determination of safe yield shall factor in sediment deposition.

(12) When determining safe yield, outflow (water demand for domestic, industrial, commercial, and agricultural use) shall be based on monthly draft rates. Uniform withdrawal rates may be used, where appropriate, and if previously approved by the RI Water Resources Board or its successor.

(13) The critical drawdown period shall be measured from full, or near full, reservoir levels to the bottom of the useable storage or lowest elevation reached for 1 year or less-cycle reservoirs.

(14) Numerical methods are preferred for safe yield determinations. Graphical methods, consistent with item 12 of this section, may be used.

(c) Describe the methodology for determining maximum potential yield, maximum well capacity,

and well efficiency of existing groundwater supplies. Based upon available information water suppliers should present a summarized description of each well as required below. Background documentation should not be included. However, references should be cited. No additional fieldwork will be required to provide "missing" aquifer test information.

(1) Identify the aquifer in which the well(s) or well field is located and any pertinent hydrologic/geologic information affecting the supply of water.

(i) For the approved wellhead protection area, provide a scaled map, with north arrow, denoting locations of observation and/or monitoring wells, ponds, streams, wetlands, other wells, and all other information that may be pertinent to the hydrogeologic setting of the well. A USGS topographic map may be used for this purpose. Where details become difficult to read, a larger scaled map, such as a driller's report, may be used.

(2) Provide a description of each production and observation well including but not limited to the following, as applicable:

(i) Description of geologic material drilled through;

(ii) Depth to bedrock;

(iii) Estimate of saturated thickness of the aquifer at the well location. If this is not available then provide the depth from the water table to the bottom of the well;

(iv) Maximum drawdown level;

(v) Date and results of most recent aquifer test or well redevelopment, to include:

(A) Name of individual or entity that conducted the pump test;

(B) Pumping rates for test;

(C) Duration of pump test;

(D) Static water level;

(E) Final pumping water level;

(F) Specific capacity;

(G) Transmissivity; and

(H) Description of any difficulties with the aquifer test.

(vi) Date and results of quarterly specific capacity determination, to include:

(A) Type and rated capacity of existing production well pump;

(B) Duration of pump operation;

(C) Static water level; and

(D) Pumping water level.

(vii) Well efficiency expressed as the ratio of the most recent measured specific capacity to the maximum specific capacity determined from the most recent aquifer test or redevelopment.

(3) Report the maximum potential yield for each well based on the results of the most

recent tests described in section 8.04.2 (c)(2) of the regulations.

(4) State the current pumping rates of the existing wells, in addition to the maximum well capacity of each well based on such limitations as the pump's relationship to other wells, interference from other wells, contamination, excessive drawdown, any restrictions on pumping rate due to operational considerations, regulatory requirements or other factors, etc. For each production well provide a brief redevelopment history, if applicable.

(d) A determination of available water shall identify any limitations to utilization of the safe yield for surface waters or maximum well capacity of wells, including any constraints such as hydraulic considerations, treatment limitations, or interference effects that must be considered in the estimate of available water. For purposes of this analysis, available water shall be the sum of the operational safe yield of surface water supplies, maximum well capacity, 90% of untapped groundwater capacity, and water purchased from other suppliers.

(1) For both existing and future conditions, compare available water with average and maximum daily demand. Improved efficiencies or "water savings" resulting from proposed supply, demand, and system management measures shall be factored into each analysis, as appropriate. If average daily demand exceeds available water, identify additional supply, demand and/or system management measures to be undertaken and if necessary, the timing and quantity of additional supplies and facilities. The analyses shall include the following:

(A) Existing Conditions: Compare existing available water with existing average daily and maximum daily demand for the most recent year.

(B) Future Conditions: Compare future available water with projected average daily and maximum daily demands for the 5 and 20 year planning periods.

8.04.3 Alternative Supply

Identification of available alternative water supply sources including retention of water sources for standby or future use that are in compliance with or can meet drinking water quality standards; reactivation of any water sources not in use; potential system interconnections for ongoing, standby, or emergency use; supply augmentation; and shared or joint-use facilities or sources. Factors to be considered include but are not limited to the following:

(1) General description of treatment necessary to utilize alternative water supply source(s) based upon final and currently proposed requirements of RIGL Chapter 46-13 as administered by the RI Department of Health;

(2) Ability of existing treatment facilities to improve raw water quality to applicable drinking water quality standards;

(3) Capacity of pumping and distribution systems;

(4) Necessary measures to maintain or improve the quality of water supply sources; and

(5) For reactivation of temporarily inactive water sources, identify necessary remediation measures.

8.04.4 Supply Augmentation Studies

Supply augmentation studies shall assess recommended alternative water supply sources with a discussion of the reasons for selecting each option to be implemented. Included in the evaluation should be an analysis of the ability to meet future demand. Where applicable, information such as necessary construction, lands needed, lands to be sold or for which a change in use is proposed, water rights needed, water quality, identification of existing and potential competing uses of the resource, relationship to local, regional and state land use plans, costs and financing, timing, and life-expectancy of facilities should be addressed.

(1) Water suppliers operating at a safe yield based upon a critical dry period with a probability of occurrence of 5% that are unable to document to the Boards' satisfaction that they are able to safely operate at this level of risk, shall be required to immediately initiate supply augmentation studies.

(2) Supply augmentation studies shall be initiated immediately if all appropriate supply, demand, and system management measures have been implemented and the average daily demand for the most recent year equals or exceeds available water, as defined in Section 8.04.2. Augmentation studies shall also be initiated immediately, if individually, the safe yield of the reservoir system or 90% of the current well capacity is exceeded.

(3) If the analysis of the ability to provide an adequate supply of potable water for the 5-year and 20-year period, as required under Section 8.04.2 (d), herein indicates the need for additional sources of supply or facilities, water suppliers shall initiate supply augmentation studies.

8.05 Demand Management

The plan shall describe measures to reduce the demand for, and to effectuate efficient use of, the state's water resources. The plan shall include a program to retrofit existing water uses not in conformance with the RI State Building Code, Plumbing Code Regulations SBC-3 (1990) for water-saving plumbing equipment.

(a) Residential Retrofit Program (RRP): The Residential Retrofit Program plan shall describe the steps necessary to establish and administer the retrofit program (e.g. hire consultants/staff) and a schedule for implementation. The Residential Retrofit Program shall provide for the distribution of retrofit kits, as described below. The Board shall consider plans utilizing water-saving plumbing equipment which achieves higher performance standards and/or results in greater water savings. An example would be an incentive program to accelerate replacement of older toilets with water conserving models. The Board shall review and approve of alternative RRP plans on a case by case basis. The minimum Residential Retrofit program shall include but not be limited to the following:

(1) Annual Notification of Program Objectives and Achievements: No later than one year after approval of the RRP plan by the Board and on an annual basis thereafter, water suppliers shall publicize the objectives and accomplishments of the retrofit program and the availability of water efficiency devices and installation services at cost, or at no direct cost.

(2) Retrofit Kits: Water suppliers shall offer kits containing water saving plumbing devices; installation of said devices will be at cost or at no direct cost to all residential users. A minimum of 1 retrofit kit which at a minimum contains 2 low-flow faucet aerators, 1 low-flow showerhead, 1 toilet displacement device, 1 package of leak detection tablets, installation instructions, leak detection pamphlet, reorder card for obtaining additional equipment, and a survey form to evaluate the potential for long term water conservation, shall be made available to all residential dwelling units.

(i) Water suppliers are encouraged to investigate making other water-saving plumbing equipment, such as replacement toilets using 1.6 gallons per flushing cycle, available at cost.

(ii) Minimum standards for water-saving plumbing equipment: Where applicable, the water saving plumbing equipment shall conform to or exceed the RI State Building Code, Plumbing Code Regulations.

(iii) Water suppliers may act as a central purchaser and supplier of water-saving plumbing equipment and may enter into cooperative agreements with other water suppliers or other agencies to facilitate bulk purchases of water-saving equipment required to implement approved retrofit plans.

(3) Implementation Schedule: Residential Retrofit Programs shall be phased in over a 10-year period. A minimum of 10% of all residential dwelling units annually shall be targeted for kit distribution and installation as outlined in Section 8.05 (a) (4). An implementation period of less than 10 years shall be required for any water suppliers projected to need new or additional supplies within the 10-year period. In these cases, the time period for implementation shall be determined by the Board on a case by case basis.

(4) Retrofit Kit Distribution: The actual number of water-saving plumbing devices installed is greatly influenced by the water supplier's level of effort in distributing the equipment, educating the public on its use and related benefits, and assisting in installation, if necessary. The distribution method selected by the water supplier shall assure a high level of water saving plumbing equipment installation.

(i) A minimum of 10% of the residential dwelling units annually shall be targeted for distribution and installation of water conservation devices.

(ii) Acceptable kit distribution methods include the following:

(A) Mailing or direct delivery of retrofit kit request cards to each residential class user;

(B) Direct distribution of kits to residential dwelling units (door-to-door delivery or direct mailing of kits);

number (C) Messages included on customer bills providing a toll free phone to call to order retrofit kit(s); or

Board. (D) Other method as previously approved of by the Water Resources

(iii) Within 30 - 60 days of distribution of retrofit kits, customers shall be reminded of the importance of water conservation and to install the water saving plumbing devices. Water suppliers may opt to publish reminders in local newspapers, to distribute installation reminder cards, telemarketing or other approaches, as appropriate.

(iv) Distribution of kits to residential users in apartments and multi-family housing units serviced by single meters: Distribution of kits shall be to the owner or manager of the apartment or multi-family housing unit. Multi-family kit request cards shall be developed and distributed. Water suppliers shall not be required to offer installation assistance to multi-family housing units.

(v) For water suppliers needing new or additional supplies within 5 years before additional sources of supply are pursued, water suppliers shall directly distribute retrofit kits at cost or at no direct cost to all residential dwelling units and shall explain the need for and cost effectiveness of full compliance with water conservation requirements.

(5) Public Education and Information: Efforts should be tied to key events in the Residential Retrofit Program and shall include a media campaign as specified in Section 8.05 (a) (1). Additionally, water suppliers are encouraged to offer water conservation presentations at local schools and to civic and other organizations. Water suppliers are encouraged to coordinate education and information efforts with other water suppliers or agencies.

(b) Major Users Technical Assistance Program (MUTAP): Water suppliers shall provide technical assistance to major users as defined herein, in the performance of water audits and in the formulation and implementation of sanitary device retrofit programs. Major users for which technical assistance may be provided include multiple unit housing areas or developments, commercial, industrial, institutional, government and agricultural and other outdoor water users.

(1) The MUTAP plan should include the following:

(i) A list of the major users, annual water uses, and types of use;

(ii) A description of the steps necessary for the major user to establish the technical assistance program (e.g. hire consultants and/or staff, training).

(iii) A prioritized schedule for conducting water audits and formulating sanitary device

retrofit programs. Priority should be given to major users with the greatest potential for water savings.

(2) Water suppliers may enter into cooperative agreements with the owners or management of such users for the preparation of specifications, bulk purchase, and installation of sanitary device retrofit equipment for the purpose of implementing the retrofit programs.

(3) Water suppliers shall request of major users a general description for implementation of demand management practices that will achieve a high level of efficiency.

(4) Implementation Schedule: The MUTAP plan shall include a schedule for implementation of the proposed technical assistance program.

(c) Appropriate fees, rates, and charges to reduce demand shall be utilized, consistent with Section 8.09 herein.

8.06 System Management

System management measures necessary to insure that the physical components of the water system are properly operated and maintained shall be described. A stated goal of system management shall be to minimize non-account water and to strive to achieve and maintain less than 15% non-account water as set forth in Water Supply Policies for Rhode Island, State Guide Plan Element 721, September 1997. Water suppliers are encouraged to establish a long-term goal of reducing non-account water to 10% of the total metered supply. System improvements and maintenance activities necessary to maintain compliance with RIGL Chapter 46-13 as administered by the RI Department of Health must also be considered. System management measures to be described shall include but not be limited to the following:

(a) Meter Installation, Maintenance, and Replacement (MIMR) Plan.

(1) 100% of water delivered, including water sold wholesale to other water suppliers shall be metered to include public buildings. Excluded from this metering requirement is water used for fire fighting purposes and system maintenance purposes, including flushing and active bleeders. Water suppliers shall set forth a plan by which all water delivered shall be metered.

(2) All water suppliers shall effect and carry out a program for installation of remote reading or automatic reading systems. These programs shall be in place and operational no later than July 1, 2001.

(3) All water suppliers shall develop and carry out programs for recording metered usage and billing thereafter, at an interval less than 1 year, as determined appropriate, not later than July 1, 2001. Water suppliers not meeting this deadline must demonstrate that the continuation of annual meter reading and billing is consistent with the purposes of RIGL 46-15.3 *et. seq.*, Water Supply System Management Act, and specific statutory provisions for the implementation of demand management measures that achieve a high level of water use efficiency through use of fees,

rates, and charges to influence use (RIGL 46-15.3 5(c)(1)(d) and the provision of timely and accurate information on costs to users (RIGL 46-15.3-22).

(4) For major users, a schedule of maintenance and replacement of meters shall be developed so as to maintain applicable meter standards. A schedule for testing and calibration shall be developed.

(5) Master meters shall be tested at least once a year and calibrated as necessary to the printed recommendations of the meter manufacturer and to good engineering practice.

(i) Ranges of meter accuracy should be in general conformance with the latest revisions of the American Water Works Association (AWWA) standards (c700 Series) as summarized in "Water Meters - Selection, Installation, Testing, and Maintenance" (AWWA M6) and/or specific Rhode Island State Plumbing Code requirements.

(ii) When an AWWA standard for a meter is not available, the user must demonstrate to the satisfaction of the Board that the meter is capable of measuring not less than 95% and not more than 105% of the water that passes through the meter. All meter tests shall be documented and maintained by the water supplier.

(b) Leak Detection and Repair (LDR) Plan:

(1) General Policy: Water supply management plans shall at a minimum set forth a comprehensive plan and schedule for the detection and repair of leaks so as to maintain non-account water at or below 15% of total metered supply. Comprehensive leak detection surveys shall be conducted on a periodic basis according to specific needs, however surveys shall be conducted immediately if non-account water exceeds 15%. Leaks should be repaired expeditiously.

(2) The Leak Detection and Repair Plan shall set forth a plan and schedule for the detection and repair of leaks and shall include but not be limited to a description of the types of leak detection methods used and the sensitivity of the method used.

(3) If a comprehensive sonic leak detection and repair program has been completed since the last plan submission, discuss the number of leaks found, the number fixed, the amount of water saved, and the existing leakage rate in gallons per day per mile.

(4) If leak detection and repair objectives have been achieved, discuss the planned continuing maintenance program to retain and achieve the lowest leakage rate feasible.

(c) Preventive Maintenance (PM) Plan shall be prepared and implemented. The PM Plan shall include:

(1) A schedule for periodic inspection, maintenance, and/or testing of critical components of the supply, treatment, storage, and distribution facilities, including emergency and standby equipment and facilities (e.g. pumping station(s), valves, hydrants, water main flushing, cleaning, lining, and upon start up, testing connections to emergency water supply sources) in general

conformance with recommended practices established in applicable American Water Works Association standards.

(2) Accurate record keeping of inspections and routine maintenance;

(3) Evaluation of records and when necessary, the scheduling and performance of corrective measures; and

(4) Maintenance of spare parts inventory and names and locations of manufacturers and distributors of critical components.

8.07 Emergency Management

The emergency management component shall assess system risks and response capabilities, and shall describe a practicable contingency plan for water supply emergencies. The plan shall at a minimum:

(a) Identify known and potential natural and human-caused risks to the water system and assess the extent and severity of each water supply emergency situation on each component of the water supply system. Identification of system risks shall include but not be limited to hurricanes and major storms, droughts which exceed the water supply systems' design drought, seasonal water shortages, interruptions in the transmission or distribution system, obvious and immediate contamination risks to water sources or transmission or distribution systems and limitations in water sales agreements. The plan need not address emergencies experienced by water suppliers on a routine basis, such as pipe breaks, inoperable valves and emergency power sources.

(b) Identify critical components of the water supply system that may be partially or totally incapacitated during emergency situations. This analysis shall serve as the basis for the development of programs of physical improvements and emergency management plans.

(c) Estimate the water system's remaining capabilities to meet demand for each water supply emergency situation. Describe the system storage capacities; supply redundancy, and other available contingency measures.

(d) Identify demands on the system and evaluate the level of service to be sustained during different emergency conditions. Major users and priority users should be identified. Assignment of priority should be based upon the potential risk to health, safety and welfare posed by the curtailment or suspension of service. The plans should identify the steps deemed appropriate and feasible to reduce the demand for water for the duration of the water supply emergency, including the enactment of bans or restrictions on certain water uses and/or new connections, as appropriate.

(e) Identify personnel responsible for actions and any training needs.

(f) Describe notification procedures and the means of implementation, if applicable, to be followed in various emergency situations. The plan shall include notification of personnel, state and local officials, media and the public, including public notification of priority users, advance

notification of users for which service may be curtailed or suspended if rationing is required and for implementation of rationing and use bans.

(g) Inventory emergency or stand-by equipment, critical spare parts, and supplies; identify additional equipment, parts, or supply needs, and the procedures for obtaining additional equipment or loaning available equipment or services. Where appropriate, stand-by power to all electrically operated facilities must be of sufficient capacity to provide 100% of the system's average daily demand during an electrical outage. Interagency agreements specifying availability and use of loaned equipment or services shall be documented in writing. This inventory shall include but not be limited to availability and need for standby power for pumping station(s), treatment plant(s) and extraordinary treatment processes.

(h) Identify sources of emergency water supply including but not limited to interconnections and independent industrial and commercial water supplies within the service area. Identification of legal, technical and financial requirements for their use, a schedule for activation, periodic testing, available yield, and quality of the sources shall be included. Agreements with other water suppliers or with independent industrial or commercial entities for use of emergency water supplies shall be documented in writing.

(i) As appropriate and feasible, the plan may also address the necessary steps to treat contaminated sources of supply.

(j) Specify water supply emergency responses which become progressively more stringent depending upon the seriousness of the water supply emergency. Critical indicators of the seriousness of the emergency, the extent of facility damage and seasonally varying triggers, such as designated reservoir levels shall be identified. For groundwater supplies, consideration should be given to seasonally varying trigger levels involving drawdown of the wells and/or static water levels. These critical indicators shall act to trigger a mandatory management review and the initiation of an appropriate response.

(k) Outline the steps to be taken for recovery from an emergency, including reverse triggers, as appropriate, and describe when the steps will be activated.

(l) Outline and provide cost estimates for immediate actions or expenditures necessary to eliminate critical vulnerabilities of the existing water supply system. Evaluate the availability of resources to eliminate vulnerabilities and for overall implementation of the emergency management plan. Pricing of specific emergency response procedures need not be included.

(m) Describe the relationship of the emergency management plan with other applicable local or state plans.

8.08 Implementation Schedule, Responsible Entities, and Projected Costs

(a) Water supply system management plans shall designate the person(s) or organization responsible for taking each action, others who must participate, and the time period in which the action is to be taken.

(b) The capital, operating, and maintenance costs, if any, of each action shall be estimated. Facilities and/or programs or studies scheduled for construction or implementation within 5 years of the date of plan preparation should be more thoroughly evaluated than those actions scheduled for later implementation.

8.09 Financial Management

(a) General Guidelines of Water Supply System Management.

(1) All rates and charges made by water suppliers which decline as quantity used increases are hereby declared not conducive to sound water supply management designed to properly conserve, develop, utilize, and protect this finite natural resource.

(2) Each water agency will operate in a financially self-supporting manner. Each shall maintain long term revenue levels sufficient to cover all fixed and variable capital and operating costs of conservation, use, management, protection, development and other costs of water supply and may be allowed a reasonable profit as may be appropriate for the water supplier's type of ownership and as consistent with Public Utilities Commission regulations. Charges to the water supplier for intergovernmental services shall be fair and reasonable.

(3) The anticipated source(s) of funds to implement the water supply system management plan shall be identified including but not limited to funds generated through fees, rates and charges against water users. Such charges shall be limited to those necessary and reasonable to undertake the actions required by RIGL Chapter 46-15.3 as made operative by these procedures. These charges shall be included in bills rendered as specified herein.

(b) Current Financial Management Practices: Water supply system management plans shall describe the water supplier's current financial management practices and status including but not limited to:

(1) In spreadsheet format, a summary of operating income and expenses for the past 3 years:

(i) Annual water rate revenue; general facility charge revenue; special assessment revenue; reserve fund revenues and/or other earned or unearned revenue from operating funds shall be listed under operating income.

(ii) Annual water system indebtedness, including debt service on bonds; operation and maintenance expenses; facility replacement funds; appropriations for major improvements; and/or other expenses shall be listed under operating expenses, as appropriate.

(iii) Any grants, loans, income from bond sales and income earned while holding these or other capital funds shall be listed under capital funds.

(2) Existing rate structures shall be described.

(3) Frequency of billing and collection procedures and policies shall be described.

(c) Future Revenue Sources: Water supply system management plans shall list and discuss anticipated revenue sources to implement system improvements and programs. A plan allocating funds to finance system improvements and programs scheduled for implementation within 5 years of plan preparation should be prepared. The plan should describe basic revenue requirements to fund system operation, maintenance and improvements and discuss the systems' ability to secure the revenue needed. Any assumptions regarding inflation rate, interest rates, bonding limit, grant eligibility, etc. should be clearly stated.

(d) Assessment of Rates: Necessary changes in the rate structure to generate revenues for future improvements shall be included. In establishing fees, rates, and charges, water suppliers shall consider the following factors:

(1) Recovery of all capital and operating costs, fixed and variable of production, treatment, conservation, use, management, protection, obtaining, development, procuring, and/or transporting water, and its sale at wholesale or retail.

(2) Marginal cost pricing.

(3) Emergency and drought period surcharges.

(4) Seasonal price structures.

(5) Difference in costs based upon different points of delivery.

(6) The effect of fees, rates, and charges on use of water and, where applicable, on wastewater costs and charges.

(7) The effect of reducing non-account water to levels consistent with or below stated goals.

(8) The costs of preparing, maintaining, and implementing water supply system management programs.

(e) Billing:

(1) Regular schedule,

(i) Bills shall be rendered on a regular schedule for metered usage.

(2) Joint Billing,

(i) All water suppliers selling water at retail shall discuss cooperative initiatives or joint billing efforts for water supply and wastewater treatment in cooperation with the parties responsible for the latter within the same water supply service area.

(ii) The water supplier shall evaluate arrangements with municipalities and wastewater treatment agencies for operation of a combined billing system, including equitable sharing of costs.

8.10 Coordination

(a) Water supply system management plans shall be coordinated and consistent with applicable local comprehensive plans and shall be integrated into the water supply plans of the municipality or municipalities in which the service area is or is planned to be located. Conversely, the local comprehensive plans shall be consistent with water supplier's water supply system management plans. Water supply system management plans shall describe water supplier's efforts to coordinate with municipalities with respect to coordination of planning efforts. Particular attention should be focused on existing and future land uses, zoning requirements, growth projections, responsibilities and capabilities to respond to water supply emergencies, planning for capital improvement needs, and other areas of mutual interest.

(b) Water supply system management plans shall describe water supplier's efforts to coordinate with other water suppliers with respect to interconnections, service area expansions, capabilities to assist in the response to water supply emergencies, the potential for regionalization and other areas of mutual interest, as appropriate.

(c) Water supply system management plans shall describe water suppliers' efforts to coordinate with operators of wastewater treatment facilities servicing all or part of the water supply service area with respect to data collection and the undertaking of feasibility studies of joint billing.

(d) In the event of conflicts between policies and plans of agencies, municipalities, water suppliers, the Board shall encourage coordination and negotiate for the public interest in water.

8.11 Rhode Island Geographic Information System Compatibility

(a) All geographic data prepared as part of this plan should be in a form that the Board is able to transfer data directly into the Rhode Island Geographic Information System (RIGIS). All data shall be mapped to meet USGS National Map Accuracy standards for 1:24000 scale mapping. The geographic basis will be Rhode Island State Plane Coordinates (RISPC) on the North American Datum (NAD 83) in units of feet.

Digital mapping products should be suitable for immediate entry into the RIGIS database without further modification. The accepted RIGIS data transfer file format is ESRI Arc/Info¹ export in a non-compressed form. Although not restricted to the use of ESRI (Arc/Info) software, all deliverables must be directly importable into Arc/Info coverage's with polygon topology suitable for immediate use by both workstation (NT and UNIX) and PC Arc/Info software.

Data set documentation requirements as are contained in a Digital Database Standards for the RIGIS, published by the Environmental Data Center of the University of Rhode Island, and as

amended and superseded by Metadata Standards and Specifications for the RIGIS, RI Department of Administration, Division of Planning (October 1993). Data sets within RIGIS are shared and offered under licensing policy to any other requester.

SECTION 9.00 DATA COLLECTION REQUIREMENTS

Water use data must be assembled as an element of projecting long-term future water demand and availability of supplies in order to assess progress in achieving identified objectives, including the effectiveness of water conservation programs.

9.01 Reporting Requirements:

An interim report shall be submitted no later than 30 months from the Board's approval date of the Water Supply System Management Plan (WSSMP). Any 30-month reporting date, previously required by DEM and required for the Water Supply System Management Plan (WSSMP), shall be re-evaluated by the Board in consultation with each supplier. An amendment to a water supply management plan may be submitted to the Board at any time.

The 30-month report shall include updated water system data as further specified below. For suppliers with approved water supply system management plans or water supply management plans, it should include the status of the water supplier's plan implementation and shall describe progress in completing specific milestones and/or tasks outlined in the approved plan. The report shall include but not be limited to the following information:

- (a) Metered water production from each source on a monthly basis;
- (b) Metered water purchased from other water supplier(s) by interconnection, on a monthly basis;
- (c) Estimate of population served, and number of service connections;
- (d) Total metered retail water sales on an annual basis and metered retail water sales by user category on an annual basis;
- (e) Metered wholesale water sales by interconnection on a monthly basis;
- (f) Estimated volume of water used for fire fighting purposes on an annual basis;
- (g) Estimated volume of non-account water on an annual basis.

SECTION 10:00 PLAN SUBMITTAL

10.01 Time Schedule for Plan Submittal

- (a) Each water supplier required by these regulations to prepare and maintain a water supply system management plan shall file such plan per a date determined by the Water Resources Board.
- (b) Institutional water suppliers or water suppliers that obtain, transport, purchase, or sell an amount of water exceeding 50 million gallons per year are required to submit a water supply system management plan, under the rules set forth in these procedures. The Board allows 18 months from the end of the chronological year in which the 50 million gallons or more per year volume occurred for the development of these plans.
- (c) In order to determine when a water supplier meets the 50 million-gallon per year threshold under WSSMP, the Board shall utilize the information from the Rhode Island Department of Health, payment of state surcharges, and any other available information.

10.02 Plan Amendments

- (a) Each water supplier shall review its plans at least once every 5 years from the date of Board approval or whenever a significant component of the plan is no longer valid, and shall amend or replace its plan as required so as to remain current. The Board may notify the water supplier in writing of any section(s) of the plan requiring revisions and of the reasons such revisions are necessary. Such revised plan shall be submitted to the Board in accordance with a negotiated schedule not to exceed 1 year beyond the 5 year due date.
- (b) Circumstances under which a plan may be deemed invalid requiring updating include but are not limited to the following:
 - (1) The water supplier proposes to add or abandon a source of supply beyond those addressed in an existing plan;
 - (2) The water supplier projects water demand to be significantly greater than the demand projected in an existing plan;
 - (3) Existing or projected demand exceeds available water;
 - (4) A new contract for the sale or purchase of water is executed;
 - (5) Use of an existing or proposed source becomes infeasible;
 - (6) Significant changes in existing or potential sources of contamination to water supplies.
- (c) If only minor alterations to an existing plan are considered necessary, the water supplier may request a waiver of the plan amendment requirement from the Board. The request for waiver must be accompanied by written evidence supporting this conclusion including a progress report on all items.

(d) Plan amendments or request for waivers will include a report of progress in implementing priority measures.

10.03 Filing of Plans

(a) Each water supplier, as defined herein, shall file at least 7 copies of all plans, and amendments thereto to the Board. The Board will deliver a copy to the following:

- (1) The Office of Drinking Water Quality of the Department of Health;
- (2) The Statewide Planning Program of the Department of Administration;
- (3) The Administrator of the Division of Public Utilities and Carriers, and
- (4) The Department of Environmental Management.

(b) The water supplier shall place an additional copy of all plans, replacements, and amendments at its main office as well as in the main library of each municipality in which it serves on a retail basis. The locations of public review copies will be part of the legal notice requirements.

10.04 Requests For Time Extensions

- (a) Water suppliers may request in writing that the Board extend the time in which to complete and submit its water supply system management plan, replacements, revisions, or amendments thereto, 30 month interim report or other filings required by the Water Supply System Management Act, RIGL 46-15.3 *et seq.*, not to exceed 1 year. Such requests for time extensions must be received no later than three months prior to the required filing's scheduled submittal date.
- (b) Approval of such requests shall be granted only upon demonstration that an extension is justified by extraordinary circumstances of the water supplier. An extension, if approved, shall not waive any of the requirements of Section 12.02, of these regulations.
- (c) No extensions of time shall be granted for the submittal of emergency management plans.

SECTION 11.00 REVIEW OF PLANS

11:01 Review Process

- (a) The Board shall coordinate the review of water supply system management plans and any replacements or amendments thereto, prepared by water suppliers subject to these rules.
- (b) Upon receipt of a water supply system management plan, replacements, revisions, or amendments thereto, by the Board, the Board shall "date stamp" the plan. The "date stamped" date shall be used to determine the initiation of the 90-day and 180-day specified review periods.

(c) The Board shall accept comments on water supply system management plans and any replacements, or amendments thereto from the Office of Drinking Water Quality of the Department of Health, the Statewide Planning Program of the Department of Administration, the Department of Environmental Management and the Division of Public Utilities and Carriers no later than 90 days from the date stamped by the Board, pursuant to Section 11.02(c).

(d) Upon consideration of the written comments by all agencies designated herein and any public comment (Section 11.02) provided to the Board, the Board shall determine whether the plan complies with the requirements of these procedures. The Board shall approve plans found in compliance with these procedures.

(e) The Board shall notify the water supplier of its determination in writing. Unless extended by the issuance of a first notice of deficiencies, the determination shall be made within 180 days of the date stamped by the Board, pursuant to Section 11.01(c).

(f) Failure of the Board to notify a water supplier of its determination within the said time limit shall constitute approval of the submitted water supply system management plan. However, if plans, replacements or amendments thereto are submitted prior to the scheduled submittal date, the Board may opt to utilize the scheduled submittal date as the initial submission date for purposes of initiating the 180 day specified review period.

(g) The time period for the review of water supply system management plans, replacements, revisions, or amendments thereto submitted after the scheduled submittal date shall be as determined by the Board.

(h) The time period for the review of water supply system management plans amended as a result of an invalidation of a plan component shall be in accordance with a schedule as agreed to by the Board.

11.02 Public Comment

(a) The Board shall provide a 30-day period within the 180-day review period to receive comments from the general public on the water supply system management plan.

(b) The Board shall publish a notice of the public comment period in a Rhode Island newspaper having daily statewide circulation and at the discretion of the Board, in a local newspaper having the largest daily circulation within the water supplier's service area.

(c) The Board shall accept written comment during the comment period.

(d) The plan shall be adopted by the governing board of each water supplier following a public hearing. Notice of such public hearing shall be published once by the supplier at least 20 days before the date set for the public hearing in a newspaper of general circulation in the State of Rhode Island. Such notice shall set forth the date, time, and place of such hearing; means of public review of the plan, and a brief description of the matters to be considered at such hearing.

SECTION 12.00 DETERMINATIONS OF PLAN COMPLIANCE

12.01 Determination of Compliance

Upon consideration of the written comments by all agencies designated herein and any public comment received by the Board, the Board shall determine whether the plan is in substantial compliance with the objectives of the Water Supply System Management Act and the requirements of these regulations. Substantial compliance shall be defined as having achieved the Water Supply System Management Act's stated objectives, goals, and planning mandates or otherwise having committed resources, as evidenced by a schedule for the timely implementation of such actions necessary to achieve the Act's objectives, goals, and mandates, as further specified in Section 8.08. The Board shall issue a determination of compliance to water suppliers whose plans have been found in compliance with these regulations.

12.02 Determination of Non-Compliance

(a) The Board shall issue a determination of non-compliance should the following occur:

(1) A municipality or water supplier subject to the Water Supply System Management Act fails to submit a water supply system management plan, replacement, revisions, or amendments thereto, or a 30 month interim report or other filings required by the Water Supply System Management within specified time periods as provided herein;

(2) Any reviewing agency finds that substantive deficiencies prevent the water supply system management plan, replacements, revisions, or amendments thereto from meeting the requirements of the Water Supply System Management Act and the Board finds that these deficiencies constitute substantial non-compliance with the Act and this rule.

(b) The Board shall notify suppliers and other reviewing agencies of its determination of non-compliance in writing and shall specify areas of non-compliance.

(c) The date for re-submission of the revised or replacement plan shall be in accordance with a schedule as agreed to by the Board and the water supplier, not to exceed 1 year from the date of determination of non-compliance. Any subsequent revisions shall be re-submitted no later than 6 months from the date of any subsequent notification by the Board.

(d) Revised or replacement plans shall be filed with the Board, as specified in Section 10.03 of these regulations, unless instructed otherwise by the Board. Said review agencies shall review and may submit written comments to the Board.

12.03 First Notice of Deficiencies

A first Notice of Deficiencies shall be issued if the Board finds that the water supply system management plan, replacement, revision or amendment thereto is deficient due to incorrect, inconsistent, or missing data or information but otherwise is in substantial compliance with the objectives of the Water Supply System Management Act.

- (a) The water supplier shall have 120 days from the date of notification within which to correct the deficiencies and resubmit the replacement plan or filing to the Board.
- (b) The Board shall have 90 days from the date of the resubmission to determine whether the replacement plan or filing is in compliance with the regulations.
- (c) Failure by the Board to notify the water supplier of its determination in writing within 90 days of the date of resubmission shall constitute acknowledgement of compliance.
- (d) The existing plan shall retain in effect until such time as the 5-year update or amendments are approved.

SECTION 13.00 EVALUATION OF PLAN IMPLEMENTATION

13.01 General Policy

The Board may issue a determination of non-compliance should the following occur:

- (a) Failure of a water supplier to implement their Board-approved plan.
- (b) Failure of a water supplier to submit a 30-month report as further specified in Section 9.01.
- (c) The Board after reviewing progress made in implementing a plan, finds that plan implementation is not sufficient to achieve the objectives of the Water Supply System Management Act. In assessing progress made under an approved water supply system management plans, the Board shall consider the financial and technical resources available to the water supplier, factors that are and are not within the control of the water supplier, changes occurring since the plan was adopted or most recently amended, and other matters relevant to the execution of a water supply system management plan.

SECTION 14.00 APPEAL PROCEDURE

14.01 Filing of Appeal

All appeals shall be in writing and shall be filed with and received by the Board within 30 days of the notification of non-compliance.

14.02 Contents of Appeal

Every appeal shall contain all information necessary and procedures required by the Board, and the water supplier's name and address, and the name of the chief executive officer, director or head of the agency.

14.03 Conduct of Hearing

The notice and conduct of the hearing by the Board shall comply in all respects with provisions of the Administrative Procedures Act, RIGL Chapter 42-35.

14.04 Burden of Proof and Standard for Review

At the adjudicatory hearing, the water supplier shall have the burden of proof to demonstrate by clear and convincing evidence that the water supply system management plan complies with the requirements of these rules and procedures.

SECTION 15.00 ENFORCEMENT

The Board shall forward any determinations of non-compliance made pursuant to Section 12.02 and 13.01 of these regulations to the Division of Public Utilities and Carriers for consideration of enforcement action as set forth in RIGL Section 39-4-3.