

HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

METER SPECIFICATIONS AND APPROVED METER LIST MANUAL

Effective September 1, 2011
Revised December 30, 2011



High Plains Underground Water Conservation District No. 1 Meter Specifications and Approved Meter List Manual (Published pursuant to District Rule 5.11)

On July 19, 2011, the High Plains Underground Water Conservation District No. 1 (the "District") adopted amendments to District rules primarily focused on changes to programs necessary to achieve the District's 50/50 Management Goal. A primary element of these amendments was the new requirement for meters and the reporting of annual water use in the District for all non-exempt wells and certain exempt wells, as defined in the rules. This Meter Specifications and Approved Meter List Manual ("Manual") contains, as required by District Rule 5.11(c):

Part One: Water Meter Manufacturer Specifications.

Part Two: Water Meter Installation, Inspection, and Sealing Specifications.

Part Three: Approved Alternate Measuring Methods List.

Part Four: HPWD Approved Meter List.

For convenient reference, Appendix A of this Manual contains relevant provisions from Rule 5 of the District's rules regarding meters.

PART ONE – WATER METER MANUFACTURER SPECIFICATIONS

Meter specifications – Each meter required by the District rules and installed after the effective date of this Manual shall meet the following minimum requirements:

(a) Mechanically driven or electronic water meters with digital or mechanical totalizers are the only meters acceptable.

(b) The water meter shall have a normal operating range sufficient to accurately measure the water flow passing the water meter under normal operating conditions.

(c) Registers with a digital totalizer must not be resettable and must be capable of a maximum reading greater than the maximum expected pumpage for two years of normal operation. The totalizer must be continuously updated to read directly only in acre-feet, acre-inches, or gallons. The totalizer must read in units small enough to measure the annual water use to within the nearest 0.1 percent of the total annual permitted quantity of water (Allowable Production Rate) and must have a dial or counter that can be timed with a stopwatch over not more than a 10-minute period to accurately determine the rate of flow under normal operating conditions.

(d) Battery operated registers must have a minimum two-year life expectancy. Battery operated registers must visibly display when a low battery condition exists at

least one month prior to battery failure so that it can be replaced before the battery is dead.

(e) The water meter must be certified by the manufacturer to register neither less than 98 percent nor more than 102 percent of the actual volume of water passing through the water meter when installed according to the manufacturer's instructions. This requirement shall be met throughout the water meter's normal operating range without further adjustment or calibration.

(f) The installed water meter, when tested by District representatives in accordance with District Rule 5.12, must register to an accuracy of neither less than 90 percent nor more than 110 percent of the actual volume of water passing through the water meter without adjustment or calibration according to the District's water meter flow verification test. For purposes of determining whether grandfathered meters authorized under District Rule 5.13 are fully functioning, the grandfathered meter must register to neither less than 80 percent nor more than 120 percent of the actual volume of water passing through the water meter without adjustment or calibration when tested by District representatives. When replacing a grandfathered meter for any reason, it must be replaced in accordance with this Manual and with a meter from Part Four of this Manual, as required by District Rule 5.13(b).

(g) The manufacturer must certify to the District that the manufacturer has an effective quality assurance program that includes wet testing a random sample of production line water meters with water meter test equipment. Manufacturers requesting inclusion of a meter(s) on the District's approved list must include a copy of the currently adopted quality assurance program, either for a specific meter, or for all meters manufactured, whichever is the case. The District reserves the right to require additional quality assurance measures prior to approving a flow meter.

(h) The manufacturer must certify to the District that the water meter test equipment utilized during quality assurance protocols has been tested annually and found accurate by standards traceable to the National Institute of Standards and Technology (NIST). Meters that are produced outside of the United States must provide documentation upon request that quality assurance protocols adopted by the country of origin are equal to or superior to the NIST standard that applies to the meter under consideration. Documentation of all applicable quality assurance testing required shall be maintained by the manufacturer for a period of at least five years and shall be made available to the District upon request.

(i) For water meters that utilize an impeller/paddle wheel, the impeller/paddle wheel must be at least 50 percent of the inside diameter of the pipe in which the meter is installed.

(j) The water meter shall be designed and constructed so that it will meet the following criteria:

- (1) Maintain the accuracy required by the District;
- (2) Totalizer is protected so that it is impossible to alter the totalizer reading without disassembling the meter or the register;

- (3) Clearly indicate the direction of water flow;
- (4) Clearly indicate the serial number of the water meter;
- (5) Has a register that is sealed from all water sources;
- (6) Has a register that is readable at all times in close proximity to the meter, whether the system is operating or not;
- (7) Able to be physically sealed by an authorized representative of the District to prevent unauthorized manipulation of, tampering with, or removal of the water meter. The District seal will be installed upon District inspection in order to prevent removal or tampering with the meter without first notifying the District.
- (8) Is equipped with a manufacturer-approved measuring chamber through which all water flows. A measuring chamber is a cylindrical chamber in which a water meter is installed that is calibrated to match the measuring element of the water meter and the nominal size of the pipe in which it is installed. There are cases where this measuring chamber is part of the meter while other meters have to be installed with a separate manufacturer-approved measuring chamber.
- (9) If the totalizer is electronically operated, then it must have the ability to retain the values stored in the mechanical or electronic memory if all power, including backup battery power, is removed or lost.
- (10) Meters installed on individual wells must be installed in a way that prevents subtracting from the total flow. One of the following methods must be used when meters are installed on individual wells (not well systems) in order to meet this requirement:
 - (A) The meter shall be equipped with an anti-reversing feature that prevents subtracting from the total flow by reversing the flow, turning the meter backwards, or any other means; or
 - (B) A one way check valve must be installed on the downstream side of the meter to prevent the meter from reversing flow on all installations except pivot risers.

PART TWO – WATER METER INSTALLATION, INSPECTION, AND SEALING SPECIFICATIONS

Different water meters require different installation designs in order for the water meter to operate so that it meets the measurement accuracy required by the District. For example, the length of available upstream and downstream straight pipe relative to the possible locations available for water meter installation may be critical in the determination of which water meters will be appropriate for individual water well designs. All manufacturers of water meters on the Approved Meter List have provided

installation requirements that must be met in order to achieve the measurement accuracy required by the District.

Each water meter installed after the effective date of this Manual shall be installed in accordance with the following:

(a) Each meter must be installed in a manner that meets or exceeds the installation requirements of the manufacturer. These manufacturer installation requirements must be strictly adhered to in order to pass the District's installation inspection.

(b) Once a meter has been installed, the well owner or operator must notify the District in writing, on a form prescribed by the District and available on the District's internet website (www.hpwd.com) or by using the District's database to report the meter installation.

(c) Upon receiving a completed form that a meter has been installed, District staff will inspect the meter installation to ensure that the meter was installed as required by this Manual.

(d) If the meter has been installed as required by this Manual, then the District staff member will seal the meter and/or register with a District seal. Except as provided by Subsection (i) below, if the District staff member determines that the meter has not been installed in accordance with this Manual, the District staff member must inform the owner or operator of the defective installation and allow the owner or operator the opportunity to cure the defect while the District staff member is on-site, if possible. If the defective installation cannot be cured while the District staff member is on-site, the owner or operator must cure the defect and must notify the District in writing in accordance with Part Two (b) at such time that the owner or operator is ready for the District to return to inspect and seal the meter.

(e) When selecting a water meter for existing wells or well systems, the person installing the meter should take into account the following information in order to achieve the manufacturer's installation specifications:

- (1) Length of straight pipe upstream and downstream of the water meter;
- (2) The need for straightening vanes;
- (3) The need for flow conditioners;

(4) Special devices that have historically been installed at the water well. Devices like "squeeze valves", "ball valves", or "gate valves" usually cause very high turbulence and must always be installed downstream of the water meter if they are used to reduce flow unless an additional device is used to specifically eliminate the adverse flow conditions. If these devices are used solely to completely turn flow off or on, they may be used in an upstream location.

(5) Water meter and the associated upstream and downstream pipe shall be sized and installed so that full pipe flow (no air) will be maintained through the water meter and so that water velocity in the measuring chamber will be within the normal operating range of the water meter at all times while water is being produced. It is highly recommended that an automatic air relief valve be installed according to the manufacturer's recommendation upstream from the water meter

to eliminate any air that is in the pipe. A “bump pipe” or similar device may be needed downstream to insure a full pipe flow during low flow conditions.

(f) For newly drilled wells completed after September 1, 2011, the water from this well must be measured through a water meter at the well or through a water meter at the system where the flow will pass through. When a meter is installed in a normal horizontal configuration, the water meter shall be installed on a straight pipe that is at least 20 pipe diameters in length. The placement of the meter shall have at least 15 pipe diameters of straight pipe upstream of the meter and at least 5 pipe diameters of straight pipe downstream of the installed water meter (see Figure 1 below). If a meter is installed in a vertical configuration at the well head, there shall be at least 20 pipe diameters of straight pipe downstream of the installed water meter. The straight pipe for vertical configuration shall have no obstruction to flow. The requirement for a certain number of pipe diameters upstream/downstream of the installed water meter will allow the portable water meters used by the District to accurately test an installed water meter. Table 1 below gives the conversion values for various pipe sizes.

Table 1 – Dimensions of straight pipe required for meter installations on new wells based on pipe diameter.

Straight pipe diameter (inches)	Total straight pipe length for combined upstream + downstream of water meter (inches)*	Total straight pipe length upstream of water meter (inches)
2	40	30
4	80	60
6	120	90
8	160	120
10	200	150
12	240	180

*-Straight pipe lengths listed do not include the length of installed water meter.

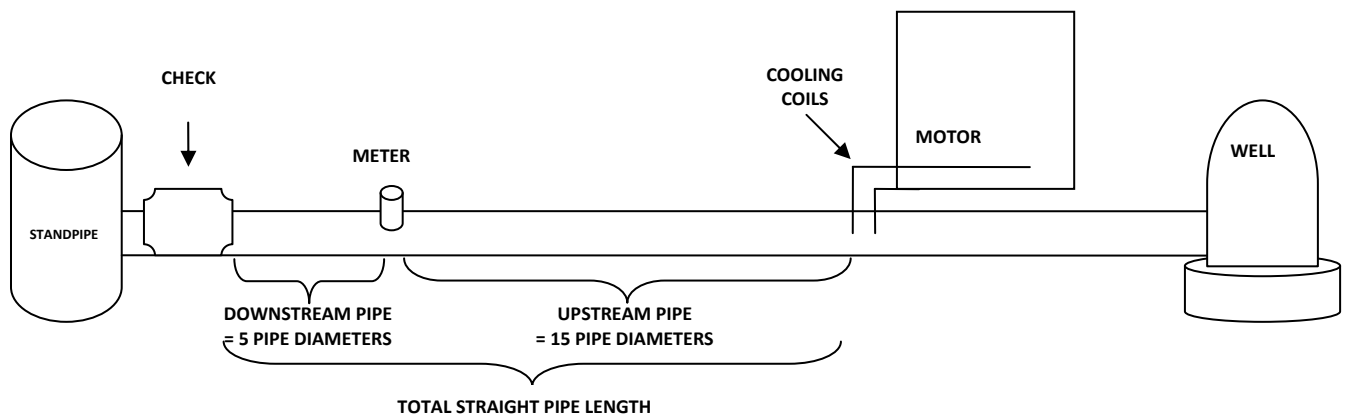


Figure 1 - Schematic illustration of water meter installation requirements for wells completed after September 1, 2011. As noted above, water meters are to be installed a minimum of 15 pipe diameters downstream from the beginning or upstream starting point of the straight pipe.

(g) On wells completed before September 1, 2011, and in instances where compliance with Part Two (f) is not economically feasible, the water meter will be installed according to the manufacturer's requirements with the following additional provisions. Immediately downstream of the manufacturer's downstream pipe diameter requirements, a tee must be installed with a shutoff valve (gate valve, squeeze valve) with a 10 inch long piece of IPS steel pipe (see Figure 2). The pipe on the tee must be a new 2, 3, 4, or 6 inch diameter IPS pipe. The pipe on the tee must not have a diameter larger than the existing pipe on the installation thru which water flows, must not be 2 inches smaller than existing pipe on the installation, and must be installed in a horizontal position on an above ground installation, or a vertical position on an underground position that is easily accessible for District access. The installation must also have a functional shutoff valve installed downstream of the tee. The two shutoff valves and the pipe on the tee must be maintained in order to allow the District to insert a meter on the pipe on the tee to conduct flow test.

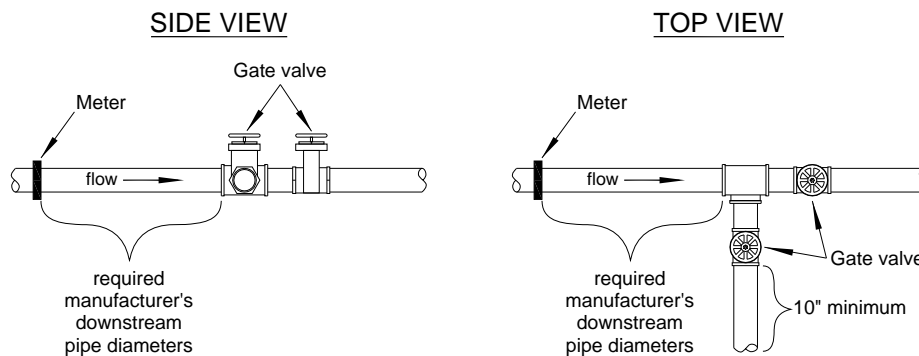


Figure 2 - Schematic illustration of water meter installation requirements in wells completed prior to September 1, 2011, where upstream and downstream pipe diameter requirements stated in Part Two (f) are not economically feasible .

(h) In no instance shall a meter be installed where the installation requirements cannot be met.

(i) Water meters installed on well systems shall be installed according to Subsection (f) above or the manufacturer's installation requirements for metering aggregated withdrawal. A meter installed to record aggregate production from a well system must be installed so as to measure the total groundwater production from all wells included in the well system.

(j) General Manager exemption under District Rule 5.11(d) - The District recognizes that there will be instances where wells completed prior to September 1, 2011 may have been completed in a way where no water meter available can be installed to meet the District's requirements, including the District requirement in Part

Two (g) of this Manual. In these situations, the owner/operator may request an exemption from the General Manager. To apply for such approval, the owner/operator shall submit a completed application form provided by the District and must include all requested information, including but not limited to a schematic of the current well completion design and the proposed make and model of the water meter to be installed.

(k) All new wells and replacement wells for which electronic water meters have been installed shall have all chemigation insertion points installed downstream of the water meter. Manufacturer installation specifications for electronic water meters vary with respect to proper insertion of chemigation equipment. Manufacturer installation specifications shall be followed on all new and replacement wells. For existing wells, if possible, the chemigation insertion point should be installed downstream of the water meter. If the chemigation is shown to cause the water meter to be out of the required accuracy, the water meter or the chemigation equipment will have to be moved or a meter has to be installed that is not affected by chemigation treatments.

(l) District Rule 5.15 provides guidance regarding the removal and subsequent replacement of a District seal to repair or replace a meter or meter components.

PART THREE – APPROVED ALTERNATE MEASURING METHODS LIST

District Rule 5.11(c) requires the General Manager to develop a list of alternate measuring methods that may be used for existing wells in lieu of water meters during the transitional period from January 1, 2012, to December 31, 2015. These methods are predicated on the assumption that the well is not pumping air and that the well flow is not restricted by a squeeze valve that is causing addition lifting pressure. Three methods have been selected for use by producers with existing wells in the District and are described in detail below.

(a) The three alternate measuring methods approved by the District include the following:

- (1) natural gas consumption;
- (2) electricity consumption; and
- (3) nozzle packages and hour-meter readings on center pivots.

(b) The conversion of both natural gas and electric consumption to reflect water usage is impacted, in part, by the amount of lift that occurs in pumping the water to land surface. In order to compensate for the significant range in pumping lifts that occurs throughout the District, county-specific conversion factors have been developed for both natural gas and electric consumption as illustrated in Tables 2 and 3 below.

(c) Natural gas consumption - The following requirements apply to the use of natural gas consumption as an alternate measuring method:

- (1) The well owner or operator shall calculate the total natural gas use for the year for each well, each property using multiple natural gas meters, or the combined total fuel use where only one meter from the energy supplier is used for billing.

(2) The monthly use amounts must be converted to MCF (1,000 cubic feet) if the billing units are in MMBTU (divide the monthly MMBTU use by the BTU Factor to convert).

(3) The monthly use amounts must be added together and the total yearly MCF amount shall be divided by the appropriate conversion factor for the county in which the well is located to calculate water use. The conversion number for MCF to acre-inches is provided in Table 2 below.

(4) The well owner or operator must provide all required information on the production reporting form provided by the District. The District encourages the submission of these reports using the District's online reporting process, but those owners or operators that cannot submit reports electronically may do so by fax, email, or mail. The well owner is responsible for maintaining and providing, upon request, all supporting documentation. Information required for annual water use reports that include measurement of water withdrawal based on natural gas consumption will include, but may not be limited to:

- (A) Name of the energy supplier,
- (B) Gas meter serial number,
- (C) Monthly usage,
- (D) Gas meter's unit of measure (MCF or MMBTU), and
- (E) The BTU factor when applicable.

(5) The calculation for converting natural gas use to water use is accomplished by dividing the total natural gas use, in MCF, by the conversion factor listed in Table 2 below, based on the county within which the well is located.

Table 2 – Conversion factor by county for natural gas use, in MCF, for the District.

County	Conversion factor for natural gas
	<p>To determine water use in acre-inches based on natural gas use, divide total natural gas usage (MCF) by appropriate conversion factor listed below</p> <p><i>Example: In Armstrong County, if natural gas use is 100 MCF, then water use is calculated as follows:</i></p> <p>100 MCF / 0.56 = 178.6 acre-inches</p>
Armstrong	0.56
Bailey	0.53
Castro	0.88
Cochran	0.61
Crosby	0.84
Deaf Smith	0.88

Floyd	0.84
Hale	0.88
Hockley	0.57
Lamb	0.67
Lubbock	0.52
Lynn	0.32
Parmer	0.96
Potter	0.90
Randall	0.67
Swisher	0.60

(d) Electricity consumption – The following requirements apply to the use of electricity consumption as an alternate measuring method:

(1) The well owner or operator shall provide the total electric consumption for the year for each well, each property using multiple electric meters or the combined total electric consumption where only one meter from the power supplier is used for billing.

(2) The monthly use amounts will be added together and the total yearly KWH's used shall be divided by the appropriate conversion factor for the county in which the well is located (conversion number for KWH to acre inches included in Table 3 below) to calculate water use.

(3) The well owner or operator must provide all required information on the production reporting form provided by the District. The District encourages the submission of these reports using the District's online reporting process, but those owners or operators that cannot submit reports electronically may do so by fax, email, or mail. The well owner or operator is responsible for maintaining and providing, upon request, all supporting documentation. Information required for annual water use reports that include measurement of water withdrawal based on electricity consumption will include, but may not be limited to:

(A) Name of the energy supplier,

(B) Electric meter serial number,

(C) Monthly usage,

(D) The calculation for converting electric use to water use is accomplished by dividing the total electric use, in KWH, by the multiplier listed in Table 3 below, based on the county within which the well is located.

Table 3 – Conversion factor by county for electric use, in KWH, for the District.

County	Conversion factor for electricity To determine water use in acre-inches based on electricity use, divide total electricity usage (KWH) by appropriate conversion factor listed below. Example: In Armstrong County, if electricity use is 100 KWH, the water use is calculated as follows: 100 KWH / 35 = 2.8 acre-inches.
Armstrong	35
Bailey	33
Castro	64
Cochran	38
Crosby	61
Deaf Smith	55
Floyd	62
Hale	56
Hockley	36
Lamb	42
Lubbock	33
Lynn	20
Parmer	70
Potter	56
Randall	42
Swisher	38

(e) Combined nozzle packages and hour-meter readings on center pivots -- The use of combined nozzle packages and hour-meter readings on center pivots utilizes the manufacturer's or another current properly functioning nozzle package specification installed on the center pivot system and the operation hours to record the total annual production for wells located on a property where the center pivot is the only method used to irrigate, and water from the well(s) is not used elsewhere. To use this method, the well owner or operator must meet the following requirements:

- (1) The center pivot system must be equipped with an hour meter installed at the control module or an integral part of the control module of the system;
- (2) The hour meter must be installed so that the hours of operation are continually recorded when the system is in operation with flow;
- (3) The hour meter must be installed in accordance with the manufacturer's specification, with a rated accuracy of plus or minus two percent

of actual time for which the meter is recording operation hours, and with a register that reports up to 99,999 hours of continuous operation;

(4) The well owner or operator must provide all required information on the production reporting form provided by the District. The District encourages the submission of these reports using the District's online reporting process, but those owners or operators that cannot submit reports electronically may do so by fax, email, or mail. The well owner or operator is responsible for maintaining and providing, upon request, all supporting documentation, such as a copy of the third party monitoring system's printout (e.g. PivoTrac report). Prior to the utilization of a third party, the third party must provide documentation to demonstrate to the General Manager that the monitoring equipment will dependably record and report accurately before the third party's reports will be allowed; and

(5) In the event the nozzle package is changed during the year, the well owner or operator must differentiate between the hours of use for each well package used.

PART FOUR – APPROVED METER LIST

All meters installed on wells on or after September 1, 2011 must be from the District's Approved Meter List. A full review and update of the Approved Meter List will occur no later than September 1 of each year. Any manufacturer or distributor of meters or any other person may submit one or more meters for consideration by the District, along with supporting information demonstrating its compliance with the specifications in this Manual, at any time for consideration to be included in this list at its next periodic update. Any meter may be removed from the Approved Meter List at any time for durability or accuracy deficiencies without notice, but such removal will not affect the compliance of any well owner or operator that has installed such a meter prior to removal. It is understood that a meter may be in local inventory from the Approved Meter List but it may be removed from the Approved Meter List. A meter that is on the Approved Meter List, but is later removed from the Approved Meter List can be installed within 90 days of the meter being removed from the Approved Meter List. Installation of a meter under these circumstances meets the requirement that a meter be installed from the Approved Meter List. A meter purchased by the well owner or operator before the date a meter is removed from the Approved Meter List may be installed after the date the meter is removed from the Approved Meter List.



HPWD APPROVED WATER FLOW METERS September 1, 2011



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All water meters listed below have been certified by the manufacturer to meet the requirements of the HPWD Meter Specifications and Approved Meter List Manual. Each meter shall be installed in a manner that meets or exceeds the installation requirements of the manufacturer. These manufacturer installation requirements must be strictly adhered to in order to pass the District's installation inspection. The installation inspection and sealing of the meter installed is required in accordance with District Rule 5.12(a). Any meter may be removed from the approved water meter list at any time for durability or accuracy deficiencies without notice, but such removal will not affect the compliance of any well owner or operator that has installed such a meter prior to removal from the Approved Meter List.

Certain meters listed below have special installation requirements so that the meter can be installed according to the District's Meter Specifications and Approved Meter List Manual. All meters with special installation requirements must be installed in accordance with the special installation requirements in order to be properly installed. Please be sure to review whether the meter you intend to install contains any special installation requirements, as listed under the "Special Requirements" column in the tables below. It is important to understand that any meter installed on an individual well (not well system) that does not have anti-reversing capabilities must have a one way check valve installed immediately downstream of the meter to prevent subtracting flow. The legend for meaning and requirements of the special conditions is as follows:

Please contact the manufacturer for a dealer in your area. The HPWD does not sell, install, or endorse any specific flow meter(s).

Bermad Inc.		
Model Number	Type and Size	Special Requirements (If any)
Turbo-Bar	Turbine, Magnetic drive 2"-20" flanged end	
900 Series	Turbine, Magnetic drive 1 1/2" – 10" flanged or MPT	

<u>Geyser</u>		
Model Number	Type and Size	Special Requirements (If any)
FT-0312	Propeller 3" to 12" Flanged end flow tube	With AF register only
ST-0612	Propeller type saddle meter, 3" to 12"	With AF register only. See Special Requirement No. 1 below
<p>Geyser Special Requirements: Special Requirement No. 1: In order to operate as certified by the manufacturer, these models require a flow tube manufactured by Geyser or those that have been identified by Geyser. Those that have been identified as meeting or exceeding Geyser's standards for flow tubes are Fresno Valves, Inc. The vertical risers on the following pivots for Valmont Industries, Lindsay Manufacturing, Reinke Manufacturing, Pierce Corporation, Universal Irrigation, T-L Irrigation are also recognized by Geyser as an approved flow tube provided they have straightening vanes supplied by Geyser or those that have been identified by Geyser. All tubes will be identified with an OD/ID sticker stating it meets our standards.</p>		

<u>Master Meter</u>		
Model Number	Type and Size	Special Requirements (If any)
MMT Turbine	Turbine 2" – 8" flanged end	
Octave	Ultrasonic 2" – 8" flanged end	
BLMJ	Multijet 5/8, 3/4, 1" MPT ends	
Dual Body Compound	Compound 2" – 6" flanged end	

<u>McCrometer</u>		
Model Number	Type and Size	Special Requirements (If any)
M0/MD300	Propeller 4" to 16" Bolt on saddle type	See Special Requirement No. 2 below
MF100	Propeller 2" to 12" Flanged end flow tube	
MG/MS100	Propeller 3" to 24" Grooved & smooth-end flow tube	
ML100	Propeller 6" to 12" Flanged end flow tube	
MO1400	Propeller 18" to 36" Bolt on saddle type	See Special Requirement No. 2 below
MT100	Propeller 2" to 6" Threaded end flow tube	
MW/MG/MT900	Propeller 2" to 24" Grooved & smooth-end flow tube	
MW500/MZ500	Propeller 2" to 24" Flanged end flow tube w/integrated straightening vanes	
MW600	Propeller 4" to 48" Weld-on saddle type	See Special Requirement No. 2 below
MW800/MM800	Propeller 3" to 24" Flanged end right angle flow tube	
QW/QZ500	Propeller 2" to 24" Flanged end flow tube	
<p>McCrometer Special Requirements: Special Requirement No. 2: In order to operate as certified by the manufacturer, these models require a flow tube manufacturer by McCrometer Great Plains or those that have been identified by McCrometer Great Plains. Those that have been identified as meeting or exceeding McCrometer Great Plains standards for flow tubes are the vertical risers on the following pivot manufacturers. Valmont Industries, Lindsay Manufacturing, Reinke Manufacturing, Pierce Corporation, Universal Irrigation, T-L Irrigation provided they have straightening vanes supplied by McCrometer Great Plains. All tubes will be identified with an OD/ID sticker stating it meets our standards.</p>		

<u>Mueller</u>		
Model Number	Type and Size	Special Requirements (If any)
400 series IIS	Magnetic drive positive displacement 5/8 - 3/4 - 1" threaded end	
420- series IIS	Magnetic drive positive displacement 5/8 x 1/2 and 5/8 x 3/4 threaded end	
500 series DI	Magnetic drive positive displacement 1"1/2- 2" flanged end	
500 Series IIS	Magnetic drive positive displacement 1"1/2- 2" flanged end	
FM3	Fire service without bypass 3" to 10" flanged end	
Horizon	Horizontal turbine 1"1/2 and 2" flanged end	
MVR	Magnetic drive vertical turbine 3/4 to 6" flanged end/threaded end	

<u>Neptune</u>		
Model Number	Type and Size	Special Requirements (If any)
HP Fire Service	Turbine fire service 3"-10" flanged end	
HP Turbine	Magnetic drive Turbine meter 1"-20" flanged end	
Protectus III	Turbine fire service 4"-10" flanged end	
T-10	Magnetic drive positive displacement 5/8- 2" flanged end/threaded end	
T-10 Double check	Magnetic drive positive displacement backflow 5/8" threaded end	
Tru/Flo Compound	Compound 2"-8" flanged end	
TRU/MAG	Electromagnetic 4"-10" flanged end	

<u>Netafim</u>		
Model Number	Type and Size	Special Requirements (If any)
Octave	Ultrasonic 2"to 8" flanged end	
WT-SM	6", 10", 12" Saddle meter (not 8")	See Special Requirement No. 3 below
WST	Impeller, 3", 4", 6", 8"	
<p>Netafim Special Requirements: Special Requirement No. 3– In order to operate as certified by the manufacturer, these models require a flow tube to be used on all non-pivot stand installations. The manufacturer’s upstream and downstream pipe requirements must be new pipe that will be used to calibrate the meter. All tubes will be identified with an OD/ID sticker stating it meets our standards.</p>		

<u>Seametrics</u>		
Model Number	Type and Size	Special Requirements (If any)
AG2000	Electromagnetic 4"-10" flanged end	
AG702	Electromagnetic 6"and 8" Tube type plain end	
WMP 10x	Electromagnetic 1"and 2" NPTF ends	

Senninger

Model Number	Type and Size	Special Requirements (If any)
AG ROTOR GF/6-3000-5-SI	Rotor Blade 6" to 10"	See Special Requirement No. 4 below
Senninger Special Requirements: Special Requirement No. 4 – In order to operate as certified by the manufacturer, these models require a flow tube to be used on all non-pivot stand installations. The manufacturer's upstream and downstream pipe requirements must be new pipe that will be used to calibrate the meter. All tubes will be identified with an OD/ID sticker stating it meets our standards.		

Siemens

Model Number	Type and Size	Special Requirements (If any)
MAG 8000	Electromagnetic, 2" – 24" flanged end	

Water Specialties

Model Number	Type and Size	Special Requirements (If any)
LP03	Propeller 4" to 16" plain strap on saddle tube w/integrated straightening vanes	
LP04-D	Propeller 4" to 16" flanged, strap on saddle tube w/integrated straightening vanes	
LP11	Propeller 4" to 12" PE , strap on saddle tube w/integrated straightening vanes	
LP31	Propeller 4" to 20" Bolt on saddle type	
ML03	Propeller 2" to 48" Flanged end flow tube w/integrated straightening vanes	
ML04	Propeller 2" to 48" Flanged end flow tube w/integrated straightening vanes	
ML07	Propeller 2" to 48" Flanged end flow tube w/integrated straightening vanes	
ML11	Propeller 3" to 48" plain end flow tube w/integrated straightening vanes	
ML12	Propeller 3" to 48" plain end flow tube w/integrated straightening vanes	
VF29	Propeller 4" to 20" Flanged end vertical upflow tee tube	

APPENDIX A

Relevant Provisions from District Rule 5, Subchapter C, Regarding Meters

RULE 5 – SUBCHAPTER C: METERING AND REPORTING REQUIREMENTS

5.11 Metering Requirements; Ability for Existing Wells to Use Alternate Measuring Method Until 2016.

(a) Existing wells: Beginning on January 1, 2012, all existing wells or well systems that are required to be metered must begin recording the use of groundwater through a meter or through the use of an alternate measuring method. All existing wells or well systems that are required to be metered must be equipped with a fully functioning meter that meets the requirements of these rules no later than January 1, 2016.

(b) New wells: Beginning on January 1, 2012, all new wells or well systems that are required to be metered shall be equipped with a fully functioning meter before producing groundwater from the well or well system.

(c) The General Manager shall develop and publish a list of approved alternate measuring methods and shall develop and publish meter specifications that shall include a list of approved meters on the District's internet website no later than September 1, 2011. The Board shall review and approve the list of alternate measuring methods and the meter specifications developed and published by the General Manager.

(d) An owner or operator may apply to the District for approval of any alternate measuring method or additional meters not included in the list developed by the General Manager. The General Manager shall approve or deny such applications. Appeals of a denial by the General Manager may be made to the Board on written request. In no event may an owner or operator of an existing well or well system operate the well on or after January 1, 2012, without either installing a fully functional meter that meets the requirements of these rules or implementing an approved alternate measuring method for the well or well system, regardless of whether a request for approval or appeal is pending before the General Manager or District. In no event may an owner or operator of a new well or well system operate the well on or after January 1, 2012, without installing a fully functioning meter that meets the requirements of these rules, regardless of whether a request for approval or appeal is pending before the General Manager or District.

(e) Replacement wells are considered to be new wells for purposes of the metering requirements of these rules.

5.12 Meter Installation and Sealing

(a) Each approved meter shall be installed, operated, maintained, and repaired in accordance with the General Manager's meter specifications. All owners or operators of wells or well systems shall notify the District in writing on a form prescribed by the District that a meter has been installed on the well or well system. Upon notification, District staff shall inspect the meter installation to

ensure that the meter was installed in accordance with the District's meter specifications and shall seal the meter. All well owners or operators shall notify the District in writing on a form prescribed by the District prior to removing the seal.

(b) No person may tamper with any meter or seal installed, or that is required to be installed, on any well or well system within the District's boundaries.

(c) The owner or operator of a well is responsible for the purchase, installation, operation, maintenance, and repair of the meter associated with the well or well system.

(d) Bypasses are prohibited unless they are also metered.

(e) Meter readings shall be recorded and groundwater production reported as required under Rule 5.17.

5.13 Grandfathering of Existing Meters

(a) Wells or well systems that are equipped with fully functioning meters as of the date the District's approved meter list is published are hereby grandfathered, and are recognized by the District as being equipped with meters in compliance with these rules for as long as the grandfathered meters remain fully functional. Owners or operators wells or well systems that are equipped with meters as of the effective date of these rules shall follow the Allowable Production Rate and reporting requirements of these rules.

(b) In the event a well or well system equipped with a meter that has been grandfathered under Subsection (a) of this rule is replaced under Rule 4.4 or requires the installation of a new meter, the well or well system shall be equipped with a new meter in accordance with the General Manager's meter specifications and shall be from the District's list of approved meters as set forth in Rule 5.11.

5.14 Metering Aggregate Withdrawal

(a) Where wells are part of a well system, one or more water meters may be used for the well system if the water meter or meters are installed so as to measure the total groundwater production from all wells included in the system with no non-metered production. The provisions of Rule 5.12 apply to meters measuring aggregate pumpage from well systems.

(b) Owners or operators of all new wells or replacement wells that are required to be metered and that are drilled to operate as part of a well system shall meter the well system in accordance with Subsection (a) of this rule before producing from the new well or the replacement well and shall report production from the entire well system upon operation of the new well or replacement well as required under this rule.

5.15 Removal of Meter for Repairs

A seal on a meter may be removed for meter repairs and the well or well system may be operated provided that the District is notified prior to removal of the seal and all

necessary repairs are completed in a timely manner. The readings on the meter must be recorded immediately prior to removal and at the time of reinstallation of the seal by the District. The record of pumpage must include an estimate of the amount of groundwater withdrawn during the period the meter was not installed and operating. Upon completion of the meter repairs, the District shall be notified and District staff shall inspect the re-installation of the meter and re-install the seal.

5.16 Enforcement

It is a major violation of these Rules to fail to record and report groundwater production through a meter or alternate metering method in accordance with these rules. After a well or well system is determined to be in violation of these rules for failure to meter, use an alternative measuring method, or maintain and report meter readings, all enforcement mechanisms provided by law and these rules shall be available to prevent unauthorized use of the well or well system and may be initiated by the General Manager without further authorization from the Board.

5.17 Production Reports

(a) Beginning on January 1, 2012, all owners or operators of wells or well systems that are required to be metered under Rule 5.10 shall begin recording groundwater production through the use of a fully functional meter that meets the requirements of these rules or through the use of an approved alternate measuring method for the well or well system.

(b) All owners or operators of wells or wells systems that are required to be metered must submit annual production reports to the District. All production reports submitted to the District shall include the following information: (1) the total amount of groundwater produced from the well or well system for the previous calendar year; (2) the number of Contiguous Acres owned or controlled for the right to produce groundwater from the well or well system and whether the number of Contiguous Acres has changed from the last production report submitted to the District; (3) the deeds, easements, contracts, leases or other conveyance documents necessary to show proof that the well owner or operator has the right to produce groundwater from the number of Contiguous Acres claimed under Subsection (b)(2) of this rule, if such documentation has not already been submitted to the District; and (4) all other information requested by the District in the reporting form and mechanism described under Subsection (c). For purposes of meeting the requirement in Subsection (b)(3) of this rule, a person may submit a United States Department of Agriculture Farm Services Agency Form 578 showing proof of ownership of property claimed to be Contiguous Acres.

(c) Production reports shall be submitted through a mechanism developed by the District for submission through the District's internet website. If an owner or operator is unable to submit the report through use of the District's internet website, the report may be submitted by fax, regular mail, or electronic mail. The report shall be submitted using a form developed by the District for such purpose. The District shall make the form available in the District office and on the District website.

(d) Meter readings or readings from alternate measuring methods for annual

water use must be recorded during the period ranging from December 15 to January 15 of each year and shall be included in the production report submitted to the District. Production reports for the previous calendar year's annual water use must be submitted to the District no later than March 1 of each calendar year. Therefore, the first annual production report required under this rule is for production during calendar year 2012 and must be submitted to the District no later than March 1, 2013.