

# ON THE LEVEL



Water Monitoring News and Updates

## Solinst®

High Quality  
Groundwater  
and Surface Water  
Monitoring  
Instrumentation

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All Under One Roof



SPRING 2009

**NEW!**

Just Released from Solinst

### LTC Levellogger Junior



Low Cost  
Level, Temperature  
and Conductivity Datalogging

The NEW LTC Levellogger Junior provides the low cost convenience of three measurement parameters in one instrument. The LTC Levellogger Junior combines a datalogger, memory for 16,000 sets of readings, 5-year battery, pressure transducer, temperature and conductivity sensors, in a small waterproof housing. It is compatible with Levellogger Gold software, accessories and Telemetry. It is ideal for:

- Saltwater intrusion monitoring
- Salinity studies, tracer tests
- Stormwater runoff monitoring
- General indication of contamination

### Laser Marked Coaxial Cable Water Level Meter



Model 102 Coaxial Cable Water Level Meters now have permanent, accurate, laser etched markings every millimeter or 1/100 ft!

Also, it still has all the convenient features that make it such a popular choice:

- Lower cost
- Durable, flexible cable on a sturdy reel
- Narrow probes with segmented weights



The NEW laser marked 102M Mini Water Level Meter is now available in lengths of 25 m and 80 ft. The small lightweight reel fits easily in a backpack or a small carrying case.



### Remediation of a Former Gas Station Site - Within 6 Months!

Vertex Environmental Inc., located in Cambridge, Ontario, specializes in the in-situ remediation of contaminated groundwater. In 2007 they were contracted to clean up a former gas station site in Guelph, Ontario. The contaminant plume containing gasoline and diesel occurs in unconsolidated silty sand to a depth of approximately 3 m (10 ft). The initial plume stretched 30 m (100 ft) long and 15 m (50 ft) wide.

Migration towards down gradient receptors was a concern, therefore a solution that worked quickly and effectively was required to help eliminate the potential for exposure. Waterloo Emitters were chosen for the site to diffuse oxygen into the contaminant plume, thereby enhancing the natural biodegradation of BTEX and Petroleum Hydrocarbons (PHCs).

... continued overleaf

## Levelogger Measures Greenland Ice Sheet Melt Water



The Greenland Ice Sheet covers 80% of the Island of Greenland - it is the largest ice mass in the Northern Hemisphere. Therefore, it should be no surprise that it is suspected to be a key contributor to current and future global sea level rise, particularly as the earth's temperature continues to increase.

Satellite evidence shows surface ice sheet melting and its volume shrinking, but questions arise - how much melt water is actually leaving the ice mass and entering the ocean, and how much refreezes within the sheet through the process of "firn densification" - increasing ice sheet density and decreasing volume, but never entering the ocean?

With funding provided by NASA, Dr. Laurence Smith, a professor with the Departments of Geography, and Earth and Space Sciences at UCLA, is leading an ambitious research project to help answer these questions.

To obtain field data critical to the study, the project is being aided by Solinst Leveloggers. Initially, in 2007, two study sites were instrumented with a Levelogger Gold and a Barologger to capture accurate ice sheet melt water levels and barometric readings. The Leveloggers are set to record every 15 minutes. The logged readings are monitored at UCLA, as the Levelogger data is sent via satellite telemetry to the University.

Six more study sites were added this past summer. The Leveloggers were installed around the edges of the ice sheet in outflow rivers, and set to capture more frequent data at 1 reading per minute, in order to measure micro floods and pulses. In 2008, calibrating in situ discharge measurements were also taken, allowing water levels to be converted to units of water flux ( $m^3/s$ ). Data was collected and downloaded in the field over the course of the summer by Smith, Vena Chu (Ph.D. student), Asa Rennermalm (postdoctoral scholar) and Rick Forster (University of Utah).

One of few studies of its kind, researchers are measuring outflow levels of the ice sheet to gain insight on how much melt water may actually be contributing to sea level rise.

*Acknowledgement: Solinst thanks Dr. Laurence Smith of UCLA for providing the details of this application.*



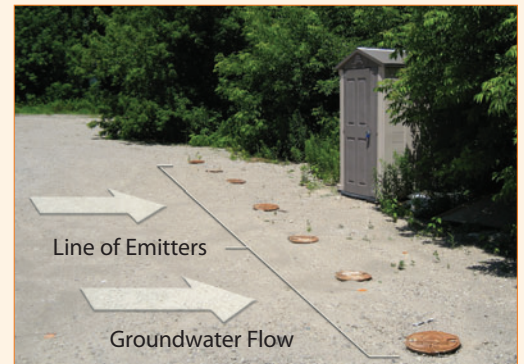
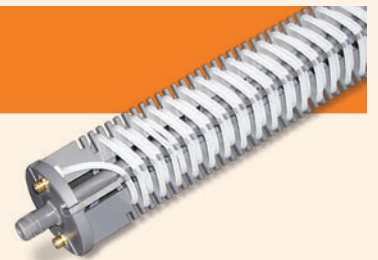
## Remediation of a Former Gas Station Site - Within 6 Months! (continued from cover)

A total of 14 Waterloo Emitters using LDPE tubing were installed in 4" wells screened at and below the water table. Emitters were placed to form a "fence" along the down gradient property boundary to cut off the contamination plume. Dried air containing 21% oxygen was released through the tubing into the plume to provide immediate bioavailability of molecular oxygen for aerobic biodegradation.

During the remediation process, Dissolved Oxygen (DO) samples were collected on a monthly basis and groundwater samples for BTEX and PHCs were collected quarterly from down gradient wells. Within one month of the installation, DO levels in the monitoring wells increased an average of 880%. Initial PHC levels were a maximum of 27 mg/L (average 9.6 mg/L). Within six months, results showed that the levels of BTEX and PHC had dropped below the analytical detection limit, meeting the Soil, Ground Water and Sediment Standards of the *Ontario Environmental Protection Act*, thus enabling the Emitter system to be decommissioned just one year after installation.

*"The Emitters created an effective aerobic reactive zone that attenuated the dissolved petroleum hydrocarbons to below detection limits within a short period of time thus protecting down gradient receptors"*

Rick McGregor, M.Sc., MBA, CGWP, P.Geo.  
Hydrogeologist/Geochemist  
Vertex Environmental Inc.



*Acknowledgement: Solinst thanks Rick McGregor of Vertex Environmental Inc. for providing the details of this application.*



## Use a CMT to Monitor a LUST Site

Solinst CMT® Multilevel Systems provide a cost effective solution for identifying and monitoring leaking underground storage tank (LUST) sites. They monitor multiple depth-discrete zones in a single borehole, providing complete data sets that quickly identify sites that pose a threat to down-gradient receptors, and those that can be closed with no further action. With strong political and economic incentives to close LUST sites, and redevelop brownfields, CMT Systems are an ideal solution.

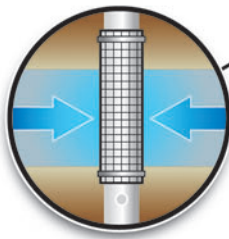
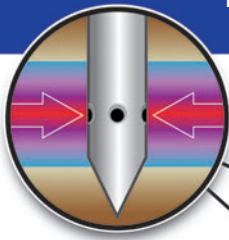
- Inexpensive and simple to install in one day
- Design, build, install - right at the borehole
- Monitor up to 7 discrete zones in one well
- Prevent vertical movement and cross contamination between zones
- Provide accurate defensible data



## Target, Quantify, and Resolve Contamination Issues

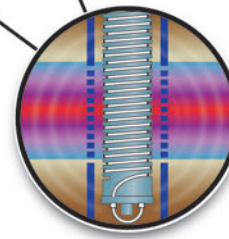
### 1 Target

- Use a **Drive-Point Profiler** or **Drive-Point Piezometers** to determine existence and location of contaminants in temporary boreholes
- Decide on placement of long-term monitoring systems
- Zero-in on zones requiring immediate remediation



### 2 Quantify

- Use **Multilevel Systems** to accurately delineate extent and movement of contaminants
- Focus remediation strategies more precisely
- Monitor remediation efforts and obtain defensible data (as shown on left)



### 3 Resolve

- Use **Waterloo Emitters** for the controlled release of oxygen (or other amendments) for contaminated groundwater bioremediation - without bubbling of excess oxygen

Solinst provides high quality groundwater instruments that can be used in every phase of a contaminated site clean-up. From the initial site investigation, to further characterization, and finally site remediation, a combination of sampling and monitoring tools are available for each stage of the process.

Our **Drive-Point Profilers** and **Drive-Point Piezometers** provide an easy, minimal disturbance approach to the initial site investigation. Quickly and inexpensively assess a site for contamination and pinpoint problem areas by collecting samples from multiple depths.

**Solinst CMT and Waterloo Multilevel Systems** can be used for long-term sampling and water level monitoring at multiple depths across a site. They provide 3D characterization of vertically shallow or deep contamination. Transects of installations offer a more precise estimate of contamination across a site.

Once areas of contamination have been identified, **Waterloo Emitters** provide a simple, low cost method to enhance remediation of contaminated groundwater using oxygen, ultimately creating the ideal aerobic conditions for successful bioremediation.

## Remote Monitoring System for Levelloggers



The **STS Gold Telemetry System** provides an economical and efficient method to collect remote data instantly. Built for Levelloggers, the System combines high quality dataloggers, intuitive software and a variety of wireless communication options to create a remote monitoring solution. Cellular, satellite and radio options give the flexibility to suit any project.

### Applications

- Remote water level monitoring
- Long-term monitoring
- Management of water taking
- Aquifer management

### Instant Access and Data Control

- Easy setup, operation and data management
- Reliable data transfer over the internet
- Manage the data yourself
- No data hosting fees



## Low Flow Sampling



Low flow purging and sampling involves extracting groundwater at rates comparable to ambient groundwater flow (typically less than 500 ml/min), so that the drawdown of the water level is minimized, and the mixing of stagnant water with water from the screened intake area in a well is reduced.

Solinst Integra® Bladder Pumps are able to provide flow rates as low as 100 ml/min, using a Solinst Electronic Pump Control Unit. The Integra Bladder Pump allows very slow, steady compression of the bladder providing a consistent rate comparable to ambient groundwater flow, helping produce samples truly representative of in-situ conditions.

## Come See Solinst Equipment (for more, visit: [www.solinst.com/Tradeshows/](http://www.solinst.com/Tradeshows/))

Date	Event	Place	Booth #
April 20 - 21	CANECT	Toronto, ON Canada	2008
April 29 - May 1	Water Tech	Banff, AB Canada	5
May 5 - 8	Battelle Bioremediation	Baltimore, MD USA	105
May 18 - 21	NHWC Conference	Vail, CO USA	11

## All Under One Roof



At the Solinst headquarters in Georgetown, Ontario, our products are designed, tested, manufactured, assembled, calibrated, shipped and even repaired - all under one roof!



Our production area features three CNC machines (Computer Numerical Control). They allow precision machining of stainless steel, PVC, Teflon®, Delrin® and other materials, which are used to produce many of the components for our products, including Levellogger housings, water level meter probes, pumps, multilevel system components, and drive-points.

A new addition to our advanced machine shop is a laser, which provides precise and accurate etching for our instruments, including the cable of the 102 Water Level Meter.



All of our products are backed by in-house technical sales representatives. Our sales and office staff includes experienced and qualified technicians, engineers, hydrologists and hydro-geologists. They provide fast and friendly service, with a high level of technical experience and know-how.

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