CASE STUDY

Detecting Contaminates in Stormwater Runoff with Hydro International

"The advantage of using the FlowCam® over traditional methods of analysis includes the ability to rapidly analyze samples and make decisions on pollutant control measures [which can] then be put in place as soon as practical."

-An Innovative and Rapid Method of Assessing Particle Shape and Size in Stormwater Runoff

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THE CLIENT

Hydro International (HI) is a global company based in the United Kingdom, with a local facility just down the road from Fluid Imaging in Portland, Maine. HI provides testing, equipment and solutions for the processing and treatment of water in a variety of industrial and municipal applications.

THE CHALLENGE

Contaminates in stormwater runoff that feed into our waterways are a leading cause of environmental pollution. Hydro International analyzes the content of stormwater and wastewater in order to provide solutions that prevent contamination utilizing machinery, cleansers, and filters.

Over ten years ago, HI decided that they needed a better method to quantify and analyze subvisible particulate in the samples they were testing. Previously tested methods including laser diffraction and Coulter counters provided size and concentration data, but could not determine the shape or type of particles being studied. It was time for an improvement.

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CASE STUDY CONTINUED ON REVERSE

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THE POWER OF IMAGES

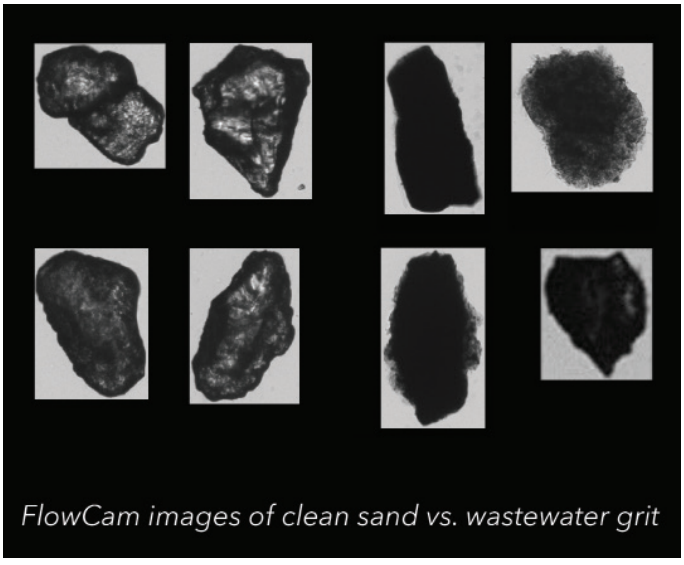
The analysis of particles in stormwater runoff presents challenges that traditional detection methods have been incapable of overcoming. When only particle count and size are available, it is impossible to tell the difference between different types of particles of the same size. Manual microscopy can be used to visualize particles, however, this method is slow and laborious, and it is very difficult to analyze a statistically relevant quantity of water.

With a grant from the Maine Technology Institute, Hydro International was able to purchase a FlowCam, a digital imaging particle analyzer that provides not only count, size, and concentration information, but 35+ other morphological characteristics plus a high-resolution digital image of each particle in a sample.

"We use the FlowCam and the data it collects to differentiate ourselves from the competition"

-Andrew Gwinn, Senior Product Engineer, Hydro International

In multiple method studies performed by Hydro International, it was determined that the FlowCam was successful at providing statistically relevant data alongside images that allowed HI to differentiate between particles like clean sand and wastewater grit. With this new tool at their disposal, HI was able to analyze samples brought to them by their clients and determine the size and type of contaminates that needed to be mitigated against. They could then make the proper recommendations on what types of machinery and filters were necessary to improve the clients' water supply.



FlowCam images of clean sand vs. wastewater grit

ABOVE: Hydro International's portable FlowCam, purchased in 2008 . This model can be easily transported for field research. Fluid Imaging's improved and updated model, the FlowCam 5000, provides a similarly lightweight and portable solution for field studies.

REAL WORLD RESULTS

One such customer, a quarry in a northern region of Spain, enlisted Hydro International to test and make mitigation recommendations in order to reduce pollution from contaminants in stormwater including limestone, iron ore, cement, and petroleum coke. Industrial sites like theirs are subject to random permit inspections by local regulatory agencies and they need to be ready for inspection at any time.

Samples were shipped to Hydro International's laboratory in Portland, Maine to be analyzed. With the FlowCam, HI was able to determine the size and composition of the pollutant particles, and make appropriate recommendations for mitigation. **The FlowCam could then prove that HI's filtration system removed 100% of particles greater than 150 microns and over 80% of particles 45 microns and larger.**

In addition to using the FlowCam for analyzing stormwater runoff, Hydro International also uses the FlowCam to study the contents of manufacturing wastewater and process water. Additionally, they have commited resources to develop new FlowCam methods to assist a variety of industries with water treament and purification.

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Particle analysis with vision