

AGENDA

FOOD SECURITY & CLIMATE CHANGE COMMITTEE

**THURSDAY, SEPTEMBER 3, 2015 – 4:30 P.M.
COMMITTEE ROOM AT CITY HALL**

1. ADOPTION OF AGENDA

2. APPROVAL OF MINUTES

Minutes of the July 9, 2015 meeting.

3. FOR DISCUSSION

- a) Correspondence: Letter from AV Community Forest Corporation in regards to sequestering carbon. (see attachment)
- b) Discussion with Russell Dyson, CEO ACRD - Status of proposal submitted to the ACRD for rain water harvesting rebate program.
- c) Presentation by Heather Shobe and Anna Lewis, Agricultural Support Workers for the Alberni-Clayoquot Regional District, regarding making recommendation to Port Alberni City Council:
 - That any requirement for a business license be waived for market gardeners within the City of Port Alberni, and that the public be notified of this incentive;
 - That the city investigate the cost of and implement a reduced water rate for market gardeners, as a support measure for increased urban agriculture;
 - That the city investigate the possibility of producing a map/weblinks with a list of urban farmers and market stands;
 - Extending liability insurance to those small farm stands on the route provided they work within regulations required by the insurer.
- d) Presentation by Heather Shobe and Anna Lewis Agricultural Support Workers for the Alberni-Clayoquot Regional District - Water harvesting grant application for funding from the Real Estate Foundation
- e) Presentation by Edna Cox - AVTTS Food Group - Regarding plans on Food Security in Alberni Valley.

4. TOPICS FOR NEXT MEETING (Thursday, October 1, 2015)

5. ADJOURNMENT

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FOOD SECURITY AND CLIMATE CHANGE COMMITTEE

THURSDAY, July 9, 2015

4:30 p.m. in the City Hall Committee Room

Present: John Mayba, Chris Alemany, Sam Brownlee, Guy Langlois, Rosalind Chapman
Sandra Gentleman, Gary Swann, Bob Haynes

Guest: Ken Watson

1. **Approval of minutes from June 4 2015**

John Mayba moved to approve, Rosalind Chapman Seconded

2. **Approval of agenda**

John Mayba moved to approve, Bob Haynes Seconded

3. Review of priority lists from all Board Members

- Gary Swann discussed the need to collect kitchen waste to make humus.
- Bob Haynes stated that he knows someone who has the equipment to process the food and yard waste into compost.
- Gary Swann and Bob Haynes will look into this issue and present their findings at our meeting in September.
- Guy Langlois will contact Russell Dyson with the ACRD to find out when their solid waste report will be done.
- Ken Watson stated that the City may have a truck available for a pilot program to collect yard and kitchen waste and that kitchen waste collection was identified in the City's future plans.
- Gary Swann discussed the need for the Community Forest to use more sustainable forest practices by growing trees for a longer growth rotation.
- John Mayba moved that the FSCC contact the Community Forest and request that they consider implementing a policy to grow trees with a longer rotation with the purpose of sequestering carbon, given the growing concern with climate change.
- Gary Swann seconded.
- Guy Langlois will draft a letter to the Community Forest and distribute it to the FSCC Committee for approval.
- Bob Haynes discussed the need for water conservation and agri-irrigation. He said that rain harvesting was a good idea.
- John Mayba suggested that there was a need for a water management plan.
- Bob Haynes and Ken Watson confirmed that there was already a water management plan.
- Ken Watson stated that there was a need for better water storage. Farmers should investigate options to store more collected rain water onsite.
- Gary Swann stated that he has a pond and a reservoir to collect rain water. His system is large enough to supply water for all his crops.
- Rosalind Chapman discussed rain harvesting systems that were being used in other communities that supplied all their water needs.

- Bob Haynes moved that the FSCC Committee request that the Agricultural Development Committee write a letter to the ACRD asking what plans are being made regarding agri-irrigation.
 - John Mayba seconded.
 - Chris Alemany discussed the need to bring the two farmers markets together.
 - Gary Swann stated that the Harbour Quay is a good location for the farmers market.
 - Chris Alemany will collect existing active transportation reports and distribute them to the FSCC Committee members.
 - Chris Alemany discussed his recommendation for the city to purchase solar panels.
 - Rosalind Chapman would like to see the First Nations taking a role in developing solar energy in our community.
 - Guy Langlois stated that the First Nations community in Sooke BC have developed a solar power grid and would serve as a good example.
 - Sam Brownlee recommended that a business case needs to be developed to support purchasing solar panels.
 - Chris Alemany will research existing business plans and present his findings at our next meeting to support recommendations for implementing a pilot project to purchase solar panels.
 - Rosalind Chapman discussed the need to increase the number of community gardens in our community.
 - Rosalind Chapman will contact the young professionals to find out if they have plans to expand the existing community garden.
 - Sam Brownlee will contact Planning to get an inventory of available unused city land that may be suitable for community gardens.
 - Guy Langlois suggested that once we have gathered information on what land is available that we request expressions of interest from community groups that would like to develop community gardens.
 - John Mayba discussed the need to support urban farming. He would like to establish some baseline data on how much food is being grown by residents.
 - Guy Langlois will provide a copy of the ACRD Food Survey that was done in 2013.
 - Sam Brownlee suggested that we speak to Transition Town regarding distributing a questionnaire on how much food people produce and having a prize attached to encourage participation.
 - Ken Watson requested that the committee make any suggestions for the Sustainably Report by Wednesday July 15, 2015. Sam Brownlee asked all committee members to commit to read the report and submit comments by end of business on Monday, July 13.
4. Guy Langlois will contact Heather Shobe regarding the presentation she will be making to City Council regarding her request for financial support for the Gleaning Project.
 5. John Mayba moved to present the Rain Harvesting Proposal to the ACRD.
Bob Haynes seconded.

6. Guy Langlois will contact Dan Schubart regarding the Blue Dot Resolution.

8. Adjournment

- Motion to adjourn by Bob Haynes, seconded by Gary Swann.
- The meeting adjourned at 6:15PM

7. Next meeting September 3, 2015.

Sam Brownlee, Chair

Davina Hartwell, City Clerk



July 20, 2015

Food Security and Climate Change Committee City of Port Alberni
c/o City of Port Alberni
4850 Argyle St
Port Alberni, BC
V9Y 1V8

Dear Guy Langois:

Thank you for your letter dated July 10, 2015. The Alberni Valley Community Forest Corporation (AVCFC) is active in seeking public input to help us manage the Community Forest.

The Alberni Valley Community Forest Corporation (AVCFC) has provided the public with a questionnaire at all of our public presentations. One of the key values the public has stated in the response to these questionnaires is to protect Old Growth Forests in the Community Forest and especially those in the Sproat Forest Development Unit. The protection of second growth to allow it to sequester more carbon has not been a key item of concern for the general public but it is defiantly an issue that should be considered.

The Community Forest is trying to achieve a balance of harvesting some Old Growth Forest in the Taylor Forest Development Unit and second growth in the Sproat Forest Development Unit. The community forest completed an inventory assessment and based on the results we have reduced our yearly cut. The main reason for the reduction was that the second growth is too young to harvest and it needs more time to reach a harvestable size.

Since the AVCFC operates on crown land, the Ministry of Forests Lands and Natural Resource Operations (MFLNRO) guides us on harvest levels. If we do not meet the harvest levels set by MFLNRO and do not have good reasoning for this the government can give our allocation of timber to another party.

The AVCFC has been lobbying MFLNRO to give us more land with larger second growth so we can leave our current smaller second growth so it can grow longer and sequester more carbon.

To reduce carbon output from the community forest we are managing our waste wood so it will be utilized in the new active carbon plant that will be located along the harbour. Where possible our waste wood will no longer be piled and burnt. It will now be ground up and trucked to the water front to be turned into activated carbon for filtering systems.

Sincerely,
ALBERNI VALLEY COMMUNITY FOREST CORPORATION

Chris Law, RFT
Manager, AVCFC

Alberni Valley Community Forest Corporation

7500 Airport Road, Port Alberni, BC, V9Y 8Y9 | manager@communityforest.ca | www.communityforest.ca | Phone 250-731-7377

Proposal: To implement a Rainwater Harvesting Rebate Program

Objectives

- To harvest and store rainwater for summer use (for irrigation and livestock consumption).
- To reduce demands on wells and aquifer.
- To increase farm productivity in warm and dry seasons.
- To increase urban agricultural capacity in the Alberni Valley.
- To mitigate the effects of drought during the summer season.
- To reduce peak water use and decrease the urgency of capacity upgrading.

Water Supply Situation

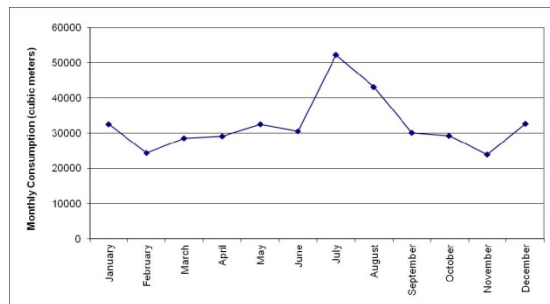
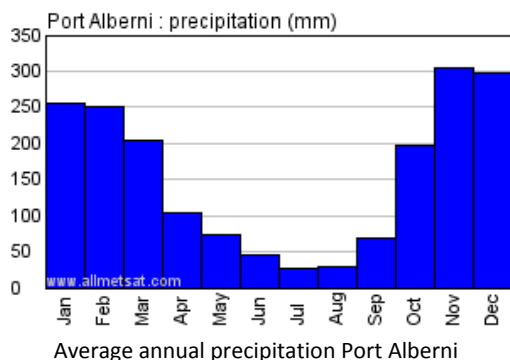
Water restrictions are being instituted almost two months earlier than usual—last year, the city of Port Alberni only implemented stage 1 restrictions on August 1. This year, they started on June 8.

“This is the first time we’ve implemented water restrictions in June,” said city engineer Guy Cicon.

An extremely low snowpack in the surrounding mountains has thrust Vancouver Island into this position. The Island as a whole is only at three per cent of normal snowpack—that’s a 32 per cent drop from this time last year—, according to the B.C. River Forecast Centre.

Katya Slepian - Alberni Valley News - Jun 11, 2015 at 11:00 AM

Rainfall data



Beaver Creek Water Systems 2013 Monthly Consumption

What is Rainwater harvesting?

A rainwater harvesting system collects rainwater that falls on rooftops and stores it in a cistern that is situated either above or below ground near the building.

Rainwater harvesting (RWH) primarily consists of the collection, storage and subsequent use of captured rainwater as either the principal or as a supplementary source of water. Examples exist of systems that provide water for domestic, commercial, institutional and industrial purposes as well as agriculture, livestock, groundwater recharge, reduction of storm water runoff volumes, process water and as an emergency supply for fire-fighting.

The highest cost of any rainwater harvesting system is typically the cistern. This is also the most critical portion of any rainwater harvesting design, as an appropriately sized cistern will ensure that the system will handle the demand placed on it by the users. Storage makes water available when it is needed, and

collects rainwater for later use during rainfall events when the rate of supply exceeds the rate of use. Systems need to be large enough to provide water throughout the year.

Non-Potable Demand

Rainwater can be harvested for the following non-potable water demands:

- Landscape irrigation
- Fire suppression
- Pool/pond filling
- Laundry washing
- Household cleaning
- Toilet flushing
- Commercial fleet washing

What other Communities are Doing

- Regional District of Nanaimo - Rainwater Harvesting Incentive Program

The RDN is offering rebates of up to \$450 for a cistern that is rated for potable use and able to collect a minimum of 4,546 litres (1,000 gallons) of rainwater. In addition, there is up to \$300 available for other eligible collection system expenses such as transport piping, debris traps, filters and installation costs. Distribution components (beyond the tank) are not covered under the rebate. This makes a total of \$750 available per household for the purchase and installation of a rainwater harvesting system. There is only one rebate per household.

- City of Victoria - Rainwater Rewards Program

Low Density Residential (1-4 units)

The City is offering rebates of between \$35 and \$1,500 to assist with the upfront cost of installing rainwater management methods and an ongoing 10% credit off the annual stormwater utility bill.

Apartments, Condominiums, Institutions and Businesses

The City is offering ongoing credits of between 2.5% and 50% off the annual stormwater utility bill. Rebates are not available for these properties, but the credit amounts are larger.

Recommendations

The Food Security and Climate Change Committee recommend that the ACRD implement a Rainwater Harvesting rebate program.

- Rebates up to \$450 for a cistern that is rated for potable use and able to collect a minimum of 4,546 litres (1,000 gallons) of rainwater.
- Rebates up to \$300 available for other eligible collection system expenses such as transport piping, debris traps, filters and installation costs. Distribution components (beyond the tank) are not covered under the rebate.
- This makes a total of \$750 available per household for the purchase and installation of a rainwater harvesting system. There is only one rebate per household. The rebate is available on

a first come, first served basis. Once funds are exhausted, the program will be finished for the fiscal year.

- Public education campaign to promote rainwater harvesting and water conservation.

Resources

Regional District of Nanaimo - Rainwater Harvesting Incentive Program

<http://www.rdn.bc.ca/cms.asp?wpID=2500>

City of Victoria - Rainwater Rewards Program

http://www.victoria.ca/EN/main/departments/engineering/stormwater/rainwater_rewards_program.html

Abbotsford/Mission Water & Sewer Commission (WSC) - Greywater Recycling & Rainwater Harvesting Feasibility Study [https://Abbotsford.Civicweb.Net/Document/25574/WSC%207-](https://Abbotsford.Civicweb.Net/Document/25574/WSC%207-2012.Pdf?Handle=CCB959A6B4E548DA8D832D6D5A2BDB57)

[2012.Pdf?Handle=CCB959A6B4E548DA8D832D6D5A2BDB57](https://Abbotsford.Civicweb.Net/Document/25574/WSC%207-2012.Pdf?Handle=CCB959A6B4E548DA8D832D6D5A2BDB57)

City of City of Guelph - Rainwater Harvesting System Rebate

<http://guelph.ca/living/environment/rebates/rainwater-harvesting-system-rebate>

Alberni Valley Regional Water Study Update

<http://www.acrd.bc.ca/cms/wpattachments/wpID249atID804.pdf>

City of Port Alberni

Water Conservation Plan



Prepared for:

City of Port Alberni
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9 May 2013



Acknowledgements

The authors extend their gratitude to staff from the City of Port Alberni for the assistance and information they provided to this report. We thank Chris Downey of Koers and Associates for advice on water conservation priorities for the City.

Please Note

The information presented in this document was compiled for the purposes stated in this document, and with the understanding that each user accepts full responsibility for the use and application of the document and the information it contains. This document and the information it contains are intended only as a general guide. It is not intended to replace the services of experienced specialists where these services are warranted by specific circumstances.

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1. Introduction

1.1. Purpose

The purpose of this report is to provide a water conservation plan for the City of Port Alberni.

Water is a finite resource, and it is critical for the health of all ecosystems and human communities. The City of Port Alberni recognizes the value of the region's natural water resources, and the need to ensure a continuing reliable and safe supply of water for all residents. The City began working with residents to conserve water as early as the 70's and later in 2000 with the introduction of residential metering. This document is the City's first strategic Water Conservation Plan.

1.2. Why this is Important

The main drivers for conserving water are scarcity, cost savings and access to funds. While scarcity is not an immediate issue, the current supply may eventually approach capacity. Bringing Sproat Lake online would greatly improve supply but that is not a given at this point.

Reducing water usage reduces operations and maintenance costs, and infrastructure costs. Two important factors affecting these costs are average day demand (ADD) and maximum day demand (MDD). Reducing ADD for example, means that the City will spend less on consumables like electricity and chlorine. A high MDD means that pumping and treatment infrastructure are working hard on peak days when probability of expensive unscheduled maintenance is higher. Water conservation measures aim to reduce these factors.

Reducing water usage also impacts wastewater. Less water consumed means less wastewater to treat.

Planning for and implementing water conservation also increases chances of success in obtaining senior government grants by demonstrating effective use and management of this valuable resource. The City has applied for funding to support the water treatment plant project outlined in [1].

1.3. Scope

As part of a broader water management program this report provides the necessary information and framework to support successful long-term planning and implementation of water conservation. This plan focuses on the areas within the City boundary, while considering the overall Alberni Valley area and other jurisdictions involved in water supply and management in the region.

1.4. Report Roadmap

This report is organized into the following sections:

- Section 1 – Introduction, this section;
- Section 2 – Methodology – how this work was carried out;
- Section 3 – History and Forecast – what we know about the City and what we can predict;
- Section 4 – Goals and Targets – what a water conservation plan aims to achieve;
- Section 5 – Proposed Measures – what specific activities are planned;
- Section 6 – Implementation Strategy – details about who will lead the activities, how, and when;

2. Methodology

Water conservation planning aims to reduce water use by implementing water conservation measures also known as water demand management measures. This section describes the methodology used to set targets and select water conservation measures for Port Alberni.

Review History and Forecast

Data on system water production and end point water consumption was obtained and organized into a water usage model. We held discussions with staff to understand consumption patterns over the past years and to assess potential future changes to consumption patterns and what may be the consequences.

Set Goals and Targets

Review the benefits to water conservation and associated goals that are relevant to Port Alberni. Set specific targets in terms of reductions to specific measurable system parameters.

Develop Short List of Conservation Measures

Together with City Staff, the entire list of conservation measures¹ was reviewed and those measures that were likely to be relevant to the City were added to a short list.

Scoring Measures against Criteria

Each measure on the short list was discussed and given four scores from 1-5 in each of the following criteria:

- How easy is the measure to implement?
- How affordable is the measure to the City?
- How acceptable would the measure be to the rate payers?
- How effective is the measure likely to be in reducing consumption?

The total score of each measure was noted and discussed in relation to priorities. Higher scoring measures in general were viewed as more favorable and higher priority. The details of this scoring review are found in Appendix E.

Develop an Implementation Schedule with Staff

Each measure was finally reviewed once again with Staff and placed into a schedule to be implemented in one of the next 3 years.

¹ There is a wide range of conservation measures that are applicable within the City of Port Alberni. The *Alberni Valley Regional Water Study Update* [1] provides a detailed description of a number of conservation measures. It emphasizes the need to reduce peak summer water use and provides numerous options for reducing outdoor water use. The US Environmental Protection Agency (EPA) provides comprehensive documentation [5] on water conservation planning. The POLIS Water Project offers a different approach to water conservation [4]. Additional documentation related to this report is outlined in the References.

3. History and Forecast

Forecasting water use allows water supply managers to anticipate and prepare for the future requirements of a water supply system. They also allow managers to identify goals for water conservation that reduce system costs and minimize pressure on the natural environment. Water use forecasts are prepared by looking at historical water use and population and making projections based on this and other information that may influence future water use.

3.1. Historical System Demand

Port Alberni regularly measures system flows and universally meters water connections in order to monitor and evaluate system performance and bill for water use. The data obtained illustrate the effects of population size and water conservation measures on total water demand.

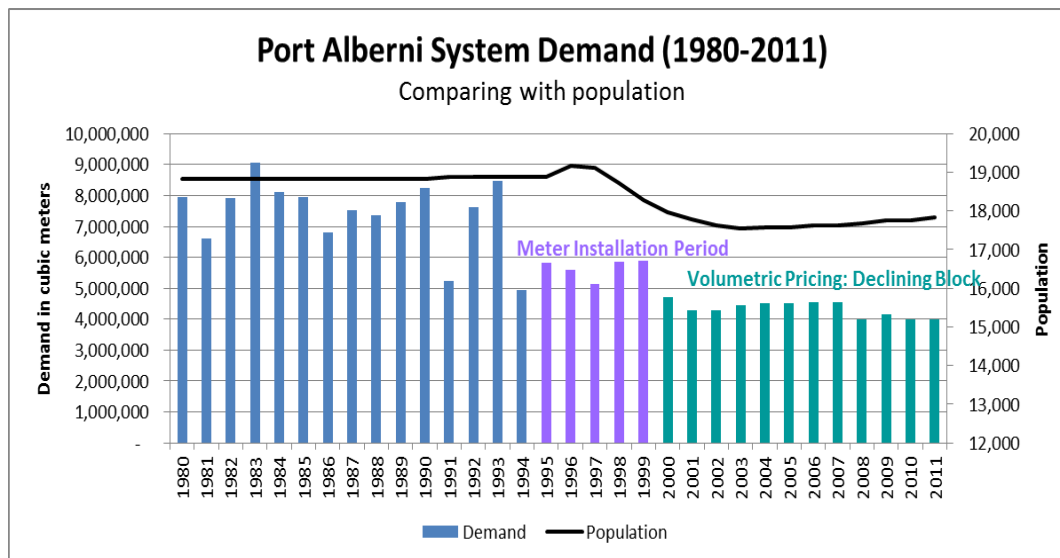


Figure 3.1: Port Alberni Total Water Production and Population 1980 to 2011

Figure 1.1 above confirms that universal metering is one of the most effective measures in reducing demand. Port Alberni has been implementing metering since the 1970's (commercial) and completed universal metering of residential customers around 2000. The figure above shows that annual water production to meet demand decreased significantly around the time meters were being introduced and has maintained this lower level since².

Figure 1.1 above also shows that while population has effectively been static over the past decade, water demand has decreased slightly. This effect is being observed in many communities throughout British Columbia and is evidence of the success of certain water conservation measures.³

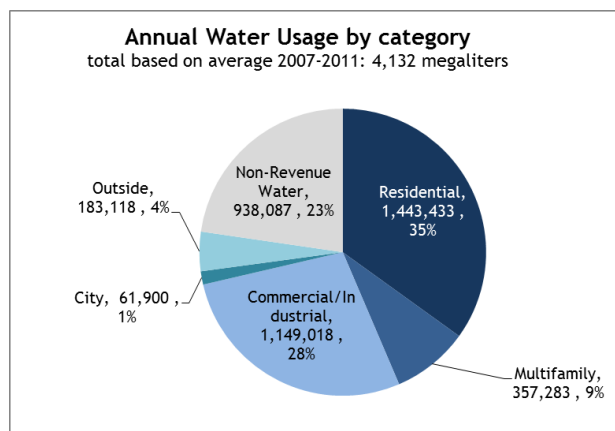
² Decreases in demand were also due to the fact that industrial and commercial activity reduced from 1995 to 2010 [1] and that Port Alberni population declined by about 8% from 1996 to 2003.

³ For example, the British Columbia building code requires the use of certain water efficient appliances and devices. The steady annual occurrence of home renovations and new developments are causing the proliferation of water efficient devices and appliances. Even if domestic water use behaviour doesn't change, the introduction of these devices and appliances will result in reduced average per capita water demand.

3.2. Comparing Metered and Non-Revenue Water

The following chart shows the source of water demand in the City. Because the City universally meters its customers, all billable water consumption is known. Comparing total billable consumption with the system total tells us that *non-revenue* water for the system is about 23% shown in this chart.

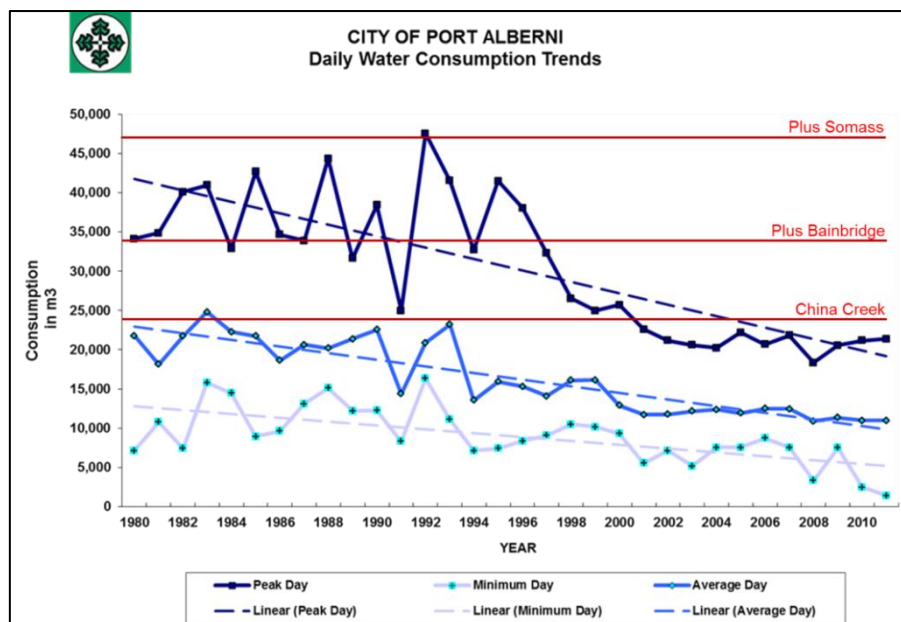
Figure 3.2: Port Alberni Annual Water Usage by Customer Category



3.3. Demand Characteristics

The following graph shows the history of City demand characteristics over the past 3 decades. It shows that maximum day demand (MDD is the dark blue line) and average day demand (ADD is the middle blue line) have decreased and leveled off. This is largely due to the introduction of universal metering.

Figure 3.3: Port Alberni Daily Consumption Trends (1980-2011)



These two system parameters are important factors affecting operating and maintenance costs, infrastructure costs and future upgrades to capacity. Reducing ADD means less overall annual consumption which will result in reduced pumping and chemical expenses.

MDD also affects pumping and treatment. Reducing MDD means infrastructure is not working as hard during peak days which reduces the probability of unscheduled maintenance which can be expensive. The red lines in the chart show the licensed capacity limits of the various sources: China Creek alone, China Creek + Bainbridge Lake and the highest red line is total system licensed capacity including emergency supply from Somass River. If MDD exceeds these, then new sources may need to be developed.

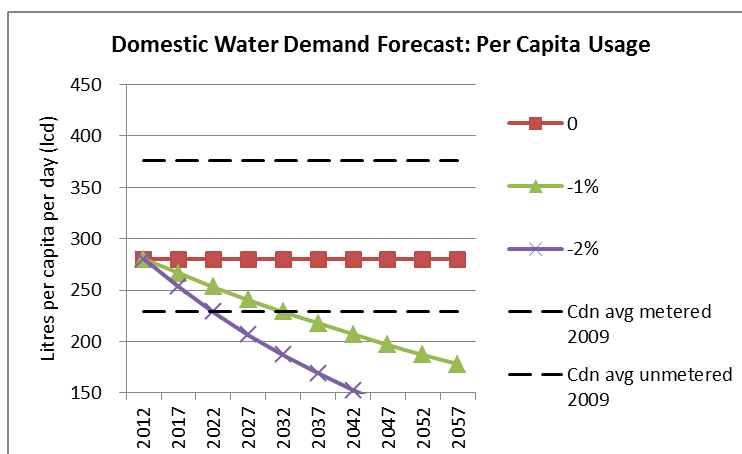
3.4. Population Projections

City of Port Alberni planning staff projects a long term growth rate of 0.5 – 0.75% per annum. By this projection, City population could be in the range of 20,000 to 25,000 by 2050. The total Alberni Valley population is projected to grow from 25,000 in 2009 to between 30,000 and 35,000 people by the year 2050 (Koers, 2010).

3.5. Per Capita Demand Forecast

Once again thanks to universal metering, domestic water demand for the City of Port Alberni is well known. This chart provides a forecast for per-capita domestic water demand.

Figure 3.4: Port Alberni 50 Year Per-Capita Domestic Water Demand Forecast

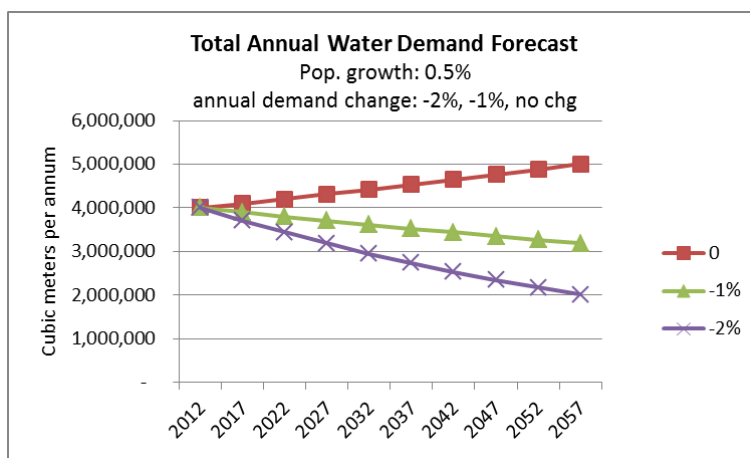


The Figure 3.4 above shows the average annual per-capita water demand in litres per person per day (lpcd) for both metered (229 lpcd) and unmetered (376 lpcd) Canadian communities. Port Alberni per-capita demand is between these averages at 282 lpcd. This chart suggests that there are opportunities for reducing City average day demand by reducing per-capita daily demand. With modest annual reductions to per-capita domestic demand (1% per annum) the City could reach the 2009 Canadian national average by 2032.

3.6. Total System Demand Forecast

This figure forecasts total system demand showing a range of changes in annual demand of 0 to -2%.

Figure 3.5: Port Alberni 50 Year System Demand Forecast Total



4. Goals and Targets

This section outlines the goals and targets that a community would like to realize from water conservation. These goals and targets are aligned with the City's Strategic Plan Goal number 1: A responsible, livable and environmentally sustainable community.

4.1. Water Conservation Goals

Benefits from water conservation may be divided into three categories: protecting the natural environment; reducing water supply and wastewater costs; and improving water supply as shown here:

Table 4.1: Water Conservation Goals

Protect the natural environment
1. Protect and preserve natural water resources.
2. Reduce the amount of greenhouse gases (GHG) that are produced when treating and moving water and wastewater.
Reduce water supply and wastewater costs
3. Extend life of existing infrastructure.
4. Eliminate, reduce, or postpone the costs of new infrastructure, including reservoirs, treatment facilities, pumping stations and pipelines.
5. Reduce operating costs associated with repair, treatment and power use.
6. Avoid new source development costs.
Ensure water supply demands are being met
7. Improve ability to provide water services with water of appropriate quality and quantity to meet customer needs.
8. Ensure requirements for fire protection are being met.
9. Improve drought and emergency preparedness.

4.2. Reduction Targets for the City

To achieve the goals listed in Table 4.1, the amount of water that is taken from the environment, treated, delivered to homes and businesses, and then, in some cases, discharged as wastewater must be reduced.

The following targets have been chosen in support of the goals list in Table 4-1:

1. Reduce annual average household water use by 18% (from 282 lcd to 229 lcd) by 2032 to match the Canadian 2009 average. This requires an average 1% annual reduction in per-capita water demand as shown in Figure 3.2.
2. Reduce unmetered non-revenue water from 23% to 10% by 2015. This is achieved mainly through a system water loss control strategy.
3. Reduce maximum day peaking factor currently at 1.8, to 1.6 or less by 2020. This is achieved mainly by reducing summer outdoor water use.

5. Proposed Measures

Water conservation planning aims to reduce water use by implementing water conservation measures also known as water demand management measures. This section of the plan outlines those water conservation measures that are proposed for implementation by the City.

5.1. Improve Water Use Accounting

Water conservation planning is a long-term and cyclical process, requiring review and elaboration of plans as information becomes available, situations change, and conservation measures that have been implemented are evaluated for their success. Fundamental to managing demand is to first understand where water is being used.

Implementing a system of water use accounting is a necessary first step in developing strategies for loss control. The costs of water leakage can be determined by looking at the costs associated with water supply treatment and delivery. Lost water produces no revenue. Repairing leaks can be costly but can produce substantial savings in water and money over time.

Next Steps for the City:

- Update annual water balance sheet giving a breakdown of system water use. The annual water balance sheet typically has the following format.

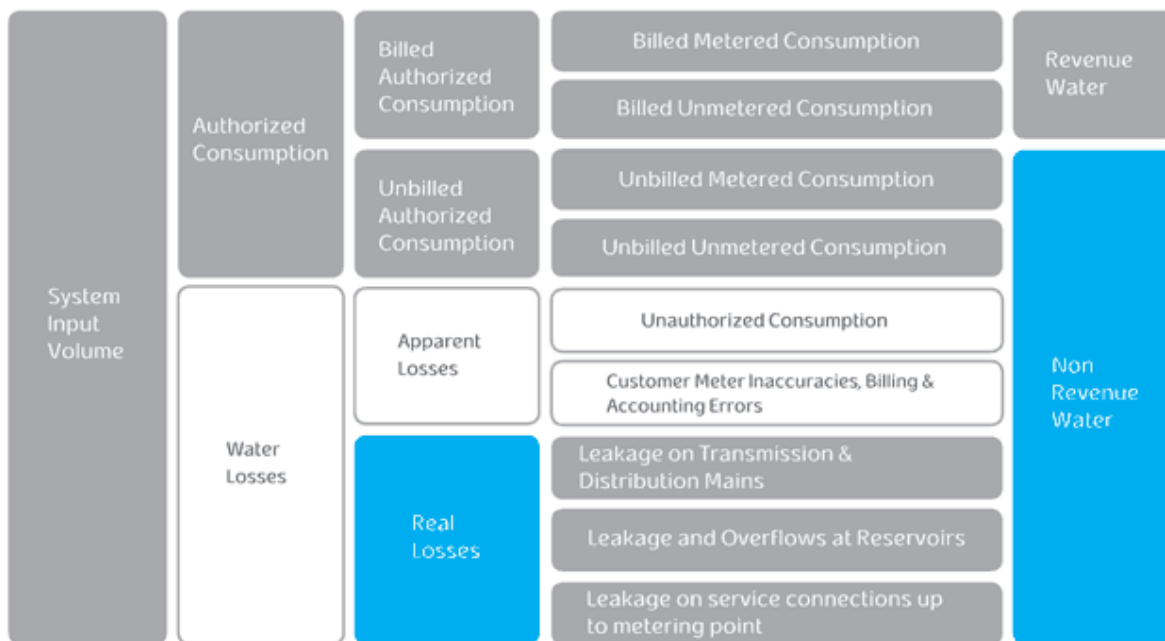


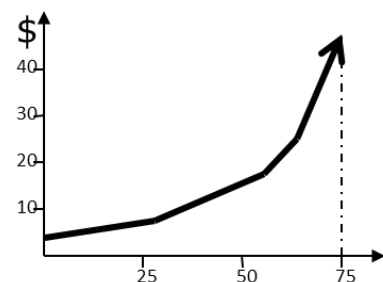
Figure 5.1: Annual Water Balance Sheet

- Improve reporting of municipal non-revenue water uses: fire-fighting, flushing;
- Investigate anomalies in winter water use data including whether some customers may be practising winter bleeding or other elevated winter uses.
- Develop a meter testing, calibration, repair and maintenance program; identify potential inaccuracies due to age;
- Upgrade meters for large users.
- Investigate the cost of upgrading and develop a pilot program to install fixed network continuous meter reading in specific locations;
- Analyze network model and identify locations for district (zone) meters;
- Develop a leak detection and repair strategy;
- Develop a plan to conduct a night-flow analysis;
- Calculate infrastructure leakage index ILI;
- Review potential benefits and costs of pressure management;

5.2. Residential Inclined Block Rate Structure

Residential has been a Constant Rate

As of 2012, the rate structure in the City is a declining block rate. The first block in this structure allows for 1,133 m³ per trimester (this is equal to 283 m³ per month, 9.4 m³ per day, or almost 4,000 l/ca/d.) This block amount is well beyond the typical per capita usage so few City residents will ever consume water beyond the first block. The net effect is that residential users effectively see a constant rate.



Increasing with an allowance (m³)

Introducing an Inclined Block Rate

Introducing an inclined block rate to the residential customer category may encourage further demand reductions – and particularly maximum day demand resulting from outdoor summer use. Adding another tier to the water price sends a specific message to customers: that excess water use is discouraged and will cost more. This price signal will motivate some individuals to change behaviour and consume less “excessive” water. This is mainly summer outdoor use such as irrigation and outdoor washing.

Next Steps...

The City has undertaken a Water Rate Study during the year 2012 and will be passing a new bylaw with adjustments to rates for 2013.

5.3. Enhanced Billing Information

Universal metering empowers users to affect their water costs. This is achieved at the point of billing by presenting users with their metered consumption and the resulting cost based on a price structure. Meter reads and volume pricing alone provide great incentive to reduce consumption. The greatest reductions are achieved by combining these with additional information on “how” to reduce consumption. Additional information can include the following:

Next Steps...

- Reporting per-capita demand for residential customers and comparing this with other comparable communities in BC and Canada;
- Providing a system average and noting where individual users are relative to the average;
- Reminding top users that they are the biggest consumers;
- Reminding users of some cost effective approaches to reducing water consumption;

5.4. Outdoor Water Use Efficiency

Outdoor water use in the summer tends to be the biggest contributor to maximum day demand. The following measures can lead to reductions in outdoor use and help minimize max day demand.

Next Steps...

- Encourage the use of water efficient landscape and irrigation designs; provide a guide to homeowners and landscapers on water efficient landscaping;
- Provide examples of water efficient landscaping at public sites;
- Investigate a program to offer one-time discounts on water bills for water efficient garden designs / irrigation systems connected to sensor / professionally installed irrigation systems;
- Review and update water-use regulations bylaw;

5.5. Indoor Water Use Efficiency

Indoor water use represents a significant portion of average day demand. The most effective measures to help reduce indoor water use are related to installing water efficient devices and appliances. There is a natural uptake of these devices already: each year as homes and businesses are renovated, older devices and appliances are replaced with newer more efficient ones. The City can encourage and support this trend in several ways:

Next Steps...

- Provide brochures reminding users of the most cost-effective water efficient devices and appliances. Include in brochures indoor leak awareness education as well: dripping faucets, running toilets etc...
- Investigate offering a rebate for certain water efficient fixtures, appliances, and major commercial equipment;
- Visit and audit large commercial users; collaborate with them in developing a plan for upgrading fixtures and other commercial equipment;
- Present water smart awards for reducing usage;

5.6. Public Engagement

Passive Engagement

Information and education are of major importance in a conservation program. They support changes in the water use patterns of consumers. Customers who are informed and involved are more likely to support conservation goals. Elements of an information and education program may include:

- Understandable water bills
- Informative water bills
- Landscaping guidelines
- Winter bleeding guidelines
- Rainwater Harvesting guidelines
- Indoor water conservation guidelines
- Water bill inserts
- School programs
- Public education program
- Workshops
- Advisory committee
- Website related content including comparisons within and outside the community

Active Engagement

Providing information in a passive way is important to the overall water conservation program. However, it is more effective to be interactive and engage the public directly. The City will investigate how it can better reach the public in a more interactive way by exploring the following approaches:

Next Steps...

- Investigate undertaking a survey of the public to better understand public behaviours and expectations;
- Investigate developing online interactive content for the website: water conservation calculators, water conservation-oriented videos; other applications including games related to water conservation;

6. Implementation Strategy

This section outlines how this water conservation plan will be implemented. Implementation schedules on the subsequent two pages will be filled out as more details are known: who will be involved and when certain activities will be undertaken.

6.1. Adoption of the Plan

City Staff will review this plan with Council and pending approval by Council Resolution, a final version of this plan will be adopted and implemented by City Staff.

6.2. Monitoring and Evaluation

The City will continue to gather data on flows and consumption and report annually on the results including the following system parameters:

- Total system production
- Tri-annual and annual consumption for each customer and totals for each customer category
- Per-capita domestic demand
- System average day and maximum day demand

The City will plot these parameters on a graph along with earlier historical values. A trend line will be adjusted annually to show whether the City is on track to meet the targets outlined in previous sections.

6.3. Implementation Schedule

A schedule for implementing the selected water conservation measures is presented in Table 6.1.

Table 6.1: Implementation Schedule for Short-Term (2013 – 2015) Measures

Measure	Required Action	Internal Responsibility	Action Partners	Action Schedule			Notes
				2013	2014	2015	
Improve Water Use Accounting	Annual update of Water Balance Sheet including Infrastructure Leakage Index (ILI)	Eng.		✓	✓	✓	
	Improve Reporting of Municipal non-revenue water uses	Eng.			✓		
	Develop a meter testing program	Eng.		✓			Accuracy analysis underway
	Upgrade meters for large users	Eng.		✓			Included in 2013 operations budget (\$40,000)
	Investigate continuous metering technology	Eng.		✓			Research and meeting with suppliers
	Investigate, pilot, launch district metered areas	Eng.				✓	
	Conduct night-flow analysis	Eng.				✓	
	Develop a leak detection and repair strategy	Eng.				✓	
Inclined Block Rates	Conduct rate review study and implement inclined block rates	Eng.		✓	✓		
Enhanced Billing Information	Reporting domestic demand statistics and comparing with other communities	Eng. & Finance		✓			
	Reporting domestic average and noting relative position on individual bills	Eng. & Finance		✓			
	Reminding top users	Eng. & Finance		✓			

Measure	Required Action	Internal Responsibility	Action Partners	Action Schedule			Notes
				2013	2014	2015	
	Reminding users of key conservation strategies at home	Eng. & Finance			✓		
Outdoor Water User Efficiency	Develop Water Efficient Gardening Guide	Eng. & Parks		✓			
	Water Efficient Gardening examples at public sites	Eng. & Parks				✓	
	Examine one-time discounts on water bills for water efficient designs	Eng. & Parks				✓	
	Review and update water use regulation bylaw	Eng.			✓		Review and upload to website
Indoor Water User Efficiency	Explore rebates for water efficient fixtures	Eng.			✓		
	Visit and audit large users	Eng.		✓			
	Explore water smart award program	Eng.			✓		
Public Engagement	Public Survey on Water Conservation	Eng.			✓		
	Online Interactive Content	Eng.			✓		

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- [5] U.S. Environmental Protection Agency (1998). Water Conservation Plan Guidelines. Available at: <http://epa.gov/watersense/pubs/guide.html>
- [6] Environment Canada (2011). Municipal Water Use Report. Available at: http://www.ec.gc.ca/Publications/B77CE4D0-80D4-4FEB-AFFA-0201BE6FB37B/2011-Municipal-Water-Use-Report-2009-Stats_Eng.pdf

Appendix A: Water System Profile for Port Alberni

The City of Port Alberni is supplied from a surface water intake on China Creek, supplemented by stored water in Bainbridge Lake. The China Creek intake consists of a dam across the river at elevation 184 m.

In 2005, the Hupacasath First Nation established a hydro-electric generating station on China Creek, taking water upstream from the water supply intake, and discharging downstream of the intake. An agreement between the City of Port Alberni and the Hupacasath First Nation (3) governs the joint use of the Creek with appropriate priority provisions for water supply and fisheries release.

The China Creek watershed above the intake is 5,700 ha in area. A dam on Lizard Lake provides an off-line watershed storage volume of 545,000 m³ that is released during the summer if creek flows drop below minimum values.

The China Creek supply is subject to frequent turbidity spikes in response to high runoff. When turbidity threatens to exceeds 1 NTU, the supply from China Creek is shut down and water is then drawn from Bainbridge Lake, which has a live storage volume of 1,230,000 m³. Water from Bainbridge Lake can flow to the City distribution system by gravity to the Lower and Upper Cowichan reservoirs, or by pumping under high demands. A pump station at the Lower Cowichan reservoir can transfer water to the Upper Cowichan Reservoir as well.

The water supply is chlorinated at the Bainbridge pump station. The total licenced capacity is 34,240 m³/day (24,450 from China Creek and 9,790 from Bainbridge). The hydraulic capacity of the supply system is 24,500 m³/day from China Creek and 15,700 m³/day from Bainbridge Lake.

The City maintains an emergency source on the Somass River, with a licenced capacity of 13,565 m³/day and a hydraulic capacity of the pump station of 17,000 m³/day. This source of water is chlorinated. It is only used in emergency conditions because of poor water quality in the summer months from fish runs and agricultural runoff upstream.

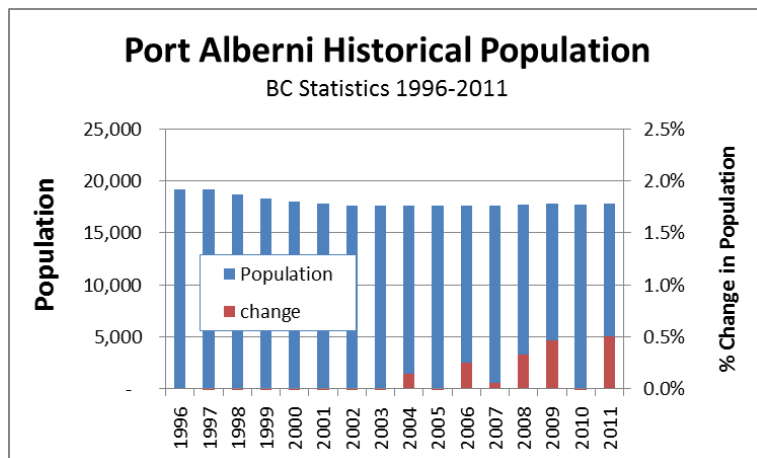
The City water distribution system is divided into several pressure zones, controlled by the main distribution reservoirs at Upper and Lower Cowichan, Burde Street, and Johnston Street, most of which are interconnected by pressure reducing valve stations. The various pressure zones originated as the system developed with merging of separate systems after amalgamation of North and South Alberni, further complicated by the variable topography and the presence of several deep ravines with few road crossings.

Since 1995 the City has also incorporated the Sahara Heights and Arrowsmith Heights Water Users Communities, and integrated the distribution systems of these areas with the City's water system.

The City is also currently in the process of negotiating a partnership to supply Beaver Creek Improvement District with water.

The City completed universal metering of all residential connections in 2005 and is now fully metered.

Figure A1: Port Alberni Population 1996 to 2011



The population of Port Alberni declined by about 8% from around 1995 to 2003. Industrial and commercial activity during this time also declined (Koers, 2010). The population of Port Alberni has steadily increased over the past decade.

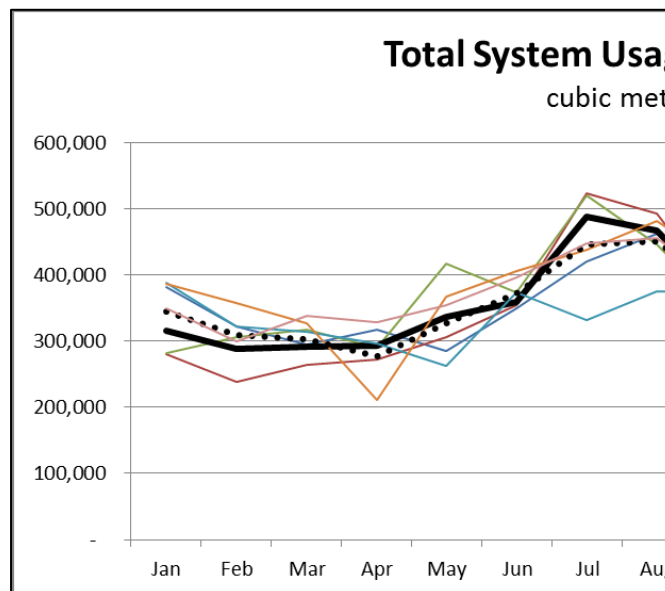


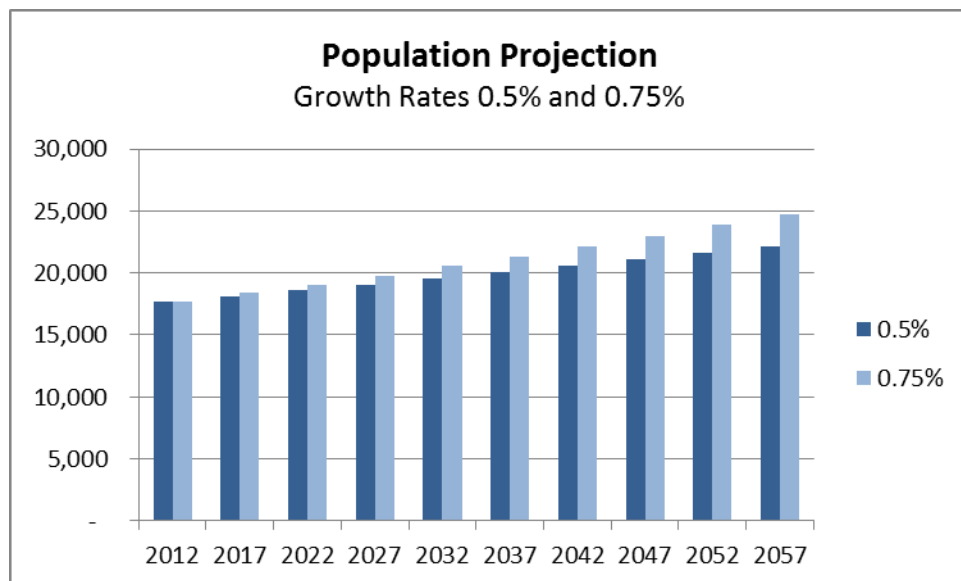
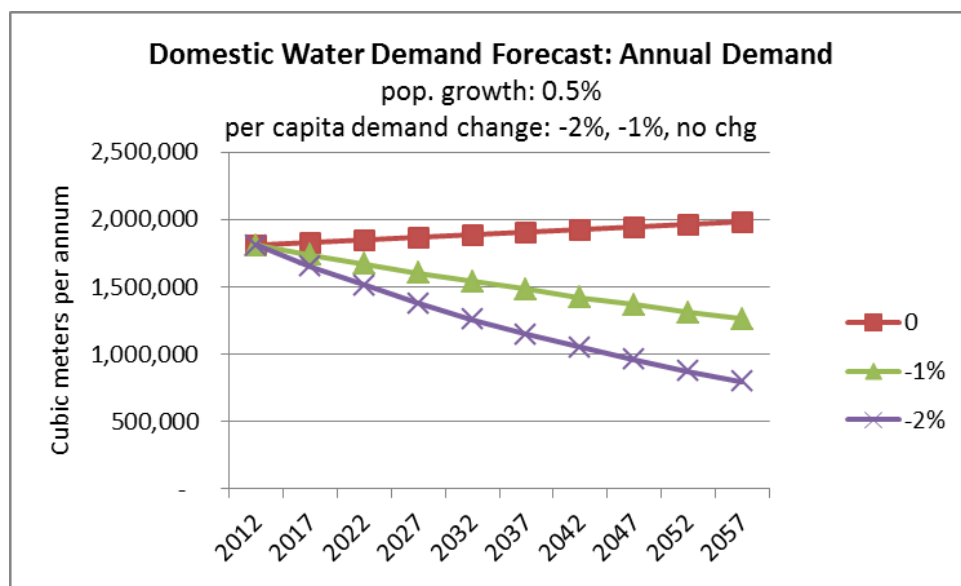
Figure A3: Port Alberni Population Projection**Figure A4: Port Alberni Projected Total Annual Demand**

Figure A2: Port Alberni Monthly Water Demand 2006-2011

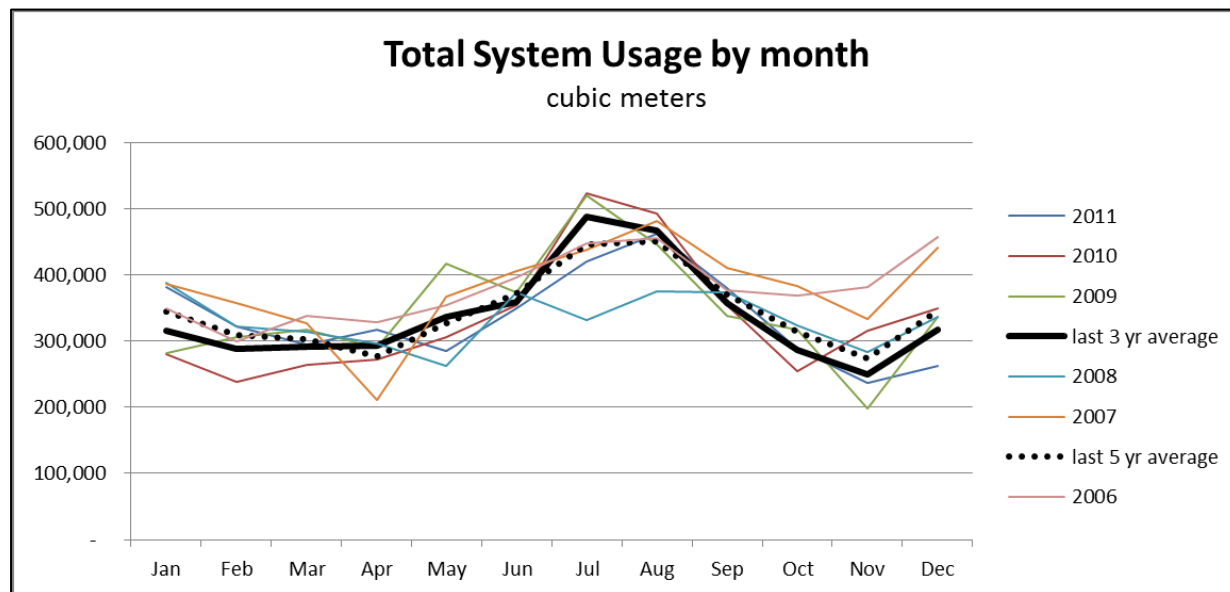


Figure A3: Port Alberni Population Projection

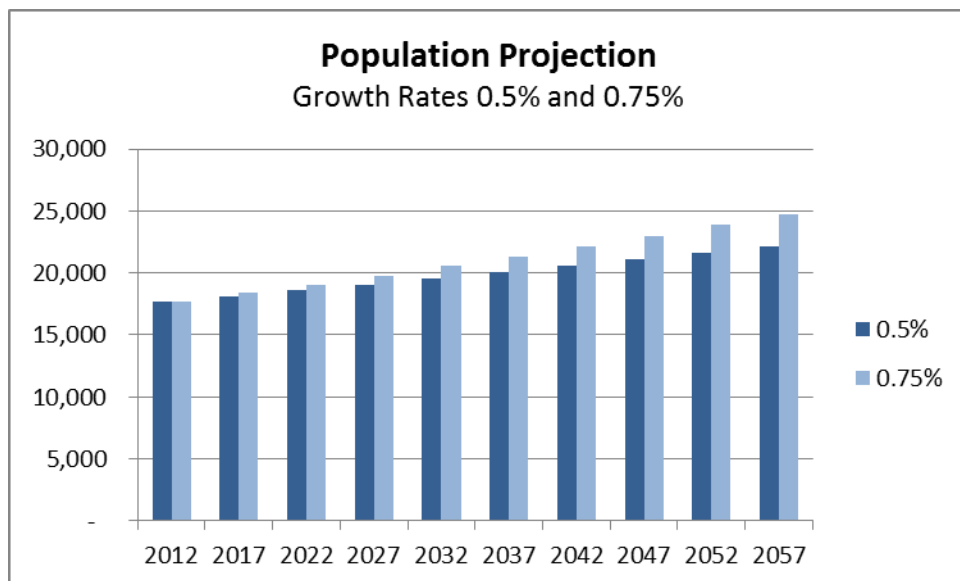
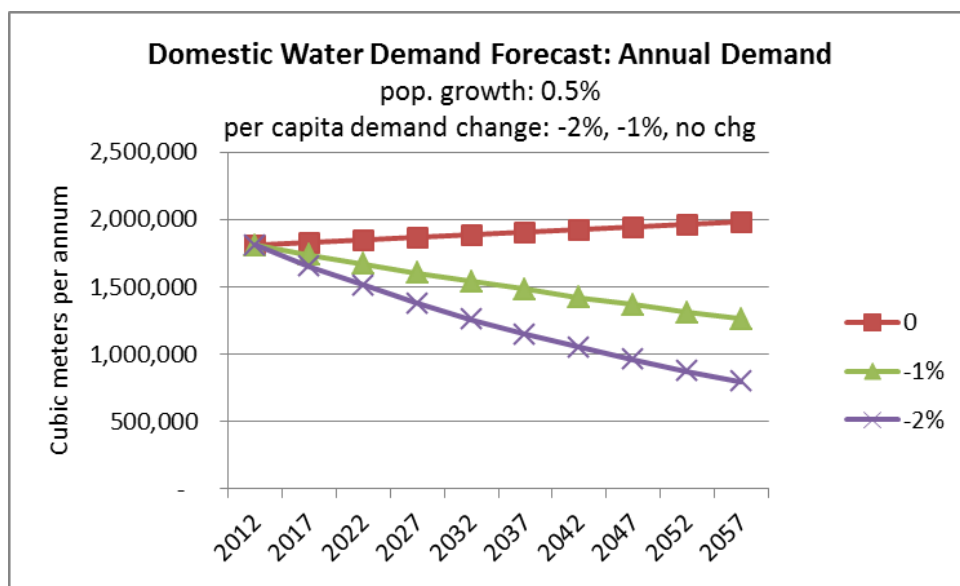


Figure A4: Port Alberni Projected Total Annual Demand



Appendix E: Water Conservation Measures Review

Water Conservation Priorities	
High Priority	0
Medium Priority	0
Low Priority	0

Port Alberni Water Conservation Measures Shortlist

	Criteria 1 Easy to Do	Criteria 2 Affordable	Criteria 3 Acceptable	Criteria 4 Effective	Total	Priority
Universal Metering, Pricing & Billing						
M1 Develop a meter testing, calibration, repair and maintenance program; identify potential inaccuracies due to age; upgrade meters for large users; adopt continuous metering technology	2	4	4	2	12	2013
M2 Send notices to high users	4	4	3	3	14	2013
M3 Provide information with water bill comparing use to other users	2	3	5	3	13	2013
Water Accounting						
M4 Complete an annual water balance sheet	5	5	5	1	16	2013
M5 Identify cause of high winter use	3	3	5	3	14	2013
Non-Revenue Water Control						
M6 Develop a non-revenue water control strategy	3	3	5	5	16	2013
Develop Infrastructure Leakage index						
Night Flow analysis						
High winter use investigation						2013
Analyze network model to and develop DMA strategy						2013
Improve reporting of non-revenue water						
Pressure Management						
Develop a leak detection & repair strategy						2013
Public Awareness and Involvement						
M9 Develop new brochures e.g. Landscape Guide to Water Efficiency, Indoor Water Conservation	3	3	4	1	11	2013
M10 Develop a website including water use calculators and brochures	3	3	4	1	11	2013
Outdoor Water Use Efficiency						
M13 Showcase water efficient landscape and irrigation designs at public sites	2	2	4	1	9	TBC
M14 Offer one-time discounts on water bills for water efficient garden designs / irrigation systems connected to sensor / professionally	1	3	3	3	10	TBC
M15 Review and update water-use regulations bylaw	3	3	3	3	12	2013
Indoor Water Use Efficiency						
M16 Offer a rebate for water efficient fixtures, appliances, and major commercial equipment	2	2	4	3	11	TBC
M17 Visit and audit large users; present water smart awards for reducing usage	3	4	4	4	15	2013

Appendix F: Notes

Summary of Discussion between Guy, JP and Chris Downey (Koers)
Email JP to Guy & Chris – August 9, 2012

Context

Development of PA Water Conservation Plan. Two equally important drivers are scarcity and cost savings. The current supply may approach capacity in the future. Bringing Sproat Lake online will greatly improve supply but that is not a given at this point. Reducing water usage will also reduce the cost of service and increase chances of success in getting a senior govt grant for WTP project. There are two main categories of costs – O&M, and infrastructure. Many factors affect these costs including three fundamental service characteristics outlined below.

Average Day Demand (ADD)

Average day demand affects operating costs, especially treatment costs; capital costs can also be affected when certain thresholds are exceeded.

PA Domestic per capita demand is 281 Lcd – Canadian average domestic per capita demand for metered communities is 229 Lcd

It is reasonable to expect per capita demand to decrease further.

Natural uptake of water efficient appliances and devices is contributing about 0.5% to 2% decreases per annum in many communities across BC.

Introducing inclined block rates to customers may further encourage water use reductions, particularly in the summer.

PA unmetered non-revenue water (leaks, flushing, fire dept) is about 20% - JP thinks majority of that is attributable to leaks – needs further investigation.

The master meter readings indicate elevated water use during winter months, suggesting possible winter bleeding –needs further investigation.

Future pump stations and reservoirs will need to be designed with ADD in mind.

Leak Detection – DMA metering – repair leakage around existing reservoirs

Pressure Management - controlling PRVs with SCADA at night, reducing pressure to reduce nighttime leaks

Maximum Day demand (MDD)

Max day demand affects the Capacity of the source (pumping and treatment)

In the past few years, MDD for PA (pop 17,000) has been about 1,250 Lcd.

The proposed regional water system total maximum day demand requirement based on population of 30,000 using 1,000 Lcd.

Residential summer use may be largest contributor to MDD.

Have lots of distribution storage but it's ageing; PA will need to make critical decisions soon about upgrades to distribution storage.

Maximum hour demand (MHD)

Max hour - 32,000 m³/day = 360 - 380 lps → 1,850 lcd

MHD impacts main distribution water pipework – MHD is indirectly impacted by focusing on reducing MDD.

Chris has a hydraulic model of City water and sewer infrastructure.

Developing specific targets for MHD may be too technical for now – City may review again in a future update to the WCP.