

Using sampling to track faecal contamination in stormwater networks

In the field: sample collection and ammonia quick test



Outlets



Streams



Manholes



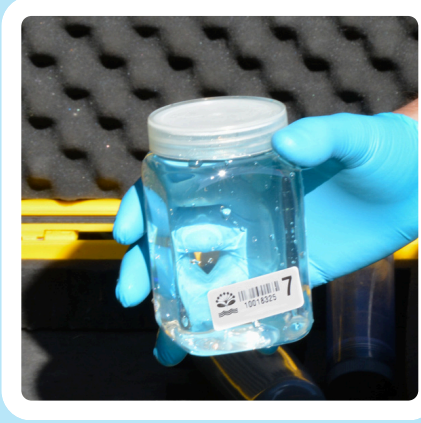
Ammonia test

Ammoniacal nitrogen (NH3) field tests are a quick and effective way to identify wastewater contamination. If we get a positive result for NH3, it is a strong indication that there is a wastewater contamination issue in the network. We use this test on every sample.

For each sample, we record a variety of information in our field app. For example; date, time, weather conditions, flow rate, pipe algal growth, water colour/clarity and the result of the NH3 test. Every sample is assigned a unique ID before the info is uploaded to our digital database so everything stays organised.

Field records

After collection: storage and transport



Sample bottle



Cold transport

Samples are chilled to prevent bacteria growth, then delivered to the Watercare lab in Māngere. Lab staff log the unique ID barcode on each sample so test results can be joined with our field records when stored in our digital database.

Logistics

In the lab: wastewater indicator tests



Analysis

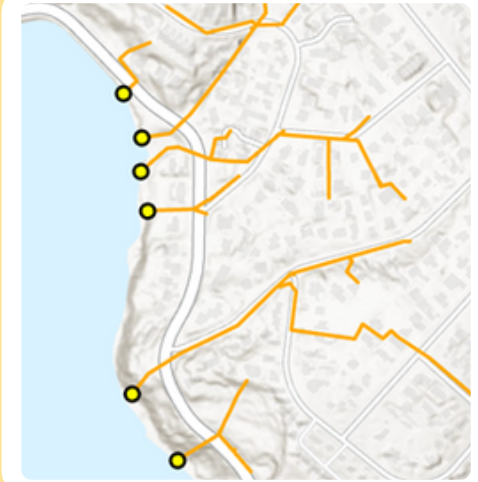
Faecal Indicator Bacteria concentrations show the level of wastewater contamination in each sample. We use FIB results to decide if a pipe or stream is contaminated. We test for *E. coli* and Enterococci.

FIB

Microbial Source Tracing uses DNA markers to determine whether the faecal indicator bacteria are from human, bird, dog or livestock. Human and animal faecal contamination issues require different mitigation measures.

MST

In the office: geospatial information systems (GIS) to map contamination using lab results



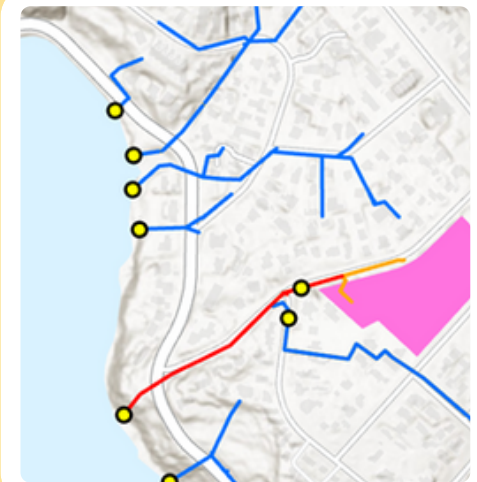
Outlet screening



Network screening



Isolate further



Area for drainage inspections

Digital geospatial tools are essential to our contamination investigations. As shown in the images to the left, we can use mapping software to track the contamination status of each part of the network. Yellow points are sample locations, orange lines are untested network branches, blue are confirmed clean, and red are contaminated. These maps can then be viewed on mobile devices to direct our teams in the field.

Operational GIS