PetroBarrier Systems Inc.

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To Whom It May Concern:

Waste water from passenger vehicles and heavy machinery poses a tremendous threat to the delicate balance of our natural water bodies. It is estimated that up to 88 million gallons (8 Exxon Valdez's) of oil enters Canada's natural water bodies each year as a result of urban and waste water run-off. Storm water contamination is a major concern.

Petro Barrier Systems Inc. (PBSI), has long been involved in the field of oil containment mitigation and has developed numerous products that work to protect water systems from various kinds of liquid hydrocarbons (oils), hazardous chemicals and heavy metals. In response to these environmental threats, PBSI has developed a point source filter that offers protection solutions for Storm and Sump Drains.

The Storm/Sump Drain Protector guards water systems from hydrocarbon oil, PCB and heavy metal contamination. The filters are equipped with specially designed pads containing patented MLM filter technology, designed specifically to absorb and contain hydrocarbon oils and remove PCB's in waste water. In the event of a major oil spill, the filter media will react immediately to form a solid gel, which stops the flow of all liquids entering the drain.

Project:

Two years ago, PBSI approached Camosun College to develop a method of remotely monitoring the storm drain protectors that they manufacture and sell. In response Will Spaulding and Imtehaze Heerah, two faculty members in the Department of Mechanical Engineering Technology, successfully designed and prototyped miniature oil detection sensors and a robust wireless commination module. Funding for the development work was provided, in part, by two successive grants from the Industrial Research Assistance Program (IRAP). A third grant, provided by NSERC ARD, has recently been issued to help the team, in close collaboration with PBSI, work toward the development of a commercial version of the oil sensors system with a seamless wireless interface between the sensors and the internet. PBSI has taken to calling the new sensor/communication system the "Alert System".

One of the most important steps in the current development process is the installation of the Alert System (sensors and wireless modules) in a set of storm drains around the Royal Roads University campus that will be exposed to real operating conditions. As well as providing real and active remote monitoring of the storm drains, the test installation will provide important system performance data and enable the refinement of the overall system and improve the design.

In addition to the testing of PBSI's technology, the installation of the Storm Drain Protectors equipped with the "Alert System" will allow Royal Roads University "real-time" knowledge of pollution activity in the drains around the campus. This not only protect the sensitive environment that surround the property, but also provides a brand new and industry leading type of detection for environmentally damaging materials that may otherwise flow through the campus undetected.

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System Overview:

The Storm Drain Alert System (installed in the storm drain protectors) is a wireless remote oil sensing and monitoring system that will constantly provide feedback and updates on the status of storm drains into which it has been installed. Each storm drain installation has the following components:

- A PBSI storm drain protector insert with oil barrier filter.
  This will protect keep any entering the drain from going down the drain protecting the environment.

- An array of oil detection sensors
  These sensors are embedded in each storm drain protector pad and function to detect the presence of oil as it tries to flow through. They are arrayed such that various pockets of the pads can be monitored simultaneously. This data set can then be converted into a map of the pad to show the extent to which the oil filter pad has been contaminated with oil.

- Drain condition monitoring sensors (float sensors, temperature sensors, etc.)
  These ancillary sensors provide additional information about the state of the environment in and around each storm drain protector. The float sensors provide valuable feedback information about the degree to which a storm drain protector is plugged. By combining the data provided by these ancillary sensors it will be possible to remotely determine what it is that has clogged a drain - oil or simply muck, such as leaves and other debris?

- A wireless transmission/receiving module
  The onboard wireless data transceiver module relays feedback signals from the drain's sensors to the internet where each drain's data can be viewed and further processed and analyzed. Each storm drain protector has one wireless module. The modules can connect to the internet in one of two ways:
  - Via an external "bridge" unit (located within range of WiFi router); or,
  - A repeater unit (to extend the range of the transmission system).

We are very excited about our Relationship with Royal Roads University and admire their commitment to protecting the environment.

Mike Ansley
Vice President – Marketing & Communications
Petro Barrier Systems Inc.