



*Be Right*<sup>TM</sup>

# Flow Monitoring Selection Guide

Helping you choose the right solution for your application.

# Right data. Right results. Right now.

Hach's flow monitoring products and services empower you with the accurate and timely wastewater or river/stream flow data you need to make confident flow management decisions in every application — collection system, treatment plant, industrial, or environmental.

Through our legacy brands Sigma and Marsh-McBirney, Hach has a proven track record of creating industry-leading innovations in open-channel wastewater flow measurement. From state-of-the-art wireless data loggers and industry-pioneering non-contact flow sensors, as well as groundbreaking Data Delivery Services (DDS), Hach is committed to providing convenient and flexible solutions to efficiently deliver good flow data.



# Solutions Overview

When it comes to collecting good flow data, there are three primary approaches and each has its advantages, depending on your organizational structure and resources. The following material is designed to help you determine the best approach for your own needs. We break them down into three primary categories: 1) Services; 2) Equipment; and 3) Rentals. Of course, should you have any questions, your local Hach flow representative is standing by to help determine the best solution for your specific requirements.



## 1. Data Delivery Services (DDS)

Data Delivery Services are not your grandfather's flow monitoring services. Using modern technology and upgraded intelligence, DDS is built for the 21st century to capture data more accurately, consistently, cost effectively and conveniently than possible using the traditional monitoring approach. For those that want good flow data but not the challenges and risk associated with managing labor, purchasing and maintaining equipment, and organizing the data, we offer the new generation of flow monitoring services — DDS.

[Learn more about our service solution on page 4](#)

## 2. Flow Monitoring Equipment

Good flow data comes from great equipment. Hach's full line of sensors, loggers and monitoring systems provide you with the perfect foundation to capture excellent data in just about every open-channel application. If your monitoring need lies in a collection system, at a treatment plant, in an industrial wastewater location, or in a natural environment like a river or stream, Hach has a solution for you.



[View our monitoring systems on page 5](#)

## 3. Equipment Rentals

If your organization has the resources to manage installations, maintenance, and data collection, we also offer equipment rentals. Receive the most state-of-the-art equipment on the market for whatever length of time you need to collect the data you're looking for. And to make collecting data even easier, we offer wireless equipment for rent as well.

[View our rental offerings on page 31](#)

## Data Delivery Services



equipment, data transmission, and technical support you need to acquire your flow data — delivered in real-time so you can immediately perform your analysis. Hach even manages all equipment installation, monitoring and maintenance, removing that aggravation from your workload. This all means you can stop losing time to the constant struggle of securing reliable flow data and instead devote your efforts to implementing projects that finally solve your wastewater flow challenges.

The process of collecting good flow data is a challenging path, full of pitfalls and potentially costly mistakes. From purchasing the correct equipment and tools for your needs to managing labor and the constant cycle of meter maintenance, there are plenty of frustration points. This is exactly why we offer flow monitoring services — to take that hassle from your plate and give you time to use good data to smartly guide your improvement projects. We call our flow monitoring services Data Delivery Services (DDS) because, when you boil it down, that's really what you want — accurate flow data simply delivered to you in a timely, hassle-free manner. And DDS is the path of least resistance to acquire that data.

DDS is a highly efficient flow monitoring service tailored to deliver the right data, right when you need it, so you can deliver the right results. For a fixed monthly fee, Hach provides all of the

[Click here to download a comprehensive DDS brochure »](#)

# Flow Monitoring Equipment

## Good flow data starts with great flow meters

Acquiring good flow data doesn't happen by chance, especially when you're dealing with the harsh environment of wastewater. Instead, good flow data acquisition comes after years of experience carefully crafting intelligent, rugged and innovative sensors and meters. But we don't stop at just delivering highly-accurate data you can be confident in. We have also pushed flow monitoring to a whole new level of ease and simplicity. Our non-contact sensors, designed to work above the flow, have changed the industry by dramatically reducing the likelihood of sensor fouling and significantly increasing equipment life-span. And our loggers, equipped with state-of-the-art wireless telemetry, have reduced site visits even further, making them only "as necessary" instead of as a costly matter of course.

Importantly, our equipment is designed to allow you to confidently collect accurate flow data in almost every application. The following illustrations indicate ideal monitoring locations based on common flow data needs in four environments:

**1. Collection systems** (p.6): Represents sanitary, storm water and combined systems

**2. Wastewater treatment plants** (p.7)

**3. Industrial wastewater locations** (p.8)

**4. Environmental flows** (p.9)

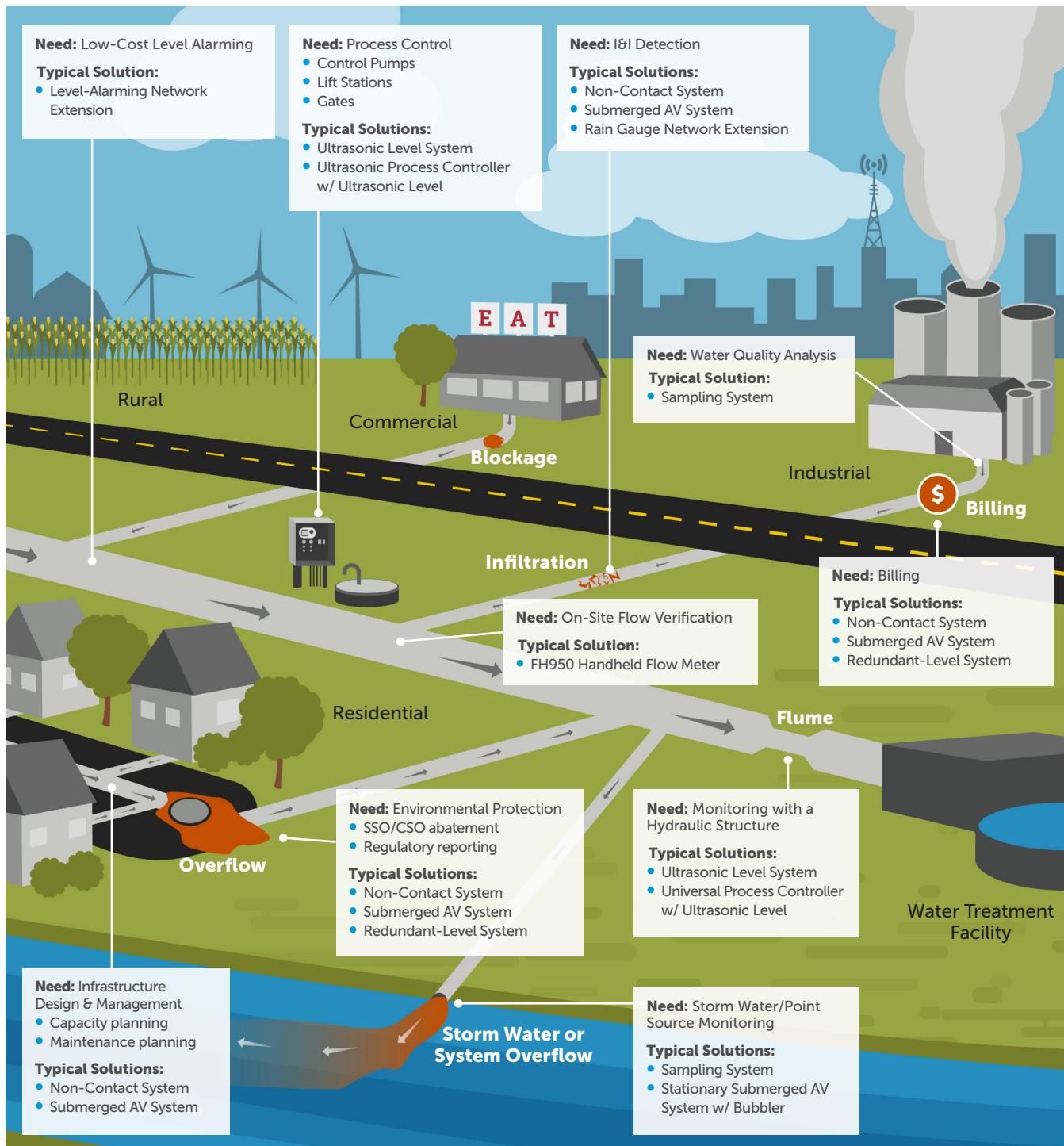
Each need is accompanied by monitoring system solutions that are typically appropriate in that location. In depth information on each monitoring system can be found in the section after the illustrations.

Of course, each location and need is unique, which is why our Sales Representatives take the time to understand your specific monitoring scenario and will recommend a solution that is right for you. To have a representative contact you, simply fill out an Information Request form found at:  
[hachflow.com/contact](http://hachflow.com/contact)

Common monitoring locations

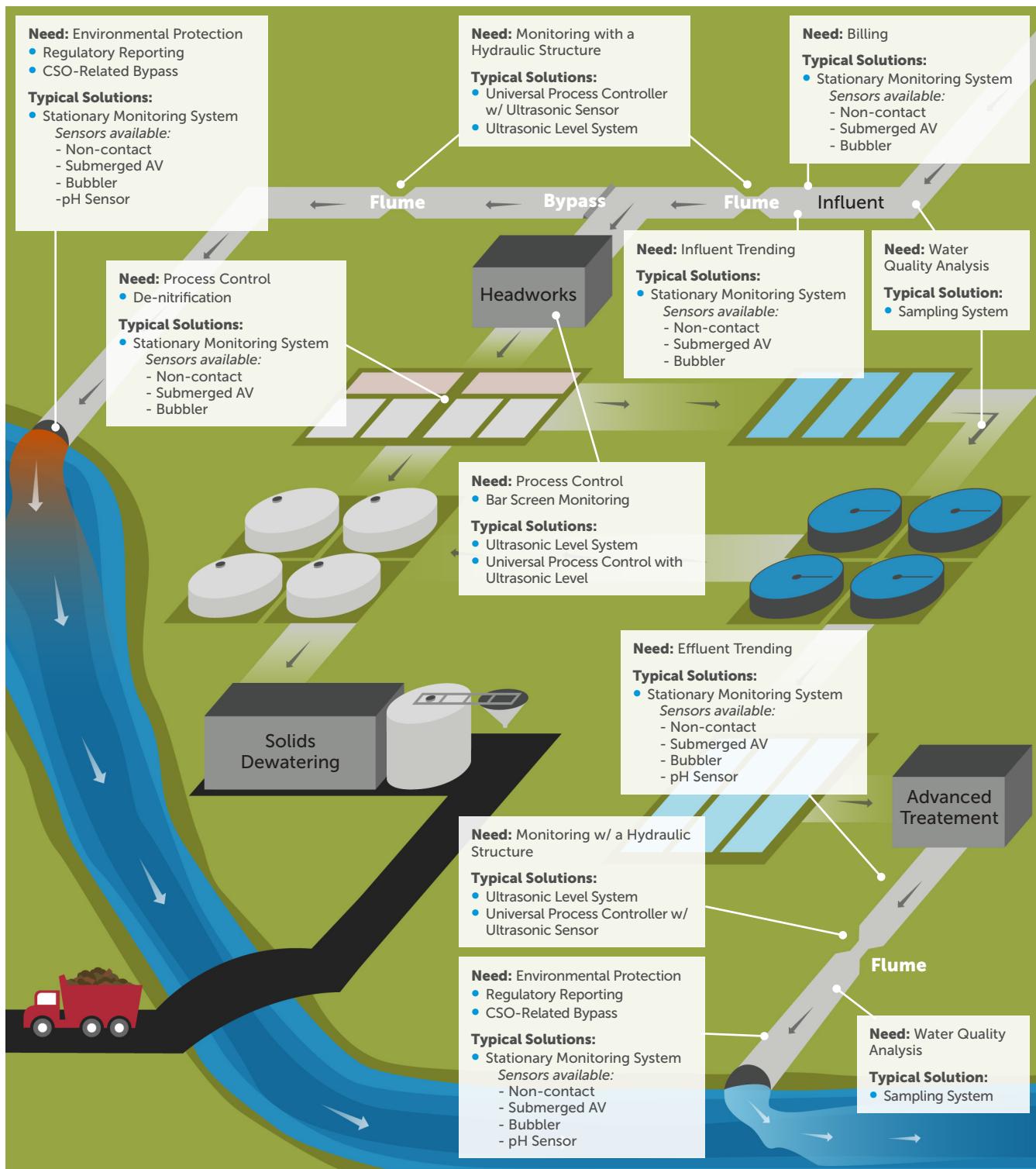
## Collection Systems

Sanitary, Stormwater, or Combined



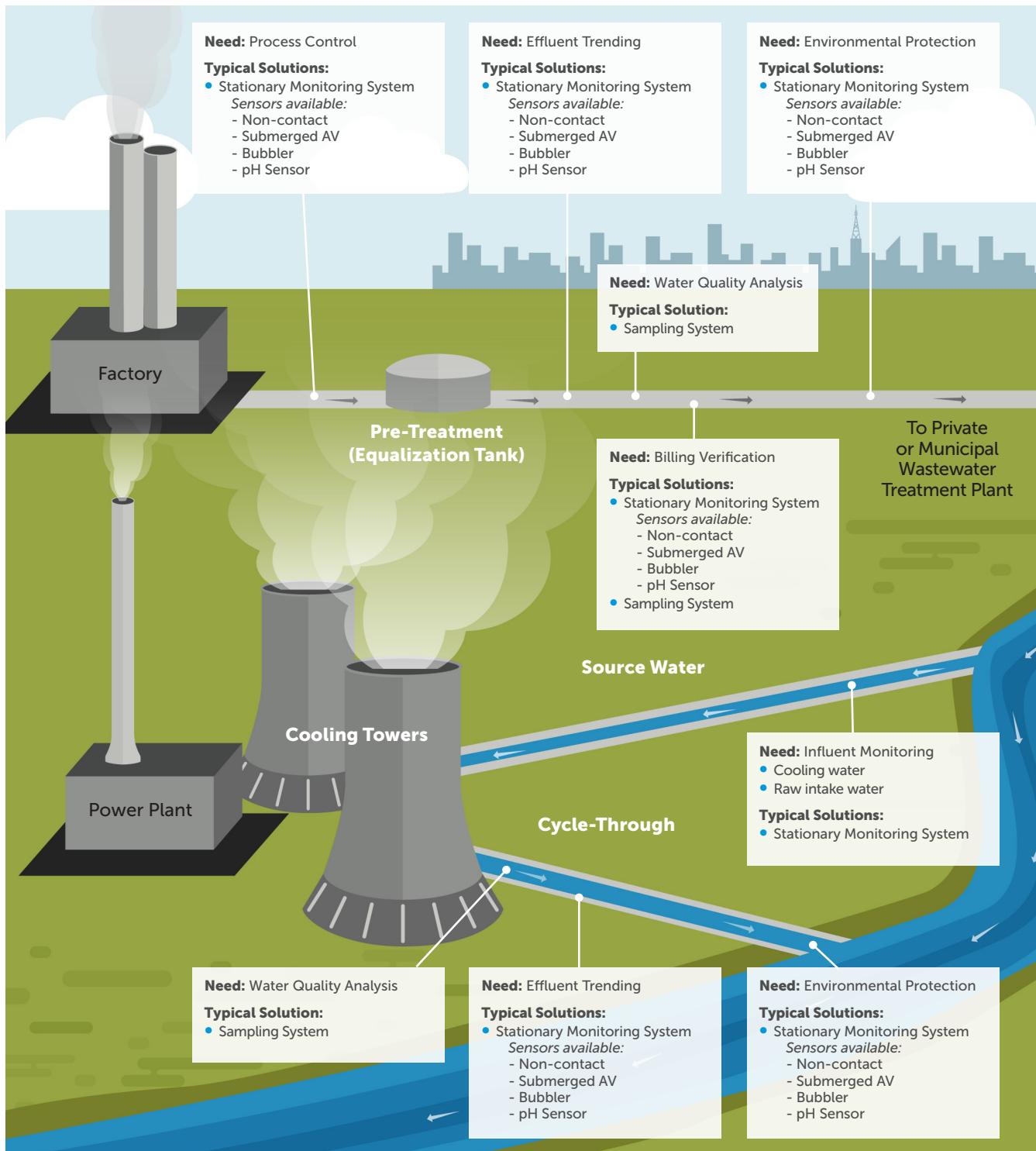
Common monitoring locations

## Wastewater Treatment Plants



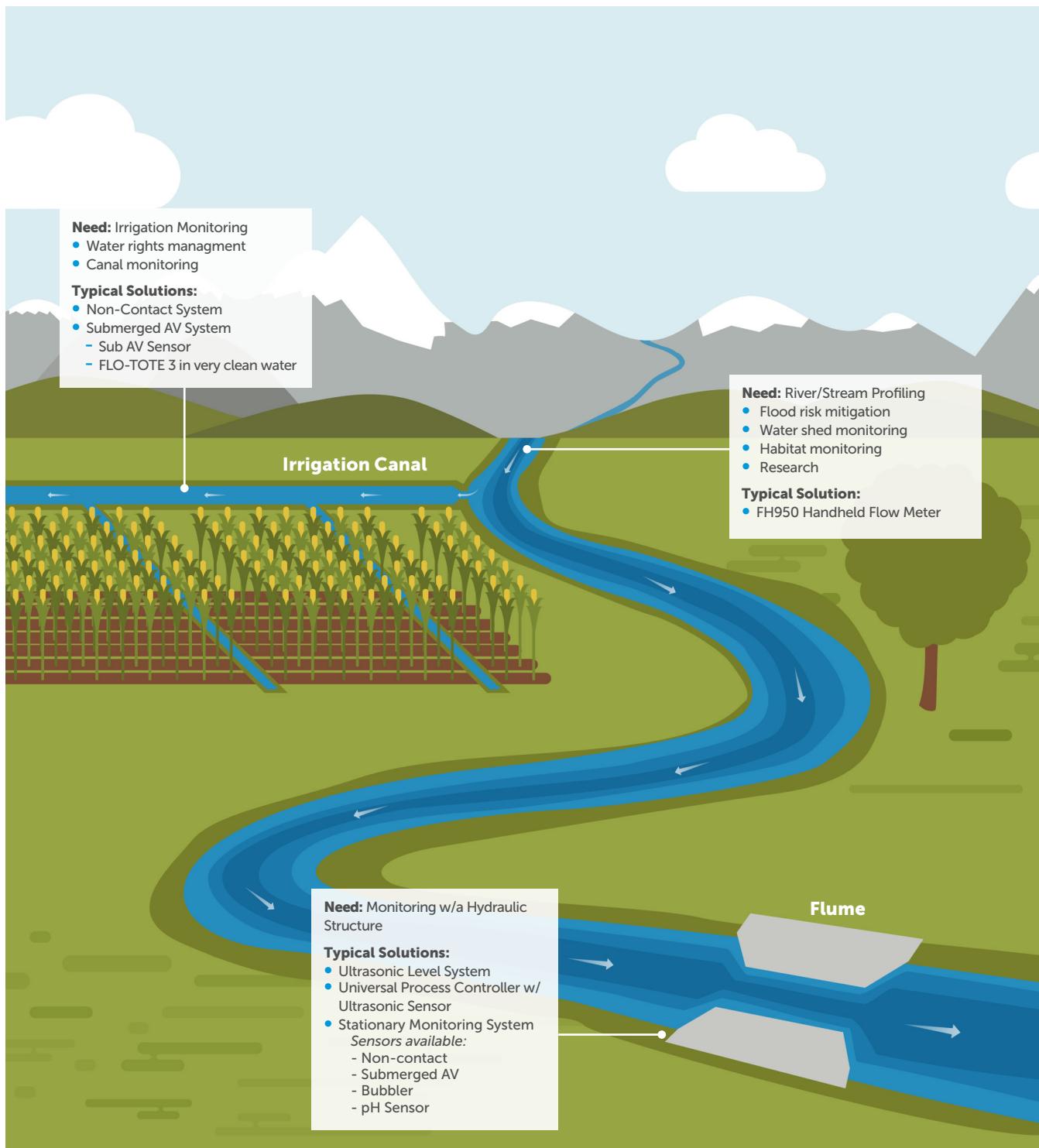
Common monitoring locations

## Industrial Wastewater



## COMMON MONITORING LOCATIONS

## Environmental



# Flow Monitoring Systems

Page 11	<a href="#"><u>Non-Contact Monitoring System*</u></a>
Page 13	<a href="#"><u>Submerged AV Monitoring System*</u></a> - Submerged AV Sensor - FLO-TOTE 3 AV Sensor
Page 15	<a href="#"><u>Ultrasonic Level Monitoring Systems*</u></a> - Downlooking - In-pipe
Page 17	<a href="#"><u>Stationary Monitoring System</u></a>
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\* Available with wireless data transmission capabilities

# Non-Contact Monitoring System

Our most universal monitoring solution, the **Hach Non-Contact Monitoring System** combines a Hach FL900 Series Flow Logger with a non-contact FLO-DAR AV Sensor to capture flow data with a high-level of accuracy, dramatically reducing required maintenance and significantly limiting the risk of lost data due to sensor downtime. And while all these factors mean less cost and hassle, by selecting a wireless logger you can also see your data, in real-time, from anywhere. This is efficiency and convenience at its best.



## Non-Contact technology reduces sensor fouling

- Reduces likelihood of bad data
- Decreases prospect of data gaps
- Increases lifespan of equipment
- Diminishes required site visits for maintenance
- Eliminates confined space entries after install
- Ensures data collection even if sensor becomes submerged

## Wireless-enabled logger improves efficiency

- Eliminates site visits for data collection
- Enables real-time data viewing from anywhere
- Powers alarming capabilities
- Provides visibility into meter health, including battery life

### System Components:

*(Click component to view datasheet)*

- » [Hach FL900 Series Flow Logger](#)
- » [FLO-DAR AV Sensor](#)

### Case studies

- » [Case Study A](#)
- » [Case Study B](#)

# Non-Contact Monitoring System

Application illustrations



## FLO-DAR

Doppler radar captures velocity and ultrasonic measures level



## Surcharge Velocity Sensor

Electromagnetic technology and a pressure transducer capture data during surcharge scenario



## Wireless Logger

View data in real-time from anywhere

# Submerged AV Monitoring System

"Quieter. Smoother. Cleaner. Precise." These are words customers use to describe the flow data they obtain with the advanced **Hach Submerged AV Monitoring System**. The technical improvements developed during a multi-year design process (one patent issued and two more pending) allow Hach's latest-generation area-velocity system to deliver better flow data than ever before.

Innovative measurement algorithms improve data quality, reducing the "pops & drops" inherent in old meters and making data plots easier to read. This is accomplished without degrading system response to sudden flow events. Improvements in sensor sensitivity and range permit successful use in higher and lower flow velocities, as well as in cleaner water. By starting with the best submerged pressure transducer on the market, and adding multi-point digital curvature compensation, we've produced a level sensor with better linearity and lower thermal drift.

Lastly, within the system's accompanying AV9000 Analyzer Module, we've built in highly advanced diagnostic features so you can tune your readings more finely than ever before. Where other systems manipulate the data after the fact, this system collects more precise data right from the source. It's this attention-to-detail that has earned the Hach Submerged AV Monitoring System the respect it deserves.

## High-technology ensures accurate data

- Fully symmetric multi-scale spectral analysis (pat. pend.) improves velocity measurement quality
- Advanced diagnostics allow verification of meter performance onsite or wirelessly
- Intuitive graphical "wizards" guide set-up and calibration, simplifying installation

## Wireless-enabled logger improves efficiency

- Eliminates site visits for data collection
- Enables real-time data viewing from anywhere
- Powers alarming capabilities
- Provides visibility into meter health, including battery life
- Provides dynamic logging intervals to automatically enable higher resolution flow data delivery during high flow periods and battery/data volume conservation during low-flow seasons



## System Components:

(Click component to view datasheet)

- » [Hach FL900 Series Flow Logger](#)
- » [Hach AV900 Analyzer Module](#)
- » [Hach Submerged AV Sensor](#)

or

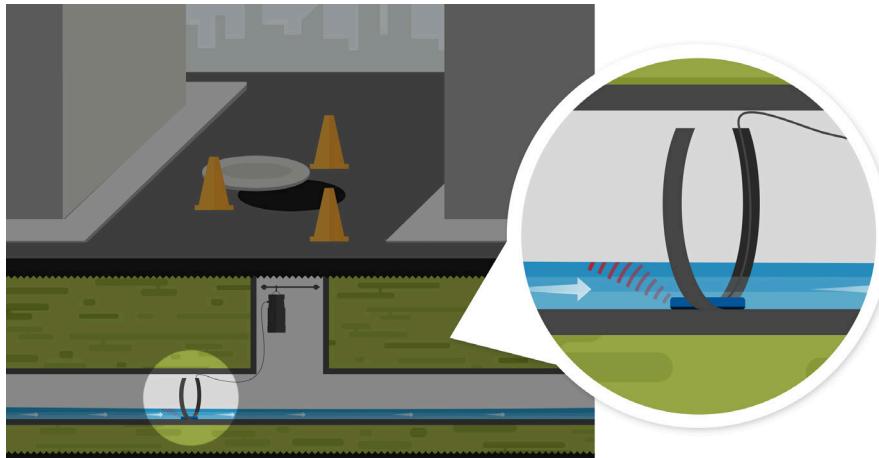
- » [FLO-TOTE 3 Submerged AV Sensor](#): Ideal for very clean water or in low velocity or level scenarios

## Case studies

- » [Case Study A](#)
- » [Case Study B](#)

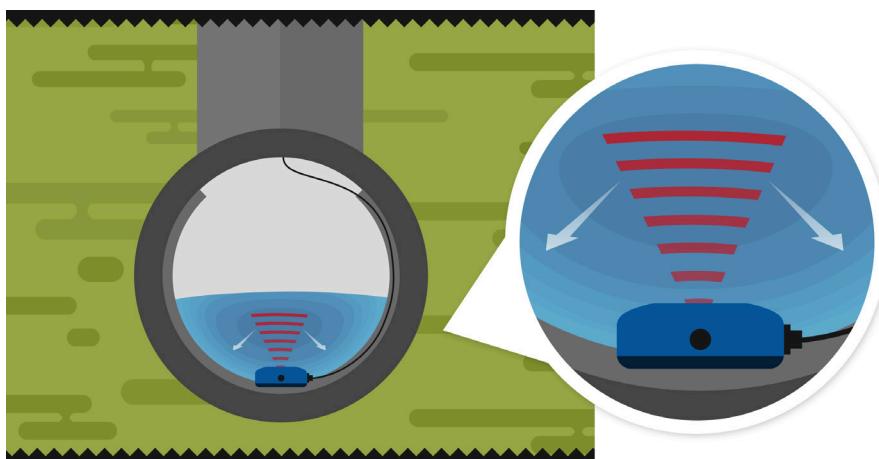
# Submerged AV Monitoring System

Application illustrations



## System installation

Works in a wide range of applications



## Multiple technologies

Uses ultrasonic Doppler technology to measure velocity and a pressure transducer to measure level.

# Ultrasonic Level Monitoring System

Hach's ultrasonic sensor options provide independent level measuring in a wide variety of applications. Bundled with a Hach FL900 Series Flow Logger, these state-of-the-art ultrasonic sensors are excellent non-contact solutions for level measurement, especially when used in combination with a flume or weir. As with other monitoring systems, the logger can be wireless-enabled to allow for real-time data viewing and level-alarming.

Two sensor options are available — the US9001 Down-Looking sensor and the US9003 In-Pipe sensor. The down-looking sensor is often used with a hydraulic structure to determine flow, including weirs, flumes and configurable level-area and head-flow tables. The in-pipe sensor is configured to eliminate inherent ultrasonic deadband and provide accurate measurements in near-full pipe conditions.



## Low-cost, flexible monitoring solution

- Economical monitoring option
- Solutions for more level-monitoring applications

## All the benefits of non-contact sensors and wireless data transmission

- Low maintenance
- Long battery life
- Real-time data viewing
- Level-alarming capabilities

[See also Universal Process Controller with Ultrasonic Level Sensor on Pages 17-18 »](#)

## System components:

(Click component to view datasheet)

- » [Hach FL900 Series Flow Logger](#)
- » [Hach US9001 Down-Looking Ultrasonic Sensor or US9003 In-Pipe Ultrasonic Sensor](#)

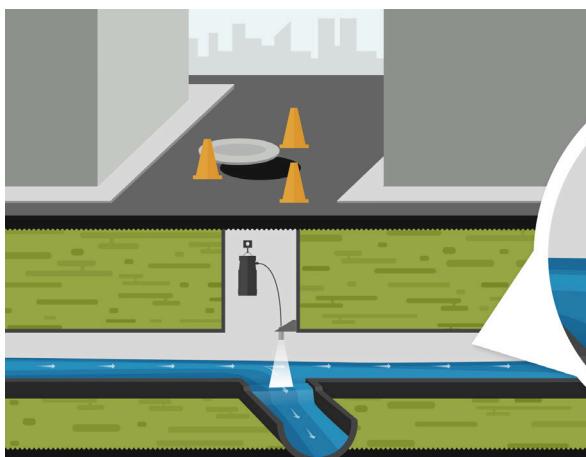
# Ultrasonic Level Monitoring System

Application illustrations



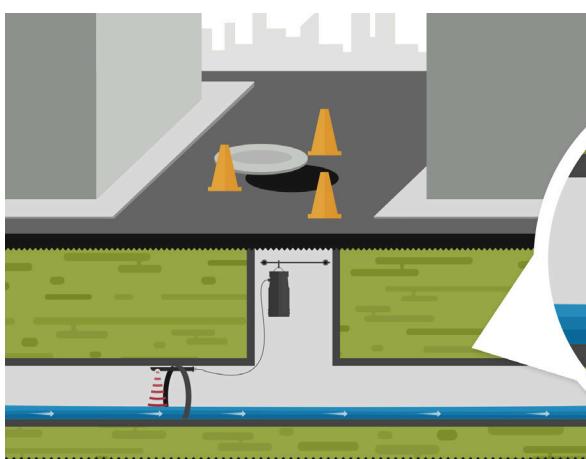
## Flume monitoring

Ideal over a flume



## Weir monitoring

Excellent level monitoring  
with a weir



## Tight spaces

The in-pipe sensor is a  
perfect level solution in tight  
open-channels.

# Stationary Monitoring System

If you need maximum flexibility, the FL1500 may be just what you're looking for. Combining sensor options previously available on the Sigma 950 or Marsh McBirney FLO-STATION, the FL1500 can connect to the full suite of flow sensor options. This versatile multi-channel logger can be used with radar, electromagnetic, Doppler, differential pressure, ultrasonic, and bubble level sensor technologies. It can handle up to four independent flow sensors and pairs with peripheral equipment such as a rain gauge, pH sensor, auto sampler, and electromechanical totalizer.



## Have confidence in your flow data

- Sensor calibration prompts with step-by-step guidance reduce likelihood of errors
- USB connectivity for quick data transfer
- Features FSDATA Desktop software (free download from hach.com) for easy data review

## Accurate operation made easy

- Large color screen display with scrolling menus
- Intuitive interface, LED status indicators
- Digital and analog inputs and outputs are standard
- Fits within a compact footprint (11" w x 5" d x 9" h)
- Compatible with the Hach BL9000 Bubble Level Sensor for reliable level measurements in challenging environments

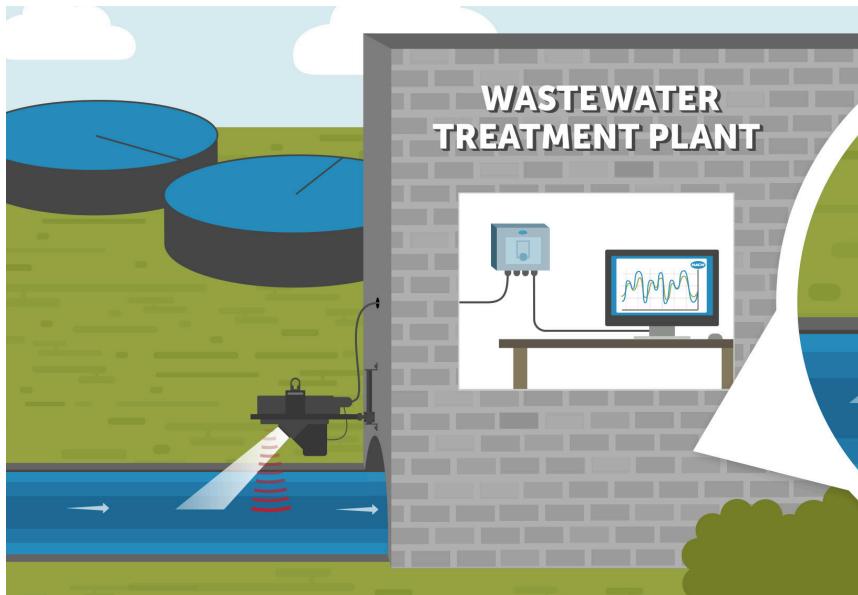
## System components:

(Click component to view datasheet)

- » [FL1500 Flow Monitor](#)
- » [FLO-DAR AV Sensor](#)
- » [Hach Submerged AV Sensor](#)
- » [Hach US9000 Series Ultrasonic Sensors](#)
- » [Hach BL9000 Bubble Level Sensor](#)
- » [FLO-TOTE 3 AV Sensor](#)
- » [Rain Gauge](#)
- » [Hach Digital Differential pH Sensor](#)
- » [Hach AS950 Automatic Sampler](#)
- » [Electromechanical Totalizer](#)

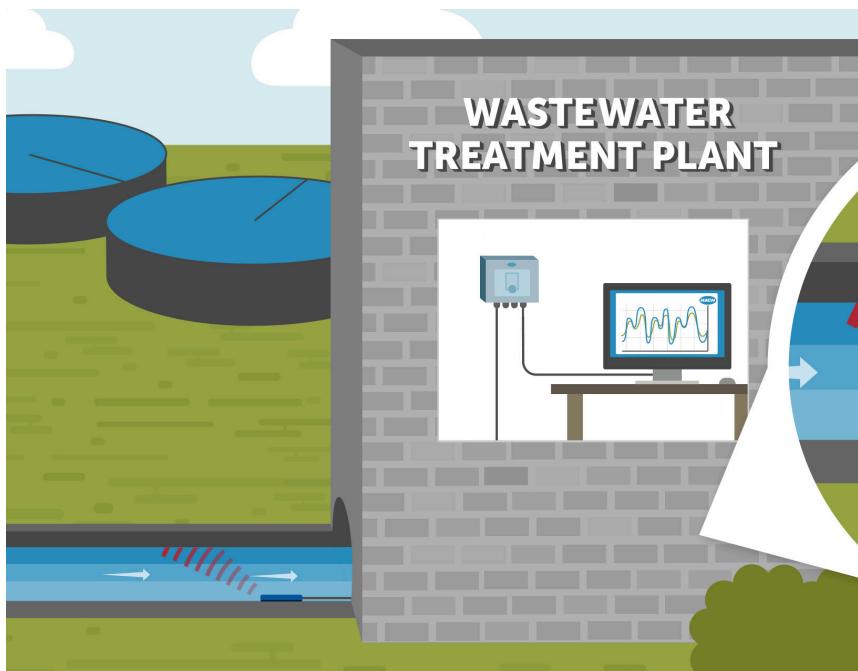
# Stationary Monitoring System

Application illustrations



## Non-Contact system installation at plant influent

Non-contact flow monitoring with permanent power source.



## Stationary submerged system installation at plant influent

Submerged flow monitoring with permanent power source.

# Universal Process Controller with Ultrasonic Level

A universal process controller, equipped with one or two ultrasonic level sensors, allows you to economically and intelligently measure level and, as needed, control your processes — in the plant, collection system, or any location with a hydraulic structure. Whether that means timing the frequency of bar screen cleanings, measuring influent or effluent, fulfilling NPDES permitting requirements, or dozens of other possible uses, this system is an excellent budget-sensitive-yet-highly-flexible solution.



## Intelligent process control

- Automate your systems based on level
- Two 0/4–20 mA outputs

## Low-cost level measurement

- Budget-friendly influent/effluent monitoring solution
- Built-in library of weir and flume types
- Easy-to-read digital display
- SD card data transfer

## System components:

(Click component to view datasheet)

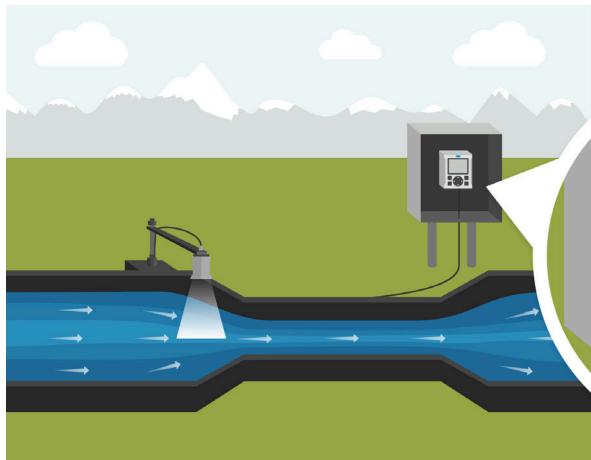
- » [Hach sc200 Universal Controller with Ultrasonic Level Sensor](#)

## CASE STUDIES

- » [Case Study A](#)

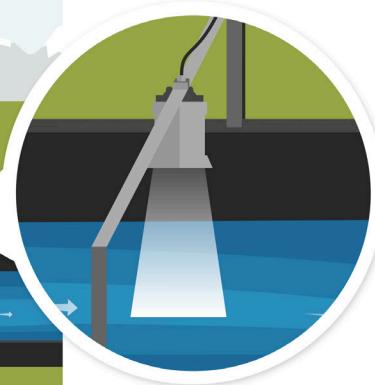
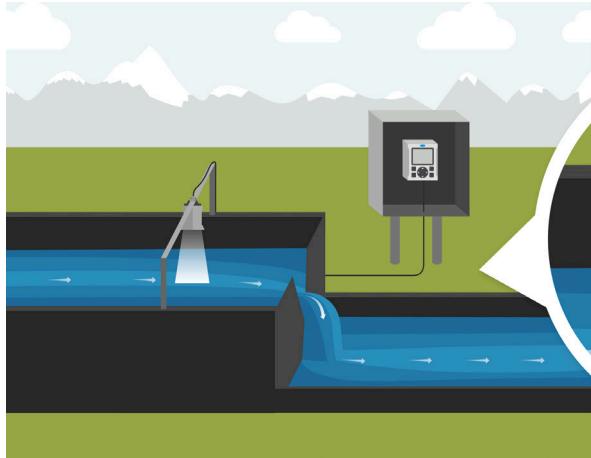
# Universal Process Controller with Ultrasonic Level

Application illustrations



## Over flume or weir

Low-cost level monitoring solution



## 2 sensor system installation around bar screen

Automate bar screen cleanings based on level in open-channels

# Redundant Level Monitoring System

Every data point is crucial, especially during short-term flow studies or in overflow monitoring or billing scenarios. Missing data for any length of time, or collecting data of suspicious validity, is simply unacceptable. That's why many organizations utilize the **Hach Redundant-Level Monitoring System**.

By partnering the Hach Submerged AV Monitoring System with a secondary Hach US9003 In-Pipe Ultrasonic Sensor, we create a highly accurate redundant level monitoring solution. In this configuration, level is captured by both a pressure transducer in the Sub AV sensor and with ultrasonic technology in the in-pipe sensor, limiting your risk of missed data or inaccurate data.



## Don't miss a single data point

- Protect yourself from sensor fouling
- Two sensors increase likelihood of constant data collection
- Compare data points from each sensor to ensure validity

## Real-time data with wireless monitoring

- Enables real-time data viewing from anywhere
- Keep an eye on meter health, including battery life, so you never lose data

### System components:

(Click component to view datasheet)

- » [Hach FL900 Series Flow Logger](#)
- » [Hach AV900 Analyzer Module](#)
- » [Hach Submerged AV Sensor](#)
- » [US9003 In-Pipe Ultrasonic Sensor](#)

# Redundant Level Monitoring System

Application illustration



## Increase your confidence

Guarantee you'll get your data with redundant measurements

# Rain Gauge Network Extension

Understanding the effects of rainfall on your sewer line or at your plant is critical, and this system is designed to capture the data you need. We call it a Network Extension because it smartly complements your network of flow monitors to capture rain-based data points. Comprised of a rain gauge tipping bucket and a wireless data logger, the **Rain Gauge Network Extension** transmits precipitation information so you'll conveniently be able to view your system's reaction to a rain event in real-time.



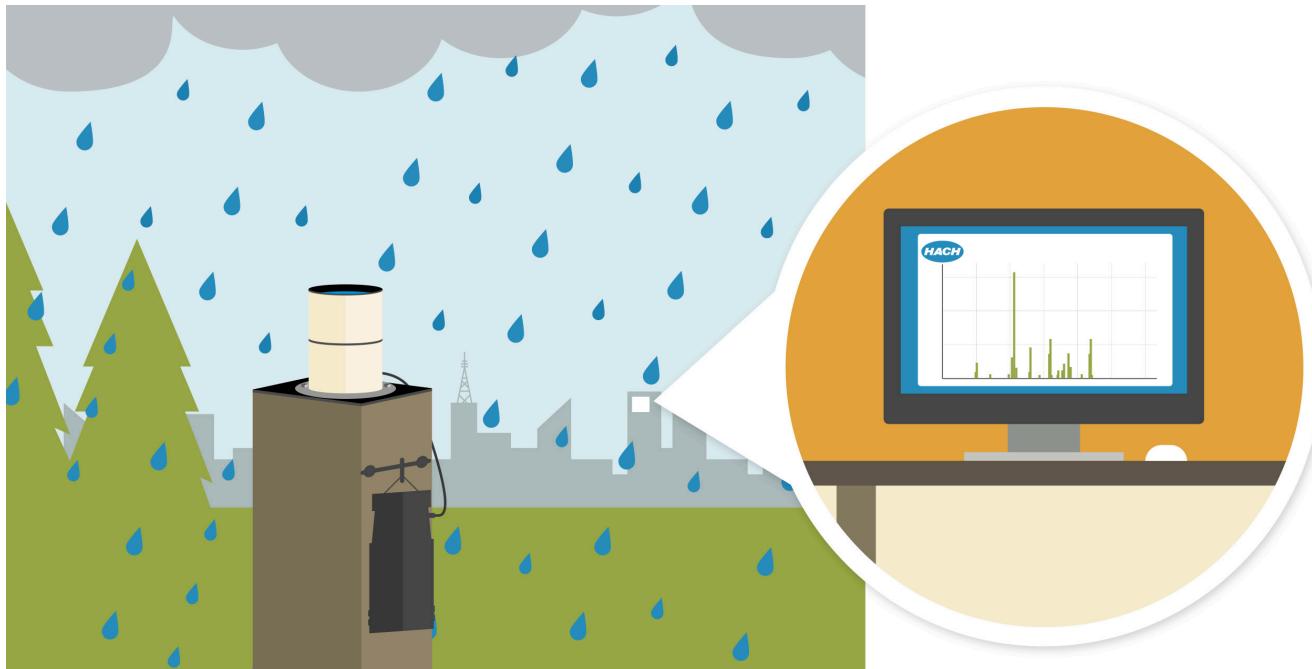
## System components:

(Click component to view datasheet)

- » [Hach FL900 Series Flow Logger](#)
- » [Rain Gauge Tipping Bucket](#)

# Rain Gauge Network Extension

Application illustration



## Collect rain data

Augment your data with rainfall input

# Level-Alarming Network Extension

This system provides a cost-effective way to monitor more sites throughout your entire collection system. While we recommend using a highly accurate wireless Non-contact Monitoring System to keep an eye on critical primary sites, this economical level-alarming system at secondary locations is the perfect way to smartly monitor more sites.

By pairing a Hach US9001B Ultrasonic Sensor with Ballast with a wireless Hach FL900 Series Flow Logger, you will receive real-time flow data right on your desktop for immediate review and analysis. And if there's ever a problem, such as overflows or blockages, you'll immediately be alerted via text message or email so a team can go resolve it.

With a **Hach Level-Alarming Network Extension**, you'll have greater awareness, and thus greater control, of your entire collection system.



## Smart alarming capabilities

- Automated alarming based on customizable settings
- Multiple data points to help determine veracity of alarm

## Broader system awareness

- Low-cost approach to monitoring more sites
- No confined space entry for install
- Minimal maintenance

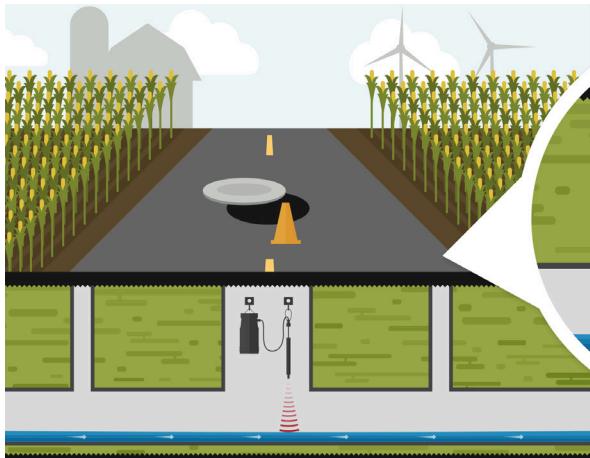
### System components:

(Click component to view datasheet)

- » [Hach FL900 Series Flow Logger](#)
- » [Hach US9001B Ultrasonic Sensor with Ballast](#)

# Level-Alarming Network Extension

Application illustrations



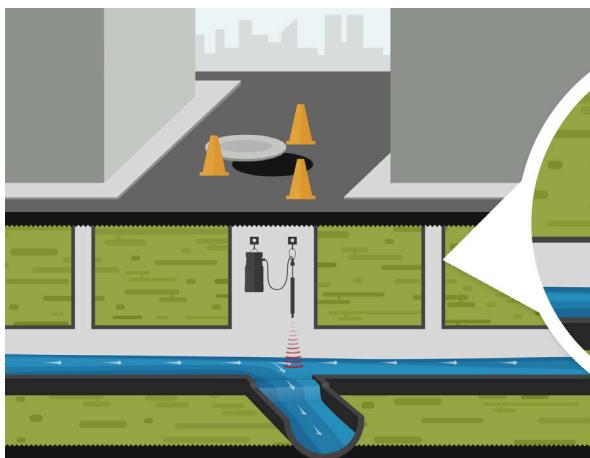
## Constant awareness

Economically monitor more of your collection system, even the most rural sites.



## More than just alarming

Also captures flow data using Manning's equation.



## No confined space entry necessary

The ballasted ultrasonic sensor allows for top-side installation and maintenance.

# Handheld Flow Meter

Certain tools are so handy every truck should carry one. For environmental and wastewater professionals, that's exactly the case with the Hach FH950 Handheld Flow Meter. There are dozens of uses for this rugged, portable monitoring system. For example, environmental professionals love them for river and stream profiling. Whereas municipal wastewater workers find they work perfectly when selecting optimal metering site locations, or when providing redundant verification that a current monitor is capturing accurate data. And with a highly intelligent sensor that takes reliable measurements even at low velocities and in both clean and dirty water, the FH950 is a must-have addition to your flow monitoring tool box.



## Time savings at every turn

- Stores data automatically, eliminating error-prone manual logging
- Automatically executes necessary calculations according to ISO and USGS standards
- Easy data transfer to any PC

## Built for in-field usage

- Truly portable at only 1.5lbs
- Full-color display for easy readability in direct sunlight
- Completely water-resistant

## System components:

(Click component to view datasheet)

- » [Hach FH950 Handheld Flow Meter](#)
- » [EM950 Velocity Sensor with optional Pressure Transducer](#)

## Case studies

- » [Case Study A](#)
- » [Case Study B](#)

# Handheld Flow Meter

Application imagery



## Environmental usage

Perfect for profiling rivers and streams



## Muni usage

Excellent redundant spot-checking tool  
to confirm accuracy of flow data

# Sampling System

Hach AS950 Automatic Samplers collect and store unbiased representative water samples for laboratory analysis. Available in three base types: portable, indoor refrigerated, and all-weather refrigerated, the AS950 Automatic Sampler is compatible with a variety of bottle sets of varying size, quantity, and material. The AS950 is configurable to meet all sampling needs by combining a controller, a base, sensors, a bottle set, accessories and sampling program features.



## Intuitive operation. Error-free results.

- Large full color display and intuitive programming give access to all programming criteria on a single screen - eliminating scrolling through menus and supporting error-free operation.
- Status screen instantly communicates alarms, missed samples and program progress for quick troubleshooting and confidence in the sampling process.

## Convenient data transfer

- USB drive compatibility provides convenient data transfer and allows quick copying of programs from one sampler to another.

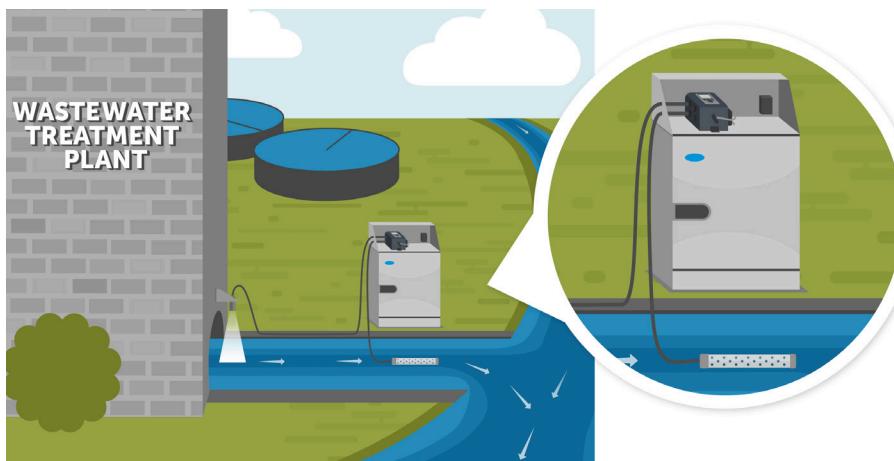
## System components:

(Click component to view datasheet)

- » [Portable AS950 Automatic Sampler](#)
- or
- » [All Weather AS950 Automatic Sampler](#)
- or
- » [Refrigerated AS950 Automatic Sampler](#)

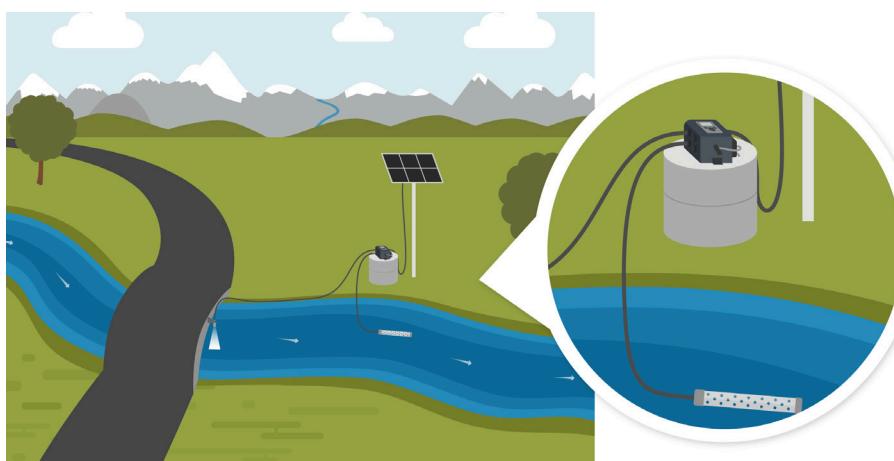
# Sampling system

## Application illustrations



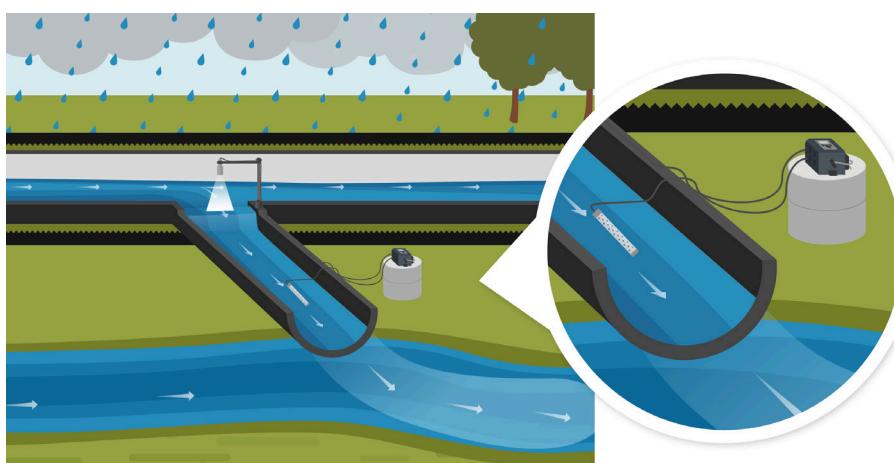
### Effluent sampling

All-weather sampling at treatment plants for regulatory reporting. Can pace by time or by flow sensor (ultrasonic or submerged AV).



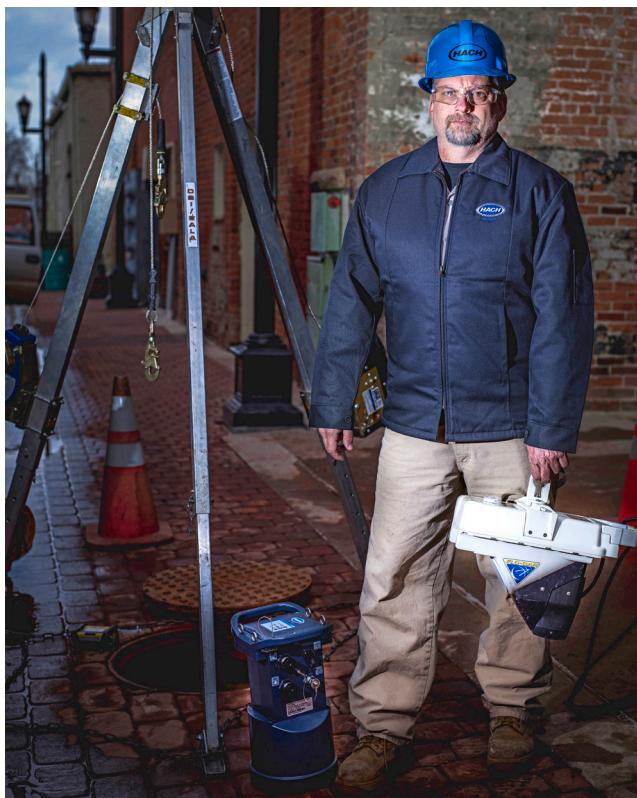
### Environmental application

Use the portable sampler with batteries or solar power for sampling in environmental applications. An ultrasonic or submerged AV sensor, combined with a hydraulic structure, can be used to pace the samples.



### Overflow sampling

Use for required water quality analysis on overflows. Can be paced by an ultrasonic down-looking sensor over the weir.



## Rental Equipment: Wireless and Non-Wireless

As explained earlier in this guide, Hach offers three options to getting a handle on your flow data: Services, Equipment, and Rentals so that you can find a match to the needs of your operation.

With our Rental program, you'll have access to the most state-of-the-art equipment on the market, for whatever length of time you need to collect the data you're looking for. And to make collecting data even easier, we offer wireless equipment for rent as well.

As always, please contact your local Hach flow representative to help determine the best solution for your specific requirements.

## Equipment available to rent:

### Sensors

- FLO-DAR AV Sensor
- Surcharge Velocity Sensor included
- Hach Submerged AV Sensor
  - AV9000 Analyzer Module included
- Hach US9000 Series Ultrasonic Sensors
  - Downlooking or In-Pipe options available
  - Ballast kit available for downlooking option
- Redundant Sensors
  - Includes Submerged AV Sensor (with AV9000 Analyzer Module) and Hach US9003 In-Pipe Ultrasonic Sensor
- Rain Gauge
- FLO-TOTE® 3 AV Sensor

### Loggers

- Hach FL900 Series Flow Logger
  - 2 port or 4 port options available
  - Wireless and non-wireless options available
- Hach FL1500 Series Flow Logger

### Hardware

- Installation Hardware
- FLO-DAR Mounting Hardware

For detailed information and specifications on each product, please visit: [hachflow.com](http://hachflow.com)

To discuss solutions with a local Hach flow products & services representative, please submit an information request at: [www.hachflow.com/contact](http://www.hachflow.com/contact)

Or contact us by phone at:  
1.800.368.2723 (Toll Free USA and Canada)  
970.622.7120 (Outside USA and Canada)