

Tidal Seepage Meter

Device measures tidal seepage over time and can obtain multiple samples per use

The U.S. Navy seeks to license a method and apparatus for measuring tidal seepage over time covered by U.S. Patent Number 7424375: Tidal Seepage Meter.

Background

Tidal seepage is the exchange of water between ground water and adjacent waterways (lakes, rivers or oceans). During the ebb and flow of the tidal cycle, water moves through marine and aquatic sediment, flowing between groundwater and surface water. Tidal seepage can carry pollution and contaminants from groundwater into lakes, rivers or ocean waters. Tidal seepage *meters* measure this flow and are positioned beneath the water body and partially embedded in the underlying sediment. The devices quantify the variable rates of flow and chemical transport between groundwater and surface water. Typical seepage meters measure aggregate seepage over time and do not provide data on how seepage changes during the tidal cycle. Additionally, typical meters can only obtain one sample per use, which increases cost and danger to divers by requiring them to make repeated dives to collect multiple samples.

The Technology

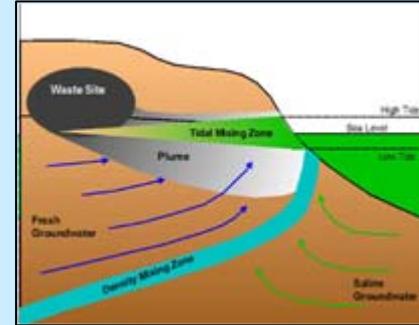
SSC Pacific has developed a method and apparatus for measuring changes in tidal seepage during the 24-hour tidal cycle, as well as for obtaining up to six seepage samples per use. The meter consists of multiple sampling chambers linked to a controller programmed with a sampling time schedule. The meter could be programmed to obtain six samples at four hour intervals, which represents a one-day tidal cycle. The controller activates a motor, which rotates sample containers in line with a seepage inlet port, capturing sample water. After the sample is taken, a stopper valve prevents water from flowing out of the sample chamber. At the end of the sample cycle, the containers are retrieved and the seepage water is analyzed.

Key Benefits

- Unlike typical seepage meters, the technology provides data on how tidal seepage changes during the tidal cycle by obtaining samples at specified time intervals
- In addition to measuring seepage flow over time, device retains sample water, which allows for analysis of chemical transport
- Could be used as a valuable educational tool to raise awareness of the connectivity between groundwater and surface water
- The ability to obtain up to six samples per deployment reduces cost and number of dives required

Development Status

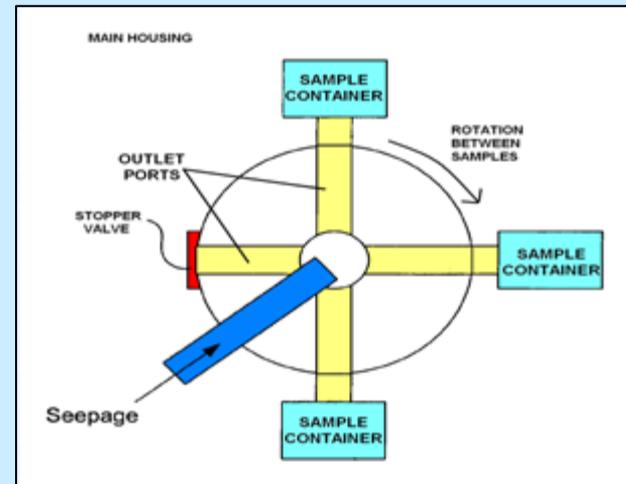
- DoD 5000 Series Technical Readiness Level 2
- One U.S. Patent Issued: 7424375: Tidal Seepage Meter



Tidal seepage carries pollution from groundwater into surface waters



Existing seepage meters are only able to collect one sample per use



Device motor rotates on a timer to take multiple samples per use

For more information on technology transfer, please contact us at (619) 553-2778 or email ssc_pac_t2@navy.mil

SD 866, October 2009. SSC Pacific, San Diego, CA 92152-5001
 Approved for public release; distribution is unlimited.

Space and Naval Warfare Systems Center Pacific (SSC Pacific) is the U.S. Navy's research, development, test and evaluation, engineering and fleet support center for command, control and communication systems and ocean surveillance.

www.spawartechtransfer.navy.mil