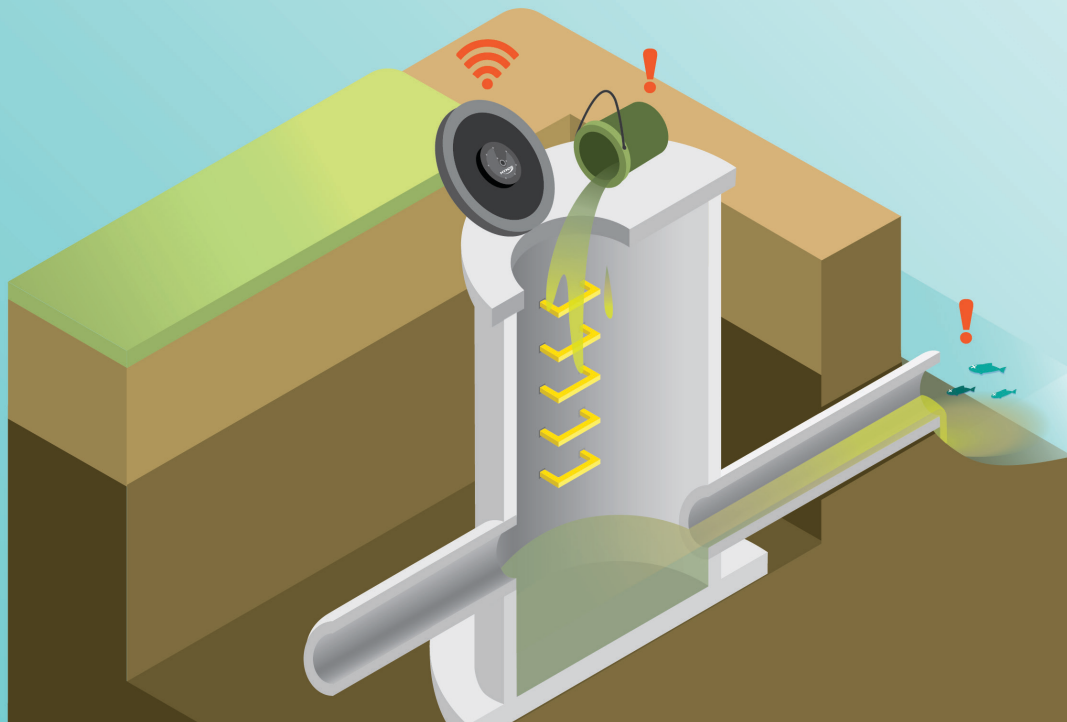




# Smarterwater<sup>®</sup> Manhole Sensor

Version: 1.3  
July 2021



## Inflow and Infiltration

### Sensor

The Smarter Manhole sensor is a product 100% developed in New Zealand by Hynds Smarterwater to respond to the need for measurement of water in gravity infrastructure so that the various water resources can be managed. Measure to Manage, Measure to Act.

The Smarter manhole Sensor is the first of its kind, being an in-manhole IoT level measurement sensor that does not diminish the effectiveness of the access point. We developed the sensor to discretely fit into the manhole cover itself, automatically measure level and tamper events and transmit them to the asset owner.

### Application

In most gravity systems the manhole acts as a detention device and provides added capacity to the network. As levels in the manhole change, the expectation is that this is related to volume of use in the system.

This is not always the case. Someone may have lifted the manhole cover to pour materials into the system, there may be illegal connections or accidental cross connection.

This poses a risk to public health through contamination and potentially exposed manhole entries, environment contamination from chemical or bio waste and potentially catastrophic harm to aquatic life. Maintenance teams may also face unexpected risks due to chemicals or waste.

### Application (continued)

Knowing that an illicit discharge event has occurred allows teams to act quickly to contain the materials and potentially prevent further incidents. Pipe work cross connections can be investigated and eliminated, and illegal connections fixed.

By utilising the smarter manhole sensor in any location, the tamper feature and level measurement of the sensor can tell the work teams where to look, and when to look. Measure to Manage, Measure to Act.

### Solution

Flows in manhole systems occur as an when required. They could be based on waste elimination, rain events or industrial discharge. With the use of the Smarter manhole sensor and the use of the anti-tamper feature, any attempt to lift and move the manhole cover will result in an instant alarm to the asset owner. This allows work teams to react to the problem swiftly and even put surveillance in place if required. Measure to Manage, Measure to Act.

For most gravity systems, the normal behaviour of each manhole is not known. The level sensor allows the asset owner to see what normal looks like, so when an event is different, an investigation can take place.

In both stormwater and wastewater systems, the combination of the Smarter manhole sensor level measurement with other instruments, such as rain gauges and application data can allow cross connections to become visible. For example, if a stormwater system has flow, but there is no rain and has not been for a period, where did the flow come from? Time to investigate.

As many of our sewer systems are also gravity, they too can have their capacities adversely effected by infiltration events from illicit discharge which can lead wet weather overflows into rivers and harbours, poisoning of the wastewater treatment facilities and significant cost to asset owners. The proper monitoring of the multiple locations can allow remedial actions to prevent sewage overflows and contamination.

