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## Re: Addendum to the Bastion K0WG, K5M7, & K5M8 TSA Report

### Introduction:

This addendum is to be distributed with the report authored by Azimuth Forestry and Mapping Solutions Ltd. and titled “Cutblocks K0WG, K5M7, and K5M8 – Bastion Creek Area – Terrain Stability Assessment”. The date of the report is April 3, 2020. The addendum must be referenced in conjunction with the TSA report

New information has come to light concerning the Bastion Creek Watershed consisting of a report authored by Dobson Engineering Ltd. titled “Detailed Channel and Debris Flow Assessment for the Bastion Creek Watershed” and dated March 2000<sup>1</sup>. The Dobson report determined that the likelihood of debris flow and debris flood events occurring on, and being transported down the mainstem of Bastion Creek is **Moderate**. Azimuth accepts the findings of the Dobson report and as a result the partial risk assessment concerning elements at risk on the Bastion Creek fan contained in the Azimuth TSA report must be modified. The modified partial risk assessment concerning the proposed cutblocks is contained in Tables 1-3 below.

### Results:

	Likelihood of a Landslide (LS) (Azimuth, 2020)	Likelihood LS impacts the mainstem of Bastion Creek (Azimuth, 2020)	Likelihood LS occurs and impacts the mainstem of Bastion creek (P(H))	Likelihood of a debris flow or debris flood to Bastion Creek fan (Dobson, 2000) (P(S:H))	Likelihood of elements at risk on the Bastion Creek fan being impacted (P(HA))
	a	b	a x b = c	d	c x d = e
Post-harvest	H**	H	VH	M	VH
Post-harvest Residual***	L	H	M	M	M

\*Elements at risk on the Bastion Creek fan include (and are not limited to) water supply infrastructure, residential structures, human safety, and the Sunnybrae-Canoe Point Road.

\*\*VL = Very Low, L = Low, M = Moderate, H = High, VH = Very High.

\*\*\*Note that the post harvest residual assumes implementation of the recommendations included in the Azimuth TSA report.

<sup>1</sup> Dobson Engineering Ltd., 2000. Detailed Channel and Debris Flow Assessment for the Bastion Creek Watershed. Small Business Forest Enterprise Program of the Salmon Arm Forest District and Federated Co-operatives Ltd. Available at: [http://a100.gov.bc.ca/pub/acat/documents/r8336/bastion\\_cap\\_2000\\_1165520663928\\_5c38a23934794197a0b4ca8466de1286.pdf](http://a100.gov.bc.ca/pub/acat/documents/r8336/bastion_cap_2000_1165520663928_5c38a23934794197a0b4ca8466de1286.pdf).

<sup>2</sup> Wilford D.J., Sakals M.E., Grainger W.W., Millard T.H., and Giles T.R., 2009. Managing forested watersheds for hydrogeomorphic risk on fans. B.C. Ministry of Forests, Resource Branch, Victoria, B.C. Land management Handbook 61. <https://www.for.gov.bc.ca/hfd/pubs/docs/lmh/lmh61.htm>

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	a	b	a x b = c	d	c x d = e
Post-harvest	M	H	H	M	H
Post-harvest Residual	L	H	M	M	M

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	a	b	a x b = c	d	c x d = e
Post-harvest	L-M	M	L-M	M	L-M
Post-harvest Residual	L	M	L	M	L

In addition, the concern was raised of the potential for the existing roads passing through blocks K5M7 and K5M8 to intercept and concentration water onto the Bastion Creek valley sidewall slope. The existing roads within the block and area downslope of the roads on the sidewall slope were inspected at the time of fieldwork. No evidence of drainage interception and concentration onto the sidewall slope was noted as the result of the existing road network. Drainage structures and ditchlines on the existing roads in the blocks are intact and in good condition. Temporary deactivation works including waterbar installation on the road surface appear to have been implemented following the last round of harvesting in the area. Recommendations concerning the existing roads in blocks K5M7 & k5M8 are contained in the Azimuth TSA report and are intended to ensure that drainage structures and ditchlines along the roads remain functional during and following the completion of harvesting activities.

### **Recommendations:**

The revised residual risk for elements at risk on the Bastion Creek fan is Moderate with respect to the southwest and southeast portions of block K0WG and is Low for blocks K5M7 and K5M8. **It is the responsibility of BCTS to review this risk assessment and determine whether the residual risk described above is tolerable.**

Given that 20 years have passed since the Dobson report was completed, conditions in the Bastion Creek Watershed and the mainstem of Bastion Creek may have changed. Due to this, consideration

should be given to completing a new study of the disposition of Bastion Creek to debris flood or debris flow events or updating the existing Dobson report to reflect current watershed conditions. These works should be completed by qualified registered professional (QRP) specializing in hydrogeomorphic processes.

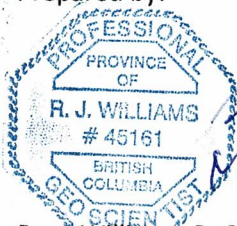
Alternatively, if the Moderate residual risk to elements at risk on the Bastion Creek fan associated with the southwest and southeast portions of block K0WG is not tolerable to BCTS, the portions of block K0WG which drain onto the sidewall slope of Bastion Creek should be removed from the harvest area. This will result in a Very Low likelihood of a landslide on the Bastion Creek sidewall slope downslope of block K0WG and a corresponding **Low residual risk** to elements at risk on the Bastion Creek fan.

**Closure:**

Sincerely,

Azimuth Forestry & Mapping Solutions Ltd.

Prepared by:



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