

2004

BC Water Conservation Survey

PREPARED FOR: B.C. Ministry of Water, Land and Air
Protection
BCWWA Water Sustainability Committee

PREPARED BY: Alliance Professional Services
CV Marketing Research Inc.

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Knowing Is Better



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1.0 EXECUTIVE SUMMARY

The Executive Summary is a brief account of the research findings, which are outlined in greater depth in the Detailed Results section of this report.

1.1 Survey Objectives

CV Marketing Research, in conjunction with Alliance Professional Services, conducted an online survey of water utilities in British Columbia to determine water conservation policies, practices, and projects. Of the 190 utility managers who were asked to take part, 72 actually participated. The information generated will help promote the development of appropriate programs and services, contribute to the creation of best management practices, and enable water managers to learn from the successes of other utilities.

1.2 Expected Growth and Water Management Challenges

Overall, the majority of water utilities surveyed are anticipating that population growth in their regions will necessitate system expansion. While nearly 2 in 3 (65%) are confident that their existing *water license* will allow for the projected population growth in their area, well over half (56%) project that their existing *infrastructure* will not. As such, more than 3 in 4 utilities (77%) are currently planning to undertake system expansion. The majority of these utilities (88%) are committing funds for this expansion, with only a few *not* relying heavily on government funding to pay for their expansions.

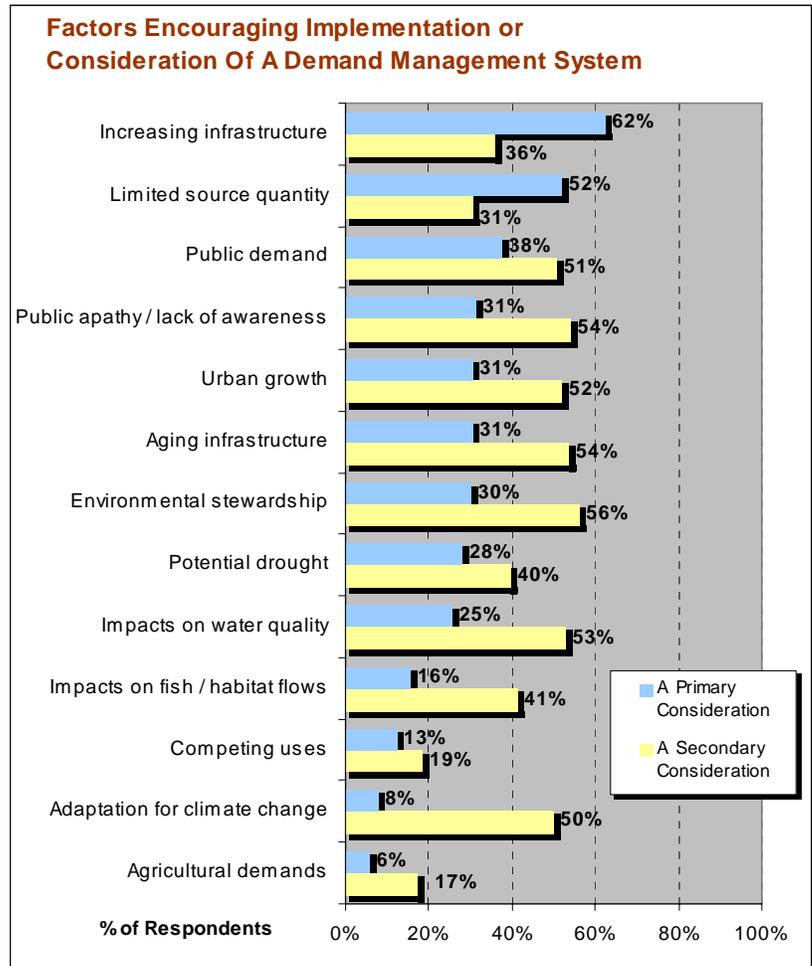
While just 1 in 3 (34%) utilities have currently embarked on a demand management program to reduce water consumption, over half of those that have not are considering doing so in the future (54%). Expectations of the costs for such a program vary between 1 and 5 percent of their operating budget, with few expecting to exceed this level.

Increasing infrastructure appears to be the leading cause for embarking upon or considering implementing a demand management system. *Limited source quantity* is a strong secondary factor. A multitude of other factors are also driving utilities to pursue demand management systems, including *public demand*, *urban growth*, and *environmental stewardship*. Less critical to the decision to pursue this system are *agricultural demands* and *adaptation for climate change* (see Figure 1 on following page).

The greatest barrier for utilities to achieving their water conservation objectives appears to be the cost of doing so, with over half of those surveyed considering this to be a major challenge. *Competing priorities* are a secondary challenge that they encounter somewhat less often. Less significant challenges or barriers include *lack of education and communication*, and *lack of planning*.

Fewer than 1 in 3 utilities are using *performance measures* to gauge whether they are achieving their conservation objectives. However, nearly half of those who are not currently using these measures (48%) are planning on using them in the future.

Figure 1



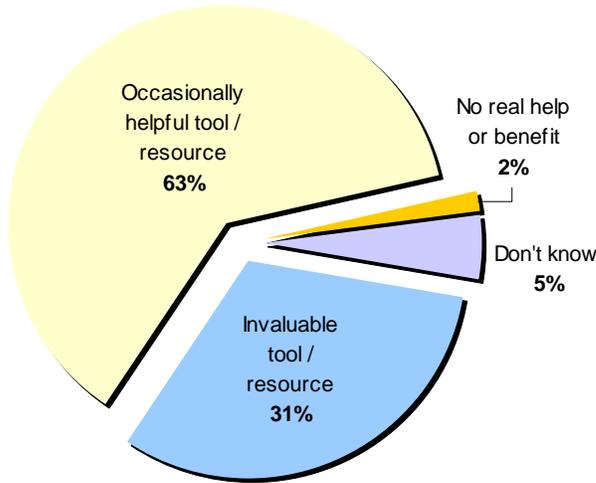
When it comes to *best management practices* (BMPs), a significant number of utilities are considering implementing them, but few are using them. The most used BMP – *establishing a metering plan to account for water use and losses* – has been adopted by just under 1 in 3 utilities (31%), although it is being considered by another 44%. Other BMPs being commonly used or considered include *developing a water distribution system renewal plan* (30% are using one, 41% are considering using one), *water conservation* (27% / 49%), and *cross-connection control* (27% / 39%).

When seeking technical information, utility managers are most frequently turning to *professional consultants* (54%), while *water related associations* (52%), and *seminars and conferences* (46%) are other popular sources.

1.3 BCWWA Water Sustainability Committee Website

Figure 2

Perceived Value of BCWWA Committee Website

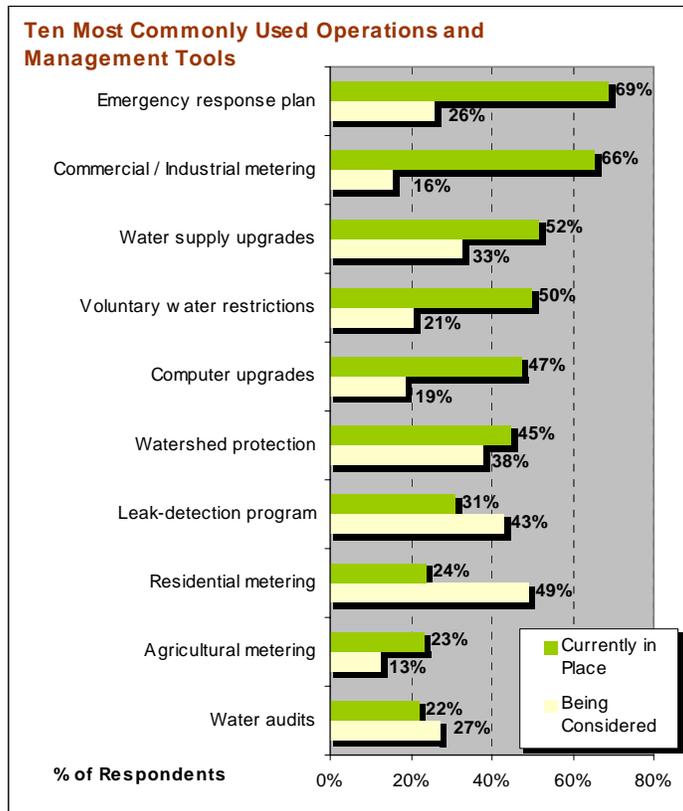


Nearly all utility managers surveyed indicated that a website developed by the BCWWA Water Sustainability Committee to provide stakeholders with up-to-date information about programs, water management initiatives, best management practices, and utility-specific success stories would be a helpful resource (see Figure 2). Nearly 1 in 3 (31%) stated that such a website would be an *invaluable* tool or resource, while the majority of all others (63%) felt that it would at the very least be an *occasionally helpful* tool or resource.

1.4 Operations and Management Tools

Of the operations and management tools most commonly used by utilities, *emergency response plans* are the most widespread, with more than 2 in 3 utilities using these (see Figure 3). *Commercial metering*, *water supply upgrades*, and *voluntary water restrictions* are also commonly used by at least half of those surveyed. Tools that are used less frequently but are strongly being considered include *residential metering* (49%), *leak detection programs* (43%), and *watershed protection* (38%).

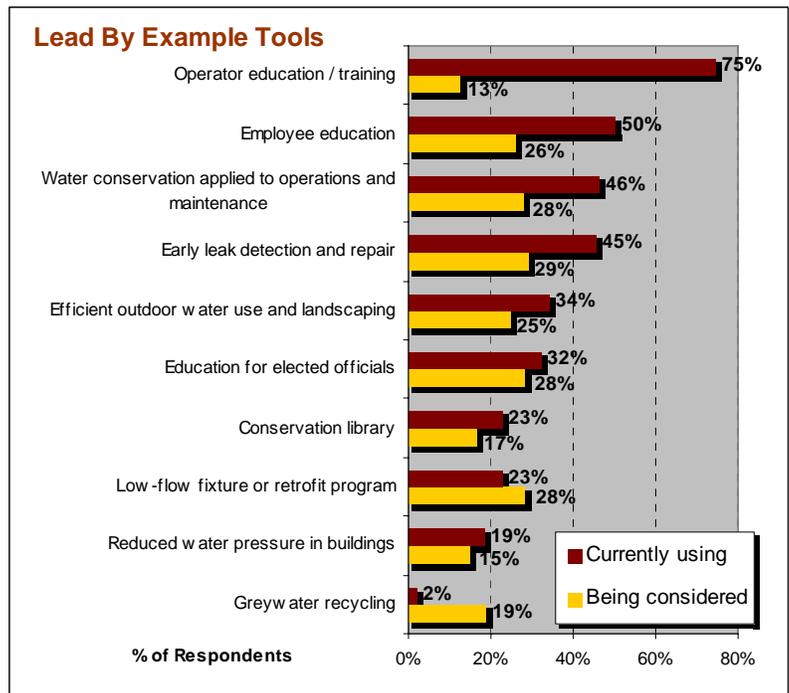
Figure 3



1.5 Lead-By-Example Tools

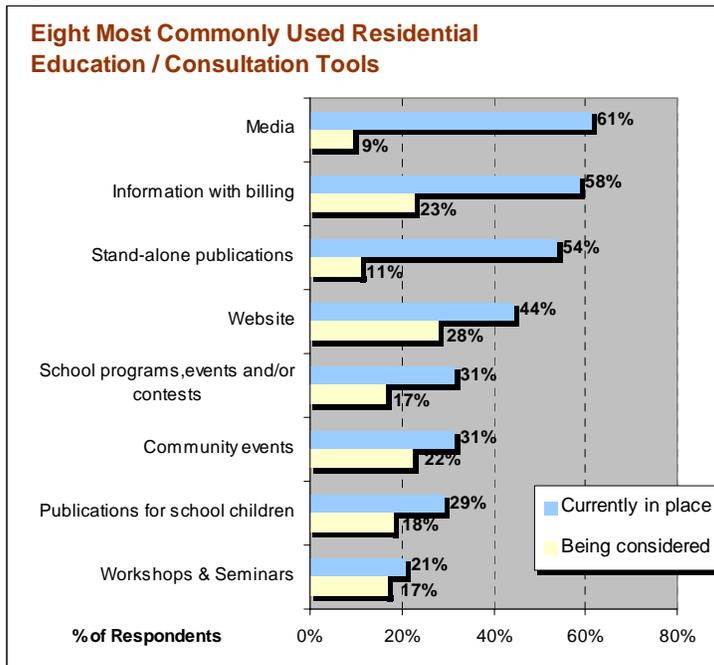
When it comes to leading by example, there are numerous tools that are currently in place within many BC utilities (see Figure 4). Three of 4 managers surveyed have *operator education and training programs* in place, while 1 in 2 have other *employee education programs* in place. Other commonly used tools include *water conservation applied to operations and maintenance* (46%) and *early leak detection and repair* (45%). While other tools and programs are less commonly used, a large number of utilities are at least considering adopting a number of these.

Figure 4



1.6 Residential Education and Consultation Tools

Figure 5

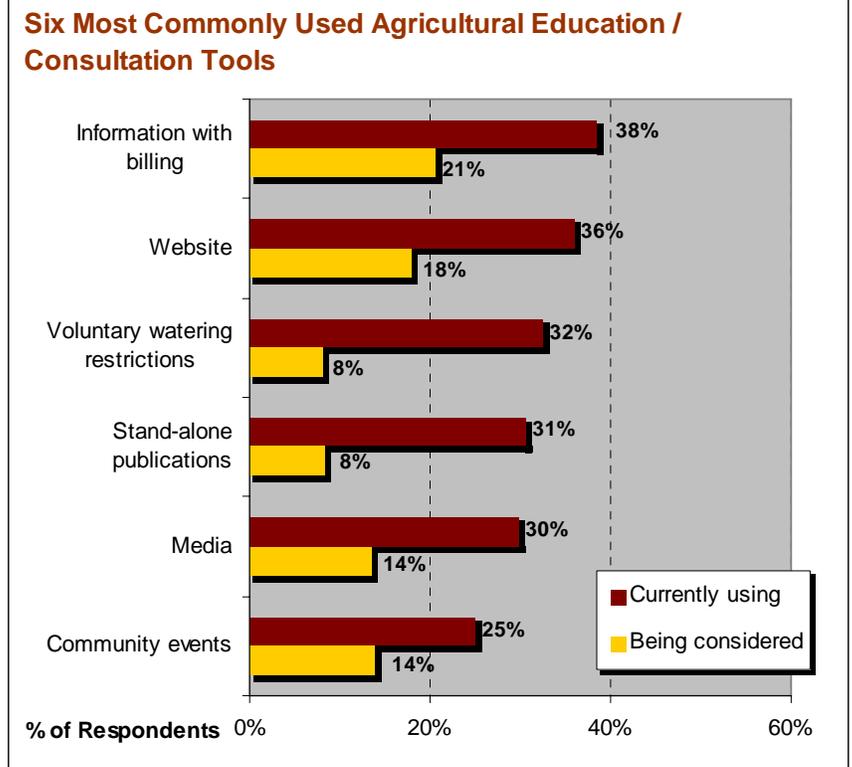


Numerous tools are used to educate and consult with residential users, but conventional *media* (61%), *billing enclosures* (58%), and *stand-alone publications* (54%) are the most frequently used (see Figure 5). *Websites* are used by just under half of the utilities surveyed while more focussed programs, such as *school* and *community events* are used by just under 1 in 3 utilities.

1.7 Agricultural Education and Consultation Tools

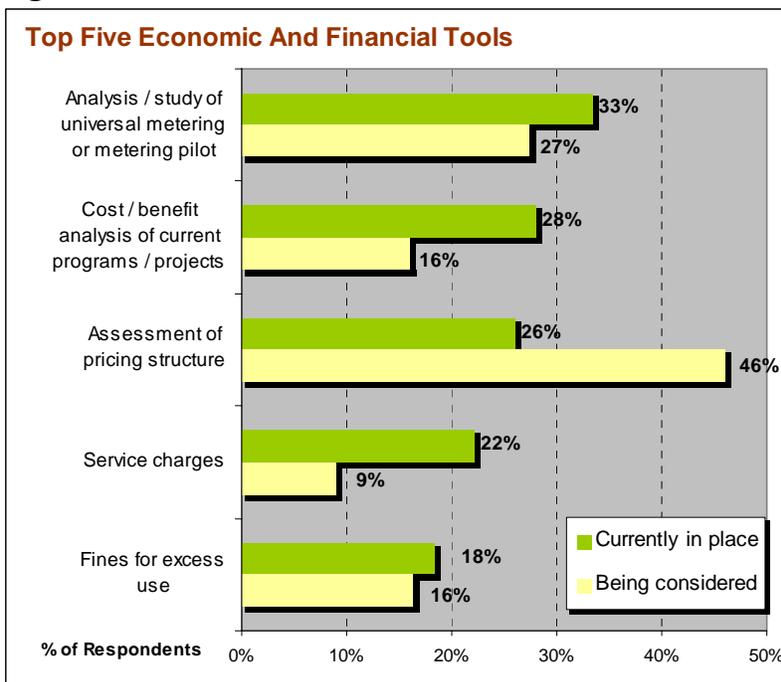
In contrast to education and consultation tools for residential water users, utility managers appear to employ far fewer methods for agricultural and ICI users (see Figure 6). Specifically, efforts are far more focussed, as evidenced by the common use of *billing enclosures* and *website* information. Unlike for residential users, standard *media* and *stand-alone publications* are used far less often to reach agricultural and ICI users. It also appears that fewer utilities are planning on adopting new education and consultation tools for these users, with most tools being considered by less than 20% of utilities.

Figure 6



1.8 Economic and Financial Tools

Figure 7



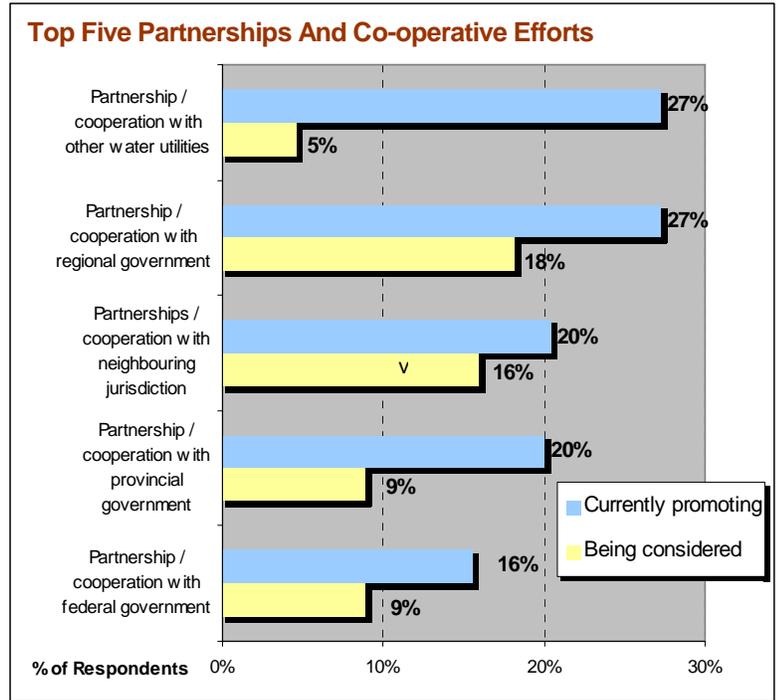
Overall, few utilities are utilising any formal economic or financial tools to promote water conservation (see Figure 7). The most widely used tool – *analysis and study of universal metering or metering pilot* – is employed by just 1 in 3 utilities surveyed, and is being considered by just over 1 in 4. Other tools employed include *cost / benefit analysis*, *assessment of pricing structures*, and *service*

charges. While assessing pricing structures is not currently widespread, nearly half of utilities surveyed (46%) do appear to be considering implementing this in the future.

1.9 Partnerships and Co-operative Efforts

Compared with use of other tools and management practices, the area of partnerships and co-operative efforts to promote conservation is relatively neglected (see Figure 8). In terms of current partnerships, the most common are with *other water utilities* and *regional governments* at 27% of utilities surveyed. Partnerships with *neighbouring jurisdictions* are nearly as common (1 in 5 utilities), as are partnerships with the *provincial government*. Interestingly, it appears that if utility managers have not already established partnerships, they are unlikely to do so in the future. In terms of *planned* co-operative efforts, 18% of utilities do intend to pursue partnership with regional governments, while 16% intend to pursue partnerships with neighbouring jurisdictions.

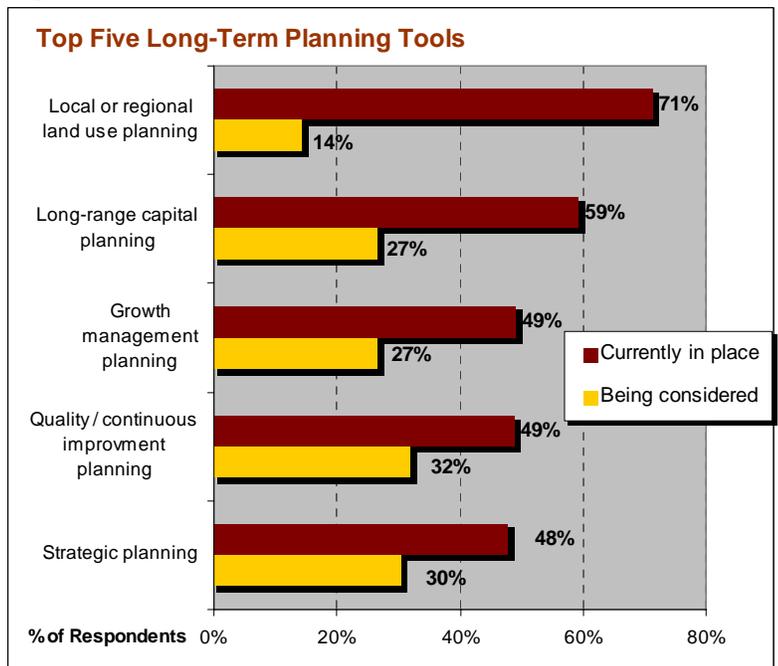
Figure 8



1.10 Long-Term Planning Tools

Most utilities appear to be quite forward thinking, as evidenced by the large number that employ multiple long-term planning tools (see Figure 9). Overall, this focus on long-term planning coincides with the large number of utilities' focus on implementing performance measures in the near future (see Section 1.1). About 7 in 10 utilities have *local or regional land use planning* in

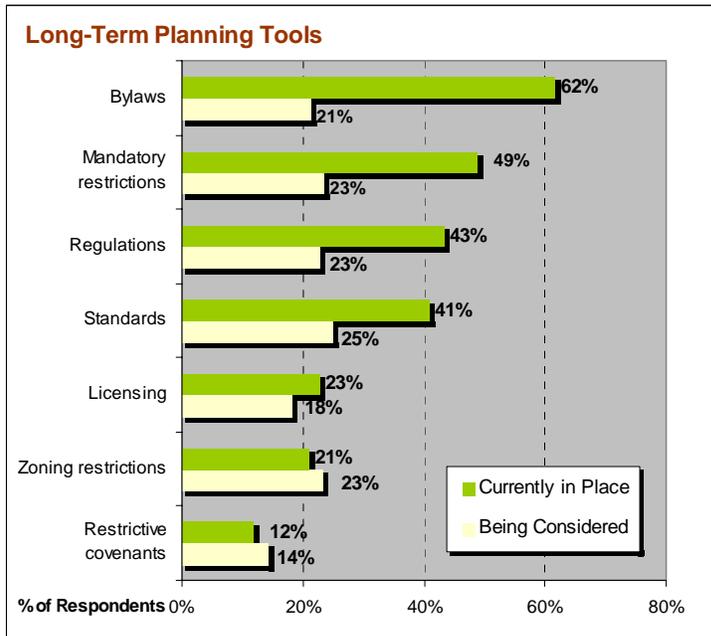
Figure 9



place and about 3 in 5 have *long-range capital planning* in place. In addition, nearly half of utilities have *growth management planning, quality and continuous improvement planning, and strategic planning* in place to promote water conservation.

1.11 Legal Tools

Figure 10



Legal tools are another area that most utilities are using to promote water conservation (see Figure 10). Not surprisingly, *by-laws* are the most common tool used, with nearly 2 in 3 of those surveyed reporting their use. *Mandatory restrictions* are also commonly used, as nearly half of utilities employ these. Other popular legal tools include *regulations* and *standards*. Less commonly used tools include *licensing* (23%), *zoning restrictions* (21%) and *restrictive covenants* (12%), although nearly 1 in 4 utilities surveyed are considering the use of *zoning restrictions* (23%).

2.0 METHODOLOGY

2.1 Collection

The 72-sample survey was collected via an online questionnaire emailed to nearly 200 water utility managers across British Columbia. The survey questionnaire, which was developed in collaboration with Alliance Professional Services, was initially emailed to managers in late March as part of a cover letter that requested their participation and subsequently outlined the survey requirements. The questionnaire contained 65 open and closed-ended questions to be completed by each utility manager. To help facilitate the considerable length of the survey, respondents were assigned a unique login code, which allowed them to save their progress and continue the survey at multiple intervals. Survey progress was monitored over the ensuing month and a half, and frequent follow-up calls were performed to assist and encourage further participation and detail. Collection of the survey was finally closed in mid-May and the results processed and detailed in the body of this report.

2.2 Margin Of Error

The margin of error for a 72-sample survey of a 190-element population is at most $\pm 9.1\%$. In other words, if all 190 water utility managers in British Columbia had participated in the survey, the results of *that* survey would be within no more than 9.1 percentage points of the results of *this* one, 19 times out of 20.

3.0 DETAILED RESULTS

3.1 GENERAL UTILITY INFORMATION

Q1. How many connections do you service?

Number of Connections Served	Percent	Respondents
Fewer than 300	12.9%	9
Between 300 and 1,000	27.1%	19
Between 1,000 and 5,000	35.7%	25
Between 5,000 and 10,000	5.7%	4
More than 10,000	18.6%	13
Valid Sample	100.0%	70

*IF MORE THAN 10,000:
How many?*

- over 13,000
- 13,500
- 14,000
- 16,000
- 17,000 total
- 19,500
- 20,960
- 24,000
- 28,666 (2002)
- 30,000
- 38,000
- 100,000

Q2. What percentages of these connections are:

A. Domestic? B. Agricultural? C. ICI?

Mean Percentage of Connections By Type	83.17%	4.91%	11.92%
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Connections By Type	Domestic	Agricultural	ICI
None (0%)	1.7%	65.0%	8.3%
1-25%	0.0%	30.1%	80.0%
26-50%	3.3%	3.3%	11.7%
51-75%	15.0%	0.0%	0.0%
76-99%	75.0%	0.0%	0.0%
All (100%)	5.0%	1.7%	0.0%
Valid Sample	60	60	60

Q3. What is the source of your water supply?

Source of Water Supply	Percent	Respondents
Surface water	40.6%	28
Groundwater	31.9%	22
Combination of surface water and groundwater	27.5%	19
Valid Sample	100.0%	69

IF GROUNDWATER PART OF SOURCE: Q4. What is the estimated volume of groundwater pumped annually?

M3 / Year ↓	1,900,000	82,125,000
3,700	2,150,000	212,000,000
5,000	2,182,461	990,000,000
17,600	2,335,000	lgal / Year ↓
25,375	2,770,000	2,000,000
48,679	2,800,000	11,124,240
150,000	3,300,000	115,000,000
320,000	4,875,460	130,000,000
330,000	6,300,000	160,000,000
550,000	10,680,000	365,000,000
1,041,000	Usgal / Year ↓	410,000,000
1,600,000	60,000,000	

Note: Each figure in the table above represents the unique amount specified by each water utility.

Q5. What is the projected annual rate of population growth in the area serviced by your utility?

Projected Rate of Population Growth	Percent	Respondents
0% to 2%	71.4%	50
>2% to 4%	27.1%	19
>4%	1.4	1
Valid Sample	100.0%	70

Q6. Do you think your existing water license allows for this rate of growth to the year 2020?

Water License Will Allow For Projected Growth	Percent	Respondents
Yes	64.6%	42
No	23.1%	15
Do not know	12.3%	8
Valid Sample	100.0%	65

Q7. Do you think your existing infrastructure will support this rate of growth until 2020?

Existing Infrastructure Will Allow For Projected Growth	Percent	Respondents
Yes	36.8%	25
No	55.9%	38
Do not know	7.4%	5
Valid Sample	100.0%	68

Q8a. Are you currently planning system expansion?

Planning System Expansion	Percent	Respondents
Yes	76.8%	53
No	23.2%	16
Valid Sample	100.0%	69



IF PLANNING SYSTEM EXPANSION: Q8b. Are you committing funds for system expansion?

Committing Funds For System Expansion	Percent	Respondents
Yes	88.2%	45
No	11.8%	6
Valid Sample	100.0%	51

IF NOT COMMITTING FUNDS: Q9. How do you plan to fund system expansion?

Plans To Fund System Expansion	Percent	Mentions
Government funding	83.3%	5
Development cost charges	50.0%	3
Increased customer rates	50.0%	3
Other (See below)	33.3%	2
Public / private partnership	0.0%	0

Based on 6 respondents who were qualified to answer this question.

'OTHER' TYPE OF FUNDING:

- A grant from the GWAIL, which is a trust grant from the provincial government.
- RD funding through an infrastructure grant.

Q10. Do you work with an advisory committee that guides you on water conservation issues?

Work With Advisory Committee	Percent	Respondents
Yes	26.1%	18
No	73.9%	51
Valid Sample	100.0%	69

Q11. Do you work with stewardship groups to promote water conservation?

Work With Stewardship Groups	Percent	Respondents
Yes	26.1%	18
No	73.9%	51
Valid Sample	100.0%	69

Q12. Have you embarked on a demand management program to reduce water consumption?

Have Embarked On DMP	Percent	Respondents
Yes	34.3%	24
No	65.7%	46
Valid Sample	100.0%	70



IF HAVE NOT EMBARKED ON DMP: Q13. Are you considering implementing a demand management program?

Considering Implementing DMP	Percent	Respondents
Yes	54.3%	25
No	45.7%	21
Valid Sample	100.0%	46



IF YOU HAVE IMPLEMENTED OR ARE CONSIDERING IMPLEMENTING DMP: Q14. What percentage of your operating budget will be applied to such a program?

Percentage of Operating Budget Applied to DMP	Percentage	Respondents
Zero percent	10.5%	2
One percent	21.1%	4
Two percent	15.8%	3
Three percent	5.3%	1
Four percent	10.5%	2
Five percent	26.3%	5
More than five percent	10.5%	2
Valid Sample	100.0%	19

'OTHER' AMOUNTS:

- Twenty percent
- Seventy-one percent

Q15. How important are each of the following reasons for embarking on or considering a demand management system:

Reasons For Implementing DMP	Importance of Reason			Valid Sample
	A Primary Consideration	A Secondary Consideration	Not A Consideration	
Increasing infrastructure	62.3%	35.8%	1.9%	53
Limited source quantity	51.9%	30.8%	17.3%	52
Public demand	37.7%	50.9%	11.3%	53
Public apathy / lack of awareness	31.3%	54.2%	14.6%	48
Aging infrastructure	30.8%	53.8%	15.4%	52
Urban growth	30.8%	51.9%	17.3%	52
Environmental stewardship	30.0%	56.0%	14.0%	50
Potential drought	28.3%	39.6%	32.1%	53
Impacts on water quality	25.5%	52.9%	21.6%	51
Impacts on fish / habitat flows	15.7%	41.2%	43.1%	51
Competing uses	12.5%	18.8%	68.8%	48
Adaptation for climate change	8.0%	50.0%	42.0%	50
Agricultural demands	5.8%	17.3%	76.9%	52

'OTHER' REASONS CONSIDERED FOR EMBARKING ON DMP:

- A requirement of the government grant we received for our water plant upgrade.
- Demand management was required by the provincial government to process a new water license application.
- Loss of fire protection.
- Reduced energy and treatment costs.
- Reduction in water wastes and shift of peak use.

Q16. How significant are each of these potential challenges or barriers to achieving your water conservation objectives:

Potential Challenges / Barriers	Significance of Challenge / Barrier			Valid Sample
	A Major Challenge/ Barrier	A Moderate Challenge/ Barrier	Not A Challenge/ Barrier	
Cost	51.6%	35.9%	12.5%	64
Competing priorities	33.9%	35.5%	30.6%	62
Lack of education and / or communication	15.9%	55.6%	28.6%	63
Lack of planning	13.1%	50.8%	36.1%	61
Legislative inadequacies	12.3%	36.8%	50.9%	57
Jurisdictional complexities	12.3%	36.8%	50.9%	57
Lack of data	10.9%	37.5%	51.6%	64
Lack of coordination / cooperation among stakeholders	9.7%	46.8%	43.5%	62

'OTHER' CHALLENGES OR BARRIERS OF SIGNIFICANCE:

- Land claim issues.
- Political will to charge.
- SEKID's demand program focused on agricultural water use because it is about eighty-five percent.
- Willingness of reducing water waste.

Q17. “Performance Measures” compare the observed results of water conservation tools to intended results. Is your utility using performance measures to determine if you have achieved your water conservation objectives?

Using Performance Measures	Percent	Respondents
Yes	29.2%	19
No	70.8%	46
Valid Sample	100.0%	65

IF USING PERFORMANCE MEASURES: Q18. What data are you collecting to measure performance?

- A daily water demand, which is system wide, weather conditions and power consumption records.
- Average daily consumption peak and daily consumption.
- Continuous flow monitor.
- Daily demand trial metering program.
- Flow monitoring data.
- Individual water use by property, annual water use by district, and water supply and storage inventory.
- Limited data because all customers are not metered. We are using treatment plant production numbers.
- Meter reading data.
- Overall liters per capita per day, demand by ICI sectors peak day use by member municipalities.
- Residential consumption per capita and summer consumption peak.
- The amount of water going out compared to that coming in.
- The annual power consumption.
- Water consumption rates each day.
- Water meters.

IF NOT CURRENTLY USING PERFORMANCE MEASURES: Q19. Are you considering using performance measures in the future?

Considering Using PM's In Future	Percent	Respondents
Yes	47.8%	22
No	21.7%	10
Do not know	30.4%	14
Valid Sample	100.0%	46

Q20A. “Best Management Practices” are industry-accepted procedures used by organisations to maximise the efficiency and cost-effectiveness of specific initiatives. Please indicate which areas, if any, your utility is using best management practices in:

Best Management Practices	Currently Using	Considering Using	Neither	Valid Sample
Water accountability / establishing a metering plan to account for water use and losses	30.5%	44.1%	25.4%	59
Developing a water distribution system renewal plan	30.4%	41.1%	28.6%	56
Water conservation	27.1%	49.2%	23.7%	59
Cross connection control	27.1%	39.0%	33.9%	59
Reducing losses in transmission and distribution systems	25.9%	44.8%	29.3%	58
Uni-directional flushing	25.0%	26.7%	48.3%	60
Water utility planning	24.6%	33.3%	42.1%	57
Water pricing and rates setting	23.7%	40.7%	35.6%	59
Deterioration and inspection of water distribution systems	21.7%	43.3%	35.0%	60

Q20B. Now, for each of the above BMPs that your utility is currently using or considering, please describe its origin:

Water conservation:

- BCWWA **2 mentions**
- Ad hoc
- AWWA
- AWWA and EPCORE developed programs.
- Developed internally.
- Metering
- Water conservation study by Dayton & Knight Ltd.

Cross connection control:

- AWWA **3 mentions**
- BCWWA **2 mentions**
- AWWA and BCWWA.
- BCWWA cross connection control course.
- Internally. Public Works Inspection prior to connecting to a Municipal Utility.
- Staff trained in CCC Survey program management.
- Ted Van der Gulik

Uni-directional flushing:

- AWWA **3 mentions**
- AWWA BCWWA **2 mentions**
- BCWWA
- BCWWA distribution courses and SAC manuals.
- Consultants
- Consulting Engineer
- EPCORE developed and marketed product.
- Internally. Public Works flushes from source to the outlying distribution areas.

Deterioration and inspection of water distribution systems:

- AWWA
- AWWA and BCWWA.
- BCWWA
- Engineering firm.
- EPCORE developed product.
- Replacing all old cast iron distribution lines with PVC.
- Reviewed with Consulting Engineer.
- This is not done. We currently keep track of the ages of pipe and the material.

Q20B. *continued*

Reducing losses in transmission and distribution systems:

- As above, we are replacing all old cast iron distribution lines with PVC.
- AWWA
- AWWA and BCWWA.
- AWWA and Epcor expertise.
- BCWWA
- Engineering firm.
- IWA

Water accountability / establishing a metering plan to account for water use and losses:

- Ad hoc
- AWWA and BCWWA.
- BCWWA
- District of Port Hardy and an EPCOR plan.
- Have started industrial and commercial metering program. We are about seventy-five percent complete.
- Only commercial on meters. No funds to put residential on meters.
- Self

Water pricing and rates setting:

- Agriculture only and this was developed internally.
- As above, we have started industrial and commercial metering program. We are about seventy-five percent complete.
- AWWA
- AWWA and BCWWA
- AWWA and Port Hardy.
- In-house
- Staff currently amending water bylaw and fees. Consistently being monitored and compared to operating costs and neighboring municipalities.

Q20B. *continued*

Water utility planning:

- AWWA
- AWWA and BCWWA.
- BCWWA
- Epcor and AWWA.
- In-house
- Subdivision expansion, rural water line expansion.
- This is updated every two to three years.
- We have budgeted in 2004 an update to our 1994 Dayton & Knight Water Supply Study.

Developing a water distribution system renewal plan:

- AWWA
- AWWA and BCWWA.
- Consultant and water model.
- Engineering firm.
- Internal planning.
- Line replacement in progress and is ongoing for over twenty years.
- As above, we have budgeted in 2004 an update to our 1994 Dayton & Knight Water Supply Study.

Other BMP'S currently being used or considered:

- Hydrometric assessment of watershed.
- Water audits of municipal facilities. Using artificial neural networks to reduce chemical costs and optimize water quality. Benchmarking.

Q21. Where do you get technical information to help you manage your system?

Sources of Technical Information	Percent	Mentions
Consultants	54.0%	34
Water related associations	52.4%	33
Seminars / conferences	46.0%	29
Reference materials	39.7%	25
Other water utilities	38.1%	24
Other (See below)	11.1%	7

Based on 63 respondents who provided a response to this question.

'OTHER' SOURCES:

- Benchmarking with other utilities and industries.
- Department of Health Officer.
- EPA and Canadian Drinking Water Guidelines.
- Our own internal modeling.
- Parts distributors.
- Provincial and Federal agencies.
- The web.

3.2 BCWWA WATER SUSTAINABILITY COMMITTEE WEBSITE

A website focusing on timely water issues and initiatives is in the early stages of development by the BCWWA Water Sustainability Committee. Intended for all stakeholders in BC, the website would provide up-to-date information about programs, water management initiatives, best management practices, and utility specific success stories. It would also provide opportunities for information sharing and discussion.

Q22. As a potential resource for your department, would you consider such a website to be an invaluable tool or resource, an occasionally helpful tool or resource, or of no real help or benefit?

Perceived Value Of BCWWA Website	Percent	Respondents
An invaluable tool / resource	31.3%	20
An occasionally helpful tool / resource	62.5%	40
Of no real help or benefit	1.6%	1
Do not know	4.7%	3
Valid Sample	100.0%	64

Q23A. If you support the development of such a website, what components, features, and services would you like to see included?

- Approved water use fixtures outside watering tips.
- BMP, water management initiatives, seminars and courses.
- Calculation of user rates, programs for unaccounted losses, public relations and communications.
- Case histories of various communities with water conservation methods, capital and costs of various municipal plants and distribution systems.
- Consumption and some characteristics.
- Cross connection practices, treatment problem solving, source protection, testing problems and practices and cost saving measures.
- Current technologies and updates.

Q23A. *continued*

- Groundwater issues and water treatment.
- High degree of user friendliness. Make navigation easy.
- Information on small water systems.
- Latest legislation online, such as drinking water and a question and answer section or forum.
- Links to their industry sites, regulations, manufactures, associations, research organizations, information on incoming regulatory changes, other industry news, and an exchange of ideas and information.
- Material specifications and BMPs.
- My preference would be that this function would be better handled by a government ministry, such as WLAP, where there would be less influence by commercial interests.
- Not on Internet or public works.
- Posted BMPs with links to their locations, case studies, program development examples and opportunities to post.
- Product lines, troubleshooting, guides resource and directories.
- Programs, training, conservation methods, new initiatives, best management practices, plus changes in legislation.
- Such a website would be most useful if it sets out to promote and support specific actions of reducing water wastes and optimizing system peak distribution by advocating new technologies, regulations or policies, and information on available resources.
- Training to use a computer.
- Water conservation frequently asked questions in a downloadable format.
- Water restriction policies, enforcements, water meter hints, bylaws, procedures, and etceteras.
- We do not have high-speed Internet and have difficulty accessing some websites.
- While water sustainability is important, our biggest challenge at this time is satisfying all the legal requirements under the drinking water protection act. Perhaps it would be helpful if some attention could be focused on this issue also.

Q23B. If you do not support the websites development or would not use it, what could be added to make it a useful tool or resource for your department?

- AWWA has a website so piggy back with the CWWA and BCWWA sites. Provide a special informational section. Providing another source is duplication and not beneficial to the CWWA and BCWWA sites.
- Information sharing and discussion, and best management practices would be useful.
- Water management initiatives in other communities, cost related information associated initiatives and derived benefits.

3.3 OPERATIONS AND MANAGEMENT TOOLS

Q24. Please indicate which operations and management tools are in place or are being considered by your utility:

Operations / Management Tools	Currently In Place	Being Considered	Neither	Don't Know	Valid Sample
Emergency response plan	69.0%	25.9%	5.2%	0.0%	58
Commercial / Industrial metering	65.5%	15.5%	19.0%	0.0%	58
Water supply upgrades	51.7%	32.8%	15.5%	0.0%	58
Voluntary water restrictions	50.0%	20.7%	25.9%	3.4%	58
Computer upgrades	47.5%	18.6%	33.9%	0.0%	59
Watershed protection	44.8%	37.9%	13.8%	3.4%	58
Leak-detection program	31.0%	43.1%	24.1%	1.7%	58
Residential metering	23.7%	49.2%	25.4%	1.7%	59
Agricultural metering	23.2%	12.5%	62.5%	1.8%	56
Water audits	21.8%	27.3%	43.6%	7.3%	55
Benchmarking	17.9%	21.4%	42.9%	17.9%	56
Sector demand study or pilot	15.8%	22.8%	47.4%	14.0%	57
Climate comfort systems	13.8%	12.1%	65.5%	8.6%	58
Pilot programs or projects	13.0%	16.7%	59.3%	11.1%	54
"Green" design / Smartgrowth	12.1%	19.0%	55.2%	13.8%	58
Voluntary in-home, low-low fixture program	10.3%	31.0%	50.0%	8.6%	58
Xeriscaping program	7.1%	16.1%	58.9%	17.9%	56
Low-flow fixture / retrofit program	5.2%	31.0%	55.2%	8.6%	58
Water reclamation, re-use, recycling programs	5.2%	22.4%	63.8%	8.6%	58
Agricultural / irrigation technologies & programs	3.5%	8.8%	73.7%	14.0%	57
Residential technologies and programs	3.4%	15.5%	63.8%	17.2%	58
Industrial & commercial technologies / programs	3.4%	10.3%	67.2%	19.0%	58

Q24. *continued*

'OTHER' OPERATIONS / MANAGEMENT TOOLS:

CURRENTLY IN PLACE

- A "Water Wise" program outlining a five-year plan to reduce water use.

BEING CONSIDERED

- Low flush toilet fixtures and sprinkler restrictions in the summer.
- Training seminars and PM programs.
- Weekly education programs.

NOT SPECIFIED WHETHER CURRENTLY IN PLACE OR BEING CONSIDERED

- A telemetry system from water release for storage to greatly reduce waste.
- Peak demand reduction programs and customer cost sharing.
- Public education on conservation.
- Water conservation such as sprinkling enforcement.

Q25. Which operations and management tool would you consider most effective in helping achieve your water conservation objectives? Why?

- Metering **5 mentions**
- Best management practices.
- Bylaw implementations.
- Customer education and awareness. If the customer does not understand the need, they will not buy into the process.
- Demand study so we can locate other sources of water.
- Educating the user because they use the resource.
- Education and dole values, agriculture and possibly meters for residential.
- Education. For a small cost a lot can be accomplished.
- Education; low flow fixtures. Water is too easy to waste.
- Flow monitoring and commercial and residential metering.
- Kid's education program.
- Leak detection of the old infrastructure.
- Leak detection, as we are able to quantify how much the system is leaking.
- Mandatory watering restrictions and low flow fixture installation in new pumps.
- Metering for tracking of consumption and to identify problem areas.
- Metering. Direct customer accountability through customer and pay philosophy.
- Meters. People with meters use less water. They have been in place here since the early 60's.
- One sprinkler and water early morning or evening.
- Public education on education and voluntary restrictions.
- Public involvement.
- Residential metering and high irrigation demands.
- Residential metering over capacity in summer.
- Residential metering, customer awareness and a great planning tool, watering audits, assist with customer awareness and social marketing strategy, leak detection, demonstrate utility commitment also allows for up to a ten percent reduction in losses.
- Residential metering.
- Residential metering. Give public a greater awareness of water as valuable resource.
- Residential metering. User pay system should slow careless use.
- SCADA. Currently only have bi-monthly meter reads.
- Sprinkling enforcement and reduce peak fines and therefore capital and operating costs.
- Sprinkling restrictions and a thirty percent reduction.
- The system has only twenty-five connections so this portion of this system is the most useful tool.
- There are no current water conservation objectives.
- Universal metering.
- Water meters and knowledge to users.
- Water meters, increasing block toll rate and public education.
- Water Smart program has a twelve-year proven effectiveness.
- Water supply upgrade improved quality.

Q26. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of operations and management tools?

- Cost **7 mentions**
- Budget constraints.
- Budget to complete residential metering.
- Cost and public acceptance.
- Cost of implementation.
- Council and old habits, tax dollars and most do not want to pay.
- Decision maker and customer misunderstanding of the water meter as the tool that benefits all lack of understanding of the relationships between metering and customer education.
- Educating the user because they use the resource.
- Funding
- Getting people to realize the price of water. It is harder to convey to the older generation.
- Human resources.
- Human Resources. One person to develop plans for all infrastructures.
- Inequity, different rules for municipalities and improvement district mismanaged municipalities and get money for not operating well.
- It is voluntary.
- Lack of funds. The system is too small to be economical.
- Lack of personnel resources.
- Money and changing old ways of thought.
- Political and cost.
- Political and the public's will to accept water metering.
- Public awareness.
- Public perception that water should be free.
- Public resistance.
- Remove scale rates from bylaw schedule.
- Resources
- Staff time and budget.
- The competing priorities of capital planning and long range plan.
- The cost of implementing and maintaining universal metering is major barrier.
- The low cost of and abundance of water.
- This is what was always done.
- Time and resources.
- Water supply for fire protection.

Q27. How could the following sectors help you use operations and management tools more effectively?

Federal government:

- Grants **8 mentions**
- Funding **3 mentions**
- More money **2 mentions**
- Agricultural metering program and farm education.
- Approve the green grant for meters that has been applied for.
- Bring cost down.
- Broader input on promised legislation changes.
- It depends on the size of the meter and funding.
- Education and money for upgrades.
- Funding support and national policy of water conservation.
- Global direction and Environment Canada's global warning studies to confirm long-term trends.
- HRDC money for training or part-time students.
- Infrastructure program setting clearer goal posts.
- Mandate metering in the building codes.
- Measurement Canada should not enter into area of consumer testing of water meters.
- Regulation and funding.

Provincial government:

- Grants **7 mentions**
- Funding **2 mentions**
- Adoption of mandatory programs legislation.
- Agricultural metering program and farm education.
- Bring cost down.
- Change the code.
- Establishing value of water promoting efficient use of water.
- Infrastructure program and setting clearer goal posts.
- Legislation, education and money.
- Mandate all new home use water efficient fixtures and have it simple so you know what is a water saver.
- More money.
- Provide funds and education.
- Regulation and funding.
- Same rules for everyone and legislate water meters.
- Seminars and information tools such as a website.
- Stop downloading.
- Training.

Q27. *continued*

Regional government:

- All users pay.
- Combined planning for adjacent utilities.
- Consistent approach to public awareness.
- Education.
- Funding.
- Grants.
- Improve co-operation.
- Improve O&M of bulk water supply meters.
- Legislation and education of users.
- More cash and more commitment.
- Provide funds and education.
- Public awareness.
- Regional management strategies and regional education.
- Regional water supply.
- Standardized resources.
- They need to consult with water purveyors.
- Training and expertise.
- Understanding educating customers on true cost of service to supply.

Private Sector:

- Better-qualified technical sales representatives.
- Consulting for specific projects.
- Education and encouragement.
- Education and communication.
- Improved awareness.
- Listen.
- More aggressive approaches to partnerships.
- Promote low volume fixtures and recapping.
- Promote low water use products by selling them and offer workshops on low water use products.
- Responsible water use and planning for water efficiency.
- Technical support.

Q27. *continued*

NGO / Volunteer Sector:

- Education **2 mentions**
- Change a wasteful mindset.
- Involve them based on partnerships.
- Limited, although there is potential.
- Promote the value of water and promote value of environment.
- Provide reasonable and common sense solutions.
- Public forum and education.
- Water conservation gardens.

Professional Associations:

- Education **2 mentions**
- Continued professional development of members to promote water conservation.
- Creative system designs and current adoption of water saving and management devices.
- Design and an advice liaison with Federal land Provincial government.
- Develop a common action plan.
- Ensure associations advise and decision makes regulatory of industry trends and perspectives.
- Incorporate water conservation methods into planning and building, facilities and subdivisions.
- Key in providing training.
- Newsletters and training.
- Provide ongoing training in specific areas.
- Selling ideas for water conservation.
- Technology review and promotion.
- Training.

Q28. Please describe any successes your utility has had with a particular operations or management tool, such as might help other utilities realize their water conservation objectives.

Specifics:

- A study on our agriculture meter program is available from MAFF and an internal report is available from SEKID's website.
- Cost efficient leakage analysis and measure winter and night time flows.
- Education of growers for water use reduction.
- Enforced water restrictions.
- Enforcement of sprinkling regulations has reduced our peak demand by about forty-five percent.
- Industrial water meters.
- Metering.
- Pilot meter replacement program.
- Power reduction planning and groundwater studies for recharge and protection.
- Recent water restrictions and monitoring.
- Reduced water demand by twenty percent through leak detection program.
- Summer lawn sprinkling restriction to twice a week.
- The educational programs aimed at the Vancouver elementary school and the public. Namely the school play, A2Z of H2O and the Water Wise Gardening Grow Natural program. The objective to the school play is to make future generations aware and the Grow Natural Water Wise Gardening is aimed at adults.
- Water audit, benchmarking, leak detection, public education and infrastructure upgrades.
- Water conservation programs have achieved a twenty percent reduction to date, significant capital deferral, social marketing strategy and partnerships work.
- Water restrictions, newspaper advertisements and school education program.
- Water Smart bike patrol and in school education.
- We are just in the midst of implementing initiatives.
- We are too early in our process to determine successes.
- Without executive metering it is difficult to tell how effective specific measures. However the stage three plus stage four measures, implemented by the GORO were effective.

Q28. *continued*

Performance Targets and Measures / Indicators:

- Ability run our Okanagan Lake and inter convection.
- Demand reduction has resulted in a twenty-five percent off the peak energy cost savings.
- It is difficult to measure and quantify attitude changes of the public.
- Metering.
- Not clearly defined.
- Reduce consumption.
- Reduce power bills and better groundwater management.
- Shooting for twenty-five to thirty percent reduction.
- They pay for what they use.
- We will be monitoring our water demands.

Water Savings:

- Unknown **2 mentions**
- A twenty percent reduction.
- About fifteen percent in peak reduction since 1993.
- Average twenty-three percent reduction in peak-day use.
- Cut back on water use.
- Increasing block toll rates and water meters.
- Reduces pumping costs.
- Somewhere between twenty-two percent and thirty-two percent.
- Ten to twelve percent.
- Yes.

Cost Savings:

- Unknown **3 mentions**
- A cost-benefit analysis shows a conservative 1:1:5 ratio.
- Capital program over twenty years has reduced from nineteen million to twenty-seven million dollars.
- Efficient testing of pump systems replacement of old pumps.
- Estimate average \$75,000 per year in power cost savings plus \$300,000 per year in deferred capital projects over past twelve years.
- It is hard to measure because of upgrades on old system.
- Reduced maintenance and hydro costs and reduced treatment costs.
- Yes.

3.4 LEAD-BY-EXAMPLE TOOLS

Q29. Please indicate how your utility is leading by example:

Type Of Lead By Example Tool	Currently Using	Being Considered	Neither	Don't Know	Valid Sample
Operator education / training	74.5%	12.7%	9.1%	3.6%	55
Employee education	50.0%	25.9%	22.2%	1.9%	54
Water conservation applied to operations and maintenance	46.3%	27.8%	24.1%	1.9%	54
Early leak detection and repair	45.5%	29.1%	23.6%	1.8%	55
Efficient outdoor water use and landscaping	34.0%	24.5%	41.5%	0.0%	53
Education for elected officials	32.1%	28.3%	32.1%	7.5%	53
Conservation library	22.9%	16.7%	54.2%	6.3%	48
Low-flow fixture or retrofit program	22.6%	28.3%	45.3%	3.8%	53
Reduced water pressure in buildings	18.5%	14.8%	61.1%	5.6%	54
Greywater recycling	1.9%	18.9%	75.5%	3.8%	53

'OTHER' WAYS UTILITY IS LEADING BY EXAMPLE:

- At present it is not.
- Extensive customer interaction and social marketing.
- Mandatory low flow fixture bylaw.
- Presentation and trade publication presentations.
- Research and testing innovative technologies.
- Retrofitting local parks to reuse water.

Q30. Which lead-by-example tool would you consider most effective in helping achieve your water conservation objectives? Why?

- Education **2 mentions**
- Efficient outdoor water use and landscaping. **2 mentions**
- Any initiatives that supports less water usage.
- Applied water conservation education.
- Demonstrate examples of customers who are responding and take the education and information to the customer right in their neighborhood.
- Early leak detection. Lower water consumption and easier on the water system.
- Education for elected officials so that they have a better understanding of challenges to water conservation.
- Education for elected officials.
- Education for elected officials. This will lead to implementation of water conservation measures and their funding.
- Efficient outdoor water use and landscaping. The greatest increase in demand occurs in summer months due to lawn sprinkling.
- Efficient outdoor water use in all parks, use only what is necessary and time clocks.
- Employee education.
- Irrigating town green spaces during dawn and dusk hours. A lot of wasted water used for sprinkling and watering.
- Low flow fixtures.
- Low flow toilets and education.
- Meter and current data.
- Operator education and training. If you do not have properly trained personnel operating your system how can you justify any of the other examples? It starts there and builds outward.
- Parks computerized irrigation. You can see the results and measure the savings. An estimated thirty percent of water lies used in parks.
- Part of our system is metered.
- Public isolation.
- Pump station and underground irrigation systems of timers.
- Water meter.
- With such a small system, conservation it is not an issue.

Q31. What is 1 major challenge or barrier to implementing or maximizing the effectiveness lead-by-example tools?

- Cost **3 mentions**
- A lack of resources.
- A lack of water use data.
- Budget for larger capital retrofits.
- Changing bylaws and plumbing codes.
- Communication and lack of understanding.
- Cost and education of elected officials.
- Cost of hiring additional staff.
- Costs to reduce water pressure.
- Funding.
- Funding and political desire.
- Money.
- Most of the year the reservoir is overflowing and people can see this and do not practice conservation.
- Old mindset, resistance to change and thoughtlessness.
- Performance monitoring and reporting.
- Plentiful supply with low treatment costs.
- Political will.
- Public education and council members that abuse water use.
- Public objectives.
- Show case of maintenance and minimal water use.
- The misconception and misunderstanding by politicians and decision makers. More work needs to occur to develop and to begin at this level and to show time cost of water.
- There is no strategic plan in place to direct conservation.
- Time and resources.

Q32. How could the following sectors help you use lead-by-example tools more effectively?

Federal government:

- Grants. **6 mentions**
- Money. **2 mentions**
- Education.
- Financial subsidy and product guidelines.
- Funding.
- Have countrywide programs.
- Improved grants for conservation initiatives.
- Legislation and funding.
- NRC and IRC representation at more conferences or workshops.
- Tie all funding assistance to water efficient implementation.

Provincial government:

- Grants. **7 mentions**
- Auto shut off and building taps with low flow devices.
- Education.
- Improved grants for conservation initiatives.
- Include in building codes water use fixtures.
- Legislation and funding.
- Money.
- Partnerships
- Regulations.
- As with the Federal Government, tie all funding assistance to water efficient implementation.

Regional government:

- Money.
- Adapting and demonstrating regional affective practices.
- Education and legislation.
- Expertise.
- Grants.
- Harmonized bylaws and programs.
- Initiatives and reward those communities and individuals who do well.
- More cash.
- Offer grants.
- Set an example by charging bylaws.
- Some sort of participation.

Q32. *continued*

Private Sector:

- Be responsible and acknowledgment of value of water.
- Information and education.
- Lead by example.
- Listen.
- Motivations.
- Ongoing.

NGO / Volunteer Sector:

- Education.
- Lead by example.
- Participation in other sectors.
- Promote efficient water use and promote environment protection.
- School education.

Professional Associations:

- Design and install water saving devices.
- Educate and use proven methods elsewhere.
- Experience.
- Newsletters.
- Ongoing.
- Standards.
- Technical input.

Q33. Please describe any successes your utility has had with a particular lead-by-example tool, such as might help other utilities realize their water conservation objectives.

Specifics:

- A proactive leak survey program, Water Wise gardening, Rain Barrel program and education.
- Bylaw enforcement water regulator.
- Early leak detection, training and reduced pressure.
- Education of selected officials, foster a culture to conserve within the corporation and work with media and community stakeholders.
- Employee education.
- Operator education.
- Power audit.
- Reservoir cleaning.
- Sprinkling restrictions.
- Too early in the process to determine successes.
- Water restrictions during summer.

Performance Targets and Measures / Indicators:

- Education of grower and domestic irrigation users.
- Reduced operating costs.
- Three year pay back of infrastructure improvement from new equipment.
- Well-managed system.

Water Savings:

- A twenty percent reduction.
- Fifteen percent in water savings.
- Less water used in parks by information and education.
- The tanks are not drained.

Cost Savings:

- Labor, materials and equipment saved two-thirds the normal cost.
- Significant capital cost savings to customers.
- The data provided by leak surveys is valuable for proving court cases.
- Thirty percent in power savings.

3.5 RESIDENTIAL EDUCATION AND CONSULTATION TOOLS

Q34. Please indicate which education / consultation tools are in place or being considered by your utility for residential users:

Education / Consultation Tools	Currently In Place	Being Considered	Neither	Don't Know	Valid Sample
Media	61.1%	9.3%	29.6%	0.0%	54
Information with billing	58.5%	22.6%	17.0%	1.9%	53
Stand-alone publications	53.7%	11.1%	33.3%	1.9%	54
Website	44.4%	27.8%	27.8%	0.0%	54
Community events	31.5%	22.2%	46.3%	0.0%	54
School programs, events and / or contests	31.5%	16.7%	48.1%	3.7%	54
Publications for school children	29.1%	18.2%	49.1%	3.6%	55
Workshops & seminars	20.8%	17.0%	60.4%	1.9%	53
Public opinion survey	18.5%	16.7%	63.0%	1.9%	54
Citizen committee / task force	17.0%	13.2%	64.2%	5.7%	53
Eco-education programs	15.4%	11.5%	67.3%	5.8%	52
Awards or recognition	13.2%	11.3%	69.8%	5.7%	53
Outdoor advertising	11.5%	21.2%	65.4%	1.9%	52
Student representatives active in community outreach	10.9%	16.4%	65.5%	7.3%	55
Focus groups	7.5%	17.0%	71.7%	3.8%	53
Referendum	3.9%	21.6%	70.6%	3.9%	51

“OTHER” EDUCATION / CONSULTATION TOOLS:

- Co-ordination through water conservation Co-ordinators.
- Internet discussion.
- Public open house.

Q35. Which education / consultation tool would you consider most effective in helping achieve your water conservation objectives for residential users? Why?

- Information with billing. **4 mentions**
- Education on efficient use of limits to supplies. Higher costs and lower quality.
- I do not know. There is no way to monitor the effectiveness of the education program.
- Information with billing and stand-alone publications gets the message to the user. School education is a great idea to instill conservation at young age.
- Lawn sprinkling regulation.
- Media.
- Media and broadcast distribution of message.
- Media and public education over the radio and newspaper has shown definite per capita decrease in consumption.
- Media campaign, community outreach, information on website on water usage and cost and methods to conserve.
- Media coverage because it is free publicity when stories are publicized on Rain Barrels, Water Wise Gardening, mulching, composting, etceteras.
- Metering plus education.
- Public opinion survey.
- Public programs.
- Referendum and metering proven to lower usage.
- School programs are an effective way of informing reading parents.
- School watershed visits.
- Stand alone publication and notices at post office.
- Stand alone publications and school programs.
- Students because they teach the older people to shut off taps.
- Water meters.
- Water Smart Bike team in school education.
- Website and billing.

Q36. What is 1 major challenge / barrier to implementing or maximizing the effectiveness education / consultation for residential users?

- Buy, touch sell and cost.
- Changing the mind set regarding water conservation issues.
- Changing the old style thought process. There is plenty of water with the use as much as I want to attitude.
- Cost.
- Cost and pressures.
- Decision makers, communities and understanding of refits of metering, proper rates and education as a package.
- Dollars.
- Funding, staffing and political will.
- It is difficult to have people recognize the value of water.
- Knowing how effective it is.
- No adopted communication plan.
- Past practice.
- Public understanding.
- Residential user's resistance to change despite being informed of water conservation.
- Resources.
- Staff time to co-ordinate, implement and manage.
- The lack of financial impact until metering is in place.
- The lack of long-term vision in water resources and its impacts on communities.
- The lack of resources.
- Time and resources.
- Time to implement.
- Water hogs.
- We have a lot of seniors and people that do not seem to care.

Q37. How could the following sectors help you use education / consultation tools for residential users more effectively?

Federal government:

- Grants. **3 mentions**
- Money. **2 mentions**
- Education.
- Information that exists in order to promote.
- Long-term policy.
- More exposure and policy on conservation tied to funding.
- Possibly legislation restrictions.
- Provide funding for infrastructure that must promote water as a motherhood issue, promote how precious water is and show how to use it efficiently.
- Provide money.
- Provide more advertisement funding from a Federal level.
- Standard programs and material.

Provincial government:

- Grants. **3 mentions**
- Money. **2 mentions**
- As above; tie funding to grants and assistance.
- Education
- Have solid waste, such as garbage and recycling and water conservation as part of the school curriculum. Elementary aged kids are the future residential users.
- Possibly legislation restrictions.
- Provide money.
- As above, information that exists in order to promote.
- School curriculum and programs.

Regional government:

- Come together on the issue with a united view.
- Common advertising campaign to promote water use efficiency.
- Education and more cash.
- Education, legislating local by-laws and metering.
- Expertise.
- Expose regional water challenges.
- Mandate community outreach.
- Provide money.
- As above, information that exists in order to promote.

Q37. *continued*

Private Sector:

- Affordability of changing equipment and practices the participation.
- Green development.
- Lead by example.
- Not to carry or support products that do meet water conservation goals.
- Promote low volume fixtures and Xeriscaping.
- Promote products and services and partner.
- Provide money.

NGO / Volunteer Sector:

- Community associations and ask them to be involved.
- Lead by example.
- Organization
- Promote conservation efforts.

Professional Associations:

- BMPs.
- Newsletters.
- Promote and make available efficient products.
- Show cost savings realized elsewhere.
- Work with the above as a voice of the industry.

Q38. Please describe any successes your utility has had with a particular education tool for residential users, such as might help other utilities realize their water conservation objectives.

Specifics:

- Bike patrol to inform and educate public in wise use of water.
- Door hangers advising of restrictions and explaining why.
- Lawn sprinkling regulation.
- Media and information.
- Peak demands reduction pilot programs, school programs, community tent events education and media advertising.
- Provide reasons for restrictions to consumers.
- School programs on conservation, radio and newspaper advertisements on conservation tips.
- The school play A2Z of H2O aimed at school children, Rain Barrel program, Water Wise Gardening Grow Natural program.
- We feel mail outs with billing is effective.

Performance Targets and Measures / Indicators:

- Fifty community tent events in 2004 and consumption education of an additional sixteen percent by area serviced.
- Cost savings with reduced usage.
- To cut water consumption in high summer use.

Water Savings:

- Twenty percent today and then achieved additional fifteen is being sought.

Cost Savings:

- Huge capital cost savings and deferral of infrastructure.
- When consumption is cut the city pays less in electrical, cost and pump statistics and groundwater.

Q39. Please describe any successes your utility has had with a particular consultation tool for residential, such as might help other utilities realize their water conservation objectives.

Specifics:

- Consultation is an educational tool.
- Water audit and committee of interested parties.

3.6 AGRICULTURAL EDUCATION AND CONSULTATION TOOLS

Q40. Please indicate which education / consultation tools are in place or being considered by your utility for ICI and agricultural users:

Education / Consultation Tool	Currently Using	Being Considered	Neither	Valid Sample
Information with billing	38.5%	20.5%	41.0%	39
Website	35.9%	17.9%	46.2%	39
Voluntary watering restrictions	32.4%	8.1%	59.5%	37
Stand-alone publications	30.6%	8.3%	61.1%	36
Media	29.7%	13.5%	56.8%	37
Community events	25.0%	13.9%	61.1%	36
Citizen committee / task force	12.5%	12.5%	75.0%	32
Workshops & seminars	11.8%	11.8%	76.5%	34
Eco-education programs	11.4%	11.4%	77.1%	35
Outdoor advertising	9.1%	18.2%	72.7%	33
Focus groups	9.1%	21.2%	69.7%	33
Public opinion survey	6.3%	6.3%	87.5%	32
Voluntary low-flow fixture program	5.9%	29.4%	64.7%	34
Referendum	3.0%	18.2%	78.8%	33

'OTHER' EDUCATION / CONSULTATION TOOLS:

- Audits one and two.
- Encouraging water audits.
- Metering.

Q41. Then indicate since what year or, if being considered, what year it is being considered for:

Media

- 2004 *2 mentions*

Information with billing

- 2004 *2 mentions*

Stand-alone publications

- 2004 *2 mentions*
- 1994

Community events

- 2004 *2 mentions*

Outdoor advertising

- 2004

Website

- 2004 *2 mentions*
- 2003

Workshops & seminars

- 2004

Focus groups

- 2004

Citizen committee / task force

- 2004

Voluntary watering restrictions

- 2004

Voluntary low-flow fixture program

- 2004

Other

- 2004 (Encouraging water audits)

Q42. Which education / consultation tool would you consider most effective in helping achieve your water conservation objectives for ICI and agricultural users? Why?

- Accurate metering coupled with quarterly billing will usually regulate growth for most businesses.
- Audits get to see how they can save money.
- Mail outs and water commission assistance is educating growers.
- Media and billing information.
- Metering due to increasing costs for more water.
- No agricultural connections.
- No targeted program for this group.
- None in place or planned.
- Referendum and metering proven to lower the volume usage.
- Same approach as residential however more focus on inside and process reduction virtually no agricultural customers.
- The ICI and agricultural users are metered and mostly optimized already through water audits as a result of being metered.
- The website is easily accessible and modern interesting media.
- We do not specifically target ICI we do provide info for all users.
- We have no users in the city.

Q43. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of education / consultation tools for ICI and agricultural users?

- Funding.
- Political unwillingness.
- Political will and resources.
- Political will and water board is elected by people most interested in water, such as orchardists.
- Price of ICI water creating incentives to count capital to improve processes.
- The cost of metering.
- There seems to be no interest at the moment.
- Water is too cheap.

Q44. How could the following sectors help you use education / consultation tools for ICI and agricultural users more effectively?

Federal government:

- Grants.
- Grants and education.
- Mandated legislation.
- Money.
- Provide grants and operating system retrofits that could reduce consumption.

Provincial government:

- Grants.
- Grants and education.
- Money.
- Require mandatory water audits through legislation.

Regional government:

- Cash and education.
- Enforce outcomes of provincial water audits.
- Expertise.
- Help with costs. You pay fifty percent of metering costs and installation costs.

Private Sector:

- Become a steward in the community.

Professional Associations:

- Newsletters.
- Work with ICI and agricultural sector.

Q45. Please describe any successes your utility has had with a particular education / consultation tool for ICI or agricultural users, such as might help other utilities realize their water conservation objectives.

Specifics:

- Education of growers for water use reduction.
- Meters reduced ICI use.
- We conducted ICI facility assessments on water conservation.

Performance Targets and Measures / Indicators:

- Reduce ICI by a further ten percent.

3.7 ECONOMIC AND FINANCIAL TOOLS

Q46. Please indicate which economic or financial tools are in place or being considered by your utility to promote water conservation:

Economic / Financial Tools	Currently In Place	Being Considered	Neither	Don't Know	Valid Sample
Analysis / study of universal metering or metering pilot	33.3%	27.5%	35.3%	3.9%	51
Cost / benefit analysis of current programs / projects	28.0%	16.0%	52.0%	4.0%	50
Assessment of pricing structure	26.0%	46.0%	24.0%	4.0%	50
Service charges	22.2%	8.9%	68.9%	0.0%	45
Fines for excess use	18.4%	16.3%	61.2%	4.1%	49
Inclining block rate structure	15.7%	25.5%	51.0%	7.8%	51
Incentives / grants to organizations conserving water	4.0%	20.0%	72.0%	4.0%	50
Seasonal rate structure	2.0%	17.6%	70.6%	9.8%	51
Rebates	0.0%	14.0%	78.0%	8.0%	50

Q47. Which economic or financial tool would you consider most effective in helping achieve your water conservation objectives? Why?

- Appropriate rate structure because money talks.
- Assessment of pricing.
- Billing and user pay rates.
- Cost benefit and cost service to council and inclining block rate and incentives to reduce cost sharing.
- Fines.
- Fines and additional use charges for customers who do not follow restrictions.
- Incentives and grants because it encourages conservation and is fair and equitable.
- Inclining block rate.
- Increasing block rate.
- Metering study and analysis.
- Price structure and people respond to incentives.
- Rebate. It comes down to cost savings to the public and what they can afford.
- Service charges.
- Study for metering.
- Universal metering study.

Q48. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of economic or financial tools?

- Cost at implantation.
- Initial and ongoing challenge is funding barriers.
- No residential metering.
- None
- Not a concern.
- People's perception that there is a lot of water and it should be free.
- Political unwillingness.
- Political will to charge what treated water is worth.

Q49. How could the following sectors help you use economic and financial tools more effectively?

Federal government:

- Grants. **2 mentions**
- Financial incentives for efficient systems.
- Funding.
- Infrastructure grants.
- Resource library.
- Send cash.
- Work with Provincial and Legislature local governments on water pricing guidelines.

Provincial government:

- Grants. **3 mentions**
- Access and government grants.
- Funding and help with implementation.
- Send cash.

Regional government:

- Education, politicians and more cash.
- Expertise.
- Participation.
- Regional leaderships promoting regional issues.

Private Sector:

- Contribute to research new systems.
- Gain support for incentive programs.

Professional Associations:

- Ensure they partner with government and the industry challenges.
- Newsletters.

Q50. Please describe any successes your utility has had with a particular economic or financial tool, such as might help other utilities realize their water conservation objectives.

Specifics:

- Consumption based rate structure has resulted in reductions and metered consumption information and proper rate actually rewards the average or less than average consumer.
- Cook and benefits analysis of water supply and treatment.
- Federal and Provincial Green Plan grant.
- Increasing block toll rates.
- Metering.

Performance Targets and Measures / Indicators:

- Fifty percent of meter costs.
- Indicates, but treatment method and source.
- Reduced costs.
- Twenty year servicing plan continues to reduce capital expenditure by fifteen percent maximum a day and demand design standards reduced.

Water Savings:

- Twenty percent overall.

Cost Savings:

- As above, fifty percent of meter costs.
- Capital program.

3.8 PARTNERSHIPS AND CO-OPERATIVE EFFORTS

Q51. Please indicate if your utility is promoting water conservation through partnerships and co-operative efforts:

Partnerships and Co-operative Efforts	Currently Promoting	Being Considered	Neither	Don't Know	Valid Sample
Partnership / co-operation with regional government	27.3%	18.2%	52.3%	2.3%	44
Partnership / co-operation with other water utilities	27.3%	4.5%	65.9%	2.3%	44
Partnerships / co-operation with neighboring jurisdiction	20.5%	15.9%	59.1%	4.5%	44
Partnership / co-operation with provincial government	20.0%	8.9%	68.9%	2.2%	45
Partnership / co-operation with federal government	15.6%	8.9%	73.3%	2.2%	45
Partnership / co-operation with major user	11.6%	14.0%	69.8%	4.7%	43
Partnership / co-operation with professional association	11.6%	7.0%	79.1%	2.3%	43
Partnership / co-operation with academic / research institutions	11.4%	9.1%	70.5%	9.1%	44
Pilot program(s)	9.3%	16.3%	67.4%	7.0%	43
Public private partnership	8.9%	11.1%	77.8%	2.2%	45
Partnership / co-operation with local business	8.9%	13.3%	73.3%	4.4%	45
Partnership / co-operation with NGO / volunteer group(s)	7.0%	16.3%	67.4%	9.3%	43
Cost / benefit analysis of partnership	4.7%	16.3%	74.4%	4.7%	43
Intergovernmental initiatives	2.3%	15.9%	75.0%	6.8%	44

Q52. Which partnership or type of cooperation would you consider most effective in helping achieve your water conservation objectives? Why?

- A partnership with regional government because it keeps the same message across the region with consistency.
- Federal and Provincial sharing grants.
- Federal and Provincial, more access to cash and educate promotion.
- Partnership with regional district and other local government members within water supply area.
- Provincial government and partnerships with other purveyors and partnerships with customers, such as cost sharing on incentives.
- Provincial government initiatives in value of water.

Q53. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of partnerships and cooperation?

- Lack of understanding of mutual benefit.
- Other parties unwilling to participate.
- Politics.
- Red tape and cost because there is not enough money.
- Resources.
- Resources, such as time and staffing levels.
- Too cumbersome.

Q54. How could the following sectors help you use partnerships and co-operation more effectively?

Federal government:

- Funding **2 mentions**
- Grants and scholarships.
- Infrastructure grants.
- Promote partnerships and then funding assistance on performance-based projects.
- Provide a more even playing field for grants.

Provincial government:

- Funding.
- Grants.
- Leadership role rather than downloading on Regional Governments.

Regional government:

- Expertise.
- Remove politics from water management planning.

Private Sector:

- Grants and scholarships.

Professional Associations:

- Newsletters.
- Resources assistance.

Q55. Please describe any successes your utility has had with a particular partnership or cooperative effort, such as might help other utilities realize their water conservation objectives.

Specifics:

- Kelowna Joint Water Committee Water Supply Association of BC
- Kelowna Joint Water Committee work together on general usage with neighboring jurisdictions, partnerships with customers on cost saving incentives.
- Partnerships with master gardeners and demonstration gardens that offer classes in water conservation in the garden, around the home, etceteras.

Water Savings:

- Looking for a further sixteen percent reduction in peak demand.

Cost Savings:

- Joint activities and more momentum for programs.

3.9 LONG-TERM PLANNING TOOLS

Q56. Please indicate which long-term planning tools are in place or being considered by your utility to promote water conservation:

Long-Term Planning Tools	Currently In Place	Being Considered	Neither	Don't Know	Valid Sample
Local or regional land use planning	71.4%	14.3%	14.3%	0.0%	49
Long-range capital planning	59.2%	26.5%	12.2%	2.0%	49
Growth management planning	49.0%	26.5%	20.4%	4.1%	49
Quality / continuous improvement planning	48.9%	31.9%	14.9%	4.3%	47
Strategic planning	47.8%	30.4%	19.6%	2.2%	46
Risk management planning	35.4%	43.8%	14.6%	6.3%	48
Demand management planning	33.3%	37.5%	20.8%	8.3%	48
Local or regional watershed management planning	31.3%	41.7%	20.8%	6.3%	48
Drought management planning	17.0%	27.7%	44.7%	10.6%	47

Q57. Which long-term planning tool would you consider most effective in helping achieve your water conservation objectives? Why?

- Long range capital planning. **2 mentions**
- A good consultant that understands the issues and academic study is usually very hard to implement.
- A set management plan.
- Conservation education program and mail out with yearly water bill.
- Demand management planning coupled with long range capital planning.
- Grown management planning.
- Long react capital planning. For years we have used a consultant to help us with planning.
- Strategic planning and keeps the focus on the future.
- Strategic planning as it makes the best use of the budget available.
- OCP. This will roadmap what direction to follow for the municipality.
- Water pricing for future funds.

Q58. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of long-term planning?

- Costs.
- Funding, and maintain local utility rates within a perceived acceptable range.
- Having the development sector our OCP prediction for future growth, this is a fact of life.
- Lack of initiative or urgency to keep planning documents current, such as a five-year update is not being done regularly.
- Lack of resources.
- People's reluctance to pay for what water is worth.
- Political buy-in cash for studies.
- Resources.
- Time and resources.
- Utilizing the plans that we now have in place.

Q59. How could the following sectors help you plan for the long-term water conservation more effectively?

Federal government:

- Grants. **8 mentions**
- Provincial Government.
- Education of public to value of water.
- Equal opportunity funding and grants.
- Funding.
- Send cash.

Regional government:

- Expertise.
- Lobby Federal and Provincial.
- Promoting local water issues.

Private Sector:

- Demonstrate efficient water use.

NGO / Volunteer Sector:

- Good design of modern applications.
- Grants and scholarships.

Professional Associations:

- Newsletters.
- They have our consultants.

Q60. Please describe any successes your utility has had with a particular long-term planning tool, such as might help other utilities realize their water conservation objectives.

Specifics:

- Available infrastructure grants.

Performance Targets and Measures / Indicators:

- A three percent growth date.
- Installed a new WWTP and new proposed station upgrades.
- Proper water pricing so funds are available when they have the most effect.
- Reduced costs to the district.
- Understand the capacity and limitations of their water sources.
- Upgrade of our infrastructure water and sewer.
- We have prepared an OCP matched our model based, a master water ran of the two above documents.

Cost Savings:

- One-third grant program.

Other legal tools:

- Different classes or grades of water.

3.10 LEGAL TOOLS

Q61. Please indicate which legal tools are in place or being considered by your utility to promote water conservation:

Legal Tools	Currently In Place	Being Considered	Neither	Don't Know	Valid Sample
Bylaws	61.7%	21.3%	14.9%	2.1%	47
Mandatory restrictions	48.9%	23.4%	27.7%	0.0%	47
Regulations	43.2%	22.7%	27.3%	6.8%	44
Standards	40.9%	25.0%	22.7%	11.4%	44
Licensing	22.7%	18.2%	47.7%	11.4%	44
Zoning restrictions	20.9%	23.3%	44.2%	11.6%	43
Restrictive covenants	11.9%	14.3%	54.8%	19.0%	42

'OTHER' LEGAL TOOLS:

- Different classes or grades of water.

Q62. Which legal tool would you consider MOST effective in helping achieve your water conservation objectives? Why?

- Bylaws. **2 mentions**
- Bylaws and adopt a cross-connection program and apply fines for abusers.
- Bylaws and ongoing enforcement.
- Bylaws and provide legal tools to facilitate programs and enforcement.
- Bylaws and regulations.
- Bylaws that allow you to turn water off if it is a repeat offender.
- Bylaws when the regulations are not adhered to.
- Established bylaws as part of building. Permits for low flow fixtures in all new construction standards. Construction and development standards related to system sizing.
- Mandatory watering restrictions with fines.
- Regulations.
- Water restrictions, cuts in pumping costs and disinfection costs.
- Watering restrictions.

Q63. What is 1 major challenge or barrier to implementing or maximizing the effectiveness of legal tools?

- Bylaw implementation.
- Entering onto private property.
- Funding and staff time.
- Inability of issuing fines, etceteras against violators. The legal system does not view wasting water as a crime.
- Lack of resources.
- Legal challenges or implementing enforcement takes time and money.
- Man power to police restorations.
- Policing customers.
- Political exceptions.
- Political unwillingness.
- Resources.
- The public is concerned of the added cost to them.

Q64. How could the following sectors help you use legal tools more effectively?

Federal government:

- I do not know. **2 mentions**
- Change plumbing code.
- Countrywide rules.
- Improve the national building code.
- Infrastructure grants.
- Legislation.
- Send cash.

Provincial government:

- Assistance and legal advice on drafting bylaws.
- Do not download.
- Funding.
- Grants.
- Improve the provincial building code.
- Legislation.

Regional government:

- Adopt bylaws.
- Expertise.

NGO / Volunteer Sector:

- Lobby for code improvements and changes.

Professional Associations:

- Lobby for code improvements and changes.
- Newsletters.

Q65. Please describe any successes your utility has had with a particular legal tool, such as might help other utilities realize their water conservation objectives.

Specifics:

- Mandatory watering restrictions with fines.
- Mandatory sprinkling restrictions.
- Not much.
- Watering restrictions of three days per week.

Performance Targets and Measures / Indicators:

- Saving water loss.

Water Savings:

- Thirty percent savings during high demands periods.
- Due to no sprinkling on Mondays.