

Hach helps environmental regulator companies achieve real-time monitoring for surface water

Hanoi and Thua Thien Hue, Vietnam

Who is the client?

Vietnam has a dense system of rivers and streams, which makes up 2 per cent of the total river flow in the world. The country's 13 biggest river systems have a total area of more than 10,000sq.km.

The river systems are being threatened by pollution which is also caused by industrialization, urban and rural development. Due to the environmental monitoring of surface water in country being conducted periodically by manual manipulation, the detection and handling of water pollution have got certain limitations. As such, the establishing of real-time water quality monitoring stations with progressive technology would empower the security of water environment.

What is the challenge?

Client requires continuous reading for their water to monitor for any water out of the signal range permit.

What is the process and Hach's solution to client?

A surface water monitoring station has designed to have two pumps operate continuously, sucking up water from a river, flows goes through a tank which is with installed 6 Hach probes and one Hach sc1000 controller for required parameters. When the water has a signal out-of-range permit, the Hach Sigma SD900 Auto Sampler runs automatically to get sample for preservation to analyze later while the system sends immediate information to the host system (located in the Department of Natural Resources and Environment and VEA), officers at the remote center room will detect and report promptly while authorities have action plans up quickly. Information on water quality will be logged regularly with five minutes interval.



Figure 1: Station Outlook

Hach provided a total solution based on per installation location, with a Hach sc1000 controller and 5 Sensors. Hach Solitax sc Sensor (testing for total suspended solids), Hach pHD sc Sensor (testing for temperature and pH),

Hach Inductive conductivity sensor (testing for electric conductivity), Hach LDO2 luminescent dissolved oxygen sensors (testing or DO), Hach NISE sc Nitrate Sensor (testing for nitrate), Hach Sigma SD900 Auto Sampler with Portable Compact Base / Indoor Refrigerated Base and Hach Ultraturb sc Turbidimeter (testing for turbidity).



Figure 2: Hach instrumentation at client's site

Client has it installed at the following locations:

- Cau River (Thai Nguyen Province),
- Day River, Nhue River (Ha Noi City),
- Huong River (Thua Thien Hue City)
- Dong Nai River (Binh Duong Province)

Clients would use the data to provide timely information monitoring results to the community, assess impact of production activities, assess pollution levels in service of environmental management and sustainable development of the province's economic and social and to submit it to handling of Administrative Violations for wastewater monitoring results exceed permitted standards.

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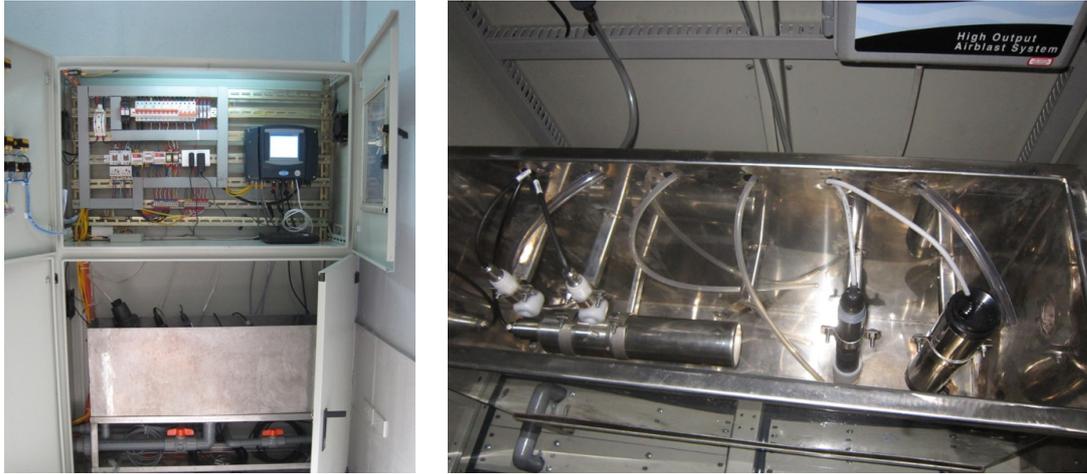


Figure 3: Hach instrumentation at client's site

Client has it installed at the following locations:

- Tri An Lake (Dong Nai Province)
- Dong Nai and Be rivers (Dong Nai Province)
- Thien Tan Plant (Dong Nai Province)
- Bien Hoa Plant (Dong Nai Province)

Using Hach's instrumentations and the total solution provided, client tested for the following mentioned parameters:

PARAMETER	PURPOSE OF MEASUREMENT
pH/temp	pH is needed to determine the corrosivity of the water. Surface water that is low in pH can attack metal piping leading to high levels of dissolved metals while high pH can cause aesthetic problems. Can indicate water upsets by industrial discharges or development of anaerobic conditions.
Electric conductivity	Important for ion balance check and other parameter estimation. Used to calculate TDS and Salinity.
Turbidity	Turbidity may reduce visibility of underwater structures such as logs or large boulders, negatively affecting a water body's recreational use. It may indicate the presence of microbes/particles in surface water changes, signal storm events and to support watershed protection plans.
Dissolved Oxygen	Measures the amount of available oxygen for aquatic life in the water. Adequate dissolved oxygen is necessary for good water quality. Natural stream purification processes require adequate oxygen levels in order to provide for aerobic life forms. As dissolved oxygen levels in water drop below 5.0 mg/l, aquatic life is put under stress. The lower the concentration, the greater the stress. Oxygen levels that remain below 1-2 mg/l for a few hours can result in large fish kills.
Ammonium, nitrogen	Nitrogen-containing compounds act as nutrients in streams and rivers. Applicable in watershed protection monitoring and effluent testing systems. Monitor conversion of ammonia and organic nitrogen forms to nitrite and nitrate. At high concentrations and pH, ammonium converts to ammonia can be toxic to microbes.

Nitrate, nitrogen	Important nutrient indicative of fertilizer application and other anthropogenic inputs, health concerns (can cause ethaemoglobinaemia in bottle fed infants) if surface water is used as source water. Nitrate reactions [NO3-] in fresh water can cause oxygen depletion.
Total suspended solids	Indicate increased erosion of stream banks, which may have a long-term effect on a body of water. In terms of water clarity, reduced light penetration due to suspended sediment can cause dissolved oxygen levels to drop in body water and obscure aquatic organisms' vision, reducing their ability to find food. These suspended particles can also clog fish gills and affect growth rates. Indicate potential pollution from wastewater effluent.

How is the end result?

In summary for the mentioned 8 numbers of stations, Hach offers total solution for client with the solution table for list of instrumentation as follows:

Products	Application Point
pH/Temp: pH/Temp sc Sensor	Surface Water Monitoring Station
Electric Conductivity: Inductive Conductivity Sensors	Surface Water Monitoring Station
Turbidity: Ultraturb sc Turbidimeter	Surface Water Monitoring Station
DO: LDO2 Luminescent Dissolved Oxygen Sensors with controllers	Surface Water Monitoring Station
TSS: Solitax sc Sensor	Surface Water Monitoring Station
Sigma SD900 Auto Sample with Portable Compact Base / Indoor Refrigerated Base	Surface Water Monitoring Station
Nitrate: NISE sc Nitrate Sensor	Surface Water Monitoring Station
Ammonium: AISE sc ISE Ammonium Probe	Surface Water Monitoring Station

Client's Feedback: With Hach as your water expert solution provider, batch problems can be avoided by means of continuous monitoring and adjustments. This requirement can only be fulfilled when reliable measurement systems are used for continuous monitoring.

FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.