



MANAGED FOREST COUNCIL

Review of Soil Conservation Events related to Forest Management
Activities within the Comox Lake Watershed

November 2015

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Introduction

As a result of boil water advisories issued by the Comox Valley Regional District (CVRD) in October and December of 2014, the Managed Forest Council (Council) committed to review forest management activities within the greater Comox Lake watershed that could have contributed to the two extended boil water advisories issued by the CVRD. Public concerns were expressed that forest management activities in the watershed contributed to the water quality issues resulting in the need for the boil water advisories. The purpose of this report is to summarize the findings of this review with a focus on significant soil conservation events that could have impacted water quality in the watershed.

The review relies on information from a number of sources to draw conclusions around soil conservation in relation to significant erosion and mass wasting events in the watershed. It does not represent an exhaustive study and is meant to be a reconnaissance level review.

Numerous studies and reports have been compiled for the Comox Lake watershed over the years. These documents present detailed information on historic uses and activity levels in the watershed. For this review a copy of the Comox Lake Watershed Assessment report from June 2006 was reviewed by Council. The background it provides on characteristics of the water source, possible contaminants, the water system itself and the various risks to water quality plays an important part in our understanding of the watershed. The technical discussion it includes on water movement throughout the watershed is critical to our understanding of sediment movement from large erosion events, soil conservation and forest management activity in the watershed. Copies of this document are available on the CVRD website.

Comox Lake Events Summary

- During the third week of October 2014 a series of storms resulted in significant precipitation in the Comox Lake Watershed. On October 27, 2014 the Comox Valley Regional District (CVRD) issued a boil water advisory to its water user community to address an elevated level of turbidity in its water supply system. This first of two boil water advisories was lifted on November 5, 2014.
- During the second week of December 2014 a series of storms resulted in significant precipitation in the Comox Lake Watershed. These rainfall events are documented in a series of e-mails from BC Hydro that describe the significant details around these rainfall events.
- Soon after the storm events in the second week of December 2014 a second boil water advisory was issued by the CVRD for residents in Courtenay and Comox as a result of high turbidity levels at the water supply intake on the Puntledge River. This boil water advisory was in place for an extended period of time beginning on Dec 11, 2014 and ending on January 27, 2015. The boil water advisory on Dec 11, 2014 was the second boil water advisory in the fall of 2014. The boil water advisory documents issued by the CVRD and Island Health are available for review on the CVRD website under the water resources tab.
- On August 7, 2015 Island Health (formerly Vancouver Island Health Authority (VIHA)) issued a hazard abatement / prevention order to the CVRD, the Village of Cumberland and TimberWest Forest Corporation. The order required the parties to submit an engineering report to Island Health that addresses the circumstances around the Village of Cumberland water system associated with Lake No. 2, its associated spillway and the impacts the overflow of this spillway has on erosion within Perseverance Creek. The technical report was to be completed by September 16, 2015. A copy of Island Health order and the technical report are available on the Island Health website (www.viha.ca).

Managed Forest Council Authority

Various sections of the *Private Managed Forest Land Council Regulation* protect drinking water quality at licensed waterworks intakes. These sections contain provisions that assess Managed Forest land owner's performance related to soil conservation and the protection of water quality. Each year Council assesses the owner's performance within these sections of the regulation through our yearly inspection program. Our inspectors assess all aspects of an owner performance in relation to these standards and their relationship to the ongoing protection of water quality. For this review our focus was on Section 26 of the regulation. Section 26 states;

Notification of landslides and debris flows

26 An owner or a contractor, employee or agent of an owner must notify the council within 24 hours of becoming aware that a landslide or debris flow has occurred on the owner's land, if the owner or a contractor, employee or agent of an owner knows that the landslide or debris flow has deposited debris or sediment into a class A stream, class B stream, class C stream, class D stream or class E stream.

The extended boil water advisories issued by the CVRD were the result of a significant erosion or mass wasting event. Section 26 is an important section of Council regulation as it provides the statutory requirement for owners to report landslide or debris flows that have entered creeks or streams. This mandatory reporting represents an important starting point for investigations into possible impacts to fish habitat or water quality under Sections 15, 17, 18,19,20,21 and 22 of the regulation. A significant contravention of these sections could lead to a conviction and fine of up to \$500,000.

Administrative Review

Currently there are two owners of private managed forest land operating within the Comox Lake watershed. The Managed Forest Council office has not received notification from either owner operating within the watershed that a landslide or debris flow occurred either before or after the boil water advisory of Dec 11, 2014 in accordance with Section 26 of the regulation.

Aerial Reconnaissance Review

A large percentage of the Comox Lake watershed is private managed forest land. The public as well as various stakeholders within the community speculated the source of the turbidity which led to the extended boil water advisory resulted from forestry activities in the watershed. To address these concerns Council staff flew the drainages of Comox Lake on February 17, 2015. The approximate flight path is documented on the Google Earth image identified in Figure 1 on the next page. The flight time in the watershed was approximately three hours with stops along the way to review possible soil conservation issues identified while in the air.



Figure 1 – February 17, 2015 flight path

The purpose of the overview flight was to assess the area for significant mass wasting events that would have contributed to the extended boil water advisories originally issued by the CVRD on December 11, 2014.

Significant mass wasting events can take many forms and include many causes. This review was focused on significant events directly related to the ongoing forest management activities in the watershed, looking for any mass wasting or significant erosion events associated with timber harvesting activity, roads or drainage structures. During the flight we identified only the following three events associated with forest management activity:

Figure 2 – An example of a small slide / failure initiated within a cut block that was deposited on the corner of a switchback. No material from this failure entered a creek.

Figure 3 – An event associated with water running down an old access road below the existing mainline that deposited eroded material at the bottom of the spur. It did not appear material from this event had entered a creek.

Figure 4- Erosion of soil down a spur road from water coming down a bank through a logged area. It did not appear any material had entered a creek.

These three events would be considered insignificant based on their location within the watershed, their scale and size, and lack of evidence of material from the events reaching waterbodies. Based on the overview flight in the watershed it was concluded there was no evidence of mass wasting events associated with ongoing forest management activities in the watershed that could have contributed in any significant way to the boil water advisory issued by the CVRD on December 11, 2014. Our observations did not identify any instances of non-compliance with the Regulation.



Figure 2- Small slide associated with a harvested area, undated event



Figure 3 – Erosion from the effects of water running downhill off the road surface in the upper portion of the picture, undated event



Figure 4 – Soil movement down a spur road in a harvested area, undated event

Erosion from Natural Sources

The review of erosion from natural sources was outside the scope of the reconnaissance level review. Natural sources of erosion represent areas of erosion that would occur regardless of the presence of forest management activity in the area. During the flight two small naturally eroding areas were reviewed, one along the Upper Cruickshank River (Figure 5) and one on Comox Creek (Figure 6). Both these areas have been known to exist for many years. During our review it did not appear these two areas had recently contributed a significant volume of bedload material to either of the two creeks.



Figure 5 – Natural bank erosion along the Upper Cruickshank River, February 17, 2015



Figure 6 – Natural bank erosion along Comox Creek, February 17, 2015

Discussions and Meetings with Stakeholders

a) Local Government and Health Authority Staff

As part of this review individuals from the CVRD, Island Health, and the Village of Cumberland were contacted. The objective was to gauge opinions on the role of forest management and to identify any direct forest management activities around soil conservation that would have led to the extended boil water advisory. The views expressed were varied as to the root cause leading to the extended boil water advisories. The concerns included the impact of the extent of forest management activities in the watershed and problems experienced within a portion of the Cumberland water supply associated with Henderson Lake. During the period when interviews were being conducted it was apparent very little information was available to stakeholders explaining the circumstances leading to the extended boil water advisory, which people found frustrating. These discussions did not identify any soil conservation issues directly related to forest management as a key contributor to the events leading to the extended boil water advisories late in 2014 and early in 2015.

b) TimberWest (MFs 7, 8 & 65) and Comox Timber (MF 39)

Our office met with TimberWest representatives in Nanaimo to review planning and operational activities around the Comox Lake watershed. Managed Forests 7, 8 and 65 constitute their private lands within the watershed. Meeting participants included both planners and operational staff. The focus of the meeting was on TimberWest planning and forest practices related to the management of their private forest lands. Our office reviewed a number of TimberWest planning and operational documents used in the management of their private lands, including their Environmental Policy, Best Management Practices and planning documents that tracked ECA (Equivalent Clear-cut Area). Operational plans around timber harvesting and road construction were also included in our review. These documents

are important to our understanding of TimberWest baseline level of due diligence around their forest management activities as practiced within the watershed. At no time prior or subsequent to the boil water advisory of December 11 did TimberWest submit a notice of a landslide or debris flow, in accordance with Section 26 of the Regulation. TimberWest did however notify our office on February 13, 2015 of the erosion that was occurring with the movement of water down the spillway of Lake #2 associated with the Henderson Lake portion of Cumberland water supply.

We also talked with representatives of the Hancock Natural Resource Group (Manager of MF 39, Comox Timber). Comox Timber owns private managed forest land around the top end of Comox Lake surrounding Cumberland and at higher elevations on the south side of the lake along its north-east shore. These discussions were about their ongoing forest management activities in the area and their awareness of any root causes of the boil water advisories. At no time prior or subsequent to the original boil water advisory of December 11 was the Managed Forest Council office notified of a landslide or debris flow attributable to ongoing forest management activities on their private lands in accordance with Section 26 of the Regulation.

Henderson Lake Portion of the Cumberland Water Supply

Throughout this review an issue involving the Cumberland water supply was pointed to by the various stakeholders with whom we talked as a possible source of the turbidity that led to the extended boil water advisory issued by the CVRD and Island Health. The issue is with what's known as the Henderson Lake portion of the Cumberland water supply. More specifically, Cumberland Lake or Lake #2 which is in a string of four lakes that make up this portion of the water supply. The other portion of the Cumberland water supply comes from Allen Lake. The issue as described in various reports and studies is that water from Cumberland Lake is diverted out the back of this reservoir down a spillway during high flow events. When this occurs the potential exists for significant erosion to occur down the ravine behind Cumberland Lake with water and eroded material eventually reaching Perseverance Creek. The mouth of Perseverance Creek is approximately 2.2 kilometers from the start of the Puntledge River. The intake of the Regional District water supply is 3.7 km downstream. The storm events that occurred in December 2014 (1 in 50 year event) in all likelihood resulted in large volumes of water moving down the spillway of Cumberland Lake with the subsequent movement of eroded material down the ravine into Perseverance Creek. Our flight on February 17, 2015 confirmed the ravine behind Cumberland Lake was actively eroding (Figures 7 and 8). What is important to note is that the extent of erosion occurring in this ravine was not encountered at any other location in the watershed during our flight. Although not conclusive, in all likelihood the eroded material from this location played a significant role in the elevated turbidity levels which resulted in the CVRD issuing a boil water advisory in December 2014 and the subsequent abatement order issued by Island Health on August 7, 2015 to the various stakeholders.



Figure 7 – Active bank erosion along ravine behind and below Cumberland Lake, Feb 17, 2015



Figure 8 – Over steepened bank of ravine behind and below Cumberland Lake, February, 17, 2015

Conclusions

The review focused on soil conservation and events that would lead to the introduction of large volumes of erodible material into the Comox Lake water system from ongoing forest management activities. Our review included the following;

- Conducting a reconnaissance level flight into the watershed in February 2015 which looked specifically for debris flows associated with ongoing forest management activities that could have contributed to the extended boil water advisory issued by the CVRD late in 2014 and early into 2015.
- Examining previously published reports into various aspects of the Comox Lake watershed that contributed significantly to our understanding of the watershed and the dynamic processes that take place in the watershed on a regular basis.
- Interviewing representatives from both local government and the health authority about their views of forest management within the watershed and possible contributing factors leading to the CVRD extended boil water advisory.
- Interviewing private forest land owners to discuss their ongoing forest management activities within the watershed.

This review has concluded there is no evidence of significant erosion or mass wasting events from the ongoing forest management activities of private managed forest owners within the Comox Lake watershed that would have contributed in any significant way to the extended boil water advisory issued by the CVRD on December 11, 2014.



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