



NAPA GREEN

WINERY WATER / WASTEWATER FLOW METERS

Water meters can be powerful tools to help you optimize your water use and the associated energy consumed to move the water around. Napa Green Winery certification requires that you have a water meter that tracks winery water use. If you need to install a water or wastewater meter this document provides some general and technical information on purchasing and installing a meter.

Wastewater meters are required by the Regional Water Quality Control Board for wineries in the Tier 3 category (300,001 GPY winery process wastewater) and above.

First, if applicable, for a water meter talk with the company that manages your wells. They can advise you about appropriate meter types and placement, and they can do the installation. For wastewater, consult with your disposal system service/installation company for the best location after any screening equipment, and in a position that captures all process wastewater flow. See the installation notes below.

Second, you will want to become familiar with the different types of meters that are available, and the different options for their use – owning versus renting, manual read versus Bluetooth/digital, etc. Some basic concepts are as follows:

Water Meter types:

Water meters are usually mounted “in line” requiring a pipe to be cut, flanged and the meter inserted. These include disc and turbine mechanical meters, and magnetic flow meters (most expensive). All meters can have remote readouts if desired, but this increases costs, and requires electrical connections.

The simplest, lowest cost is either the disc type or turbine type mechanical meters with a local readout. Often these meters can be retrofitted with a remote readout. Check with your supplier for the options and costs.

Some wineries are using inline meters with battery powered electronic digital readouts. Be careful with these as if the batteries fail, you will lose your reading.

While there are “clamp on styles” they may not be as accurate and will require electrical power. These can be obtained for free from PG&E's lending library for temporary studies if needed. Also, instrumentation rental firms can provide clamp on meters for a fee, and some will record the data.

Wastewater Meter Types

Due the nature of wastewater and the contaminants, avoid a meter with flow tube internal elements such as a turbine or disc meter. The preferred meter is a magnetic flow meter or a “magmeter” that has no in pipe elements. These will require power, though some are available with battery power battery powered electronic digital readouts. Be careful with these as if the batteries fail, some meters will lose their readings.

Other options include open channel flumes such as Parshall or Palmer Bowlus, but these are usually installed in larger, gravity flow systems, and will require an ultrasonic level meter.

Meter operation options:

With the inline water meters, as water passes through the meter, it drives an oscillating disc, a turbine wheel, or flow is sensed via a magnetic pickup embedded in the body of the meter. The meter must have no turbulence for the most accuracy, and your meter manufacturer will specify a straight run of pipe upstream and downstream (expressed in pipe diameters) to avoid turbulence.

Magmeters have no internal elements and flow is sensed via a magnetic pickup embedded in the body of the meter and are usually the most accurate and are the best option for wastewater flow measurement.

Clamp on meters use an Ultrasonic “Doppler effect” and usually require some particles in the liquid to reflect the signal for best accuracy. The meter must be set up for the pipe size, thickness, and material.

Manual reading of the meter is the simplest, and least cost. To enhance this and remotely transmit the data for reporting options you should contact your supplier for options, costs, signal methods and needed infrastructure (such as Wi-Fi strength/availability). On the local readouts, by using the three different readouts on the meter register, the meter can be used for water audits and studies.

Magmeters will have a local digital display that can be read locally or provide a pulse or signal to a remote readout. (A minor note-protect these from sunlight as that will make the meters vary hard to read as they turn opaque).

There are systems that will capture flows and trend/alarm usage, such as badger meter Aqua Cue system, but require the proper readout cartridge and communication infrastructure.

<https://www.badgermeter.com/products/analytics-software/aquacue-flow-measurement-manager/>

Technical considerations:

Think about placement of meters to best optimize tracking of winery operations. Locate the water meter in the water pipe system preferably downstream of your storage tanks, so that you can capture flows to your winery and winery process areas. Try to avoid capturing landscape irrigation flows, as well as vineyard irrigation, as this will hamper efforts to understand your winery water usage. You may also want to consider a smaller meter specifically for your landscaping water flows.

For wastewater flows, the meter will need to collect winery effluent flow measurements after screening and at a point in the system where process water, including any process water generated from outdoor processing areas, discharges from the winery but before treatment in a pond, land application area, or subsurface disposal system.”

To determine meter size, you will need to look at the flows of the users your meter will be measuring, their required operating pressure, and the supply pressure at the well head or water supply.

- Typically, your highest use will be prior to or during harvest with tank cleaning and floor/pad cleaning going on. Multiple uses at once will drive high flows (a ¾” water hose is around 20 GPM at 50 psi, a hose nozzle 5-7 GPM, and a tank cleaning nozzle 10-30 GPM). An example estimation would be:

User	Flow GPM	Max GPM
3/4 hose@ 50 PSI	20	20
Hose Nozzle	5 to 7	7
Tank cleaning machine	10 to 30	30
Miscellaneous		10
		67

- In addition to user flows the pipe size where you are installing the meter will drive the meter sizing. Some typical flows for meter sizes (non magmeters) are:

Pipe Size	Max Continuous flow-GPM	Pressure Drop-PSI
1"	55	5.3
1 1/2"	120	7.3
2"	160	15

On the installation location:

- A threaded positive displacement meter for water flow will be adequate (depending on the size you choose), but flanged meters allow for easy removal.
- Make sure that you install the meter in the required orientation - most meters require a horizontal position and cannot be installed in a vertical run. Mechanical disc meters can be mounted in vertical runs, but flow must be in the up direction.
- Be sure to allow enough space between fittings (elbows) for the meter, typically 10 pipe diameters upstream, and 5 pipe diameters downstream. Some meter manufactures have noted that improper installation that causes air bubbling from turbulence can create as much as 300 to 400% error, depending on the meter. Wastewater mag meters require less straight run (2 diameters upstream and 1 diameter downstream), check the meter manufacturer data.
- Wastewater meters must be after screening and at a point in the system where process water, including any process water generated from outdoor processing areas, discharges from the winery but before treatment in a pond, land application area, or subsurface disposal system.
- On SDS systems (subsurface disposal systems) the preferred location is at the pump discharge of the last sump.
- Place the meter in a piping location that will always be full of water.
- Place the meter in a location that is easily accessible to read, or if you are going to wireless, allow for proper power, conduit, wiring and assure communication links.

Meter cost:

- The cost of the water meter will range from \$240 for a 1" meter to \$700 for a 2" meter (not including installation). Be careful about reducing the meter size to decrease costs as it may increase pressure loss.
- Magmeters range in price from \$1000 to \$6000, based on pipe size, connection, and readout features. Be sure to consider power and communication needs
- Pressure losses can range from 3 to 5 PSI (not magmeters) or more depending on the flows and meter size.

Some water meter vendors in the Napa area:

Pace Supply

10 Enterprise Court
Napa, CA
707-252-9345

Wyatt Irrigation

4407 Solano Avenue
Napa, CA
707-251-3747

R&S Supply

91 Sheehy Court
Napa, CA
707-252-6969

Doshier Gregson

5365 Broadway St
American Canyon, CA
707- 226-9698

Oakville Pump Service

7855 St. Helena Hwy 29
Oakville, CA
707- 944-2471

Imboden Pump Service

1030 Pueblo Ave.
Napa, CA
707-252-6493

Wastewater meter vendors in the Napa area:

Heritage Systems

2471 Solano Ave.
Napa, CA
707-258-0553