Smart Wastewater Networks

The Answer to EPA Compliance for Wastewater Collection Systems
Meet EPA CMOM goals through Predictive, Proactive and Risk-Averse actions

Save up to 80% on Costs for I&I Detection and Compliance

Maintain Compliance with Real-Time Alerts for sub-standard conditions

Withstand the Scrutiny of any Regulatory Compliance process

SmartWastewater.com
A Smart Wastewater Network is a fully integrated set of products, solutions and systems that enable municipalities and wastewater utilities to:

- Comply transparently and confidently with regulatory and policy requirements regarding wastewater environmental and operating performance directives.
- Remotely and continuously monitor and diagnose problems; pre-emptively prioritize and manage maintenance issues; control and optimize all aspects of the wastewater collection system using data-driven insights.
- Provide reliable and defensible information to government agency regulators in order for them to make favorable decisions regarding acceptable levels of compliance.
The Compliance Conundrum

Everyone agrees that a “round-the-clock” performance assessment system would be a valuable addition for providing the public with a safe and efficient wastewater collection operation. Yet, no such system exists. Engineering, operations and maintenance personnel are tasked on a daily basis with regulatory compliance responsibilities ranging from preventing toxic sewer spills, overflows and basement back-ups to pinpointing locations within hundreds of miles of conveyance piping responsible for the inflow and infiltration of millions of gallons of unwanted rain and groundwater… all without the benefit of a system capable of alerting those in charge to the environmental hazards mentioned above.

The reason behind the lack of such a system is simple. Up until now, it has been prohibitively expensive and operationally difficult!

Smart Networks Have Arrived!

Smart infrastructure networks have been altering the landscape by providing immeasurable benefits for many industries. The wastewater utility sector should be no exception. In order for programs like the EPA’s CMOM to become a reality along with the Clean Water Act reaching its full potential for minimizing the tens of thousands of overflows and toxic spills annually damaging our environment, affordable and user-friendly smart networks capable of proactively assessing the condition of North America’s trillions of dollars of valuable underground infrastructure need to be put to advantage by every community and utility responsible for the conveyance of wastewater.
Inflow & Infiltration (I&I) overwhelms collection systems, is responsible for 27% of sanitary sewer overflows and basement back-ups and puts undue strain on wastewater treatment facilities. Unfortunately, 80% of I&I resides in just 20% of the conveyance network and how does one discover the location of that 20% quickly, safely and inexpensively? The answer lies in a Smart Wastewater Network comprised of low-cost sensors, wireless communications and high-speed analytics capable of automatically pinpointing excessive areas of I&I down to a pair of adjacent manholes.

Under the Clean Water Act, sanitary sewer overflows (SSO’s) have always been illegal. For municipalities and utilities responsible for managing wastewater conveyance networks the best answer to avoiding potentially huge fines is to never allow the SSO to happen in the first place. A Smart Wastewater Network utilizing cellular-enabled sensors to dispatch early-warning text messages that proactively alert O&M personnel of the possibility of an impending overflow event can achieve this goal. In addition, historical monitoring data from the problematic site will assist in diagnosing the cause.

The U.S. Clean Water Act and the U.S. EPA CSO Control Policy require permit holders with combined sewer systems experiencing Combined Sewer Overflows (CSO’s) to undertake a process to accurately characterize their wastewater collection system, demonstrate implementation of the “Nine Minimum Controls” and develop a Long-Term Control Plan (LTCP). Smart Wastewater Networks provide the ability for initiating a dynamic monitoring program that measures and records the frequency, duration and discharge rate of each Combined Sewer Overflow event.

The U.S. EPA is in the process of developing regulations (CMOM Program) that in the near future will become minimum permit requirements for the operation and maintenance of all wastewater conveyance networks. The EPA benchmarks the efficiency of wastewater operations by the ratio of preventive to corrective maintenance making real-time condition assessment a key component for managing today’s aging wastewater infrastructure. By including Real-Time Intelligence within the CMOM framework, cities and utilities gain huge benefits when migrating from a “reactive” to a “proactive” platform.
Compliance Reimagined

By leveraging the integration of low-cost sensors, wireless connectivity and high-speed analytics, Smart Wastewater Networks put forward an exciting new approach to regulatory compliance. The software knows which solutions apply to a specific regulation, curates in one step, and enables newly hired O&M professionals to work like seasoned experts. Smart Networks allow utility personnel to automate 80% of their low-end compliance responsibilities leaving them free to devote the bulk of their attention to the remaining 20% requiring professional expertise and judgment.

Meet EPA CMOM goals through Predictive, Proactive and Risk-Averse actions

Regulatory compliance is “not” about the Process. It is all about the Results!

Current approaches to regulatory compliance have relied primarily upon physical investigation and reactive response. A tactic that is unsustainable and mostly ineffective due to its lack of useful information. Smart Wastewater Networks convert data to “intelligence points” making abnormal situations immediately recognizable and available for analysis by utility personnel. Drawing on insights from operating performance data in real-time results in reducing compliance costs by at least one-third; increasing speed of response by weeks if not months; eliminating the probability of thousands of dollars in fines; and providing a solid foundation for establishing an EPA recommended CMOM Program. “Smart Wastewater Networks” for maintaining regulatory compliance is an idea whose time has come!
Knowledge is king. Low-cost iTracker® sensors monitor collection system performance on a 24/7 basis. Installed in less than 15 minutes, cellular enabled and requiring “zero” maintenance, iTracker® Performance Sensors turn any wastewater grid into an operationally intelligent network.

Proprietary algorithms embedded within iTracking’s® analytical software program convert real-time performance data into actionable insights for speedy delivery to all personnel charged with maintaining the operating integrity of the collection network.

Actionable insights require human decisions based upon those insights. Personnel armed with “smart” resources (pre-emptive alerts, historical data, real-time intelligence, predictive analytics) greatly increase their chances for success when dealing with issues of compliance.

Adherence to regulations requires the production of concrete evidence. Government agency personnel need to see proof of compliance based upon real-time data sets. Smart Wastewater Networks provide definitive confirmation of conformity to regulatory directives.
SMART WASTEWATER NETWORKS

Smart Sensors

Wireless Connectivity

Auto Analytics

I&I Micro Detection
Automated analytics pinpoint I&I down to a set of adjacent manholes.

SSO Overflow Prevention
Early-warning text alerts notify O&M of impending overflow events.
**CSO Monitoring**

Smart sensors automatically inform maintenance personnel of a CSO occurrence.

**CMOM**

Smart networks provide a proactive framework for creating a CMOM program.

**RDII Modeling**

RDII modelers are provided with real data sets for creating high accuracy simulations.

**Real-Time Operations Center**

[Image of a map with a network of connections and a person in a control room]
Affordability Across the Network

At Eastech, we understand that no matter how great the technology, it still needs to be affordable for it to become universally accepted. But thanks to today’s advanced sensor, wireless and analytical technologies, 24/7 monitoring of wastewater conveyance has become an affordable reality costing just $4/day/site and after 2 years dropping to $1.25/day/site*. Smart Wastewater Networks provide municipalities and utilities with the opportunity to operate proactively in order to eliminate the financial burdens associated with consent decrees and regulatory agency fines.

SMART SENSOR

Highly affordable smart sensors, without requiring confined space entry or maintenance, create a 24/7 network of “intelligence points” that are capable of detecting I&I down to adjacent manholes, alert maintenance crews of impending SSO’s and backups and build a solid foundation for an EPA recommended CMOM program.

*24 month/$1 buyout
SSO’s and basement backups are proactively addressed through inexpensive text alerts conveniently viewed by field crews on their mobile devices. Text alerts also inform maintenance personnel of the need for cleaning sewer lines. Cellular delivered analytics provide charts, graphs and reports assessing the performance and condition of underground conveyance lines.

Round-the-clock knowledge of wastewater collection network operating condition is provided license-free for the first 2 years. Besides receiving proactive text alerts relating to impending overflows, blockages and the need for cleaning, automated analytical software produces in-depth reports pinpointing areas of I&I down to micro-basins comprised of just a few manholes.

Except for 5-minute replacement of a pair of $36 batteries, smart sensors run maintenance-free. Installed above the flow stream, smart sensors are immune to the effects of sediment and debris that create havoc with other types of monitoring devices such as portable “bottom sitting” flow meters. Once installed, on-going maintenance costs become a non-issue.
Results Across All Departments

Regulatory agency compliance is a round-the-clock job that touches every department within the utility including outside consulting engineering firms. Without the correct tools, the task becomes nearly impossible. Smart infrastructure networks deliver real-time performance data across the entire utility management platform enabling each department to closely collaborate with EPA personnel ultimately providing both parties with reliable and defensible documentation as it relates to operating integrity.

A “round-the-clock” window into wastewater infrastructure performance

OPERATIONS
I&I Detection/CMOM

With the simple click of a button, reports are automatically generated showing the exact location of problematic areas responsible for major volumes of I&I. Once smart sensor data is imported into a smart network analytical program, the software takes over. I&I is pinpointed down to micro-basins as small as a pair of adjoining manholes.
The key to SSO and basement back-up prevention is to never let the event happen in the first place. Smart sensors monitor manholes having a history of such events and alert field maintenance crews **hours to weeks in advance** of the possibility of an impending overflow or back-up. Regulatory fines are avoided along with the unpleasant effects of adverse publicity.

**ENGINEERING**

Capacity/RDII Modeling

Automated reports in the form of hydrographs assist engineering personnel in detecting areas within the collection network operating at maximum capacity prior to their causing overflows and back-ups. **Real data sets**, in lieu of theoretical assumptions, provide hydraulic modelers with the ability to confidently predict wastewater infrastructure performance.

**SENIOR MANAGEMENT**

EPA Compliance

At the end of the day, it is ultimately the responsibility of senior management to assure that their utility is operating within the compliance boundaries set forth by the U.S. EPA. Smart Networks provide positive proof in the form of **reliable, repeatable and defensible reports** that the utility is doing everything possible to meet the guidelines mandated by industry regulations.
Defining the Future of Regulatory Compliance

Affordable Acquisition Cost
If the ability to comply with regulatory agency directives falls beyond a city or utility’s financial resources, then the entire discussion quickly becomes a “non-issue”. The correct tools must first be put in place before success can even be considered and those tools require capital. Eastech understands that and has designed compliance solutions that eliminate the requirement for any upfront costs.

User-Friendly Integrated Solution
The number one concern amongst senior managers of cities and utilities is the requirement that any new or smart technology be a quality, integrated solution with special emphasis on the term “user-friendly”. With just a few hours of training, O&M personnel will gain a full understanding of the workings of Eastech’s Smart Network sensor technology along with its automatic “click of a button” report generation.

High Resolution Surveillance
Maintaining wastewater infrastructure is a 24/7 responsibility. Guesswork must be taken out of the equation. The ability to create a strategically distributed high-resolution network of low-cost sensors throughout the collection grid is the reason why Smart Networks deliver consistent and reliable results.

Proactive Maintenance Structure
If the collection infrastructure network is not informative or predictive, then maintaining compliance is “out the window”. For a Smart Wastewater Network to be truly successful and satisfy the requirements of governmental oversight, the primary deliverable becomes the ability for enabling all involved personnel to perform their duties in a “proactive” manner.

Defensible Proof of Compliance
Questionable or nonexistent evidence of regulatory compliance usually results in large fines, adverse publicity or even worse, long-term consent decrees. Smart Network analytical programs, with the simple click of a button, generate repeatable and defensible reports avoiding the penalties mentioned prior.
To learn more about Smart Wastewater Networks and how they can cost-effectively keep you in Compliance, please contact us directly at 1-800-226-3569 or visit:

smartwastewater.com