

Final Draft

EAST NILES COMMUNITY SERVICES DISTRICT WATER SYSTEM CONNECTION FEE STUDY

Prepared By:

AECOM

5001 E. Commercenter Drive, Suite 100
Bakersfield, California 93309

Project No. 60701779

May 2024

Monique Roberts

Monique Roberts, P.E.



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EAST NILES COMMUNITY SERVICES DISTRICT
WATER SYSTEM CONNECTION FEE STUDY

The East Niles Community Services District (ENCSD or District) authorized AECOM to evaluate the District’s current water system connection fees and prepare the following report to address the basis for a revised connection fee for water facilities. The connection fee calculations in this evaluation are based on cost estimates of the improvements necessary to serve proposed new development within the District’s Sphere of Influence. Revenues from connection fees are used to pay the costs of the system improvements required to serve future development. State law precludes the use of such revenues to pay for any portion of operation and maintenance expenses.

Existing Water System Connection Fees

California Government Code (Section 66013) requires that connection fees “shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed”. The District’s current water system connection fees were established by meter size pursuant to a Water System Connection Fee Study conducted in 2008¹ and are summarized in Table 1:

Table 1
Current Water System Connection Fees

Meter Size	Connection Fee
5/8x3/4-inch	\$5,000
1-inch	\$13,330
1 ½-inch	\$16,670
2-inch	\$33,330
3-inch	\$50,000
4-inch	\$66,670
6-inch	\$166,670
8-inch	\$500,000
12-inch	\$1,100,000

The connection fees shown in Table 1 are in addition to other fees and charges established by the District as a part of their water service application process.

Development of Revised Water System Connection Fees

Providing water service to customers within proposed new developments requires the District to have adequate water supply, treatment, transmission, booster pumping, and storage facilities available to meet the anticipated demands. It is appropriate and necessary for new connections to contribute their fair share of the costs associated with constructing water system facilities to serve these new connections. The development of revised water system connection fees is described in the following sections.

¹ 2008 Water System Connection Fee Study prepared by AECOM.

Identification of Proposed Water System Facility Improvements

The District is in the process of updating its Water Master Plan, with a draft of the ENCSD Water Master Plan prepared by MKN & Associates, Inc (MKN) in June 2022. Included in the draft Water Master Plan are water system design criteria and water demand factors by various land use types. The analysis and identification of proposed water system facility improvements to serve new developments is based on the following assumptions for this Water System Connection Fee Study:

- The 5/8x3/4 inch meter size for connection fees as noted in Table 1 is assumed to represent a single family residential equivalent (SFRE) dwelling unit.
- The average day water demand for single family residential use within the development area is based on the General Urban demand factor of 1.93 gallons per minute (gpm)/acre from the draft Water Master Plan² and an average density of 4 SFRE/acre estimated from single-family residential developments currently under construction in the ENCSD³. The resulting demand factor is 0.48 gpm/SFRE.
- Maximum day water demands are calculated based on a peaking factor of 2.5 times average day demands as estimated using water system records from 2020 through 2022 and the procedures outlined in California Waterworks Standards⁴. The resulting maximum day demands are 4.83 gpm/acre and 1.21 gpm/SFRE.
- Peak hour demands are calculated using a peaking factor of 1.5 times maximum day demands per California Waterworks Standards. The resulting peak hour demands are 7.24 gpm/acre and 1.81 gpm/SFRE.
- Water system facility improvements components are proposed based on meeting the needs of a conceptual single family residential development in the ENCSD Sphere of Influence and serviced by one 5/8x3/4 inch meter per SFRE.

The water facility improvement components identified for the conceptual single family residential development are described below.

Water Well

New groundwater wells within the ENCSD are planned to have a target capacity of 1,400 gpm⁵. However, it is likely that actual well capacities may be closer to 1,200 gpm. The calculation of the SFRE per water well is based on maximum day demands per California Waterworks Standards requirements for water sources. Dividing the estimated 1,200 gpm well capacity by a maximum day demand of 1.21 gpm/SFRE results in a service capacity of approximately 992 SFRE per well. The conceptual service area for this well is approximately 248 acres based on 4 SFRE/acre.

Treatment – TCP and/or Arsenic

Groundwater within the ENCSD has been found to have concentrations of 1,2,3-TCP and Arsenic that exceed the Maximum Contaminant Levels (MCL). Therefore, a component for a treatment system has

² From Table 5-15 in the June 2022 Draft Water Master Plan prepared by MKN.

³ Estimated from Tentative Tract Numbers 6939, 7152, and 7153.

⁴ California Code of Regulations Title 22, Division 4, Chapter 16 – California Waterworks Standards

⁵ From Amendment to Engineering Report (Amendment to Engineering Report) for the ENCSD North Weedpatch Highway Water System Consolidation Project prepared by AECOM in April 2019, Page 8.

been included as a part of the proposed water facility improvements. The calculation of the SFRE for treatment system improvements is based on average day demands since the treatment system would operate off peak and provide water into storage for later use. An average day demand capacity of 1,400 gpm is assumed per treatment system⁶. Dividing the 1,400 gpm capacity by the average day demand of 0.48 gpm/SFRE results in a service capacity of approximately 2,917 SFRE per treatment system. The conceptual service area for the treatment system is approximately 729 acres based on 4 SFRE/acre.

Storage Tank

Storage requirements for the conceptual residential development are based on the storage design criteria presented in the June 2022 draft Water Master Plan which consists of the following:

- Operational storage at 25% of maximum day demand
- Fire storage at 500 gpm for two hours (60,000 gallons)
- Emergency storage at 33% of maximum day demand

The ENCSD has proposed a 2.0 million gallon (MG) storage tank for new development (Shalane Tank). This tank is used as a basis for the determination of storage component for the proposed water system facility improvements. Subtracting the fire flow from the 2.0 MG storage, and assuming the required storage of 58% of maximum day demands (total of emergency and operational storage) at 1.21 gpm/SFRE, the proposed tank could serve approximately 1,920 SFRE⁷. The conceptual service area for the tank is approximately 480 acres based on 4 SFRE/acre.

Booster Pump Station

The service capacity for the booster pump station component of proposed water system facility improvements is based on meeting maximum day demands. A design capacity of 1,500 gpm is assumed for the booster pump station based on preliminary design data for booster pump station as a part of the ENCSD North Weedpatch Highway Water System Consolidation Project. Dividing the 1,500 gpm capacity by the maximum day demand of 1.21 gpm/SFRE results in a service capacity of approximately 1,240 SFRE per booster pump station. The conceptual service area for the booster pump station is approximately 310 acres based on 4 SFRE/acre.

Transmission Pipeline

The service capacity for the transmission pipeline component of water system facility improvements is based on meeting maximum day demands. The pipeline component is intended to represent a capacity acquisition or buy-in to transmission mains. It should be noted that distribution pipelines (i.e., small diameter pipelines within the various developments) are not included in the determination of connection fees since they are typically constructed by developers.

The service capacity is based on a 12-inch diameter pipeline with a maximum velocity of 6 feet/second.⁸ Dividing the pipe capacity of 2,115 gpm by the peak hour demand of 1.81 gpm/SFRE results in a service capacity of approximately 1,169 SFRE per transmission pipeline. The conceptual service area for the transmission pipeline is approximately 292 acres based on 4 SFRE/acre. An

⁶ Design capacity of treatment systems from Amendment to Engineering Report.

⁷ Storage Formula = (2 MG – 0.06 MG Fire Flow) x 1,000,000/(0.58 x 1.21 gpm/SFRE x 1440)

⁸ From June 2022 Draft Master Water Plan prepared by MKN, page 4-4.

approximate length of two miles of transmission pipeline is assumed based on the conceptual pipeline service area of 292 acres. It is assumed that additional funding sources, such as developer funding with reimbursement agreements, will be utilized to construct transmission pipelines to proposed developments that are not located near existing District water system facilities.

The determination of service capacity by number of SFRE for the various water facility improvement components is summarized in Table 2 below.

Table 2
Summary of Service Capacity (No. of SFRE) for
Water Facility Improvement Components

Description	Design Capacity	Design Criteria/Demand Factor	Service Capacity: No. of SFRE
Water Well	1,200 gpm	Maximum Day Demand 1.21 gpm/SFRE	992
Treatment: TCP and/or Arsenic	1,400 gpm	Average Day Demand 0.48 gpm/SFRE	2,917
Storage Tank	2.0 MG	Maximum Day Demand 58% of 1.21 gpm/SFRE ¹ Fire Flow - 500 gpm for 2 hours	1,920
Booster Pump Station	1,500 gpm	Maximum Day Demand 1.21 gpm/SFRE	1,240
12-inch Transmission Pipeline	2,115 gpm ²	Peak Hour Demand 1.81 gpm/SFRE	1,169

1. Based on a 24-hour period.
2. Based on a pipe velocity of 6 feet/second.

Estimated Costs of Proposed Improvements

Conceptual level construction cost opinions developed for proposed ENCSD water system facilities were used to develop estimated costs per future SFRE. The cost opinions for the water well, treatment system, and booster pump station were based on the Cost Opinion in the Amendment to Engineering Report for the North Weedpatch Highway Water System Consolidation Project (North Weedpatch Project) prepared by AECOM in April 2019. The cost opinion for the 2.0 MG storage tank is based on the cost opinions for the Shalane Tank prepared by MKN in April 2022. The cost for 12-inch transmission pipeline is based on an estimated installed pipe cost of \$120/LF from April 2022. Costs are increased based on an inflation rate of 4% per year. Contingencies and soft costs are estimated at 50% of estimated construction costs.

The water component facility cost opinions used in this analysis are summarized in Table 3. The estimated cost for each water system component has been divided by the service capacity in number of SFRE as determined in Table 2 to develop an estimated cost per SFRE. Based on this analysis, the total estimated cost per SFRE is calculated to be approximately \$10,000. For the 5/8x3/4-inch standard residential meter size, this represents an approximate annual increase of 4.4% for the sixteen years since connection fees were last adopted in 2008.

Table 3
Summary of Conceptual Level Construction Cost Opinions
& Calculation of Estimated Cost/SFRE

Water System Component	Construction Cost Opinion	Service Capacity: No. of SFRE ⁶	Estimated Cost/SFRE ⁷
Water Well ¹	\$2,592,700	992	\$2,610
Treatment: TCP or Arsenic ²	\$2,491,100	2,917	\$850
12-inch Transmission Piping ³	\$2,364,300	1,169	\$2,020
2.0 MG Storage Tank ⁴	\$5,121,900	1,926	\$2,670
Booster Pump Station ⁵	\$2,299,500	1,240	\$1,850
TOTAL ESTIMATED COST/SFRE			\$10,000

1. Based on cost opinion for North Weedpatch Project (from Amendment to Engineering Report prepared by AECOM in April 2019) for water well improvements including inflation for 5 years at 4% and contingencies and soft costs at 50%.
2. Based on cost opinion for North Weedpatch Project (from Amendment to Engineering Report prepared by AECOM in April 2019) for Arsenic Treatment including inflation for 5 years at 4% and contingencies and soft costs at 50%.
3. Based on estimated installed pipe cost of \$120/foot for two miles of pipe, mobilization and appurtenances at 15%, inflation for 2 years at 4%, and contingencies and soft costs at 50%.
4. Based on ENCSD cost opinion for Shalane Tank (prepared by MKN in April 2022) excluding transmission pipe and including inflation for 2 years at 4% and contingencies and soft costs at 50%.
5. Based on cost opinion for North Weedpatch Project (from Amendment to Engineering Report prepared by AECOM in April 2019) for booster pump station improvements including inflation for 5 years at 4% and contingencies and soft costs at 50%.
6. Service Capacity No. of SFRE for each water system component per Table 2.
7. Estimated Cost/SFRE for each water system component rounded to nearest \$10.

Calculation of Proposed Water System Connection Fees

Since the previous Water Connection Fee Study was completed in 2008, the District has standardized to the use of Neptune Meters. The ENCSD established its current water rates in its 2017 Cost of Water Service Analysis using meter equivalent ratios, the ratio of the flow capacity of the various meter sizes to the 5/8x3/4 inch standard residential meter, based on performance data prepared by Neptune Meters. Performance data charts for the various meter sizes were used to determine the flow capacity of the meters. The calculation of meter equivalent ratios is summarized in Table 4 and the referenced performance data charts for Neptune Meters is provided in Appendix A.

It is proposed to use the meter equivalent ratios from the 2017 Cost of Water Service Analysis as the basis for determining the proposed connection fees by meter size. It should be noted that there are currently no metered connections larger than 6-inches in the ENCSD. Therefore, an 8-inch meter is the largest size shown in Table 4.

Table 4
Calculation of Meter Equivalent Ratios

Meter Size	Meter Flow Capacity (gpm)	5/8x3/4inch Meter Equivalent Ratio
5/8x3/4 inch	20	1.0
1-inch	50	2.5
1-1/2 inch	100	5.0
2 inch	160	8.0
3 inch	450	22.5
4 inch	900	45.0
6 inch	2000	100.0
8 inch	4000	200.0

The estimated cost per SFRE of \$10,000 calculated in Table 3 is proposed as the connection fee for a 5/8x3/4-inch standard residential meter size. The proposed water system connection fees by meter size based on the meter equivalent ratios from Table 4 are presented in Table 5.

Table 5
Proposed Water System Connection Fees

Meter Size	Connection Fee
5/8x3/4-inch	\$10,000
1-inch	\$25,000
1 ½-inch	\$50,000
2-inch	\$80,000
3-inch	\$225,000
4-inch	\$450,000
6-inch	\$1,000,000
8-inch	\$2,000,000

Recommendations

It is recommended that Water System Connection Fees be adopted for Fiscal Year 2024-25 as proposed in Table 5 with an annual adjustment for inflation in accordance with the Consumer Price Index (CPI) for All Items generated by the United States Department of Labor, Bureau of Labor Statistics for April of each subsequent fiscal year.

It is further recommended that the District periodically review its Water System Connection Fees so that they may be adjusted as necessary based on the expected costs to provide water service to new development at that time.

Appendix A

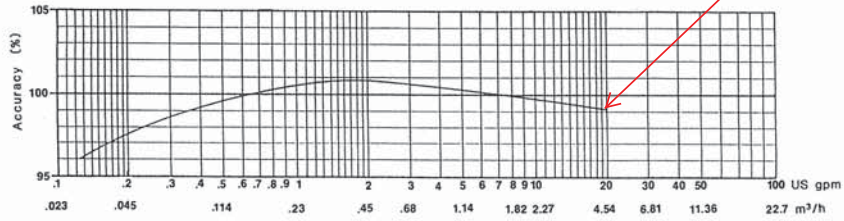
Neptune Meter Capacity Charts

T-10 Meter

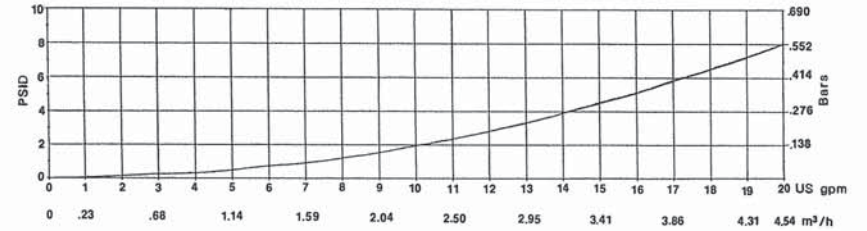
Sizes: 5/8", 3/4", and 1"

5/8" x 3/4" capacity = 20 gpm

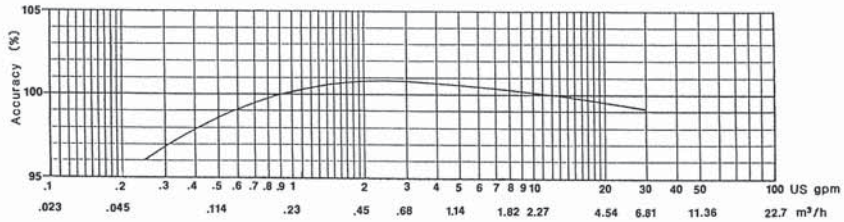
5/8" Accuracy



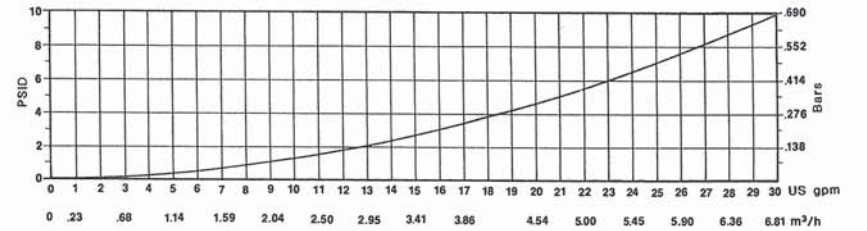
5/8" Pressure Loss



3/4" Accuracy

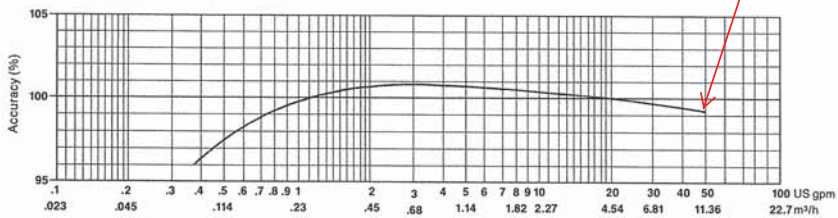


3/4" Pressure Loss

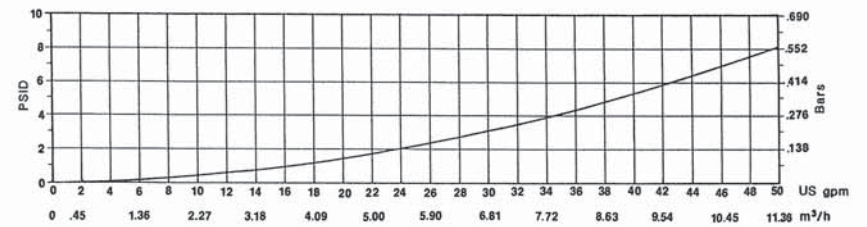


1" Accuracy

1" capacity = 50 gpm



1" Pressure Loss

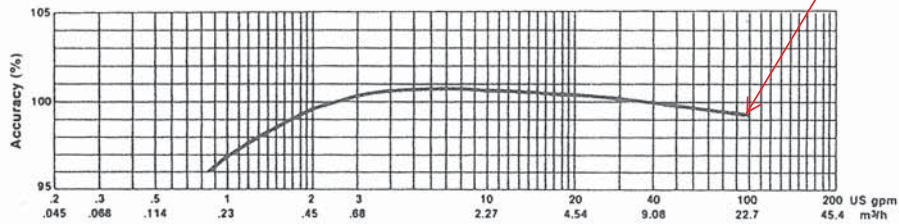


These charts show typical meter performance. Individual results may vary.

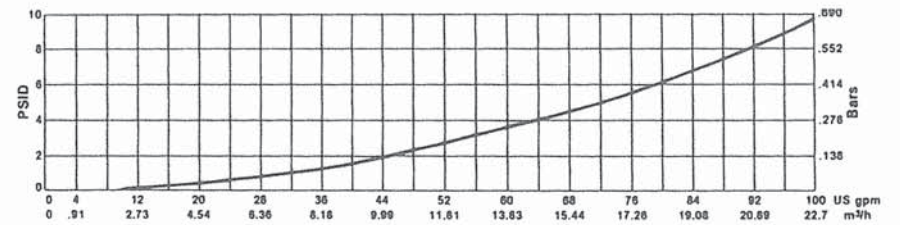
T-10 Meter

Sizes: 1 1/2" and 2"

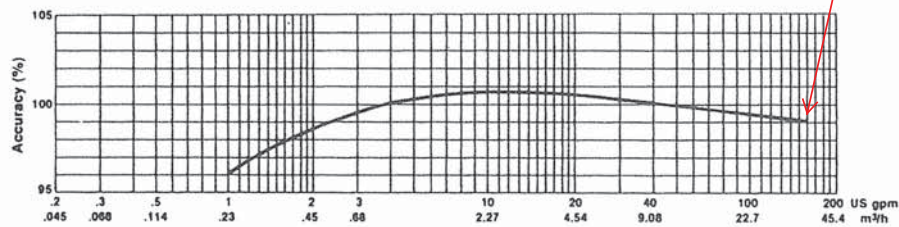
1 1/2" Accuracy



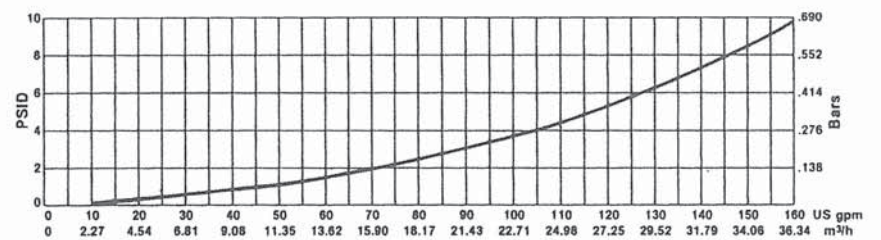
1 1/2" Pressure Loss



2" Accuracy



2" Pressure Loss



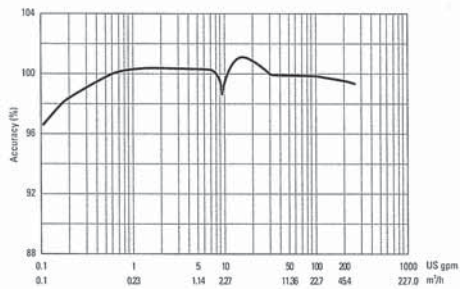
These charts show typical meter performance. Individual results may vary.

TRU/FLO® Compound Meter

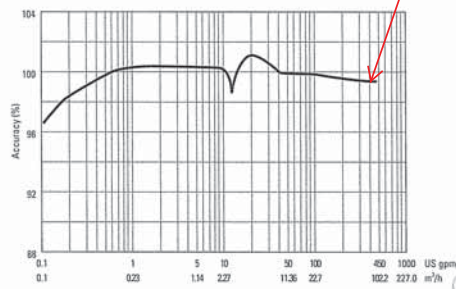
Sizes: 2"HP, 3", 4", 6", and 6"x8"

3" capacity = 450 gpm

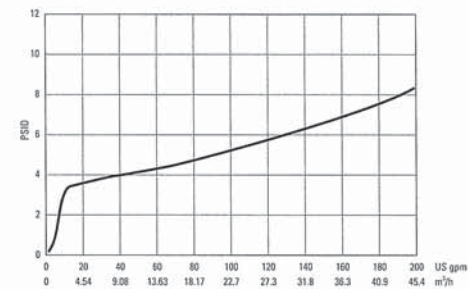
2" Accuracy



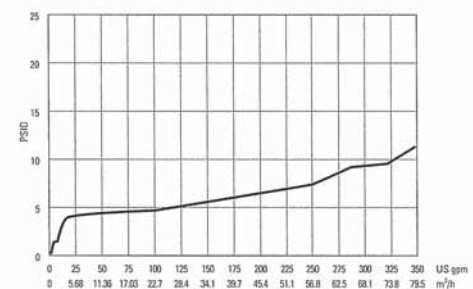
3" Accuracy



2" Pressure Loss



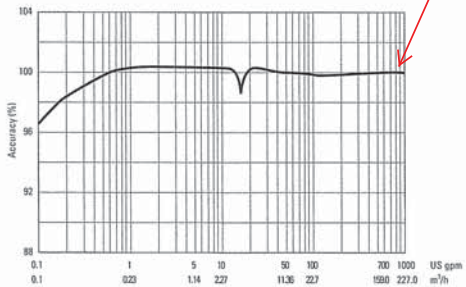
3" Pressure Loss



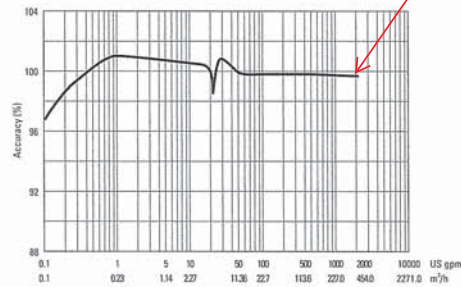
4" capacity = 900 gpm

6" capacity = 2,000 gpm

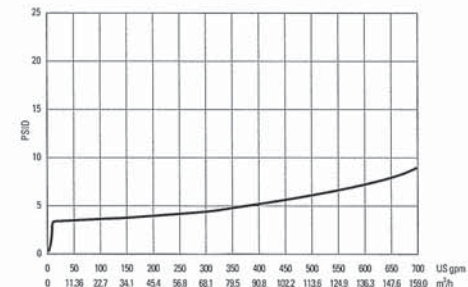
4" Accuracy



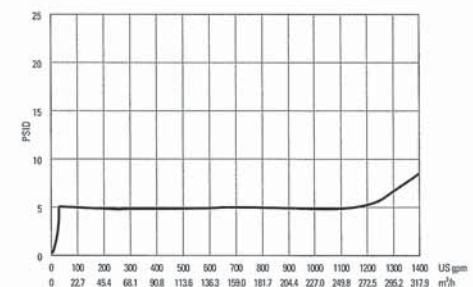
6" Accuracy



4" Pressure Loss



6" Pressure Loss

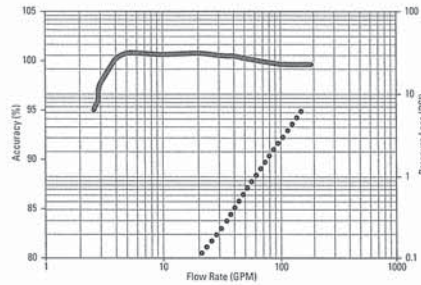


These charts show typical meter performance. Individual results may vary.

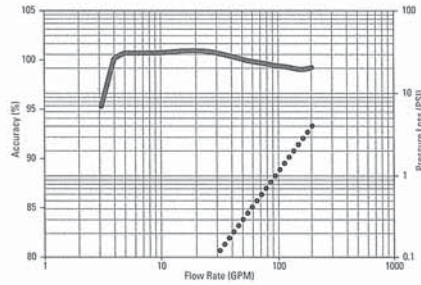
High Performance Turbine Meter

Sizes: 1 1/2", 2", 3", 4", 6", 8", and 10"

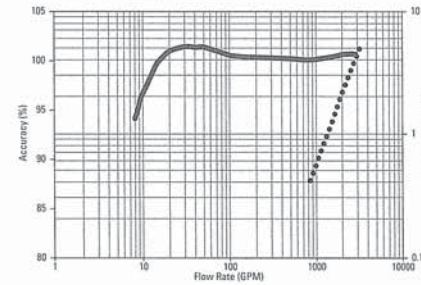
1 1/2" Accuracy



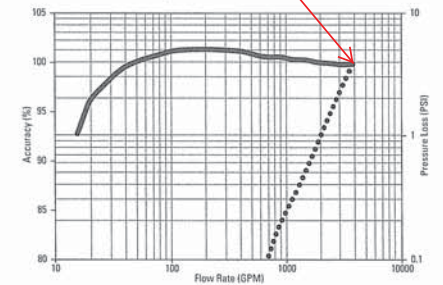
2" Accuracy



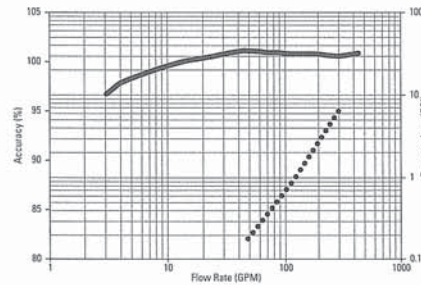
6" Accuracy



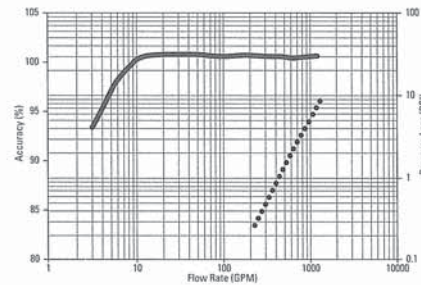
8" Accuracy



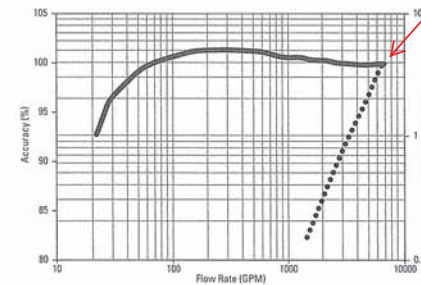
3" Accuracy



4" Accuracy



10" Accuracy



— Accuracy
 Head Loss

— Accuracy
 Head Loss

These charts show typical meter performance. Individual results may vary.