CITY OF RUTLAND, VERMONT CASE STUDY

THE CHALLENGE

Rutland, Vermont, is a small city of about 16,500 residents. Like many municipalities in the United States (US), it operates a combined wastewater treatment network sections of which are more than 100 years old.

Last year, the state legislature enacted laws imposing significantly more onerous reporting requirements for Combined Sewer Overflow (CSO) events on operators. These set out an obligation to notify the state of such events up to one hour after they began.

The City saw in the legislation an opportunity to proactively increase the transparency of local government and provide up-to-date information about wastewater management issues to citizens. To this end, the City embarked upon a public information initiative that included setting up social media to inform customers of wastewater events including overflows. This provided a user-friendly alternative to the page housing this information on the municipality’s website.

Prior to implementing Ayyeka’s level monitoring technology, the City relied on physical measuring techniques, such as reading height markers from a simple wooden stick, to periodically sample levels in its wastewater system. Although this fulfilled its basic reporting obligations, it clearly did not provide real-time information. It also necessitated frequent field visits, and – being a non-digital methodology – could not connect with interfaces such as the City’s Supervisory Control and Data Acquisition (SCADA) tool. It neither provided the means to predict the development of a CSO event nor could it alert operators to one that was already in progress.

Remedial and proactive engineering work could only be planned on the basis of modeling efforts predicated upon the accuracy of data taken from indirect estimates of water flows. The paucity of information from the network edge also greatly impeded the City’s efforts to address the root problems inherent in its network design that were causing the overflows to happen.
THE SOLUTION

To comply with the legislation and deliver their planned citizen information initiative, the City realized that it needed to develop an affordable system that could provide real-time level data to its regulators, its customers, and engineers.

After piloting Ayyeka against several other solutions whose “bells and whistles were found to be wanting in practice”, the City chose to deploy Wavelet CSO Kits at the system’s main outflow points. Following a post-pilot evaluation, Ayyeka's Industrial IoT (IIoT)-powered data acquisition system proved to represent the “best value for money” among the solutions tested by the City’s integration team.

Non-technical users were quickly able to learn how to visualize field data using the Ayyeka web-based Data Hub. Engineers were able to integrate the real-time data feed directly into the city's SCADA monitoring and control platform more quickly than expected. Members of the public could subscribe to receive live updates about overflow events from familiar platforms such as Facebook and other social platforms.

Treatment room operators “quickly learned to prefer the Ayyeka Data Hub” overtaking manual readings such as obtaining grab samples from the field. “The ability to manipulate where you set alarms, configure alerts, and view multiple locations simultaneously on the same graph was particularly well received by the team”, Mr. Wennberg said. Another operator enthusiastically extolled Ayyeka as “the best online interface that we have worked with to date.”

An additional benefit of Ayyeka’s addition to the City’s technology stack has been the ability to assist with the drafting of a Hydrologic and Hydraulic (H&H) study that the City is undertaking to improve the performance of its wastewater network over the long term.

External consultants are working with the city to draft a plan that will use Ayyeka devices to capture extensive data from the field. When complete, it will give network operators the ability to accurately predict the development of CSO events. In addition, it will enable the City to undertake a cost-benefit analysis to determine what mix of green infrastructure (above-ground water interception devices), gray infrastructure (underground retention measures), and data infrastructure (flexible state underground devices, such as inflatable weirs, operated based on cues from smart sensors) will yield the best long-term results for minimizing CSO events.

Achieving a complete separation of the stormwater and wastewater components of the City’s sewer network is beyond the financial means of both the City and (probably) of the State of Vermont. Ayyeka’s system has provided the City with an alternative and convenient way to affordably revolutionize the operation of its network without needing to physically change it.

The strategies that the City will take based upon the H&H study and the data derived from the Ayyeka installation project will greatly assist its efforts to remain compliant with the terms of the Section 1272 Order (“Regulation of activities causing discharge or affecting significant wetlands”) that it recently received from the State regulator. The legislative instrument sets out guidance plans for operators that do not currently comply with best practice management guidelines to reduce their overflow rates. Adherence to the terms of the Order can also be expected to greatly reduce the fines that the City accrues from regulators, thereby realizing cost savings.