

# Guideline 1: Data Collection

This section provides guidelines for monitoring wastewater flows and collecting samples for wastewater characterization. Consistent use of these methods is very important to ensure the quality and usability of the collected data.

## 1.1 Wastewater Flow Measurement

Obtaining accurate measurements of wastewater flows from discrete sources within the winery is a critical component of the facility assessment. Monitoring programs should be designed to assess flows over the full range of operating conditions, from crush to off-season. Careful planning may be required to capture data on flows that are intermittent or event-related.

Flow meters can be installed as either dedicated or temporary stations. For key junctures in the facility and/or points designated for ongoing compliance monitoring, dedicated instruments will be the best choice for consistency, cost effectiveness and convenience. For other locations, where data will be collected over a limited time period for purposes of the facility evaluation, temporary meters can be used. These are often rented rather than purchased, especially when a number of meters are needed to capture flows in different parts of the winery over the same time period. If access to a particular wastewater stream is not possible without significant facility modifications, it may be possible to substitute measurements of source water inflows to that process, estimating losses as appropriate. In determining whether to rent or buy or install dedicated equipment, note that it will be important to periodically repeat certain flow measurements to confirm that facility modifications or procedural changes have been effective and are sustained. In the case of small flows, simple approaches like using a bucket and stop watch are sometimes sufficient.

There are many types of flow meters available. Examples of some of the most commonly used types are described on Table 1-1 below. For further guidance on flow meter selection, an interactive tool is available at: <http://seametrics.com/flowmeterfinder/flowmeterfinder.html#>

**Table 1-1: Flow Meter Types and Characteristics**

Type	Mechanism	Measurement	Mounting	Comments
Ultrasonic - Transit time	Source and receiving transducers mounted on opposite sides of a pipe	Signal moves faster when it travels with the flow rather than against it, and the flow rate can be determined from this difference.	External, clamp-on, allowing flow measurement with no wetted parts.	<ul style="list-style-type: none"> <li>More accurate than Doppler for clean water applications</li> <li>Ideal for temporary use</li> <li>Low corrosion and maintenance needs</li> </ul>
Ultrasonic - Doppler	Source and receiving transducers mounted on opposite sides of a pipe	Emits an ultrasonic signal which bounces off particles entrained in the flowing liquid, causing a frequency shift that is proportional to the velocity.	External, clamp-on, allowing flow measurement with no wetted parts.	<ul style="list-style-type: none"> <li>More reliable than Transit Time for dirty wastewater applications; water containing silt or sand particles; or water with entrained air bubbles</li> <li>Low corrosion and maintenance needs</li> <li>Ideal for temporary use</li> </ul>
Electromagnetic (Magmeter)	Measure velocity based on principle of electromagnetic induction	When a conductive fluid flows through a magnetic field, a voltage is produced that is proportional to the fluid's velocity.	Internal or as insertion	<ul style="list-style-type: none"> <li>Can be used in a wide range of pipe sizes from small to large diameter</li> <li>Access may require piping modification, potentially disrupting operations</li> </ul>
Area Velocity	Uses submerged sensor (ultrasonic or magmeter) to measure velocity, and another method to measure fluid depth to yield flow volume	Contingent on sensor	Can be installed in lines with open channel flow that are gravity-drained, such as trench drains or pipelines	<ul style="list-style-type: none"> <li>Typically used with a data logger to record flow at regular time intervals</li> </ul>