

City of Spokane

CHAPTER 4

Conservation Program, Water Rights Analysis, System Reliability, and Interties

4.1 Conservation Program Development and Implementation

The following information has been compiled with the intent of meeting the *Conservation Planning Requirements*, a publication of the Washington State Department of Health.

Water Use Data Collection Requirements

Type of Data	Units of Measure	Frequency of Collection
Source of Supply Meters to be on each well pump	Currently read as thousands of gallons per day	Daily, read as operator makes rounds checking stations

Total Pumpage

1994	3,346,996,257 Cubic Feet (Cu-Ft)
1995	3,007,027,273 Cu-Ft
1996	3,176,784,358 Cu-Ft
1997	2,960,773,262 Cu-Ft
1998	3,203,997,727 Cu-Ft

Emergency Interties

Cubic Feet	Monthly totals
No water purchased (See Note 1)	Not collected

Wholesale

Cubic Feet	Monthly totals
No water purchased (See Note 1)	Not collected

Peak Day/Peak Month

Millions of gallons from supply sources Totals calculated for each day
 System totals are calculated each month

1994	Peak Day	24,772,727 Cu-Ft	July 22
	Peak Month	616,430,480 Cu-Ft	July
1995	Peak Day	21,122,995 Cu-Ft	July 17
	Peak Month	469,612,700 Cu-Ft	July

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1996	Peak Day	21,313,904 Cu-Ft	July 15
	Peak Month	551,316,710 Cu Ft	July
1997	Peak Day	21,033,690 Cu-Ft	August 4
	Peak Month	519,151,730 Cu-Ft	August
1998	Peak Day	23,272,058 Cu-Ft	July 27
	Peak Month	551,074,330 Cu-Ft	August

Revenue Water

Service Meter Readings—Residential

Total cubic feet One half of meters read each month. All residential meters are read on a 2-month cycle

1994	56,826 accounts	1,400,000,000 Cu-Ft
1995	57,264 accounts	1,177,500,000 Cu-Ft
1996	57,644 accounts	1,230,000,000 Cu-Ft
1997	57,705 accounts	1,220,000,000 Cu-Ft
1998	57,745 accounts	1,370,000,000 Cu-Ft

Service Meter Readings—Commercial

Total cubic feet Commercial meters are read monthly

1994	8,420 accounts	560,000,000 Cu-Ft
1995	8,437 accounts	560,000,000 Cu-Ft
1996	8,525 accounts	560,000,000 Cu-Ft
1997	8,533 accounts	515,000,000 Cu-Ft
1998	8,554 accounts	522,000,000 Cu-Ft

Government

Total cubic feet Read monthly includes city, county, state, federal, and schools

1994	400 accounts	80,000,000 Cu-Ft
1995	400 accounts	80,000,000 Cu-Ft
1996	400 accounts	106,000,000 Cu-Ft
1997	415 accounts	105,000,000 Cu-Ft
1998	436 accounts	127,000,000 Cu-Ft

Non-Revenue Water

Unaccounted For Water

Total Cubic Feet Totals are calculated annually

1994	804,439,305
1995	815,646,123
1996	857,177,941
1997	728,496,925
1998	655,876,203

Note:

1. The utility billing system used to obtain the above records did not have classifications (accounts) for agriculture, industrial, emergency interties, or wholesale sales. These type of entities are grouped into our commercial accounts. Also accounts for residential and multifamily are not well documented.

At the time of creating this plan, the City of Spokane is installing and debugging a new utility billing system. The intent is to adjust the classifications in the utility billing system, as best we can, to align with the classifications listed in the Conservation Planning Requirements.

Water Rates

The water rates that have been approved for the years 2000 thru 2001 have been codified under Ordinance No. C-32504, Chapter 13.04, Article II Rates. A copy of the ordinance language is provided in Appendix 4.1.1. The City is moving toward elimination of the current declining block rate structure. The City also maintains a minimum monthly service charge which is based on meter size. The monthly water bill is provided with both the sewer and garbage bills.

Water Demand Forecast

The water demand forecast is provided in Chapter 2. There are some differences from the requirements for demand forecasting as listed in the conservation requirements due to the unavailability of some data. This is partly due to the different customer classes that the City has data for and partly due to problems with the population forecasts. Some of these problems are solved by changing the Water Department's customer classes to agree with the requirements, while the population projections need data that we currently don't have.

Conservation Program

The City of Spokane, Department of Water and Hydroelectric Services, is mindful that it must maintain a "high quality" water system. A major part of this effort is to conserve resources in as many ways as is available. The following paragraphs identify the strategy of departments conservation programs.

Conservation Objectives

The objective of the water conservation program is to limit the growth in the peak day demand so that the existing sources can continue to serve an increasing number of customers, resulting in a reduction of the per capita average day demand.

In the areas of conserving water we have programs that have been in place for several years.

Metered Consumption

Water conservation was first initiated when the City of Spokane required all consumption to be metered. Today, for the most part all water consumption is metered with the exception of hydrants and "grandfathered" firelines. All new construction and remodels of existing structures that require firelines, are required to install meters.

Meter Repair/Replacement

A vital part of the water meter program is to insure that the consumption water meters are operating properly. As part of this proactive program, the water meter department test all 3-inch and larger meters bi-annually, and all 1-1/2 and 2-inch meters ever 5 years. Water meters removed from service, and determined "rebuildable" will be rebuilt in the Departments meter shop. All "rebuilt" meters are flow tested for proper calibration prior to re-entering service. Flow testing of meters is done by water department staff using "state-of-the-art" equipment.

Additionally, there is a program in place to cull the water system of "obsolete" water meters. When an "obsolete" meter is encountered, it is removed from service and replaced immediately with a new or rebuilt meter.

Inordinate Water Use/Waste of Water

If a water meter in service is "flagged-high" (indicating unusually high consumption) by the utility billing system, a meter inspector will be sent to investigate the "problem." The investigation typically occurs within 24 hours of notification. Historical records indicate that the investigation determines an "on property" water leak. Should this be the case, the Water Department will insist that the repair be done in a timely manner. City of Spokane Municipal Code 13.04.1902, see Exhibit 4.1.1, deems it illegal to knowingly waste water. If the water meter is determined suspect, the meter is immediately removed from service and replaced with a new or rebuilt meter. The suspect meter is then tested in our meter shop to determine the inaccuracy of the meter. If inaccuracies are determined the owner is notified and adjustments are made to their water bill. History shows that the water meter is usually accurate.

Leak Detection

Another key element of our water conservation efforts, rest with our computerized leak correlation program. Instituted in the 1970's, this program's focus is to locate leaks in the water system, and affect immediate repair of pipe. Today, this is a "full time" program, with personnel trained specifically to operate the state-of-the-art equipment. The leak correlation crew blankets the entire water system identifying leaks. Depending on the need, this crew will concentrate on specific areas that have been determined suspect. Over the years this program has been instrumental in making the water system ever "tighter."

The Water Department crews that operate valves in the water system also play a role in detecting leaks. The program for operating valves insures the proper operation of all valves (excluding individual services) in the water system. An important part of this program is to listen for the sound of rushing water as each valve, or series of valves, are operated. If the sound of water is detected, when no sounds are expected, the leak correlation crew is summoned to determine the source of the sound. Once located, repair crews are called to affect the repair.

Supply Metering

The water pumped at our Well Stations has, in many cases, been calculated because existing source meters have metered erroneously or failed totally. A high priority program calls for installation of new flow meters at all Well Stations. This program is included in the current Six-Year Comprehensive Water Program, and is scheduled for completion the summer of 2002.

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would be the first priority to consider because of their large usage. At this time the department does not plan to implement a Xeriscape program.

15. Conservation pricing has shown some reduction in average per capita usage as utility bills increase with rate increases in recent years. The rates could be made seasonal to have a greater affect on the peak day demand. Currently, plans to transition to an increasing block rate structure.
16. Utility Financed Retrofit—This would require a study to determine if there are any measures that have a favorable cost/benefit ratio and a reasonable pay back period. Without a great need to conserve there is not a great benefit to be derived from what could be large expenses to the water department. The department does not plan to implement this strategy presently.
17. Seasonal Demand Management could possibly lower the peak day demand with scheduled lawn watering. Recent indications of increased numbers of sprinkler systems reduce the high demand days before or after holidays.
18. Recycling/Reuse of water that might be available at the Upriver Complex which could use cooling water discharge from power plants (1 mgd); Avista Energy cooling water discharge from power plants, (1 mgd); Spokane Waste Water Treatment Plant (20-30 mgd). The most likely use of recycled water is for watering parks and golf courses. Currently, a small amount of reuse occurs at the AWTP to wash clarifiers. Other potential uses for reused water would be street cleaning, sewer flushing, and dust control for construction projects. At this time, the City does not anticipate a significant amount of recycling/reuse water.

Target Water Savings Projections

For the City of Spokane, the weather has such a large factor in affecting the Peak Day Demand, as well as the Average Per Capita Demand, that it is difficult to separate the weather effect from the conservation effect. It is possible to use five-year averages in an attempt to nullify the weather effect, and we would like to see the Peak Day Demand not increase and the Average Per Capita Demand decrease as the system adds new customers. If the system grows by 1 percent per year in the number of services, then the projected conservation savings would need to equal 1 percent to continue to meet the customers needs without adding resources.

Regional Conservation Programs

Conservation is a theme embraced by water purveyors in Spokane County and documented in the Spokane County Coordinated Water System Plan. The City of Spokane has agreed to combine efforts with other water purveyors in the promotion of water conservation. Literature promoting water conservation will be sent out periodically with utility bills. Consumer Confidence Reports will also provide information relating to conservation.

Rate Structure

Water service rates for the years 2000 and 2001 have been amended reducing the number of consumption categories. Further, over a period of time, the department plans to institute a rate structure that increases costs of water proportional to the consumption (increasing block rate structure).

Other Conservation Activities

In addition to the water conservation program, the Department also has an on-going program that examines existing electric motors and motor controllers, looking for opportunities to conserve electrical energy. In conjunction with this program, as new facilities are constructed, the Department attempts to install the most efficient pumps possible. In identifying potential equipment replacement for efficiency purposes, initial studies must show a reasonable payback period before the project is considered beyond the investigative stage.

Evaluation of Conservation Measures

The City firmly believes that the proposed methods for eliminating water leaks in the distribution system are reducing the amount of unaccounted for water.

The Department also believe that with the implementation of an increasing block water rate structure will also lead to greater conservation.

The program that may have a the most significant impact, is Well Station source metering. Metering the amount of water pumped into the water system combined with the consumption metering will provide the Water Department more accurate details of the water system dynamics. This information will provide us with better understanding of how to implement and measure conservation programs.

The following programs will be instituted by the Department over the next years:

Conservation Strategies and Implementation

1. Conservation is a theme embraced by water purveyors in Spokane County and documented in the Spokane County Coordinated Water System Plan. The City of Spokane has agreed to combine efforts with other water purveyors in the promotion of water conservation. Literature promoting water conservation will be sent out periodically with utility bills. Consumer Confidence Reports will also provide information relating to conservation.
2. Install Source Meters at all Well Stations. This program is included in our Six-Year Comprehensive Program. Implemented in 1999, installation of the source meters will be completed the summer of 2002. Evaluation of this program will come when pumping and consumption histories are developed.
3. An ongoing program at the Water Department is the School Outreach Program. The Water Department is a member of the Partners Group that is affiliated with Spokane School District 81. We provide student tours of the Upriver Complex that highlight the Water System Control Center, hydroelectric power generation, the Well Electric Well Station, and Well Number 1 that provides a view of the aquifer. The discussion during the tour stresses the importance of protecting the aquifer, as well as different methods of

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- water conservation. The department will continue to promote tours and public education.
4. The Water Department utilize the local Speakers Bureau in presenting programs that the Water Department believes to be important. In more recent times speakers have focused on the Wellhead Protection Program. The department will provide speaker services for civic clubs as requested in the future.
 5. The Water Department has participated in local Theme Shows and Fairs. At these functions, equipment has been demonstrated and information provided to the public on what constitutes the Water Department. At these shows educational information about the aquifer, and information on conserving water is provided. The Department will continue to participate in local shows and fairs to promote water quality and conservation.
 6. Purveyor Assistance does not appear necessary or cost effective at this time.
 7. Customer Assistance does not appear necessary or cost effective in reducing the peak demand.
 8. Technical Studies are not necessary at this time, but would be necessary to justify the expense of any assistance program. Some type of pilot project would be needed to evaluate the cost effectiveness of any program that was implemented.
 9. Provide a utility bill that shows water consumption history. The intent of this program would be to better inform the customer, with the idea that they will modify their water consumption habits. The new utility billing system (currently being installed) can provide this information, but its placement into operation is subject to key elements of the program being perfected.
 10. The City of Spokane operates a metered water system whereby all water services are metered. This program includes flow testing, and calibrating water meters to assure their accuracy. No additional activities surrounding water meters are proposed at this time. The existing program will remain intact
 11. The City of Spokane operates a Leak Detection Program that has been in affect nearly thirty years. This program has been instrumental in locating numerous leaks that would have otherwise remained unnoticed. The City's leak correlation crew will continue to monitor the system for leaks.
 12. The distribution of a Single-Family/Multi-Family Kit /Program might reduce the average daily demand but would not have much of an effect on the peak day since the peak days are primarily driven by lawn watering. The department does not plan to conduct this activity.
 13. Develop Nurseries/Agricultural Conservation Program—We do not supply enough nurseries or agricultural customers to make this a cost effective program. The department does not plan to conduct this activity.
 14. Develop Landscape Management/ Playfields utilizing a Xeriscape Program. Typically, plants used in xeriscaping are heat and drought tolerant, and are not conducive with cold wet freezing winters. However, if the need is great enough, parks and golf courses