

SPANAWAY WATER COMPANY CONSERVATION PROGRAM

Historic Background

System Metering:

Spanaway Water Company initially provided service to customers at a fixed bi-monthly rate. Beginning in the late 1960's the Company began installing service meters for new construction and retrofitting existing service connections. Services were generally metered by the mid 1970's with the exceptions being the fire stations. The final service connection was completed in December 2005 with the addition of an 8" fire service meter to the Central Pierce Fire and Rescue training facility at 22nd Ave. E. and 176th St. E.

System Billing:

With the installation of meters in the late 1960's billing began to be based on a base rate that included 600 CF plus consumption. Additional consumption was billed at a flat fixed rate per 100 CF beyond the initial 600 CF included in the base. Billing was hand calculated and processed until November 1992 when the Company implemented its first computerized billing system. Rates in 1992 were still comprised of a base with 600 CF and excess consumption billed at a fixed rate. Prior to implementation of computerized billing, calculation of consumption rates, individually or system wide were at best very difficult and time consuming.

Conservation Measure Implementation and Impact on Water Use:

The conservation measure implementation that follows will be presented in chronological order. In those areas where water use efficiency impacts of conservation measures are clearly quantifiable they will be identified and historic use patterns presented in graphic form.

Historic and Current Conservation Program Elements

I. Public Education:

Customer Newsletters:

The Company produced its first customer newsletter in the spring of 1992. A portion of this newsletter was devoted to water conservation in the form of "One inch per week" lawn watering information. Since 1992, the Company has produced at least two newsletters per year, generally in the spring/early summer and the fall. Nearly every letter has at least some water savings information including:

- "One inch per week" lawn watering information;
- Indoor water saving tips;
- Outdoor water saving tips;
- Winterization tips to save water and plumbing;
- Minimizing peak day water use;
- Checking for toilet tank leaks;
- Water rates, our change to increasing block rates, and their impact on your water bill

- Lawn maintenance, fertilization, and irrigation as recommended by WSU for western Washington;
- Efficient timing for lawn watering;
- Information on “Water Wise Landscaping” seminars;
- Information on “Water Smart Open House” seminars;
- How to use your water meter to check for leaks;
- Peak use impact on need for additional sources and water rates;
- Water conservation to aid in salmon recovery efforts;
- Home water conservation check lists;
- DOH conservation regulation development due to Municipal Water Law;
- DOH draft “Water Use Efficiency Rule” requirements.

The effect of public education on customer water use is difficult at best to determine. However, raising public awareness is of benefit and efforts have been made to inform customers of the impacts of their water use. These impacts include system demand, the need for additional source and storage capacity, potential effects on salmon and the natural environment, regulatory issues, water rates, and their individual water bills.

Governor/State/large Utility Initiated Water Messages:

Though not part of the Company’s conservation efforts actions taken by the Governor and/or state agencies and/or large regional utilities (Seattle, Tacoma, and Everett) do have an impact on water use. In both 2001 and 2005 the governor declared droughts for the state. In 2001 the larger utilities generated public awareness notices of possible water shortages. For 2001 our public education efforts also placed extra emphasis on the need to conserve both due to weather conditions and the growing implications of the listing of salmon under the Endangered Species Act. In both of those years we saw a marked reduction compared to 2000 and 2004 respectively in actual metered average day demand (2001 – 9.6%, 2005 – 16.5%), production peak day demand (2001 – 22.6%, 2005 – 26.4%), and total annual production (2001 – 22.2%, 2005 – 12.2%). The reduction in actual metered average day demand was likely largely due to these messages by the Governor, larger utilities, and the Company. Potentially of greater impact and demonstrated by the total annual production was the completion of leak detection survey and studies with related repairs in 1994/5, 2000 and 2004/5. These efforts will be discussed below.

II. Billing Information:

When the Company began computerized billing in November 1992, the bills mailed to customers included a bar chart that indicated the water use for the current and prior five billing periods (one year). This chart showed individual customers how their use varied through the year. Because these charts had a fixed usage scale, those customers with consistent usage, very little, or high usage could not clearly see variations in usage. This issue has now been addressed.

Currently, bills have individualized consumption charts. Two major changes were made; the first is the utilization of usage for the past two years. The current year’s bi-monthly usage is shown as a solid bar located adjacent to the same period from the prior year shown in box form. Second, the usage scale now has a scale of “0” to the highest usage in the past two years rounded up to the nearest 100 cubic feet. This provides users a scale that reflects even minor changes should their use be relatively consistent.

Computerized bills also provide an efficient means to identify unusual usage helping to identify possible customer leaks or “stuck” meters. Variance reports run by the staff now allow

the bill to include a note “Usage appears high—check for leaks”. Alternatively if usage is unusually low, staff can be sent to check the proper operation of the meter.

Computerized billing information provides a means to effectively monitor and report metered water usage at a number of different levels such as system total, cycle total, customer class, meter size, etc. This ability allows analysis of water use that was not possible prior to the computerized billing system.

Like public education the impacts of presenting billing information on water use is difficult. In those situations where unusual usage is noted the use of billing information is helpful in quickly identifying and providing notice to customers of the leak in their portion of the system. Ultimately this reduces overall water use.

III. Leak Repair Incentive:

Historically the Company did not provide incentives for customer repair of leaks other than lower billings due to the return to normal water usage. Unfortunately, often the cost of leak repair exceeded the increase in water bills. This was partially addressed in 1994 when the Company adopted the increasing block rate structure. To further encourage a customer to repair identified leaks the Company adopted a leak repair policy.

Beginning in May 1997 when a customer leak was identified and repaired by the customer in a timely manner, the customer could receive a leak adjustment equal to one half of the increase in water use that was measured as a result of the leak. Thus the Company was willing to absorb one half of the excess water use in exchange for the prompt leak repair of the customer’s water system. This policy has resulted in the active repair of leaks within the customers’ plumbing systems. It is difficult to determine the total effect of this program due in part to the fact that most leaks will eventually be repaired when the water bills increase to the level where repair is mandatory from the customer’s economic perspective. The Company believes that this policy does provide a positive incentive for leak repair especially when coupled with the incentive created by the increasing block rate structure.

IV. Water Rates:

Increasing Block Rates:

Beginning on July 1, 1994 the Company began using an increasing block rate structure for all consumption (the first 600 CF was no longer included in the base). Figure 1 on the next page presents the evolution of this rate structure over the years including increases in individual block rates, additional blocks, and other fees.

When the increasing block rates were initially started the Company experienced some very strong objections and protests, including inquiries from federal congressional representatives. These protests were based both on the utilization of increasing block rates and the actual size of the resulting rate increase. Analysis of the existing rate structure clearly identified that fees charged for new growth was subsidizing existing customers. Correction of this situation required the rate increase. Implementation of the increasing block rate was designed with two goals in mind. First to encourage conservation; and second, to minimize the impact on lower water users while insuring that larger water users contributed at a higher rate to maintain and operate the additional source and storage required to meet their higher water demands.

The impact of the increasing block rates appears to be a major contributor to overall reduction in metered water use. The most specifically identifiable drop in consumption occurred

between 1994 and 1995, the first year the new rate structure was in place. For that year, metered ADD water use dropped from 312 to 279 GPD – over a ten percent reduction. Since that time the decline in metered ADD has generally continued but at a much slower rate, and is influenced by both annual weather patterns and regional/statewide drought alerts.

V. Meter Change-Outs and Testing:

Water meters began to be used by the Company in the late 1960's without consideration of the need for periodic replacement or testing of the meters. While the water provided by the Company has minimal "grit", water meters over time wear and generally accepted practices include replacement every ten to twenty years. Beginning in 1991 an active meter replacement program was implemented. Since 1994 over 5,000 meters have been replaced. Currently all active residential and meters up to 1 1/2" are no more than sixteen years old (installed in 1991). The intent of this program is to insure that low flows are registered by these water meters.

Similarly, the Company is reviewing 2" to 8" meter installations. In those situations where low flow usage may be common, i.e. schools, consideration is being given to replacement of turbine meters with compound meters to improve low flow registration. This process will include a meter testing program for all larger meters as part of the determining factor in replacement or repair. Currently the Company has the following larger meters:

Size:	Number of installations:
2"	47
3"	5
4"	6
6"	2
8"	1

Finally, since 2004, all new installations and replacement meters are radio read meters. These meters not only allow much quicker meter reading but also provide leak indication when the meter registers continuous use for a 24 hour period. Ultimately the Company's goal is to provide for automated meter reading from fixed locations for multiple purposes including normal billing purposes, peak hour consumption patterns and volumes, and routine monitoring for meter recorded leaks. Though the technology is not currently available or financially feasible to accomplish these tasks, they will be implemented when available.

VI. Regional Conservation Organizations:

The Company has been a participating member in the Water Conservation Coalition of Puget Sound – Partnership for Water Conservation through its membership in the Pierce County Regional Water Association. The Coalition and its successor Partnership actively work to provide public education and conservation programs and services on a regional scale.

The Pierce County Health Department has established an annual "Water Festival" for school age children with emphasis on water quality, aquatic habitat, and water conservation. The Company has and will continue to participate in this program by providing volunteer services of Company employees, displays, and equipment for demonstration purposes. This program has been very successful and is enjoyed by our employee participants.

Possible Future Additional Conservation Measures to be Considered:

VII. Water Audits for Larger Water Users:

VIII. Rain Sensors for Lawn Irrigation Systems:

Leak Detection Program and Impact on Water Production

Leak Detection Program: While water system leak detection programs are not considered part of water demand management under draft Department of Health implementation planning for the Municipal Water Law, these programs can have major impact on the water required to maintain service through a water system. Details of Spanaway Water Company's leak detection and repair efforts are provided below.

The effect on water use through the combination of conservation and leak detection efforts is presented below.

1994/5 Leak Detection Survey:

The Company completed its first leak detection effort in late 1994. This survey was completed on the entire system with monitoring for leaks completed at all valves/valve clusters and fire hydrants. Identified leaks ranged in size from less than one GPM to over 100 GPM, none of which were apparent on the ground surface. Total cost for the survey and repairs was approximately \$50,000 resulting in a 20% reduction in system wide ADD (in conjunction with reduction due to the increasing block rates) of 529,000 GPD or 367 GPM. This is the equivalent to a small to medium sized well. The Board of Directors and Company staff were very pleased with this effort and found it to be very cost effective.

In the spring of 1995, the area was struck by a 5+ earthquake. Though no immediate impacts were seen at the time this certainly led to additional leaks that required an extended period to develop to noticeable levels.

1999/2000 Leak Detection Study:

In response to increasing un-metered water demand, the Company completed a second more detailed leak study in the winter/spring of 1999/2000. The work again included monitoring all valves/valve clusters and fire hydrants, but now also included all water service meter setters. This second study resulted in a 1999 to 2001 system wide pumped ADD reduction of 702,600 GPD or 487 GPM. Of this amount, approximately 400 GPM was the result of the leak detection program, the balance being reduced water usage by customers as noted below. Though the cost of this work rose to \$80,000 the Company again found the effort to be very cost effective.

The results of the 1999/2000 leak detection and repair program was magnified in 2001 by the Governor's drought declaration and intense public education efforts by the Company and large utilities. This public education impact is shown by the reduction in metered ADD from 253 GPD/Unit in 1999 to 236 GPD/Unit in 2001. The resulting system wide metered ADD reduction of 123,488 GPD or 85.76 GPM contributed significantly to the 1999 – 2001 water use decrease.

Unfortunately, in the spring of 2001 the area experienced the 6.8 Nisqually earthquake. As with the 1995 earthquake, we noted no immediate impacts, however, unaccounted for water continued to be monitored.

2004/5 Leak Detection Study:

By 2004 un-metered water use had again begun to increase to a degree justifying a third leak detection study. This study and related repairs were completed in early 2005 with a resulting 2004 to 2005 decrease in system wide pumped ADD of 348,058 GPD or 242 GPM. In 2005, like 2001, a drought had again been declared by the Governor. Metered water use as a result of the declared drought and ultimately cool damp summer dropped to 234 GPD/Unit the

lowest ever recorded by the Company and contributed substantially to the reduction in total water pumped.

2007 and Future Leak Detection Efforts:

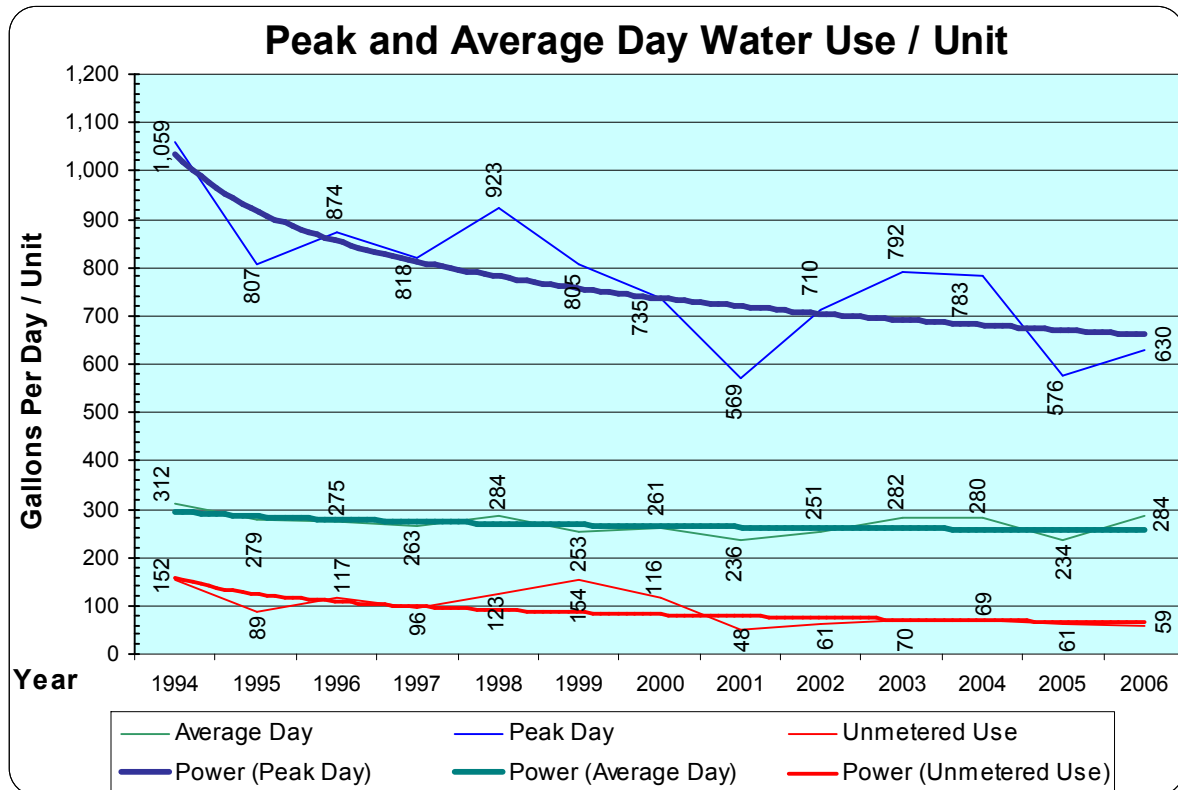
The Company's leak detection program history detailed above indicates that continued leak detection efforts are beneficial as a cost effective method for achieving water savings. The Company, in conjunction with several Water Cooperative of Pierce County (Co-op) members, has entered into agreements with Utility Services Association, for ongoing annual leak detection services. The intent of these efforts is on-going leak detection with entire system examination each four year period. Beginning in 2007 the Company began an annual leak detection survey process with the completion of a leak detection survey of twenty-five percent of the water system. This process will be aided in the future through the use of technological advances in leak detection equipment.

In April 2007 several members of the Co-op purchased 75 leak detection units with radio transmitters that may be temporarily installed on valves and services within the water system. Under this effort each utility will have use of all these shared units for a period each year proportional to the number of units purchased. It is anticipated that annually a minimum of 25 percent of a system can be monitored for leaks using these devices. Several of the utilities, including Spanaway Water, are also purchasing non-shared units. The intent of these "private" units is to allow each company to monitor suspected leaks independently at any time of year. In both these cases, when potential leaks are noted, Utility Services Association will further investigate and correlate leaks for repair. Using this process we anticipate that we can maintain an on-going cost effective leak detection program.

Historical Impact of Conservation and Leak Detection Programs

Leak detection and the increasing block rates have historically proven to be the most effective means to reduce water demand. The Company will continue its leak detection program and monitor its influence on total water demand.

The impacts of many conservation measures are generally difficult to quantify due to conditions that effect water use, the greatest being variability in annual weather patterns. However, trends are identifiable with distinct reductions notable for some conservation measures. Please refer to the following charts for reference.



In 1994/5 two major conservation efforts combined for a substantial reduction in all types of water use. These conservation efforts included: 1) the Company's first leak detection survey; and 2) the implementation of increasing block rates. The impact of the leak detection study resulted in a reduction of 63 GPD/unit (41%) in un-metered water use. The impact of the rate increase and the public education related to the individual customer's water bill is seen in the metered ADD reduction of 33 GPD/unit (10.6%). The net effect of both these efforts was a 252 GPD/unit (23.8%) reduction in peak day use.

The response seen in the 1999/2000 - 2001 period was similar to that seen in 1994/5. In these years the major factors in the reductions were: 1) the Company's leak detection study, and 2) the 2001 drought declaration and multiple public education efforts. Again the leak detection efforts over the two year period resulted in a reduction of 106 GPD/unit (68.8%) in un-metered water use. The Governor's drought declaration and public education resulted in a 15 GPD/unit

(6%) reduction in metered water use. Like 1995, the combine effect of these efforts reduced peak day demand by 206 GPD/unit (25.6%).

The most recent leak detection effort in 2004/5 continued to reduce un-metered water use by 8 GPD/unit (11.6%). This lower level of reduction reflects the continued tightening of the water system. As in 2001, the Governor declared a drought in 2005. Unlike 2001, the weather proved to be relatively moist through the 2005 summer, this combined with the drought declaration led to a reduction in metered ADD of 56 GPD/unit (19.3%) with a peak day reduction of 214 GPD/unit (27.1%).

Overall the trends consumption trends have continued to decline since 1994. Variations are seen year to year dependent on weather conditions including temperature and rainfall. During this twelve year period peak day demand has been reduced 320 GPD/unit (34.2%) 935 to 615 GPD/unit, ADD demand reduced 22 GPD/unit (7.9%) 280 to 258 GPD/unit, and un-metered water by 77 GPD/unit (58.3%) 132 to 55 GPD/unit.

Water Conservation Goals

The overall goal of the Company's conservation program is to continue the reductions in water use on a per unit basis in the following areas: metered water use, un-metered water use, and total pumped water use. The specific goal of the company for this planning period is to maintain an ongoing reduction in the pumped average day demand such that the slope of the trend line maintains a decrease of at least 0.5% per unit per year. This should reflect general reductions of usage at a rate of 0.25% per year in both the metered ADD/Unit and un-metered water ADD/Unit per year over the next six years. The usage of the pumped average day demand trend line is to damper the impacts of any given year being particularly warm and dry or cool and wet. The trend line as used in this conservation planning period is presented graphically on the following page with maximum target values on the following spreadsheet.

No specific goals are set related to reducing peak day demand. This decision was made due to the volatility of peak day demand as a result of rainfall and temperature conditions. However, efforts directed at larger summer water users should assist in the Company's efforts to reduce both peak day and average day demand.