PEMBERTON VALLEY DYKING DISTRICT

To: CEPF Funding Application Review

RE: SLRD Category 2 funding for Mt. Meager Monitoring.

On the August long weekend of 2010, the largest landslide in recent Canadian history occurred on Mt. Meager / Capricorn Creek North of Pemberton, B.C. Over 50 million Cubic Meters of material came down in the early morning hours. The slide blocked the Lillooet River and Meager Creek, temporarily damming up water. The residents of the upper Pemberton Valley noticed that the river dropped to almost no flow. They called this to local emergency planners, and a helicopter was dispatched to the area at first light. Luckily, the dams burst very quickly, and the water began to flow before the newly forming lakes could build up enough volume to cause a flash flood. Pemberton and its residents were extremely lucky on this day.

Later, in 2010, we identified that an early warning system could have alerted emergency planners and the Pemberton Valley Diking District (PVDD). The PVDD initiated a project in early 2011 to install a system. The now-named PVEMC, or Pemberton Valley Emergency Committee, a joint committee comprised of the PVDD, Lil'wat Nation, The SLRD and the Village of Pemberton, actively lobbied for Provincial partners to fund this program. In 2013, EMBC came into the picture and agreed to fund the 30K needed to install this system. The system was installed in 2014 and is still running today. The current systems give an alarm when the river drops at an above-normal rate, alerting emergency planners to a possible problem. While this system is a great asset, the sensors are only 25 km from the town of Pemberton. The slide location is another 33 km away, so the river would be blocked for over 2.5 hours before the current early warning system picks up a problem. The current system provides us with about a 2-hour notice of the water levels before the levels are noticed in the town. This is insufficient time to evaluate the risk and trigger an evacuation. The system was installed in its location due to the limitations of communications and the complex geography of the area.

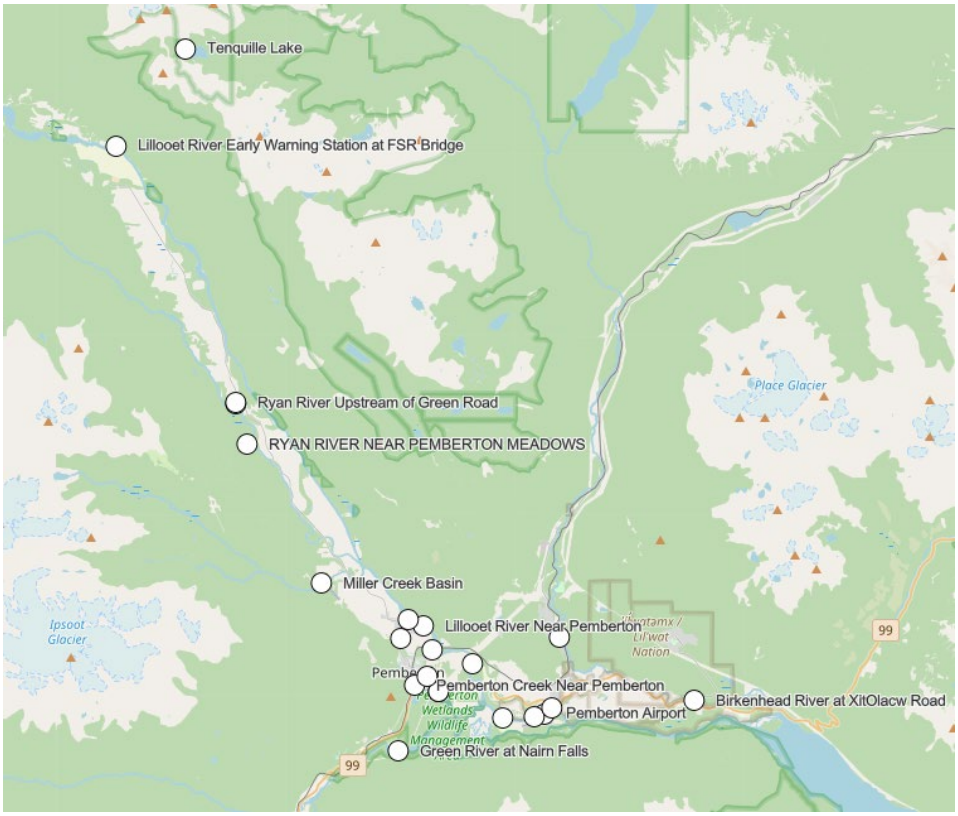
In 2017, Innergex, a sustainable energy producer, completed its upper Lillooet River hydro project. This brought a new partner into the valley. With this, SFU was working on monitoring systems with their academic students and the Department of Earth Sciences and Center for Natural Hazard Research. Since then, Innergex, SFU and the PVDD have been working toward a monitoring system that could trigger an alert in the town of Pemberton.

Innergex has existing power, Wi-Fi, and comms to an SFU repeater station. A weather station and two high-resolution cameras have been running since 2020. This system is useful but lacks the alert function, and problems must be found by logging in and looking at the camera. A 20,000 cubic meter slide was observed in this way in May 2023 but was not noticed until several days after the occurrence.

PO BOX 235 1381 Aster St, Pemberton, BC V0N 2L0 phone: (604) 894-6632 fax: (604) 894-5271 trustees@pvdd.ca www.pvdd.ca
PEMBERTON VALLEY DYKING DISTRICT

The PVEMC group operates flood level, flood prediction, and WSE monitoring gauges in the Pemberton Valley. This effort is 100% locally funded and has a robust long-term commitment from the group. Two of the gauges were installed using a CEPF grant in 2021/22 that the VOP secured. Although we rely on ECCC and the RFC for flood and weather prediction, without local environmental and river data to refine the broad predictions, we could not accurately or effectively provide the safety that our residents require.

The gauge network, which runs on the Aquarius network supported by Northwest Hydraulic Consultants, also delivers data from partners like the MOE, MOF, and WSC gauges.



As you can see from the graphic, the PVEMC group, led by the PVDD, has built extremely robust systems and proven our competence in installing and maintaining the gauges. The group funds the approximately $50K maintenance costs, and the PVDD funds an additional $20K annually. The network of gauges and its alerting system are constantly being improved

upon as data becomes available. There are now over 25 preprogrammed alerts that go out via text and email and trigger actions for the PVDD and local emergency planners. This local data refines our ability to issue alerts and orders and track an event for future knowledge.

The weak point in this system is the vicinity of the current early warning gauge. This year, the PVDD, Innergex and SFU have teamed up to acquire MITACS funding to develop the systems further. A full-time academic expert in this field of study will work with the PVEMC group and private/academic partners to further refine our current system and tie the system into the SFU database and the Aquarius network. Innergex and SFU have been running an infra-sound / seismic system for almost a year to capture ambient noise in the area. With this CEPF funding stream, we can add more infra-sound and seismic equipment and a broader comms network to expand our monitoring area. This will allow for not only remote triggering of a signal to alert us that an event has occurred, but it would also give amplitude and a rough area of occurrence. Given that Mt. Meager is such an active area, it is of supreme importance to the safety of the residents of this valley. Given that Pemberton Valley has been home to Lil'wat Nation for over 5000 years and the economic value of our farming community, this is an essential tool for us. As climate change unlocks the frozen slopes of Mt. Meager, this is even more important as slide activity will increase, as will the danger to residents.

Pemberton has proven that we have the skills, experience and drive to complete these projects. Our excellent team has worked on similar projects with great success on Mt. Currie, Mt. Meager, and Mt. Cayley. We know that with this funding and help from our partners, we can provide a system that will help protect our area's residents for many years to come.

Kevin Clark

Manager PVDD

PO BOX 235 1381 Aster St, Pemberton, BC V0N 2L0 phone: (604) 894-6632 fax: (604) 894-5271 trustees@pvdd.ca www.pvdd.ca
PEMBERTON VALLEY DYKING DISTRICT