# RESEARCH CONFIRMS THAT SCALE*WATCHER*® CAN CONTROL ZEBRA MUSSEL SETTLEMENT

A study undertaken by Aquatic Sciences Inc has clearly demonstrated that the **Scale***watcher*® Electronic System can successfully control infestations of zebra mussels in pipes and water inlets. The research, carried out over a six-week period along the Welland Canal in Southern Ontario where densities exceed 20,000/m², showed that the **Scale***watcher* System had reduced the amount of molluscs by up to 97%.

The impact of zebra mussels now extends from the Great Lakes watershed to the mouth of the Mississippi River. They effect industry and small-volume water users by clogging pipes and intake structures. Industries in infected areas regularly treat the water with oxidants, heat or molluscides to eradicate zebra muscles from the service water system. Heightening awareness of aquatic environments and health issues has resulted in increased regulations and lower discharge limits for chemical treatment resulting in Industry now requiring alternative methods to control infestations.

The **Scale***watcher* system is extensively used in Industry throughout the world to control fouling resulting from the build-up of scale. Industries in Japan found that the system controlled not only scaling but also crustaceans in the piping system to a heat exchanger. This observation led **Scale***watcher* North America Inc. to hypothesize that the **Scale***watcher* system may also control zebra mussels.

Crustaceans and zebra mussels are similar in the way they use calcium. They both convert calcium in a free ion form to calcium carbonate to construct their shell or exoskeleton.

ASI set up a study to determine whether the ***Scale****watcher* system inhibits zebra mussel settlement compared to a control system. Using a research trailer, ASI installed a 200 gal. head tank filled with canal water at the north end of the trailer. The test and control system was gravity fed by the head tank. One-inch PVC tubing was connected to a 1" ball valve and to a 1" gate valve on the head tank. The control chambers were connected to the ball valve outlet and the **Scale***watcher* test system and chambers were connected to the gate valve outlet. The 1" tubing leading from the gate valve was connect to an 18" length of 2" galvanized steel pipe. Electrical leads from the **Scale***watcher* unit were wrapped around the steel pipe which in turn was connected to the test system which consisted of a set of three test chambers (bioboxes) simulating the zebra muscles preferred colonization environment.

Three 0.015 m² PVC culture plates were placed in each test chamber to measure zebra mussel settlement. Constant flow rates, through control and test bioboxes, were maintained by manipulating ball valves leading into the bioboxes.

Technicians took measurements daily recording conductivity and water temperature for the control and test systems.

At the end of the test, the culture plates were removed and samples taken for analysis. It was found that the density of the zebra mussels on the area treated by the **Scale***watcher* unit was 10 times lower than the control. These results indicate that the **Scale***watcher* unit inhibited the settlement of zebra mussels

The **Scale***watcher* unit controlled both pediveliger and juvenile zebra mussels, which suggested to ASI that the system may change chemical partitioning of calcium in the water and cause settling larvae to perceive an unsuitable environment. These mussels would choose to remain in the water column and pass through the system despite the presence of a suitable substrate.

**Scale***watcher*'s patented technology works by producing a complex frequency modulated waveform. Reacting to the varying applied field, the **Scale***watcher* creates an induced electric field inside the pipe whereby the crystal growth of the scaling minerals in the water is promoted. As the crystals remain within the flow of the water, they no longer contribute to the build-up of hard pipewall deposits. Existing scale layers are softened, and loosened scale crystals are removed from the system by the water flow. **Ends**