



The EnviMon Project:

A ground-breaking solution for real-time monitoring of metals in aquatic environments.

Challenge:

The presence of dangerous metals in surface and ground water is a significant risk to our health and the environment, and represents an increasingly serious problem worldwide. At present the detection of metals requires manual water sampling and laboratory analysis – a time-consuming, retrospective method with no possibilities for real-time intervention.

Solution:

EnviMon will develop and commercialize an automated on-line water monitoring and reporting solution for continuous metering of metal concentrations. The aim is to provide continuous monitoring and better control, including early warning alarms in drainage basins.

Helping heavy industry improve environmental performance and productivity

The project's innovations will help water-intensive industries like mining, metal manufacturing and pulp and paper to reduce metal emissions and thus improve their environmental performance and productivity. The system will fully meet the needs of environmental authorities responsible for water monitoring.

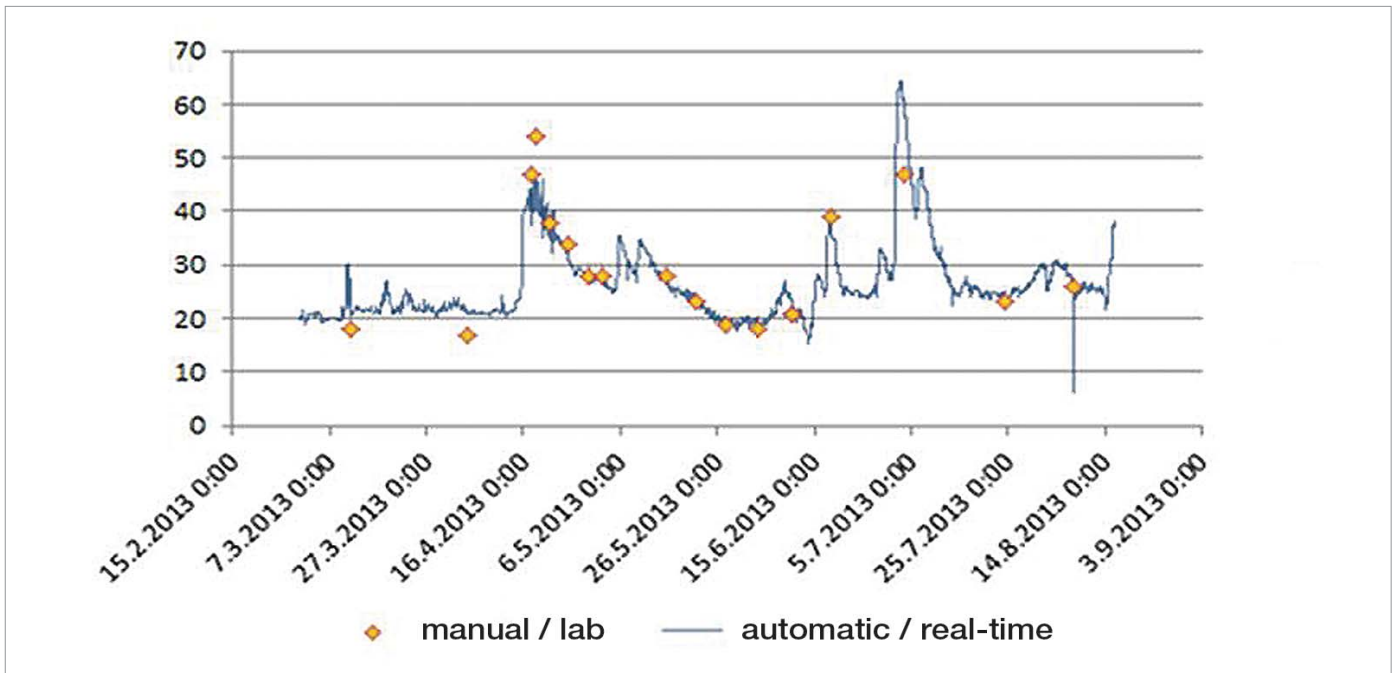


EnviMon will be the first automated and autonomous metal-in-water monitoring solution, capable to measure metal concentrations i harsh environments.



Co-funded by the Eco-Innovation Initiative of the European Union

Remote real-time measurement versus manual sampling



EnviMon introduces fully automated measurement, analysis and reporting of metal concentration in water. The system is being specifically developed to monitor metals in industrial waste water, but is equally applicable in other metal effluent monitoring scenarios.

The diagram above shows a comparison between a manual sampling regime and automatic continuous monitoring. This clearly illustrates two important advantages of real-time measurement over manual sampling and laboratory analysis:

More exact measurement of actual amount of metal discharged over time:

- Frequent automatic measurements by a fixed sensor provide a more accurate total estimate of metal discharge than less frequent laboratory analysis.

Early warnings of accidents or illegal discharges:

- Because measurements are done in real time, immediate action can be taken if there is a sudden significant rise in metal contaminants in the effluent.

Features and benefits of EnviMon real-time monitoring solution:

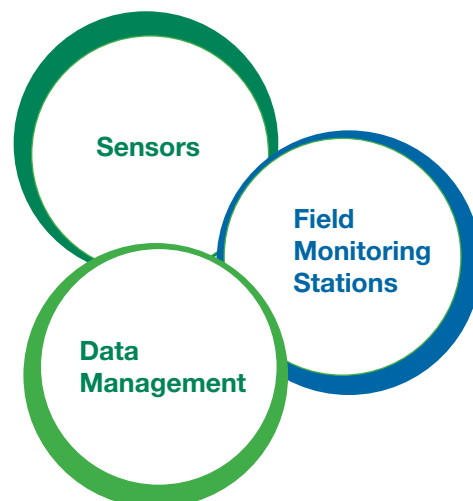
- An on-line metal monitoring solution measuring up to 10 different metals in real time
- More accurate measurement of metal contamination than existing manual routines
- Increased safety for people and the environment through early warning alerts and alarms
- Designed for reliable autonomous operation in harsh environment
- Monitoring station can run on 12V green power sources
- Significantly reduced cost of monitoring industrial waste water
- Fully automatic water sampling, analysis and reporting - no manual activities required to fulfill government monitoring regulations
- Web based reporting solution - access and share data over internet

A complete environmental monitoring solution

Unique sensor technology

The EnviMon project includes implementation and field testing of state-of-the-art sensor technology which measures metals in water, based on a voltammetric principle. The measuring device is accurate to 1ppb (1 µg/L) with typical measuring accuracy of +/- 10% at 10 ppb.

Up to 10 different metals can be continuously monitored by the system. In addition the EnviMon project aims at developing a method for statistically estimating concentrations of other metals in order to estimate the total metal load in the water. The sensor unit weighs less than 10 kg and can be installed directly into the monitoring well.



Autonomous monitoring stations for harsh environments

EnviMon project will develop, and through pilot-installations, test and verify complete field stations for measuring metal in water. Product development is based on decades of experience in design and production of complete environmental monitoring stations for harsh Nordic environments.

The low-energy 12V monitoring station can run on green power sources - solar, wind, etc. - enabling installations in remote areas. The system offers a range of communications options - USB/RS232, TCP, 4-20 mA. The field stations and sensors are designed with low maintenance in mind. The typical maintenance interval is on average once a month.



MapGraph - environmental monitoring and information management

For data logging, analysis and reporting EnviMon utilizes MapGraph, web-based environmental information management software provided by EnviTech. MapGraph safeguards the data from the sensors in a central archive and generate the necessary environmental reports and documentation for the authorities on a regular basis.

The system is easy to use, and metal-in-water data can be monitored and shared safely through the web in real time. Alarm limits and alerts can easily be set up, and sensor readings can be visualized on a dynamic map which is continuously updated.



MapGraph provides companies and public organizations with a complete solution for environmental monitoring and information management.



EnviMon - Project summary

Overall objective: To increase the use of on-line monitoring solutions in natural waters affected by heavy industries, by providing the market with an efficient system that is capable of detecting metal concentrations.



EnviMon will provide:

- An automated water monitoring solution that can be used by heavy industries and environmental authorities for continuous detection of metal concentrations and other harmful substances in natural waters
- Pilot installations for testing and verifying long-term functionality in harsh Nordic conditions
- A statistical model to estimate concentrations of other metals, based on correlations, in order to determine the total metal load in the water
- Decreased emissions and 50-80% decrease in discharge water monitoring costs at the test sites
- Increased awareness of the automated water monitoring solution amongst the project's target groups

Project details:

EnviMon - Environmental Monitoring Solution for Heavy Industries

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EcoInnovation 2013/
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