



APPLICATION REPORT

Water & Wastewater

Inlet flow measurement in the open channel of a sewage treatment plant

- Flow measurement for controlling mechanical preliminary clarification
- Determining volumes of sewage in partially filled gravity pipelines
- Automated dosing of precipitants using a PLC

1. Background

AEGN (Association pour l'épuration régionale des eaux usées des bassins versants de la Glâne et de la Neirigue) operates a sewage treatment plant for treating municipal wastewater in Autigny, Switzerland. At the inlet of the sewage treatment plant the wastewater is first collected in a tank and then transported for mechanical preliminary purification via two screw pumping stations. The wastewater flows through a screen and grit chamber in an open, partially filled channel (gravity pipeline) before going on to preliminary clarification. This channel is designed for a maximum flow height of 400 mm / 5.7".



Open channel from grit chamber to preliminary clarification

2. Measurement requirements

By law, AEGN must conduct an inlet measurement of the volume of wastewater flowing into the sewage treatment plant. Up until now, the operator used a Venturi flow measurement for this. However, this kept resulting in backwater. Accuracy was, therefore, deemed to be very low. Following renovations to the channel, the measurement ultimately stopped working altogether. The failure of the application affected the entire purification process, because AEGN always dosed the precipitants for preliminary clarification according to the flow rate, and this was now virtually impossible. Due to the use of the screw pumping stations, flowrates in the channel fluctuate considerably (15...300 l/s or 237.8...4755 US gpm), and these cannot be accurately calculated without technical tools.

The operator, therefore, decided to install a flowmeter at the entrance to the preliminary clarification plant for the first time. The search proved difficult due to the prevailing parameters. As the channel could not be lowered, any suitable measuring instrument had to fit into the existing infrastructure. The gravity pipeline also required a measuring solution that could be used at different fill levels.

KROHNE

3. KROHNE solution

AEGN opted for the TIDALFLUX 2300 F for this application, an electromagnetic flowmeter for partially filled pipelines. Following intensive tests, the customer decided to use two individual instruments with a nominal diameter of DN350. The units were installed beside each other in the gravity pipeline of the inlet structure, which is located in the supply pipe to the preliminary clarification plant.

The TIDALFLUX features an integrated, non-contact capacitive level measuring system and is, therefore, designed for measurements in AEGN's unpressurized sewage channel. The KROHNE instrument can reliably determine the inlet flow rate from a fill level of 10%. The polyurethane liner protects the measuring instrument against the sometimes abrasive and aggressive components in the wastewater.



Installation of TIDALFLUX 2300 in sewage channel

4. Customer benefits

Thanks to the TIDALFLUX, AEGN now has a reliable and - compared to the Venturi measurement - much more accurate way of determining flow rates. Not only does the plant comply with the wastewater directives; the customer can also continuously document inlet flow, but most importantly he can optimise the purification processes using a PLC as well. The precipitants can now be added according to the wastewater freight. This means that only the precipitants that are actually needed are used, which will reduce costs in the long term. By using the TIDALFLUX, AEGN is now more flexible and can respond more quickly to fluctuating wastewater volumes, as plant manager Nicolas Pasquier confirms: "The invested time and planning have paid off. Now we can identify every cubic meter of flow and can thus very accurately control the purification process."

5. Product used

TIDALFLUX 2300 F

- Electromagnetic flowmeter for the water and wastewater industry
- Measurement in partially filled pipelines (from 10% fill level) up to DN1600 / 64"
- Patented, non-contact level measurement
- No on-site calibration necessary
- High abrasion and chemical resistance
- ATEX / IECex Zone 1



Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
application@krohne.com

Please visit our website for a current list of all KROHNE contacts and addresses.

