Sydney WATER

Flow measurement

for trade waste dischargers

Contents

Introduction

These guidelines provide technical service information for flow measurement, open area requirements and other equipment used to monitor trade wastewater discharges into Sydney Water's wastewater system. This will help our customers understand their discharge requirements.

These guidelines are by no means exhaustive, and we do not recommend or endorse any manufacturers, agents or products listed.

This booklet should be read together with Sydney Water's *Trade Waste 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 and allow you to submit your application early and avoid delays when negotiating a Trade Waste Service Agreement.

Special note:

Designing flow measurement systems to suit particular 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.

1. Flow measurement equipment

Sydney Water requires some trade waste customers to install flow measurement equipment, to gather accurate information on the rates, volumes and frequencies of trade waste discharges to the wastewater system. The measured trade waste volume is used together with sample analysis results to calculate the masses of pollutants discharged.

The flow data gathered is used to:

- determine mass (trade wastewater) and volume (sewer usage) charges accurately
- determine a discharge factor
- provide the customer with discharge data, so they can manage their trade wastewater discharge more effectively
- enable flow proportional sampling of the trade wastewater
- provide hydraulic data to assess the future capacity of the wastewater system.

2. Requirements for flow measurement equipment

Sydney Water's *Trade Waste Policy and Management Plan* describes how we determine the rates and volumes of trade wastewater discharged into Sydney Water's wastewater system under an agreement or conditional permit:

- Where the maximum daily discharge of trade wastewater is 5,000 litres a day or less, we may apply a trade wastewater discharge factor. This is the percentage of the metered water use discharged to our wastewater system as trade wastewater. It will be either an industry standard decided by Sydney Water or 100%, if there is no set standard.
- Where the maximum daily discharge of trade wastewater is greater than 5,000 litres a day, the customer shall provide an approved Full Pipe Electromagnetic Flow Meter that can be electronically verified. The customer shall also provide approved instrumentation to record an instantaneous readout of flow rate in litres per second and total volume in kilolitres discharged on a continuous basis.

Notes:

1. Customers installing new discharge flow meters require a certificate of verification at the time of installation and repeated at least every 12 months. Flow meters must be verified according to manufacturers' specifications.
2. Customers with existing discharge flow meters must still supply calibration certificates every 12 months . The flow meter must be calibrated on-site using a volumetric method or a check flowmeter, with instrumentation and methods being fully traceable to National Standards through a NATA registered laboratory.
3. You should install the primary measurement device and approved discharge flow meter instrumentation in a location that excludes any domestic wastewater generated on -site.

3. Location of flow measurement equipment on-site

The flow measurement equipment is to be:

- located as close as possible to the pollutant source or immediately downstream of the pre-treatment plant, so the total discharge can be monitored. To enable flow proportional sampling, you must have the flow converter/totaliser next to the sampling point, so that the automatic sampler can be connected to the correct plug
- equipped with a 240-volt AC power supply. The flow meter must be hardwired to the electrical supply. In addition, a suitable weather proof 240-volt AC power outlet must be available next to the sampling point, to enable connection to power automatic wastewater sampling equipment.

4. Discharge factors

What is a discharge factor?

A discharge factor is the percentage of the metered water use discharged to Sydney Water's wastewater system from a non-residential property.

There are two types of discharge factor:

- Sewer usage (SUDF)
- Trade wastewater (TWDF)

How is the SUDF determined?

This volume of wastewater includes all discharge to the sewer, including trade wastewater, domestic wastewater and any other liquids that are part of the wastewater stream, such as excess recycled water. In certain cases, standard factors are established for some business processes.

Note:

1. Where contaminated ground water or open area first flush systems discharge to the sewer, you must use a flowmeter to determine discharge volume.
2. When calculating wastewater usage volumes, we use an allowance of 100 litres per person per day to estimate any unmeasured domestic component.

How is the Trade Waste Discharge Factor calculated?

This volume of wastewater is the discharge from the trade wastewater processes only. It is calculated by determining the volume of trade wastewater as a percentage of incoming metered water use, or by using an industry standard discharge factor. We may determine the volume of trade wastewater by:

- measuring the flow to the 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.

5. Instrument specification and installation procedures for trade wastewater

Specifications for flow measurement

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

Standard pipe sizes:	25 mm to 150 mm. Larger size pipes may be used with prior approval.
Measurement range:	0.3 to 8 metres per second velocity.
Accuracy:	Plus or minus two per cent of the actual flow at the lowest typical flows. Record all discharge to the sewer.
Output signals:	You must include a facility for an interface between the flow metering instrumentation, automatic sampling equipment and data logger/recording equipment, by providing the following two 'Amphenol' type plugs: 1. 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'. 2. 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 one kilolitre except for small volume dischargers or companies with low flows, when you may set the pulse output in multiples of litres, for example 100 litres. (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. • 240 volt AC outlet – 'Rowco' RC310, or similar. • Instrumentation is to be hardwired and housed in a weatherproof enclosure with a clear front, where it can be easily accessed. • You must 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 Sydney Water must approve this. Any change from kilolitres must be displayed on the instrumentation and enclosure). • 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: • An isolating valve must be installed 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.

6. Flow measurement products, suppliers and services

Flow measurement instruments can be expensive and include very 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 the Sydney Water 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.

7. Commissioning, maintaining and verifying flow meters

Verifying

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, total kilolitres discharged. The pulse output information must be entered.

Maintaining flow meters

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.

Calibrating flow meters

Manufacturers test and calibrate flow meters under controlled conditions, before the meters leave the factory. When installed, the flow meter must be verified in place at the customer's site.

Flow meters are to be verified in the field, at least once every 12 months. Customers must report the method of verification and the pulse output intervals to Sydney Water. You must submit a Certificate of Verification to Sydney Water at least once every 12 months, for the flow measurement instruments installed. You must verify your flow meter onsite 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

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.