



THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

INFRASTRUCTURE COMMITTEE MEETING OF THE VILLAGE OF LIONS BAY HELD ON MONDAY, MAY 27, 2019 at 7:00 PM COUNCIL CHAMBERS, 400 CENTRE ROAD, LIONS BAY

AGENDA

- 1. Call to Order**
- 2. Appointment of Recorder**
- 3. Approval of the Agenda**
- 4. Public Questions & Comments**
- 5. Approval of Minutes**
 - A. Infrastructure Committee Meeting – March 25, 2019 (Page 3)
- 6. Business Arising from the Minutes**
- 7. Unfinished Business**
- 8. New Business**
 - A. Review and Presentation of an EV Charging Station
 - B. Review of the Infrastructure Committee (IC)
 - I. Discussion of the role(s) and expectations of the IC from the point of view of:
 - a) The resident members
 - b) The Council members
 - c) Staff
 - II. What do the above groups want from the IC?
 - a) What benefit(s) are there for each of the above groups or individuals?
 - b) What do the members consider to have been the benefits provided to date by the committee to the Village?
 - III. What do the members enjoy from participation on the IC?
 - a) How can we make this better?
 - IV. What “boundaries” must/should we make?
 - a) Guiding Policy/Terms of Reference

9. Public Questions & Comments

10. Next Meeting Date

11. Adjournment

**INFRASTRUCTURE COMMITTEE MEETING
OF THE VILLAGE OF LIONS BAY
Council Chambers, 400 Centre Road, Lions Bay
March 25, 2019 at 7:00 PM**

Minutes of the Meeting

In Attendance:

Fred Bain – Councilor and Committee Chair
Norm Barmeier - Councilor
Neville Abbott – Councilor
Ron McLaughlin - Mayor
Naizam Jaffer – Public Works Manager
Peter DeJong - CAO
Jim Mutrie – Resident
Tony Greville – Resident
Karl Buhr – Resident
Brian Ulrich – Resident

1. Call to Order – 7 pm
2. Appointment of Recorder
 - A) Fred and Nai
3. Approval of the Agenda
 - A) Approved
4. Public Questions and Comments
5. Delegation
 - A) None
6. Approval of Minutes
 - A) Minutes of the meeting of February 28th, 2019 Approved
7. Business Arising from the Minutes
8. Unfinished Business
 - A) Magnesia Status Update [No Update]
 - B) Oceanview Stormwater System [No Update]

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9. New Business

A) Presentation by Dr. Steven Weijs - UBC – Lions Bay Hydrology Study

Over the last two years, undergraduate and graduate students have been studying our drinking water supply and the streams and catchments that feed them.

UBC has been equipment poor but that's soon going to change – Dr. Weijs has submitted a grant to the Canadian Foundation for Innovation and after two successive failures, this year the grant was approved.

Students have been using salt dilution gauging to determine stream flow; however, this has been limiting as they can only conduct experimentation when they visit Lions Bay. Dr. Weijs then discussed 2017 measurement data and showed the seasonal curve – they hope to be able to determine what proportion of water comes from snowmelt and groundwater which will help predict what will happen as Climate Change progresses.

Another study being done by graduate students is looking at natural isotopes of water – isotopic variations in snow melt, stream water, and groundwater are another method by which they can estimate the proportions of each in our drinking water.

Magnesia has higher conductivities and they think that's because of the wetland areas above while Harvey has a larger proportion of snowmelt that runs off quickly due to the steepness of terrain.

Once they have continuous time series of data they will begin to put together models to study variations in our watersheds.

Insights gained so far:

Flow is lowest in the summer due to low precipitation and high temperatures (thus evapotranspiration). There appears to be a low supply of groundwater that is sustaining flow in late July and August, but from where exactly (i.e. which depth/general location) and how much is being supplied is unknown.

However, most of the smaller streams continued to flow even in August.

In the fall flow becomes very dependent on precipitation events and can be quite large following storms (no data on this yet).

One the first snow falls at higher elevations (around October/November), flow decreases again and becomes a bit less varied.

Flow is relatively low in the winter, but not as low as summer.

Spring melt will increase flow and snowmelt will sustain a higher base flow until June.

The greatest water sources are precipitation (dominant in fall) and snow melt (dominant in spring).

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Based upon isotope results, Harvey is fed about 50% from snow melt and 50% from groundwater or interflow in June.

Magnesia's results were inconclusive but we can assume that lakes near the headwaters contribute quite a bit to the streamflow in June.

Funding for Students:

Graduate Students

National Science and Engineering Research Council (NSERC) + Dep't top-ups	\$75,000
Dr. Weijs Start-up funds / discovery grant	\$10,000
NSERC project on uncertainty in streamflow measurements	\$25,000
UBC Public Scholar Initiative (for equipment)	\$9,000

Undergraduate Students

NSERC USRA Grants 3 x \$4,500	\$13,500
Dr. Weijs Start-up funds / discovery grant	\$16,000

Funding for Equipment:

Start-up funds	\$10,000
40% Canada Fund for Innovation	\$125,000
40% BC Knowledge Development Fund	\$125,000
20% Matching Vendor Discounts + Lions Bay	\$62,500

Lions Bay commitment from MoU:

In-kind support*	\$10,000
Cash support (annual)	\$2,000

*In-kind support for installing equipment is used for CFI matching

Key questions moving forward are

What to measure, where and when?

How to measure streamflow economically and reliably in steep streams?

What are contributions of snow and groundwater?

Setting up prediction models for monthly streamflow in summer: water information is most valuable.

How to optimally combine regional records of streamflow with local one to estimate frequency of low flows?

What can be expected under climate change?

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Key equipment to be installed in Summer 2019

Automated salt dilution gauging

Water level and electrical conductivity sensors

Wireless network weather stations (Precipitation, Humidity, Temperature, Wind, Solar Radiation, Soil Moisture, Surface Temperature, and Snow Depth)

LoRaWAN (low range – wide area network) Gateway (on future cell tower?)

Snow-cameras / sensors

Dr. Weijs to work with Public Works to determine a suitable location for the automated salt dilution gauging apparatus.

Students have determined an appropriate location for snow pillow measurement cameras. Students will use the surface area of visible snow, the hours of solar energy exposure and intermittent depth measurements will help piece together the available meltwater contained within the snow packs.

Follow up steps:

Dr. Weijs will contact Public Works to determine the best location or the auto-salt apparatus Nai, to confirm with Finance, the available funds (our contribution) to the UBC study.

10. Public Questions and Comments – None

11. Adjournment

12. Next meeting: February 28th, 2019 Adjournment