# Table of Contents

1.0 Introduction ................................................................. 1  
   1.1 Authorization ............................................................... 1  
   1.2 Background ............................................................... 1  
   1.3 Purpose ................................................................. 1  
   1.4 Key terms ............................................................... 1  
   1.5 Watershed Protection Planning Sequence .......................... 2  

2.0 Watershed Protection Vision Statement ............................... 3  

3.0 Background Information .................................................. 5  
   3.1 Baseline data ............................................................. 5  
   3.2 Provincial legislation .................................................... 7  
      3.2.1 Auditor General’s report ......................................... 9  
      3.2.2 Drinking Water Protection Act ................................. 9  
      3.2.3 Water Management Plan ....................................... 11  
   3.3 Vancouver Island policies ............................................ 12  
      3.4 Local bylaws that include watershed protection ............... 13  
         3.4.1 Comox Valley Regional District ............................ 13  
         3.4.2 City of Courtenay ............................................... 14  

4.0 Stakeholder consultation .................................................. 15  
   4.1 Methodology ............................................................ 15  
   4.2 Key values ............................................................. 15  
   4.3 List of actions .......................................................... 15  

5.0 Recommendations ......................................................... 17  
   5.1 Stakeholder consultation ............................................ 17  
   5.2 Education initiatives .................................................. 17  
   5.3 Monitoring of sewage disposal ..................................... 18  
   5.4 Partnerships ........................................................... 18  

6.0 Knowledge gaps .............................................................. 19  

7.0 Secure funding ............................................................... 20  

8.0 Conclusions ................................................................. 21
List of Tables

Table 1: Other provincial and federal legislation responsible for drinking water quality. 8

List of Appendices

Appendix A: Map of Comox Lake Watershed
Appendix B: Description of Land Ownership
Appendix C: Shoreline Land Ownership Map
Appendix D: Vision Statement from Stakeholder Consultation
Appendix E: February 2011 Stakeholder Consultation Session
Appendix F: May 2011 Stakeholder Consultation Session
Appendix G: Summary of February 2011 Stakeholder Consultation Session
Appendix H: Feedback Comox Valley Water Watch Coalition
Appendix I: Feedback Ministry of Health
Appendix J: Feedback BC Hydro
Appendix K: Feedback TimberWest
Appendix L: Submitted TimberWest Ownership Map 2007
Executive Summary

A watershed protection plan is pre-emptive and intends to prevent risk to water quality before it occurs. The development of a plan is based on watershed characterization, risk assessment and identification, ultimately ending with recommendations for action-based mitigation strategies to address identified risks. The goal of a watershed protection plan is to manage activity in order to minimize any potential adverse effects and reduce or eliminate current impacts on water quality.

This report recommends watershed protection actions specific to the Comox Lake watershed. A challenge in the Comox Lake watershed is that it is a multi-use and multi-owned watershed. Along the shoreline, there are nine different categories of landowners or responsible jurisdictions. The watershed is a popular recreational spot for swimming, boating, fishing and hiking, with active logging in the watershed. Most importantly, the watershed provides drinking water to approximately 60% of Comox Valley homes and businesses.

A watershed characterization and risk assessment for the Comox Lake watershed has already been conducted and served as the basis for this report. The recommended actions have been informed by two stakeholder sessions that were held in February and May 2011.

The main recommendations from the report are to:

- Consult with stakeholders on a quarterly basis, specifically key landowners, government agencies, and professional consultants;
- Support public education initiatives;
- Establish a septic disposal education and monitoring program;
- Support partnerships with non-profits;
- Develop detailed risk mitigation actions;
- Review the need for future studies;
- Establish communication protocols; and
- Secure ongoing funding.
1.0 Introduction

1.1 Authorization

This report has been prepared based on Wedler Engineering LLP’s proposal of services to the Comox Valley Regional District. It is the initial phase of the development of a watershed protection plan, an action listed under Goal 1: to deliver safe high quality drinking water in the Regional Water Supply Strategy.

1.2 Background

The development of the watershed protection plan has been funded by the Public Health Agency of Canada (PHAC). The project deliverables included a watershed protection planning template and plan for Comox Lake. The baseline data was gathered from watershed protection plan from other jurisdictions, planning documents, and similar reports developed in the Comox Valley. The development of a watershed protection plan is one of the recommended objectives in the Regional Water Supply Strategy.

1.3 Purpose

This watershed protection plan will establish action-based steps to mitigate assessed risk factors to drinking water source(s) that fall under the jurisdiction of the Comox Valley Regional District by:

- Creating an awareness of activities and attached risks present in the watershed;
- Building relationships with stakeholders with the intention of networking and providing feedback to the development of a watershed protection plan; and
- Draft recommendations for risk mitigation actions based on stakeholder consultations.

1.4 Key terms

**Watershed**: an area of land that contributes runoff to a specific delivery point, such as the mouth of a river. Large watersheds may be composed of many smaller sub-watersheds, each contributing runoff to various streams and rivers that meet at a common delivery point. In the Comox Valley, the Browns, Tsable and Oyster Rivers and Comox Lake have been labeled critical watersheds in the Nature without Borders report. Critical watersheds are catchment basins that provide a wide-range of purposes, which in addition to drinking water, provide corridors for wildlife.

**Watershed protection plan**: framework to guide actions to protect water quality.

**Safe water**: potable water that meets all recognized water quality standards as required by health authorities.

**High quality water**: source water that has not been contaminated or subject to human activity or degradation.
1.5 Watershed Protection Planning Sequence

Watershed protection planning is a multi-phased process that on average takes two years to complete. Typical project stages are identified below.

**Phase I** Risk identification and assessment

The issues to be addressed in order to create the plan are characterization of the water source and assessed risks, authority and policy/jurisdictions involved in local governance, and enforcement practices already present

Process for public and stakeholder consultation and local challenges outlined

Establish who is to be responsible for the different stages of the plan – background studies, stakeholder meetings

This stage is complete.

**Phase II** Analysis and development of options

Actions/aspects of watershed management to meet the assessed risks

Timeline for completing the plan and prioritization of the actions to meet the assessed risks

Funding sources – on-going, i.e., bylaw to have a parcel tax to explicitly fund watershed protection

Communication protocols

Partnerships and/ or watershed boundaries shared with other communities

**Phase III** Develop recommendations, seek government decisions, and proceed with implementation

This report represents the beginning of phase II. The following pages are summaries of relevant data and legislation, including stakeholder consultation that has informed the list of recommendations to mitigate risks to the Comox Lake watershed. This report is a planning tool and should not be considered the final document in the process of watershed protection planning in the Comox Lake watershed.

Further tasks including dedicated funding in order to detail mitigation strategies and formalize a communication protocol will complete Phase II.
2.0 Watershed Protection Vision Statement

In February of 2008, the Province of British Columbia delivered letters patent to the newly formed Comox Valley Regional District (CVRD), which included a requirement for “the development of a recommended regional water supply service plan and recommended structure for operating the regional district’s water supply services in the area.”

In order to meet the above requirements, and provide strategic direction for water supply for the entire region, the following has been established as the vision for the CVRD for water supply:

We provide a long term, high quality, reliable water supply to the entire Comox Valley while protecting ecosystems and the environment.

To support the execution of this vision, the following goals were developed:

Goal 1 – Deliver safe high quality drinking water.
Goal 2 – Provide cost effective and reliable water supply and delivery into the future.
Goal 3 – Ensure clear, accountable, and equitable water management and governance.
Goal 4 – Educate and engage citizens to value water.

The Regional Water Supply Strategy has been endorsed by the Town of Comox and the Village of Cumberland as of May 2011.

An action listed in Goal 1: “deliver safe high quality drinking water” was to develop a watershed protection plan. This report advances that goal.

For the purpose of this report, the watershed in question is that of Comox Lake defined in the map at Appendix A. It is currently a multi-use lake that has nine categories of land ownership along the shoreline, along with recreational and commercial users throughout the watershed on land, water and in the air. (Appendix B and C)

Based on stakeholder consultation (Appendix D), possible vision statements for watershed protection are:

- To provide a long term (sustainable) high quality safe water supply
- To protect a water source so that it can provide high quality safe drinking water for now and future generations.
- To ensure the water and ecosystems are protected to achieve and maintain a high quality sustainable water source.
Possible goals to be included in the vision:
- Human health equals community well-being
- Ecosystem protection, specifically wildlife and fish habitat
- Public ownership/responsible ownership through knowledge and enforcement of bylaws

Overall the key values the group agreed upon for watershed protection were: sustainable; high quality; and safe.

The recommended vision statement is:

The Comox Valley Regional District will ensure that water sources and ecosystems within their jurisdiction are protected in order to provide a high quality, sustainable drinking water supply alongside a viable fish and wildlife habitat.
3.0 Background Information

3.1 Baseline data

In 2006, the Comox Valley Strathcona Regional District embarked on a watershed assessment of Comox Lake. Consultants undertook a characterization of the water source, a contaminant source inventory, a water system description, and a risk characterization. All technical memorandums can be found at this web link.

Quoted from Comox Lake Watershed Assessment Water System Description 2006:

“Overall, Comox is an excellent water source for community water supply. The main concern is that as unprotected surface water supplies, the sources are susceptible to contamination by bacteria, viruses, Giardia and Cryptosporidium from humans, domestic and wild animals. These microorganisms are found in even the most pristine surface waters” (page 4).

Information summarized from the report entitled Comox Lake Watershed Assessment Characterize Risks 2006:

The primary goal of the Comox Lake watershed risk assessment was to identify the major risks to the Comox Lake water source so that a future program to mitigate these risks could be developed with the major stakeholders in the area.

The watershed assessment followed the sections of the Province of British Columbia’s proposed Comprehensive Drinking Water Source to Tap Assessment Guideline that includes the characterization of the water source, an inventory of the potential contaminant sources, a description of the water supply system, and the characterization of the risks posed to the water source.

The methodology used in the study incorporated the:

- Likelihood that the event will occur;
- Consequences of the event if the event occurs; and
- Vulnerability of the watershed to the event.

Risk to the watershed was measured by the time it would take to enter the intake pipe and the proximity to the intake pipe, which has been categorized as the time-to-impact barrier. The closer the risk events occur in time and distance to the intake pipe the higher the risk.

Very High Risks included:

1. Vehicular traffic over the bridge close to the Comox Lake outlet
2. Transportation on roads adjacent to Puntledge River
3. Boating on Puntledge River upstream of penstock
4. Intentional harm to the water source
High risks included:

1. Logging within 300 metres of the Puntledge River between Comox Lake outlet and penstock intake
2. Transport on roads 1km of the Puntledge River upstream of the penstock
3. Wildlife contamination between outlet and penstock (eastern portion of lake)
4. Potential aircraft crash in Comox Lake or near Puntledge River
5. Lakeshore cabins and camping in undesignated areas (eastern portion of lake)
6. Boating and fishing (eastern portion of lake)
7. Flooding

The Watershed Assessment report concluded that the greatest effect to mitigate risk would be to relocate the intake upstream of major human activities. Remaining risks could be reduced by eliminating human activities upstream of the new intake, prohibiting or severely restricting activities in or around the lake downstream of the intake, and eliminating existing development and activity below the probable maximum flood level.

The report entitled Mitigation of Water Source Risks at Existing Intake (2007) listed actions by the Comox Lake Watershed Interest group, which included:

- Assessments of logging plans, water sampling, water quality protection, buffers along streams, following environment guidelines.
- Monitoring forest road status and addressing measures to reduce risks of bridges.
- Provide information of locations and frequency of beach-use.
- Install a septic system for wastewater management.
- Provide rules for boat users (cleaning boats, no throwing, refueled onshore).
- Provide rules for campers and beach-users (pets to be on leashes, droppings cleaned up, no dogs in swimming area; no plastic bags or disposable diapers in outhouses, no gray water release; provision of garbage and recycle containers).
- Provide information about boat users (frequency of use and parking areas).
- Provide information about numbers of cabins and period of lease agreement.
- Provide rules for fishing users (launched from boat ramp only and beached in posted areas only).

In this report, the consultants added additional actions:

- Introduce wastewater treatment systems to residential cabins.
- Public education, enforcement of compliance with rules, and reducing camping areas and number of sites for camping and beach-use.
- Prohibit naval and/ or air force training on the lake.
Finally, the phase three reporting in the series of technical memorandums (unavailable in electronic format), Comox Lake Watershed Assessment Phase 3 Risk Validation, based their findings on data collected from fifty-two North American lakes. The findings were that outbreaks of waterborne disease occurred only in systems where human and/or animal activity in the watershed was not restricted. Conclusions were:

- Outbreaks of waterborne disease occurred only in unprotected watersheds.
- In unprotected watersheds, advanced treatment significantly reduces, but does not fully eliminate, the risk of outbreak.
- Where watershed protection is included in addition to advanced treatment, the risk of outbreak is near zero.
- Watershed protection is a major factor in reducing the risks.

The series of technical memorandums concluded that the greatest effect on reducing the risks would be obtained by relocating the intake upstream of the major human activities and eliminating/limiting human behaviour upstream of the intake.

3.2. Provincial legislation

All water in British Columbia is owned by the Crown on behalf of the residents of the province. It is the Water Act that outlines the rules of engagement for licensing, diversion and use of water.

The provision (and protection) of potable water is generally dealt with through the lenses of quantity and quality. The Ministry of Environment is responsible for monitoring the flow/quantity i.e. licensing access to surface waters in the province, and monitoring water quality at the point of diversion of the natural stream into a waterworks system. The Guidelines for Canadian Drinking Water Quality are national standards set by Health Canada; these are guidelines that can be adopted and/or altered by the province. These guidelines apply to drinking water at the point of consumption after it has been treated. The Ministry of Health sets the standards for drinking water quality in the province based on the national guidelines. There are four basic requirements for delivery of safe drinking water known as the multi-barrier approach:

1. Source protection
2. Appropriate water treatment
3. Maintained distribution system
4. Adequate monitoring

The monitoring drinking water quality regulations are the responsibility of the Ministry of Health as enacted in the Drinking Water Protection Act and Regulation, although, there are other key jurisdictions that have responsibility for drinking water quality (Table 1 on the following page).
### Table 1: Other provincial and federal legislation responsible for drinking water quality

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Jurisdiction</th>
<th>Connection to maintenance of drinking water quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Managed Forest Land Act</td>
<td>Private Managed Forest Land Council</td>
<td>Numerous aspects define how forest activities in and around streams (streamside harvesting and road construction) must ensure no material adverse effects on water quality; Penalties and fines exist; Agreement with drinking water purveyors of community water supplies is needed when building road within 100m of intake; Applicable to landowners who opt their private land into the Private Managed Forest Land Program (under the Minister of Forests, Land and Natural Resource Operations); Private Managed Forest Landowners pay property tax and must demonstrate a forestry management commitment; and Exit fees are arranged as a further incentive for landowners to keep land in this class.</td>
</tr>
<tr>
<td>Water Act</td>
<td>Ministry of Environment</td>
<td>Applicable to any private landowner regardless of land class; Anyone that may conduct activities that has the potential to negatively affect water quality at a licensed water intake must notify the owner of that license; Penalties and fines exist; Expropriation of lands is an option if known to be operated in a way that is materially degrading water quality for licensed users; Anyone who impairs water which is allocated to a water license is required to provide a substitute source to the licensee until the problem is rectified; Numerous specifications about how and what types of activities can happen in and around streams; and Water Management Plans are an option.</td>
</tr>
<tr>
<td>Environmental Management Act</td>
<td>Ministry of Environment</td>
<td>Provisions regarding discharge of waste into or near water bodies and landfills near water bodies.</td>
</tr>
<tr>
<td>Federal Fisheries Act</td>
<td>Fisheries and Oceans Canada</td>
<td>Applies to all watercourses that support fisheries; Penalties/fines for any harmful alteration, disturbance, or disruption of a fishery and/or related habitat; and good water quality for fish normally equates to good water quality for drinking water.</td>
</tr>
<tr>
<td>Fish Protection Act</td>
<td>Ministry of Environment</td>
<td>Supported by the Riparian Areas Regulation, and the Sensitive Stream Designation and Licensing Regulation; Relates similarly to drinking water as does the Federal Fisheries Act.</td>
</tr>
<tr>
<td>Forest and Range Practices Act</td>
<td>Ministry of Forests, Lands and Natural Resource Operations</td>
<td>Although minor in extent in the Puntledge watershed, Crown land forest operations have a variety of requirements to ensure operators put maintenance of drinking water quality as a planning priority in relation to riparian management of lakes and streams. Lakeshore management and community watersheds.</td>
</tr>
<tr>
<td>-Wildlife Act</td>
<td>-Ministry of Forests</td>
<td>These acts and their associated regulations have a variety of approaches to motivate awareness about activities that may impact water courses and the environment and/or water users.</td>
</tr>
<tr>
<td>-Environmental Management Act</td>
<td>-Ministry of Forests</td>
<td></td>
</tr>
<tr>
<td>-Federal Hazardous Products Act</td>
<td>-Ministry of Forests</td>
<td></td>
</tr>
<tr>
<td>-Transportation of Dangerous Goods Act(s)</td>
<td>-Ministry of Environment</td>
<td></td>
</tr>
</tbody>
</table>
3.2.1 Auditor General's report

In 1999, the Auditor General of BC released its report *Protecting Drinking Water Sources*. This report fully supports province-wide watershed protection, claiming that government is not meeting their responsibility to protect drinking water sources from human-related impacts.

*The key problem is lack of an effective, integrated approach to land-use management*.

Accordingly, a reliable provision of high quality drinking water depends on several levels of protection:

1. Effective control over land use, i.e. water source protection and source selection.
3. Well-maintained water distribution system.
4. Water quality testing.

The Auditor General recommended in 1999 that the Province designate within government a lead agency for drinking water interests, to coordinate government policy and action on drinking water issues. The suggestion was to realign the distribution of existing responsibilities to just one agency. A lead agency would also improve accountability on reporting to the Legislative Assembly and the public. Since then, the Drinking Water Protection Act and the *Action Plan for Safe Drinking Water 2002* in BC have been produced, with the Ministry of Health as the lead agency.

3.2.2 Drinking Water Protection Act

The Drinking Water Protection Act and regulations are administered and enforced by the Drinking Water Officer (DWO) within the Vancouver Island Health Authority (VIHA). The DWO is a part of a larger health protection team that has the power to determine the most appropriate way to address potential concerns in a particular water system. The Drinking Water Program is administered locally by DWO, Public Health Engineers and Medical Health Officers, who are responsible for direct service delivery in BC's Health Authorities. Drinking Water Officers provide surveillance and monitoring of drinking water systems which may affect the public's health.

The Drinking Water Protection Act focuses on four main areas:

- Drinking Water Supply
- Water System Assessments and Plans
- Drinking Water Protection
- Drinking Water Protection Plans
Water system owners are responsible for the provision of safe drinking water and notification of water quality problems. A formal Drinking Water Protection Plan (DWPPPlan) is a tool that may be available under the Drinking Water Protection Act if local officials (i.e. local government and health authority) determine that local tools at their disposal are insufficient to cover all their drinking source water protection planning needs. This is a new tool that has not yet been used in BC. Experience to date in the Comox Valley indicates that collaboration between local government, the local health authority and the province will be important to identifying the specific role a DWPPPlan could play in addressing specific local needs that cannot be otherwise addressed through existing processes and regulatory tools.

Some of the steps in preparing a formal Drinking Water Protection Plan (DWPPPlan) are:

- The provincial Health Minister can commence a formal DWPPPlan process upon recommendation of the Provincial Health Officer. A regional Medical Health Officer can request the Provincial Health Officer make such a recommendation to the Health Minister. Ultimately, the Health Minister will be looking for collaboration between local government and local health officials before being satisfied that a formal DWPPPlan is needed and has local support;
- In initiating a DWPPPlan, the Health Minister decides which local parties are best situated to prepare the plan and what the specific focus of the plan should be. Key considerations for the Health Minister in this decision are: What is the local support for a DWPPPlan and what specific protection needs could a DWPPPlan address that cannot otherwise be addressed?
- Subject to Cabinet review and approval, and are implemented by regulations;
- If the DWPPPlan is supported by Cabinet, aspects of it can be made legally enforceable;
- Terms of reference are established by a Ministerial Order;
- Required to consider existing provincial or local government strategic, operational, and land use or water use planning processes;
- Include an extensive public consultation process;
- Approved through a Cabinet order to acquire official status; and
- Implemented through regulation issued by the Lieutenant Governor in Council to do one or more of the following:
  a. Require that other specified Provincial government or local authority strategic or operational planning processes consider the drinking water protection plan;
  b. Require that the results of specified Provincial government or local authority strategic or operational planning processes be consistent with the drinking water protection plan; and/ or
  c. Provide that specified Provincial government or local authority strategic or operational plans, bylaws or other planning documents, or bylaws do not have
legal effect to the extent of any inconsistency with the drinking water protection plan.

A formal Drinking Water Protection Plan under the Drinking Water Protection Act is a tool that can be sought as a last resort where local authorities conclude that specific drinking water protection needs cannot be otherwise addressed. To date, a formal Drinking Water Protection Plan has not been employed in the province of BC.

An Assessment Response Plan must be undertaken prior to a drinking water protection plan being ordered. The Comox Valley Regional District has completed an assessment response plan titled the Comox Lake Watershed Assessment phase 2 August 2007.

An Assessment Response Plan detailed in the Drinking Water Protection Act may be ordered by the drinking water officer if:

- An assessment has identified threats to the drinking water provided by the water supply system, and
- The water system is of a prescribed class.

3.2.3 Water Management Plan

A Water Management Plan is a broader tool that includes water source and land-use around the source; this plan falls under the responsibility of the Ministry of Environment. Although the two processes are similar in many respects, a Drinking Water Protection Plan is more focused on the water source-to-tap aspect of drinking water while a Water Management Plan is relevant for area-based planning. An area may be considered for the development of a Water Management Plan to address:

- Conflicts between water users;
- Conflicts between water users and in-stream flow requirements; or
- Risks to water quality.

Processes in the development of a Water Management Plan include:

1. An assessment of preparedness among stakeholders, First Nations and the Province;
2. Request by letter to the Regional Water Manager;
3. Terms of reference established by a Ministerial Order;
4. An extensive public consultation process;
5. Approved through Cabinet; and
6. Implemented through regulation issued by the Lieutenant Governor, resulting in legally enforceability.
An example of a Water Management Plan:

On July 14, 2006, a Ministerial Order (MO) was signed by Environment Minister Barry Penner to initiate and define the terms of reference for a Water Management Plan in the Township of Langley. In collaboration with the Ministries of Environment (MOE) and Agriculture and Lands (MAL), Langley has developed the Province's first water management plan brought into force in 2004 under Part 4 of the Water Act. The Township's Water Management Plan developed policies and regulations to protect local groundwater resources for community use as well as to promote healthy habitat.

As of this date the Ministry of Environment has not taken any initiative to require a water management plan in the Comox Valley, however they are aware of the potential drinking water protection plan order and the ongoing work within the regional water supply strategy.

3.3 Vancouver Island policies

On Vancouver Island, the 4-3-2-1 policy has been implemented by the Vancouver Island Health Authority, which all water systems with over 500 connections are required to initiate by April 30, 2011. Currently, most water systems use chlorination as their only method of disinfection but under VIHA’s 4-3-2-1 requirements water service providers will be required to add additional water treatment barriers such as ultraviolet light.

4-3-2-1 stages are:

- 4 - Log inactivation of 99.99% of viruses through water treatment barriers such as filtration and/ or UV;
- 3 - Log removal or inactivation of 99.9% of Giardia cysts and Cryptosporidium oocysts, i.e., E.coli and Salmonella;
- 2 - treatment process for all surface waters or unprotected groundwater; and
- 1 - NTU maximum turbidity in finished water.

Drinking water taken from pristine sources may be exempt from filtration requirements as long as all of the Health Canada’s Criteria for Exclusion of Filtration in Waterworks Systems are met. The outlined criteria are:

1. Minimum of two disinfectants to deactivate viruses and parasites;
2. Low levels of Escherichia coli bacteria;
3. Low daily turbidity levels; and
4. Watershed control program, for example, controlled fecal discharges.

The filtration exclusion criteria are similar to the 4-3-2-1 Treatment Regulation for Safe Drinking Water that is based on the Drinking Water Protection Act and the Canadian Drinking Water Quality Guideline. The additional criterion in the filtration exclusion is a watershed control program.
3.4 Local bylaws that include watershed protection

Under the Community Charter and the Local Government Act, local governments have jurisdiction over municipal water supplies, drainage and wastewater treatment systems, floodplain management, water conservation programs, land use planning and watershed and water supply planning.

3.4.1 Comox Valley Regional District

The CVRD’s role in terms of watershed protection is to provide safe drinking water and to regulate appropriate levels of activity and development in the watershed. Public outreach is also a responsibility of the CVRD.

The Regional Growth Strategy was adopted in March 2011. This document highlights supporting policies to protect the quality of water sources. The RGS is a regional vision that commits affected municipalities and regional districts to a course of action to meet common social, economic and environmental objectives. It is initiated and adopted by a regional district and referred to all affected local governments for acceptance. In terms of watershed protection, the Regional Growth Strategy lists the following goals:

- Manage development on the basis of precautionary principles within watershed of water supply lakes. This will require development proposals to include reports by appropriate professionals to study potential impacts on water quality and quantity, including a peer review of professional findings and recommendations.
- Support the development of plans that protect drinking water for the Comox Valley.
- Work with other stakeholders and agencies to identify areas for aquifer protection and develop OCP guidelines for their protection.
- Where development is proposed in a watershed of a water supply lake that is controlled politically by one jurisdiction, but where the lake provides a water source to other jurisdiction(s), the jurisdiction responsible for approving development within the watershed will formally consult with the jurisdictions receiving water from the watershed.
- Require an aquifer protection development permit for electoral areas at time of subdivision, which would require groundwater quantification, vulnerability and protection measures prepared by a qualified professional with quantification, and ensure that there are no other impacts on adjacent wells.

The Regional Water Supply Strategy provides the vision, goals and objectives for the future of drinking water governance, supply and treatment in the Comox Valley. The visionary statement is: to provide a long term, high quality, reliable water supply to the entire Comox Valley while protecting ecosystems and the environment.
To support the execution of this vision, the following goals were developed:

- Deliver safe high quality drinking water.
- Provide cost effective and reliable water supply and delivery into the future.
- Ensure clear, accountable, and equitable water management and governance.
- Educate and engage citizens to value water.

A watershed protection program is one of the listed actions under Goal 1 “deliver safe high quality drinking water”.

Another initiative being undertaken by the CVRD is an on-going water quality monitoring program partnership between the Comox Valley Regional District and the University of Victoria. The project requires multiple years of climate variability, watershed land-use and chemical and microbial water quality data to develop models predicting how climate variability will change the vulnerability of communities to waterborne pathogens under changing climate and land-use. The 1st year has been used to train people, develop a robust sampling program and develop the framework for a down-scaled regional climate variability model. Bacterial samples have been collected and their genetic finger prints developed to determine what animal sources are contributing to fecal bacterial contamination of source water in the lake. These results will pinpoint where the fecal contamination is coming from and how a watershed protection, management and adaptation strategies should be developed and implemented.

3.4.2 City of Courtenay

In March 2006, the Council of the City of Courtenay recognized water as a human right:

- Water supports and connects all life and access to clean water is essential to the health and sustainability of all life on this planet.
- The value of earth’s fresh water to the common good takes priority over any possible commercial value.
- Fresh water is a legacy, a public trust, and a collective responsibility.


4.0 Stakeholder consultation

4.1 Methodology

Consultation was collected from a wide range of individuals and organizations that included concerned citizens, non-profits and professional agencies. List of attendees is included as Appendices E and F.

There were two stakeholder sessions. The first one was to review the list of identified risks, expand upon the list and suggest actions to mitigate these risks. For a summary of stakeholder consultation February 2011, see Appendix G.

The second stakeholder session was to discuss a vision statement for watershed protection and to review the list of actions that had been suggested in the previous meeting.

Several stakeholders have submitted substantial comments that have been incorporated throughout this document. Included in Appendices H through L are the detailed submissions received to date.

4.2 Key values

At the stakeholder meeting held February 24, 2011, participants were asked to state what they value about Comox Lake and how they use it. The two most valued aspects of Comox Lake were its water quality and the recreational opportunities. Comox Lake was described as beautiful, vital and pristine, a community resource and amenity, a place with archaeological importance to First Nations, and water that “tastes so great you don’t have to chew it”.

4.3 List of actions

Actions identified by stakeholders were drafted in the first session and then in the second session were discussed in terms of the following criteria:

- What impact will the action have on protecting water quality?
- How do actions get prioritized?
- How could your organization contribute to this action?
- Who is responsible for this action?
- What resources are needed to undertake the action? Where will the resources come from?
The following table is the list of actions draft by stakeholders. This is not a finalized list.

<table>
<thead>
<tr>
<th>Action: Education</th>
<th>Action: Restricted access</th>
<th>Action: Curbing development</th>
<th>Action: Improved amenities</th>
<th>Action: Bylaw enforcement/planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>signage</td>
<td>security</td>
<td>zoning</td>
<td>better road drainage</td>
<td>enforcement of boat fueling</td>
</tr>
<tr>
<td>outreach</td>
<td>fences, checkpoints, patrols</td>
<td>land acquisition</td>
<td>bathrooms</td>
<td>emergency response plan</td>
</tr>
<tr>
<td>stewardship</td>
<td>no human presence</td>
<td>moratorium on development</td>
<td>garbage cans</td>
<td>Spill response plan</td>
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<td>deactivate roads</td>
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The outcome of the stakeholder sessions resulted in the suggestion of a wide range of actions that did not necessarily match to a specific risk. More work needs to be done to clearly outline this process and review all criteria to measure the impact an action will have on a specific risk. Further development of the specific details of some of the actions is needed, in particular, the practicality of gates and fencing, boat restrictions, specific regulations for the intake etc.
5.0 Recommendations

The actions that were suggested by stakeholders need further development, specifically identification of responsibility, where funding will come from, and the timeline for implementation and prioritization. A detailed action plan is recommended as the next phase of watershed protection planning.

Actions that are possible to initiate now are annual stakeholder meetings, education programs, and a septic monitoring program. Actions that restrict access to the land, water and air need further examination at this point.

5.1 Stakeholder consultation

It is important to validate the vision statement developed in consultation with the current stakeholders. The next step in developing actions is to consult with key landowners in the watershed, for example, BC Hydro and TimberWest along with key government agencies such as the Ministry of Health, Ministry of Environment, Vancouver Island Health Authority, and the Comox Valley Regional District. The stakeholder list used to develop this report serves as an excellent starting point for an invite list to an annual open house to review the development of the watershed protection planning process.

5.2 Education initiatives

Below are some potential programs to increase public awareness about watershed protection:

- Projects with local schools to present maps and videos on water quality and habitat protection;
- Adopt-a-watershed program;
- Mentorship program for post-secondary students wanting to work in the design, supply and treatment, and protection of drinking water;
- Permanent water advisory board;
- Annual watershed tours/open house for the public;
- Celebration of Drinking Water Week;
- Monthly educational articles in the local papers;
- A exhibit on the history of activities in the watershed at a local museum;
- Educational campaigns about garbage and littering;
- Education at boat launch about NOT refueling your boat in the water; and
- Increased visibility at public events as a regional “water team”.
5.3 Monitoring of sewage disposal

Regular monitoring of all septic tanks and sewage disposal systems in the watershed could be made mandatory through a bylaw monitoring program. Onsite sewerage systems that are installed, repaired and maintained by certified installers who could also include visits to the systems on an annual basis. The health authorities have enforcement powers under the Sewerage System Regulation regarding onsite sewage systems that fail or are inadequately maintained. There could be a coordinated effort between the CVRD and the health authorities to implement information and monitoring programs.

In June 2007, the Regional District of Nanaimo Board approved the development of a public information and education program for onsite sewage disposal systems with a 2008 budget of $25,000, to be funded by an increase in septage tipping fees. The Capital Regional District has an “Onsite Sewage Management Program” and the Township of Langley is developing bylaws in septic management through the Subdivision Development and Control Bylaw.

An information program could include:

- Surveys of local residents in suspected problem areas to gain a sense of the nature and extent of on-site sewage issues.
- A coordinated complaint/referral process wherein the identity of complainants may remain anonymous if desired.
- Improved follow-up to installation of new systems to assure quality control.
- An incentive program for annual monitoring and maintenance of older on-site systems, or alternatively, adopting regulations for mandatory maintenance and reporting.

In the Comox Lake watershed, sewage disposal systems are present in the campground, at the cabins and residential homes, and the Courtenay and District Fish and Game Protective Association.

5.4 Partnerships

Volunteer-based education and monitoring programs such as the Canadian Heritage River Systems and Wilderness Watch – or any of the public education initiatives listed in section 5.2 – may be eligible to receive funding from federal funding agencies. An example of a funding source is Environment Canada’s EcoAction Community Funding Program that supports projects on clean water and nature that have measurable actions. Non-profits would be the project manager in partnership with local government and/or individuals. There is a maximum of $100,000 per project available.
6.0 Knowledge gaps

Future studies may be needed. As new risks appear or change, new assessments need to be undertaken. For example, if the intake was to change location and/ or depth, or too much time has lapsed between collecting and reporting, up to date studies should be conducted. There have been concerns voiced that the Comox Lake Watershed Assessment Characterize Risks completed in 2006 exaggerated human impacts while under-emphasizing the intrinsic impacts from water fowl and wildlife. This report did not include hydro-electric generation as a part of their study either.

Specific studies could include:

- Details on logging’s direct impact on erosion in the watershed which increases total suspended solids. If a direct correlation between factors such as road placement, steepness of slopes logged, type of logging, time of year and time to reforestation to total suspended solids could be found, more effective logging practices could be designed.

- Frequency of use as per each indicated risk, for example, how many people swim in the lake per summer? Based on that figure, what is the estimated risk of parasite introduction?

- Costs resulting from an outbreak may be useful to estimate. Hospital stays and visits to the doctor, lost business, and increased staffing of the water system operators etc.

- Cost and probability of land acquisition? Is this a viable economic option as compared to a potential outbreak and those associated costs? Is land purchase cheaper than clean up costs to the forestry/land users? Is land acquisition and restricted access cheaper than upgraded water treatment, filtration plants etc.

- A review of water licensing and how water use affects water quality.
7.0 Secure funding

To continue work on this project i.e. to the implementation phase, on-going funding will need to be established.

Some funding areas may be federal environmental programs, specifically climate change adaptation initiatives, provincial health grants, and infrastructure improvement funding programs. Regional governments may have funding for public education and water awareness initiatives for school-aged groups, water conservation programs etc. Upholding the actions listed in a watershed protection plan requires long-term, stable funding, for example, through volume-based water use fees via water metering, water licenses, recreational user fees, or property taxes.

As it is local government who are hands-on in terms of the management, protection, treatment and supply of drinking water, they will have the role as project lead and should initiate funding applications to undertake watershed protection planning.

Regional District of Nanaimo example:

The Regional District of Nanaimo (RDN) proposed a 10 year budget for $5.2 million to implement a Drinking Water and Watershed Protection Action plan. Through a referendum in 2008, the plan was approved through a parcel tax of $17 per year per parcel on all properties (residential, commercial and industrial) in all of the seven electoral areas within RDN jurisdiction. As per 2011, no municipal funds contribute to the plan other than for the Team Water Smart program. The program is expected to increase and include additional support from the municipality over the next three to four years.

The parcel tax approach reflects the concept that all landowners benefit equally from drinking water and watershed protection. This varies from a property tax approach, where properties with a high assessment value pay a higher portion of the total cost.

To date, the funding generated has been used to drill observation wells, increase surface water monitoring with the Ministry of Environment, water conservation and outreach programs, develop well smart and septic smart programs.
8.0 Conclusions

This report has been a component of a larger project that included a literature review and a watershed protection planning template. The entire project was initiated in January 2011 and culminated with this report in May 2011. This development of a draft watershed protection plan for the Comox lake watershed has succeeded in collecting stakeholder input/ network building and drafting actions to mitigate risk. Generally, a watershed protection plan takes two to five years to complete.

Stakeholder consultation

It is important to continue the momentum established with the current stakeholders. The next step in developing actions is to consult with key landowners in the watershed, for example, BC Hydro and TimberWest along with key government agencies such as the Ministry of Health, Ministry of Environment, Vancouver Island Health Authority, and the Comox Valley Regional District. The stakeholder list used to develop this report serves as an excellent starting point for an invite list to an annual open house to review the development of the watershed protection planning process.

Stakeholder meetings with key landowners, government agencies, and professional consultants should occur every quarter. As this report will be going to the Comox Valley Regional District Committee of the Whole and the Board, a Board resolution would be beneficial in establishing the stakeholder meetings. Furthermore, this report should be referred to the Water Committee as it is tasked with running the current water system fed by Comox Lake, and part of that task includes protection of public health. As such, watershed protection will fall in their mandate as a component of operating the Comox Lake Sub-Regional Water System.

The above stakeholder group is in line with the recommendation from the Regional Water Supply Strategy to establish a “watershed and watersource” protection committee, which would be able to examine and act on the issue of watershed protection on a regional basis.

To date, the feedback loop from the general public has been inclusive of all interested parties in the Comox Valley; there were over 50 groups and individuals invited to attend meetings and review draft versions of the watershed protection plan. For the immediate next steps, such an extensive public consultation is not required. The next steps, i.e. the creation of mitigation strategies, need to be well-formulated prior to any public meeting/ open house.
Timeframe

The timeframe needs to include an intensive feedback loop in order to plan meetings and to consult with key landowners and government agencies. Based on a rough comparison to water management planning timeframes in the Cowichan Basin and Nanaimo Regional District it is reasonable to suggest the following for the continuation of Phase II Analysis and Development of Options:

- Detailed development of actions, to include quarterly stakeholder consultations and open house: one year
- Development of communication/media protocols: 6 months, concurrent to the development of actions
- Networking building/partnerships: on-going

The above steps are predicated on the establishment of funding. The inclusion of watershed protection planning as a part of a service area bylaw is only one option. Other approaches would be to apply for grants from Health Canada, Environment Canada etc.

Once actions have been detailed, the process can move into the approval and implementation phase. This should take approximately one year.

Future development of actions

A systematic review of the identified risks and direct actions with timeframe, jurisdiction, cost/benefit analysis etc should be the next steps in the development of a watershed protection plan. Future studies to supplement the development of actions to mitigate the effects of climate change need to be better identified, water use planning and licensing need review (see knowledge gaps 6.0).

In summary, it is recommended to continue the momentum of the development of a watershed protection plan through:

- Maintaining stakeholder consultation
- Establishing education initiatives
- Monitoring of sewage disposal
- Building community partnerships
- Generating future studies
- Securing funding

This report was premised on the report findings in the technical memorandums produced by CH2MHILL.
Appendix A: Map of Comox Lake Watershed
Appendix B: Description of Land Ownership

[Type text]
Description of Land Ownership

The span of landowners in the Comox Lake watershed includes the Comox Lake Land Cooperation, ownership on simple fee, BC Hydro, Comox Timber LTD., Courtenay and District Fish and Game Protective Association, province of British Columbia, Timberwest Forest LTD., Village of Cumberland, and West Fraser Mills.

In the Comox Lake watershed 60% of the 50,000 hectares is owned by TimberWest, land which is regulated by the [Private Managed Forest Land Act](#). The provision of emergency response programs for fire and spill are provided by private forest management companies.

The Comox Lake Land Corporation, originally Timberwest land, was purchased in the 1990’s by 25+ people. The owners have a share in the entire property, which stretches from approximately the boat launch on the Cumberland side around the bay to White’s Bay, including the cabins located off Horsbury Road. They also own the lake bottom. Colloquially this group of landowners is referred to as the “cabin owners”. They are under the jurisdiction of the Village of Cumberland and own both their land and cabins.

Ownership on fee simple comprises of 9-10 properties along the Cumberland side of the shoreline and the adjacent side of the road leading to the boat launch. BC Hydro has the only undeveloped lot left on the shorefront under this type of ownership model. These properties fall under the Nelson district as Area C and supply their own drinking water from wells.

The Campground property is owned by the Village of Cumberland. They have contracted out to have the campground managed by a private business. Recently a group called the Cumberland Lake Park Committee was established to determine what the business development of the campground could look like over the next few years. The committee asked the Village of Cumberland to refrain from making any changes this year as they felt more time was needed to study the possibilities.

There are also cabins on a renewed 5 year lease from Timberwest in “Little Italy” at the southwest side of the lake. These cabins are only accessible by boat. Along the Cruikshank there are cabins accessible by boat and road. This is Timberwest property under Comox Valley Regional District jurisdiction.

BC Hydro’s property is along the banks of the Puntledge River from the lake outlet to the drinking water intake and hydro-generating station.

The Courtenay and District Fish and Game Protective Association owns lakefront and lake bottom at the outlet of the lake.

To the south west of the Courtenay and District Fish and Game Protective Association’s property are the Comox Lake Ecological bluffs, established in 1996. This is a protected area and considered highly sensitive.
Appendix C: Shoreline Land Ownership Map
Appendix D: Vision Statement from Stakeholder Consultation
Vision Statement from Stakeholder Consultation
May 5, 2011

The proposed vision statement for Comox Lake included discussion as to whether multi-use should be incorporated in the vision statement. A clearly defined outline of the watershed area and a clear concise definition of safe, high quality drinking water are also needed.

Using the draft vision statement, stakeholders were asked to work in small groups to brainstorm the values and goals that were missing and included in the vision.

The vision statement used for discussion was: **to ensure the drinking water source and surrounding fish and wildlife habitat are protected to provide high quality safe drinking water for residents and visitors of the Comox Valley.**

**Brainstorming:**
Values and Goals *missing* from the vision statement:
- Human health
- Better definition of clean water
- Ecosystem protection
- Water pollution
- Sense of well-being (community)
- Sustainable watershed that can withstand climate change
- Cost effectiveness. Chemicals versus watershed protection
- Limited resource that requires protection
- Watershed protection is understood and enforced by the community and not compromised by land ownership/governance/politics; and enforceability
- Status quo of watershed as multi-use can change
- Raw water= not inherently safe
- High quality source water = achieve, maintain, and protect
- Keep focus narrow to just water quality
- Public ownership/Expansion to Strathcona
- Sustainable: quality, quantity, and flow
- Recreational values

Values and Goals *included* in the vision statement
- Protect and maintain
- High quality source water

Don’t need residents or visitors
Don’t include wildlife and fish habitat as these are goals/outcomes and should not be in the vision itself

Overall key common values: sustainable, high quality, safe
Possible vision statements:
- To provide a long term (sustainable) high quality safe water supply.
- To protect a water source so that it can provide high quality safe drinking water for now and future generations.
- To ensure the water and ecosystems are protected to achieve and maintain a high quality sustainable water source.

Possible goals to be included in the vision:
- Human health: community well-being
- Ecosystem protection: wildlife and fish habitat
- Public ownership/responsible ownership: knowledge and enforcement of bylaws
Appendix E: February 2011 Stakeholder Consultation Session
## Attendees

**COMOX VALLEY DRINKING WATER PROTECTION PLAN TEMPLATE**

**WORKING GROUP SESSION #1**  
Thursday, February 24, 2011

**Comox Valley Regional District boardroom**  
1:00 – 5:00 pm

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<td>Delores Broten</td>
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<td>Vancouver Island Health Authority</td>
<td>Dwayne Strohl</td>
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<td>Wedler Engineering LLP</td>
<td>Andrew Gower</td>
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<td>Sonya Jenssen</td>
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Appendix F: May 2011 Stakeholder Consultation Session
# COMOX VALLEY DRINKING WATER PROTECTION PLAN

## WORKING GROUP SESSION #2

Thursday, May 5, 2011

**Village of Cumberland Council Chambers**

1:00 – 4:00 pm

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<td>Tracey Michalski</td>
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<td>Alan Chatterton</td>
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<td>Kathryn Clouston</td>
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<td>Sonya Jenssen</td>
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<td>Village of Cumberland</td>
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<td>Comox Valley Water Watch Coalition</td>
<td>Linda Safford</td>
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Appendix G: Summary of February 2011 Stakeholder Consultation Session
Summary of February 24, 2011 Stakeholder Consultation Session

The methodology used to extract harm-reduction suggestions was a café style brainstorming session where participants twice rotated through three areas to draft risk factors and propose actions to mitigate the risks. The session was based around risk factors that were taken directly from the Comox Lake Watershed Assessment Characterize Risks Technical Memorandum 2006. Risks that were addressed in this session were harm, recreation, roadways, industry, climate change, and sewage disposal. Risk factors such as pets and wildlife, hydroelectric generation, trail use along White’s Bay or the Puntledge River, and flooding were not included in this brainstorming session.

The topic of harm used examples such as vandalism and terrorism, airplane crashes and naval training to initiate discussion. Participants were asked to brainstorm other known harm risk factors and came up with land-use/private airfield located too close to the lake, contamination or silt sedimentation due to land use, earthquakes, forest fires either man-made or naturally occurring, and invasive species such as zebra mussels.

From this discussion, actions to lessen the above-mentioned harm-based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Restrict access with fencing, check-points, patrols
- No human presence allowed in the watershed
- Deep-water intake
- Restrict aeronautical behaviour – no float planes, no fly zone, no military exercises
- Changes to ownership – governance and watershed protection
- Emergency response plan
- Restrict development in the watershed
- Educate, outreach, and stewardship
- Backflow prevention

The topic of recreation used examples such as boating, fishing, boat launch, kayaking, mountain biking, horseback riding and hiking to initiate discussion. Participants were asked to brainstorm other known recreational risk factors and came up with dirt biking/ATVs – oil spills and access to creeks, watershed access to people, saltwater boats cross contaminating, cleaning/motor-flushing of boats, transport of invasive species via recreational vehicles, camping – garbage and sewage. Other risks listed were: Swimming – disease from human waste, introduction of pets (dogs and disease), hydrocarbons introduced from float planes, helicopters, airstrip, hunting (shells and garbage), houseboats, jet skis, recreational property construction, recreational gold panning and rock climbing.
From this discussion, actions to lessen the above-mentioned recreation-based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Control access by way of zoning, permits and licenses
- Signage
- Enforcement in terms of boat fueling, fines and bylaws
- Only allow for lower horsepower leading to non-motorized boating only
- Education
- Provide amenities, bathrooms, garbage cans, boat cleaning stations
- Spill response planning

The topic of roadways used examples such as forest roads, highways and rural roads to initiate discussion. Participants were asked to brainstorm other known roadway risk factors and came up with new road construction/leachate from construction materials, impervious road surfaces, road maintenance, drainage and dust control issues, vehicle maintenance and break-downs in the watershed, road type is “less secure” than what most drivers are used to – leads to increased risk of accidents and pollution, roads act as a gateway/access point to the watershed and lake – dumping grounds and off-road use, cargo on vehicles can cause a risk from an accident or spill, transport of invasive species and loss of habitat and sedimentation. The road to the Lake Park is sloughed in two places, which can decrease available parking and road deterioration could increase chances for a vehicle to roll over the embankment and into the lake. It was also mentioned that lobbying continues to open a roadway for a highway link from Cumberland along the lake shore to Port Alberni.

From this discussion, actions to lessen the above-mentioned roadway-based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Low impact development: avoid, reduce, mitigate
- Prevent development entirely
- Tighter regulations, especially closer to the intake
- Tire washing stations (invasive species)
- Boat washing stations (salt water boats)
- Improved signage
- Security, gates, supervision
- Stronger RCMP enforcement targeting drunk drivers alongside the lake
- Improved roadside barricades, speed bumps, roundabouts
- Deactivate roads
- Road design/drainage
- Emergency response planning
- Education through social media
The topic of industry used examples such as coal mine leachate, logging, underwater log salvage, gravel pits, farming and Pidgeon Lake landfill to initiate discussion. Participants were asked to brainstorm other known industrial risk factors and came up with gold panning/mining, run of river projects, resource mining in the uplands, and storage of fuel for nautical purposes, commercial boating and houseboats. Industrial zoned lands in Bevan were also mentioned as a potential risk.

From this discussion, actions to lessen the above-mentioned industry-based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Landfill controls – leachate, bird, methane capture, new location
- Logging – best management practices and reforestation
- Zoning – control industrial activities near the lake, riparian protection
- “Value added wood products” type of development
- Mitigation planning – communicate with industry, gap analysis, organic farming only
- Land acquisition
- Log salvage – restrict proximity to intake, impact assessment
- Former coal mines – ensure tailings are not disturbed, run-off control

The topic of climate change used examples such as rainfall frequency and temperature change to initiate discussion. Participants were asked to brainstorm other known climate change risk factors and came up with increased flooding events leading to sewerage/contamination loading, landslides, logging + landslides and damage to dams, increased water temperature leading to organic growth, blue-green algae, new species, waterborne diseases, decreased rainfall in summer leading to increased forest fires, turbidity and run-off, contaminants, glacial melt, rising water levels lead to threat to critical infrastructure, prolonged drought/desertification, more snow = more spring run-off, pine beetle/infestation = bigger forest fire threat.

From this discussion, actions to lessen the above-mentioned climate change based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Maintenance program for sewage disposal system/review cabin locations
- Increase water treatment/water storage/chemical storage
- Reforestation/replanting in riparian and logged areas – drought resistant plants
- Move critical infrastructure to safe ground
- Modify logging practices
- Deep water intake
- Reduce carbon footprint
The **topic of sewage disposal** used examples such as residential and seasonal cabins, camping and beach-use to initiate discussion. Participants were asked to brainstorm other known recreational risk factors and came up with eutrophication, flooding, increased usage due to population increase, quality of sewerage systems, absence of sewage disposal, disposal of pharmaceutical products, wells dug near the landfill, pets and wildlife below the high water mark, and trails adjacent to the lake.

From this discussion, actions to lessen the above-mentioned sewage based risks to the lake and watershed were drafted. The following are action-based strategies suggested by the stakeholders:

- Public education about septic operations
- Boat launch restrictions/maintenance records kept on file
- Ongoing water quality monitoring
- Improved amenities/Pump-and-haul facilities – tanks, portable toilet facilities
- No septic allowed
- Treatment added to system
- Upgrade current systems
- No overnight camping on boats without toilet facilities
- Size restriction on boats – tanks, holding tanks a must
- Limited land use development
- Focus use away from the intake
- Zoning/bylaws – buffer zones, lot size restrictions, permits for septic and backhoes
- Moratorium on development – no subdivisions
- Low flush toilet grant program
- Strata collection system – direct sewage disposal out of the watershed

In the final part of the meeting, participants were given five votes to choose the actions they felt would most likely have an impact on reducing risk and five votes to indicate which actions their organization would be most willing to comply with and implement. The voting gives an indication of stakeholders’ willingness to comply from a subjective stance; nonetheless, this is valuable as cooperation is key in the adoption of a watershed protection plan. Therefore, willingness to comply was highlighted in the charts below.
Figure 1: Harm
To meet risks associated with harm, stakeholders were most willing to participate in education, outreach and stewardship and restrict development.

Figure 2: Recreation
To meet risks associated with recreation, stakeholders were most willing to support public education and control access through zoning.
Figure 3: Roadways
To meet risks associated with roadways, stakeholders were most willing to educate through social media.

Figure 4: Industrial
To meet risks associated with industry, stakeholders were most willing to control activities through zoning.
Figure 5: Climate change
To meet risks associated with climate change, stakeholders were most willing to implement a sewage disposal maintenance program for cabins.

Figure 6: Sewage disposal
To meet risks associated with sewage disposal, stakeholders were most willing to change zoning.
The voting process has been used to identify preliminary conclusions regarding the sense of willingness/ability to comply with watershed protection actions. What garnered the most votes was the willingness to build public awareness through education, restrict development/ control zoning, introduce bylaws and enforcement, and install a deep water intake. Septic controls, improved sewage amenities, and ongoing water quality monitoring were also popular choices. Interestingly, logging practices were perceived as having an impact but an ability to comply with measures to address this threat was low. Also noteworthy is that a multi-use watershed was supported but with enforced restrictions. This is a sentiment similarly expressed in a study of the Okanagan Valley watershed in 2004-2005, a watershed that is also shared and has multiple uses. In this study, a good working relationship between all watershed users was the desired outcome (Report Abstract [here](#)).

The meeting was adjourned with a brief feedback session on the process itself. Participants liked that a range of organizations were represented and perspectives presented, prioritizing actions was deemed a useful exercise, and overall the meeting was commented on as being well-organized. In general, the meeting allowed for participants to meet face-to-face and see the range and amount of groups interested in watershed protection in the Comox Lake watershed. Improvements could have been made in sending out the agenda ahead and presenting background information at the start of the meeting. There was a comment that additional evening meetings should be held in order to ensure all stakeholders could participate. The budget and timeframe do not allow for this process to be repeated but all those unable to attend were sent the list of risks to comment on and encouraged to respond to the project team via email or phone.
Appendix H: Feedback Comox Valley Water Watch Coalition
c/o Box 1270
Comox, BC V9M 7Z8
Monday, 16-May-11

Sonya Marie Jenssen,
Wedler Engineering LLP
211-2459 Cousins Ave
Courtenay BC V9N 3N6

Dear Sonya,

Comox Valley Water Watch Coalition wishes to congratulate and thank everyone involved in these multi-stakeholder planning sessions for the great work done to date in planning to protect the Comox Lake watershed and its drinking water. We also commend you for the preparation of the excellent Draft Watershed Protection Plan.

We regret that at the planning session on May 5th, the time considerations foreclosed on discussion of the last two topics of potential restrictions, i.e., logging and mining and improved amenities. We wish to be sure that our concerns are registered in finalizing the plan.

We believe that the greatest threat to water quality is the unrestricted access by logging and mining companies to the watershed.

We feel that the Private Managed Forest Lands Act is insufficient regulation to assure protection of drinking water quality. There should be no logging allowed in drinking watersheds. However, if logging is allowed, it should be by the individual tree selection method ONLY.

As for mining, of course the monitoring of old mines and their leachate should be on-going. Although the proposed new Raven coal mine is not in the Comox Lake watershed, the company’s holdings do extend into that watershed, and thus we believe that all new coal mining should be explicitly prohibited.

Thank you for considering our concerns as you finalise the plan.

Delores Broten and Linda Safford, for the
Steering Committee for Comox Valley Water Watch Coalition
Appendix I: Feedback Ministry of Health
Ministry of Health comments on draft Watershed Protection Report dated 11 May 2011:

3.2 Key jurisdictions

- There are a few more legislation/jurisdiction links we recommend be mentioned: natural resources ministries tend to have provisions which address water protection with respect to the activities they regulate. One relevant example is the *Forest and Range Practices Act (FPRAct)*, which contains a number of regulatory authorities respecting riparian management, lakes and streams in relation to forestry activities. The *FPRAct’s Government Actions Regulation sections 6 and 8* has relevant provisions regarding lakeshore management and community watersheds.
- MOE’s Water Act is mentioned, but its Environmental Management Act also has some relevant provisions regarding discharge of waste into or near water bodies and landfills near water bodies.
- Previous drafts identified zoning as a relevant authority. We recommend that the authority of Local Government be mentioned under section 3.2.
- Section 3.2 contains a description of a Drinking Water Protection Plan under BC’s *Drinking Water Protection Act*. We’ve attached some recommended track change revisions to that description in the e-mail.

5.3 Monitoring of sewage

- RD Nanaimo’s work in this area is mentioned. You may wish to also mention that CRD also has an “Onsite Sewage Management Program’ which includes a bylaw promoting maintenance and pump-out. Township of Langley is also developing some bylaws in septic management through a Subdivision Development and Control Bylaw.
- The second sentence in this section incorrectly indicates that health authorities have an “approval process” for onsite sewage systems. In fact, the “approval” consists of certified installers signing off on the installations. The information program described in this section could include coordinated support from both the Regional District (modelled on CRD’s program) and VIHA. Health Authorities have enforcement powers under the Sewerage System Regulation respecting onsite sewage systems that fail or are inadequately maintained.
Appendix J: Feedback BC Hydro
Appendix J: Comments from BC Hydro

The report summarizes work done to date, relevant legislation for protection of drinking water and results of stakeholder engagement sessions. The actions identified in the report have the potential to affect BC Hydro depending on what is included in the specific plans. In general, the descriptions are high level: there is limited detail on the actions, how to implement them, and no specific land use planning recommendations in this report.

We would be pleased to discuss further when more specifics are available. In general the water stored in Comox Reservoir and inflow into Comox Reservoir is fully allocated to BC Hydro for the purpose of power generation at the Puntledge Generating station under BC Hydro’s Water Licences.

Water removed from the system prior to generation at Puntledge Generating Station will result in a commensurate reduction in clean renewable energy. BC Hydro has communicated with the Ministry of Energy and Mines and the Comptroller of Water Rights (CWR) that if a proponent wishes to withdraw water directly from Comox Reservoir or increase the volumes from the Puntledge penstock, it should be done in a manner that will not fetter BC Hydro’s existing operations or regulatory obligations, increase risk or liability to BC Hydro, or negatively impact BC Hydro electrical rates. As part of any licencing decision made by the Comptroller of Water Rights, BC Hydro will continue to work with the proponents to come to an arrangement, if possible, that respects the aforementioned objectives.

Some Specifics:

BC Hydro has not reviewed the map in Appendix C and does not comment on the accuracy of the BC Hydro properties identified.

Recommendations indicate “actions that affect access to land, air or water need further examination” (Page 14). BC Hydro will want to have input in to ensure maintenance, operations, transmission and distribution are not adversely affected.

There is a statement that specific regulations at the intakes should be developed (Page 13, last sentence). Assuming this refers to the current intake or a proposed intake, BC Hydro needs to be involved in development of this action plan.

Actions identified in the summary of stakeholder input that may affect existing BC Hydro operations and maintenance include: no human presence, boating restrictions, and vehicle access limitations, deactivating roads, buffers along streams, emergency response planning and spill response planning. The actions are not described in detail. BC Hydro will want to have input in to ensure maintenance, operations, transmission and distribution are not adversely affected.

The report identifies a goal of “Ecosystem Protection: fish and wildlife habitat” but with no specifics about what this is or how this may integrate/conflict with existing fisheries objectives under the Water Use Plan, the Fish Wildlife Compensation Program Coastal Puntledge Watershed Plan, Fisheries and Oceans Canada Summer Chinook Recovery Plan, etc... BC Hydro will want to have input in to ensure that our existing programs are not adversely affected.

The stakeholder brainstorming did not consider the water management requirements for hydro generation (Appendix G), the management of the reservoir for generation, the commensurate loss of clean renewable energy for water withdrawn upstream of the reservoir, or the conflicting goals of reservoir operations for generation, flood protection vs drinking water supply.

Darren Sherbot (BE BSc MRM)
Generation Resource Management
6911 Southpoint Dr
Burnaby BC, V3N 4X8
604 528 3053
Appendix K: Feedback TimberWest
To: Sonya Jenssen, Wedler Engineering; Andrew Gower, Wedler Engineering
From: Domenico Iannidinardo, TimberWest
CC: Kevin Lorette, CVRD; Camille Nero, Wedler Engineering; Morgan Kennah, Island Timberlands, Ken Epps, Island Timberlands
Date: 18 May 2011
Re: Comments regarding Wedler’s recent compilation of the CVRD watershed planning process

The May 11, 2011 draft of the Comox Lake Watershed Protection Plan addresses many of the points presented in my memo to you on May 9, 2011. Thank you again for the opportunity. The comments below are intended to assist you in producing a further improved final report.

Please contact me at anytime with questions about this submission.

Regards,

Domenico Iannidinardo, MBA, RPF, RPBio, PEng
Manager, Environment & Resource Integration
IannidinardoD@TimberWest.com
250 729 3778

Comments regarding the 11 May draft report:

- Although the executive summary has been replaced with an abstract, consider the following as reasons why this may not truly meet the typical definition of an abstract:
  - Concept of pre-emptive is introduced for the first time in the Abstract
  - Logging throughout the watershed introduced for the first time (and is wrong – parks, etc...)
  - “Provides drinking water to approximately 60% of Comox Valley homes and businesses” not mentioned anywhere else in the report

- Abstract would fit better as an initial statement in the Introduction

- Introduction
  - Clarifies report as a Watershed Protection Plan, which is defined but consider matching the title of the report to this definition. For instance, try: “Comox Lake Watershed Protection Plan – Initial Report, Phase II, Part 1”
- **Vision Statement** along with Appendix D
  - Human health is a given but community well-being was not really defined.
- **Background Information**
  - Consider putting full links of embedded links as footnotes at the bottom of the page so that those who may only have a paper copy can still track the references down (throughout report).
  - 3.2 Key Jurisdictions – This section references the Health Authority (Drinking Water Protection Act) and, to a lesser extent MOE Water Act as it relates to Water Management Plans. There is no discussion of other aspects of the Water Act (i.e. Section 9), the Federal Fisheries Act, the Fish Protection Act, the Wildlife Act, the Species At Risk Act, the Environmental Management Act, the Hazardous Products Act, and the Wildfire Act which all have significant authority related to water quality and environmental protection which are key elements of the Watershed Protection Plan vision statement. These Acts and associated regulations form the basic foundation for TimberWest’s Standard Operating Procedures (SOPs) and Best Management Practices (BMPs). Before there is a discussion re new by-laws and BMPs for forest management activities, there needs to be thorough review and understanding of this legislation. I’ve provided a table below for your consideration for inclusion into the final report:

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Connection to Maintenance of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private Managed Forest Land Act</strong></td>
<td>• Numerous aspects define how forest activities in and around streams (streamside harvesting and road construction) must ensure no material adverse effects on water quality;</td>
</tr>
<tr>
<td></td>
<td>• Penalties and fines exist;</td>
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<tr>
<td></td>
<td>• Agreement with drinking water purveyors of community water supplies is needed when building road within 100m of intake;</td>
</tr>
<tr>
<td></td>
<td>• Applicable to landowners who opt their private land into the Private Managed Forest Land Program (under the Minister of Forests, Land and Natural Resource Operations)</td>
</tr>
<tr>
<td></td>
<td>• Private Managed Forest Landowners pay property tax and must demonstrate a forestry management commitment; and</td>
</tr>
<tr>
<td></td>
<td>• Exit fees are arranged as a further incentive for landowners to keep land in this class.</td>
</tr>
<tr>
<td>Legislation</td>
<td>Connection to Maintenance of Drinking Water</td>
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</tbody>
</table>
| **Water Act**                          | • Applicable to any private landowner regardless of land class;  
• Anyone that may conduct activities that has the potential to negatively affect water quality at a licenced water intake must notify the owner of that licence;  
• Penalties and fines exist;  
• Expropriation of lands is an option if known to be operated in a way that is materially degrading water quality for licenced users;  
• Anyone who impairs water which is allocated to a water licence is required to provide a substitute source to the licencee until the problem is rectified;  
• Numerous specifications about how and what types of activities can happen in and around streams; and  
• Water Management Plans are an option.                                                                                      |
| **Drinking Water Protection Act**       | • Many specific options available to prevent drinking water health hazards and drinking water health risks, including but not limited to:  
• Stop work orders; and  
• Drinking Water Protection plans, as an option of last resort.                                                                                                               |
| **Federal Fisheries Act**               | • Applies to all watercourses that support fisheries;  
• Penalties/fines for any harmful alteration, disturbance, or disruption of a fishery and/or related habitat; and  
• Good water quality for fish normally equates to good water quality for drinking water.                                                                                  |
| **Fish Protection Act**                 | • Supported by the Riparian Areas Regulation, and the Sensitive Stream Designation and Licencing Regulation;  
• Relates similarly to drinking water as does the Federal Fisheries Act.                                                                                                        |
| **Forest and Range Practices Act**      | • Although minor in extent in the Puntledge watershed, Crown land forest operations have a variety of requirements to ensure operators put maintenance of drinking water quality is a planning priority. |
Legislation | Connection to Maintenance of Drinking Water
--- | ---
*Wildlife Act, Environmental Management Act, Federal Hazardous Products Act, Transportation of Dangerous Goods Act(s), Wildfire Act* | These acts and their associated regulations have a variety of approaches to motivate high awareness about activities that may impact water courses and the environment and/or water users.

- **Stakeholder Consultation**
  - 4.2 Key Values – I’m not sure what “water that tastes so great you don’t have to chew it” adds to the discussion and there is a implication that “chewing it” may be may be a present requirement.

- **Recommendations**
  - 5.1 Annual Stakeholder Meetings – The annual open house forum proposed is a good option for presenting information and progress but may be a poor forum for addressing new initiatives and strategies. The Campbell River and RDN models of invited stakeholders representing specific groups or interests have proven effective in steering their watershed protection initiatives.

- **Appendix A – Map of Comox Lake Watershed**
  - Good map but park boundary, Puntledge water intake site and Hydo dam site would help. I’ve attached two maps – one shows the roughly 20,000ha of non-TimberWest owned land (i.e., the shaded area) in the 50,000ha Comox Lake Watershed (i.e. TimberWest owns about 60%, all of which is in Private Managed Forest Land). Note that a significant proportion of the west side of the drainage is in Strathcona Park. The other map does not show TW land. I defer to your preference which map you would like to use. Note that Island Timberlands and Hancock Forest Management also have minor amounts of private managed forest in the watershed, some of which is picked up in your Appendix C map. Consider adding legends and north arrows as you see fit.

- **Appendix B – Description of Land Ownership**
  - If the intended focus of pointing members to the Private Managed Forest Land Act is more than just isolating how it blocks local authorities, please consider pointing them to the summary table I provided and also that private managed forest landowners provide a free service to the purveyor (CVRD) by having a variety of emergency response (ie spill, fire) programs that also benefit and/or contribute to water quality maintenance.
  - It might not be necessary to point out that the Comox Lake Land Corporation purchased the land from TimberWest’s and/or its predecessors

- **Appendix C – Shoreline Land Ownership Map**
  - Good but dam and water intake sites would help

**Additional Comments:**
- You’ve removed reference to Auditor General’s Report although this may be somewhat relevant to some of the discussion in this report. The Auditor General’s report implies that that present legislation may be adequate and that the primary downfall of the government may be an effective, integrated approach to dealing with drinking water interests/concerns. These lead directly to the Health Authorities’ role under
the Drinking Water Protection Act. The table of legislation I inserted above should help convey this message to the audience of this report, but consider tying the table in with the Auditor General’s report too as it can provide context for the reader to know that all levels of government continue to work on integrating water management legislation.

- Still no clearly defined place for professional/technical input into the planning process despite these being critical components of Phases II and III of the watershed protection planning process. I considered adding a row to the legislation table to talk about resource management statutes in BC. Please note and consider adding this concept of professional review and these facts:
  - There are four main professional natural resource management statutes in BC, each with their own separate act and governing body outlining qualifications and application. Ongoing audits by professional bodies and requirements for continuing competency ensure that these professionals are held accountable for their work. Moreover, each has strict requirements for upholding the public interest in relation to environmental matters:
    - Foresters Act – Requires Professional Foresters to oversee activities on forest land, which includes major private forest land holdings (i.e. TimberWest’s holdings in the Comox area). Professional foresters must be involved in forest planning and coordination of other professionals as noted below;
    - Engineers and Geoscientists Act – Professional Engineers and Geoscientists are required for many aspects of forest management (e.g., terrain, roads, bridges, culverts);
    - College of Applied Biology Act – Registered Professional Biologists and Registered Biology Technologists are used extensively in forest management and are required for many aspects of government reporting (such as ecological inventories and monitoring); and
    - Agrologists Act – Professional Agrologists are used periodically in coastal forest planning, but certainly more so in BC Interior forestry operations where issues of range management overlap forestry.

- No discussion of knowledge gaps in the report. It may be prudent to include such a discussion in this early report or state that is will be in future reports.

- Deb Epps at the Ministry of Environment now has a completed version of the Comox Lake Watershed Water Quality Objectives report (deb.epps@gov.bc.ca). I can email you a copy if you can’t get it from her (it may even be on the web by now). Although it focuses on aquatic life standards, it has a lot of direct applicability to generally good water standards for this particular watershed. TimberWest and Island Timberlands provide ongoing support to this research – research that probably deserves more attention in this report, or at least in subsequent reports to this draft.
Appendix L: Submitted TimberWest Ownership Map 2007

[Type text]