Flow measurement for trade waste dischargers

Sydney WATER

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1 Introduction

These guidelines provide information about our requirements for flow measurement equipment used to monitor trade wastewater discharges into Sydney Water's wastewater system. This will help you understand our discharge measurement requirements.

These guidelines are by no means exhaustive, and we don't recommend or endorse any of the manufacturers, agents or products listed.

You should also read our *Responsibilities of connected customer policy*.

When you contact any product manufacturers or agents, refer to the relevant Sydney Water specification in this document. When you have a flow measurement system installed, ensure that the manufacturer or their agent completes the commissioning.

The following guidelines should help you:

- plan projects involving trade wastewater discharges
- allow you to submit your application early
- avoid delays when negotiating a Trade wastewater agreement.

Note

Designing flow measurement systems to suit site conditions is a specialist function. Many consultants, manufacturers and suppliers can provide suitable equipment, but this equipment must be integrated into a flow measurement system that suits your individual site conditions. Only suitably qualified people should design and install this equipment.

2 Flow measurement equipment

We require some trade waste customers to install flow measurement equipment to gather accurate information on the rates, volumes and frequency of trade waste discharges to our wastewater system.

We use the flow data to:

- determine the volume of discharge and the mass of substances being discharged (in conjunction with sample analysis results)
- calculate appropriate charges
- determine a wastewater usage discharge factor
- facilitate flow proportional sampling of the trade wastewater
- provide hydraulic data to assess the future capacity of the wastewater system
- manage compliance against the conditions of your agreement.

3 Requirements for flow measurement equipment

A full pipe electromagnetic flow meter that can be electronically verified is a standard requirement for new consents to discharge industrial trade wastewater. An electromagnetic flow meter is also required for some permits to discharge commercial trade wastewater.

You should install the primary measurement device and approved discharge flow meter instrumentation in a location that excludes any domestic wastewater generated on-site

Where you're required to install an electromagnetic flow meter, you must also provide approved instrumentation that instantaneously records the flow rate readout in litres per second and total volume in kilolitres discharged on a continuous basis.

We no longer accept an 'hours run' meter as an alternative to an electromagnetic flow meter.

Flow measurement equipment must:

- be as close as possible to the pollutant source or immediately downstream of the pre-treatment plant, so you can monitor the total discharge
- have the flow converter/totaliser next to the sampling point, so you can connect an automatic sampler to the correct plug (equipped with a 240-volt AC power supply). This is to enable flow proportional sampling
- be hardwired to the electrical supply
- have a suitable weather-proof 240-volt AC power outlet le next to the sampling point, to enable connection to power automatic wastewater sampling equipment.

Flow measurement instruments can be expensive and include highly technical equipment.

Only qualified specialists should install this equipment. When the flow meter is installed, ensure that the manufacturer or their agent also completes the commissioning, including calibration/verification on-site.

When you contact any product manufacturers or agents, refer to our specifications (in this document).

Water meters are not suitable to measure trade wastewater discharge, because they are constructed of different materials and corrode in industrial effluent.

4 Commissioning, verifying, calibrating and maintaining flow meters

Manufacturers test and calibrate flow meters under controlled conditions before the meters leave the factory.

When a flow meter is installed, it must be commissioned and verified on-site. This will include having the desired units of measure, such as litres per second and total kilolitres discharged. You must also enter the pulse output information. When you install a new discharge flow meter, you must provide us with the 'certificate of verification'.

Flow meters must be verified in the field, at least once a year. You must submit a certificate of verification to us every time a flow meter is reverified. The certificate must report the method of verification and the pulse output intervals. You must verify your flow meter on-site using equipment that is NATA approved and fully traceable to National Standards. Verification equipment must have a capability test within a range of +/- 2% of the required specification. On-site calibrations must be done using a volumetric method or a check flow meter.

If a flow meter must be taken off-site for calibration/repairs, it must be verified when it is returned to the site. You must install a replacement meter while the original meter is off-site.

You must maintain the flow meter in good working order, following the manufacturer's instructions. To maintain integrity of the flow meter, you must also regularly maintain all pipework.

4.1 Instrument specification and installation procedures for trade wastewater

The flow measurement device must be a full pipe in line electromagnetic flow meter, which is capable of electronic verification.

Standard pipe sizes	25 mm to 150 mm. You may use larger sized pipes with prior approval.
Measurement range	0.3 to 8 m/second velocity.
Accuracy:	Plus or minus 2% of the actual flow at the lowest typical flows. Record all discharge to the wastewater system (sewer).
Output signals	Include a facility for an interface between the flow metering instruments, automatic sampling equipment and data logger/recording equipment, by providing the following two 'Amphenol' type plugs:

	To connect a data logger or chart recorder: • Analogue output: 1 to 5 volts DC (4 to 20 milliamps). • Serial No MS3102A14S9P – positive to pin A and negative to pin B. **To connect an automatic sampler for flow proportional sampling:** • Voltage free (isolated) pulse output, with a minimum duration of 300 milliseconds for each unit count on the totaliser unit. • Serial No: MS3102A14S6P - pulse output connected to pins A and C. • Set the pulse output at 1 kl except for small volume dischargers or companies with low flows, when you may set the pulse output in multiples of litres, for example 100 L. (Any change from kilolitres should be displayed on the instrumentation and enclosure). Companies with a Risk Index 1 to 4 may need two connections with pulse output for flow proportional sampling from two automatic samplers.
Power supply	• A 240 volt GPO, as close to the instrumentation as possible to connect an automatic sampler and/or recording equipment. • A 240 volt AC outlet – 'Rowco' RC310, or similar. • Hardwired instrumentation housed in a weatherproof enclosure with a clear front, where it can be easily accessed. • Use a licensed electrician for all electrical work. • All electrical work must meet Australian Standards.
Conductivity of process fluid (where applicable)	Minimum 20 µS/cm.
Visual displays	• Preferred display: LCD or LED digital format. • Instantaneous flow rate in litres per second (to one decimal place). • Totaliser in kilolitres (minimum six digit) with no external reset. (For some small volume dischargers or companies with low flows, the totaliser may be set in litres, but we must approve this. Any change from kilolitres must be displayed on the instrumentation and enclosure). • The totaliser must be capable of retaining its reading in a power failure.
Installation procedures	Full pipe flow measurement installations may vary, depending on the type and manufacturer of the flow meter. Refer to the manufacturer's specifications. All installations must comply with the following: • You must install an isolating valve upstream of the meter for maintenance purposes. This is not required for pumped discharges. • Pipework in and out of the flow meter must ensure that the flow meter section remains full at all times. Avoid installing the flow meter near strong electromagnetic fields.

5 Trade waste discharge factors

A trade waste discharge factor estimates the volume of trade wastewater as a percentage of incoming meter water use. We may use a trade waste discharge factor to determine the volume of trade wastewater being discharged and to calculate trade waste charges.

We may determine the volume of trade wastewater by:

- measuring the flow to the wastewater system (sewer)
- using check meters to measure water used in trade waste generating processes
- using check meters to measure water that is not discharged to the sewer
- estimating water in product from production figures or other meaningful data.

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