



Same Land, Different Acronyms: Understanding

WHEN PLANNING FORESTRY ACTIVITIES WITHIN a watershed, ecological services, such as a healthy supply of drinking water, often compete for attention with other water-related values. However, forest professionals must show that they have considered the potential impact that their work will have on water intakes. Forest professionals are often conversant with riparian areas and fisheries, but addressing risks to drinking water can be a substantial challenge. A first step is to become familiar with the legislative requirements and the language of drinking water protection.

Relevant Legislation

Most resource professionals will be familiar with the requirements of the *Forest and Range Practices Act* (FRPA) and its regulations regarding drinking water quality in the context of community watersheds. However, resource professionals also need to be familiar with the provisions of the *Drinking Water Protection Act* (DWPA) when preparing plans and prescribing or supervising activities on the ground.

The DWPA and its regulations are the principle legislative tools governing drinking water in BC. Section 23 of the DWPA prohibits introducing, causing or allowing anything to be introduced into a domestic water system or a drinking water source that results in a drinking water health hazard. This is supported by Section 59 of the *Forest Planning and Practices Regulation* (FPPR) under FRPA which states that an authorized person who carries out a primary forest activity must not cause material that is harmful to human health to be deposited in, or transported to, water that is diverted for hu-

man consumption by a licensed waterworks.

As all water treatment systems have limitations, the forest professional's responsibility to protect source water quality is an essential component in the water provider's role of delivering safe drinking water to consumers. If a drinking water officer (DWO), a government employee who implements and administers the DWPA, concludes that Section 23 has been contravened as a result of activities in the watershed then they may issue an abatement order or impose punitive actions. Clear communication between forest professionals, water providers and DWOs can help avoid watershed conflicts.

Water Sources and Water Source Areas

A water source, in the eyes of a water supplier, means a stream, lake, spring or aquifer where a point of diversion (a water intake) has been established. The drinking water source area is the watershed or watersheds that connect and feed into the water source. Any activity in the source area that may impact water quality at the intake is of concern to the water supplier.

Domestic Water System or Water Supply System

An individual family may obtain a permit to divert water from a surface water source for drinking. This is called a domestic water system under the DWPA. If the same point of diversion is supplying drinking water to two or more families, it is called a water supply system and requires a construction and operation permit under the DWPA. All resource activities upstream of any water system are prohibited from contaminating drinking water under Section 23 of the DWPA.

Contamination

Contamination is the introduction of deleterious substances into a stream, lake or subsurface water flow. Direct contamination may result from fuel or oil spills, chemical applications, or the introduction of human or animal waste. Indirect hazards may arise from increased human and animal use of the area. For example, road development increases sedimentation, human and vehicle pollution, and creates new corridors for wildlife. This may intensify the levels of contaminants, turbidity, and human pathogens (viruses, protozoa and bacteria) entering into the water network that must be managed by a treatment system.

Turbidity

Turbidity, or cloudiness in the water, is caused by suspended organic and colloidal matter, such as clay, silt, finely divided organic and inorganic matter, bacteria, protozoa, and other microscopic organisms. It is measured in Nephelometric Turbidity Units (NTUs) and is generally acceptable when below 1 NTU and becomes visible when above 5 NTUs. Processes such as sedimentation, erosion or landslides contribute to turbidity in the water. Turbidity, depending on its source, is associated with the potential presence of pathogens in drinking water. Increased turbidity may overload disinfection processes and place human health at risk.

Treatment

Water treatment refers to barriers put in place to safeguard against human health risks. Treatment infrastructure varies depending



the Language of Drinking Water Protection

on the quality of the water source and may include disinfection and/or filtration to remove or inactivate contaminants. A source such as a deep well may need very little treatment, whereas a water intake at a lake, stream or shallow well may require multiple treatment barriers. Treatment systems are based on expected levels of turbidity and contamination. Increases to either have the potential to overwhelm water treatment capabilities.

Filtration

Filtration is a treatment applied to reduce turbidity and human pathogens by removing suspended particulate matter. Increases in turbidity can potentially increase daily filtration maintenance and operating costs. Systems that draw good quality water from protected deep well and surface sources often do not need filtration. Filtration is recommended for unprotected surface intakes and, in some cases, shallow wells. However, even in situations where source water is of uncertain quality, the high cost of filtration technology means that water suppliers may not be able to afford filtration systems. Disinfection is often then the sole method for drinking water treatment.

Disinfection

Disinfection is a treatment process to reduce waterborne pathogens. A water supplier is required to disinfect a water supply to remove potentially harmful microorganisms. Chlorination and ultra violet light (UV) are the most common disinfection treatments in BC.

Chlorination is the addition of chlorine to disinfect drinking water. It is highly effective given sufficient levels of chlorine

and exposure time. Residual chlorine in the water after treatment prolongs disinfection throughout the delivery system. Chlorinating water with higher than normal turbidity may not fully treat all pathogens, may produce a potentially harmful by-product, and reduces residual chlorine which increases the risk of contamination in the delivery system.

Ultraviolet light (UV) disinfection is a non-chemical process that inactivates harmful microorganisms by exposing water to UV waves. Increased turbidity can affect UV treatment as large particles in the water can block and absorb the UV light, reducing its ability to inactivate microorganisms. UV is also only effective within the facility and, unlike chlorine, does not guard against contaminants within the water delivery system.

Applying the Language

Forest professionals address multiple values in their forest stewardship plans and site plans, often requiring consultation with experts in other disciplines. Drawing on the knowledge of DWOs, water suppliers, and domestic water users is integral to developing results, strategies and specific forest practices for drinking water protection.

Forest professionals can get the most out of these discussions by maintaining an awareness of the associated terminology and legislation. Refer to the "Comprehensive Source-to-Tap Assessment Guide" (www.health.gov.bc.ca/protect/pdf/cs2ta-intro.pdf) for more information regarding drinking water source area protection.

Two websites supported by the Ministry of Environment may also be of assistance.

The BC Water Resources Atlas (WRBC) (www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html) is an i-Map service that can display data regarding Points of Diversion (water licenses). The Water Licenses Query (http://a100.gov.bc.ca/pub/wtrwhse/water_licences.input) can allow you to research water licenses by license number, stream name, and/or purpose. 🐟

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The Role of the DWO

Local implementation and administration of the DWPA is carried out by drinking water officers (DWOs) and their delegates in each provincial health authority. DWOs assess if water delivered by a water supplier poses a risk to human health. This is accomplished through monitoring and assessments of the water supply system from source to tap. DWOs also respond to concerns by water suppliers and the public regarding activities in a source area that may impact drinking water, and their decisions can have operational consequences for forest licensees.