

**LITTLE BLUE NATURAL RESOURCES DISTRICT**  
**DISTRICT APPROVED FLOW METERS**

The water user shall select the proper size, pressure rating, and operating range (minimum and maximum GPM) for his or her water flow meter installation and properly install the meter in accordance with the Little Blue NRD's requirements and the manufacturer's instructions.

1. All meters shall be warranted to register not less than 98% not more than 102% of the actual volume of water passing the meter for all rates of flow within the meter size's range of flow.
2. The meter shall be equipped with a direct reading rate-of-flow indicator showing instantaneous flow in gallons per minute, or a sweep hand indicator for which rate-of flow can be determined by timing. The meter registry shall have a visual, volume-recording totalizer which shall record in gallons, acre inches, or acre feet.
3. The meter shall be located near the well in such a manner as to measure the entire flow from the well, except when a single meter is installed in such a manner as to measure the combined flow from two or more wells, the meter shall then be installed to measure the combined flow prior to entering the distribution system.
4. The meter must also be installed in such a manner that there shall be a full pipe flow of water at all times while water is being pumped. Full pipe flow can be achieved by elevating a downstream section of pipe, constructing a "gooseneck" in the downstream pipe, or installing a control valve downstream of the meter to create back pressure. If your system is under pressure, you will normally have full pipe flow.
5. Pipe flow is influenced by valves, elbows, check valves or other obstructions or conditions which create turbulent or jetting flow. Minimums of unobstructed straight run of pipe upstream and downstream of the meter installation are needed to correct these flow problems. This straight run of pipe must be sufficient for turbulent water to settle down to smooth flow conditions.
6. There are two types of turbulent flows, jetting and non-jetting. Non-jetting flows occur downstream of turbine pump discharges, pipe elbows, cooling coils, etc. Jetting flows typically occur downstream of check valves but are also developed from pressure regulating valves and other in-pipe restrictions. Use of straightening vanes immediately upstream of a propeller meter (within 5 pipe diameters of the propeller) is recommended, the installation of vanes can be used to lessen the amount of straight pipe required. The piping requirements discussed below are in "pipe diameters"; for example, if the meter is installed in an 8 inch pipe, 10 pipe diameters are 80 inches.

The Little Blue NRD maintains a listing of water flow meters that meet District specifications, this list will be compiled on the basis of manufacturer's specifications provided. This is not an endorsement of the products, because a meter is not on the list does not indicate the meter doesn't meet specifications. If the meter a producer wishes to use is not on this list, please contact the Little Blue NRD. After a review of manufacturer's specifications, any meter which meets Little Blue NRD guidelines may, at the discretion of the District, be added.

## Approved Irrigation Flow Meters

### Mechanical

McCrometer Propeller Flow Meters  
 Geysler Propellor Flow Meters  
 Netafim WT or WST  
 Senninger Flo-Wise Ag Rotor

### Electronic

McCrometer Mag 3000  
 Netafim Octave Ultrasonic  
 SeaMetrics Model AG 2000  
 Siemens Sitrans F Mag 8000  
 Growsmart IM3000 Mag Flowmeter

**The minimum spacing requirements from propeller tip or flow measurement tip for jetting and non-jetting flows are listed below.**

	<b><u>Non Jetting Flow *</u></b>	<b><u>Jetting Flow **</u></b>
<b><u>McCrometer &amp; Geysler</u></b>		
no vanes	10 diameters	20 diameters
with vanes	5 diameters	10 diameters
<p style="font-size: small;">Geysler &amp; McCrometer meter installations all require 2 diameters downstream measured from the back of the propeller.                      Note: McCrometer propeller meters may be installed 1.5 diameters downstream of jetting or non-jetting flows if used with <b>McCrometer FS100 Insertion Flow Conditioner</b>. Geysler propeller meters may be installed 1.5 diameters downstream of jetting or non-jetting flows if used with <b>Geysler Flow Equalizer</b>.</p>		
<b><u>Senninger</u></b>	Jetting or non-jetting flows - 5 diameters upstream, 2 diameters downstream	
<b><u>Netafim</u></b>		
<b>WST</b>	Jetting or non-jetting flows - 5 diameters upstream, 2 diameters downstream	
<b>WT</b>	Jetting or non-jetting flows - 10 diameters upstream, 5 diameters downstream	
<b><u>Siemens</u></b>		
<b><u>SeaMetrics</u></b>	Jetting or non-jetting flows – 2 diameters upstream, 1 diameter downstream	
<b><u>Growsmart</u></b>		
<b><u>McCrometer Mag 3000</u></b>	Jetting or non-jetting flows - 3 diameters upstream, 1 diameter downstream	
<b><u>Netafim Octave</u></b>	Jetting or non-jetting flows – 2 diameters upstream, 2 diameters downstream Install 5 diameters downstream of pump, and 2 diameters downstream of meter	

\* **Non-Jetting Flow** is turbulence associated with turbine discharge heads, pipe elbows, T's , and cooling coils. Non-jetting flow occurs as the flow exits a 45 or 90 degree elbow which causes swirling.

\*\* **Jetting Flow** is turbulence associated with valves, such as swing check valves, chemigation valves, gate valves and butterfly valves. Jetting flow is due to the fact that the clacker or valve flap does not fully swing up out of the water flow.

## Approved Non-Irrigation Flow Meters

The meters that may be used for non-irrigation applications can be of saddle, flanged, or setter type; either pit or surface mounted. They must be capable of handling the flow rates and pressures associated with their application and meet standards for operation as approved by either the American Water Works Association (AWWA) or International Organization for Standardization (ISO). They must be installed as designed by their manufacturer to achieve the standards outlined in numbers 1 thru 6 above.