Water Use Efficiency Subcommittee Report

A Report to the Washington State Department of Health,
Office of Drinking Water

April 2005

Contents

Report Structure

This report of the Water Use Efficiency Subcommittee (subcommittee) of the Washington Water Supply Advisory Committee provides advice to the Department of Health (DOH) on water use efficiency regulations being developed under the Municipal Water Supply – Efficiency Requirements Act, Chapter 5, Laws of 2003, First Special Session (Municipal Water Law). It is structured in a manner intended to capture the full range of views offered by the subcommittee. Early in the process, the subcommittee agreed that they were not seeking consensus, but rather intended to provide a full array of options and recommendations to DOH. They further agreed that all views discussed by the full subcommittee should be included in this report, even if that view is held by only one subcommittee member. The organization of this report reflects this agreement.

Each section has three major headings:

- Relevant section(s) of the Municipal Water Law
- Overview of subcommittee discussions, including pertinent background information or general thoughts of the subcommittee
- Subcommittee options and recommendations

Single vs. Multiple Recommendations

It is important to note that a **single recommendation** can not be assumed to represent a consensus of the full subcommittee. It simply means that no other recommendations were offered. If there was only one recommendation it appears as follows:

Pipe Size

Recommendation: DOH should include specific criteria in regard to pipe sizing requirements in regulation.

If there are **multiple recommendations** that could each be implemented, separately or together, each choice is listed as a recommendation and numbered as follows:

Pipe Size

Recommendation 1: DOH should include specific criteria in regulation in regard to pipe sizing requirements.

Recommendation 2: DOH should develop technical assistance materials to assist purveyors with the selection of the correct pipe size for distribution system projects.

If there are **multiple choices that are mutually exclusive**, each choice is listed as an option and numbered as follows:

Pipe Size

Option 1: DOH should include specific criteria in regulation in regard to pipe sizing requirement.

Option 2: DOH should only reference industry standards in regulations related to pipe sizing.

The Full Record of the Subcommittee Process

While the objective of this report is to capture the views of the subcommittee, it does not represent the full record of the subcommittee process. The full record of the subcommittee process will be retained by DOH as part of the files for the water use efficiency regulations. It is available to the public upon request.

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The full record consists of this report and all documents related to the subcommittee process including but not limited to: meeting agendas, meeting minutes, discussion papers and issue matrices developed by DOH and others, transcribed flip chart notes, written comments provided by subcommittee members and other interested parties.

Background

Purpose of Report

In June 2003, the Washington State Legislature passed the Municipal Water Supply – Efficiency Requirements Act, Chapter 5, Laws of 2003 First Special Session (Municipal Water Law). The Municipal Water Law directed the Department of Health (DOH) to develop significant new water use efficiency regulations for municipal water suppliers. The key components of the new requirements are:

- Mandatory provisions for conservation plans.
- Standards for water distribution system leakage.
- Establishment of conservation goals in a public forum.
- A conservation performance reporting system to show progress towards meeting conservation goals.

The Municipal Water Law directed DOH to convene a stakeholder advisory committee to assist in developing water use efficiency regulations. The purpose of this report is to capture the recommendations and views of that advisory committee.

Subcommittee Process

DOH convened the stakeholder advisory committee as a subcommittee of the Washington Water Supply Advisory Committee in March 2004. The subcommittee met on a monthly basis until February 2005. As directed by the Washington State Legislature, the subcommittee representatives included public water system customers, environmental interest groups, business interest groups, a cross section of municipal water suppliers, water utility conservation professionals, and the Department of Ecology. DOH invited representatives from local governments, the Utilities and Transportation Commission, and water system technical assistance providers. Representatives from the Tulalip Tribes and the Yakima Nation sat as observers to the process. A roster of the Water Use Efficiency Subcommittee is in Appendix A.

Workgroups

The subcommittee formed three workgroups to study certain topics in greater depth and provide a range of options for the full subcommittee's consideration. The workgroups products are:

- Cost-Effectiveness Evaluation Workgroup Report – Appendix B
- Data Collection and Reporting – Matrix 2, Water Conservation and Water Usage Data Elements
- Performance Reporting and Accountability Workgroup Report – Appendix C

The Department of Health's Role in Utility Water Conservation

Since the late 1980s DOH has had an increasing role in utility water conservation. Water conservation was among the major areas explored by the Joint Select Committee on Water Resource Policy formed by the 1988 Washington State Legislature. Conservation was also an important component of the landmark 1990 Chelan Agreement.

One result of the Chelan Agreement was the formation of the Water Resources Forum. DOH staff participated in the state caucus of the Water Resources Forum. DOH's current planning guidance related to water rights and utility water conservation are based on the concepts developed by this forum.

Another significant event in the history of utility water conservation was the 1989 Water Use Efficiency Act. This legislation updated the plumbing code to require efficient fixtures for new construction, and established the requirement that utility water conservation programs should be included in water system plans.

As a result of the efforts described above, water use efficiency is currently an integral part of the DOH's planning program. *Conservation Planning Requirements* (DOH PUB 331-008) published in March 1994 by DOH, Department of Ecology, and the Washington Water Utility Council, describes how purveyors completing a water system plan should incorporate water use efficiency into their planning process. Guidance includes data reporting, demand forecasting, and evaluation of conservation measures.

In 1999, in support of Governor Gary Locke's Salmon Recovery Strategy, the Washington State Legislature provided funding to DOH to provide technical assistance to local governments and special districts on water conservation and reuse. This funding was used to establish a full-time position in each of DOH's three regional offices. In 1999, DOH surveyed representatives from small to medium sized water systems to find out how to be more effective in the area of water use efficiency. The results of the surveys were used to create DOH's technical assistance program and develop a water use efficiency campaign for water systems serving from 100 to 1,000 connections. The technical assistance funding provided by the 1999 Washington State Legislature was discontinued in 2003. Regional staff was reassigned to develop the new water use efficiency regulations.

The 2003 Washington State Legislature took the most recent step by passing the Municipal Water Law. The Municipal Water Law directed DOH to adopt water use efficiency regulations and provided funding for the regulation development and start-up activities through 2007, primarily for the development of the water use efficiency regulations. The 2003 Legislature also provided funding to support DOH's efforts to implement the Municipal Water Law. Most of that funding came from twenty-five cents per residential connection surcharge on operating permits of municipal water suppliers. The support of the Washington Water Utility Council, representing purveyors throughout the state, was critical in securing this funding for DOH.

Municipal Water Law

In regard to this report and the water use efficiency subcommittee process, the key piece of the Municipal Water Law is the water use efficiency provision. This section of the law is provided in Appendix D, Water Use Efficiency Section of the Municipal Water Law. This section amends RCW 70.119A and directs DOH to establish new water use efficiency regulations.

The Municipal Water Law, however, is a much broader piece of legislation that also amends sections of the State Board of Health Code, RCW 43.20; and sections of the state's water code, RCW 90.03. These changes affect DOH's water system planning process and provide some unique benefits (including greater water right flexibility and certainty) to many purveyors. DOH and the Department of Ecology are working together to implement the other provisions of the Municipal Water Law outside of this process. The other provisions related to DOH's programs are described briefly below.

Citation	**Title**	**Summary**
RCW 90.03.015(3) and (4)	Municipal water supplier definition	Defines a municipal water supplier and establishes municipal water supply purposes.
RCW 90.03.260(4) and (5)	Water right connection/population limitations	Clarifies the state's water code by stating that the number of water service connections and population are not limiting attributes of water rights held by municipal water suppliers with a DOH-approved water system plan or other approval that specifies the number of connections.
RCW 90.03.386(1)	Plan review coordination between DOH and Department of Ecology	Amends the state's Water Code directing DOH and Department of Ecology to coordinate water system plan approval procedures with water right determination procedures for both water system plans and small water system management programs.
RCW 90.03.386(2)	Service area consistency	Allows a municipal water supplier to expand the place of use of its water right to all areas included within the service area described in its approved water system plan or small water system management program. This benefit is provided if the water right holder is in compliance with the terms of its water system plan and the service area is consistent with applicable approved comprehensive plans, land use plans, development regulations, coordinated water system plans, and watershed plans. A municipal water supplier's place of use is not reduced if the service area identified

Citation	Title	Summary
		in an approved water system plan or small water system management program is smaller than the place of use identified in the water right.
RCW 90.03.386(3)	Conservation requirements for water systems with 1,000 or more connections	Provides direction on conservation to municipal water suppliers with water systems serving 1,000 or more connections. This includes reporting the conservation measures that were put into practice in the past and how those conservation measures have increased their water use efficiency. It also directs municipal water suppliers that are using inchoate portions of a water right certificate to describe how they could delay the use of the inchoate water rights through additional cost-effective conservation measures.
RCW 43.20.260	Local government consistency and duty to serve	Requires new services within a municipal water supplier's service area to be consistent with applicable approved local land use plans, comprehensive plans, and development regulations. Municipal water suppliers must delineate retail service areas in their water system plan. Those with DOH-approved water system plans now have a duty to provide service to new connections within their retail service area.
RCW 90.46.120(3)	Reclaimed water	Requires purveyors with systems serving 1,000 connections or more to evaluate reclaimed water opportunities.

Public Water System Terminology

For the purpose of this report, several terms must be understood to avoid confusion. The MWL introduces a new term "municipal water supplier" that is defined in RCW 90.03.015(3) as:

> ""**Municipal water supplier**" means an entity that supplies water for municipal water supply purposes."

In addition, the following terms must be understood to comprehend the report.

Municipal water suppliers are considered purveyors, as defined in WAC 246-290-010. The term "purveyor" is:

> ""**Purveyor**" means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of such entities."

It is important to make a distinction between the purveyor and the physical system itself. The term "public water system" found in WAC 246-290-020(1) helps clarify this distinction. Use of the terms "public water system", "water system", or "system" refers to the physical system as defined below.

> ""**Public water system"** - shall mean any system providing water for human consumption through pipes or other constructed conveyances, excluding a system serving only one single-family residence and a system with four or fewer connections all of which serve residences on the same farm. Such term includes:
>
> (a) Collection, treatment, storage, and/or distribution facilities under control of the purveyor and used primarily in connection with such system; and
>
> (b) Collection or pretreatment storage facilities not under control of the purveyor, but primarily used in connection with such system."

"**Governing body**" means the individual or group of individuals charged with ultimate responsibility for policy and budget decisions for a particular public water system. DOH, in consultation with legal consul, will need to clearly define this term in regulation, which is not defined in the MWL statue or current DOH regulations.

Water Use Efficiency and Water Conservation

The definitions "water use efficiency" and "water conservation" have different meanings in different settings. Early in the process, the subcommittee established working definitions for these terms. The definitions provided below are based on those discussions, as well as written comments, and DOH staff analysis. The main distinction between the two terms is "water use efficiency" identifies the three major elements that DOH must include in its regulatory program. "Water conservation" is a broader term that refers to all the things a purveyor does to minimize inefficiencies and reduce water withdrawals and water use.

Water use efficiency: Regulatory programs administered by DOH and implemented by water purveyors that include conservation planning requirements, water distribution system leakage standards, and water conservation performance reporting requirements.

Water conservation: Measures undertaken by water purveyors to minimize supply and demand inefficiencies, and lessen water withdrawals and water use. These include internal and external measures.

Internal measures (supply-side): Actions and programs under the direct control of the purveyor to reduce system inefficiencies, improve operations, management, and planning related to water production and distribution.

External measures (demand-side): Actions and programs under the control of the purveyor to educate customers, promote how and why to use water efficiently, and offer incentives for customers to reduce their water use.

Department of Health Planning Program

The Municipal Water Law refers to water system plans and small water system management programs, two planning documents which are the foundation of DOH's planning program. Conservation planning is included in both documents and is a critical element of water use efficiency.

Water system plan: A comprehensive description of the water system and how the system owners and managers intend to develop the system in the next 6 to 20 years. State law requires water system plans to be approved every 6 years for water systems with 1,000 or more connections, all new water systems or expanding water systems, water systems experiencing problems as determined by DOH, and water systems for which the purveyor is proposing to use the document submittal exception process. Water use efficiency as a part of a water system plan is described in WAC 246-290-100(d):

> "Water resources analysis, including: (i) Development and implementation of a cost effective conservation program, which includes evaluation of conservation-oriented water rate structures; (ii) Water demand forecasts; (iii) Water use data collection..."

Small water system management program: A collection of important documents and records gathered to help ensure compliance with regulations. All Group A noncommunity and community water systems not required to submit a water system plan for approval are required to develop and implement a small water system management program. A subset of small water system management programs must be approved by DOH, including new community and nontransient noncommunity water systems, water systems experiencing problems as determined by DOH, and to meet certain funding eligibility requirements. Water use efficiency as a part of a small water system management program is described in WAC 246-290-105 includes source meter readings, customer usage, and a conservation program.

Major Components of the Law

Part 1. Legislative Direction

Section I. The Relationship of Water Use Efficiency, Financial Viability, Affordability of Water Supplies, and Water System Reliability

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(1) provides fundamental direction to the Department of Health (DOH) and expresses the Legislature's intent that water use efficiency be balanced with and complement three other elements of water system and water resources management: water system financial viability, affordability of supplies, and water system reliability.

Overview of Subcommittee Discussions

Subcommittee discussions on this section of the law were limited, but four major issues emerged. The first was how the objectives in this section should be balanced. Several subcommittee members said the primary objective of the Municipal Water Law (MWL) is to establish water use efficiency requirements. It is DOH's responsibility to be mindful of the other items without compromising this primary objective. The second focused on the need for flexibility in requirements. The third was related to the legislative direction on "affordability of supplies." Some subcommittee members voiced the view that the Legislature intended an interpretation that is broader than DOH's traditional perspective, which is limited to "affordability of rates." The fourth related to differing perspectives on reliability. Some subcommittee members said it is critically important to focus on the role of water use efficiency as an essential element of sound and sustainable water management. Others asserted that public health and basic system reliability must be prioritized over water use efficiency.

Subcommittee Options and Recommendations

Priority on Water Use Efficiency

The language in this section of the law calls for a balance of different aspects of utility operations. Some subcommittee members felt that it was critical that DOH remain mindful that the primary direction is to "…establish water use efficiency requirements designed to ensure the efficient use of water…" (RCW 70.119A.180(1)).

Recommendation: DOH should emphasize the priority expressed by the Washington State Legislature and provide sufficient direction to meet the intent of ensuring the efficient use of water by all municipal water suppliers throughout the state.

Financial Viability and Water Use Efficiency

Financial viability assessments are currently used to make sure that purveyors have the resources to fully comply with regulations. Some subcommittee members felt that DOH will need to be cautious when writing regulations to ensure that financial viability is not used inappropriately to

avoid water use efficiency requirements.[1] Many on the subcommittee also believe financial viability is an important consideration, one that was underscored by the Legislature in law.

Recommendation: In regard to financial viability, DOH should make it clear that: (1) it is the municipal water supplier's responsibility to manage its affairs and maintain financial viability, and (2) it is DOH's responsibility to clearly communicate expectations, provide technical assistance when needed, and take actions necessary to ensure compliance with new requirements.

Regulatory Flexibility

By including financial viability in this section of the law, the subcommittee understands that the Legislature recognizes that these new regulations have financial impacts on municipal water suppliers.

Recommendation 1: DOH should consider financial resource impacts of new regulations on municipal water suppliers. Requirements must be scalable and flexible enough to ensure they can be successfully implemented by all municipal water suppliers.

Recommendation 2: DOH should require all municipal water suppliers to create an overall financial and reporting structure so they can implement and track water conservation programs and demonstrate efficient use of water.

Financial Viability Technical Assistance

Given the importance of financial viability to regulatory compliance, it is critical that DOH extend every reasonable effort to help purveyors with small water systems be successful.[2] Some subcommittee members felt that additional direction on financial viability is needed in regulation, particularly for purveyors with smaller water systems.

Recommendation 1: DOH should develop criteria for demonstrating financial viability for all municipal water suppliers.

Recommendation 2: DOH should update its current guidance[3] in the area of financial viability for purveyors with small systems.

[1] Financial viability is currently a component of DOH's planning regulations, WAC 246-290-100 and 105.
[2] The need for DOH to help small water systems in the area of financial viability was also addressed in recommendations provided in the 2003 report from the Water Supply Advisory Committee titled Recommendations Regarding Affordability and Sustainability of the State's Drinking Water Systems, DOH PUB 331-241.
[3] DOH currently publishes a Financial Viability Manual for New and Expanding Small Water Systems, DOH PUB 331-104.

Recommendation 3: DOH should increase technical assistance in the area of financial viability for purveyors with small systems.

Affordability of Supplies

DOH has traditionally taken a relatively narrow view of affordability, primarily focusing on water rates and the customers' ability to pay. Some subcommittee members believe that since the legislation uses the term "affordability of supplies" as opposed to affordability of rates a broader interpretation may have been intended.

Option 1: DOH should broaden its perspective of "affordability" beyond rates. DOH should adopt a policy that water use efficiency is a tool to preserve the long term affordability of the state's water supplies to ensure healthy people and a healthy state for future generations.

Option 2: DOH should retain its focus on affordability of rates. While a broader perspective may be desirable, in a regulatory context, rates are the only element of affordability that is measurable and that possesses the necessary relevance to customers.

Reliability

The subcommittee did not offer a specific recommendation related to water system reliability. However, there were two general views on this topic that emerged as common themes throughout the process.

The first was that water use efficiency is a fundamental tenet of sound water management and essential to ensuring sustainability of water supplies. It is critical for DOH to emphasize this perspective clearly in the regulations and any direction or guidance DOH provides for municipal water suppliers as well as its staff.

The second perspective centered on the assertion that the highest priority for DOH and municipal water suppliers must be public health. Some subcommittee members asserted that there must be a fundamental prioritization of human health and water system reliability in the regulations. A concern was frequently expressed that, in some cases, available finances and manpower resources may have to be focused on public health priorities and basic system reliability before extensive water use efficiency programs can be undertaken. This perspective focuses on the more immediate reliability concerns such as security and integrity of the water system components as opposed to the focus on sustainable water supplies expressed above.

Section II. Water Use Efficiency Requirements for all Municipal Water Suppliers

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(2) establishes the fact that the law and new conservation "…requirements apply to all municipal water suppliers..."

Overview of Subcommittee Discussions

The subcommittee did not specifically devote time to this topic. However, throughout the process, subcommittee members did remind DOH and each other that these new requirements were to apply to all municipal water suppliers.

Subcommittee Options and Recommendations

Applicability to all Municipal Water Suppliers

The legislation requires DOH to minimize the financial impact on small water systems. Some subcommittee members expressed concern that small water systems would be essentially exempted from certain requirements in an effort to minimize the financial burden on smaller municipal water suppliers.

Recommendation 1: DOH should ensure that new conservation requirements are applied to all municipal water suppliers.

Recommendation 2: DOH should take into account the capability of each municipal water supplier. Requirements should match capabilities.

Recommendation 3: DOH should seek creative ways, such as phasing, funding, and technical assistance, to help municipal water suppliers with small systems succeed.

Recommendation 4: DOH should prioritize its limited resources. A significant effort may be required to work with all municipal water suppliers.

Section III. Water System Size, Forecasted Demand, and Water Supply Characteristics

Relevant Sections of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(2) requires DOH to tailor regulations to fit the specific circumstances of each municipal water supplier.

RCW 70.119A.180(4)(d) requires DOH to seek existing and simple methods for meeting the intent of the legislation and emphasizes the need to minimize the financial impact on small water systems.

Overview of Subcommittee Discussions

Three fundamental questions on how DOH will implement RCW 70.119A.180(2) came up during virtually every major subcommittee discussion.

1. What is the appropriate way to determine water system size (*i.e.,* number of connections, population, amount of water used, etc.)?
2. What are the appropriate categories of water system size?
3. How will water supply characteristics be addressed?

Subcommittee Options and Recommendations

Program Model

The subcommittee determined that tailoring requirements appropriate to water system size, forecasted system demand, and water system supply characteristics can become extremely difficult. DOH proposed using a general framework, or a program model to develop requirements for different parts of the regulation. DOH worked with the subcommittee throughout the process to refine that model. In general, the program model incorporated two basic concepts:

1. Requirements vary by water system size. Small systems are further defined by separating those using a small water system management program from those required to complete a water system plan.

   The subcommittee offered a number of alternative size categories. These categories are captured in Matrix 1, Size Categories. The subcommittee struggled between the problems arising from aggregating dissimilar systems into broad size categories and the confusion of presenting a complex framework. They acknowledged that there are substantial differences in capacity among systems of different sizes within any of the proposed categories.

2. Water systems that have critical issues related to forecasted demand or water supply characteristics will be subject to a higher level of requirements.

   The subcommittee and DOH staff also struggled with this concept. Many subcommittee members felt the concept of including enhanced requirements for specified characteristics of forecasted demand and water supply was sound. DOH staff prepared a proposal that generally increased planning and reporting requirements for systems with specified water supply characteristics. This proposal was considered by most subcommittee members to be insufficiently developed to be included in this report.

   However, it was noted that DOH's staff proposal could be critically important and probably warranted further development because it defined 1) how municipal water suppliers throughout the state would be divided into categories in the regulation, 2) what would be required if a system fell into a category for enhanced requirements, and 3) what circumstances would indicate the need for enhanced requirements.

Determination of Water System Size

The MWL directs DOH to tailor the requirements, in part, by water system size, but does not specify how system size should be determined. DOH regulations are typically based on the current number of active connections. However, water systems are typically approved for growth so there can be a larger number of connections approved than are in existence at the time of approval.

Option 1: DOH should use the number of active connections as the basis for water system size.

Option 2: DOH should use the approved number of connections as the basis for water system size.

Option 3: DOH should use the approved number of equivalent residential units as the basis for water system size.

Option 4: DOH should use the amount of water used as the basis for water system size.

Option 5: DOH should consider staff and financial resources available to the municipal water supplier when determining water system size categories.

Forecasted Demand Characteristics

Subcommittee discussion on forecasted demand characteristics focused on identifying the characteristics that municipal water suppliers should evaluate.

Option 1: DOH should require municipal water suppliers to consider specific demand characteristics when setting their conservation goals and determining what conservation measures to evaluate and implement. At a minimum, they should consider:

- Growth patterns
- Peaking factor
- Use patterns among customer classes
- Recharge effect (on-site sewage)
- Current level of conservation

Option 2: DOH should require municipal water suppliers to consider specific demand characteristics when setting their conservation goals and determining what conservation measures to evaluate and implement. At minimum, they should consider:

- Growth patterns
- Peaking factor
- Use patterns among customer classes

Option 3: DOH should require municipal water suppliers to address demand characteristics in a general narrative only.

Option 4: DOH should require municipal water suppliers to describe in their water system plan or small water system management program how selected conservation measures will address the conditions listed in Option 1 or Option 2.

Water Supply Characteristics

The subcommittee considered the specific water supply characteristics that should be evaluated by a municipal water supplier.

Option 1: DOH should require municipal water suppliers to address the following conditions, as applicable, when developing their conservation programs and establishing their conservation goals:

- Water right limitations
- Impacts to surface water sources in closed basins

- Impacts to surface water sources in fish-critical basins
- Impacts to groundwater sources where aquifer depletion is occurring
- Impacts to surface water bodies where water quantity is a limiting factor for critical fish populations
- Water quality issues related to temperature and flow
- Adopted watershed plans or comprehensive plans with a defined conservation goal of protecting or restoring the source water body in terms of water quantity

Option 2: DOH should require municipal water suppliers to address the following conditions, as applicable, when developing their conservation programs and establishing their conservation goals:

a. Water rights are determined insufficient to meet forecasted demands within the long range (typically 20-year) planning horizon, or
b. The municipal water supplier's system is drawing water from a water body that:
    - Supports a species listed as threatened or endangered under the federal Endangered Species Act, and flow has been documented as a factor limiting species recovery
    - Is located in a critical basin identified in the state's Salmon Recovery Strategy, and flow has been identified as a barrier to fish populations by the Washington State Department of Fish and Wildlife, in accordance with the procedures of the Salmon Recovery Act
    - Is a designated critical area pursuant to the Growth Management Act, and has been formally identified in accordance with locally-adopted procedures to be affected by low water flows
    - Is affected by low flows as identified in an approved and adopted watershed plan developed pursuant to the Watershed Management Act
    - Is not meeting minimum flows established by state law
    - Is not meeting flow requirements established by action of a federal or state court

- Is listed under the Clean Water Act section 303(d) for water quality issues related to temperature and flow

Option 3: DOH should require municipal water suppliers to address water supply characteristics in a general narrative only.

Option 4: DOH should require municipal water suppliers to describe in their water system plan or small water system management program how the selected conservation measures will address the conditions listed in either Option 1 or Option 2.

Some subcommittee members expressed concern that the conditions listed in Options 1 or Option 2 would include virtually every public water system. Therefore it would be difficult to use as a screening tool. Other subcommittee members believe these are precisely the issues municipal water supplier should be looking at.

Targeted Financial Assistance

While subcommittee members recognize there are no funding mechanisms now available to assist municipal water suppliers with development and implementation of conservation programs, some subcommittee members believe the list of water supply characteristics listed above could be a foundation for targeting future funding.

Recommendation: DOH should use the list of water supply characteristics provided above to target technical assistance and lay the foundation for future funding proposals to develop and implement water conservation programs.

Source Inventory

Subcommittee members believe municipal water suppliers should have a good understanding of their water source(s).

Option 1: DOH should require municipal water suppliers to develop a Source Description Inventory similar to the one provided in Appendix E, Source Description Inventory.

Option 2: DOH should require municipal water suppliers to develop a basic source description that highlights important source characteristics.

Option 3: DOH should continue its current practice of requiring evaluation of the municipal water supplier's water right, the actual yield of the supply in relation to the water right, and any legal qualifications of the water right as part of the water right self assessment. This self assessment provides sufficient information to the public process about the source(s) of supply.

Critical Basins for Fish Recovery

Some subcommittee members placed particular importance on the critical basins for fish recovery established as part of statewide salmon recovery efforts.

Option 1: DOH should require all municipal water suppliers within the 16 critical basins for fish recovery to meet a higher level of conservation performance.

Option 2: Source location within one of the 16 critical basins should not, in and of itself, be a criterion for higher performance expectations.

Guidance on Forecasted Demand and Water Supply Characteristics

Many subcommittee members think that a large number of municipal water suppliers will need technical assistance in developing their source inventories and determining if they have issues related to forecasted demand or water supply characteristics.

Recommendation: DOH should develop guidance describing how municipal water suppliers should address forecasted demands and water supply characteristics and develop their conservation programs.

Natural Resource Agency Consultation

To make good decisions related to water supply characteristics, DOH and municipal water suppliers will need the expertise of agencies with jurisdiction over water resources in the state.

Recommendation 1: DOH should require municipal water suppliers to consult with the Department of Ecology and other natural resource agencies when evaluating water supply characteristics.

Recommendation 2: DOH and the Department of Ecology should provide any readily available information related to supply characteristics to assist municipal water suppliers in preparing their water conservation plans.

Matrix 1: Size Categories

Water System Size: Total Connections*								
	Small Non-Expanding		**Small New or Expanding**		**Medium**		**Large**	
Option 1	**15 – 999**		**15 – 999**		**1,000 – 9,999**		**≥ 10,000**	
Option 2	**15 – 999**		**15 – 999**		**1,000 – 9,999**		**10,000 – 49,999**	**> 50,000**
Option 3	**15 – 999**		**15 – 999**		**1,000 – 4,999**	**5,000 – 9,999**	**>10,000**	
Option 4	**15 – 249**	**250 – 999**	**15 – 249**	**250 – 999**	**1,000 – 2,499**	**2,500 – 9,999**	**10,000 – 49,999**	**>50,000**

*These size categories are intended as a general framework for requirements. They may be further broken down for a specific area of the regulation. For example, the requirements related to data collection may incorporate an additional category for water systems under 250 connections.

Part 2. The Three Elements of the Regulation

Section I. Conservation Planning

A. Planning Intent

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(a) provides the Legislature's direction to require municipal water suppliers to integrate conservation into all aspects of their operations and to include such integration in their water system plans (WSP) or small water system management programs (SWSMP). This section also directs the Department of Health (DOH) to use the current *Conservation Planning Requirements* (DOH PUB 331-008) (1994 Guidance) as a starting point in developing the conservation rule.

Discussions on conservation planning began with a basic description of DOH's planning program. A summary of the DOH's planning program can be found in the Background Section.

Overview of Subcommittee Discussions

The Municipal Water Law (MWL) requires conservation planning and directs DOH to begin with the 1994 Guidance, which the subcommittee agreed was a good starting point. Purveyors have used the 1994 Guidance to develop and implement conservation elements for WSPs.

In general, subcommittee members agree DOH's current WSP program is sufficient for integrating conservation with operations and management. Some subcommittee members expressed concern about municipal water suppliers that are only required to complete a SWSMP, but not to have it reviewed and approved by DOH. Some believed DOH should require formal review and approval.

Subcommittee Options and Recommendations

<u>Small Water System Management Program Approval</u>

Option 1: DOH should continue current review and approval procedures for SWSMPs with no modification.

Option 2: DOH should require municipal water suppliers to submit a SWSMP to DOH for approval when problems are identified related to water supply characteristics.

Option 3: DOH should require all SWSMPs to be submitted to DOH for approval.

Option 4: DOH should require that all SWSMPs be submitted to DOH for approval and be updated on a regular basis.

Integration with Operations and Management

The MWL recognizes the importance of integrating conservation with operation and management. Conservation-related activities (*i.e.,* meter readings) should be identified in the appropriate sections of the WSP and SWSMP.

Recommendation 1: DOH should retain current regulatory language related to the budget operations and management programs in WSPs and SWSMPs. Current regulations are sufficient to show integration of conservation with operations and management.

Recommendation 2: DOH should review conservation programs during sanitary surveys. Federal law requires sanitary surveys every five years consisting of a review, inspection, and assessment of the public water system.

Identification of Appropriate Funding and Implementation

The MWL recognizes the importance of identifying funding and implementation strategies in WSPs and SWSMPs, including the type of project, timeline, cost, and how it will be funded. Implementation strategies are described in the Evaluation and Selection of Cost-Effective Conservation Measures in Part 2, Section I.D.

The financial information submitted to DOH depends on the size of the water system, the type of plan, and whether the system is investor-owned and regulated by the Washington Utilities and Transportation Commission. Purveyors with water systems serving 1,000 connections or more are required to submit a one-year balanced operating budget. Purveyors with water systems serving fewer than 1,000 connections submitting a WSP are required to submit a six-year balanced operating budget. The *Financial Viability Manual* (DOH PUB 331-104) includes a sample budget DOH considers sufficient to show all of the costs and revenues for a purveyor with a water system of that size. Those completing a SWSMP are required to include a simple six-year operating budget.

Water System Plans

Recommendation: DOH should continue current practices. Current regulations and guidance for WSPs are sufficient to identify appropriate funding of conservation programs.

Small Water System Management Programs

Recommendation 1: DOH should continue current practices. Current regulations and guidance for SWSMPs are sufficient to identify appropriate funding of conservation programs.

Recommendation 2: DOH should revise the budget provided in the SWSMP Guide to gather more detailed information.

B. Data Collection and Reporting

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(a)(ii)(D) requires municipal water suppliers to collect water conservation data (*i.e.*, water production and consumption), report this data in their WSP or SWSMP, and evaluate their water efficiency program effectiveness.

Overview of Subcommittee Discussions

The Legislature directed DOH to use the 1994 Guidance as a starting point in developing the new regulation. The Data Collection and Reporting Workgroup started with the data elements contained in the 1994 Guidance and then focused on the data necessary for conservation planning, the leakage standard, and performance reporting under the MWL.

Some subcommittee members emphasized that data collected must be chosen carefully to keep the process from becoming too costly or too time consuming. Others expressed concern about the need to make information available to the public and hold municipal water suppliers accountable for demonstrating quantitative progress.

The Data Collection and Reporting Workgroup members achieved strong consensus on their recommendations and options. The subcommittee agreed to adopt Matrix 2, Water Conservation and Water Usage Data Elements. Their recommendations and options are listed below.

Subcommittee Options and Recommendations

<u>Data Collection General Philosophy</u>

The data collected for water system planning should be sufficient to determine compliance with the leakage standard and the performance reporting requirements of MWL.

<u>Data Elements of Municipal Water Law Requirements</u>

The Data Collection and Reporting Workgroup's proposal is captured in Matrix 2, Water Conservation and Water Usage Data Elements. It is a mix of data elements from the 1994 Guidance, new concepts from the MWL, and new terminology being adopted nationally by the water industry. It also reflects some of the subcommittee members' desire for more emphasis on resource stewardship and peak usage information. Some subcommittee members believe there is a critical need for municipal water suppliers to know their supply characteristics, including any water resource issues. They also believe utilities should make their customers aware of activities that affect water resources. This collective knowledge will enhance the conservation goal-setting process.

Some subcommittee members expressed a concern that annual summary figures do not give an accurate view. A number of subcommittee members thought that municipal water suppliers should record and track usage by peak and off-peak periods. The opinion was also expressed that municipal water suppliers will become better water resource managers if they identify usage

impacts from Washington's hot and dry summer weather, which drives water usage to its highest levels. Another view was that monthly production data would be sufficient.

A significant change from past data collection requirements is the increased emphasis the MWL places on distribution system leakage. Matrix 2, Water Conservation and Water Usage Data Elements, provides significant detail about the new American Water Works Association (AWWA) water loss terminology and processes necessary to identify water leakage. In 2003, AWWA adopted the International Water Association's (IWA) recommendations on water loss terminology. The AWWA manual on system leakage is under revision today because of these changes.

Appendix F, American Water Works Association – Water Balance Format clarifies how to identify different water uses and losses using the new terminology proposed in Matrix 2, Water Conservation and Water Usage Data Elements, for water system plan data requirements.

Recommendation: DOH should use Matrix 2, Water Conservation and Water Usage Data Elements, as the basis for determining what information municipal water suppliers must collect and report for the water conservation planning requirements of MWL and for the data required by the new distribution leakage standard.

Matrix 2: Water Conservation and Water Usage Data Elements

System Size (Total Connections)	**15 to 999**	**≥ 1,000**
Planning Document	**SWSMP / WSP**	**WSP**
System Input[4] (own source production per source and imported water) **Resource Stewardship and Peak Usage**	• Record annual system input (production) volume • Record Average Day Demand for each planning year • If doing a water system plan, calculate Maximum Day Demand using the *Water System Design Manual* (DOH PUB 331-123) • Option 1: Record monthly production • Option 2: Record monthly total system production (input) and include off-peak total and a peak season total to equal an annual total (two subtotals to equal annual total) for summarizing annual historical information	• Record annual system input (production) volume • Record Average Day Demand for each planning year • If doing a water system plan, calculate Maximum Day Demand using the *Water System Design Manual* (DOH PUB 331-123) • Option 1: Record monthly production • Option 2: Record monthly total system production (input) and include off-peak total and a peak season total to equal an annual total (two subtotals to equal annual total) for summarizing annual historical information
Population Served	Estimate annual totals	
Water Rates	Provide current water rate structures. NOTE: Evaluation of rate structures is addressed in the conservation measures portion of the regulation	
Real Losses (physical leakage)	Use Simple Formula first: System Input (Production) subtract Authorized Consumption = Total Water Losses. Record annual Total Water Losses by volume. Annual Total Water Losses recorded in percent (Total Water Losses divided by System Input [subtract water exported]) = Leakage Percent (1) If meeting or showing less than the state leakage standard, the system is in compliance (2) If total water loss exceeds leakage standard when simple formula is used, then: (a) The advanced formula may be used to recalculate leakage. System Input (Production) subtract Authorized Consumption (billed or unbilled, metered or un-metered), subtract Apparent Loss (Unauthorized Consumption, metering and data inaccuracies) = Real Water Losses. If advanced formula results are still greater than the leakage standard, submit a water loss control action plan OR (b) A Water Loss Control Action Plan may be submitted. The plan must identify funding and timelines for proposed actions	
Billed Authorized Consumption (metered water sales, including exported water)	Record total annual usage of residential and non-residential connections if there is more than just residential use	<u>Breakout Customer Usage</u>: Municipal water suppliers specify their own customer classes and define water use patterns <u>Frequency and Method for Recording Data</u>: Municipal water suppliers must provide annual usage data and quantitative information on peak and off-peak usage by customer class

[4] See Appendix E, American Water Works Association – Water Balance Format

System Size (Total Connections)	**15 to 999**	**≥ 1,000**
Planning document	**SWSMP / WSP**	**WSP**
Service Metering	Option 1: All municipal water suppliers should evaluate the installation of service meters Option 2: Require service meters to be phased in over time Option 3: DOH should require all municipal water suppliers to install service meters, phased in over time. There should be an exemption allowed for economic hardships to customers related only to the capital costs of meter installation and operating costs of meter readings. This hardship should be allowed for a set time and must be renewed Option 4: DOH should not require metering of all service connections for municipal water suppliers that have a DOH accepted alternative methodology for determining leakage	

C. Demand Forecast Methodology

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(a)(ii)(E) provides the Legislature's direction to require municipal water suppliers, as part of their planning document, to forecast their demand to determine future water needs.

Overview of Subcommittee Discussions

Demand forecasting is an important element of conservation planning. It helps estimate future capacity, based on existing use patterns, and identifies use among different customer classes. This allows targeting of conservation measures to most effectively reduce demand. As directed by the MWL, discussions on demand forecasting began with DOH's 1994 Guidance.

Subcommittee members were concerned that conservation demand forecasting could conflict with forecasting methods from DOH's *Water System Design Manual* (DOH PUB 331-123), which provides methods for forecasting demand for source production. On one hand, source production is made up of many elements including customer demand. On the other, in conservation demand forecasting customer demand is part of the source production demand.

Subcommittee members see the value of forecasting demand for customer classes in helping municipal water suppliers determine where to focus their conservation efforts. In the data collection and reporting discussion it was determined that municipal water suppliers with systems serving fewer than 1,000 connections should break down their customers into residential and non-residential classes. Municipal water suppliers with systems serving 1,000 connections or more should determine their own break down of customer classes.

Subcommittee members weighed the benefits of determining the Maximum Daily Demand for each customer class as alluded to in the 1994 Guidance. They believe determining peak season use may be more beneficial than a daily figure for each customer class. In the data collection and reporting discussion, they recommended that municipal water suppliers with systems serving 1,000 or more connections provide quantitative information on peak and off-peak consumption.

The subcommittee discussed whether the criterion described in the 1994 Guidance is sufficient and should be included in the regulation. One criterion is consistency with local planning, which includes any applicable comprehensive plan (including chapter 37.70 RCW), land use plan, development regulation, or approved watershed plan (per chapter 90.82 RCW or RCW 90.54.040(1)). The subcommittee asked how local planning should be addressed and shared their thoughts on how local planning consistency should occur. They also asked what will happen if a municipal water supplier and a local planning agency disagree. DOH suggested that subcommittee members with comments on local planning consistency contact DOH staff who is working on that topic, which is outside of the water use efficiency rulemaking process.

Subcommittee Options and Recommendations

Demand Forecast General Requirements

Recommendation: DOH should use Matrix 3, Demand Forecasting, as the basis for demand forecasting for the water conservation planning requirements of the MWL.

Water Resource Plans

Subcommittee members asked how municipal water suppliers will know which sections of water resource plans are pertinent to include in the demand forecast. Approved water resource plans discuss water resources forecasting. This may include, but are not limited to, watershed plans.

Recommendation: DOH should offer technical assistance on what sections of water resource plans may be pertinent to demand forecasting. However, it is the municipal water suppliers' responsibility to determine what plans, and what sections of the plans, are applicable to their system(s).

Matrix 3: Demand Forecasting

System Size (Total Connections)		15 to 999		≥ 1,000
	Planning Document	**SWSMP**	**WSP**	**WSP**
Demand Forecast Elements	**Timeframe of Forecast (Planning Horizon)**	Existing and approved number of connections	Existing 6-year and 20-year	Existing 6-year and 20-year
	Information to be Forecasted	Annual total for residential and non-residential connections	Average Daily Demand for residential and non-residential connections	Average Daily Demand and quantitative information on peak season for each customer class used by the municipal water supplier for the system
Criteria that Need to be Addressed	**Population Growth Projections**		Must be used to determine growth. If different, must provide justification (see MWL Guidance on Local Planning Consistency)	
	Land Use and Zoning	Address how this will affect demands		
	Water Resources Plans	All pertinent information must be addressed, including regional assessments of water supply and any other considerations found in approved water resource plans, including watershed plans		
Forecasts to be Included for System Production	**Based on Existing Consumption**	Required		
	Based on Meeting Conservation Goal	Required		
	Forecast all Cost-Effective Conservation Measures			Required for water systems expanding into inchoate water under RCW 90.03.386(3)(c)

D. Evaluation and Selection of Cost-Effective Conservation Measures

Relevant Sections of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(a)(ii)(A) requires municipal water suppliers in their planning document to implement cost-effective conservation measures to achieve their conservation goals.

RCW 90.03.386(3) requires municipal water suppliers with 1,000 or more connections to describe in their water system plan how further cost-effective conservation would affect further use of their inchoate water rights.

Overview of Subcommittee Discussions

As part of a WSP or a SWSMP, municipal water suppliers must evaluate and choose conservation measures that will achieve their conservation goals. Beginning with the 1994 Guidance, subcommittee discussions centered on the following topics:

- Setting conservation goals – Conservation goal setting is described in Part 2, Section III, Conservation Goal Setting and Performance Reports.
- Selection of categories of conservation measures to be evaluated – The 1994 Guidance defines specific conservation measures that should be evaluated based on size. The conservation measures listed are only a few of over 100 which a system may implement. The approach recommended is that DOH should require categories of measures to be evaluated. The categories for any system would be based on system size. The municipal water supplier would then determine the specific measures within a given category that should be considered for implementation.
- Cost-effectiveness of conservation measures – The subcommittee believes it is important to develop criteria in regulation to determine if a conservation measure is cost-effective. Because of its complexity, this subject was first discussed in a workgroup, which created a report with options that served as the foundation for subcommittee discussions (see Appendix B, Cost-Effectiveness Evaluation Workgroup Report).
- Identification of the conservation measures to be implemented – Cost-effective conservation measures a municipal water supplier chooses to implement should be included in the WSP or SWSMP.

Subcommittee Options and Recommendations

Relationship of Conservation Goal Setting to Cost-Effective Evaluation

Subcommittee members offered a range of options that dealt with the relationship between the cost-effectiveness evaluation and conservation goal setting.

Option 1: DOH should require the cost-effectiveness evaluation to occur prior to conservation goal-setting.

Option 2: DOH should require the conservation goal-setting process to occur before the cost-effectiveness evaluation.

Option 3: DOH should not specify the order of the cost-effectiveness evaluation and conservation goal-setting process.

Option 4: DOH should not link conservation goal setting with the cost-effectiveness evaluation because they are in two distinct parts of the regulation.

Categories of Conservation Measures

The subcommittee determined that DOH should develop and prescribe categories of conservation measures. Municipal water suppliers would then determine the specific conservation measures within a given category that should be considered for implementation. DOH guidance should describe the conservation measures in each category and the appropriate system size for each conservation measure. For examples of conservation measures in each category, see Appendix G, Conservation Measures Table.

Recommendation: DOH should define the categories of conservation measures municipal water suppliers must evaluate. Municipal water suppliers should select conservation measures they will evaluate within the required categories. DOH should use Matrix 4, Categories of Conservation Measures to be Evaluated, to determine the categories of conservation measures appropriate to each system size category.

Number of Conservation Measures that Must be Evaluated in Each Category

Option 1: DOH should not require evaluation of a specific number of conservation measures from each category.

Option 2: DOH should require evaluation of a specific number of conservation measures from each category.

Evaluation and Implementation of Conservation Measures

Certain conservation measures must be evaluated or implemented because of other sections of the MWL and laws in existence before the MWL. All municipal water suppliers must evaluate conservation-oriented rates, determine their leakage, and reduce their leakage if it is above the set standard. Purveyors with systems serving 1,000 or more connections are required to evaluate reclamation. Source meters must be installed. The subcommittee discussed whether any other conservation measures should be required to be evaluated or implemented. The following options and recommendation came from those discussions.

Conservation Measures Required by Other Statutes

Recommendation: DOH should include in the regulation the evaluation or implementation of all conservation measures that are required by other laws.

Source Meters

Recommendation: DOH should continue to require the installation of source meters.

Service Meters

Option 1: DOH should require all municipal water suppliers to evaluate the installation of service meters on their systems.

Option 2: DOH should require all municipal water suppliers to install service meters on their systems, phased in over time.

Option 3: DOH should require all municipal water suppliers to install service meters on their systems, phased in over time. There should be an exemption allowed for economic hardships to customers related only to the capital costs of meter installation and operating costs of meter readings. This hardship should be allowed for a set time and must be renewed.

Option 4: DOH should not require metering of all service connections for municipal water suppliers that have a DOH accepted alternative methodology for determining leakage.

Meter Calibration

Recommendation: DOH should require all municipal water suppliers to ensure their source and service meters are maintained in good working order.

Cost-Effective Evaluation of Conservation Measures

At a November 2004 Cost-Effective Evaluation Workgroup meeting, an expert presented various perspectives that can be used to evaluate the cost-effectiveness of a conservation measure.

- Utility Perspective – Will the conservation measure be cost-effective for the municipal water supplier to implement?
- Cost-Sharing Perspective – Will the conservation measure be cost-effective for the water supplier to implement if the costs are shared with other entities?

- Total Resource Perspective – Will the conservation measure be cost-effective no matter who (municipal water supplier or customer) pays for it?
- Participating Customer Perspective – Will the conservation measure be cost-effective for the participating customer?
- Non-Participating Customer Perspective – Will the average bill increase or decrease for customers? It is important to compare this value to what the average bill would be if the conservation measure was not implemented.
- Societal Perspective – Is the conservation measure cost-effective when comparing the costs and benefits for society?

The Cost-Effective Evaluation Workgroup recognizes that municipal water suppliers with small systems may face challenges completing and paying for these evaluations. The workgroup understands that the societal perspective is more difficult to evaluate due to difficulties in quantifying certain costs and benefits, such as avoided environmental costs. Because of these difficulties, options were presented that may be used in lieu of a complete societal perspective evaluation. The options are listed on Matrix 5, Cost-Effectiveness Evaluation.

To adequately evaluate conservation measures, municipal water suppliers should assess two different types of costs they may avoid by implementing the conservation measure. The first is the marginal operating cost of producing water, which includes costs such as energy and treatment. The second is the marginal capital costs of producing water, which includes costs such as equipment and facilities. Some subcommittee members asked if marginal capital costs should be included for all water systems. For more information on the workgroup report see Appendix B, Cost-Effectiveness Evaluation Workgroup Report.

Recommendation 1: DOH should use Matrix 5, Cost-Effectiveness Evaluation, as the basis for requirements.

Recommendation 2: DOH should provide guidance on how to evaluate conservation measures for each perspective. This may be a checklist or a fill-in-the-blank worksheet.

Recommendation 3: DOH should provide guidance with default information on costs to implement conservation measures and the benefits of water savings.

Recommendation 4: DOH should not require an evaluation if conservation measures from each of the required categories will be implemented.

Recommendation 5: DOH should require all information on the evaluation to be submitted in the planning document.

Inclusion of Avoided Wastewater Costs in the Evaluation

The subcommittee discussed when avoided wastewater costs should be included in cost-effectiveness evaluations.

Option 1: DOH should require all municipal water suppliers that have a wastewater facility within their service area to include the avoided wastewater costs as part of their avoided water costs.

Option 2: DOH should require municipal water suppliers that own their own wastewater facilities to include their avoided wastewater costs as part of their avoided water costs.

Option 3: DOH should only require inclusion of avoided wastewater costs in the evaluation of the societal perspective.

Option 4: DOH should not require wastewater costs to be included in any cost-effectiveness evaluation.

Identifying Selected Conservation Measures

Once the conservation goals are set and the evaluation has been completed, the municipal water supplier must select the conservation measures it will implement to meet its conservation goals. Sufficient information regarding how and when the selected conservation measure will be implemented must be included in the WSP or SWSMP.

Water System Plans

Recommendation: DOH should require municipal water suppliers to describe the selected conservation measures, provide a schedule and budget for implementation, describe how they will evaluate program effectiveness, project the water savings expected, and describe the achieved improvements in conservation efficiency as described in RCW 90.03.386(3)(b).

Small Water System Management Programs

Recommendation: DOH should require municipal water suppliers to describe the selected conservation measures and provide a schedule and budget for implementation.

Guidance Materials for Cost-Effectiveness Evaluations

Recommendation: DOH should develop guidance and support materials (computer programs, spreadsheets, models, etc.) to help municipal water suppliers with small and medium sized systems evaluate cost-effectiveness.

Matrix 4: Categories of Conservation Measures to be Evaluated

System Size (Total Connections)	15 to 999		1,000 to 9,999	≥ 10,000
Planning Documents	**SWSMP**	**WSP**	**WSP**	**WSP**
Source Meters	Required			
Service Meters	See options in Matrix 2, Water Conservation and Water Usage Data Elements			
Meter Test / Calibration / Replacement Program	Source and service meters must be maintained in good working order			
Leakage Reduction	Required if leakage is greater than set standard per RCW 70.119A.180			
Conservation-Oriented Rates	Required to be evaluated per RCW 43.20.235			
Regulatory Conservation Measures				Evaluate
Education	Evaluate	Evaluate	Evaluate	Evaluate
Indoor Residential Conservation Measures		Evaluate	Evaluate	Evaluate
Outdoor Conservation Measures		Evaluate	Evaluate	Evaluate
Industrial / Commercial / Institutional Conservation Measures			Evaluate	Evaluate
Reclamation			Required to be evaluated per RCW 90.46.120	

Matrix 5: Cost-Effectiveness Evaluation

<table>
<tr><td>System Size
(Total Connections)</td><td>15 to 999</td><td>15 to 999</td><td>1,000 to 9,999</td><td>≥ 10,000 to
49,999</td><td>≥ 50,000</td></tr>
<tr><td>Planning Documents</td><td>SWSMP</td><td>WSP</td><td>WSP</td><td>WSP</td><td>WSP</td></tr>
<tr><td>Costs to Include</td><td>Marginal operating costs</td><td>Option 1: Marginal operating costs
Option 2: Marginal operating and capital costs</td><td>Option 1: Marginal operating costs
Option 2: Marginal operating and capital costs</td><td colspan="2">Marginal operating and capital costs</td></tr>
<tr><td rowspan="2">Perspective</td><td colspan="2" rowspan="2">Option 1: Evaluate utility perspective
Option 2: Evaluate utility, total resource cost, participating and non-participating customer perspectives</td><td colspan="3">Option 1: Evaluate utility perspective
Option 2: Evaluate utility perspective and address cost-sharing perspective
Option 3: Evaluate utility, total resource cost, participating, and non-participating customer perspectives. Address cost-sharing perspective
Option 4: In Options 1 and 2 change “address cost-sharing perspective” to “evaluate”</td></tr>
<tr><td>Optional approaches for addressing societal perspective (not all options listed are mutually exclusive)

Option 1: Evaluate total resource cost, participating customer, and non-participating customer perspectives
Option 2: Societal narrative description
Option 3: Societal adder or similar approach
Option 4: DOH provides default values
Option 5: Begin including societal perspective at 5,000 connections instead of 1,000</td><td>Optional approaches for addressing societal perspective (not all options listed are mutually exclusive)

Option 1: Evaluate total resource costs, participating customer, and non-participating customer perspectives
Option 2: Societal narrative description
Option 3: Societal adder or similar approach
Option 4: DOH provides default values
Option 5: Pilot quantitative analysis with state agency involvement (DOH and Department of Ecology)</td></tr>
</table>

Note:

- Matrix shows the minimum to include in the evaluation. Municipal water suppliers may choose to evaluate additional perspectives.
- A societal adder adds a defined percentage to the value of a specified increment of water to account for the benefits of not using that water.

1. Evaluation of Conservation-Oriented Rates

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(a)(ii)(B) directs municipal water suppliers preparing a WSP or a SWSMP to include an evaluation of conservation-oriented rates. This requirement is essentially identical to existing law except that it expands the requirement to SWSMPs.

Overview of Subcommittee Discussions

The subcommittee discussion on this topic was very limited. Subcommittee members wanted to focus on other sections of the MWL rather than on something that is very similar to existing state statute.

Part of the Performance Reporting and Accountability Workgroup's task was to provide a range of options DOH can use to review the municipal water supplier's evaluation of the feasibility of conservation-oriented rates. Although the workgroup did not provide a specific recommendation on this topic, they said the status quo is not acceptable given the Legislature's new emphasis on conservation. At a minimum, the workgroup says DOH should specify criteria for this evaluation and subsequent decision-making process.

No recommendations on this topic were solicited from the subcommittee.

Section II. Water Distribution Leakage Standard

Relevant Sections of the Municipal Water Law as Codified in RCW

There are two separate leakage requirements under the MWL: evaluation of leakage as a subset of water conservation planning, and complying with a new state distribution leakage standard.

RCW 70.119A.180(4)(a)(ii)(C) expands the planning requirement to all municipal water suppliers, and includes an evaluation of their water distribution system leakage. It requires municipal water suppliers to document the steps they take to reduce leakage in the conservation elements of their WSP or SWSMP.

RCW 70.119A.180(4)(b) directs DOH to establish a water distribution system leakage standard for the state that is no lower than 10 percent.

Overview of Subcommittee Discussions

In regards to planning requirements related to leakage, the subcommittee focused on determining what data elements are needed to evaluate a municipal water supplier's water distribution system leakage, and the steps necessary for the municipal water supplier to comply with the new state leakage standard.

The subcommittee generally agreed on establishing a distribution system leakage standard of 10 percent for all municipal water suppliers. The subcommittee noted that leakage is separate from other types of water losses, such as meter inaccuracy, fire fighting, and flushing. Some members believe that since the industry standard is 10 percent for all unaccounted-for water, direction from the Legislature that the standard could be no lower than the 10 percent was too generous.

Among the topics discussed, the subcommittee reviewed the new terminology related to water loss being developed by AWWA. In 2003, AWWA adopted the IWA's recommendations on water loss terminology. Most subcommittee members accepted the adoption of new water loss terminology.

The subcommittee differed, however, on the scope of the municipal water suppliers components subject to the leakage standard. Some subcommittee members suggested that the distribution system leakage standard should apply only to distribution systems as currently defined in DOH regulations. Others felt that the standard should include the transmission piping and facilities from the source to the service.

The subcommittee also discussed whether or not to include leakage in performance reports. Some suggested that this would provide municipal water suppliers with an incentive to improve beyond the state standard. Others believe that leakage should not be included in performance reports.

Finally, the subcommittee took up the question of whether service meters are essential and should be required. Some believe they are. Others suggest that alternatives such as performance-based water loss control practices should be allowed.

Subcommittee Options and Recommendations

Leakage Standard Level

DOH cannot set the state leakage standard below 10 percent, but could set it higher. The distribution leakage standard excludes "accounted-for uses", such as flushing, fire protection, parks and public spaces, street cleaning, and construction. It also excludes most "unaccounted-for water" losses related to meter inaccuracies, theft, under-estimated accounts, improperly typed and sized meters, meter-reading errors, and accounting errors.

Since the mid-1990s, the national water industry standard has been less than 10 percent for all "unaccounted-for water" losses and uses. The AWWA says, "Advances in technologies and expertise should make it possible to reduce lost and unaccounted-for water to less that 10 percent."[5] The 1994 Guidance recommended that when "unaccounted-for water", losses exceed 20 percent, the purveyor should complete a water audit and implement leak detection and repair.

Subcommittee members realize water meters are not always precise. Final reported numbers may need qualification or validation.

Recommendation 1: DOH should set the distribution system leakage standard at 10 percent for all municipal water suppliers. Municipal water suppliers with smaller systems should have more time to comply, rather than establishing different state standards for small and large systems.

Recommendation 2: DOH should allow use of existing funding mechanisms and seek additional funding to help municipal water suppliers comply with the new standard.

Evaluating and Reporting Leakage in Water System Plans or Small Water System Management Programs

All municipal water suppliers will need to measure their distribution system leakage rates, and if they exceed the state standard, evaluate past efforts to minimize leakage, and include information about the steps they intend to take to reduce leakage in their WSP or SWSMP.

Recommendation 1: DOH should require municipal water suppliers to evaluate and report distribution system leakage in their WSP or SWSMP. If leakage exceeds the state standard, WSPs and SWSMPs should include a past six-year summary of leakage volumes and actions taken to reduce

[5] Journal AWWA, July 1996, "Committee report: water accountability," AWWA Leak Detection and Water Accountability Committee.

leakage. If leakage is in compliance with the state standard, WSPs and SWSMP should include a summary of the actions that will be employed to maintain leakage within the state standard.

Recommendation 2: DOH should modify the *Small Water System Management Program Guide* (DOH PUB 331-134) to include the new state leakage standard.

Recommendation 3: DOH should require more frequent reporting if a municipal water supplier has leakage higher than the state standard. This should be done through a Water Loss Control Action Plan.

Terminology

Water loss terminology is changing internationally and nationally. For example, the term "unaccounted-for water" is being replaced with many other terms that better define all the water uses and losses involved in water delivery. The subcommittee agrees that consistent water accounting definitions are needed to make comparisons meaningful. Standard definitions promote transparency and learning. Some subcommittee members raised concerns over changes in terminology because this regulation will be introducing a number of new things to municipal water suppliers. There is a lot of information for municipal water suppliers to comprehend. Education will be necessary for success.

Option 1: DOH should continue using current terminology.

Option 2: DOH should use new terminology proposed by the AWWA for defining water uses and losses. Municipal water suppliers should categorize as many of their water uses and losses as possible. See Appendix F, American Water Works Association – Water Balance Format.

Real Water Loss

The MWL uses the phrase distribution system leakage. The AWWA term for distribution system leakage is "real losses." The subcommittee noted that the system components listed in the AWWA definition differs from DOH's current definition of "distribution system".

Option 1: DOH should use a modification of the AWWA term so it fits with the current definition of "distribution system" in chapter 246-290 WAC.

Option 2: DOH should use the AWWA definition. Real loss includes leakage on mains, leakage, and overflows at storage facilities (not dams), and leakage on service lines up to the water customer's service line.

Data Elements for Leakage

The Data Collection and Reporting Workgroup proposed data elements to be required under MWL. The subcommittee accepted the data elements described in Matrix 2, Water Conservation and Water Usage Data Elements.

Recommendation: DOH should use the data elements for leakage described in Matrix 2, Water Conservation and Water Usage Data Elements.

Water System Components Subject to the Distribution Leakage Standard

Different opinions were expressed about what parts of the water delivery system the new standard applies. The difference lies in interpretation of the term, "distribution system." Some subcommittee members expressed concern that if raw water is considered, the 10 percent recommendation is too low.

Option 1: DOH should use the current definition for water distribution system found in chapter 246-290 WAC.

Option 2: DOH should use the current definition for water distribution system found in chapter 246-290 WAC and require municipal water suppliers to address raw water transmission leakage in a narrative portion of their WSP or SWSMP.

Option 3: DOH should define the water distribution system as follows: the water distribution system conveys water from the treatment or production facilities to the user.[6] The distribution leakage standard should include finished water (post-treatment), transmission pipes, storage tanks, reservoirs, pumping, supply mains, and appurtenant valves.

Option 4: DOH should adopt Option 3 and add raw source water transmission lines.

Option 5: DOH should define the water distribution system to include only the distribution grid, and not include raw source water transmission piping, in-town storage, or reservoir losses. Gross transmission leakage issues should be referred to the Department of Ecology.

[6] Culp/Wesner/Culp, *Handbook of Public Water Systems*, 1986.

Formula for Evaluating Leakage (Systems with Source and Service Meters)

In general, subcommittee members believe that DOH should include a simple method to calculate leakage rates in regulation. Some subcommittee members are concerned that many municipal water suppliers cannot calculate leakage rates because their systems lack meters and they do not have a method of tracking authorized water uses.

Recommendation: DOH should use the leakage standard formula found in Matrix 6, Distribution System Leakage Standards Program.

Undefined Uses and Losses Considered Leakage

Most subcommittee members believe that municipal water suppliers should categorize and track as many of the water uses and losses on their system(s) as possible. For details, see Appendix F, American Water Works Association – Water Balance Format. Treating all unknown water losses as leakage will provide an incentive to establish better water accounting.

Recommendation: DOH should consider leakage all water losses and uses that cannot be calculated or estimated.

Inaccuracy of Meters

The AWWA accuracy standard for new meters can range from 1.5 percent to 5 percent. Some small systems have inappropriately-sized meters. Meters may be improperly maintained, operate under varying flow conditions, or installed in ways that are not conducive to test or maintain.

Recommendation 1: DOH should allow municipal water suppliers to factor in meter inaccuracy as a line item in their accounting process when they calculate their leakage, as long as the percentage is not greater than two percent.

Recommendation 2: DOH should not be prescriptive on the subject of meter calibration. If a particular system is having difficulty meeting the leakage standard, meter calibration should be considered in a Water Loss Control Action Plan.

Recommendation 3: DOH should refer to the Department of Ecology's rule regarding meter testing and calibration.

Service Metering and Leakage Standard

Many subcommittee members do not believe leakage can be evaluated easily or with any accuracy without requiring source and service meters. They said that they have not seen a credible example of how to show compliance with the new leakage standard without full system metering (source and service). Others believe evaluating the installation of service meters is all that the law intended.

Options for service meter requirements are presented in Part 2, Section I.D, Evaluation and Selection of Cost-Effective Conservation Measures.

Alternative to Leakage Percentage

RCW 70.119A.180(4)(b) states: "…The department may consider alternatives to the percentage…where alternatives provide a better evaluation of the water system's leakage performance…"

Subcommittee members recommended allowing alternative methods such as zone metering, night testing, testing for leakage in distribution areas and extrapolating to the rest of the system, comparing production numbers to analogous systems, and showing their work to meet compliance of the new leakage standard through performance-based measures. Another proposal is to track leakage volumes on a historical basis and show the percent change of water-loss volume over time. Some believe this may more accurately show that leakage has decreased. Some subcommittee members were concerned that successful conservation efforts could cause the percent leakage figure to increase, even when volumes are declining. This could be a disincentive for other conservation efforts. Finally, some subcommittee members suggested that DOH require service meters as a mandatory water loss control action, if after a period of time; a municipal water supplier is not making enough progress to meet the new state standard.

Option 1: DOH should allow performance-based alternatives for smaller systems, along with tracking and analyzing gross leakage from source meter readings and historical production records.

Option 2: DOH should allow alternative methods for estimating system leakage using acceptable industry practices such as zone metering, distribution assessments, and nighttime leakage assessments. The burden of proof lies with the municipal water supplier to create a defensible alternative and demonstrate it is within the norm of similar systems. DOH must approve any alternative methodology. DOH should also provide technical assistance.

Option 3: DOH should require service meters if performance reports over time do not indicate a sufficient reduction in usage.

Option 4: DOH should allow alternative methods, such as the IWA Infrastructure Leakage Index, if they provide a better evaluation of water distribution leakage. However, alternative measurements must be translated into leakage volume so amounts can be compared over time.

Failure to Comply with Leakage Standard

Recommendation 1: DOH should require a Water Loss Control Action Plan that identifies the steps needed to achieve the state standard. For all municipal water suppliers that do not meet the leakage standard, a Water Loss Control Action Plan should be required and submitted to DOH for review. The plan should include funding needs and proposals, and provide budget information. See Matrix 6, Distribution System Leakage Standards Program.

Recommendation 2: DOH should not require a professional engineer stamp for submittal of a Water Loss Control Action Plan.

Matrix 6: Distribution System Leakage Standards Program

System Size (Total Connections)	15 to 999	≥ 1,000
Leakage Standard Meter Requirements Leakage Terminology	• Distribution Leakage Standard = 10 percent • Source meter and calibration requirements • Use new AWWA water loss terminology that's being adopted nationally and internationally	
Water Accounting for Systems with Source and Service Meters	• Read source meters monthly, keep records, review the data to incorporate into daily/monthly operations and maintenance activities • Use Simple Formula first: System Input (Production) subtract Authorized Consumption = Total Water Losses. Record annual Total Water Losses by volume. Annual Total Water Losses recorded in percent (Total Water Losses divided by System Input [subtract water exported]) = Leakage Percent (1) If meeting or showing less than the state leakage standard, the system is in compliance (2) If total water loss exceeds leakage standard when simple formula used then: (a) The advanced formula may be used to recalculate leakage. System Input (Production) subtract Authorized Consumption (billed or unbilled, metered or un-metered) subtract Apparent Loss (Unauthorized Consumption, metering, and data inaccuracies) = Real Water Losses. If advanced formula results are still greater than the leakage standard submit a Water Loss Control Action Plan OR (b) A Water Loss Control Action Plan may be submitted. The plan must identify funding and timelines for proposed actions	
	Service meter replacement program identified in WSP	
Water Accounting for Systems with less than 100 percent Metering	Submit an alternative methodology for estimating system leakage using acceptable industry practices to DOH for approval. If the system does not have service meters, it must provide a defensible description of uses and losses that shows the work and assumptions	
Water Loss Control Action Plan	Option 1: Water Loss Control Action Plan required if system is showing more than 10 percent leakage	
	Option 2: Water Loss Control Action Plan required if system is showing more than 20 percent leakage	Option 2: Water Loss Control Action Plan required if system is showing more than 10 percent leakage
Leakage Control – Graduated Requirements	Increasing methods of control at > 20 percent and > 30 percent	Increasing methods of control at > 10 percent, > 15 percent, > 20 percent, and > 30 percent

Note: It may not be technically feasible to locate and repair leaks on the small lines found in many smaller systems, therefore, the 10 percent standard is more difficult to achieve on very small systems.

Section III. Conservation Goal Setting and Performance Reports

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(4)(c) directs the DOH to require municipal water suppliers to establish conservation goals and produce regular performance reports for the public.

Overview of Subcommittee Discussions

There was a great deal of interest in the law's requirements associated with conservation goal setting and performance reports. The starting point for all discussions on conservation goal setting is the fact that the MWL clearly states that municipal water suppliers set their own conservation goals. The subcommittee worked to ensure public processes and information prepared by municipal water suppliers would be appropriate and create an environment for effective public involvement and input, ensuring high levels of performance.

This topic was taken up by the Performance Reporting and Accountability Workgroup. A report is in Appendix C, Performance Reporting and Accountability Workgroup Report.

Subcommittee Options and Recommendations

<u>The Role of the Governing Body</u>

The MWL includes specific language related to conservation goal setting by a water system's governing body and optional factors that may be considered when setting conservation goals (see RCW 70.119A.180(4)(c)(i)). Those factors are historic conservation performance and conservation investment, customer based demographics, regional climate variations, forecasted demand, system supply characteristics, system financial viability, system reliability, and affordability of water rates.

Recommendation 1: DOH should include this provision of the MWL (RCW 70.119A.180(4)(c)(i)) directly in regulation.

Recommendation 2: DOH should develop guidance to assist municipal water suppliers with the public process and development of conservation goals that take into account the factors identified in this section of the law.

<u>Development of Conservation Goals for the Public Forum</u>

The municipal water supplier should develop conservation goals for consideration by the governing body of its systems and the public. Information must be sufficient for the governing body to make decisions. Some subcommittee members were concerned that there may be confusion related to the use of the term "governing body". Although some municipal water suppliers, such as cities, have clear governing bodies that are distinct from water system management, the term does not fit as well for privately-owned systems or small homeowner associations. There also may be confusion when systems are managed or operated by a separate Satellite Management Agency. DOH will need to clarify in the regulations about what constitutes a "governing body" and define its responsibilities.

Recommendation: DOH should require municipal water suppliers to prepare background materials and proposed conservation goals for their system(s). The background materials should be tailored to the complexity of the system(s) and should include conservation program elements, costs and the rationale for each conservation goal, and a schedule for implementation and achievement of conservation goals.

Notification about the Public Forum

To attend and participate in the public forum where conservation goals are being set, the public needs sufficient notice.

Recommendation: DOH should require a minimum two week notice for the public forum to set conservation goals. The notice should include the date, time, and place of the forum, and an invitation to attend. It should be in the same format typically used to provide public notice.

Access to Information Materials

For a meaningful discussion, the public must have access to the proposed conservation goals and supporting materials.

Recommendation: DOH should require that all information on how the conservation goals are set, how cost-effectiveness is evaluated, and how the conservation measures will be implemented be included the municipal water suppliers' WSP or SWSMP. This information should be made available to the public.

Opportunity to Comment

For a meaningful public process, the public must have an opportunity to provide comments to the system's governing body on the conservation goals being set for that system.

Recommendation: DOH should ensure that the public is given an opportunity to comment on the conservation goals to the governing body (either in writing or in an open public forum) that the governing body considers these comments and that the conservation goals are set in an open public forum.

Existing Public Process

Many municipal water suppliers must comply with state and local requirements for public processes. In some cases, new public process requirements could conflict with other requirements or unnecessarily complicate the public processes already in place.

Option 1: DOH should ensure that new requirements are integrated smoothly with existing state and local requirements for holding public forums.

Option 2: DOH should allow municipal water supplier to use their existing public forum processes.

Consistency with Utilities and Transportation Commission's Regulations

There are issues in the MWL posing unique concerns to municipal water suppliers that are private for profit entities regulated by the Utilities and Transportation Commission[7], particularly in regard to the public forum and conservation goal setting. The stakeholder process has made DOH aware of them.

Recommendation: DOH should coordinate closely with the Utilities and Transportation Commission to ensure that municipal water suppliers are not given conflicting requirements.

Regional Public Forums

Many municipal water suppliers own and operate multiple water systems. Separate public forums for each system would be costly and difficult. Many subcommittee members agreed that a regional public forum should be allowed as long as it remains clear that municipal water suppliers are responsible for setting conservation goals and implementing conservation programs for each individual system and that the public forums should not be so broad that the public cannot participate in a meaningful way.

Some subcommittee members also expressed concern that system-specific conservation goal setting and performance reporting may be a disincentive to regional partnerships for conservation.

Recommendation 1: DOH should allow municipal water suppliers that are responsible for multiple systems to hold regional public forums. However, conservation goals must be established for each individual system.

Recommendation 2: DOH should promote regional water conservation partnerships.

[7] Some of these issues have been described in a memorandum prepared by a subcommittee member (Jerry Peterson, Washington Water Service). That memorandum has been included in its entirety in Appendix C, Performance Reporting and Accountability Workgroup Report, Attachment 1.

Frequency of Conservation Goal Adoption

The MWL directs DOH to establish performance reporting requirements with a reporting frequency appropriate to water system size and complexity. The MWL does not explicitly address the frequency of conservation goal adoption. DOH will need to specify in regulation how often conservation goals should be set.

Most subcommittee members believe conservation goals are best developed within the context of a comprehensive planning process. Some subcommittee members believe the public process of conservation goal setting is a unique opportunity to communicate with the public and should occur on a more frequent basis.

The options listed below assume that all municipal water suppliers will be required to establish conservation goals for their system(s) within a set time period following adoption of DOH's regulations.

Option 1: DOH should require municipal water suppliers to evaluate their conservation goals whenever a WSP or a SWSMP is developed and updated.

Option 2: DOH should develop a schedule for evaluating conservation goals that coincides with the submittal of the comprehensive performance report requirement and is appropriate to water system size and complexity.

Options 3: DOH should require municipal water suppliers to evaluate their conservation goals annually.

Adjustments to Conservation Goals

Although not explicitly stated, the MWL suggests that municipal water suppliers be allowed to adjust their conservation goals over time. This flexibility is necessary because there are so many uncontrollable circumstances that may affect results (for example, weather, economy, or lack of regional experience with specific actions).

Recommendation: DOH should allow adjustments to conservation goals under well-defined conditions listed in the regulation.[8] Such revisions should be made in an open public forum, meeting the same requirements as initial adoption.

Content

The MWL does not provide specific direction on the content of conservation goals. DOH's regulations will need to clearly explain what should be included in conservation goals. Most subcommittee members believe that municipal water suppliers should determine the content of

[8] A more detailed discussion of the appropriate conditions is provided in Appendix C, Performance Reporting and Accountability Workgroup Report.

the conservation goals for their system(s). Some subcommittee members saw a benefit in having some common metrics as part of the conservation goals for all systems.

Option 1: DOH should give municipal water suppliers broad discretion in designing their conservation goals and conservation program implementation schedule if the conservation goals: 1) address supply and demand characteristics, 2) include implementation and achievement schedules, and 3) include measurable outcomes that will be tracked and reported in the performance reports.

Option 2: DOH should give municipal water suppliers broad discretion in designing their conservation goals and conservation program implementation schedule if the conservation goals: 1) address supply and demand characteristics, 2) include implementation and achievement schedules, and 3) include measurable outcomes, in terms of quantifiable reduction of water, that will be tracked and reported in performance reports.

Option 3: DOH should establish specific quantitative customer consumption parameters (*i.e.,* Average Day Demand, Maximum Day Demand) for conservation goals. Municipal water suppliers would set their own conservation goals for each required parameter, including implementation and achievement schedules.

Publication of Performance Reports

For a meaningful public process, the public must know how the municipal water suppliers will meet the conservation goals set for their system(s).

Recommendation: DOH should require municipal water suppliers to make performance reports available to customers and the public. The municipal water supplier should be allowed to determine how to report to customers and the public.[9]

Public Report on Plan to Meet Conservation Goals

The MWL requires municipal water suppliers with systems that do not meet their conservation goals to report to DOH what they are going to do to correct the situation. The subcommittee believes they also should also inform customers and the public, and provide them an opportunity to comment.

[9] Making reports available to the general public may be difficult for some utilities. DOH may need to develop guidance on this topic.

Recommendation: DOH should require municipal water suppliers with a system or systems not meeting their conservation goals, to provide a plan describing how their conservation goals will be met. Customers and the public should have access to the plan and the opportunity to comment on the plan. Notice and other process requirements should be similar to initial conservation goal setting.

Leakage Standard Reporting

Performance reports required by the MWL are a good opportunity to use non-regulatory incentives to improve conservation. Many subcommittee members believe including leakage in performance reports would provide an incentive to improve beyond the 10 percent state standard. Some subcommittee members did not interpret the law to require that leakage be addressed in performance reports.

Option 1: DOH should require all municipal water suppliers to submit annual leakage percents and an annual volume for all real water losses. Reports should be submitted at a frequency based on system size and complexity.

Option 2: DOH should not require performance reporting to include production and leakage information.

Performance Report Content and Frequency

The Performance Reporting and Accountability Workgroup explored the ideal frequency and content of conservation performance reports. Matrix 7, Performance Reporting, was developed by DOH staff and presented to the subcommittee. Some subcommittee members expressed concern about misinterpretation of data. They urged DOH to exercise caution when establishing performance reporting requirements and publishing data externally. Raw data on water consumption and compliance could be easily misinterpreted. Water systems making strong efforts to improve performance may require a number of years before consumption patterns change or full compliance with new requirements is achieved.

Some subcommittee members also emphasized the view that performance reporting regulations need to be tailored to ensure they are not overly burdensome (expensive) in terms of frequency and complexity.

Recommendation: DOH should use Matrix 7, Performance Reporting, as a basis for the new regulations.

Matrix 7: Performance Reporting

<table>
<tr><td colspan="2">System Size
(Total Connections)</td><td colspan="2">15 to 249</td><td colspan="2">250 to 999</td><td>1,000 to 2,499</td><td>2,500 to 4,999</td><td>5,000 to 49,999</td><td>≥ 50,000</td></tr>
<tr><td colspan="2">Planning Document</td><td>SWSMP</td><td>WSP</td><td>SWSMP</td><td>WSP</td><td colspan="2">WSP</td><td colspan="2">WSP</td></tr>
<tr><td rowspan="3">Brief Report</td><td rowspan="2">Frequency</td><td colspan="2">Option 1: Every 6 years</td><td colspan="2">Every 5 years</td><td>Every 4 years</td><td>Every 3 years</td><td>Every 2 years</td><td>Annually</td></tr>
<tr><td colspan="8">Option 2: Annual
Option 3: Every 2 to 3 years</td></tr>
<tr><td>Content</td><td colspan="8">Option 1: Statistical Report, which should include a minimum the most recent year of data actually recorded
• Annual Off-Peak and Peak Season Source Production
• Off-Peak and Peak Season Average Day Demand
• Percent Leakage and Total Volume Lost to Leakage
Option 2: General Narrative
• General information describing progress toward meeting established conservation goals and following adopted schedules for implementation and achievement</td></tr>
<tr><td rowspan="2">Comprehensive Program Evaluation</td><td>Frequency</td><td colspan="2">No requirements</td><td colspan="2">Option 1: When WSP is submitted
Option 2: Every three years</td><td colspan="2">Option 1: When WSP is submitted
Option 2: Every three years</td><td colspan="2">Option 1: When WSP is submitted
Option 2: Annually</td></tr>
<tr><td>Content</td><td colspan="2">No requirements</td><td colspan="6">Quantitative demonstration that water systems are progressing toward conservation goals and meeting established schedules. Reports shall include water use by each customer class, an evaluation of water use, trends in water use, water system losses, water system performance at meeting conservation program goals and recommendations on enhancing efficiency of water use</td></tr>
</table>

Part 3. Compliance

Section I. Compliance

Relevant Section of the Municipal Water Law as Codified in RCW

RCW 70.119A.180(7) directs the Department of Health (DOH) to ensure municipal water suppliers are complying with water use efficiency regulations. DOH is also directed to implement a compliance program that begins with cooperative non-punitive measures, such as education and technical assistance, and includes more formal compliance mechanisms to be used as necessary.

Overview of Subcommittee Discussions

Subcommittee members were very interested in compliance and accountability topics and they agreed that DOH must demonstrate statewide leadership for water use efficiency. Many pointed out that the Legislature clearly wants DOH to use all of its authorities and tools to achieve compliance. Discussions on these topics followed a common theme. Some subcommittee members called for strict mandatory standards fully detailed in the regulation. Others believe the regulation must be scaleable and flexible or municipal water suppliers simply will not succeed.

This topic was taken up by the Performance Reporting and Accountability Workgroup. The report is in Appendix C, Performance Reporting and Accountability Workgroup Report.

Subcommittee Options and Recommendations

<u>Non-compliance Should Have Meaningful Consequences</u>

Any new regulation poses challenges and impacts to municipal water suppliers. Failure to comply must have real consequences or low levels of compliance will result.

Recommendation 1: DOH should actively enforce water use efficiency regulations using formal and informal methods.

Recommendation 2: DOH should develop specific compliance strategies through policy and guidance that effectively employ all tools at their disposal. A comprehensive list of compliance tools available to DOH is in Sections 1.3 and 1.4 of the Performance Reporting and Accountability Workgroup Report in Appendix C.

<u>Prioritization</u>

The Municipal Water Law (MWL) establishes water use efficiency requirements for all municipal water suppliers. DOH was given clear responsibility to develop, oversee, and enforce those requirements. To prioritize resources, DOH has implemented a compliance program based on public health risk. This strategy, if strictly adhered to, could result in a lower emphasis on

water use efficiency than envisioned by the Legislature. DOH will need to develop a compliance strategy that reconciles the expectations of the Legislature with its existing compliance approach.

Recommendation: DOH should integrate its water use efficiency compliance strategy with current strategies. However, those strategies should be enhanced to consider the appropriate characteristics of water supply and forecasted demand.[10] This will require close coordination with the Department of Ecology to ensure municipal water suppliers are implementing the appropriate level of water conservation, particularly in the 16 critical basins for fish recovery.

Compliance Approach for Conservation Planning

The MWL directs DOH to include any new conservation planning requirements of MWL into its current planning program. DOH currently uses a prioritization process to target water systems for planning compliance.

Recommendation: DOH should integrate conservation planning compliance into its current approach to planning compliance, and target water systems where supply and demand characteristics warrant increased focus on conservation.

Compliance Approach for the Leakage Standard

The MWL has placed a high priority on water distribution system leakage. Therefore, DOH should place emphasis in its compliance program on ensuring that municipal water suppliers achieve compliance with the new leakage standard as described in RCW 70.119A.180(4)(b).

Recommendation 1: DOH should implement a compliance approach similar to the one outlined in Section 1.6.3 of the Performance Reporting and Accountability Workgroup Report (Appendix C). The key elements of that approach are:

- Increasing oversight and monitoring by DOH for higher levels of leakage.
- Requiring municipal water suppliers with systems that exceed the leakage standard to submit Water Loss Control Action Plans to DOH for review and approval.
- Using formal and informal compliance tools.
- Placing conditions on grants and loans to ensure leakage reduction is a priority-funded capital improvement when the municipal water supplier is not meeting the leakage standard.

[10] See Appendix E, American Water Works Association – Water Balance Format and Appendix C, Performance Reporting and Accountability Workgroup Report, Section 1.6.1 for further discussion of characteristics of water supply and forecasted demand.

Recommendation 2: DOH should define meaningful consequences for municipal water suppliers whose systems fail to comply with the leakage standard under the established DOH timetable.

Recommendation 3: DOH should require municipal water suppliers submitting Water Loss Control Action Plans to provide periodic progress reports on their milestones showing how they are gaining compliance.

Compliance Approach for Conservation Goal Setting and Performance Reporting

The performance reporting elements of the MWL are fundamentally new concepts. The legislation is largely focused on the process of conservation goal development and performance reports and it highlights the important role that an informed public can have in motivating municipal water suppliers to achieve high levels of performance.

Recommendation: DOH should implement a compliance approach that emphasizes the use of tools that inform the public[11] when municipal water suppliers are not meeting the procedural requirements related to conservation goal setting and performance reports.

Municipal Water Suppliers that Do Not Meet Their Conservation Goals

The MWL directs municipal water suppliers that fail to meet their established conservation goals to develop a plan to modify their programs for success.

Recommendation: DOH should incorporate this requirement (see RCW 70.119A.180(4)(c)(v)) directly into its water use efficiency regulations.

Department of Health's Review of Evaluations

The MWL requires municipal water suppliers to select cost-effective conservation measures, evaluate conservation rates, and evaluate water system leakage. The legislation does not specify criteria for determining the adequacy of these evaluations.

The Performance Reporting and Accountability Workgroup developed four options for determining adequacy of an evaluation. These were developed in recognition that:

1) Specific requirements applied to any given public water system must be appropriate to the size, supply characteristics, and forecasted demand, and

[11] See Appendix C, Performance Reporting and Accountability Workgroup Report, Section 1.6.4 for the discussion of those tools and how they can be used.

2) DOH will likely need to employ a different approach for cost-effectiveness evaluation, evaluation of leakage, and evaluation of conservation-oriented rates.

Option 1: DOH should not develop criteria for adequacy of evaluations. Municipal water suppliers should be allowed to determine what constitutes and adequate evaluation.

Option 2: DOH should identify specific criteria for any evaluations submitted as part of a conservation element of a WSP or SWSMP.

Option 3: DOH should develop detailed methods for evaluations submitted as part of a conservation element of a WSP or SWSMP.

Option 3: DOH should adopt methods which are to be used for evaluations with a provision that an alternate approach, with DOH approval, could be used if a rationale that justifies its use and demonstrates how the method provided the same or better quality of evaluation is included.

Specific recommendations are not provided. The optional approaches were used as guidance to DOH and the subcommittee when considering specific requirements.

Appendices

Appendix A: Water Use Efficiency Subcommittee Roster

About the Washington Water Supply Advisory Committee

The Water Supply Advisory Committee (WSAC) was formed by the Washington State Legislature in 1995 (RCW 70.119A.160). The Washington State Legislature directed the WSAC to "provide advice to the department on the organization, functions, service delivery methods, and funding of the drinking water program." The WSAC represents a range of drinking water interests - including utility owners and operators, consumers and environmental advocates – and advises the Washington State Department of Health in its mission to protect the health of Washington citizens by assuring safe, reliable drinking water.

WSAC Executive Committee

- Bruce Beauchene, Chair
  City of Kennewick Public Works Department
- Bob Pancoast, Vice Chair
  Compass Geographics Inc.
- Cas Hancock
  Cas Hancock & Associates
- Gary Rhoades
  Evergreen Rural Water of Washington
- John Kounts
  Washington PUD Association
- Hal Schlomann
  WA Association of Sewer & Water Districts
- Lorna Parent
  Skagit County Health Department
- Judy Turpin
  Washington Environmental Council

WSAC Water Use Efficiency Subcommittee Members

This subcommittee of the WSAC was convened in March 2004 and met on a monthly basis until February 2005. Members were appointed by the Executive Committee of the WSAC.

Public Water System Customers
Howard Laughery, East Wenatchee Water District Customer
Denise Smith, League of Women Voters

Environmental Interest Groups
Karen Allston, The Center for Environmental Law & Policy; Alternate - Shirley Nixon
Rachael Paschal Osborn, Sierra Club Statewide Water Task Force and Palouse Water Conservation Network; Alternate - Bev Keating
Judy Turpin, Washington Environmental Council; Alternate - Josh Baldi

Business Interest Groups
Andrew Cook, Building Industry Association of Washington
Tim Wilson, Irrigation Water Management Society; Alternate - Peter Dervin, Washington Association of Landscape Professionals

Municipal Water Supplier - Large Systems
Richard Gustav, Seattle Public Utilities; Alternate - Marla Carter, City of Everett Public Works Department
John Kirner, Tacoma Water Department; Alternate - Randy Black, Lakewood Water District
Frank Triplett, Spokane Water Department; Alternate - Steve Skipworth, Vera Water and Power

Municipal Water Supplier - Medium Systems
Bob Alberts, City of Pasco; Alternate - Bruce Beauchene, City of Kennewick Public Works Department
Greg Brizendine, East Wenatchee Water District; Alternate - David Johnson, Chelan County PUD
Donald Wright, South King County Regional Water Association; Alternate - Jim Haneline, Summit Water Company

Municipal Water Supplier - Small Systems
Bob Pancoast, Compass Geographics Inc; Alternate - Harry Paul, Thurston PUD
Jerry Petersen, Washington Water Service; Alternate - Drew Noble, Investor Owned Water Utilities Association of Washington
Debbie Thomas, Kitsap PUD; Alternate - Betty Vance, Valley Water District

Water Utility Conservation Professional
David Fujimoto, Cascade Water Alliance; Alternate - Andrew Graham, Economic & Engineering Services, Inc.

Department of Ecology
Ben Bonkowski, Water Resources Program; Alternate - Lynn Coleman

Local Governments
Tom Fox, King County Department of Natural Resources & Parks; Alternate - Tom Clingman, Thurston County Department of Water & Waste Management
Connie Krueger, City of Leavenworth
Mark Tompkins, San Juan County Health Department

Utilities and Transportation Commission
Gene Eckhardt, WA Utilities & Transportation Commission

Technical Assistance Provider
Gary Rhoades, Evergreen Rural Water of Washington; Alternate - George Schlender, Rural Community Assistance Corporation

Tribal Government Observers

Tribal Governments
Patricia Paul, The Tulalip Tribes
Dawn Vyvyan, The Yakama Nation
Terry Williams, The Tulalip Tribes; Alternate - Kimberly Ordon, Attorney at Law

Department of Health Staff Support

Rich Hoey, Executive Lead
Richard Siffert, Project Manager
Jim Roux, Staff Lead
Jennifer Kropack, Technical Support
Deana Taylor, Technical Support
Michelle K. Austin, Administrative Support

Appendix B: Cost-Effectiveness Evaluation Workgroup Report

Water Supply Advisory Committee
Water Use Efficiency Subcommittee
Cost-Effective Evaluation Workgroup Report

December 15, 2004
(Revised April 2005)

Objective

Provide recommendations and options for rules and guidance, which cover a full spectrum of options for consideration by the full subcommittee, for the following question:

- How should a utility complete a cost-benefit evaluation?

Organization

Section 1 – Determining Perspective
Section 2 – Evaluating Conservation Measures
Section 3 – Documents Reviewed
Section 4 – Matrix – Example of Implementation

Section 1 – Determining Perspective

The first question that must be asked when determining whether a conservation measure is cost-effective to implement is to determine from what perspective the question is being asked.

There are different perspectives that the utility may look at to determine whether the conservation measure is cost-effective. Below are perspectives utilities may evaluate measures against and options for each perspective of how those perspectives may be used. The Department of Health (DOH) should determine, at a minimum, what perspective(s) utilities must evaluate based on their size (see matrix). Whatever perspective is chosen, the utility's work should be included in the planning document.

Utility Perspective

The purpose of this perspective is to look at the costs and benefits directly related to the utility and their operation. This determines whether the measure is cost-effective for the utility to implement. This has been the perspective used most often in the past when determining whether a measure is cost-effective. Below are lists of the costs and benefits that may be included in an evaluation from the utility perspective.

Costs:

- Research and development
- Staff time (utility staff and contract)
- Measure costs (hardware, promotion, rebates, disposal)
- Evaluation of measure effectiveness
- Other costs

Benefits:

- Reduced costs in producing water (energy, treatment) (Marginal Operating Costs)
- Avoided cost of delaying, deferring or minimizing capital improvement projects (Marginal Capital Costs)
- Other benefits

Cost-Sharing Perspective

The purpose of this perspective is to determine if the measure would be cost-effective if the costs were shared with one or more different utilities. The costs and benefits associated with the utility perspective would be used as the basis for this evaluation.

Total Resource Cost Perspective (TRC)

The purpose of this perspective is to determine whether the measure would be cost-effective, no matter who pays for the measure. Therefore it includes the costs to the utility and also includes any costs that the customer would incur. This is compared to the benefits seen by the utility. Below is a list of costs and benefits that may be included in an evaluation from the Total Resource Cost perspective.

Costs:

- Research and development
- Staff time (utility staff and contract)
- Measure costs (hardware, promotion, rebates, disposal)
- Evaluation of measure effectiveness
- Other costs
- Participant out-of-pocket costs

Benefits:

- Reduced costs in producing water (energy, treatment) (Marginal Operating Costs)
- Avoided cost of delaying, deferring or minimizing capital improvement projects (Marginal Capital Costs)
- Other benefits

Participating Customer Perspective

The purpose of this perspective is to determine if the measure would be cost-effective for the customer participating in the program. This perspective also answers the question whether this program would be attractive to customers. Therefore it compares how much the measure will cost the customer against the benefits it would see through reductions in water bills and possibly other utility bills. Below is a list of costs and benefits that may be included in an evaluation from the participating customer perspective.

Costs:

- Out-of-pocket costs
- Other utility bill increases
- Other increased costs

Benefits:

- Water bill reductions
- Other utility bill reductions
- Other reduced costs

Non-Participating Customer Perspective (Ratepayer Impact Measure)

The purpose of this perspective is to determine whether the average bill for the non-participating customer increases or decreases. If costs exceed the benefits, then rates may increase. Therefore the evaluation compares the costs incurred to the utility plus the revenue lost that it will have to recover against benefits seen by the utility.

Costs:

- Research and development
- Staff time (utility staff and contract)
- Measure costs (hardware, promotion, rebates, disposal)
- Evaluation of measure effectiveness
- Other costs
- Lost revenue (equal to participant benefit)

Benefits:

- Reduced costs in producing water (energy, treatment) (Marginal Operating Costs)
- Avoided cost of delaying, deferring or minimizing capital improvement projects (Marginal Capital Costs)
- Other benefits

Society Perspective

The purpose of this perspective is to look at the costs and the benefits of the measure to the entire society. This encompasses all the perspectives that were discussed earlier plus other costs and benefits that affect the greater society. Some of these are difficult to estimate (i.e. avoided environmental costs and avoided wastewater costs). This holistic approach includes the costs to the utility, customer and others. The benefits include those to the utility, customer and others like the environment/wastewater utilities. Below is a list of costs and benefits that may be included in an evaluation from the society perspective.

Costs:

- Capital expenditures for equipment or device
- Operating expense for development and implementation of measure
- Cost to other water suppliers
- Cost to customers
- Others costs

Benefits:

- Avoided cost of delaying, deferring or minimizing capital improvement projects (Marginal Capital Costs)
- Reduced costs in producing water (energy, treatment) (Marginal Operating Costs)
- Environmental benefits and avoided environmental costs (improved water quality, recharge areas, increased water in streams, decreased pesticide/fertilizer use)
- Avoided wastewater costs (operating and capital)
- Other benefits

Section 2 – Evaluating Conservation Measures

When Evaluations are not Necessary

- If there are any measures to be required to be implemented, the utility would not be required to evaluate the measure.
- If there are any measures that the utility determines they are going to implement, they would not be required to evaluate the measure.

Timeframe for Comparison

Once the cost-benefit analyses of the different perspectives are completed, the utility must compare and determine which are considered cost-effective. There are numerous accepted methods for what timeframe can be used (e.g.. lifetime of measure). What timeframe is chosen can impact the result. DOH believes providing guidance on the different methods is appropriate.

Costs for Comparison

- Marginal **Operating Cost** of Producing Water – This is operating costs (energy and treatment) that will be avoided because of reduced water production. This method may look at water production over the entire year or during the peak season.

- Marginal **Capital Costs** of Producing Water – This is the capital costs (equipment and facilities) of producing the next increment of supply that will be avoided, delayed, or reduced because of reduced water production. This method may look at water production over the entire year or during the peak season.

Section 3 – Documents Reviewed

American Water Works Association, Manual M52 Water Conservation Programs – A Planning Manual, DRAFT NOT IN PRINT.

American Water Works Association Pacific Northwest Section, Water Conservation Guidebook for Small and Medium-Sized Utilities, 1993.

California Urban Water Conservation Council, Guidelines for Preparing Cost-Effectiveness Analyses of Urban Water Conservation Best Management Practices, 1996.

Environmental Protection Agency, Water Conservation Plan Guidelines, 1998.

Section 4 – Cost-Effectiveness Matrix

December 15, 2004

Note: Matrix is the minimum of what should be included in the evaluation.
Utilities may choose to evaluate more perspectives when making decisions.

<table>
<tr><td>System Size
Total Connections</td><td>15 – 999</td><td>15 – 999</td><td>1,000 – 9,999</td><td>≥ 10,000 – 50,000</td><td>≥ 50,000</td></tr>
<tr><td>Planning Requirements</td><td>SWSMP</td><td>WSP</td><td>WSP</td><td>WSP</td><td>WSP</td></tr>
<tr><td>Water Efficiency Program Level</td><td>Basic</td><td>Basic</td><td>Intermediate</td><td>Advanced</td><td>Advanced</td></tr>
<tr><td>Costs to include:</td><td colspan="2">Marginal operating costs</td><td>Marginal operating costs
Enhanced Program:
Marginal operating & capital costs</td><td colspan="2">Marginal operating and capital costs</td></tr>
<tr><td rowspan="2">Perspective</td><td colspan="2" rowspan="2">Option 1: Evaluate Utility perspective only
Option 2: Evaluate Utility, TRC, Customer (participating & non-participating) perspectives</td><td colspan="3">Option 1: Evaluate Utility perspective & address cost-sharing perspective
Option 2: Evaluate Utility, TRC, Customer (participating & non-participating). Address cost-sharing perspective</td></tr>
<tr><td colspan="2">For Enhanced Program:
Option 1: Societal narrative description
Option 2: Societal adder or other simplified approach
Option 3: DOH provides default values</td><td>For Enhanced Program:
Option 1: Societal narrative description
Option 2: Societal adder or other simplified approach
Option 3: DOH provides default values
Option 4: Pilot quantitative analysis with agency involvement (DOH and Ecology)</td></tr>
</table>

Notes:

1. The AWWA Pacific Northwest Section (PNWS) and M52 suggest a simplified utility perspective for small utilities. DOH sees the evaluation for SWSMPs as a simplified fill-in-the-blank approach.
2. All documents reviewed suggest at least evaluating measures based on the utility perspective.
3. AWWA's draft M52 (M52) recognizes that there are other perspectives the utility may review (customer, other utilities, environmental benefits). They believe these perspectives are important to review for utilities greater than 10,000 connections.
4. California's guidance (CA) suggests reviewing the following perspectives: Utility perspective, cost-sharing with other utilities perspective, customer perspective (both participating and non-participating), and society perspective.
5. Description of the Society Perspective Options:
    a. Narrative Description – A narrative description would be provided that explains how the societal costs and benefits will impact the water system. Included also would be the effect of whatever factor put them in the enhanced program category. In a narrative, the water system will explain whether these factors may make the conservation measure more cost-effective. The narrative would be meaningful and provide explicit information relating to that specific water system instead of general information.
    b. Societal Adder – A certain percentage is added to the benefits of the other perspective(s) to account for the more difficult to quantify avoided costs that are in the societal perspective (i.e. avoided environmental costs, avoided wastewater costs, quality of life).
    c. Default Values – DOH determines a simplified quantitative approach and determines default values that utilities can use for the society perspective in lieu of system specific values.
    d. Pilot Quantitative Analysis – An enhanced program for certain large systems would be to complete a system-specific societal perspective analysis as a pilot. This should be completed with technical and financial assistance from State Agencies to determine the feasibility of this type of analysis for other systems.

Appendix C: Performance Reporting and Accountability Workgroup Report

Water Supply Advisory Committee
Water Use Efficiency Subcommittee
Performance Reporting and Accountability Workgroup

November 5, 2004
(Revised April 2005)

Background

This document has been developed by the Performance Reporting and Accountability Workgroup. The objective of this workgroup was to develop recommendations and options for rules and policies related to the following:

a. Actions the Department of Health (DOH) should take to ensure that utilities are meeting their conservation goals in accordance with RCW 70.119A.180(4)(c).
b. DOH's role in determining the acceptability of the utility's evaluation of goals and conservation measures.
c. The elements of a compliance program that would meet the objectives of RCW 70.119A.180(7).

This document attempts to a cover a full spectrum of options for consideration by the full Water Use Efficiency Subcommittee. This document is organized into three sections:

Section 1 Compliance
Section 2 Conservation Goals
Section 3 Performance Reporting

Workgroup Process

DOH provided the workgroup with a draft version of this document on August 6, 2004 and requested that the workgroup review this paper to:

a. Identify additional issues that should be added to this document.
b. Identify additional options that should be considered.
c. Further develop and clarify the information presented in this paper.
d. Identify additional information that the subcommittee will need to facilitate discussions on these topics.

The workgroup met on August 18, 2004 and October 12, 2004 and provided comment via e-mail to accomplish this work.

Next Steps

In accordance with the workgroup proposal approved by the subcommittee, this document is being presented to the subcommittee for consideration. When approved by the full subcommittee, this document will be incorporated into the summary report from the subcommittee to DOH.

1. Compliance

1.1. Municipal Water Law Citation

The Municipal Water Law (MWL) provides the following direction to the Department of Health (DOH) regarding its water use efficiency compliance program.

RCW 70.119A.180(7) – To ensure compliance with this section, the department shall establish a compliance process that incorporates a graduated approach employing the full range of compliance mechanisms available to the department.

1.2 Graduated Approach

This provision of the law speaks to how DOH should implement its program. DOH currently employs a compliance program that begins with cooperative non-punitive measures such as education and technical assistance. Movement to more formal mechanism is used only when determined necessary to obtain compliance. This compliance approach appears to meet the intent of this provision of the MWL and should be employed for water use efficiency.

1.3 Existing Compliance Mechanisms

The following is a list of existing compliance mechanisms available to DOH:

a. Provide technical assistance.
b. Issue programmatic letters.
c. Publish successes and non-compliance.
d. Use partnerships with local health jurisdictions for outreach with water systems.
e. Training and education for the public.
f. List deficiency in Sanitary Survey reports. [1]
g. Special on-site conservation audits.
h. Withhold planning document approval.
i. Financial Assistance.
j. Conditions on Drinking Water State Revolving Fund (DWSRF) Loans.
k. Change operating permit status (color).
l. Active enforcement:
    i. Notice of Violation
    ii. Bilateral Compliance Agreements
    iii. Agreed Order
    iv. Departmental Order
    v. Civil Penalties

[1] DOH will need to ensure that any new elements added to the sanitary survey are meaningful, do not detract from the core purpose of the survey, and utilize the on-site time of DOH staff effectively.

1.4 New Authority and Direction Provided by the 2003 MWL

The MWL provided the following authorities and direction to DOH related to water use efficiency:

a. Statutory authority for water use efficiency regulations related to conservation planning, a water distribution leakage standard, and conservation performance reporting.
b. Direction to provide technical assistance upon request to municipal water suppliers and local governments regarding water conservation.
c. Direction to establish a compliance process that incorporates a graduated approach employing a full range of compliance mechanisms available to the department.
d. A requirement added to RCW 90.03.386 that municipal water suppliers must implement cost-effective conservation in accordance with DOH regulations.
e. A requirement added to RCW 90.03.386 that municipal water suppliers with 1000 connections or more must describe:
    i. The projects, technologies, and other cost-effective measures that comprise its water conservation program.
    ii. Improvements in the efficiency of water system use resulting from implementation of its conservation program over the previous six years.
    iii. Projected effects of delaying the use of existing inchoate rights over the next six years through the addition of further cost-effective water conservation measures before it may divert or withdraw further amounts of its inchoate right for beneficial use.

1.5 DOH Review of Evaluations

RCW 70.119A.180(a) through (c) require utilities to select cost-effective measures, evaluate conservation rates, and evaluate water system leakage respectively. The legislation does not specify criteria for determining adequacy of these evaluations.

The options listed below were developed in recognition that 1) specific requirements applied to any given utility must be appropriate to the size, supply characteristics and forecasted demand, and 2) DOH will likely need to employ a different approach for each of the three sections of the MWL listed above.

Option 1

DOH should not develop criteria for adequacy of evaluations. Utilities should be allowed to determine what constitutes an adequate evaluation.

Option 2

DOH should identify specific criteria that must be met by the utility when describing its evaluation and decision making process. For example, the Demand Forecast section of the 1994 Conservation Planning Requirements uses this approach by listing factors that are to be used in developing demand forecasts. For regulation, the criteria that would need to be met would be that the utility must describe how all elements listed impact its demand forecast.

Option 3

DOH should develop detailed methods that utilities must meet to constitute an adequate evaluation. For example, regulations would specify established methods recognized as industry standards or developed by DOH.

Option 4

DOH should adopt methods which are to be used for evaluation with a provision that an alternate approach, with DOH approval, could be used if the utility can present a rationale that justifies its use as providing the same or better quality of evaluation.

The workgroup voiced the opinion that while Option 1 represents a real alternative, it would represent a "status quo" approach that should be rejected.

1.6 Proposed Conservation Program Compliance Approach

1.6.1 Prioritization

The MWL established water use efficiency requirements for all municipal water suppliers. DOH was given clear responsibilities to develop, oversee, and enforce those requirements. In order to prioritize resources, DOH has implemented a compliance program prioritized by public health risk. This strategy is likely to result in a lower emphasis on water use efficiency than envisioned by the Washington State Legislature. DOH will need to develop a compliance strategy that reconciles the expectations of the Washington State Legislature with its traditional compliance approach.

In general, DOH's water use efficiency compliance approach should be integrated with current strategies. Those strategies should be enhanced to include consideration of the factors listed below. This will require close coordination with the Department of Ecology, the state's water resource management agency, to ensure utilities are implementing the appropriate level of water conservation, particularly in fish critical and water critical areas.

a. Past practices and performance by utilities in the area of water conservation.
b. Historical water consumption and usage patterns.
c. Specific requirements established in approved watershed plans developed pursuant to chapter 90.82 RCW or adopted water management plans developed pursuant to chapter 90.54 RCW.
d. In-stream flow requirements legally established under the authorities of federal, tribal, state or local governments.
e. Surface water impacts in fish critical basins.
f. Impacts to fish populations listed under the Endangered Species Act.
g. The ability of a groundwater source to sustain continued or expanded withdrawals.
h. Input from the annual agency consultation required by RCW 90.82(3) of the MWL.

The following sections outline an approach to a water use efficiency compliance program that meets the intent of the MWL. Other approaches should also be considered by DOH as it develops its water use efficiency programs.

1.6.2 Conservation Planning

The MWL builds upon the current utility conservation program by directing DOH to use its utility planning program for specific conservation planning elements. The compliance issues that can be expected relative to conservation planning include the following:

a. Inadequate evaluation of cost-effective measures.
b. Inadequate evaluation of conservation rates.
c. Inadequate evaluation of water system leakage.
d. Insufficient planning, including schedule, to address leakage.
e. Insufficient conservation program to meet conservation goals.
f. Inadequate data submitted in planning document.
g. Inadequate demand forecast.
h. Insufficient information regarding funding of conservation program.
i. Inadequate information regarding public process for adoption of goals and schedule.

DOH's current approach is to work with the utility through the planning process to resolve issues. Water System Plan (WSP) or Small Water System Management Program (SWSMP) approval is withheld until the issues are resolved to the satisfaction of DOH regional office staff.

Withholding plan approval has a number of consequences for the utility. If the utility is required to complete a WSP, failure to obtain approval can affect operating permit status and number of approved connections. It can also prevent approval of projects needed for expansion and prevent approval or disbursement of DWSRF Loans.

If the utility is required to complete a SWSMP, failure to complete the SWSMP is noted as a deficiency on sanitary survey reports. If the utility is required to obtain approval of the SWSMP in accordance WAC 246-290-105, failure to obtain approval could result in compliance actions by DOH. Approved SWSMP's are also required as a condition of DWSRF loans if the utility applying for the loan is not otherwise required to complete a WSP.

In all cases, utilities fail to meet their planning requirements; DOH uses a prioritization process to target water systems for compliance. Current practices for targeting water system for planning compliance should be modified to include consideration of the factors listed in Section 1 above.

1.6.3 Leakage Standard

The MWL has placed a high priority on water distribution system leakage. [2] Therefore DOH should place emphasis in its compliance program on ensuring that all municipal water suppliers achieve compliance with the new leakage standard as described in RCW 70.119A.180(4)(b)of the MWL.

[2] For the purposes of this document, the term "water distribution system leakage" refers to physical loss of water through leaks. Other components of water loss and issues related to calculation of distribution system leakage and metering are not addressed in this document.

The following approach assumes that DOH will establish a water distribution system leakage standard of 10 percent for all municipal water suppliers. Applicability and scale appropriate to the different sized water systems also taking into account timing, phasing, and funding.

Leakage Less than 10 Percent

Water distribution system leakage should be addressed in the utility's WSP or SWSMP. The utility should include recommendations and activities to maintain low water distribution system leakage in their planning documents.

Leakage 10 Percent or Greater, but Less than 15 Percent

Utilities in this category should be required to implement a plan [3] that outlines steps determined appropriate by the utility and DOH, to reduce water distribution system leakage below 10 percent. The utility's WSP or SWSMP should be amended to include the plan in their current capital improvement program.

Leakage of 15 Percent or Greater, but Less than 20 Percent

Utilities in this category should prioritize and implement a plan that outlines steps determined appropriate by the utility and DOH as soon as economically feasible to begin reducing water distribution system leakage. The utility's WSP or SWSMP should be amended to include the plan in their current capital improvement program. DOH should use planning compliance, programmatic letters and active enforcement measures as appropriate. In addition, there should be a high prioritization of state grants or loans submitted for the purpose of reducing distribution water system until distribution water system leakage is reduced to below 15 percent.

Leakage Greater than 20 Percent

DOH should prioritize and take appropriate actions (including active enforcement when necessary) when water distribution system leakage is found to be 20 percent or greater. Utilities in this category should prioritize and implement a plan that outlines steps determined appropriate by the utility and DOH as soon as economically feasible to begin reducing water distribution system leakage. The utility's WSP or SWSMP should be amended to include the plan in their current capital improvement program. In addition, there should be a high prioritization of state grants or loans submitted for the purpose of reducing distribution water system leakage. Grants and loans should only be approved to address leakage (except in cases where there is an overriding public health concern as determined by DOH) until water system leakage is reduced to below 15 percent.

[3] As used in this section, the term "plan" is not limited to formal planning documents (WSP, SWSMP) required by DOH. For the purposes of this section it includes any formal action plan adopted by the utility to address the utility's leakage problem.

1.6.4 Performance Reporting

The performance reporting elements of the MWL are fundamentally new concepts. The legislative direction is largely focused on the process of goal development and performance reports. Section 3 of this document addresses the Performance Reporting requirements in more detail.

Compliance mechanisms for performance reporting issues should use tools that focus on providing information to the public. RCW 70.119A.180(4)(C) of the MWL highlights the important role that an informed public can have in motivating utilities to achieve high levels of performance. Such tools could include the following:

a. Use DOH public notification regulations.
b. Publish data and water system compliance with conservation requirements information.
c. Post data and water system compliance with conservation requirements on an external website.
d. Require water systems to post and/or publish conservation compliance and consumption data.
e. Use news releases to share information about utility conservation performance.

DOH will need to exercise caution when publishing data externally. Raw data on water consumption and compliance could be easily misinterpreted. Water systems making strong efforts to improve performance may require a number of years before consumption patterns change or full compliance is achieved.

The compliance issues that DOH anticipates relative to performance reporting include the following:

a. Failure to adopt goals in accordance with schedules established in regulation.
b. Process for goal setting was not in accordance with regulations.
c. Process for goal setting is incomplete.
d. Failure to submit performance reports.
e. Performance reports determined inadequate.
f. Failure to submit a plan to meet its conservation goal, if performance reports indicate that established goals are not being met.

The MWL gives specific direction in regard to the issue of a utility failing to meet its established goals. RCW 70.119A.180(4)(C)(v) of the MWL requires that the utilities develop a plan to modify their **programs** if established goals are not being met. DOH will need to incorporate this requirement into its water use efficiency regulations.

2. Conservation Goal and Implementation Schedule Setting

2.1 Municipal Water Law Citation

The Municipal Water Law (MWL) describes the objective of conservation goal setting.

RCW 70.119A.180(4)(c)…. The objective of setting conservation goals is to enhance the efficient use of water by the water system customers…

2.2 Process

2.2.1 Governing Body and Variability

Requirements found in RCW 70.119A.180(4)(c)(i) related to goal setting by the water system's governing body and optional factors that the municipal water supplier may consider should be directly reflected in rule. Additional information to assist water systems should be provided by the Department of Health (DOH) in the form of guidance.

2.2.2 Open Public Forum

Legislation does not address the purpose of this provision. DOH has stated that its interpretation is that the open public forum was included for two reasons:

- Water conservation decisions made by the utility will impact customers and they should have the opportunity evaluate and provide input on these decisions.
- Water conservation decisions made by the utility will affect the utility's use of the state's water resources. All stakeholders should have an opportunity to evaluate and provide input on these decisions.

2.2.3 Process Elements

Regulations related to public process should allow utilities that have public processes defined in statute to use those processes for conservation goal setting. Suggested Process Elements:

- Open to customers and the general public.
- Procedures for accepting and responding to comments from customers and general public. Comment summaries, records of public meetings and other methods should be recognized.
- 14 day public notice.
- Documentation of public forum submitted to DOH.
- Presentation of the following minimum information:
  - Conservation goals and implementation schedule.
  - The most recent performance reports and overall program evaluation.
  - Water system compliance status.
  - Description of cost-effectiveness process.

DOH should also develop general guidance describing other types of pertinent information that utilities may choose to include in their public processes. Such information could include the following:

a. Current consumption levels.
b. Estimated reductions from proposed program.
c. Saving realized from previous conservation efforts.
d. Source(s) of water.
e. Condition of source(s) of water (quality and quantity).
f. Regulatory issues related to public health or water withdrawal.
g. Rate and revenue impacts of proposed conservation measures.
h. General information about other users sharing the source(s) of water.

2.3 Frequency of Goal Adoption

The MWL directs DOH to establish performance reporting requirements with a frequency of reports appropriate to water system size. The MWL does not explicitly address the frequency of goal adoption. DOH should specify in regulation when utilities will be required to set conservation goals.

The options listed below assume that all municipal water suppliers will be required to establish goals within a set time period following adoption of DOH's regulations.

Option 1

Each utility will include in their process for adopting goals a schedule defining when goals will be evaluated for revision.

Option 2

Goals should be evaluated for revision at the time of Water System Plans (WSP) or Small Water System Management Plans (SWSMP) development.

Option 3

Goals should be evaluated for revision on a schedule that coincides with performance report submission and is appropriate to water system size.

2.4 Adjustments to Goals

Although not explicitly stated, the language suggests that utilities should be allowed to adjust their goals over time. Adjustments to goals should be conditional, however with well defined conditions listed in regulation. Suggested conditions:

- Established goals were based on assumptions that did not turn out to be valid.
- Financial situation of the utility changed and adjustments are necessary to maintain financial viability.
- Goals have been realized and utility determines that it should focus on different conservation objectives.
- New goals are established by the governing body and must meet open public forum requirements.
- New goals are submitted to and reviewed by DOH.
- Cost-effectiveness level changes.
- External factors (such as unexpected severe drought) change.
- New opportunities to improved water use efficiency emerge.

The discussion above is related to adjustment of goals under specified circumstances. It is important to note that RCW 70.119A.180(4)(c)(v) of the MWL requires that the utilities develop a plan to modify their programs if established goals are not being met.

2.5 Content

Option 1

Utilities should be given broad discretion in designing its goals and implementation schedule under the condition that goals include implementation and achievement schedules and measurable outcomes that will be tracked and reported in the water system's performance reports.

Option 2

Utilities should be required to establish quantitative and/or programmatic goals that are linked to forecasted demand and supply characteristics in addition to the basic requirement that goals include implementation and achievement schedules and measurable outcomes that will be tracked and reported in the water system performance report.

Option 3

DOH should establish specific quantitative parameters related to customer consumption (i.e. ADD, MDD) that utility goals must be developed for. The utility sets its own goals that include implementation and achievement schedules.

2.6 Failure to Meet Established Goals

This issue is addressed under compliance.

3. Performance Reporting

3.1 Municipal Water Law Citation

The Municipal Water Law (MWL) describes the objective performance reports.

RCW 70.119A.180(4)(c)…"Establish minimum requirements for water conservation performance reporting to assure that municipal water suppliers are regularly evaluating and reporting their water conservation performance…"

3.2 Audience

The MWL only identifies the public water system customers and the public as intended audiences for performance reports. Implicit in the law, is that the Department of Health (DOH) may require submittal of any information or reports determined necessary to meet the intent of the law.

3.3 Mechanism

Option 1

DOH should incorporate performance reports into existing mechanisms for performance reports including Water System Plans (WSP), Small Water System Plans (SWSMP), and Consumer Confidence Reports (CCR). [4] [5]

Option 2

DOH should develop new stand alone mechanisms for performance reporting.

3.4 Frequency

Option 1

Performance reports should be required at the time of WSP or SWSMP development. This would result in six year intervals for large and expanding water systems. Smaller water system would only develop performance reports at the time of SWSMP development.

[4] Any expansion to current CCR requirements must be limited to ensure that CCR's do not become too difficult to prepare and submit.

[5] Planning documents are better designed to provide mechanisms for a longer term and more thorough evaluation of utility conservation performance. CCR's are best used for brief reports and could offer a snapshot of utility conservation.

If this option is used, DOH should consider enhancement of its SWSMP submittal requirements to ensure that all municipal water suppliers are submitting performance reports in accordance with the intent of the MWL. As a minimum, updates to conservation elements of SWSMP's and increased performance reporting should be required when water conservation is critical (i.e. water system is exceeding water rights, water source is being severely impacted, fish populations are impacted in a fish critical basin, required by approved watershed plan., etc.).

Option 2

Performance reports should be required on a schedule that coincides with performance report submission and is appropriate to water system size.

- Annually for water systems with 10,000 or more total connections and any water system not meeting their conservation goals.
- Every three years for water systems with 1,000 - 9,999 total connections.
- Every three years for expanding [6] water systems with 999 or fewer total connections.
- Every six years for non-expanding water systems with 999 or fewer total connections.

3.5 Level of Detail

Option 1

Performance reports should provide a quick and easily produced view of utility conservation performance.

Option 2

Performance reports should provide a thorough evaluation of utility conservation performance with analysis of trends and incremental change.

Option 3

Performance reporting requirements should be developed on a general framework that includes annual reports to provide a quick and easy to produce view of utility conservation performance supplemented with more thorough evaluations prepared at longer intervals (six to ten years) to allow analysis of trends and incremental change.

3.6 Content

Option 1

Utilities shall include general information that describes how they are progressing toward their established goals and following their adopted schedules for implementation and achievement.

[6] Expanding public water systems are defined in WAC 246-290-010.

Option 2

Utilities shall demonstrate in quantitative terms that they are progressing toward goals and meeting established implementation and achievement schedules. Regulations will include minimum requirements to address specific water consumption/production parameters. DOH recommends that all water systems report the following statistics: [7]

- Annual Winter and Peak Season Source Production (365 days of data).
- Annual Source Production for each source (water systems with 1000 connections or more).
- Winter and Peak Season Average Day Demand.
- Percent Leakage and Total Volume Lost to Leakage.

Option 3

Utilities shall demonstrate in quantitative terms that they are progressing toward goals and meeting established implementation and achievement schedules. Reports shall include water use by each customer class (single family residential, multi-family residential, commercial, industrial, etc) as determined by the water system, and an evaluation of water use, trends in water use, water system losses, water system performance at meeting conservation program goals and recommendations on enhancing efficiency of water use.

[7] Several comments were received that suggested that reports should be standardized to permit statewide analysis and provide reports that are easier for the public to understand. Option two is the only one presented here that could meet that need directly through performance reports.

Attachment 1 – Concerns Related to UTC Regulated Systems

WSAC Water Use Efficiency Subcommittee Meeting
July 30, 2004

Responses to Questions Regarding Public Forums and UTC Role in Conservation Goal Setting
by:
Jerry Petersen
Washington Water Service Company

Section 7(4)(C)(i) of the June 20, 2003 Second Engrossed Second Substitute House Bill 1338 (A.K.A. Municipal Water Law) requires that "Conservation goals shall be established by the municipal water supplier in an open public forum."

For privately owned water systems DOH asks:

1) *"Are there any barriers for systems that are privately owned that impact public involvement in establishing conservation goals?"*

2) *"What role does UTC have in their public process (for example, setting of rates, conservation goal adoption?"*

Regarding Barriers to Public Forums:
It is not uncommon and nothing prevents a private company from holding a public meeting. These meetings are typically focused on public education, in which the company explains to customers the challenges the company faces, options being considered, and/or the decisions that have been made. In some cases these meetings are called to give a system specific group of customers an opportunity to choose and commit to funding an elective system upgrades. (i.e. Fe/Mn treatment, generator, storage, etc.) It is generally understood, however, that a private company bears sole financial responsibility for all of its decisions and their outcome. In essence the company is the stakeholder. They provide a service to the public but are not agents for or partnered with them. The customers are not always aware that they do not have the right to participate, or dictate, private company decision making. Unlike City, PUD and customer owned Mutual venues, public comment plays a limited role in private company decisions. So, can these meetings be deemed "Public Forums"? Does the term mean public education or collaborative engagement? The term needs to be carefully defined in rulemaking related to privates. What barriers are there to privates holding "Public Forums"? I think the intrinsic separation of customer and company in private business is a significant barrier to achieving Forum style dialogue.

Also, when considering Satellite Management Agencies, who operate a few or perhaps tens or hundreds of water systems, individual system goal setting forums become impractical. The question then becomes, can conservation goal setting and public engagement be done regionally, across a group of separate systems, and does that meet the requirement for "Public Forum"? What about those systems that are owned by others but are managed collectively by a Satellite Management Agency on contract? Can the SMA expect the various system owners to agree to the goals that are set in a regional process? It could be asked if the States SMA program that centralizes management responsibilities is itself a barrier to achieving public forums.

Regarding UTC Role in Goal & Rate Setting:

There are two types of private water system ownership:

- UTC Regulated
- Unregulated (*Systems with annual revenues of less than $429.00/Conn ($35.37/Mo) and having less than 100 connections are not UTC regulated)*

One of the rolls of UTC is to insure that customers are treated fairly through consistent application of approved practices, procedures and charges.

Another is that UTC must also approve all requests to change rates before they can be put in place. UTC insures that the expenses and rate of return requested by the utility result in rates that are:

- Fair
- Just
- Reasonable
- Sufficient

…and not a penny more.

UTC staff would likely recommend that the Commission "accept" conservation goals that are proposed by the utility only if there is a meaningful oversight process to ensure conservation goals are reasonable, fair, etc. This recommendation would, of course, come after the Company has engaged the public and made their decisions and bundled their proposed goals and related enforcement practices. UTC staff may participate in public meetings but are not likely to make specific goal recommendations.

UTC must also review, approve or deny any regulated company's request for rate increase including those that a company professes to be necessary in order to offset revenues that they expect will be lost to lower consumption. It is also noteworthy that at the present time UTC staff have indicated that they will not support such rate increase requests. The reason: It has not been demonstrated that the lower consumption rates will persist. To put it in their terms, price elasticity measures are unreliable, at best, and UTC staff's experience has been that customers are creatures of habit and that consumption will return to higher levels resulting in the companies collecting too much revenue. UTC staff have indicated, however, that there are ways that Staff and the companies could develop creative regulatory solutions to deal with the uncertainties of such rate designs, etc. However, it will not be easy and will likely be a very slow and frustrating process for regulated water companies to forecast revenues and gain timely rate relief in the early years of conservation efforts. This is a serious disincentive for regulated utilities to pursue conservation. Even if rate relief were timely the utility is merely allowed to collect or re-establish the revenue it needs in order to meet its needs, and no more. It may not over collect. This holds true for stepped conservation rates. They must be structured so that all revenue collected does not exceed the company's total revenue requirement. Dollars generated from penalties or the upper billing step is not extra. It must not cause the company's total revenue to exceed its revenue requirement.

UTC does not allow rate adjustments that are intended to recapture revenues lost up to the time of a rate request. This is commonly referred to as retroactive rate making. However, UTC staff are aware of the revenue consequences of conservation and have indicated that in these type instances they are willing to explore what they refer to as "deferred accounting treatment" of recent revenue losses, in order to bring them forward for consideration over a short run. But, the Commission itself has not yet considered this issue. The Commission will typically only approve rates that look forward and only for expenditures that are:

- Known (historically ongoing, mandated or contracted activities – never the promised, intended, or anticipated)
- Measurable (Quantifiable in numbers and cost)

UTC audits and confirms that all costs presented by the company meet these two tests, only then will they allow them to be offset by rates but not a bit more.

Regarding conservation enforcement tools that would fall under the purview of UTC it should be noted that, aside from encouraging conservation by employing conservation rate structures, regulated companies could also disconnect services as a last resort. Although UTC rules (WAC 480-110-335) do permit the discontinuance of service to a customer for non-payment, uses injurious to the system or that are inconsistent with the use applied for, willful waste, tampering, and "Violation of watering restrictions", performing disconnection of service for failing to meet conservation (which is not specifically mentioned) is expected to be difficult to impose. The reason is that re-establishment of service is expected to require evidence of remedy before service is restored. How would improved efforts to conserve be demonstrated by the customer? Some of the UTC regulatory language regarding "Discontinuance of Service" is listed below:

WAC 480-110-355 Discontinuance of service (Q: Do these rules provide the regulated company with tools to effectively implement water conservation strategies?):

(1) Service may be disconnected either by customer direction or by company action:

(b) Company-directed:

(ii) For water use purposes or properties other than those specified in the customer's application for service;

(iii) For willful waste of water through improper or defective piping, equipment, or otherwise;

(iv) For piping or equipment that does not meet the company's standards or fails to comply with other applicable codes and regulations;

(ix) For violating rules, service agreements, or effective tariffs, including violation of outdoor watering instructions given to customers in order to curtail water use during time of shortage;

(x) Use of equipment that detrimentally affects the company's service to its other customers.

Appendix D: Water Use Efficiency Section of the Municipal Water Law

RCW 70.119A.180 Water use efficiency requirements – Rules.

(1) It is the intent of the legislature that the department establish water use efficiency requirements designed to ensure efficient use of water while maintaining water system financial viability, improving affordability of supplies, and enhancing system reliability.

(2) The requirements of this section shall apply to all municipal water suppliers and shall be tailored to be appropriate to system size, forecasted system demand, and system supply characteristics.

(3) For the purpose of this section:

(a) Water use efficiency includes conservation planning requirements, water distribution system leakage standards, and water conservation performance reporting requirements; and

(b) "Municipal water supplier" and municipal water supply purposes" have the meanings provided by RCW 90.03.015.

(4) To accomplish the purposes of this section, the department shall adopt rules necessary to implement this section by December 31, 2005. The department shall:

(a) Develop conservation planning requirements that ensure municipal water suppliers are:

(i) Implementing programs to integrate conservation with water system operation and management; and

(ii) Identifying how to appropriately fund and implement conservation activities. Requirements shall apply to the conservation element of water system plans and small water system management programs developed pursuant to chapter 43.20 RCW. In establishing the conservation planning requirements the department shall review the current department conservation planning guidelines and include those elements that are appropriate for rule. Conservation planning requirements shall include but not be limited to:

(A) Selection of cost-effective measures to achieve a system's water conservation objectives. Requirements shall allow the municipal water supplier to select and schedule implementation of the best methods for achieving its conservation objectives;

(B) Evaluation of the feasibility of adopting and implementing water delivery rate structures that encourage water conservation;

(C) Evaluation of each system's water distribution system leakage and, if necessary, identification of steps necessary for achieving water distribution system leakage standards developed under (b) of this subsection;

(D) Collection and reporting of water consumption and source production and/or water purchase data. Data collection and reporting requirements shall be sufficient to identify water use patterns among utility customer classes, where applicable, and evaluate the effectiveness of each system's conservation program. Requirements, including reporting frequency, shall be appropriate to system size and complexity. Reports shall be available to the public; and

(E) Establishment of minimum requirements for water demand forecast methodologies such that demand forecasts prepared by municipal water suppliers are sufficient for use in determining reasonably anticipated future water needs;

(b) Develop water distribution system leakage standards to ensure that municipal water suppliers are taking appropriate steps to reduce water system leakage rate or are maintaining their water distribution systems in a condition that results in leakage rates in compliance with standards. Limits shall be developed in terms of percentage of total water produced and/or purchased and shall not be lower than ten percent. The department may consider alternatives to the percentage of total water supplied where alternatives provide a better evaluation of the water system's leakage performance. The department shall institute a graduated system of requirements based on levels of water system leakage. A municipal water supplier shall select one or more control methods appropriate for addressing leakage in its water system;

(c) Establish minimum requirements for water conservation performance reporting to assure that municipal water suppliers are regularly evaluating and reporting their water conservation performance. The objective of setting conservation goals is to enhance the efficient use of water by the water system customers. Performance reporting shall include:

(i) Requirements that municipal water suppliers adopt and achieve water conservation goals. The elected governing board or governing body of the water system shall set water conservation goals for the system. In setting water conservation goals the water supplier may consider historic conservation performance and conservation investment, customer base demographics, regional climate variations, forecasted demand and system supply characteristics, system financial viability, system reliability, and affordability of water rates. Conservation goals shall be established by municipal water supplier in an open public forum;

(ii) Requirements that the municipal water supplier adopt schedules for implementing conservation program elements and achieving conservation goals to ensure that progress is being made toward adopted conservation goals;

(iii) A reporting system for regular reviews of conservation performance against adopted goals. Performance reports shall be available to customers and the public. Requirements, including reporting frequency, shall be appropriate to system size and complexity;

(iv) Requirements that any system not meeting its water conservation goals shall develop a plan for modifying its conservation program to achieve its goals along with procedures for reporting performance to the department;

(v) If a municipal water supplier determines that further reductions in consumption are not reasonably achievable, it shall identify how current consumption levels will be maintained;

(d) Adopt rules that, to the maximum extent practical, utilize existing mechanisms and simplified procedures in order to minimize the cost and complexity of implementation and to avoid placing unreasonable financial burden on smaller municipal systems.

(5) The department shall establish an advisory committee to assist the department in developing rules for water use efficiency. The advisory committee shall include representatives from public water system customers, environmental interest groups, business interest groups, a representative cross-section of municipal water suppliers, a water utility conservation professional, tribal governments, the department of ecology, and any other members determined necessary by the department. The department may use the water supply advisory committee created pursuant to RCW 70.119A.160 augmented with additional participants as necessary to comply with this subsection to assist the department in developing rules.

(6) The department shall provide technical assistance upon request to municipal water suppliers and local governments regarding water conservation, which may include development of best management practices for water conservation programs, conservation landscape ordinances, conservation rate structures for public water systems, and general public education programs on water conservation.

(7) To ensure compliance with this section, the department shall establish a compliance process that incorporates a graduated approach employing the full range of compliance mechanisms available to the department.

(8) Prior to completion of rulemaking required in subsection (4) of this section, municipal water suppliers shall continue to meet the existing conservation requirements of the department and shall continue to implement their current water conservation programs.

Appendix E: Source Description Inventory

The information below was provided to the subcommittee as on outline proposal. It was not fully accepted by the subcommittee, but a number of members expressed the view that it provided a good starting point for regulations related to source descriptions.

Source Description Inventory
(Draft 12-13-04)

As part of the source description, each water system with 1,000 or more connections should describe the environment in which it operates in order to understand potential environmental impacts of its water use. Answering the following questions will aid water systems in identifying pertinent information.

NOTE: For surface water sources, "source stream" refers to stream from which the municipal supply is diverted. For groundwater sources, "source stream" refers to the stream(s) to which the municipal supply's target aquifer is hydraulically connected.

Describe Municipal water user
What is base water use (generally defined as December to February average production)? What is peak month water use? What is the ratio of peak month water use to base month (winter) use?
What are the low flow months for the watershed in which the water source is located?
What is the effect on streamflow of diversion of peak month use during the critical low flow period?
Is the water supply adequate for the 6 and 20 year planning timeframes including consideration of modeled effects of climate change?
Will conservation reduce the limitations on the source of supply?

Water Source
What is source of water?

- pumped from stream
- pumped from aquifer

If aquifer, what stream or streams are hydraulically connected, or likely connected?
Is source stream or aquifer in one of the 16 Critical watersheds?
Is source stream or aquifer part of critical habitat for ESA listed species?
Have instream flows been adopted by rule for the source stream? If so, how often are they being met?
Have trust water rights been established for the source stream flow protection? If so, how will pumping affect the flows protected by those rights?
Are instream flows in the source stream declining? If so, describe the decline.
Are average water levels in the source area aquifers declining? If so, at what rate?

Quality
Is water quality impaired (on 303(d) list) for the source stream?
If so, for what criteria?

Are NPDES permits issued for the source stream, and if so, what assumptions about historic low flows are provided in that permits?

Are any TMDL's scheduled, in preparation or completed for the source stream? If so, is instream flow a factor in load allocation?

General

Are there current or proposed water uses downstream of source withdrawal for:

- Municipal water supply
- Industrial
- Agricultural, including irrigation of food crops
- Hydropower

Have public or private funds been expended to improve instream flows in the source stream, including for water right acquisitions, water use efficiency improvements, etc.?

Does the source stream support aquatic food production such as fish, waterfowl, and shellfish for people and wildlife?

Does the source stream or aquifer support wetlands used for:

- maintenance of water quality
- maintenance of habitat for fish, birds, wildlife, etc.

Does the source stream support aquifer recharge in downstream segments?

Does the source stream support recreational activities such as trout fishing, boating, swimming, wildlife viewing, hiking, camping, etc.?

Does the source stream support aesthetic features such as waterfalls?

What projections have been made in the source watershed concerning climate change and water resources availability and trends?

Appendix F: American Water Works Association – Water Balance Format[12]

January 2005

System Input Volume (Own Sources, Imported Sources) SUBTRACT (Water Exported Water Supplied)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non-Revenue Water: Firefighting Flushing, parks
			Unbilled Unmetered Consumption	
	Water Losses	Apparent Losses	Unauthorized Consumption	Theft
			Metering Inaccuracies & Data Handling Errors (Improper type or sized meter for application, data inaccuracies)	
		Real Losses	Leakage on Transmission and/or Distribution Mains	
			Leakage and Overflows at Storage Tanks	
			Leakage on Service Connections up to point of Customer Line	

[12] Source: AWWA, Journal, AWWA Water Loss Control Committee Report, August, 2003

Appendix G: Conservation Measures Table

Each of the documents used to develop this table uses a different convention for determining measures that should be evaluated for implementation. The convention used for each document is described below.

CPR [1] Small < 1,000 connection

Medium 1,000 – 24,999 connection

Large 25,000 or more connection

AWWA [2] Based on type of program instead of size categories. Applicable to systems from 1,000 to 25,000 connections

EPA [3] Basic < 10,000

Intermediate 10,000 – 100,000

Advanced greater than 100,000

CA [4] All measures required unless they are deemed not cost-effective by the utility or not able to because of authority

DOH [5] Small < ,1000 connection

Medium 1,000 – 9,999 connection

Large 10,000 or more connection

Source Meters					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Source Meters – Required per RCW 90.44.450, RCW 90.03.360, WAC 173-173	Small and SWSMP	Minimum	Basic		Small

Service Meters					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Service Meters	Small and SWSMP	Minimum	Basic	Required	Small

Meter Testing / Calibration / Replacement Program					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Meter Testing/Replacement Program Required Accuracy per WAC 173-173-120			Advanced		Small

Leakage Reduction					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Determine System Leakage – Required per RCW 70.119A.180	Medium	Moderate	Basic	Required	Small
Leak Detection and Repair – (Leakage Reduction is Required per RCW 70.119A.180)	Medium	Moderate	Basic		Small
Pressure Management – DOH has Minimum Requirements WAC 246-290-230			Intermediate		Medium

Conservation Oriented Rates					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Rate Structure – Evaluation Required per RCW 43.20.235	Small	Moderate	Basic	Required	Small

Regulatory Conservation Measures					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Ordinances/Regulations		Maximum	Advanced		Large
Water Waste Prohibition – RCW 90.03.005, 90.44.110				Required	Small

Education					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Conservation Coordinator				Required	Large
Bill Showing Comparison of Average Usage					Small
Bill Showing Consumptive History	Medium		Basic		Medium
Conservation Packet for New Customers					Medium
Customer Assistance	Medium				Medium
Program Promotion	Small and SWSMP	Minimum	Basic	Required	Small
Purveyor Assistance	Medium				Large
School Outreach	Large	Moderate	Intermediate	Required	Medium
Speaker's Bureau	Large				Large
Technical Studies	Large		Advanced		Large
Theme Shows and Fairs	Large				Large
Wholesaler Incentives				Required	Large

Indoor Residential Conservation Measures					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Dual-Flush Devices		Maximum			Large
Indoor Leak Repair		Maximum			Small
Indoor Water Audit		Moderate		Required	Medium
Low-Flow Faucets – RCW 19.27.170		Maximum			Small
Low-Flow Showerheads – RCW 19.27.170		Moderate			Small
Retrofit Kits	Medium	Minimum	Intermediate	Required	Medium
Toilet Leak Detection Tablets					Small
Toilet Tank Displacement Devices		Minimum			Small
Ultra Low Flush Toilets – RCW 19.27.170		Moderate		Required	Medium
Utility Financed Retrofit	Large	Maximum	Advanced	Required	Large
Variable Flush Time Devices		Moderate			Large

Outdoor Conservation Measures					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Drip Irrigation Systems		Large			Large
Greywater					Large
Landscape Management	Medium		Advanced		Medium
Landscape Ordinance					Medium
Lawn-Watering Guides		Moderate	Intermediate		Small
Low-Water Use Landscaping	Maximum		Intermediate		Medium
Low Water Use Plants Education		Moderate			Small
Nurseries/Agriculture	Medium				Medium
Outdoor Water Audit		Moderate			Medium

Industrial/Commercial/Institutional (ICI)					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Cooling Tower Improvements		Maximum			Large
ICI Ultra Low Flush Toilet				Required	Large
ICI Water Audit			Intermediate	Required	Medium
Identify ICI accounts				Required	Medium
Industrial Improved Plant Facilities Maintenance		Moderate	Advanced		Large
Irrigation Audit		Moderate	Intermediate	Required	Medium
Irrigation Scheduling		Maximum			Medium
Landscape Irrigation Reduction		Moderate			Medium
Low Water Use/ Soil Preparation Education					Small
Season Demand Management	Large				Medium
Soil Preparation and Mulching		Maximum			Large
Utility Financed Retrofit	Large	Maximum	Advanced		Large

Reclamation					
Measure to be Evaluated	**CPR**	**AWWA**	**EPA**	**CA**	**DOH**
Reclamation/Reuse – Required Evaluation per RCW 90.46.120 for Systems ≥1,000 Connections	Large	Maximum	Advanced		Medium

[1] Washington State Departments of Health and Ecology, *Conservation Planning Requirements: Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs*, DOH PUB 331-008, Ecology PUB 94-24, March 1994.

[2] American Water Works Association – Pacific Northwest Section, *Water Conservation Guidebook*, American Water Works Association, 1993.

[3] U.S. Environmental Protection Agency, *Water Conservation Plan Guidelines*, EPA-832-D-98-001, 1998.

[4] California Urban Water Conservation Council, Memorandum of Understanding, March 2004.

[5] DOH recommendation for size categories. This would be for guidance only.

Appendix H: Definitions

The following definitions are provided as an aid to readers not familiar with the terms used throughout this document. Except where noted, the subcommittee did not discuss these definitions. Many of these definitions are taken directly from current Department of Health regulations. Other terms may be included in new regulations if needed. Final definitions for any terms added to regulations will need to be precisely developed by Department of Health staff and reviewed by stakeholders through informal and formal public processes.

affordable rates – A charge for water service that the consumer is able to pay without jeopardizing the consumer's ability to pay for other necessities (food, shelter, other utility service, medical care, clothing, and transportation) [1]

apparent losses – Includes all types of inaccuracies associated with customer metering, plus unauthorized consumption (theft or illegal use). Note: Over-registration of customer meters, leads to under-estimation of real losses. Under-registration of customer meters, leads to over-estimation of real losses [2]

authorized consumption – Volume of metered and/or un-metered water taken by registered customers, the water supplier, and others who are implicitly or explicitly authorized to do so by the water supplier, for residential, commercial, and industrial purposes. Note: Authorized consumption may include items such as fire fighting and training, flushing of mains and sewers, street cleaning, watering of municipal gardens, public fountains, frost protection, building water, etc. These may be billed or unbilled, metered or un-metered [2]

average day demand – The total quantity of water use from all sources of supply as measured or estimated over a calendar year divided by three hundred sixty-five. Average day demand is typically expressed as gallons per day per equivalent residential unit [3]

avoided costs – The savings associated with undertaking a given activity (such as demand management) instead of an alternative means of achieving the same results (adding supply), can be measured in terms of incremental costs [4]

coordinated water system plan – A plan developed for a critical water supply service area pursuant to RCW 70.116 that consists of individual water system plans and an areawide supplement that addresses regional water system issues

cost-sharing perspective cost-effectiveness evaluation – This perspective determines whether the measure is cost-effective for the utility to implement if the costs were shared with other utilities [5]

demand forecast – An estimate of future water system water supply needs assuming historically normal weather conditions and calculated using numerous parameters, including population, historic water use, local land use plans, water rates and their impacts on consumption, employment, projected conservation savings from implementation of a conservation program, and other appropriate factors [7]

demand-side (external) conservation measures – Actions and programs by the utility to educate and promote how and why to use water efficiently, and to offer incentives for customers to reduce water use [6]

distribution main – A distribution main is the delivery system to individual customer service lines and provides water for fire protection through fire hydrants, if applicable [3]

equivalent residential unit – A system-specific unit of measure used to express the amount of water consumed by a typical full-time single-family residence [7]

external (demand-side) conservation measures – Actions and programs by the utility to educate and promote how and why to use water efficiently, and to offer incentives for customers to reduce water use [6]

financial viability – The capability of a water system to obtain sufficient funds to construct, operate, maintain, and manage a public water system on a continuing basis, in full compliance with federal, state, and local requirements [7]

inchoate water right – An inchoate water right is one that is unperfected because water has not yet been fully put to beneficial use, but that remains in the process of being perfected. Perfection is the act of putting the water to full beneficial use. Note: An application for a water right permit is not an inchoate water right, because there is no authorization to use water. [8]

industrial, commercial, institutional – A group of non-residential customer classes identified for specific non-residential water conservation measures [8]

infrastructure leakage index – A performance indicator for water loss control represented by a ratio of real losses to the unavoidable annual real losses [2]

internal (supply-side) conservation measures – Actions and programs under the direct control of the utility to reduce system inefficiencies, improve operations, management and planning related to water production and distribution [6]

leak detection – Methods used in the field to identify water leakage from pipes and fittings [8]

maximum day demand (MDD) – The highest actual or estimated quantity of water that is, or is expected to be, used over a twenty-four hour period, excluding unusual events or emergencies. Maximum day demand typically expressed as gallons per day per equivalent residential unit [7]

non-participating customer (rate impact measure) perspective cost-effectiveness evaluation – This perspective determines whether the average bill will increase or decrease for the customers. It is important to compare this value to what the average bill would be, if the conservation measure was not implemented

non-revenue water – Those components of system input which are not billed and do not produce revenue – equal to unbilled authorized consumption, apparent losses, and real losses [2]

own sources – Volume of water input to a system from the water supplier's own sources [2]

participating customer perspective cost-effectiveness evaluation – This perspective determines whether the measure is cost-effective for the participating customer

peaking factor – A ratio of maximum (peak) day use to average day use for the year [3]

real losses – Physical water losses from the pressurized system up to the point of measurement of customer use. The annual volume lost through all types of leaks, bursts and overflows depends on frequencies, flow rates, and average duration of individual leaks, bursts and overflows. Note: Although physical losses after the point of customer flow measurement or assumed consumption are excluded from the assessment of real losses, this does not necessarily mean that they are insignificant or unworthy of attention for demand management purposes [2]

reclaimed water – Effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater [7]

reuse – The use of reclaimed water, in compliance with Washington State Department of Health and Department of Ecology regulations and the Water Reclamation and Reuse Standards, for a direct beneficial use [9]

revenue water – Those components of system input that are billed and produce revenue (also known as billed authorized consumption). Equal to billed water exported, billed metered consumption and billed un-metered consumption [2]

sanitary survey – A review, inspection, and assessment of a public water system by the department or department designee including, but not limited to: source, facilities, equipment, administration and operation, maintenance procedures, monitoring, record keeping, planning documents and schedules, and management practices. The purpose of the sanitary survey is to evaluate the adequacy of the water system for producing and distributing save and adequate drinking water [7]

satellite management agency – A person or entity that is approved by the department to own or operate public water systems on a regional or county-wide basis without the necessity for a physical connection between such systems [7]

service meter – A devise that measures the amount of water delivered to a customer [10]

small water system management program – A Department of Health planning document pursuant to chapter 246-290 WAC that addresses the current and future operational, technical, managerial, and financial needs of a small non-expanding water system

societal perspective cost-effectiveness evaluation – This perspective determines whether the measure would be cost-effective by comparing the costs and benefits for the society

source meter – A meter that measures total output of a water source over specific time periods [7]

supply-side (internal) conservation measures – Actions and programs under the direct control of the utility to reduce system inefficiencies, improve operations, management and planning related to water production and distribution [6]

system input – Volume input to that part of the water supply system to which the water balance calculation relates, allowing for known errors. Equal to own sources plus water imported [2]

total resource perspective cost-effectiveness evaluation – This perspective determines whether the measure is cost-effective no matter who (utility or customer) is paying for the measure

unaccounted for water – Water lost through leaks, evaporation, or use not recorded. It excludes water used for system flushing, fire protection, and other designated uses that could be estimated. These uses are called accounted for water [11]

unbilled authorized consumption – Those components of authorized consumption which are not billed and do not produce revenue. Equal to unbilled metered consumption and unbilled un-metered consumption [2]

utility perspective cost-effectiveness evaluation – This perspective determines whether the measure is cost-effective for the utility to implement

water audit – A systematic accounting of water throughout the production, transmission, and distribution facilities of the system [4]

water conservation – Measures undertaken by water systems to minimize supply and demand inefficiencies, and lessen water withdrawals and water use. These include internal and external measures [6]

water imported or exported – Volumes of bulk transfers across operational boundaries [2]

water loss control action plan – Written document of specific activities to implement within a specified time frame in order to reduce water leakage [6]

water losses – When authorized consumption is subtracted from system input, water loss remains. Water losses are broken into two categories, apparent losses and real losses. Water losses can be considered as a total volume for the whole system, or for partial systems such as raw water mains, transmission or distribution systems, or individual zones [2]

water right – A permit, claim, or other authorization, on record with or accepted by the Department of Ecology authorizing the beneficial use of water in accordance with all applicable state laws [7]

water supplied – System input minus water exported [2]

water system plan – A Department of Health planning document pursuant to chapter 246-290 WAC that addresses the current and future operational, technical, managerial, and financial needs of an individual water system

water use efficiency – Regulatory programs administered by DOH and implemented by water purveyor that include conservation planning requirements, water distribution system leakage standards, and water conservation performance reporting requirements

[1] Rubin, Scott J., *Briefing Paper on Issues Relating to the Affordability and Sustainability of Rates for Water Service*, June 2002

[2] 2003 American Water Works Association / International Water Association Water Balance Format

[3] Department of Health, *Water System Design Manual*, DOH PUB 331-123

[4] U.S. Environmental Protection Agency, *Water Conservation Plan Guidelines*, EPA-832-D-98-001, 1998

[5] California Urban Water Conservation Council *Guidelines to Conduct Cost-Effectiveness Analysis of Best Management Practices for Urban Water Conservation*, September 1996

[6] Water Use Efficiency Subcommittee

[7] Group A Public Water Systems, Chapter 246-290 WAC, Effective July 3, 2004

[8] Doug McChesney, Department of Ecology

[9] Washington State Departments of Health and Ecology 1997 *Water Reclamation and Reuse Standards*, PUB 97-23

[10] Department of Health Technical Staff

[11] Washington State Departments of Health and Ecology, *Conservation Planning Requirements: Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs*, DOH PUB 331-008, Ecology PUB 94-24, March 1994