Water Management Plan
2011 Criteria

City of Shasta Lake
Shasta Lake, California

Prepared for
City of Shasta Lake

Consulting Engineers & Geologists, Inc.

350 Hartnell Avenue, Suite B
Redding, CA 96002-1875
530-221-5424

Rev 2, January 2015
514010

Reference: 514010

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Prepared for:

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1650 Stanton Drive
Shasta Lake, CA 96019

Prepared by:

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Date of First Draft – November 26, 2012
Date of Final (Rev 2) – January 16, 2015

QA/QC: MSC

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List of Attachments:

Section I: Description of the District

District Name: City of Shasta Lake

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Title: Water Superintendent

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A. History

The population in the City of Shasta Lake area increased from about 100 people in 1938 to about 2,600 people in 1945 due to the construction of Shasta Dam.

The City of Shasta Lake water system was, in essence, created in 1945 by the establishment of the Shasta Dam Public Utility District (SDAPUD) that was organized to serve the unincorporated communities of Central Valley, Project City, and Pine Grove. The initial water system improvements were financed by private loans and bonds in 1947 and by the purchase agreement with Central Valley Water Company to lease purchase their existing distribution facilities. A long-term (40 years) water contract was signed in 1948 with the USBR. In 1954, the United States Bureau of Reclamation replaced the 10-inch spiral steel line constructed in 1947 with 9,470 feet of 16-inch and 4,830 feet of 14-inch steel line. This also included increasing pump capacity and storage at the Reclamation Dam facilities. At the same time, a 6-inch line was also extended to serve the area then known as Buckeye County Water District (City of Redding).

In 1966 SDAPUD constructed a 2.0 MGD filtration plant approximately one mile northwest of Central Valley, just above the Toyon Government Camp. Capacity improvements to this plant occurred over the next 24 years until 1990 when the new treatment plant at Fisherman's Point replaced the old facility. In 1978, the SDAPUD annexed the Summit City PUD, and acquired its 1.0 MGD water filtration plant, transmission, and distribution facilities. Additional improvements to the distribution and storage facilities were implemented by the SDAPUD until 1993 when the City of Shasta Lake was created and acquired control of the water system.

1. ***Date district formed:*** 1944 ***Date of first Reclamation contract***: 1948

***Original size (acres)*:** 4,768 ***Current year (last complete calendar year)*:** 2011

2. ***Current size, population, and irrigated acres.***

	2011
Size (acres)	6,947
Population served (urban connections)	10,280
Irrigated acres	23.8*
*All irrigated acres use reclaimed water provided by the City of Shasta Lake.	

3. Water supplies received in current year.

Water Source	*AF*
Federal urban water (Tbl 1)	2,493
Federal agricultural water (Tbl 1)	0
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	0
Upslope drain water (Tbl 1)	0
District groundwater (Tbl 2)	0
Banked water (Tbl 1)	0
Transferred water (Tbl 1)	0
Recycled water (Tbl 3)	106.9
Other (define) (Tbl 1)	0
Total	2,599.9

4. Annual entitlement under each right and/or contract.

The City of Shasta Lake has had agreements with other entities in the past, but the ones listed in the table below are the only currently active agreements from which the City can obtain water.

	AF	*Source*	*Contract #*	*Availability period(s)*
Reclamation Urban AF/Y	4,430	CVP	4-07-20-W1134-LTR1	March 1, 2005 to Feb 28, 2045
Reclamation Agriculture AF/Y	N/A			
City of Redding AF/Y	224	GW	N/A	2007 agreement with annual renewal. City has not purchased water since 2005.
Shasta County Water Agency (SCWA)	50	CVP	14-06-2003367A	Annual renewal between City and SCWA
Anderson Cottonwood Irrigation District (ACID)	2000	CVP	3346A-R-1	Available between April 1 and October 31 through February 28, 2045.
MCM Properties	325	CVP	7827A	March 1, 2006 to Feb 28, 2045
McConnell Foundation	N/A	CVP	N/A	Short-term purchase agreement for needed amounts, subject to availability

The Reclamation amount of 4,430 AF/Y includes 30 AF/Y allocated to the City of Redding Summit City Pressure Zone, an area of the City of Redding supplied by the City of Shasta Lake.

5. Anticipated land-use changes. For Ag contractors, also include changes in irrigated acres.
None

6. Cropping patterns (Agricultural only).
Not Applicable (N/A), no agricultural uses.

7. Major irrigation methods (by acreage) (Agricultural only).
N/A

B. Location and Facilities

The City of Shasta Lake's water supply is surface water conveyed from Shasta Lake. The diversion point is at the face of Shasta Dam, where there are two intakes at elevation 754 and 960 feet above sea level. The coordinates are (T33N, R5W, 15). Raw water is pumped from the Dam to the City's Water Treatment Facilities via the USBR Raw Water Pumping Station located at the base of Shasta Dam.

The distribution system contains approximately 60 miles of pipelines. The system consists of steel, cast iron, asbestos cement, and polyvinyl chloride piping. Most of the steel piping is pre-1960 vintage with a large portion of smaller diameter mains (less than 5-inch in diameter) being installed prior to 1950. There are approximately 42,240 feet of undersized steel pipe over 45 years old that are in need of replacement.

See Attachment A - City Service Area Map.

1. Incoming flow locations and measurement methods.

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
Shasta Lake	Face of Shasta Dam	McCrometer magmeter (owned/operated by Reclamation)	Currently not operational.
Redding/Shasta Lake emergency intertie	District Drive (Knauf property)	Siemens Sitrans F M Magflow Mag 5000	± 0.5%
Bella Vista/Shasta Lake emergency intertie	Akrich Street	McCrometer propeller flowmeter (Shasta Lake to Bella Vista) Sparling compound meter G0070 (Bella Vista to Shasta Lake)	±2% for both meters

2. Current year Agricultural Conveyance System.
N/A

3. Current year Urban Distribution System.

Miles AC Pipe	*Miles Steel Pipe*	*Miles Cast Iron Pipe*	*Miles - Other*
25	29.4	2.4	7.0 (PVC)

4. ***Storage facilities (tanks, reservoirs, regulating reservoirs.)***
   The storage system consists of nine treated water storage tanks and one raw-water storage tank, ranging in size from 200,000 gallons to 2,900,000 gallons. The total treated water storage is 6,120,000 gallons.

Name	*Type*	*Capacity (AF)*	*Distribution or Spill*
150,000 Gallon Raw Water (WTP)	Steel	0.46	Distribution (raw water)
220,000 Gallon (WTP)	Steel	0.68	Distribution
330,000 Gallon (WTP)	Steel	1.01	Distribution
200,000 Gallon (Pickard Street)	Steel	0.61	Distribution
200,000 Gallon (Rouge Road)	Steel	0.61	Distribution
200,000 Gallon (Shasta Way, North End)	Steel	0.61	Distribution
470,000 Gallon (Stasta Way, South End)	Steel	1.44	Distribution
2.9 MG (Montana Ave)	Steel	8.90	Distribution
1 MG (Montana Ave)	Steel	3.07	Distribution
600,000 Gallon (Holly Street)	Steel	1.84	Distribution

5. ***Description of the agricultural spill recovery system and outflow points.***
   Not applicable.

6. ***Agricultural delivery system operation (check all that apply).***
   Not applicable.

7. ***Restrictions on water source(s).***

Source	*Restriction*	*Cause of Restriction*	*Effect on Operations*
Shasta Lake	CVP water can be delivered only within the USBR service area	Service area identified in USBR contract	Could delay future commercial and industrial growth
Shasta Lake	Transfer water from ACID and MCM Properties do not have long term approval to divert from the USBR	Temperature criteria for juvenile salmon must be mitigated. Approval will require a method to divert only upper level warmer water during dry water years	No drought protection during CVP allocation reduction years. Could eventually delay future growth of the City.

8. ***Proposed changes or additions to facilities and operations for the next 5 years***
No significant changes planned at this time. A Water System Master Plan update will be conducted during FY 2015/16 and will identify any necessary capital improvements. Other additions may be constructed due to development, but nothing is currently planned.

C. Topography and Soils

1. ***Topography of the district and its impact on water operations and management.***
The City of Shasta Lake lies within the upper Churn Creek and Stillwater Creek watersheds that slope to the south from the hilly ridge forming the southern containment of Shasta Lake (W.A. Gelonek & Affiliates, Inc., 1981). The City lies at the northerly end of California's Sacramento Valley and boarders Interstate 5 and the Union Pacific Railroad. Developed areas are gently rolling with numerous small creeks tributary to the two major waterways. The southern portion of the City tends to be flatter; the northern boundary becomes hilly with steep slopes and generally undeveloped land (W.A. Gelonek & Affiliates, Inc., 1981).

   Elevations in the City range from a high of 1,280 feet above sea level at the northern boundary to a low of about 670 feet at the southern boundary. The majority of the developed community lies between 800 and 900 feet.

   Due to the topography within the city limits, the water system includes 10 pressure zones fed by gravity storage tanks, with pressure reducing valves to regulate pressures. Pressures range from 12 psi at the highest elevation to 135 psi at the lowest elevation.

2. ***District soil association map (Agricultural only).***
Not applicable.

3. ***Agricultural limitations resulting from soil problems (Agricultural only).***
Not applicable.

D. Climate

1. ***General climate of the district service area.***
The City of Shasta Lake has hot dry summers and cool rainy winters. Temperatures range from below freezing to 115 F, with most of the rain coming from November to May. Winds are from the North and West.

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
Avg Precip.	*11.12*	*10.05*	*8.74*	*4.37*	*2.58*	*1.30*	*0.20*	*0.40*	*1.05*	*3.40*	*7.86*	*10.74*	*61.82*
Avg Temp.	*45.7*	*48.8*	*52.1*	*58.1*	*66.1*	*74.1*	*81.8*	*80.2*	*75.1*	*64.8*	*53.0*	*46.6*	*62.2*
Avg Max. Temp.	*52.5*	*56.7*	*61.3*	*68.5*	*77.5*	*86.0*	*95.2*	*93.7*	*87.8*	*75.2*	*60.5*	*53.1*	*72.3*
Avg Min. Temp	*38.9*	*41.0*	*43.0*	*47.7*	*54.8*	*62.2*	*68.3*	*66.6*	*62.3*	*54.4*	*45.6*	*40.1*	*52.1*
ETo	*1.55*	*2.24*	*3.72*	*5.10*	*6.82*	*7.80*	*8.68*	*7.75*	*5.70*	*4.03*	*2.10*	*1.55*	*57.0*

Weather station ID 048135 *Data period: Year* 1943 *to Year* 2012

ET Station ID CIMIS Reference ET *Average annual frost-free days:* 355

Data Sources:

- Precipitation, temperature: Western Regional Climatic Center, www.wrcc.dri.edu
  - Precipitation: http://www.wrcc.dri.edu/cgi-bin/cliGCStP.pl?ca8135
  - Temperature: http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca8135
- Evapotranspiration: Reference evapotranspiration for Zone 14 (Mid-Central Valley, Southern Sierra Nevada, Tehachapi & High Desert Mountains) from California Irrigation Management Information System (CIMIS), http://wwwcimis.water.ca.gov/cimis/images.etomap.jpg.

2. ***Impact of microclimates on water management within the service area.***
   Impacts to operations are minor. Throughout the system, the City uses general freeze protection (insulation, heat trace, etc.).

E. Natural and Cultural Resources

1. ***Natural resource areas within the service area.***

Name	*Estimated Acres*	*Description*
Moody Creek	Unknown	Small creek
Churn Creek and tributaries	Unknown	Small creeks

2. ***Description of district management of these resources in the past or present.***
   None.

3. ***Recreational and/or cultural resources areas within the service area.***

Name	*Estimated Acres*	*Description*
Margaret Polf Park	25.3	Soccer, softball, football, bicycle-motocross and walking/jogging trail
Harold T. "Bizz" Johnson Park	5.91	Little League Baseball
Wynne Price Field	5.00	High School and summer baseball
Clair Engle Park	2.75	Senior Community Center, outdoor stage and bandstand, playground, picnic facilities, barbecues and a skateboard park.
Akard Park	2.99	Outdoor basketball court, playground, picnic area and small baseball field
Shasta Park	0.50	Playground and picnic area
Blue Canyon Park	1.50	Playground and picnic area
Dam Worker's Park	0.25	Picnic area

F. Operating Rules and Regulations

1. ***Operating rules and regulations.***
   See Attachment B, City of Shasta Lake's Operating Rules and Regulations for Water

2. ***Water allocation policy (Agricultural only).***
   N/A, no agriculture uses.

3. ***Official and actual lead times necessary for water orders and shut-off (Agricultural only).***
   N/A, no agriculture uses.

4. ***Policies regarding return flows (surface and subsurface drainage from farms) and outflow (Agricultural only).***
   N/A, no agriculture uses.

5. ***Policies on water transfers by the district and its customers.***
   Water transfers are governed by the specific agreements between agencies. The City has no overall general written policy. Other than the City's water contracts, the City usually buys water from only the McConnell Foundation, so other water transfers are not common.

G. Water Measurement, Pricing, and Billing

1. ***Agricultural Customers.***
   N/A, no agriculture uses.

2. ***Urban Customers.***

   a. Total number of connections 3754
   b. Total number of metered connections 3754
   c. Total number of connections not billed by quantity 0
   d. Percentage of water that was measured at delivery point 100%
   e. Percentage of delivered water that was billed by quantity 87.3%
   f. Measurement device table

Meter Size and Type	*Number*	*Accuracy* (+/-percentage)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
5/8-3/4" Disc	3,588	± 1.5%	30	N/A	Per manufacturer
1" Disc	96	± 1.5%	30	N/A	Per manufacturer
1 ½" Disc	17	± 1.5%	30	N/A	Per manufacturer
2" Disc	43	± 1.5%	30	Every 3 years	Per manufacturer
3" Turbine	1	± 1.5%	30	Every 3 years	Per manufacturer
4" Turbine	2	± 1.5%	30	Every 3 years	Per manufacturer
6" Turbine	1	± 1.5%	30	Every 2 years	Per manufacturer
8"	0		N/A		
10" Magnetic	2	± 1.5%	30	yearly	Per manufacturer
Compound	1**	± 1.5%	30	N/A	Per manufacturer
Turbo	0		N/A		
Other (Reuse)	3	N/A	30	N/A	Per manufacturer
Total	3754				

*Documentation verifying the accuracy of measurement devices must be submitted with Plan and included as Attachment C.
**This is a compound (4" and 1") meter to a portion of the City of Redding served by the City of Shasta Lake. The City of Redding further distributes the water to individual end users.

3. Agricultural and Urban Rates.

a. Current year agricultural and /or urban water charges - including rate structures and billing frequency

Billing is done on a monthly basis. Charges are based on meter size (fixed) and usage (volumetric).

b. Annual charges collected from agricultural customers
N/A, no agriculture uses.

Annual charges collected from urban customers are shown in the following tables. Note that the rates increased July 1, 2011 (the beginning of the fiscal year). The rates shown in the tables below reflect the rates after the July 1, 2011 increase.

Fixed Charges			
Charges ($ unit)	***Charge units ($/meter size) etc.***	***Units billed during year (by meter size) etc.***	***$ collected ($ times units)***
5/8" meter	$16.94	42,722	$723,711
¾" meter	$25.41	12	$305
1" meter	$42.36	1,119	$47,401
1-1/2" meter	$84.72	176	$14,911
2" meter	$135.55	517	$70,079
3" meter	$254.15	12	$3,050
4" meter	$423.58	24	$10,166
6" meter	$847.16	12	$10,166
8" meter	$1,355.45	0	0
10" meter	$2,456.75	24	$58,962
12" meter	$3,642.77	0	0

Volumetric charges			
Charges ($ unit)	***Charge units ($/HCF), etc.***	***Units billed during year HCF.***	***$ collected ($ times units)***
Lifeline (1-1000 CF)	$0.88/HCF	26,173.42	$23,032.61
All others (1-1000 CF)	$1.10/HCF	310,416.82	$341,458.50
1001-5000 CF	$1.26/HCF	290,481.25	$366,006.38
Excess (over 5000 CF; applies to 5/8" meter only)	$1.53/HCF	309,858.49	$474,083.49

See Attachment D for Sample Bill.

c. Describe the contractor's record management system
The City uses contractor specific software: Incode's utility billing system, and Badger Connect and Tantalus remote read software.

Records are available on-line for customer review for seven years. Hard copies are kept for ten years in a vault, and then placed in storage. Data are stored electronically and reconciled annually to the general ledger. The City does not currently reconcile delivery differences but plans to implement a procedure to compare water production versus delivered. Billing frequency is monthly.

H. Water Shortage Allocation Policies

1. ***Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated.***
   See Attachment E, Water Shortage/Conservation Policies.

2. ***Current year policies that address wasteful use of water and enforcement methods.***
   The City currently has policies and enforcement for certain types of landscaping projects per municipal code Chapter 15.10. See Attachment B, Operating Rules and Regulations for Water.

I. Evaluate Policies of Regulatory Agencies Affecting the Contractor and Identify Policies that Inhibit Good Water Management.

Discuss possible modifications to policies and solutions for improved water management.
None.

Section II: Inventory of Water Resources

A. Surface Water Supply

1. ***Surface water supplies in acre feet, imported and originating within the service area, by month (Table 1).***
   See Attachment L, Water Inventory Tables, Table 1

2. ***Amount of water delivered to the district by each of the district sources for the last 10 years.***
   See Attachment L, Water Inventory Tables, Table 8.

B. Groundwater Supply

1. ***Groundwater extracted by the district and delivered, by month (Table 2).***
   See Attachment L, Water Inventory Tables, Table 2

2. ***Groundwater basin(s) that underlies the service area.***

Name	*Size (Square Miles)*	*Usable Capacity (AF)*	*Safe Yield (AF/Y)*
None			

The City is located outside of the Redding ground-water basin, which contains the main water-bearing geologic units in the northern Sacramento Valley.

The geology underlying the City is characterized mainly by dense, relatively unfractured metavolcanic rock (Copley greenstone). Wells completed in the Copley greenstone generally have very low yields (less than 10 gpm). Less dense, probably more highly fractured black shale, the Kennett formation underlies the northeastern corner of the City. Wells of record completed in the Kennett formation within the City have similar or slightly higher yields than those completed in the Copley greenstone.

Chico formation rocks underlie the extreme south portion of the City. The Chico formation generally has poor water quality, and wells completed in this area of the City generally have low yields. A small area of Red Bluff formation occurs in the southeastern corner of the City.

Most wells of record within the City have very low yields (less than 10 gpm). The highest yielding wells in the vicinity of the City are those of the Mountain Gate Community Services District (CSD). The Mountain Gate CSD has two wells that average about 200 gpm each. The Mountain Gate CSD wells are completed in highly fractured Kennett formation, and are down gradient of a drainage area 1,200 acres that supplies recharge to the formation.

The area with the best potential ground-water yield within the City's sphere of influence is the northeastern corner. This area appears to have a similar geologic setting to that of the Mountain Gate CSD well area. The Kennett formation has been mapped in that area, and there appears to be at least two fracture zones running through the area. Geologic conditions may not match exactly those of the Mountain Gate area, however, and it cannot be stated with certainty that yields similar to those at Mountain Gate can be obtained.

3. ***Map of district-operated wells and managed groundwater recharge areas.***
N/A, no district-operated wells.

4. ***Description of conjunctive use of surface and groundwater.***
No conjunctive use.

5. ***Groundwater Management Plan.***
Not applicable. The City is a member of the Redding Area Water Council, which is a collaboration of public and private agencies that are interested in our water resources and their plan and managed use. This collaborative has prepared a countywide water resource master plan, which looked at the groundwater resources within the Redding basin and Shasta County. The City of Shasta Lake is not located over a groundwater basin, does not use groundwater, and has no role in groundwater management. The countywide water resource master plan proposes possible conjunctive use of groundwater for the City of Shasta Lake. This would mean diverting ACID water out of Shasta Lake for our City while we pumped groundwater out of a future well, near the canal, into the ACID canal.

6. ***Groundwater Banking Plan.***
Not applicable.

C. Other Water Supplies

1. ***"Other" water used as part of the water supply – Describe supply.***
See Attachment L, Water Inventory Tables, Table 1

D. Source Water Quality Monitoring Practices

1. ***Potable Water Quality (Urban only).***
See Attachment H – Annual Potable Water Quality Report

2. ***Agricultural water quality concerns*: *Yes*** _____ ***No*** **X**
(If yes, describe)
N/A, no agricultural uses.

3. ***Description of the agricultural water quality testing program and the role of each participant, including the district, in the program.***
N/A, no agricultural uses..

4. ***Current water quality monitoring programs for surface water by source (Agricultural only).***
N/A, no agricultural uses.

E. Water Uses within the District

1. ***Agricultural.***
N/A, No agriculture uses.

2. ***Types of irrigation systems used for each crop in current year.***
N/A, no agricultural uses.

3. ***Urban use by customer type in current year.***

Customer Type	*Number of Connections*	*AF*
Single-family	3442	1550.54
Multi-family	101	88.9
Commercial	198	243.29
Industrial	10	294
Institutional	See commercial	
Landscape irrigation	0	
Wholesale	0	
Recycled	3	106.9
Other (specify)		
Other (specify)		
Other (specify)		
Unaccounted for		316.27
Total	3754	2599.9

4. Urban Wastewater Collection/Treatment Systems serving the service area.

Treatment Plant	*Treatment Level (1, 2, 3)*	*AF*	*Disposal to / uses*
Wastewater Treatment Plant	2	1,456	Churn Creek (winter), reuse (irrigation, log deck wetdown, dust control)
	Total	1,456	
Total discharged to ocean and/or saline sink		0	

5. Groundwater recharge in current year (Table 6).

Recharge Area	*Method of Recharge*	*AF*	*Method of Retrieval*
None			
	Total		

6a. Transfers and exchanges into the service area in current year – (Table 1).

From Whom	*To Whom*	*AF*	*Use*
None			
	Total		

6b. Transfers and exchanges out of the service area in current year – (Table 6).

From Whom	*To Whom*	*AF*	*Use*
None			
	Total		

7. Wheeling, or other transactions in and out of the district boundaries – (Table 6).

From Whom	*To Whom*	*AF*	*Use*
Not applicable			
	Total		

8. ***Other uses of water.***

Other Uses	*AF*
None	

F. Outflow from the District (Agricultural only)

No agriculture.

G. Water Accounting (Inventory)

Urban water inventory tables are included in Attachment L.

Section III: Best Management Practices (BMPs) for Agricultural Contractors

Not applicable, there are no agricultural uses or contractors.

Section IV: Best Management Practices for Urban Contractors

A. Urban BMPs

BMP forms for 2011 have been completed and submitted. A copy of the submitted forms is included in Attachment M.

Foundational BMPs

1. ***Utility Operations Programs.***
    - 1.1. Operations Practices
        - A.1) Conservation Coordinator
        - A.2) Water waste prevention
        - A.3) Wholesale agency assistance programs
    - 1.2. Water Loss Control
    - 1.3. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections
    - 1.4. Retail Conservation Pricing

2. ***Education Programs.***
    - 2.1. Public Information Programs
    - 2.2. School Education Programs

Programmatic BMPs

3. ***Residential.***
    - 3.1) Residential assistance program
    - 3.2) Landscape water survey
    - 3.3) High-efficiency clothes washers (HECWs)
    - 3.4) WaterSense Specification (WSS) toilets
    - 3.5) WaterSense Specifications for residential development

4. ***Commercial, Industrial, and Institutional (CII).***

5. ***Landscape.***

B. Provide a 4-Year Budget for Expenditures and Staff Effort for BMPs

Starting in 2014 the budget will represent the City's commitment to implementing the BMPs.

1. ***Amount actually spent during current year.***
   The City has a budget line item for water conservation totaling $8,000 per fiscal year. This amount is not further allocated but can be used for any water conservation activities related to the BMPs. The staff hours are not officially allocated but represent a minimum effort typically expended on all water conservation efforts related to the BMPs.

Year 2012 or Year 1		Projected Expenditures	
BMP #	*BMP Name*	*(not including staff hours)*	*Staff Hours*
1.	*Utilities Operations*		
	1.1 Operations Practices	*$0*	*100*
	1.2 Water Loss Control	*$0*	*0*
	1.3 Metering	*$0*	*0*
	1.4 Retail Conservation Pricing	*$0*	*0*
2.	*Education Programs*		
	2.1 Public Information Programs	*$8,000*	*0*
	2.2 School Education Programs	*$0*	*0*
3.	*Residential*	*$0*	*0*
4.	*CII*	*$0*	*0*
5.	*Landscape*	*$0*	*0*
	Total	*$8,000*	*100*

2. Projected budget summary for 2nd year.

Year 2013 or Year 2		Projected Expenditures	
BMP #	BMP Name	(not including staff hours)	Staff Hours
1.	*Utilities Operations*		
	1.1 Operations Practices	*$0*	*100*
	1.2 Water Loss Control	*$0*	*0*
	1.3 Metering	*$0*	*0*
	1.4 Retail Conservation Pricing	*$0*	*0*
2.	*Education Programs*		
	2.1 Public Information Programs	*$8,000*	*0*
	2.2 School Education Programs	*$0*	*0*
3.	*Residential*	*$0*	*0*
4.	*CII*	*$0*	*0*
5.	*Landscape*	*$0*	*0*
	Total	*$8,000*	*100*

3. Projected budget summary for 3rd year.

Year 2014 or Year 3		Projected Expenditures	
BMP #	BMP Name	(not including staff hours)	Staff Hours
1.	*Utilities Operations*		
	1.1 Operations Practices	*$0*	*100*
	1.2 Water Loss Control	*$0*	*0*
	1.3 Metering	*$0*	*0*
	1.4 Retail Conservation Pricing	*$0*	*0*

2. Education Programs			
2.1 Public Information Programs		*$8,000*	*0*
2.2 School Education Programs		*$400*	
3. Residential		*$12,000*	*0*
4. CII		*$0*	*0*
5. Landscape		*$0*	*0*
	Total	*$20,400*	*100*

4. Projected budget summary for 4th year.

Year 2015 or Year 4		Projected Expenditures	
BMP # BMP Name		(not including staff hours)	Staff Hours
1. Utilities Operations			
1.1 Operations Practices		*$0*	*100*
1.2 Water Loss Control		*$0*	*20*
1.3 Metering		*$0*	*10*
1.4 Retail Conservation Pricing		*$0*	*0*
2. Education Programs			
2.1 Public Information Programs		*$1,000*	*50*
2.2 School Education Programs		*$1,000*	*8*
3. Residential		*$19,505*	*0*
4. CII		*$0*	*0*
5. Landscape		*$8,300*	*0*
	Total	*$29,805*	*188*

C. Foundational BMPs

1. **Assign a Water Conservation Coordinator:**
   Tony Thomasy, Water Plant Superintendent

2. **Water Loss Control/System Efficiency**
   In 2014 the Fishermans Point Water Treatment Plant produced 1993 ac/ft of Potable water, of which 1880 ac/ft was read through all registered meters within the City for a water loss of 6.01%. Plant flow transmitters are checked annually for accuracy.
   The City contracts to offer free water audits to residential customers. All customers advised when the City suspects a possible water leak (high usage).

3. **Public Outreach**
   The City posted water conservation signs at high traffic locations. Educational material is dispersed periodically (community functions) to children of all ages. Water conservation ads are inserted in the local paper and mail stuffers are added to customer bills on a quarterly rotation.

4. **Water Waste Prevention**
   Chapter 15.10 - Water Efficient Landscaping of the City of Shasta Lake Municipal Code (title 15, Buildings and Construction) covers all aspects of this BMP, which is available for viewing at https://www.municode.com/library/ca/shasta_lake/codes/code_of_ordinances.

D. GPCD Compliance Option (please see attached below)

1. The City's Baseline GPCD **(1997-2006)** equals 269.2. This data was compiled from the Electronic Annual Reports submitted by the City to the Department of Public Health.
2. The 2014 GPCD target for the City of Shasta Lake is 240.1 and the actual is 173.7.

California Urban Water Conservation Council

TARGETS / COMPLIANCE
(CUWCC MOU)

Baseline / Initial GPCD
(Use option buttons to select)

GPCD in 2006 ○	286.8
Baseline GPCD (1997 to 2006) ◉	269.2
GPCD in 2010	
GPCD Target for 2018	220.7

Potable Water GPCD for each Year in the Baseline Period

Year	GPCD
2006	286.8
2005	272.6
2004	307.7
2003	254.8
2002	296.1
2001	278.3
2000	264.0
1999	251.0
1998	236.2
1997	244.6

Biennial GPCD Compliance Table

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	259.5	100%	269.2
2012	2	92.8%	249.8	96.4%	259.5
2014	3	89.2%	240.1	92.8%	249.8
2016	4	85.6%	230.4	89.2%	240.1
2018	5	82.0%	220.7	82.0%	220.7

Monthly GPCD Data for Weather Normalization

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2010												
Baseline avg*	269.2	269.2	269.2	269.2	269.2	269.2	269.2	269.2	269.2	269.2	269.2	269.2

* The average for each month is based on the baseline period 1997 to 2006

City of Shasta Lake

	Potable Water In (PWI)	Population (POP)	Gallons per Capita Day (GPCD)
1997	819065000	9174	244.61
1998	790730000	9174	236.14
1999	897609000	9800	250.94
2000	883510000	9170	263.97
2001	931508000	9170	278.31
2002	991124400	9170	296.12
2003	904700000	9730	254.74
2004	1092639000	9730	307.66
2005	1027175000	10325	272.56
2006	1077451000	10293	286.79

Baseline GPCD **269.18**

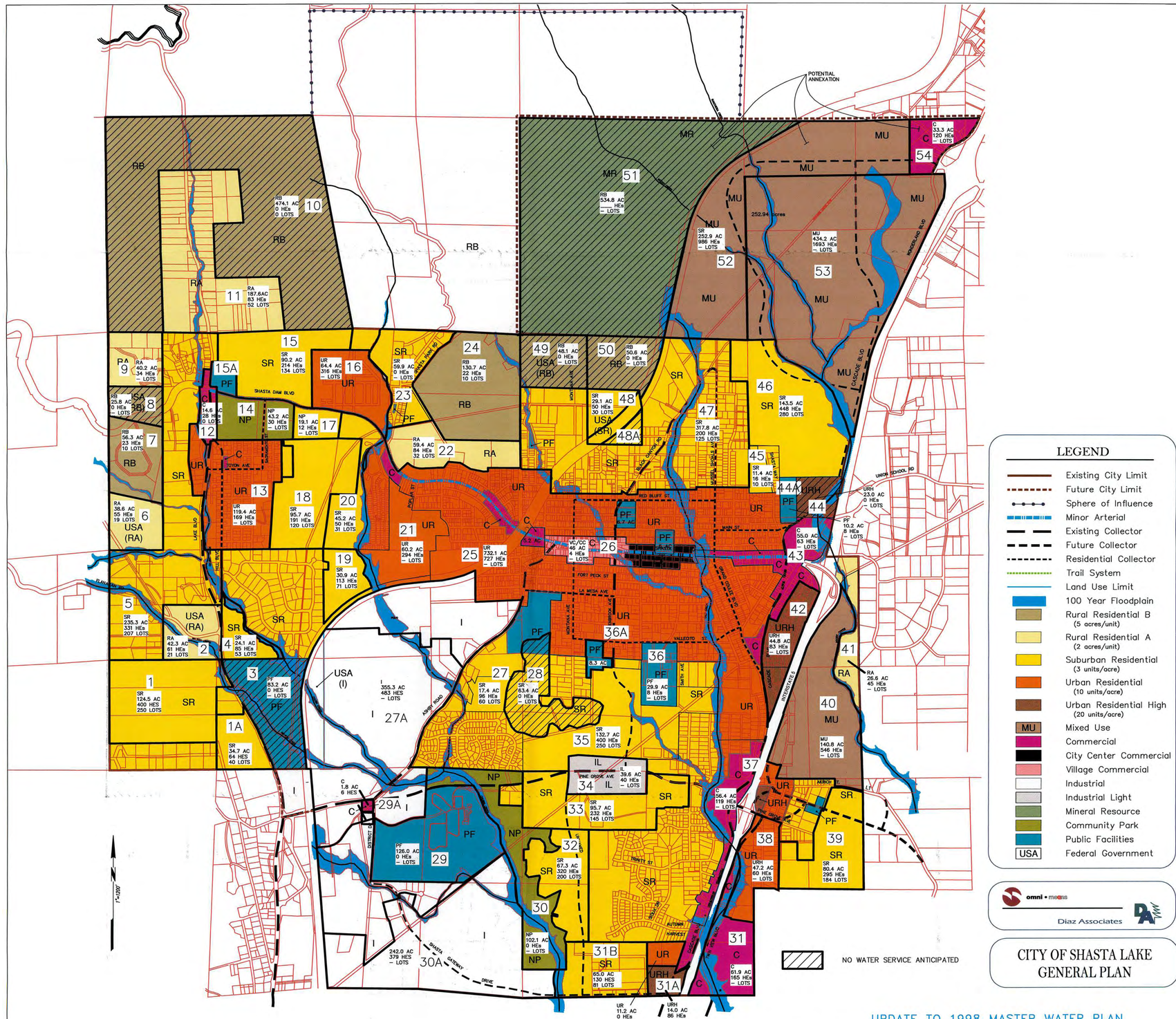
Baseline GPCD equals average annual GPCD for years 1997-2006

2014	649594000	10246	**173.70**

Percent reduction in GPCD as of 2014 **55%**

Above data retrieved from yearly reports submitted to DDW

2018 GPCD target for the City of Shasta Lake as a Signatory **220.73**



LEGEND

- Existing City Limit
- Future City Limit
- Sphere of Influence
- Minor Arterial
- Existing Collector
- Future Collector
- Residential Collector
- Trail System
- Land Use Limit
- 100 Year Floodplain
- Rural Residential B (5 acres/unit)
- Rural Residential A (2 acres/unit)
- Suburban Residential (3 units/acre)
- Urban Residential (10 units/acre)
- Urban Residential High (20 units/acre)
- MU — Mixed Use
- Commercial
- City Center Commercial
- Village Commercial
- Industrial
- Industrial Light
- Mineral Resource
- Community Park
- Public Facilities
- USA — Federal Government

omni • means

Diaz Associates

CITY OF SHASTA LAKE GENERAL PLAN

UPDATE TO 1998 MASTER WATER PLAN

DATE			PLATE
12/03	PACE CIVIL, INC. REDDING, CALIFORNIA	CITY OF SHASTA LAKE FUTURE GROWTH PROJECTIONS 2002 TO ULTIMATE	2

Attachment B

Operating Rules and Regulations for Water

Chapter 13.12 WATER SERVICE SYSTEM

Sections:

Article I. Water Service Regulations

13.12.010 Application of chapter provisions.

This chapter fixes rates for water furnished by the city water department, and provides rules and regulations governing the furnishing of water by the city's water department.

(Amended during 1998 codification; prior code § 9.04.010)

13.12.020 Water not supplied outside city.

In accordance with the conditions of the city's contract with the United States Bureau of Reclamation, no water shall be supplied to any property located outside of the city's boundaries.

(Amended during 1998 codification; prior code § 9.04.020)

13.12.030 Service to premises—Limitations.

A. No water shall be served to two or more parcels of property separately owned through a common service pipe or water meter.

B. Each applicant for a water service connection shall be notified that a single meter may serve only one residence, or one residential building, or one commercial or one industrial building. However, residential or commercial building groups, the individual buildings of which cannot be owned separately, and which are located on parcels which cannot be divided into smaller portions, may be served from the same single meter.

C. If the use to which the building is intended indicates that a meter larger than a five-eighths-inch meter will be needed, it will be the responsibility of the city manager to determine the size of meter needed, and to inform the applicant that he or she will be required to install such a specified meter. Building plans, as approved by the Shasta County building department, must be submitted by the applicant for determination of meter size required.

(Amended during 1998 codification; prior code § 9.04.030)

13.12.040 Meter—Attachment conditions.

A. The city's water department may attach a meter to any service, or service pipe, at any time it shall be deemed expedient to do so, and render corrected bills from the date of installation of such meter according to the meter rates set forth in this title. After the meter is so attached, any damage to such meter resulting from malice, carelessness or neglect of the customer, or any member of his or her family or anyone employed by him or her, and any damage which may result from hot water or steam from a boiler or otherwise, shall be paid for by the consumer to the city on presentation of a bill therefor; and in case such bill is not paid, the water shall be shut off from the premises without further notice, and shall not be turned on until all charges are paid.

B. It is unlawful to interfere with or remove a water meter from any service where it has been attached, without first notifying and receiving permission from the meter and service clerk of the city. Such permission shall be granted only for the purpose of tests, replacements, repairs to the meter or service pipe, readjustment of service, or similar emergency.

(Amended during 1998 codification; prior code § 9.04.040)

13.12.050 Meter—Use required when—Bypassing prohibited.

A. All city water used on any premises where a meter is installed must pass through the meter, except as provided in case of private fire services. No bypass or connection between the meter and the main shall be made or maintained.

B. Consumers will be held responsible and charged for all water passing through their meters.

(Amended during 1998 codification; prior code § 9.04.050)

13.12.060 Meter—Inaccurate registration—Customer charges.

If a meter fails to register during any period, or is known to register inaccurately, the consumer shall be charged with an average daily consumption as a season, as shown by the meter when in use and registering accurately.

(Amended during 1998 codification; prior code § 13.12.060)

13.12.070 Meter—Testing by city— Adjustment of charges.

Any consumer may demand that the meter through which water is being furnished be examined and tested by the city, for the purpose of ascertaining whether or not it is registering correctly the amount of water which is being delivered through it. Such demand shall be made in writing to the city. The written demand shall be accompanied by a deposit in an amount determined by the current chargeout rate for one-half hour of city staff time. Upon receipt of such demand, it shall be the duty of the city to cause the meter to be examined and tested for the purpose of ascertaining whether or not it is registering correctly the water being delivered through it. If, on such examination and test, the meter shall be found to register over three percent more water than actually passes through it, another meter will be substituted therefor, the deposit fee shall be repaid to the person making the application, and the water bill for the current period adjusted in such a manner as the city manager may deem fair and just. If the meter is found to register not over three percent fast, the deposit shall be forfeited to the city and the water bills paid as rendered.

(Amended during 1998 codification; prior code § 9.04.070)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.080 Tapping or connections—City permission required.

No person shall tap or connect with any water main or pipe which forms any part of the water storage, transmission, or distribution system of the city, without first notifying and obtaining written permission to do so from the public works director of the city, who shall issue no such permit to or for any person or firm whose indebtedness to the city for water or other charges is delinquent.

(Amended during 1998 codification; prior code § 9.04.080)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.090 Services and meters—Property of city—Damage responsibility.

All services and water meters installed by the city shall remain at all times the property of the city, and shall be maintained and repaired and renewed by the city when rendered unserviceable through fair wear and tear; provided, that where replacements, repairs or adjustments of any meter are rendered necessary by the act, negligence or carelessness of the consumer, or any member of his or her family or person in his or her employ, any expense caused to the department thereby shall be charged against and collected from the consumer.

(Amended during 1998 codification; prior code § 9.04.090)

13.12.100 Installation at applicant's expense when.

In all cases where an installation is requested for any purpose not covered by other provisions of Chapters 12.04, 12.08 and Title 13 of this code, such service shall be installed at the expense of the applicant, at city cost.

(Amended during 1998 codification; prior code § 9.04.100)

13.12.110 Check valve requirements.

The placing of an approved reduced pressure principle (RPP) device on the property side of the water meter of any consumer is for the safety and protection from damage of the water system, meters and piping of the city, and such approved RPP devices shall be installed by and at the expense of the consumer. If the consumer fails to comply with this section, all costs to repair the damage to the city's water system, meters and piping will be billed to the consumer. In addition, the water will be shut off to the property until an approved RPP device is installed.

(Amended during 1998 codification; prior code § 9.04.110)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.120 Shutoff valves.

All shutoff valves on the city's side of the water meter are installed by the city for the use of the city. Such shutoff valves shall not be used or in any way molested or manipulated by consumers of water, except in case of emergency. For ordinary usage, all consumers shall provide their own shutoff valves and pressure regulators on the property side of the meter.

(Amended during 1998 codification; prior code § 9.04.120)

13.12.130 Vacant houses or businesses.

In case a house or business building becomes vacant, the regular minimum rate shall be charged and collected from the owner thereof, whether water is used or not, unless the water department is notified in writing of the fact that the property is unoccupied and is requested to cut off water therefrom.

(Amended during 1998 codification; prior code § 9.04.130)

13.12.140 Standby charges.

A standby charge shall be charged and collected from the owner of a vacant lot which has a water meter in place. The charge shall be the regular minimum monthly service charge.

(Amended during 1998 codification; prior code § 9.04.135)

13.12.150 Temporary water service.

A. Where temporary water service is requested to be furnished through fire hydrants or other existing connections, a portable meter will be installed and water charged for at the following rates:

The sum of the (meter surcharge) plus (demand charge for one unit) plus (consumption charge), in accordance with the surcharge, demand charge and consumption rates currently in effect.

B. Such service shall be installed by the water department at the expense of the applicant, at city costs.

(Amended during 1998 codification; prior code § 9.04.140)

13.12.160 Customer restrictions and city rights.

A. No consumer shall supply water to any person, firm or corporation other than the occupant or occupants of the premises of such consumer; provided, that the consumer may supply water to persons, firms or corporations for use in the performance of any contract for the improvement of any street or other public place, after having given notice to and received permission from the general manager of the water department, who shall issue no such permit to or for any person, firm or corporation whose indebtedness to the city for water or other charges is delinquent, or who has on one or more occasions taken water from the distributing system of the city or from the pipes of consumers connected with the distributing system of the city without having given notice and received permission provided for herein.

B. No consumer shall permit leaks or waste of water. The city reserves the right to bill the property owner of substandard dwellings or other type buildings for water service where the city records show consistent financial losses due to billing the tenants of these substandard dwellings or other type buildings.

(Amended during 1998 codification; prior code § 9.04.150)

13.12.170 Backflow prevention requirements—Leaks and waste prohibited.

The city is required by laws of the state of California, the California Administrative Code, Title 17, Chapter V, Sections 7583 through 7622 inclusive, and by the Shasta County health department to enforce regulations to safeguard its drinking water supply by preventing backflow into the water system. If a property served water by the city has a well or other source of water supply, it must provide a state-approved reduced pressure principle (RPP) device on the property side of the city water meter service. The RPP device must be tested and certified by a certified backflow device tester at least once each year for backflow leaks. If leakage is found, a new RPP device shall be installed immediately. The California Department of Public Health sanitary engineering personnel, the Shasta County health department personnel and the city's personnel may also inspect the RPP device at various times each year, and if found to be defective, the property owner will be notified to make repairs at once.

(Amended during 1998 codification; prior code § 9.04.160)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.180 Water for steam boilers, hydraulic elevators, power pumps and similar apparatus.

A. No person shall draw water from the city pipes directly into any stationary steam boiler, hydraulic elevator, power pump, or similar apparatus.

B. Where city water is used to supply a steam boiler, hydraulic elevator or power pump, its owner shall provide a tank of sufficient capacity to afford a supply for at least twelve (12) hours, into which the service pipe shall be discharged.

(Amended during 1998 codification; prior code § 9.04.170)

13.12.190 Service turnoff authority.

The water department shall have the power to turn off water from mains and pipes of the system without notice.

(Amended during 1998 codification; prior code § 9.04.180)

Article II. Rates and Charges

13.12.200 Rates for service.

The following rates and compensation are fixed and established as the rates to be charged and collected by the city's water department for water furnished by the department:

CITY OF SHASTA LAKE - WATER UTILITY RATES

Water Rates							
Current		Aug.7, 2009	July 1, 2010	July 1, 2011	July 1, 2012	July 1, 2013	
Annual Rate Increase		**8%**	**8%**	**8%**	**8%**	**5%**	
Consumption Charges ($/100 CF)							
Lifeline Consumption Rate (1—1,000 CF)	$0.70	$0.75	$0.81	$0.88	$0.95	$0.99	
All Other Consumption Rate (1—1,000 CF)	$0.87	$0.94	$1.01	$1.10	$1.18	$1.24	
Consumption Rate (1,001—5,000CF)	1.00	1.08	1.17	1.26	1.36	1.43	
[(1)]Excess Consumption Rate (over 5,000 CF)	1.22	1.32	1.42	1.53	1.66	1.74	
Monthly Service Charges ($/MO)							Capacity Factor
5/8" Meter	13.45	14.53	15.69	16.94	18.30	19.21	1.0
¾" Meter	20.18	21.79	23.53	25.41	27.45	28.82	1.5
1" Meter	33.63	36.32	39.22	42.36	45.75	48.03	2.5
1½" Meter	67.25	72.63	78.44	84.72	91.49	96.07	5.0
2" Meter	107.60	116.21	125.50	135.55	146.39	153.71	8.0
3" Meter	201.75	217.89	235.32	254.15	274.48	288.20	15.0
4" Meter	336.25	363.15	392.20	423.58	457.46	480.34	25.0
6" Meter	672.50	726.30	784.40	847.16	914.93	960.68	50.0

8" Meter	1,076.00	1,162.08	1,255.05	1,355.45	1,463.89	1,537.08	80.0
10" Meter	1,950.25	2,106.27	2,274.77	2,456.75	2,653.29	2,785.96	145.0
12" Meter	2,891.75	3,123.09	3,372.94	3,642.77	3,934.19	4,130.90	215.0
Proposed Wastewater Rates							
Current		Proposed July 2009	Proposed July 2010	Proposed July 2011	Proposed July 2012	Proposed July 2013	
Annual Rate Increase		9%	9%	9%	9%	9%	
Wastewater Rates Used							
Single-Family Monthly Service Charge	36.85	45.17	48.78	47.72	52.01	56.70	
Lifeline Single Monthly Service Charge	29.48	37.13	40.03	38.18	41.61	45.36	
Rate Increase		9%	9%	9%	9%	9%	
Lift Station Monthly Surcharge*		5.00	5.00	0%	0%	0%	

;rn0; Notes: (1) Applies to 5/8-inch meter only.

(Ord. 07-187 § 1: Ord. 04-158 § 1: Ord. 97-97 § 1: Ord. 94-31 § 1: prior code § 9.08.010)

(Ord. No. 09-201, § 1, 7-7-2009)

13.12.210 Unit determination—Property under one ownership with single use.

For a property under one ownership, having a single building or use, served by a single meter, as: One dwelling, one commercial enterprise or building, one business enterprise or building, one public service or public service building, one industrial operation or building, one school or school building, one church or church building, one nonprofit organization or building, one office or office building not in a multiple unit, or for any other single use or building, the unit determination shall be: One unit per meter.

(Prior code § 9.08.020)

13.12.220 Unit determination—Properties under one ownership having multiple uses.

A. For properties under one ownership, having multiple uses or buildings, served by a single meter, as: Homes, mobile homes, apartments, complex dwelling units, mobile home parks, two or more commercial enterprises or buildings, two or more business enterprises or buildings, two or more public services or public service buildings, two or more industrial operations or buildings, two or more churches or buildings, two or more schools or school buildings, or any combination of the above or other uses, the unit determination shall be: One unit per occupancy, per proprietorship, per building, or per use.

B. When a unit is deleted, at the owner's request, from the multiple unit demand charge, no water shall again be served to the deleted unit, and a separate water service connection and

meter must be installed to serve the deleted unit if water is served to it, unless the buildings or uses meet the requirements of subsection B. of Section 13.12.030 of this chapter.

(Prior code § 9.08.030)

13.12.230 Unit determination—Properties under one ownership providing rooms, guest homes or travel trailer parks.

Properties under one ownership, served by a single meter, providing rooms, spaces or suites, for rent or use, as: Rooming houses, hotels, motels, rest or guest homes, travel trailer parks, office or public buildings renting out rooms or suites, or any building or business with rooms, suites or spaces, the unit determination shall be:

Per room, suite, space or use division:

One-quarter, one-half, three-quarters, or one full unit, to be determined by the city according to estimated water required by the room, space, suite or division.

(Amended during 1998 codification; prior code § 9.08.040)

13.12.240 Unit determination— Nonpermanent, self-contained mobile homes used as domiciles.

All nonpermanent, self-contained, travel or mobile homes, used as a domicile for other than the property owner's family, occupying the same lot or property served with water by the city, shall be charged as one unit, in addition to the property owner's unit charge. Charges made for water to a nonpermanent trailer will be dropped when the city has been notified at the city's office, or in writing, that the trailer has been moved from the property, and no longer supplied with water.

(Amended during 1998 codification; prior code § 9.08.050)

13.12.250 Unmetered water rates.

The city shall charge for unmetered water delivered to any public or private customer as follows:

A. Water for commercial: regular city rates;

B. Water for street-sprinkling or flushings, and other nondomestic or noncommercial uses: three dollars and fifty cents ($3.50) per one thousand (1,000) gallons;

C. Water for park purposes: regular city rates.

(Amended during 1998 codification; prior code § 9.08.060)

Shasta Lake, California, Code of Ordinances >> Title 13 - PUBLIC SERVICES >> Chapter 13.12 - WATER SERVICE SYSTEM >> Article III. Fire Protection Services >>

Article III. Fire Protection Services

13.12.260 Fire hydrants—Placement and maintenance.

Fire hydrants shall be placed, maintained and repaired by the Shasta Lake fire protection district and/or the city.

(Amended during 1998 codification; prior code § 9.12.010)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.270 Fire hydrants—Opening and use restrictions.

Fire hydrants are provided for the sole purpose of extinguishing fires, and shall be opened and used by the city water department and the Shasta Lake fire protection district, or such persons as may be authorized to do so by the public works director and/or the fire chief, respectively, in accordance with the provisions of Chapters 12.04 and 12.08 and Title 13 of this code.

(Amended during 1998 codification; prior code § 9.12.020)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.280 Fire service—Monthly rates—Use of hydrants prohibited when.

A. The monthly rates to be charged and collected for service used for unmetered fire protection shall be as follows:

2 inch pipe or less .....$ 5.00

3 inch pipe or less 10.00

4 inch pipe or less 15.00

6 inch pipe or less 20.00

8 inch pipe or less 25.00

10 inch pipe or less 30.00

B. In no case shall private fire hydrants be used for other purposes than fire protection. Violation of this rule will be cause for water service to be discontinued to the premises.

C. No charge will be made for private fire protection where water used passes through a metered service.

(Prior code § 9.12.030)

13.12.290 Private fire protection services and charges.

Private fire protection, when installed by the city, shall be installed at the expense of the applicant at city cost. Such services shall be used only in case of fire. Any person using such fire service for other than fire purposes shall be subject to the penalty provisions contained in Section 1.16.010 for each such use. Additionally, the city is authorized to enforce this provision by cutting off all water from the property where such use occurs. When water is cut off by virtue of this provision, no further water shall be served to such property until any estimated water consumption and penalties have been paid, plus the turn-on charges in accordance with Sections 13.04.330, 13.04.370 and 13.04.380 of this title.

(Amended during 1998 codification; prior code § 9.12.040)
(Ord. No. 12-228, § 1, 9-4-2012)

Article IV. Water Main Extensions

13.12.300 Agreement and charge for installation.

In general, whenever extension of a water main within the city boundaries is required because a principal part of the premises to be served does not lie along an available water main with adequate capacity and proper pressure, the extension will be installed after an agreement has been executed by the applicant and the city, and the applicable charge paid by the applicant. The manner of determining this charge is set forth in this chapter.

(Amended during 1998 codification; prior code § 9.16.010)

13.12.310 Installation—By owner or city— Specifications and costs.

A. A water main extension may be installed by the city at its option, or the city may require the applicant to install the water main extension.

B. In the case of an applicant installation, the material installed and the work performed must comply with the specifications furnished by the city, and shall be subject to city inspection at all times. The applicant will be required to pay for all inspection services.

C. Upon completion of the installation in accordance with the agreement, title to the extension shall be transferred to the city by the applicant upon acceptance of the extension by the city.

(Amended during 1998 codification; prior code § 9.16.020)

13.12.320 Specifications determined by city.

The specifications, point of commencement, charge to the applicant, and all other requirements for main extensions shall be determined by the city, with proper allowance being made for future demand.

(Amended during 1998 codification; prior code § 9.16.030)

13.12.330 Financing by city when.

Main extensions installed for general improvement of the distribution system will be financed by the city. Such improvements will not be installed upon the request of one or more applicants to serve a particular premises.

(Amended during 1998 codification; prior code § 9.16.040)

13.12.340 Charges to applicants for main extensions—Determination.

A. In general, the following provisions shall be in effect for determining the charges to the applicant for a main extension:
   1. The maximum length of main extension for which the applicant will be required to pay shall not exceed the distance from the location of service to the nearest available main six inches or larger in diameter with adequate capacity and under proper pressure to supply the expected demand. However, the applicant will be required to pay for extension of mains to front completely the premises to be served.
   2. The charge shall be for an extension adequate to serve the applicant, but shall not be less than the charge for installing a main six inches in diameter, and appurtenant structures and costs.
   3. The city will sustain that portion of the cost for an extension which exceeds the charge for the main required to serve the development proposed. The city may require a guarantee of revenue whenever enlargement of existing facilities is needed behind the point of commencement of an extension.

B. When a main extension is requested by a property owner for fire service, the extension will be paid in full by the property owner (owners) requesting the extension.

C. When the city determines to install water main extensions and the extension benefits the water distribution system as a whole and offers a particular benefit to adjacent property owners:
   1. The city shall install the extension.
   2. Thirty (30%) percent of the construction cost will be attributed to any adjacent properties specially benefited by the extension. This portion will be distributed to the specially benefited adjacent properties based on each property's linear foot frontage as it relates to the total footage of the extension.
   3. Payment from the specially benefited properties will be due when the property connects to the water system and will be paid along with the then existing fees and charges required of all new meters.
   4. In the event a property owner can demonstrate that the owner's property was benefited less than the share of costs attributed to the property, the city council may reduce the share of costs to the appropriate amount.

(Amended during 1998 codification; prior code § 9.16.050)
(Ord. No. 12-228, § 1, 9-4-2012)

13.12.350 Front foot charges—Requirements and procedures.

A. The city will collect a front foot charge, where applicable, before granting a standard service or a private fire service to premises which lie along and may be served directly from any main extension installed under the provisions of this chapter. The front foot charge for a main extension shall be in effect for a period of twenty (20) years from the date of execution of the contract, if the extension is installed by the applicant. This provision shall apply to all water mains installed under contracts executed on or after the effective date of the ordinance codified in Chapters 12.04, 12.08 and Title 13 of this code.

B. The front foot charge shall not be applied more than once to any premises. Except for unusual conditions, premises already served at the date of installation of the extension will be excluded in determining the front foot charge.

C. If a main extension is installed by an applicant, the front foot charge will be determined by dividing the charge for the extension by the front footage of all premises which lie along and may be served directly from the extension.

(Amended during 1998 codification; prior code § 9.16.060)

13.12.360 Front foot charges—Refund conditions.

A. The applicant who has financed a main extension (or his or her assigns) is entitled to the front foot charges collected by the city on such extension where it is necessary for the city to connect a standard service or a private fire service to such extension. The amounts collected will be refunded without interest within ninety (90) days following the date of collection.

B. No front foot charge refunds will be made after twenty (20) years from the date of execution of the contract for an applicant-installed extension, except those refunds which have accrued during such twenty (20) year period.

C. The total amount of all refunds made by the city to the applicant (or his or her assigns) may not exceed the charge to the applicant, computed as if the installation were made by the city.

(Amended during 1998 codification; prior code § 9.16.070)

Article V. Cross-Connection Control

13.12.370 Purpose of chapter provisions.

The purpose of this chapter is to:

A. Protect the public potable water supply of the city from the possibility of contamination or pollution by isolating within its customers' internal distribution system(s), or within its customers' private water system(s) such contaminants or pollutants which could backflow or back-siphon into the public water supply system;

B. Promote the elimination or control of existing cross-connections, actual or potential, between its customers' in-plant potable water system(s) and nonpotable water systems, plumbing fixtures and industrial piping systems;

C. Provide for the maintenance of a continuing program of cross-connection control which will systematically and effectively prevent the contamination or pollution of all potable water systems.

(Amended during 1998 codification; prior code § 9.20.010)

13.12.380 Responsibility for city adherence to regulations.

The city manager shall be responsible for the protection of the public potable water distribution system from such contamination or pollution as could otherwise be caused by the backflow or back-siphonage of contaminants or pollutants through the water service connections. The city manager shall further be responsible for the city's adherence, where possible, to Regulations Relating to Cross-Connections, as contained in the California Administrative Code, Title 17; Public Health, Chapter 5; Sanitation (Environmental), Subchapter 1; Engineering (Sanitary), Group 4, Drinking Water Supplies.

(Amended during 1998 codification; prior code § 9.20.020)

13.12.390 Authority to order installation of backflow prevention devices.

If, in the judgment of the city manager, an approved backflow prevention device is required for the safety of the water system at the city's water service connection to any customer's premises, the city manager or his or her designated agent shall give notice in writing to such customer, ordering the customer to install such approved backflow prevention device at each service connection to his or her premises. The customer shall, within thirty (30) calendar days following delivery of the written notice, install, or cause to be installed, such approved device or devices at the customer's expense, and failure, refusal or inability on the part of the customer to install, or cause to be installed, such device or devices within that period of time shall constitute a ground for discontinuing water service to the customer's premises until such device or devices have been properly installed.

(Amended during 1998 codification; prior code § 9.20.030)

13.12.400 Water-shortage emergency.

By resolution adopted after a noticed public hearing, the council may declare a water shortage emergency. During the period of the water-shortage emergency the following restrictions shall apply to all city customers:

A. Use of potable water to irrigate turf, ground cover, shrubbery, crops, vegetation, and trees in such a manner as to result in runoff for more than five minutes;

B. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety;

C. Allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break;

D. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket, except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment;

E. No restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested;

F. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where nonpotable or recycled water is sufficient;

G. Use of potable water for sewer system maintenance or fire protection training without prior approval by the city engineer;

H. Use of potable water to fill or maintain levels in swimming pools, decorative fountains, ponds or evaporative coolers unless a recycling system is used.

In addition, the council may adopt by resolution other restrictions necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

(Ord. 08-194 § 1 (part))

13.12.401 Enforcement.

Any customer violating the regulations and restrictions on water use set forth in this chapter shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the city may cause a flow-restrictor to be installed in the service. If a flow-restrictor is placed, the violator shall pay the cost of installation and removal. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the county district attorney's office for prosecution. The city may also disconnect the water service. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the city council.

(Ord. 08-194 § 1 (part))

13.12.402 Penalty for violations.

Except as provided in the enforcement section for the first and second violations, any person, firm, partnership, association, corporation, or political entity violating or causing or permitting the violation of any of the provisions of this section or providing false information to the city in response to city requests for information needed by the city to calculate consumer water allotments shall be guilty of a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days or by a fine not exceeding one thousand dollars ($1,000.00) or both. Each separate day or portion thereof in which any violation occurs or continues without a good faith effort by the responsible party to correct the violation shall constitute a separate offense and, upon conviction thereof, shall be separately punishable.

(Ord. 08-194 § 1 (part))

13.12.403 Appeals.

Variances from the requirements of this section may be granted by the city council only after denial of a variance request by the city manager. Appeals of variance request denials shall be made in writing to the city clerk at least two weeks prior to the meeting at which they will be heard. Upon granting any appeal, the city council may impose any conditions it determines to be just and proper. Variances granted by the city council shall be prepared in writing, and furnished to the applicant. The city council may require it to be recorded at applicant's expense.

(Ord. 08-194 § 1 (part))

13.12.404 Remedies/cumulative.

The remedies available to the city to enforce this chapter are in addition to any other remedies available under the city's code or any state statutes or regulations, and do not replace or supplant any other remedy, but are cumulative.

(Ord. 08-194 § 1 (part))

Attachment C

Measurement Device Documentation

Badger Meter

Recordall® Cold Water Bronze Disc Meter

Size 5/8 x 3/4" (DN 15mm)

NSF/ANSI Standard 61 Certified, Annex G

DESCRIPTION

Badger Meter offers the Recordall Disc meter in Cast Bronze and a Lead-Free Alloy. The Lead-Free Alloy (Trade designation: M25-LL) version has been certified to comply with NSF/ANSI Standard 61, Annex G and carries the NSF-61 Mark on the housing. All components of the Lead-Free Alloy meter, i.e., disc, chamber, housing, seals, etc. comprise the certified system.

APPLICATIONS: For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

OPERATION: Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc, which moves freely, nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train reduces the disc nutations into volume totalization units displayed on the register dial face.

OPERATING PERFORMANCE: The Badger Meter Recordall Disc meters meet or exceed registration accuracy for the low flow rates (95%), normal operating flow rates (100 ± 1.5%), and maximum continuous operation flow rates as specifically stated by AWWA Standard C700.

CONSTRUCTION: Badger Meter Recordall Disc meter construction, which complies with ANSI/AWWA standard C700, consists of three basic components: meter housing, measuring chamber, and permanently sealed register. The water meter is available in bronze and lead-free alloy with externally-threaded spuds. A corrosion-resistant engineered polymer material is used for the measuring chamber.

To simplify maintenance, the register, measuring chamber, and strainer can be replaced without removing the meter housing from the installation. No change gears are required for accuracy calibration. Interchangeability of parts among like-sized meters also minimizes spare parts inventory investment.

MAGNETIC DRIVE: Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling for straight-reading, remote or automatic meter reading options.

SEALED REGISTER: The standard register consists of a straight-reading odometer-type totalization display, 360° test circle with center sweep hand and flow finder to detect leaks. Register gearing consists of self-lubricating engineered polymer gears to minimize friction and provides long life. Permanently sealed; dirt, moisture, tampering and lens fogging problems are eliminated. Multi-position register simplifies meter installation and reading. Automatic meter reading systems are available for all Recordall Disc meters. All reading options are removable from the meter without disrupting water service.

TAMPER-PROOF FEATURES: Customer removal of the register to obtain free water can be prevented when the optional tamper detection seal wire screw or TORX® tamper resistant seal screw is added to the meter. Both can be installed at the meter site or at the factory.

MAINTENANCE: Badger Meter Recordall Disc meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location. As an alternative to repair by the utility, Badger Meter offers various maintenance and meter component exchange programs to fit the needs of the utility.

CONNECTIONS: Tailpieces/Unions for installations of meters on various pipe types and sizes, including misaligned pipes, are available as an option.

Model 25

SPECIFICATIONS

Typical Operating Range (100% ± 1.5%)	1/2 - 25 GPM (.11 to 5.7 m^3/hr)
Low Flow (Min. 98.5%)	1/4 GPM (.057 m^3/hr)
Maximum Continuous Operation	15 GPM (3.4 m^3/hr)
Pressure Loss at Maximum Continuous Operation	2.8 PSI at 15 GPM (0.19 bar at 3.4 m^3/hr)
Maximum Operating Temperature	80°F (26°C)
Maximum Operating Pressure	150 PSI (10 bar)
Measuring Element	Nutating disc, positive displacement
Register Type	Straight reading, permanently sealed magnetic drive standard. Remote reading or Automatic Meter Reading units optional.
Register Capacity	10,000,000 Gallons, 1,000,000 Cubic Feet, 100,000 m^3. 6 odometer wheels.
Meter Connections	Available in bronze and engineered polymer to fit 3/4" (DN 15mm) spud thread bore diameter sizes. See table below.

METER SPUD AND CONNECTION SIZES

Size Designation	x	"L" Laying Length	"B" Bore Dia.	Coupling Nut and Spud Thread	Tailpiece Pipe Thread (NPT)
5/8" x 3/4"	x	7 1/2"	5/8", 3/4"	1" (3/4")	3/4"

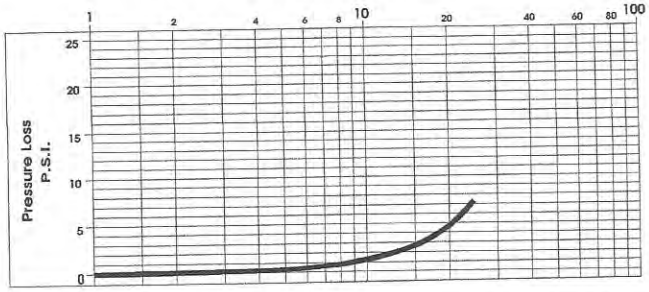
MATERIALS

Meter Housing	Cast Bronze, Lead-Free Alloy
Housing Bottom Plates	Bronze, Cast Iron, Engineered Polymer, Lead-Free Alloy
Measuring Chamber	Engineered Polymer
Disc	Engineered Polymer
Trim	Stainless Steel, Bronze
Strainer	Engineered Polymer
Disc Spindle	Stainless Steel, Engineered Polymer
Magnet	Ceramic, Polymer-Bonded
Magnet Spindle	Stainless Steel, Engineered Polymer
Register Lid and Shroud	Engineered Polymer, Bronze
Generator Housing	Engineered Polymer

Technical Brief

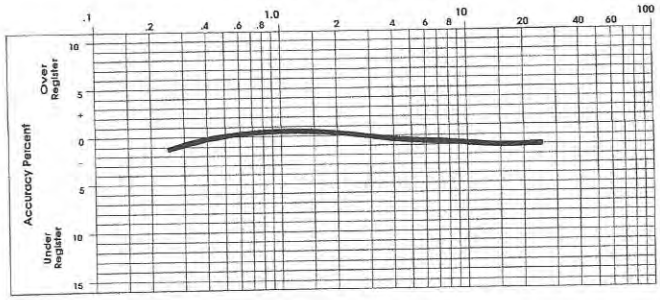
PRESSURE LOSS CHART

Rate of Flow, in Gallons per Minute



ACCURACY CHART

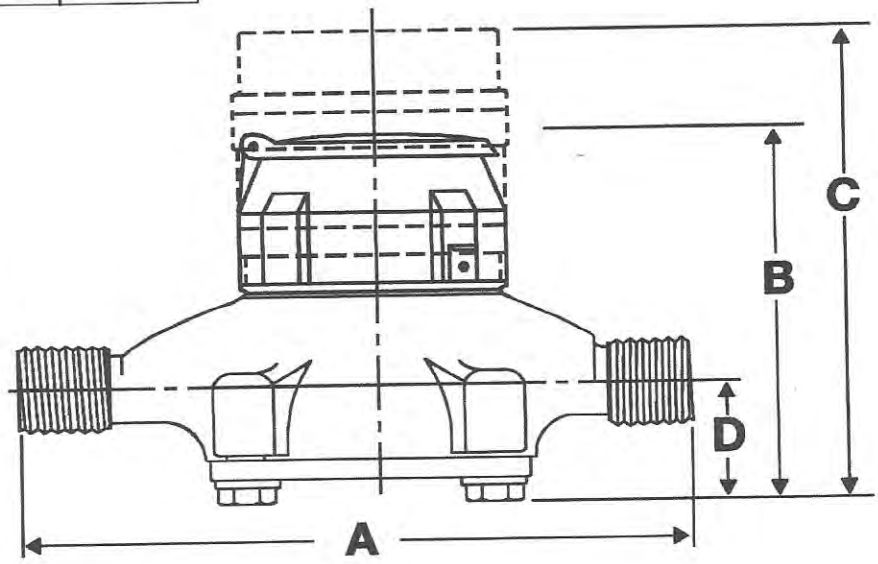
Rate of Flow, in Gallons per Minute



METER SIZE	METER MODEL	A LAYING LENGTH	B HEIGHT REG./RTR	C HEIGHT GEN.	D CENTERLINE BASE	WIDTH	APPROX. SHIPPING WEIGHT
$^{5}/_{8}$X $^{3}/_{4}$" (15mm)	25	$7^{1}/_{2}$" (190mm)	$4^{15}/_{16}$" (125mm)	$6^{5}/_{16}$" (160mm)	$1^{11}/_{16}$" (42mm)	$4^{1}/_{4}$" (108mm)	$4^{1}/_{2}$ lb. (2.0kg)

Sweep Hand Registration

MODEL	GALLON	CU.FT.	CU. METER
M25	10	1	.1/.01



Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists.

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Badger Meter

Recordall® Cold Water Bronze Disc Meter

Size 1" (DN 25mm)

NSF/ANSI Standard 61 Certified, Annex G

DESCRIPTION

Badger Meter offers the Recordall Disc meter in Cast Bronze and a Lead-Free Alloy. The Lead-Free Alloy (Trade designation: M55-LL) version has been certified to comply with NSF/ANSI Standard 61, Annex G and carries the NSF-61 Mark on the housing. All components of the Lead-Free Alloy meter, i.e., disc, chamber, housing, seals, etc. comprise the certified system.

APPLICATIONS: For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

OPERATION: Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc, which moves freely, nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train reduces the disc nutations into volume totalization units displayed on the register dial face.

OPERATING PERFORMANCE: The Badger Meter Recordall Disc meters meet or exceed registration accuracy for the low flow rates (95%), normal operating flow rates (100 ± 1.5%), and maximum continuous operation flow rates as specifically stated by AWWA Standard C700.

CONSTRUCTION: Badger Meter Recordall Disc meter construction, which complies with ANSI/AWWA standard C700, consists of three basic components: meter housing, measuring chamber, and permanently sealed register. The water meter is available in bronze and Lead-Free Alloy with externally-threaded spuds. A corrosion-resistant engineered polymer material is used for the measuring chamber.

To simplify maintenance, the register, measuring chamber, and strainer can be replaced without removing the meter housing from the installation. No change gears are required for accuracy calibration. Interchangeability of parts among like-sized meters also minimizes spare parts inventory investment.

MAGNETIC DRIVE: Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling for straight-reading, remote or automatic meter reading options.

SEALED REGISTER: The standard register consists of a straight-reading odometer-type totalization display, 360° test circle with center sweep hand and flow finder to detect leaks. Register gearing consists of self-lubricating engineered polymer gears to minimize friction and provides long life. Permanently sealed; dirt, moisture, tampering and lens fogging problems are eliminated. Multi-position register simplifies meter installation and reading. Automatic meter reading systems are available for all Recordall Disc meters. See the back of this sheet for additional information. All reading options are removable from the meter without disrupting water service.

TAMPER-PROOF FEATURES: Customer removal of the register to obtain free water can be prevented when the optional tamper detection seal wire screw or TORX® tamper resistant seal screw is added to the meter. Both can be installed at the meter site or at the factory.

MAINTENANCE: Badger Meter Recordall Disc meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location. As an alternative to repair by the utility, Badger Meter offers various maintenance and meter component exchange programs to fit the needs of the utility.

CONNECTIONS: Tailpieces/Unions for installations of meters on various pipe types and sizes, including misaligned pipes, are available as an option.

Model 55

SPECIFICATIONS

Typical Operating Range (100% ± 1.5%)	1-55 GPM (.23 to 12.5 m³/hr)
Low Flow (Min. 95%)	1/2 GPM (.11 m³/hr)
Maximum Continuous Operation	40 GPM (9.1 m³/hr)
Pressure Loss at Maximum Continuous Operation	3.4 PSI at 40 GPM (.23 bar at 9.1 m³/hr)
Maximum Operating Temperature	80°F (26°C)
Maximum Operating Pressure	150 PSI (10 bar)
Measuring Element	Nutating disc, positive displacement
Register Type	Straight reading, sealed magnetic drive standard. Remote reading or Automatic Meter Reading units optional.
Register Capacity	10,000,000 Gallons, 1,000,000 Cubic Feet, 100,000 m³, 6 odometer wheels.
Meter Connections	Available in bronze and engineered polymer to fit 1" (DN 25mm) spud thread bore diameter sizes. See table below.

METER SPUD AND CONNECTION SIZES

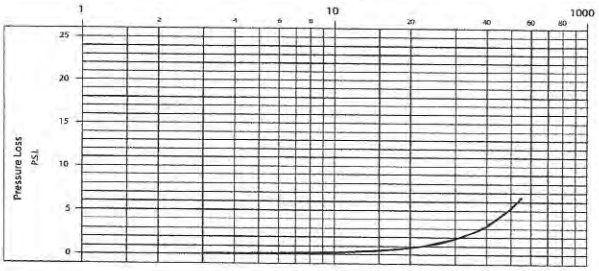
Size Designation	x	"L" Laying Length	"B" Bore Dia.	Coupling Nut and Spud Thread	Tailpiece Pipe Thread (NPT)
1"	x	10 3/4"	1"	1 1/4" (1")	1"

MATERIALS

Meter Housing	Cast Bronze, Lead-Free Alloy
Housing Bottom Plates	Bronze, Cast Iron, Lead-Free Alloy
Measuring Chamber	Engineered Polymer
Disc	Engineered Polymer
Trim	Stainless Steel, Bronze
Strainer	Engineered Polymer
Disc Spindle	Engineered Polymer
Magnet	Polymer Bonded
Magnet Spindle	Engineered Polymer
Register Lid and Shroud	Engineered Polymer, Bronze
Generator Housing	Engineered Polymer

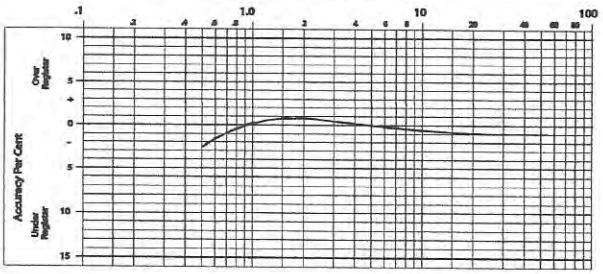
PRESSURE LOSS CHART

Rate of Flow, in Gallons per Minute



ACCURACY CHART

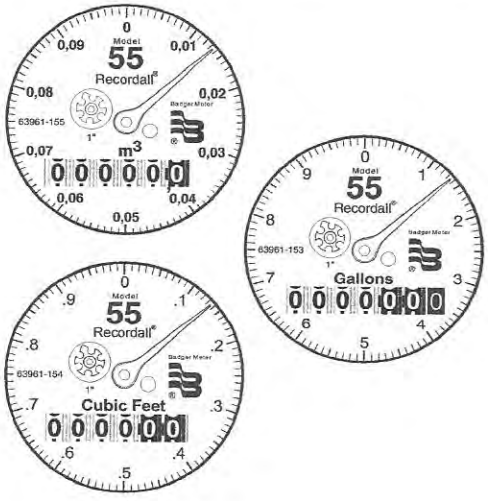
Rate of Flow, in Gallons per Minute

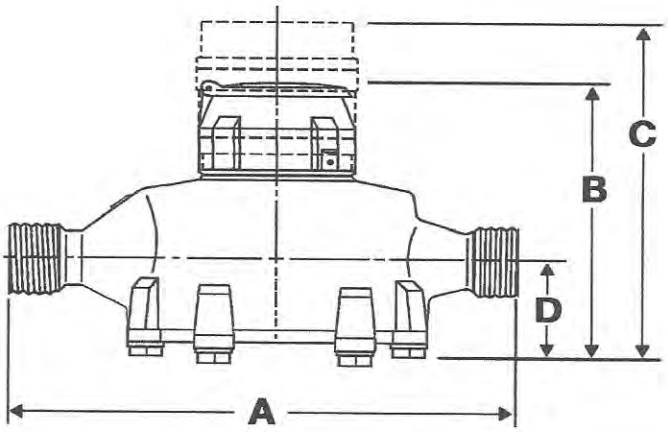


METER SIZE	METER MODEL	A LAYING LENGTH	B HEIGHT REG./RTR	B HEIGHT TO ADE	C HEIGHT GEN.	D CENTERLINE TO BASE	WIDTH	METER WEIGHT
1" (25mm)	55	10 3/4" (273mm)	6" (152mm)	6 1/2" (165mm)	7 3/8" (187mm)	2 1/32" (52mm)	6 1/4" (159mm)	8.75 lbs.

Sweep Hand Registration

MODEL	GALLON	CU.FT.	CU. METER
M55	10	1	.1





Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists.

Badger Meter | **P.O. Box 245036, Milwaukee, Wisconsin 53224-9536**
800-876-3837 | infocentral@badgermeter.com | www.badgermeter.com

Recordall® Disc Meters

Lead-Free Bronze Alloy Models 120 & 170, Sizes 1-1/2" (40 mm) & 2" (50 mm), NSF/ANSI Standards 61 and 372 Certified

DESCRIPTION

The Recordall Models 120 and 170 Disc Series meters meet or exceed the most recent revision of AWWA Standard C700 and are available in a lead-free bronze alloy. Both meters comply with the lead-free provisions of the Safe Drinking Water Act, are certified to NSF/ANSI Standards 61 and 372 (Trade Designations: M120-LL and M170LL) and carry the NSF-61 mark on the housing. All components of the lead-free bronze alloy meter (housing, measuring element, seals, and so on) comprise the certified system.

Applications: For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

Operation: Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc, which moves freely, nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train reduces the disc nutations into volume totalization units displayed on the register or encoder face.

Operating Performance: The Recordall Disc Series meters meet or exceed registration accuracy for the low flow rates (95%), normal operating flow rates (100 ± 1.5%), and maximum continuous operation flow rates as specifically stated in AWWA Standard C700.

Construction: Recordall Disc meter construction, which complies with ANSI/AWWA standard C700, consists of three basic components: meter housing, measuring chamber, and permanently sealed register or encoder. The water meter is available in a lead-free bronze alloy. A corrosion-resistant engineered polymer material is used for the measuring chamber.

Magnetic Drive: Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling for straight-reading or AMR/AMI meter reading options.

Tamper-Proof Features: Unauthorized removal of the register or encoder is inhibited by the option of a tamper detection seal wire screw, TORX® tamper-resistant seal screw or the proprietary tamper-resistant keyed seal screw. Each can be installed at the meter site or at the factory.

Maintenance: Badger Meter Recordall Disc Series meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location.

To simplify maintenance, the register, measuring chamber, and strainer can be replaced without removing the meter housing from the installation. No change gears are required for accuracy calibration. Interchangeability of parts among like-sized meters minimizes spare parts inventory investment. The built-in strainer has an effective straining area of twice the inlet size.

Connections: Companion flanges in cast iron or NL bronze are available as options. Straight connection sets are available in NL bronze.

M120 M170

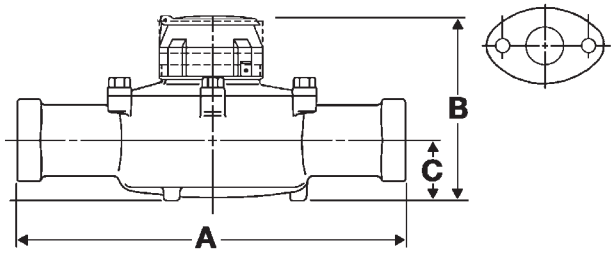
SPECIFICATIONS

Meter Model	M120	M170
Typical Operating Range (100% ± 1.5%)	2.5…120 gpm (0.57…27 m^3/hr)	2.5…170 gpm (0.57…39 m^3/hr)
Low Flow (Min. 95%)	1.25 gpm (0.28 m^3/hr)	1.5 gpm (0.34 m^3/hr)
Maximum Continuous Operation	80 gpm (18 m^3/hr)	100 gpm (23 m^3/hr)
Pressure Loss at Maximum Continuous Operation	4.8 psi at 80 gpm (0.33 bar at 18 m^3/hr)	3.3 psi at 100 gpm (0.23 bar at 23 m^3/hr)
Maximum Operating Temperature	80° F (26° C)	80° F (26° C)
Maximum Operating Pressure	150 psi (10 bar)	150 psi (10 bar)
Measuring Element	Nutating disc, positive displacement	Nutating disc, positive displacement
Meter Connections	1-1/2" AWWA two-bolt elliptical flange, drilled or 1-1/2…11-1/2 NPT internal pipe threads	2" AWWA two-bolt elliptical flange, drilled or 2…11-1/2 NPT internal pipe threads
Test Plugs	Optional 1" NPT test plug (TP)	Optional 1" NPT test plug (TP)

Materials

Meter Housing	Lead-free bronze alloy
Housing Top Plates	Lead-free bronze alloy
Measuring Chamber	Engineered polymer
Disc	Engineered polymer
Trim	Stainless steel
Strainer	Engineered polymer
Disc Spindle	Stainless steel
Magnet	Ceramic
Magnet Spindle	Stainless steel
Register Lid and Shroud	Engineered polymer, bronze

DIMENSIONS



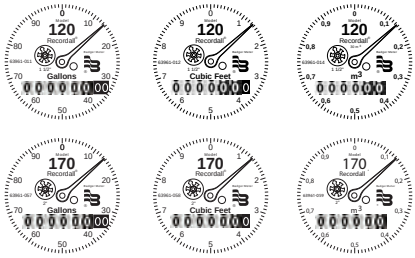
Meter Size	Meter Model	A Laying Length	B Height Reg./RTR	C Centerline Base	Width	Approx. Shipping Weight
1-1/2" (40 mm)	120 EL, Hex 120 EL, TP	12-5/8" (321 mm)	7" (178 mm)	2-3/8" (60 mm)	8-3/4" (222 mm)	19 lb (8.6 kg)
1-1/2" (40 mm)	120 ELL 120 ELL, TP	13" (330 mm)	7" (178 mm)	2-3/8" (60 mm)	8-3/4" (222 mm)	19 lb (8.6 kg)
2" (50 mm)	170 EL, Hex 170 EL, TP	15-1/4" (387 mm)	8" (203 mm)	2-7/8" (73 mm)	9-1/2" (241 mm)	30 lb (13.6 kg)
2" (50 mm)	170 ELL 170 ELL, TP	17" (432 mm)	8" (203 mm)	2-7/8" (73 mm)	8-1/2" (241 mm)	30 lb (13.6 kg)

EL = Elliptical | ELL = Elliptical Long | Hex = Hexagon, 1-1/2…11-1/2" NPT Thread | TP=Test Plug 1"

REGISTERS / ENCODERS

Standard—Sweep-Hand Registration

The standard register is a straight-reading, permanently sealed magnetic drive register. Dirt, moisture, tampering and lens fogging problems are eliminated. The register has a six-odometer wheel totalization display, 360° test circle with center sweep hand, and flow finder to detect leaks. Register gearing is made of self-lubricating engineered polymer, which minimizes friction and provides long life. The multi-position register simplifies meter installation and reading. The register capacity is 10,000,000 gallons (1,000,000 ft³, 100,000 m³).



Meter Model	Gallon	Cubic Feet	Cubic Meter
120	100	10	1/0.1
170	100	10	1

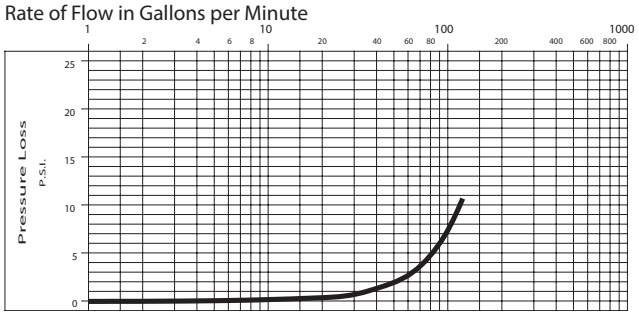
Optional—Encoders for AMR/AMI Reading Solutions

AMR/AMI solutions are available for all Recordall Disc Series meters. All reading options can be removed from the meter without disrupting water service. Badger Meter encoders provide years of reliable, accurate readings for a variety of applications and are also available pre-wired to Badger Meter approved AMR/AMI solutions. See details at **www.badgermeter.com**.

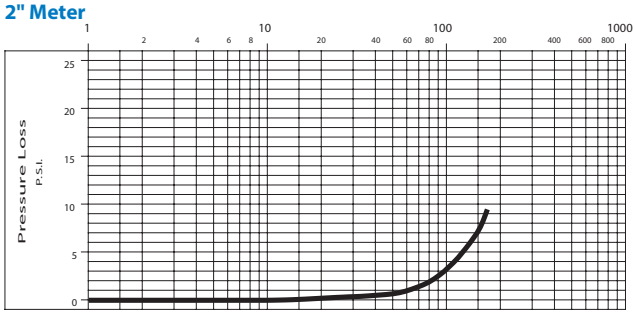
PRESSURE LOSS CHARTS

1-1/2" Meter

Rate of Flow in Gallons per Minute



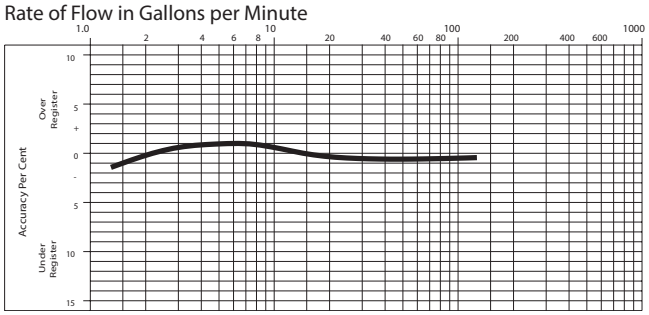
2" Meter



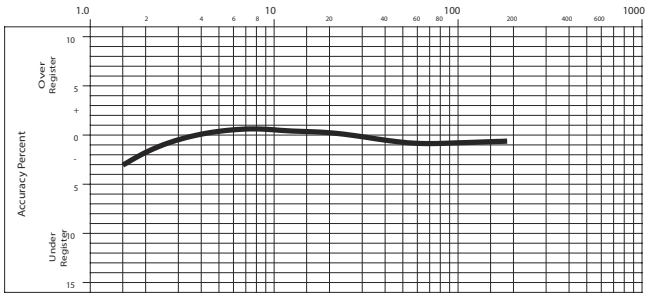
ACCURACY CHARTS

1-1/2" Meter

Rate of Flow in Gallons per Minute



2" Meter



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Legacy Document Numbers: RDM-DS-00071-EN and RDM-DS-00072-EN

Recordall® Turbo Series Meters

Models 160 (1-1/2"), 200 (2"), 450 (3"), 1000 (4"), 2000 (6"), 3500 (8"), 5500 (10"), & 6200 (12"); NSF/ANSI Standards 61 and 372 Certified

DESCRIPTION

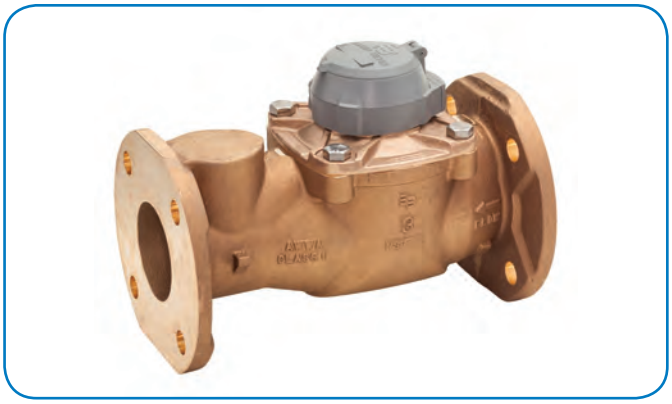
Recordall Turbo Series meters meet or exceed the most recent revision of AWWA Standard C701 Class II Standards and are available in a lead-free bronze alloy for sizes 1-1/2" through 10" and cast iron for 12" meters. Turbo Series meters comply with the lead-free provisions of the Safe Drinking Water Act. Sizes 1-1/2" through 10" meters are also certified to NSF/ANSI Standards 61 and 372 (Trade Designation: Turbo Series LL-NS) and carry the NSF-61 mark on the housing. All components of the lead-free alloy meter (housing, measuring element, seals and so on) comprise the certified system.

Models 160 through 6200 are designed for 1-1/2" through 12" applications. These meters feature:

- Direct coupled turbine based on an exclusive "floating rotor" design that reduces bearing friction—and associated wear and tear.
- Low pressure loss for improved system efficiency.
- Exceptional registration accuracy across low flow rate, normal operating flow rate and maximum continuous operation flow.
- Permanently sealed, tamper-resistant register or encoder.
- Integral strainer option for sizes 1-1/2" through 4" help protect your system from damaging debris and related downtime.
- Meters and encoders are compatible with Badger Meter AMR/AMI meter reading systems and other approved reading technologies.

Applications: Recordall Turbo Series meters are designed for cold water, commercial and industrial applications where flows are consistent medium to high flows. Applications include hotels, apartment buildings, irrigations centers and manufacturing and processing plants. Turbo Series meters help reduce day-to-day maintenance costs while delivering accurate and efficient performance.

Operation & Performance: Direct magnetic drive is achieved when the magnet carrier is driven by a gear train coupled to the rotor. The gear train consists of two sets of gears connected by a vertical transmission shaft. One gear set is at the magnet carrier, the other is a worm gear set at the rotor shaft. When water flows into the Turbo Series meter measuring element, it contacts the multi-vaned rotor. The resulting rotor rotation is then transmitted by magnetic coupling to a sealed register or encoder. The direct magnetic drive is built to provides a reliable meter-to-registration coupling.



Tamper-Proof Features: Unauthorized removal of the register or encoder is inhibited by the option of a tamper detection seal wire screw, TORX® tamper-resistant seal screw or the proprietary tamper-resistant keyed seal screw. Each can be installed at the meter site or at the factory.

Construction: The Recordall Turbo Series meter is constructed in compliance with ANSI and AWWA C701 standards. It consists of the following basic components: meter housing, interchangeable, unitized measuring element and permanently sealed direct reading registers or encoders.

The measuring element consists of the transmission coupling, rotor, inlet and outlet straightening vanes with nose cones, and calibration ring assembly. The unique inlet and outlet straightening vanes minimize swirl from piping arrangements upstream as well as downstream.

A strainer is recommended to help ensure optimal flow conditioning and protection for the measuring element. An integral strainer is available as an option for 1-1/2" through 4" meter sizes. The stainless steel strainer is built into the inlet end and includes a removable cover plate to permit easy access for routine cleaning. External strainers are available in sizes 2" through 12".

To simplify maintenance, the registers or encoders and measuring elements can be removed without removing the meter housing. Interchangeability of certain parts between meters also minimizes spare parts inventory investment.

Meter Installation: The meter is designed for installations where flow is in one direction only. Companion flanges for installation of meters on various pipe types and sizes are available in cast iron or NL bronze as an option. See the Recordall Turbo Series Meters User Manual for specific instructions.

SPECIFICATIONS

Turbo Series Model	**160** 1-1/2" (40 mm)	**200** 2" (50 mm)	**450** 3" (80 mm)	**1000** 4" (100 mm)	**2000** 6" (150 mm)	**3500** 8" (200 mm)	**5500** 10" (250 mm)	**6200** 12″ (300 mm)
Meter Flanges AWWA 125 Pound Class	Elliptical	Elliptical or Round	Round	Round	Round	Round	Round	Round AWWA 125 lb class
Typical Operating Range (100% ± 1.5%)	4…200 gpm (0.9…45.4 m^3/h)	4…310 gpm (0.9…70.4 m^3/h)	5…550 gpm (1.1…124.9 m^3/h)	10…1250 gpm (2.3…284 m^3/hr)	20…2500 gpm (4.5…568 m^3/h)	30…4500 gpm (6.8…1022 m^3/h)	50…7000 gpm (11.4…1590 m^3/h)	90…8800 gpm (20.5…1998 m^3/h)
Typical Low Flow (95% min.)	2.5 gpm (0.6 m^3/h)	2.5 gpm (0.6 m^3/h)	4 gpm (0.9 m^3/h)	6 gpm (1.4 m^3/h)	12 gpm (2.7 m^3/h)	20 gpm (4.5 m^3/h)	30 gpm (6.8 m^3/h)	65 gpm (14.8 m^3/h)
Max. Continuous Flow	160 gpm (36 m^3/h)	200 gpm (45.4 m^3/h)	450 gpm (102.2 m^3/h)	1000 gpm (227.1 m^3/h)	2000 gpm (454 m^3/h)	3500 gpm (795 m^3/h)	5500 gpm (1250 m^3/h)	6200 gpm (1408 m^3/h)
Maximum Intermittent Flow	200 gpm (45.4 m^3/h)	310 gpm (70.4 m^3/h)	550 gpm (124.9 m^3h)	1250 gpm (284 m^3h)	2500 gpm (568 m^3/h)	4500 gpm (1022 m^3/h)	7000 gpm (1590 m^3h)	8800 gpm (1988 m^3/h)
Pressure Loss at Max. Continuous Flow	3.8 psi (0.26 bar)	3.1 psi (0.21 bar)	1.8 psi (0.12 bar)	7.3 psi (0.50 bar)	4.8 psi (0.33 bar)	2.5 psi (0.17 bar)	1.6 psi (0.11 bar)	0.8 psi (0.05 bar)
Pressure Loss at Max. Continuous Flow: With Integral Strainer	9.9 psi (0.68 bar)	8.3 psi (0.57 bar)	5 psi (0.43 bar)	17.8 psi (1.2 bar)	—			
Max. Operating Pressure	150 psi (10 bar)							
Max. Operating Temperature	120° F (49° C)							
Optional Integral Strainer	Built into inlet end. Removable cover plate permits access to strainer for cleaning.				—			
Optional External Strainer	—	Available for Models 200, 450, 1000, 2000, 3500, 5500 and 6200.						
Test Plug	Standard with integral strainer; optional for other models.				Optional for Models 2000 and 3500.		—	

MATERIALS

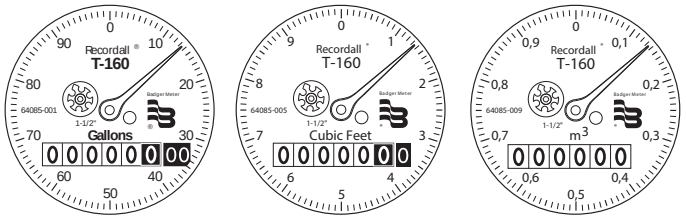
Meter Housing	Lead-free alloy (**EXCEPTION**: Model 6200 meter housing is blue epoxy-coated cast iron)
Turbo Head	Lead-free alloy
Nose Cone & Straightening Vanes	Thermoplastic
Rotor	Thermoplastic
Rotor Radial Bearings	Lubricated thermoplastic
Rotor Thruster Bearing	Sapphire jewels
Rotor Bearing Pivots	Passivated 316 stainless steel
Calibration Mechanism	Stainless steel & thermoplastic
Magnet	Ceramic
Trim	Stainless steel
Register Housing & Cover	Thermoplastic or bronze
Optional Strainer and Trim	Stainless steel

REGISTERS / ENCODERS

Standard—Sweep-Hand Registration

The standard register is a straight-reading, permanently sealed magnetic drive register. Dirt, moisture, tampering and lens fogging problems are eliminated. The register has a six-odometer wheel totalization display, 360° test circle with center sweep hand, and flow finder to detect leaks. Register gearing is made of self-lubricating engineered polymer, which minimizes friction and provides long life. The multi-position register simplifies meter installation and reading. The high-flow register capacity for the 1-1/2", 2", 3" and 4" meters is 100,000,000 gallons (10,000,000 ft^3, 1,000,000 m^3). The high-flow register capacity for the 6", 8", and 10" meters is 1,000,000,000 gallons (100,000,000 ft^3, 10,000,000 m^3). The high-flow register capacity for the 12" meter is 10,000,000,000 gallons (1,000,000,000 ft^3, 10,000,000 m^3).

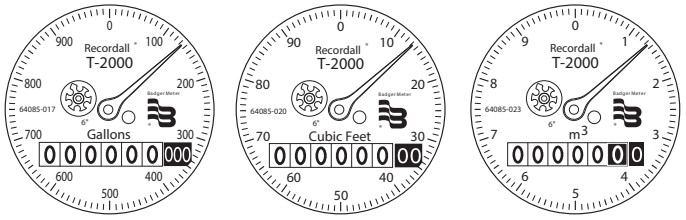
Registers for 1-1/2", 2", 3" and 4" Meters



Sweep Hand Revolution

Meter Model	Gallon	Cubic Feet	Cubic Meter
160	100	10	1
200	100	10	1
450	100	10	1
1000	100	10	1

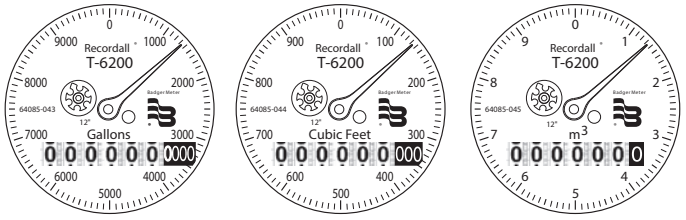
Registers for 6", 8" and 10" Meters



Sweep Hand Revolution

Meter Model	Gallon	Cubic Feet	Cubic Meter
2000	1000	100	10
3500	1000	100	10
5500	1000	100	10

Registers for 12" Meters



Sweep Hand Revolution

Meter Model	Gallon	Cubic Feet	Cubic Meter
6200	10000	1000	10

Optional—Encoders for AMR/AMI Reading Solutions

AMR/AMI solutions are available for all Recordall Disc Series meters. All reading options can be removed from the meter without disrupting water service. Badger Meter encoders provide years of reliable, accurate readings for a variety of applications and are also available pre-wired to Badger Meter approved AMR/AMI solutions. See details at **www.badgermeter.com**.

PHYSICAL DIMENSIONS OF METERS WITHOUT STRAINER

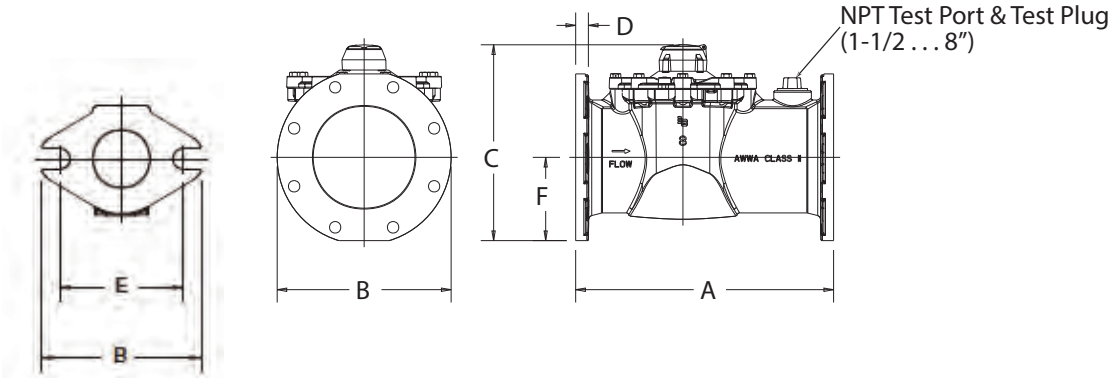


Figure 1: Sample Illustration from 8" Model 3500

Turbo Series Model	160	200	200	450	1000	2000	3500	5500	6200
Meter Flanges	1-1/2" Elliptical	2" Elliptical	2" Round	3" Round	4" Round	6" Round	8" Round	10" Round	12" Round
Meter & Pipe Size	1-1/2" (40 mm)	2" (50 mm)	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
Net Weight	14.3 lb (6.5 kg)	14.9 lb (6.8 kg)	17.4 lb (7.9 kg)	31 lb (14.1 kg)	40 lb (18.1 kg)	77 lb (35 kg)	123 lb (55.7 kg)	210 lb (95.3 kg)	262 lb (118.8 kg)
Shipping Weight	16.8 lb (7.6 kg)	16.4 lb (7.4 kg)	18.9 lb (8.6 kg)	34 lb (15.4 kg)	45 lb (20.4 kg)	89 lb (40.4 kg)	147 lb (66.6 kg)	235 lb (106.6 kg)	286 lb (129.7 kg)
Qty. of Bolts	2	2	4	4	8	8	8	12	12
NPT Test Port & Test Plug (optional)	1" (25.4 mm)	1-1/2" (40 mm)	1-1/2" (40 mm)	2" (50 mm)	2" (50 mm)	2" (50 mm)	2" (50 mm)	—	—
Length (A)	13" (330 mm)	10" (254 mm)	10" (254 mm)	12" (305 mm)	14" (356 mm)	18" (457 mm)	20" (508 mm)	26" (660.4 mm)	19-11/16" (500 mm)
Width (B)	5-7/32" (133 mm)	5-27/32" (148 mm)	6" (152 mm)	7-1/2" (191 mm)	9" (229 mm)	11" (280 mm)	13-1/2" (343 mm)	16" (406.4 mm)	19" (482 mm)
Height (C)	6-9/32" (159 mm)	6-1/2" (165 mm)	7-3/32" (180 mm)	8-11/16" (220 mm)	9-21/32" (245 mm)	13-5/16" (338 mm)	15-3/16" (385 mm)	17-15/32" (443 mm)	19-11/16" (500 mm)
Flange (D)	51/64" (20 mm)	25/32" (20 mm)	5/8" (16 mm)	3/4" (19 mm)	13/16" (21 mm)	7/8" (22 mm)	1" (25 mm)	1-1/16" (27 mm)	1.26" (32 mm)
Bolt Circle (E)	4" (102 mm)	4-1/2" (114 mm)	4-3/4" (121 mm)	6" (152 mm)	7-1/2" (191 mm)	9-1/2" (241 mm)	11-3/4" (298 mm)	14-1/4" (362 mm)	17" (432 mm)
Centerline (F)	1-27/32" (47 mm)	2-1/16" (52 mm)	2-5/8" (67 mm)	3-11/32" (85 mm)	4-5/16" (109 mm)	5-1/4" (133 mm)	6-3/8" (162 mm)	7-7/8" (199.4 mm)	8-7/8" (226 mm)

PHYSICAL DIMENSIONS OF METERS WITH INTEGRAL STRAINER

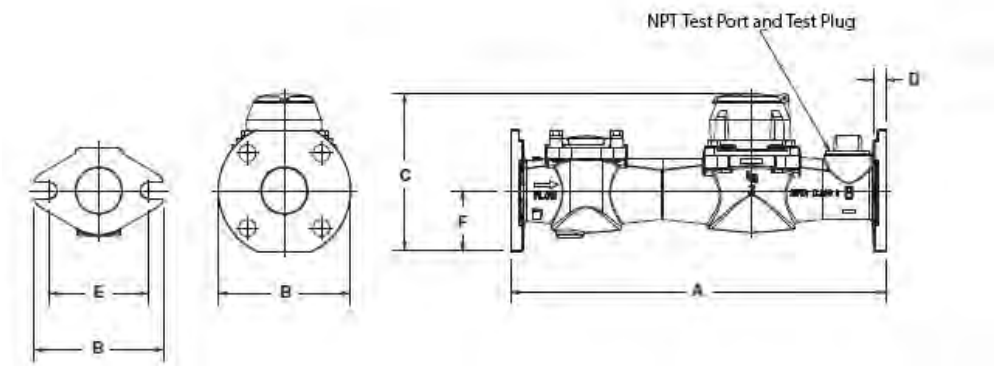
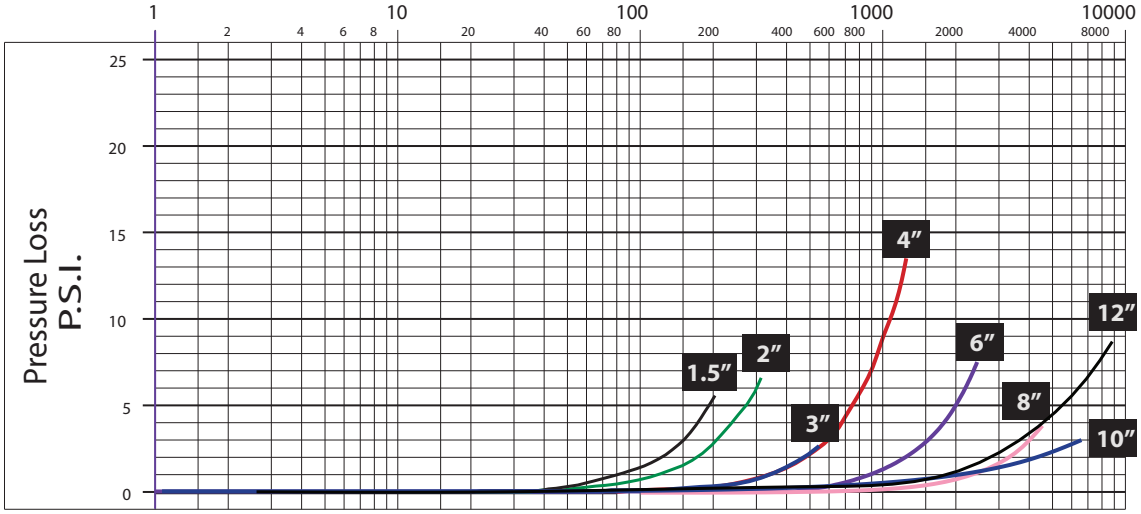


Figure 2: Physical dimensions

Turbo Series Model	160	200	200	450	1000
Meter Flanges	Elliptical	Elliptical	Round	Round	Round
Meter & Pipe Size	1-1/2" (40 mm)	2" (50 mm)	2" (50 mm)	3" (80 mm)	4" (100 mm)
Net Weight	14.3 lb (6.5 kg)	24 lb (11 kg)	26 lb (12 kg)	49 lb (22 kg)	60 lb (27.22 kg)
Shipping Weight	16.8 lb (7.6 kg)	28 lb (13 kg)	30 lb (14 kg)	55 lb (25 kg)	70 lb (31.75 kg)
Number of Bolts	2	2	4	4	8
NPT Test Port & Test Plug (Standard)	1" (25.4 mm)	1-1/2" (40 mm)	1-1/2" (40 mm)	2" (50 mm)	2" (50 mm)
Length (A)	13" (330 mm)	17" (432 mm)	17" (432 mm)	19" (483 mm)	23" (584 mm)
Width (B)	5-7/32" (133 mm)	5-27/32" (148 mm)	6" (152 mm)	7-1/2" (191 mm)	9" (229 mm)
Height (C)	6-9/32" (159 mm)	6-1/2" (165 mm)	7-3/32" (180 mm)	8-15/16" (227 mm)	9-21/32" (245 mm)
Flange (D)	51/64" (20 mm)	27/32" (47 mm)	5/8" (16 mm)	27/32" (21 mm)	13/16" (21 mm)
Bolt Circle (E)	4" (102 mm)	4-1/2" (114 mm)	4-3/4" (121 mm)	6" (152 mm)	7-1/2" (191 mm)
Centerline (F)	1-27/32" (47 mm)	2-1/16" (52 mm)	2-5/8" (67 mm)	3-19/32" (91 mm)	4-5/16" (109 mm)

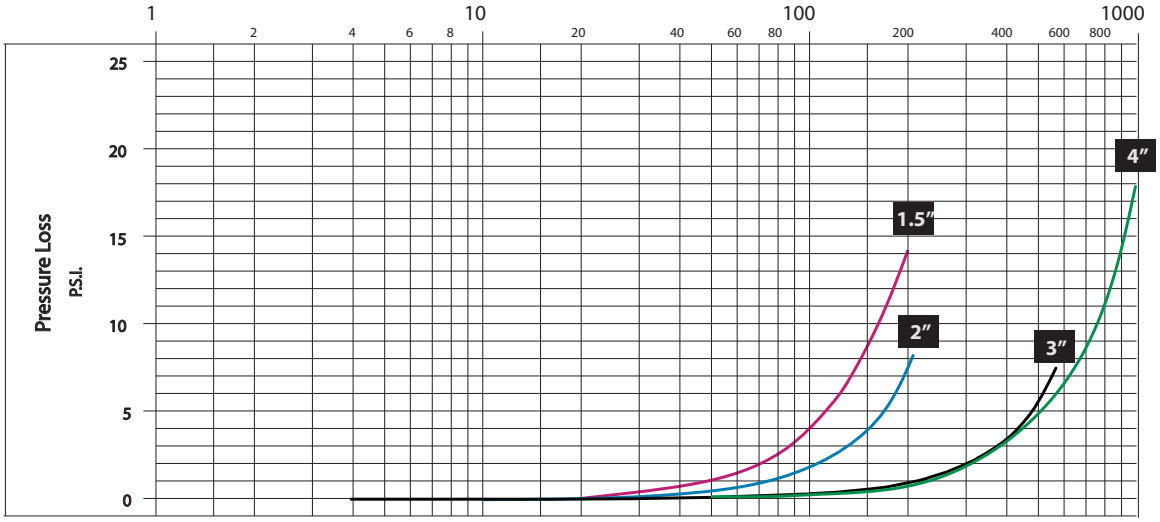
PRESSURE LOSS CHART FOR METERS WITHOUT STRAINER

Rate of flow in gallons per minute (gpm)



PRESSURE LOSS CHART FOR METERS WITH INTEGRAL STRAINER

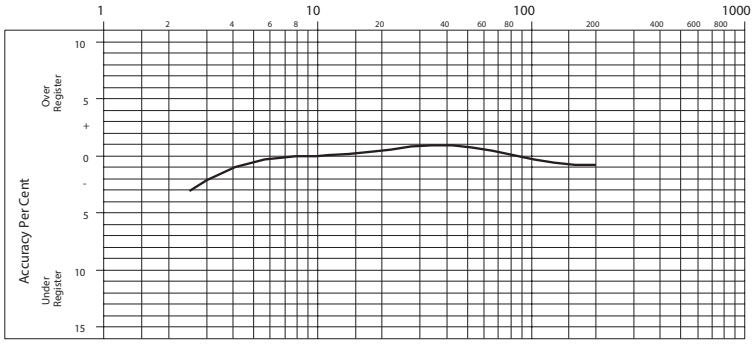
Rate of flow in gallons per minute (gpm)



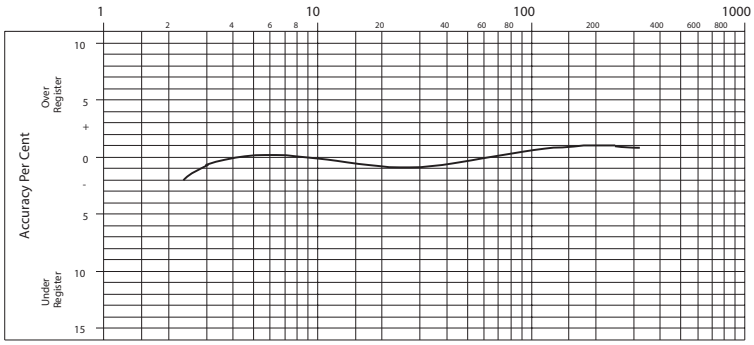
ACCURACY CHARTS FOR METERS WITHOUT STRAINER

Rate of flow in gallons per minute (gpm)

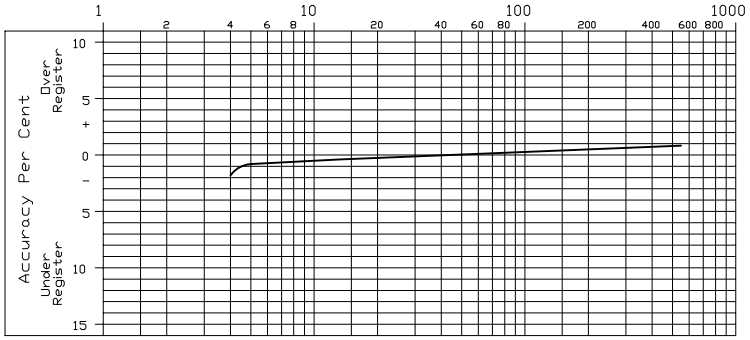
1-1/2" Meter



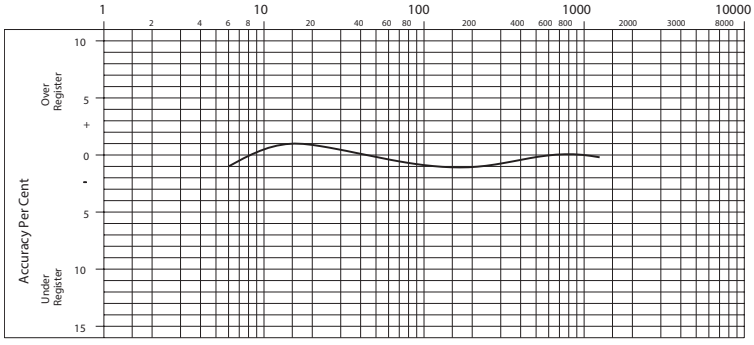
2" Meter



3" Meter



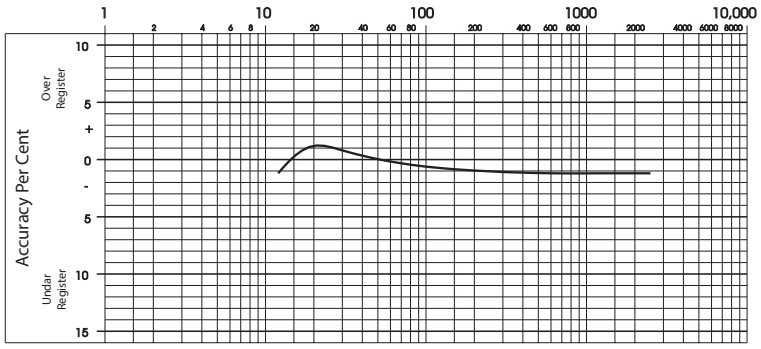
4" Meter



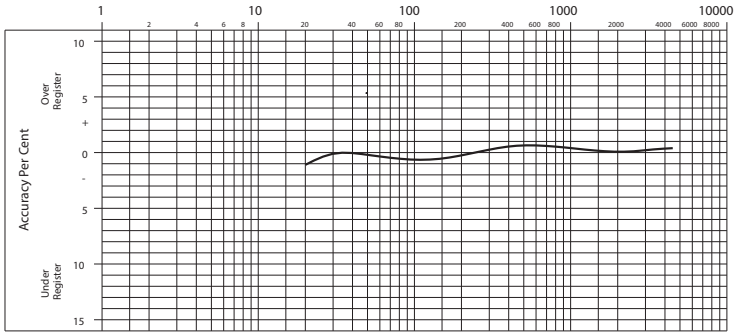
ACCURACY CHARTS FOR METERS WITHOUT STRAINER (CONTINUED)

Rate of flow in gallons per minute (gpm)

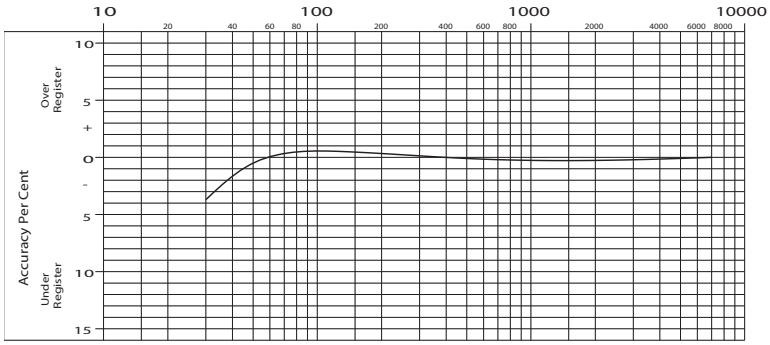
6" Meter



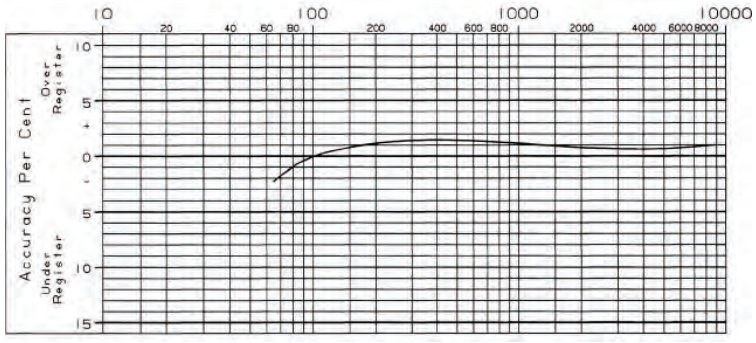
8" Meter



10" Meter



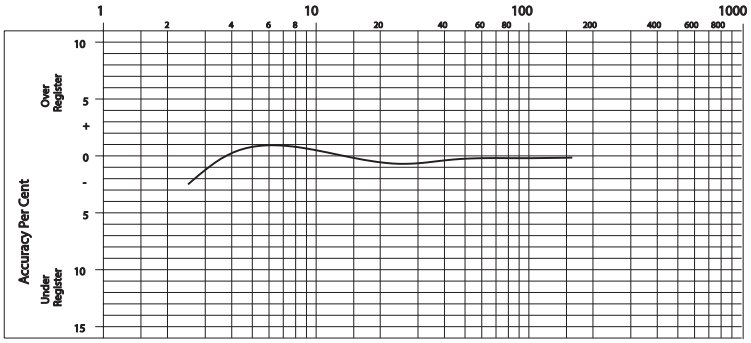
12" Meter



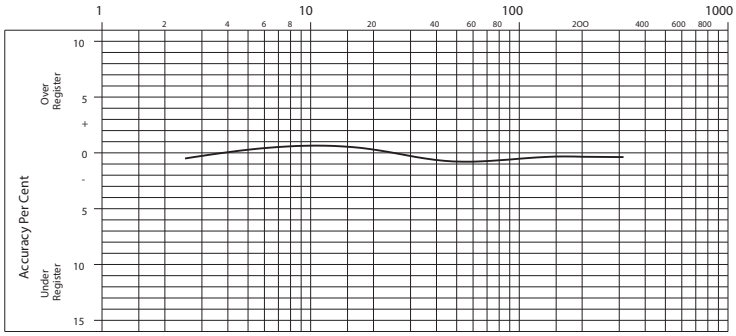
ACCURACY CHARTS FOR METERS WITH INTEGRAL STRAINER

Rate of flow in gallons per minute (gpm)

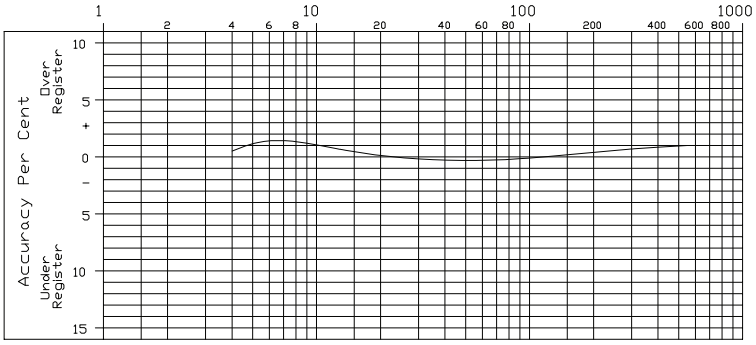
1-1/2" Meter



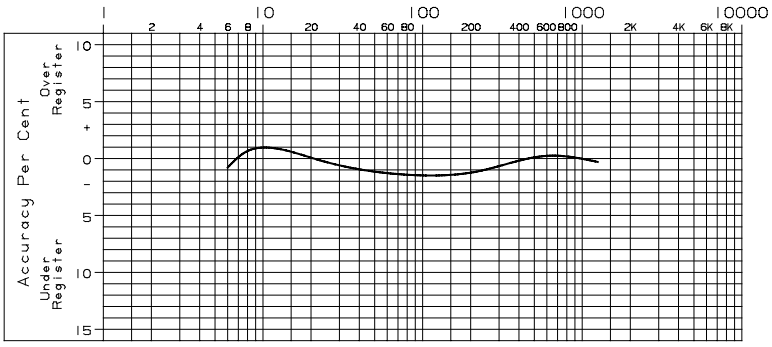
2" Meter



3" Meter



4" Meter



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China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412

Legacy Document Numbers: RTS-T-1-1/2. 3. 4. 6. 8. 10 and 12; RTS-T-I 1-1/2, 2, 3, and 4

ModMAG®
M-Series® | B-MAG Electromagnetic Flow Meters

M-Series® M2000

Electromagnetic Flow Meter

DESCRIPTION

The Badger Meter M-Series® M2000 is the result of years of research and field use of electromagnetic flow meter technology. Based on Faraday's law of induction, these meters can measure almost any liquid, slurry or paste that has minimum electrical conductivity.

Designed, developed and manufactured under strict quality standards, the M-Series meter features sophisticated, processor-based signal conversion with accuracies of ±0.25 percent. The wide selection of liner and electrode materials helps ensure maximum compatibility and minimum maintenance over a long operating period.

OPERATION

The flow meter is a stainless steel tube lined with a non-conductive material. Outside the tube, two DC powered electromagnetic coils are positioned opposing each other. Perpendicular to these coils, two electrodes are inserted into the flow tube. Energized coils create a magnetic field across the whole diameter of the pipe.

As a conductive fluid flows through the magnetic field, a voltage is induced across the electrodes. This voltage is proportional to the average flow velocity of the fluid and is measured by the two electrodes. The M2000 amplifier receives the detector's analog signal, amplifies that signal and converts it into digital information. At the processor level, the signal is analyzed through a series of sophisticated software algorithms. After separating the signal from electrical noise, it is converted into both analog and digital signals that are used to display rate of flow and totalization.

With no moving parts in the flow stream, there is no pressure lost. Also, accuracy is not affected by temperature, pressure, viscosity, density or flow profile. There is practically no maintenance required.

ELECTRODES

When looking from the end of the meter into the inside bore, the two measuring electrodes are positioned at three o'clock and nine o'clock. M2000 mag meters have an "empty pipe detection" feature. This is accomplished with a third electrode positioned in the meter between twelve o'clock and one o'clock.

If this electrode is not covered by fluid for a minimum five-second duration, the meter will display an "empty pipe detection" condition, send out an error message, if desired, and stop measuring to maintain accuracy. When the electrode again becomes covered with fluid, the error message will disappear and the meter will continue measuring.

As an option to using grounding rings, a grounding electrode (fourth electrode) can be built into the meter during manufacturing to assure proper grounding. The position of this electrode is at five o'clock.

APPLICATION

The M2000 amplifier can be integrally mounted to the detector or can be remote-mounted, if necessary and has many advantages over other conventional technologies. The meter targets a variety of applications and is well suited for the diverse water and wastewater treatment industry. The M2000 meter can accurately measure fluid flow—whether the fluid is water or a highly corrosive liquid, very viscous, contains a moderate amount of solids, or requires special handling. Today, magnetic meters are successfully used in industries including food and beverage, pharmaceutical, water and wastewater, and chemical

FEATURES

- Available in sizes 0.25…54" (6…1350 mm)
- Pulsed DC magnetic field for zero point stability
- Integral and remote signal converter availability
- Corrosion resistant liners for long life
- Measurement largely independent of flow profile
- User friendly programming procedure
- Empty pipe detection
- Power loss totalization
- Digital signal processor (32-bit)
- Non-volatile programming memory
- Rotating cover
- Calibrated in state-of-the-art facilities
- NSF listed
- CSA certified

Badger Meter

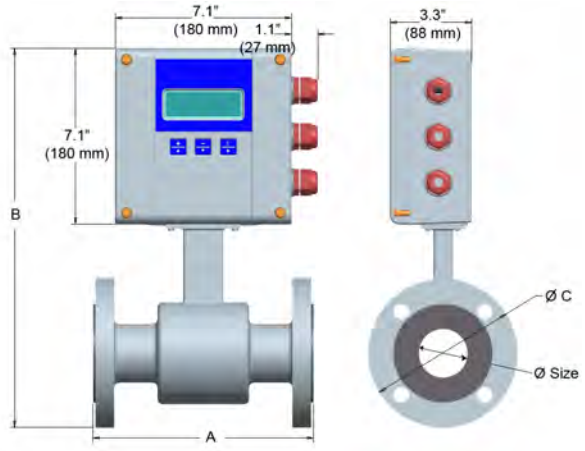
MAG-DS-01047-EN-05 (November 2014)

Product Data Sheet

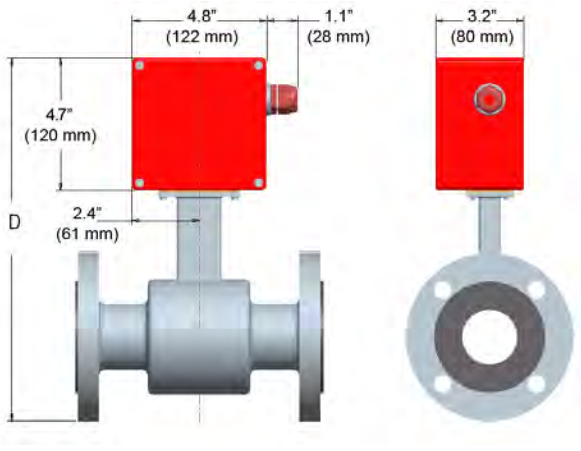
SPECIFICATIONS

Flow Range	0.10…39.4 ft/s (0.03…12 m/s)
Accuracy	± 0.25 percent of rate for velocities greater than 1.64 ft/s (0.50 m/s) ± 0.004 ft/s (± 1 mm/s) for velocities less than 1.64 ft/s (0.50 m/s)
Repeatability	± 0.1%
Power Supply	**AC Power Supply:** 85…265V AC; Typical Power: 20V A or 15W; Maximum Power: 26V A or 20W **Optional DC Power Supply:** 10…36V DC; Typical Power: 10W; Maximum Power: 14W
Analog Output	4…20 mA, 0…20 mA, 0…10 mA, 2…10 mA (programmable and scalable) Voltage sourced 24V DC isolated. Maximum loop resistance < 800 ohms.
Digital Output	Four total, configurable 24V DC sourcing active output (up to 2),100 mA total, 50 mA each; sinking open collector output (up to four), 30V DC max, 100 mA each; AC solid-state relay (up to 2), 48V AC, 500 mA max
Digital Input	Max 30V DC (programmable – positive zero return, external totalizer reset or preset batch start)
Frequency Output	Scalable up to 10 kHz, open collector up to 1 kHz, solid-state relay
Misc Output	High/low flow alarm (0…100% of flow), error alarm, empty pipe alarm, flow direction, preset batch alarm, 24V DC supply, ADE
Communication	RS232 Modbus RTU; RS485 Modbus RTU, HART, Profibus DP require separate daughterboards
Pulse Width	Scalable up to 10 kHz, passive open collector up to 10 kHz, active switched 24V DC. Up to two outputs (forward and reverse). Pulse width programmable from 1…1000 ms or 50% duty cycle.
Processing	32-bit DSP
Empty Pipe Detection	Field tunable for optimum performance based on specific application
Excitation Frequency	1 Hz, 3.75 Hz, 7.5 Hz or 15 Hz (factory optimized to pipe diameter)
Noise Dampening	Programmable 0…30 seconds
Low Flow Cut-Off	Programmable 0…10% of maximum flow
Galvanic Separation	250V
Fluid Conductivity	Minimum 5.0 micromhos/cm
Fluid Temperature	**With Remote Amplifier:** PFA, PTFE & Halar 302° F (150° C) **With Meter-Mounted Amplifier:** Rubber 178° F, (80° C), PFA, PTFE & Halar 212° F (100° C), Rubber 178° F, (80° C)
Ambient Temperature	– 4…140° F (–20…60° C)
Relative Humidity	Up to 90 percent non-condensing
Flow Direction	Unidirectional or bidirectional two separate totalizers (programmable)
Totalization	Programmable/resettable
Units of Measure	Ounce, pound, liter, US gallon, imperial gallon, barrel, hectoliter, mega gallon, cubic meter, cubic feet, acre feet
Display	4 x 20 character display with backlight
Programming	Three-button, external manual or remote
Amplifier Housing	Cast aluminum, powder-coated paint
Detector Housing	Carbon steel welded
Pipe Spool Material	316 stainless steel
Flanges	**Standard**: ANSI B16.5 Class 150 RF cast steel; **Optional:** 300 lb cast steel, 316 stainless steel
Liner Material	PFA up to 3/8", PTFE 1/2…24", soft and hard rubber from 1…54", Halar® from 14…40"
Electrode Materials	**Standard:** Alloy C; **Optional:** 316 stainless steel, gold/platinum plated, tantalum, platinum/rhodium
Mounting	Meter mount or remote wall mount (bracket supplied)
Locations	Indoor and outdoor
Meter Enclosure Classification	NEMA 4X (IP66); **Optional:** Submersible NEMA 6P (IP67), remote amplifier required
Junction Box Enclosure Protection	For remote amplifier option: powder-coated die-cast aluminum, NEMA 4 (IP66)
Cable Entries	1/2" NPT cord grip (3)
Optional Stainless Steel Grounding Rings	**Meter Size** — **Thickness (of one ring)** Up through 10" — 0.135" 12…54" — 0.187"
NSF Listed	Models with hard rubber liner, 4"size and up; PTFE liner, all sizes
Token Features	Data Logging (Blue token); Store/Restore (Red token); Firmware Upgrade (Black token)

DIMENSIONS IN INCHES (MILLIMETERS)



Meter with M2000 Amplifier



Meter with Junction Box for Remote M2000 Amplifier

Size		A		B		C		D		Est. Weight with M2000		Flow Range			
												LPM		GPM	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lb	kg	min	max	min	max
1/4	6	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.05	20	0.01	5
5/16	8	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.09	36	0.02	10
3/8	10	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.14	57	0.04	15
1/2	15	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.32	127	0.08	34
3/4	20	6.7	170	14.2	361	3.9	99	11.5	293	13	5.5	0.46	183	0.12	48
1	25	8.9	225	14.4	366	4.3	108	11.7	298	18	8.0	0.79	318	0.21	84
1-1/4	32	8.9	225	15.2	386	4.6	117	12.5	318	20	9.0	1.5	594	0.39	157
1-1/2	40	8.9	225	15.4	390	5.0	127	12.7	322	21	9.5	2.1	834	0.55	220
2	50	8.9	225	15.9	403	6.0	152	13.2	335	26	11.5	3.6	1431	0.94	378
2-1/2	65	11.0	280	17.1	434	7.0	178	14.4	366	52	23.5	6.2	2471	1.63	653
3	80	11.0	280	17.3	440	7.5	191	14.7	372	54	24.5	8.4	3344	2.21	883
4	100	11.0	280	18.4	466	9.0	229	15.7	398	56	25.5	12	4997	3.30	1320
5	125	15.8	400	19.6	498	10.0	254	16.9	430	58	26.0	20	8008	5.29	2115
6	150	15.8	400	20.6	524	11.0	279	17.9	456	60	27.0	30	11890	7.85	3141
8	200	15.8	400	22.5	572	13.5	343	20.4	518	86	39.0	59	23765	15.69	6278
10	250	19.7	500	26.8	681	16.0	406	24.1	613	178	81.0	95	37934	25.05	10021
12	300	19.7	500	28.9	734	19.0	483	26.2	666	207	94.0	127	50894	33.61	13445
14	350	19.7	500	30.8	782	21.0	533	28.2	716	258	117	173	69272	45.75	18300
16	400	23.6	590	33.7	856	23.5	597	31.0	788	306	139	226	90477	59.75	23902
18	450	23.6	590	35.0	890	25.0	635	32.4	822	400	181	286	114511	75.63	30250
20	500	23.6	590	38.2	969	27.5	699	35.5	901	493	224	353	141371	93.37	37346
22	550	23.6	590	39.6	1005	29.5	749	36.9	937	523	237	428	171059	112.97	45189
24	600	23.6	590	42.2	1071	32.0	813	39.5	1003	552	251	509	203574	134.45	53779
28	700	23.6	590	46.2	1173	36.5	927	44.0	1118	648	294	693	277089	183.00	73199
30	750	31.5	800	48.3	1228	39.0	984	45.7	1161	702	319	795	318087	210.07	84030
32	800	31.5	800	52.2	1325	41.4	1015	49.5	1257	768	349	905	361912	239.02	95607
36	900	31.5	800	55.3	1405	46.0	1168	54.1	1374	848	385	1145	458045	302.51	121003
40	1000	31.5	800	60.0	1525	50.2	1230	57.4	1457	922	419	1414	565487	373.46	149386
42	1050	36.0	914	66.0	1675	53.0	1346	63.4	1610	1198	499	1559	623449	411.74	164698
48	1200	39.4	1000	69.9	1775	59.4	1455	67.2	1707	1208	549	2036	814301	537.79	215116
54	1350	39.4	1000	75.4	1915	66.2	1681	73.0	1927	1854	619	2576	1030599	680.64	272255

Control. Manage. Optimize.

www.badgermeter.com

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Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
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Legacy Document Numbers: MAG-DS-00176-EN and MAG-DS-00178-EN

Badger Meter

Recordall® Turbo Series Meter

Model 450 Fire Hydrant Meter, 3"

DESCRIPTION

The Badger Meter Model 450 fire hydrant meter is designed for use in measuring potable cold water from a fire hydrant or other non-permanent installation where flow is in one direction.

Operation

Water flows into the meter's measuring element where flow readings are obtained by rotor revolutions transmitted by magnetic drive coupling through the meter's cover plate to the sealed register. Magnetic drive is achieved by a right angle worm drive, coupling the rotor to the vertical transmission spindle. A ceramic magnet on the spindle rotates around the vertical axis. Through the magnetic coupling, rotor rotation is transmitted to a follower magnet which transmits rotation to the register gearing.

Operating Performance

The Model 450 fire hydrant meters meet or exceed registration accuracy for the low flow rate, normal operating flow rate, and maximum continuous operation flow rate as specifically stated in AWWA Standard C701.

Construction

The Model 450 fire hydrant meter construction consists of three basic components: meter housing, measuring element, and permanently sealed register. The housing is light-weight heat treated aluminum alloy, compact and easy to handle.
The measuring element consists of the transmission coupling, measuring element insert, rotor, straightening vane, and calibration vane assembly. The straightening vanes minimize swirl from piping arrangements upstream.

Magnetic Drive

Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling.

Restriction Plate

A permanent orifice, positioned in the outlet side of the meter housing, limits the maximum flow of water through the meter. This is provided to protect the measuring element from overspeeding when the meter discharges to atmosphere.

Sealed Register

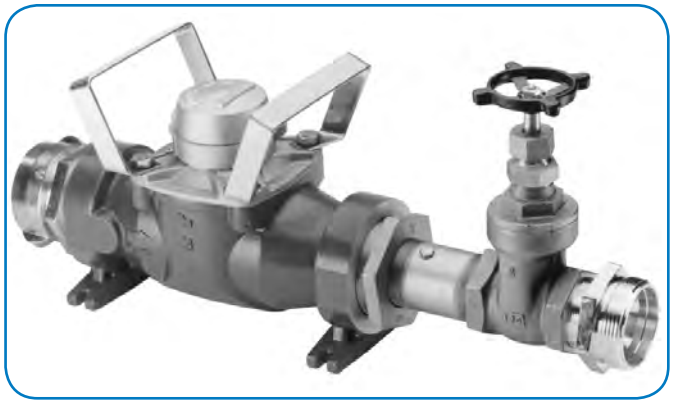
The standard register consists of a straight-reading odometer-type totalization display, 360° test circle with center sweep hand and flow finder to detect leaks. Register gearing consists of self-lubricating thermoplastic gears to minimize friction and provide long life. Permanently sealed; dirt, moisture, tampering and lens fogging problems are eliminated. Multi-position register simplifies meter installation and reading.

Tamper-Resistant Features

Removal of the register to obtain free water is prevented when the tamper detection seal wire screw or TORX® tamper-resistant seal screw is added to the meter. A tamper-resistant calibration plug seal provides protection from unauthorized personnel use.

Strainer

A compression fit double layer stainless steel strainer is installed in the inlet housing tube. The strainer insures optimum long-term field performance.



Maintenance

The Model 450 fire hydrant meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location. As an alternative to repair by the utility, Badger Meter offers various maintenance and meter component exchange programs to fit the needs of the utility.

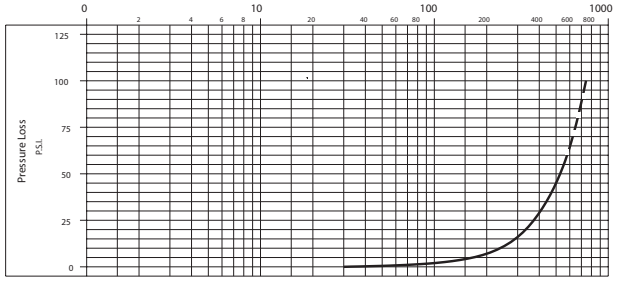
Hose Couplings

The meter is available with standard (2-1/2" – 7-1/2 NST) fire hose swivel couplings, unless otherwise specified. Complete thread specifications (listed on the back page of this document) must be furnished for special fire hose fittings.

Options: 2" or 2-1/2" gate valve, check valve.

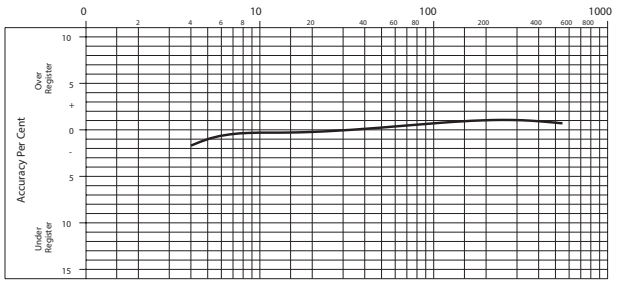
Pressure Loss Chart

Rate of flow in gallons per minute (gpm)



Accuracy Chart

Rate of flow in gallons per minute (gpm)



Product Data Sheet

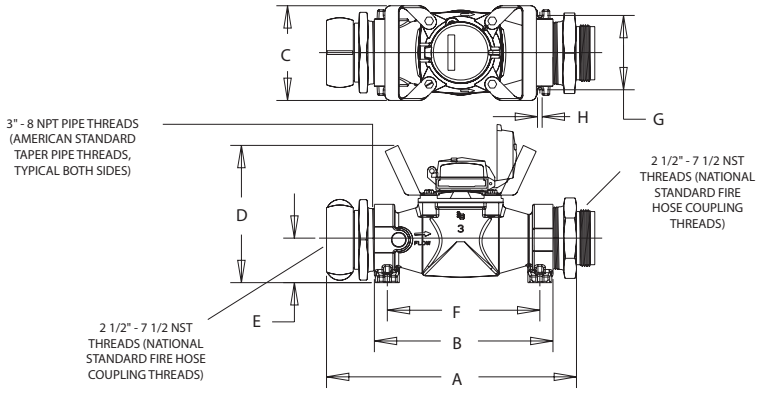
SPECIFICATIONS

Typical Operating Range (100%±1.5%)	5…660 gpm (1.1…150 m^3/hr)
Maximum Continuous Flow	500 gpm (102 m^3/hr)
Maximum Intermittant Flow	660 gpm (150 m^3/hr)
Typical Low Flow (Min. 95%)	4 gpm (0.9 m^3/hr)
Pressure Loss at Max. Continuous Operation	37 psi @ 450 gpm (2.55 bar @ 102 m^3/hr) (standard couplings with orifice and screen) **Note:** 27 psi @ 350 gpm
Maximum Operating Pressure	150 psi (10 bar)
Standard Hose Coupling	2-1/2" – 7-1/2 NST threads (78P – 3.4 mm) (National standard fire hose coupling thread)
Register	Straight-reading, permanently sealed magnetic drive standard.
Registration	100,000,000 gallons; 100 gallons/sweep hand revolution.
	10,000,000 cubic feet; 10 cubic ft/sweep hand revolution.
	1,000,000 m^3; 1 m^3/sweep hand revolution.
Flow Restriction (Orifice)	Limits flow through the meter to 660 gpm @ 85 psi (150 m^3/hr @ 59 bar) system pressure with standard couplings.

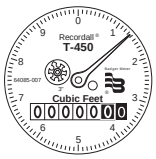
Materials

Housing	Heat treated aluminum alloy
Nose Cone and Straightening Vanes	Thermoplastic
Rotor	Thermoplastic
Rotor Radial Bearings	Lubricated thermoplastic
Rotor Thrust Bearings	Sapphire jewels
Rotor Bearing Pivots	Passivated 316 stainless steel
Calibration Mechanism	Stainless steel and thermoplastic
Magnet	Ceramic
Register Cover	Bronze
Options	2" gate valve, 2-1/2" gate valve, 2" check valve, bronze
Trim	Stainless steel
Inlet Screen	Stainless steel with Elastomer

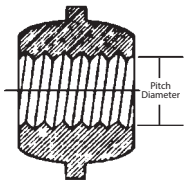
DIMENSIONS



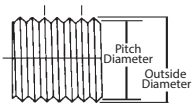
Meter & Pipe Size	Length w/coupl. A	Length w/o coupl. B	Width C	Height D	Ctrline E	F	G	H	Net Weight w/o Fittings	Net Weight w/Fittings	Net Weight w/Valve	Shipping Weight w/o Fittings	Shipping Weight w/Fittings	Shipping Weight w/Valve
3" (DN 80)	17" (432 mm)	12" (305 mm)	6-3/8" (162 mm)	9.0" (229 mm)	2-15/16" (73 mm)	10-1/4" (260 mm)	5" (127 mm)	11/32" (9 mm)	14.2 lb (6.44 kg)	20.6 lb (9.34 kg)	31.6 lb (14.33 kg)	17.2 lb (7.80 kg)	23.6 lb (10.7 kg)	34.6 lb (15.7 kg)



Specifications for Special Fire Hose Coupling Threads



Female Threads



Male Threads

Required Information

- Number of threads per inch and thread form, if other than American National Standard.
- Outside diameter of male threads.
- Pitch diameter of male threads.
- Pitch diameter of female threads.

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Legacy Document Number: RTS-T-3FH-EN

Attachment D

District Sample Bills

CITY OF SHASTA LAKE
MUNICIPAL UTILITIES
P.O. Box 777
1650 Stanton Drive
Shasta Lake, CA 96019
Tele: 275-7400
www.cityofshastalake.org

ADDRESS SERVICE REQUESTED

ACCOUNT INFORMATION

STATEMENT DATE:	01/26/2012
ACCOUNT NUMBER:	18-0003-15
CUSTOMER:	THERESA SOTO
SERVICE LOCATION:	625 EUGENE ST

ACCOUNT SUMMARY

CURRENT CHARGES DUE 02/15/12	$206.80
TOTAL AMOUNT DUE	**$206.80**

☐ **Check here if paying by credit card (see reverse for details)**

AUTOSCH 5-DIGIT 96013 1 PS5 72456AA26-A-1
1 1 AV 0.350

THERESA SOTO
625 EUGENE ST
SHASTA LAKE CA 96019-9737

CITY OF SHASTA LAKE
PO BOX 777
SHASTA LAKE CA 96019-0777

18-0003-15

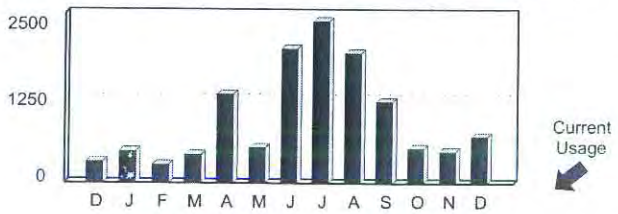
PLEASE DETACH THIS STUB AND MAIL WITH PAYMENT IN THE ENCLOSED ENVELOPE

CITY OF SHASTA LAKE BILLING STATEMENT
ALL BILLS DUE AND PAYABLE UPON RECEIPT. DELINQUENT 20 DAYS FROM STATEMENT DATE.

ACCOUNT INFORMATION

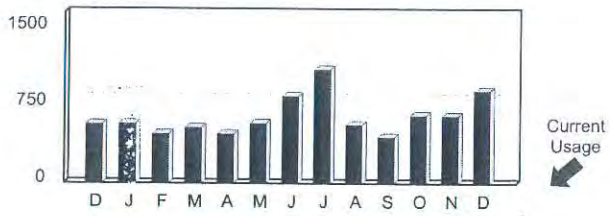
STATEMENT DATE:	01/26/2012
ACCOUNT NUMBER:	18-0003-15
CUSTOMER:	THERESA SOTO
SERVICE LOCATION:	625 EUGENE ST

YOUR MONTHLY WATER USAGE - CUBIC FEET



This Month # Days: 33 Usage: 692

YOUR MONTHLY ELECTRIC USAGE - KWH



This Month # Days: 31 Usage: 816

CURRENT SERVICE - WATER 12/20 to 01/22

Description	Previous	Current	Usage	Amount
READING	58082	58774	692 x 1.10 ÷ 100 →	$7.61
WATER: 5/8" SERV				$16.14
SAFE DRINKING WATER				+ $0.80
				16.94

CURRENT SERVICE - ELECTRIC 12/20 to 01/20

Description	Previous	Current	Usage	Mult	Amount
READING	23180	23996	816	1.0	$100.21
ELECTRIC: RES SERV					$12.50
ELE PUBLIC BENEFIT					$3.21

Includes .00022 mills California surcharge for energy conservation purposes.

CURRENT SERVICE - OTHER SERVICES AND CHARGES

Description	Service	Amount
WASTEWATER	WW RESIDENTIAL	$47.72
SOLID WASTE	SOLID WASTE 96 GAL	$18.61

ACCOUNT SUMMARY

TOTAL PAYMENTS:	($175.65)
CURRENT CHARGES DUE 02/15/12	$206.80
TOTAL AMOUNT DUE	**$206.80**

PUBLIC INFORMATION

7.61 * Total Water Bill
+ 16.94 → is $24.55

City Council meetings 6pm 1st & 3rd Tuesday of each month at the John Beaudet Community Center, 1525 Median Street
City of Shasta Lake: 1650 Stanton Drive, P.O. Box 777, Shasta Lake, CA 96019, Tele: 275-7400, www.cityofshastalake.org

OSAI072711R150078 - 72456AA26-A 1 1 1 2

Water Rates

	Current	Aug. 7, 2009	July, 1 2010	July, 1 2011	July 1, 2012	July 1, 2013	
Annual Rate Increase		**8%**	**8%**	**8%**	**8%**	**5%**	
Consumption Charges ($/100 CF)							
Lifeline Consumption Rate (1-1000 CF)	$0.70	$0.75	$0.81	$0.88	$0.95	$0.99	
All Other Consumption Rate (1-1000 CF)	$0.87	$0.94	$1.01	$1.10	$1.18	$1.24	
Consumption Rate (1001-5000CF)	$1.00	$1.08	$1.17	$1.26	$1.36	$1.43	
(1)Excess Consumption Rate (over 5000 CF)	$1.22	$1.32	$1.42	$1.53	$1.66	$1.74	
Monthly Service Charges ($/MO)							**Capacity Factor**
5/8" Meter	$13.45	$14.53	$15.69	$16.94	$18.30	$19.21	1.0
3/4" Meter	$20.18	$21.79	$23.53	$25.41	$27.45	$28.82	1.5
1" Meter	$33.63	$36.32	$39.22	$42.36	$45.75	$48.03	2.5
1 1/2" Meter	$67.25	$72.63	$78.44	$84.72	$91.49	$96.07	5.0
2" Meter	$107.60	$116.21	$125.50	$135.55	$146.39	$153.71	8.0
3" Meter	$201.75	$217.89	$235.32	$254.15	$274.48	$288.20	15.0
4" Meter	$336.25	$363.15	$392.20	$423.58	$457.46	$480.34	25.0
6" Meter	$672.50	$726.30	$784.40	$847.16	$914.93	$960.68	50.0
8" Meter	$1,076.00	$1,162.08	$1,255.05	$1,355.45	$1,463.89	$1,537.08	80.0
10" Meter	$1,950.25	$2,106.27	$2,274.77	$2,456.75	$2,653.29	$2,785.96	145.0
12" Meter	$2,891.75	$3,123.09	$3,372.94	$3,642.77	$3,934.19	$4,130.90	215.0

(1) Applies to 5/8-inch meter only

* includes .80 Safe drinking water Fee/charge

Attachment E

District Water Shortage Plan

Article V. - Cross-Connection Control

13.12.370 - Purpose of chapter provisions.

The purpose of this chapter is to:

A. Protect the public potable water supply of the city from the possibility of contamination or pollution by isolating within its customers' internal distribution system(s), or within its customers' private water system(s) such contaminants or pollutants which could backflow or back-siphon into the public water supply system;

B. Promote the elimination or control of existing cross-connections, actual or potential, between its customers' in-plant potable water system(s) and nonpotable water systems, plumbing fixtures and industrial piping systems;

C. Provide for the maintenance of a continuing program of cross-connection control which will systematically and effectively prevent the contamination or pollution of all potable water systems.

(Amended during 1998 codification; prior code § 9.20.010)

13.12.380 - Responsibility for city adherence to regulations.

The city manager shall be responsible for the protection of the public potable water distribution system from such contamination or pollution as could otherwise be caused by the backflow or back-siphonage of contaminants or pollutants through the water service connections. The city manager shall further be responsible for the city's adherence, where possible, to Regulations Relating to Cross-Connections, as contained in the California Administrative Code, Title 17; Public Health, Chapter 5; Sanitation (Environmental), Subchapter 1; Engineering (Sanitary), Group 4, Drinking Water Supplies.

(Amended during 1998 codification; prior code § 9.20.020)

13.12.390 - Authority to order installation of backflow prevention devices.

If, in the judgment of the city manager, an approved backflow prevention device is required for the safety of the water system at the city's water service connection to any customer's premises, the city manager or his or her designated agent shall give notice in writing to such customer, ordering the customer to install such approved backflow prevention device at each service connection to his or her premises. The customer shall, within thirty (30) calendar days following delivery of the written notice, install, or cause to be installed, such approved device or devices at the customer's expense, and failure, refusal or inability on the part of the customer to install, or cause to be installed, such device or devices within that period of time shall constitute a ground for discontinuing water service to the customer's premises until such device or devices have been properly installed.

(Amended during 1998 codification; prior code § 9.20.030)

13.12.400 - Water-shortage emergency.

By resolution adopted after a noticed public hearing, the council may declare a water shortage emergency. During the period of the water-shortage emergency the following restrictions shall apply to all city customers:

A. Use of potable water to irrigate turf, ground cover, shrubbery, crops, vegetation, and trees in such a manner as to result in runoff for more than five minutes;

B. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety;

C. Allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break;

D. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket, except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment;

E. No restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested;

F. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where nonpotable or recycled water is sufficient;

G. Use of potable water for sewer system maintenance or fire protection training without prior approval by the city engineer;

H. Use of potable water to fill or maintain levels in swimming pools, decorative fountains, ponds or evaporative coolers unless a recycling system is used.

In addition, the council may adopt by resolution other restrictions necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

(Ord. 08-194 § 1 (part))

13.12.401 - Enforcement.

Any customer violating the regulations and restrictions on water use set forth in this chapter shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the city may cause a flow-restrictor to be installed in the service. If a flow-restrictor is placed, the violator shall pay the cost of installation and removal. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the county district attorney's office for prosecution. The city may also disconnect the water service. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the city council.

(Ord. 08-194 § 1 (part))

13.12.402 - Penalty for violations.

Except as provided in the enforcement section for the first and second violations, any person, firm, partnership, association, corporation, or political entity violating or causing or permitting the violation of any of the provisions of this section or providing false information to the city in response to city requests for information needed by the city to calculate consumer water allotments shall be guilty of a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days or by a fine not exceeding one thousand dollars ($1,000.00) or both. Each separate day or portion thereof in which any violation occurs or continues without a good faith effort by the responsible party to correct the violation shall constitute a separate offense and, upon conviction thereof, shall be separately punishable.

(Ord. 08-194 § 1 (part))

13.12.403 - Appeals.

Variances from the requirements of this section may be granted by the city council only after denial of a variance request by the city manager. Appeals of variance request denials shall be made in writing to the city clerk at least two weeks prior to the meeting at which they will be heard. Upon granting any appeal, the city council may impose any conditions it determines to be just and proper. Variances granted by the city council shall be prepared in writing, and furnished to the applicant. The city council may require it to be recorded at applicant's expense.

(Ord. 08-194 § 1 (part))

13.12.404 - Remedies/cumulative.

The remedies available to the city to enforce this chapter are in addition to any other remedies available under the city's code or any state statutes or regulations, and do not replace or supplant any other remedy, but are cumulative.

(Ord. 08-194 § 1 (part))

Attachment F

Not Used

Attachment G

Not Used

Attachment H

Annual Potable Water Quality Report - Urban

City of Shasta Lake
2011 Water Quality Consumer Confidence Report
Public Water System Number 4510006

The City of Shasta Lake Water Utility is proud to report that it provided significantly higher quality water than required by the very stringent Federal and State Water Quality Standard during 2011. Water for the City of Shasta Lake originates from one surface water source known as Shasta Lake. For additional information or input concerning your drinking water, contact William Bishop at (530) 275-7450 or email wbishop@cityofshastalake.org

Este informe contiene informacion muy importante sobre su agua potable. Traduzcalo o hable con alguien que lo entienda bien.

DEFINITIONS OF SOME OF THE TERMS USED IN THIS REPORT

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. **Primary MCLs** are set as close to the **PHGs** (Or **MCLGs)** as is technologically, and economically feasible. **Secondary MCLs** are set to protect the odor, taste, and appearance of drinking water.

Primary Drinking Water Standards (PDWS): MCLs for contaminants that affect health along with their monitoring and reporting requirements, and surface water treatment requirements.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the Federal Environmental Protection Agency (USEPA).**Maximum Residual Disinfectant Level (MRDL)**: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Regulatory Action Level (AL): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

ppb: parts per billion or micrograms per liter (ug/l), **ppm:** parts per million or milligrams per liter (mg/l), **nd**: non detectable at testing limit.

TDS: Total Dissolved Solids.

THE SOURCES OF DRINKING WATER (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. *A source water assessment* was conducted for the City of Shasta Lake's Raw Intake in January 2003. The source is considered vulnerable to the following activities not associated with any detected contaminates: Automobile gas stations, chemical/petroleum processing/storage, and concentrated aquatic animal production facilities as defined in the federal regulations. A copy of the assessment may be viewed at the City of Shasta Lake, 1650 Stanton Dr.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.

GENERAL INFORMATION ON DRINKING WATER

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1-800-426-4791.

SOME PEOPLE MAY BE MORE VULNERABLE to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly individuals, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The USEPA/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

WATER QUALITY DATA

WATER QUALITY CONTROL

Before the water reaches your tap, samples from the water distribution system and the water treatment plants are collected and tested in State-certified laboratories. The City of Shasta Lake Water Utility has a regular program of water analysis and system inspection which assures safe water for you

and your family. Treatment process consists of chemical coagulation, flocculation, filtration and disinfection. Two State-certified water plant operators assure that water treatment operations provide excellent quality water three hundred sixty-five days a year.

MICROBIOLOGICAL WATER QUALITY

Testing for bacteriological contaminants in the distribution system is required by State regulations. This testing is done regularly to verify that the water system is free from coliform bacteria. The minimum number of tests required per month is sixteen. In our distribution system, we obtain four water samples per week and test for coliform bacteria. The highest number of samples found to contain coliform bacteria during any one month was zero.

LEAD AND COPPER TESTING RESULTS

Lead & copper testing of water from individual taps in the distribution system is required by State regulations. The table below summarizes the most recent sampling for lead and copper. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Shasta Lake is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at *http://www.epa.gov/safewater/lead*.

Lead and Copper	Year Tested	Number of samples collected	Number of samples required	90th Percentile Result	Action Level
Lead (ppb)	2010	30	30	ND	15
Copper (ppb)	2010	30	30	115	1300

CHEMICAL SAMPLING RESULTS SHOWING DETECTED CONTAMINANTS

The following tables list all detected chemicals in our water during the most recent sampling. Please note that not all sampling is required annually so in some cases our results are more than one year old. These values are expressed in ppm unless otherwise stated.

Contaminants with Primary MCLs					
Chemical Detected	**Year Tested**	**Level Detected**	**MCL**	**PHG or MCLG**	**Origin**
Aluminum (ppb)	2012	73	1000	600	Erosion of natural deposits; residue from some surface water treatment processes
Chlorine	2010	2.00	4.0	4.0	Injection into water at plant for disinfection

Contaminants with Secondary MCLs				
Chemical Detected	**Year Tested**	**Level Detected**	**Secondary MCL**	**Origin**
Sodium (ppm)	2008	7	None	Runoff/leaching from natural deposits; seawater influence
Hardness (ppm)	2012	50	None	Naturally occurring
Chloride (ppm)	2012	1.2	500	Naturally occurring
TDS (ppm)	2003	64	1000	Runoff/leaching from natural deposits

SURFACE WATER TREATMENT COMPLIANCE INFORMATION

Our filtration system must meet a performance standard of less than or equal to 0.2 NTU in 95 % of the measurements taken each month. The highest single turbidity measurement for the entire year was 1 NTU. The lowest monthly percentage of turbidity samples meeting the performance standard was 99 %. Turbidity is a measurement of the cloudiness of water and one NTU is equivalent to one unit of turbidity.

VIOLATION INFORMATION: NONE (no violation occurred).

OTHER MEASURES TAKEN TO INSURE SAFE DRINKING WATER

A water main flushing program and cross connection control program are other measures taken to help assure safe drinking water. Water customers who receive this report are asked to share information with any tenant or water user on their premises. We think it is important for you, our customer, to have current and factual information about your water supply. The City of Shasta Lake Water Utility staff is available to answer your questions and provide further information to those who want it. You are welcome to call us at 275-7450 or 275-7400 or by email wbishop@cityofshastalake.org

Information that deals with decisions about our water system is announced during the City of Shasta Lake Council meetings. The City Council meets on the first and third Tuesday of every month at 7:00 P.M. in the Senior Citizen Hall at 1525 Median St., Shasta Lake, 96019. 530- 275-7400.

Attachment I

Not Used

Attachment J

Not Used

Attachment K

Not Used

Attachment L

Urban Water Inventory Tables

Year of Data	2011	**Enter data year here**

Table 1

Surface Water Supply

2011 Month	**Federal Urban Water** (acre-feet)	**Federal Ag Water.** (acre-feet)	**State Water** (acre-feet)	**Local Water (define)** (acre-feet)	**Transfers into District** (acre-feet)	**Other Water** (acre-feet)	**Total** (acre-feet)
Method	M1						
January	125	0	0	0	0	0	125
February	129	0	0	0	0	0	129
March	123	0	0	0	0	0	123
April	151	0	0	0	0	0	151
May	216	0	0	0	0	0	216
June	210	0	0	0	0	0	210
July	361	0	0	0	0	0	361
August	345	0	0	0	0	0	345
September	328	0	0	0	0	0	328
October	196	0	0	0	0	0	196
November	170	0	0	0	0	0	170
December	139	0	0	0	0	0	139
TOTAL	2,493	0	0	0	0	0	2,493

Table 2

Ground Water Supply

2011 Month	District Groundwater (acre-feet)	Private Urban *(acre-feet)
Method		
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	0	0

*normally estimated

Table 3

Total Water Supply

2011 Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Recycled M&I (acre-feet)	Total District (acre-feet)
Method			M2	
January	125	0	0.00	125
February	129	0	0.00	129
March	123	0	0.00	123
April	151	0	17.28	168
May	216	0	25.47	241
June	210	0	19.64	230
July	361	0	11.05	372
August	345	0	11.36	356
September	328	0	22.10	350
October	196	0	0.00	196
November	170	0	0.00	170
December	139	0	0.00	139
TOTAL	2,493	0	106.90	2,600

*Recycled M&I Wastewater is treated urban wastewater that is used for irrigation, log deck wetdown, and dust control.

Table 4

Urban Distribution System

2011 Area or Line	Length (feet)	Leaks (acre-feet)	Breaks (acre-feet)	Flushing/Fire (acre-feet)	Total (acre-feet)
2" pipe	5,000	2.21	0	2.21	4.42
4" pipe	58,360	25.42	0	25.42	50.84
6" pipe	174,240	75.98	0	75.97	151.95
8" pipe	31,680	13.81	0	13.81	27.62
10" pipe	22,176	9.67	0	9.67	19.34
12" pipe	15,840	6.91	0	6.91	13.82
14" pipe	9,504	4.14	0	4.14	8.28
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	316,800	138.14	0	138.13	276.27

Notes:
1. No record of breaks in 2011.
2. Leaks and Flushing/Fire volumes are estimates.
3. An additional 40 AF is lost to filter backwash at the treatment plant (see Table 6).

~~Table 5~~

Table 6

2011 District Water Inventory

Water Supply	Table 3		2,600
Environmental Consumptive Use		minus	40
Groundwater Recharge	(Perc ponds & recharge wells)	minus	0
Transfers out of District		minus	0
Flushing / Fire	Table 4b	minus	138
Distribution System Leaks & Breaks	Table 4b	minus	138
Water Available for sale to customers			2,284
Actual Water Sales 2011	From District Records		2,284
Inside Use	Feb urban use x 12		1,289
Landscape / Outside Use	(calculated)		995
Unaccounted for Water	(calculated)		0

Note: Environmental consumptive use accounts for loss due to filter backwash at treatment plant.

~~Table 7~~

Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Urban Water (acre-feet)	Federal Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (define) (acre-feet)	Transfers into District (acre-feet)	Other Water (acre-feet)	Total (acre-feet)
2002	2,994	0	0	0	0	0	2,994
2003	2,776	0	0	0	0	0	2,776
2004	3,092	0	0	0	0	0	3,092
2005	2,947	0	0	0	0	0	2,947
2006	3,155	0	0	0	0	0	3,155
2007	2,957	0	0	0	0	0	2,957
2008	2,920	0	0	0	0	0	2,920
2009	2,957	0	0	0	0	0	2,957
2010	2,572	0	0	0	0	0	2,572
2011	2,493	0	0	0	0	0	2,493
Total	28,863	0	0	0	0	0	28,863
Average	2,886	0	0	0	0	0	2,886

Attachment M

Submitted BMP Forms for 2011

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2011

View MOU

BMP 4 CII

You must enter all measured water savings manually in the summary cells on the right. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings was measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in the flex track data entry form which are necessary to show that the measure was implemented as described.

CII Type of measure implemented

Traditional

A) High - Efficiency Toilets.

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes ○No

Council's Annual Water Savings 0.041748 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

B) High - Efficiency Urinals (0.5 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes ○No

Council's Annual Water Savings 0.069086 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet Enter the file name and Email to office@cuwcc.org

C) Ultra Low Volume Urinals (0.125 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes ○No

Council's Annual Water Savings 0.080603 AF per device

If not, Please provide the following

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet Enter the file name and Email to office@cuwcc.org

D) Zero Consumption Urinals (0.0 gpf)

Flex Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Do you accept the Council's default savings number for this measure? ○Yes ○ No

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

Council's Annual Water Savings 0.0921146 AF per device

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

E) Commercial High - Efficiency Single Load Clothes Washers

Traditional

Number 0

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Flex Track

Do you accept the Counsil's default savings number for this measure ? ◯Yes◯No

Council's Annual Water Savings 0.116618 AF per device

If not , Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

F) Cooling Tower Conductivity Controllers.

Traditional

Number 0

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ◯Yes◯No

Council's Annual Water Savings 1.032250 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

G) Cooling Tower pH Controllers

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 3.981543 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet Enter the file name and Email to office@cuwcc.org

H) Connectionless Food Steamers.

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.25 AF per Steamer Compartment

mIf not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet Enter the file name and Email to office@cuwcc.org

I) Medical Equipment Steam Sterilizers

Flax Track

Traditional

Number: 0

Type of program: Select an Option

Other type of program:

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 1.538 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

J) Water - Efficient Ice Machines.

Traditional

Number 0

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.0834507 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

K) Pressurized Water Brooms.

Traditional

Number 0

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure? ○Yes○No

Council's Annual Water Savings 0.1534 AF per device

Flex Track

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

L) Dry Vacuum Pumps.

Traditional

Number 0

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Flex Track

Do you accept the Council's default savings number for this measure ? ○Yes○No

Council's Annual Water Savings 0.064 AF per device

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

Traditional Reporting Stop Here, Do not continue

Flex Track Reporing Please Continue...

M) Industrial Process Water Use Reduction.

Number

Type of program Select an Option

Other type of program

Measured water savings (AF/Year)

Type of Process Water Reduced

If re-using water, what was the secondary use of the water? (such as pre-rince cycle or landscaping)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

N) Commercial Laundry Retrofits.

Number of customers

Measured water savings (AF/Year)

Type of customer

- ☐ hotels
- ☐ campuses
- ☐ prisons
- ☐ laundromats

Lease / own machines

○ Lease ○ Own Machines ○ Both

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

O) Industrial Laundry Retrofits.

Measured water savings (AF/Year)

Total Number of customers

Total Volume of laundry processed annually

Select an Option

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

P) Filter Upgrades (for pools, spas, and fountains).

Number of pools upgraded

Number of spas upgraded

Number of fountains upgraded

Measured water savings (AF/Year)

Type of program

Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Q) Car Wash Reclamation Systems

Measured water savings (AF/Year)

	Conveyor	In-bay
Total Number of program participants (accounts)		
Total Number of vehicles washed annually		

Do you accept the Council's default savings number for this measure? ○Yes ○No

Council's Annual Water Savings 0.00004607 (or 15 gals) per vehicle

If not, Please provide the following:

Total Measured Water Savings(AF/Year)	
Measure life (years)	
Lifetime water savings (years)	

If you are using your own water-savings measure, send your supporting spreadsheet

R) Wet Cleaning.

Brief description of program		**Measured water savings (AF/Year)**

Total Measured Water Savings(AF/Year)	
Measure life (years)	
Lifetime water savings (years)	

If you are using your own water-savings measure, send your supporting spreadsheet

S) Water Audits (To avoid double counting, do not include device/replacement water savings.)

Number of water audits by type of business

Measured water savings (AF/Year)

Auto	
Food	
Health	
Hotels	

Manufacturing	
Membership	
Multi-use	
Office	
Religious	
Restaurant	
Retail/ Wholesale	
School	
Other (with description)	
Description of Other	

Total Measured Water Savings(AF/Year)	
Measure life (years)	
Lifetime water savings (years)	

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

T) Clean In Place (CIP) Technology (such as bottle sterilization in a beverage processing plant)

		Measured water savings (AF/Year)
Number of customers		
Type of program	Select an Option	
Other type of program		

Total Measured Water Savings(AF/Year)	
Measure life (years)	

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

U) Waterless Wok

Number

Type of program — Select an Option

Measured water savings (AF/Year)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

V) Alternative On-site Water Sources (For Rain Water Harvesting, commercial rain barrels are excluded. For Foundation Drain Water, exclude permeable paving.)

Measured water savings (AF/Year)

Select type	Number	Description
☐ Cooling Condensate		
☐ Foundation Drain Water		
☐ Gray Water		
☐ Storm Water		
☐ Rain Water		
☐ Pond and Water Feature Recycling		

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

W) Sub - metering

Measured water savings (AF/Year)

Select type	Number	Description
☐ Condominiums		
☐ Apartments		
☐ Mobile Homes		

Do you accept the Council's default savings numbers for this measure? ○Yes○No

Council's Annual Water Savings
Appartments & Condos=0.024419 AF/YR
Mobile Home = 0.056774 AF/Yr

If not, Please provide the following:

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

X) High Efficiency Showerheads

Measured water savings (AF/Year)

Number

Type of program Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Y) Faucet Flow Restrictors

Measured water savings (AF/Year)

Number

Type of program Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

Z) Water Efficient Dishwashers

Measured water savings (AF/Year)

Select type Number

☐ Rack

☐ Conveyor

☐ Other

Description of Other

Type of program Select an Option

Other type of program

Total Measured Water Savings(AF/Year)
Measure life (years)
Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

AA) Hot Water on Demand

Measured water savings (AF/Year)

Number
Type of program — Select an Option
Other type of program

Total Measured Water Savings(AF/Year)
Measure life (years)
Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet

BB) Pre-rinse Spray Valves of 1.3 gpm (gallons per minute) or less

Measured water savings (AF/Year)

Number
Type of program — Select an Option
Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

CC) Central Flush Systems

Measured water savings (AF/Year)

Number

Type of program — Select an Option

Other type of program

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

Other Measures chosen by the Agency

Measured water savings (AF/Year)

Description of program

Sample (if applicable)

Total Measured Water Savings(AF/Year)

Measure life (years)

Lifetime water savings (years)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2011

BMP 3 Residential

View MOU

You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data points also requested in form which are necessary to show that the measure was implemented as described.

1 - 2) Residential Assistance / Landscape Water Survey

Flex Track

Traditional

	Single Family	Multi Family
Total Number of Accounts	3,343.00	100.00
Total Number of Participants Overall	0.00	0.00
Total Number of Leak Det Surveys	0.00	0.00
Total Number of Showerheads	0.00	0.00
Total Number of Faucet Aerators	0.00	0.00
Total Number of Landscape Water Survey	0.00	0.00

Number of Other Measures

Description of Other Measures Distributed

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to office@cuwcc.org)

Measured Water Savings AF/YR

3) High Efficiency Clothes Washers (HECWs)

Flex Track

Traditional

Number of installations for HECWs with an AVERAGE Water Factor of 5.0: 0.00 WF less than 5.0: 0.00

Are Financial incentives provided for HECWs ? ○ Yes ⊙ No

Has your Agency completed a HECW Market Penetration Study (this question does not impack your coverage report, purely informational) ○ Yes ⊙ No

HECW Market Penetration Study Documents (Enter the file name and Email file to office@cuwcc.org)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

Measured Water Savings AF/YR

4) WaterSense Specification (WSS) Toilets

(Agency must complete information for at least one coverage option (For Traditional 1, 2, or 3; For Flex Tarck 1, 2, 3, or 4).
You are encouraged to include information on other coverage options, as available.
If seeking credit for additional water savings, you must select Flex Track option)

Traditional

4.1. Retrofiton Resale Ordinanceis in Plac ○ Yes ⊙ No

If Yes, Choose A File (Enter the file name and Email file to office@cuwcc.org)

4.2. A 75% Market Saturation Achieve ○ Yes ⊙ No

If yes, Choose A File (Enter the file name and Email file to office@cuwcc.org)

4.3. WSS Toilets Installed

	Single Family	Multi Family
Number of WSS Toilets Installed	0.00	0.00
Measured Water Savings AF/YR		

Flex Track

4.4. Non-WSS Toilets

Type of Toilets	Single Family Number of Toilets	Single Family Water Savings	Multi Family Number of Toilets	Multi Family Water Savings
Select an Option				

Description of Other Non-WSS Type of Toilets

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

5) WSS for New Residential Development

(Agency must complete information for at least one coverage option.You are encouraged to include information on other coverageoptions, as available. If seeking credit for additional water savings you must select the Flex Track option)

Traditional

	Single Family	Multi Family
Residential development Rebates	Yes ○ No ⊙	Yes ○ No ⊙
Recognition Programs	Yes ○ No ⊙	Yes ○ No ⊙
Reduced connection Fees	Yes ○ No ⊙	Yes ○ No ⊙
Ordinances	Yes ○ No ⊙	Yes ○ No ⊙

New Development Ordinance

Number of new Single Family Units built in Service Area

Number of new Multi Family Units built in Service Area

In the following table, enter one row for each incentive type program you offer

List of Incentive Amount

Incentive Type	Incentive Amount	Number of WSS fixtures installed	Number of Participating Single Family	Number of Participating Multi Family

Flex Track

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

Measured Water Savings AF/YR

For Traditional Option, Stop Here, do not go further.
For Flex Track Option, please continue...

Flex Track Menu Options

In addition to the measures on the BMP List, the Flex Track menu options may be implemented to meet the savings goal for this BMP. Fill in the water savings measures that your agency has implemented.

A) High bill contact with single-family and multi-family customers

Select the Types of Contact:

☐ Email ☐ Phone ☐ Letter ☐ Others (describe)

Upload sample of contact contents (email, letter, etc.)
– if applicable; enter the file name and email file to office@cuwcc.org

Who initiated the contact: (Please Specify customer, agencies, or both)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured Water Savings AF/YR

B) Educate residential customers about the behavioral aspects of water conservation

Select types of educational methods used:	# Events	# Customers Reached
☐ Workshop		
☐ Community Event		
☐ Letter		
☐ On-Site Visit		
☐ Phone Call		
☐ Water Survey		
☐ Website Hit		
☐ Door Hanger		
☐ Other (Describe)		

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured Water Savings AF/YR

C) Notify residential customers of leaks on the customer's side of the meter

Type of Notification (Describe)

How many were sent out?

Upload sample notification method(email, letter, etc.) – if applicable

(Enter the file name and Email file to office@cuwcc.org

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured Water Savings AF/YR

D) Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meter.

Number of Leaks Repaired

Number of bill adjustments/credits/refunds provided

Describe here or upload a document with a policy description below:

Upload file describing Policy (Enter the file name and Email file to office@cuwcc.org)

If you are using your own water-savings measure, send your supporting spreadsheet
Enter the file name and Email to office@cuwcc.org

Measured Water Savings AF/YR

E) Provide unique water savings fixtures that are not included in the BMP list above

Fixture or Device	Description	Quantity Installes

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

Measured Water Savings AF/YR

G) Install residence water use monitors.

Type of Monitor	Brand	Number Installed
☐ Dashboard		
☐ Leak Detector		
☐ Data Logger		

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

Measured Water Savings AF/YR

H) Participate in programs that provide residences with school water conservation kits.

Number of Kits Distributed

Kit contents (including model of fixtures)

List of what was actually installed in the homes (number of showerheads, aerators etc.).

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

Measured Water Savings AF/YR

I) Implement an automatic meter reading program for residential customers.

AMR or AMI Select an Option

Type of Network Select an Option

Number of connections installed

☐ Is your agency using these to contact high water-use customers?

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

Measured Water Savings AF/YR

OTHER Types of Measures.

Type of Program	Sample / Description

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured Water Savings AF/YR

Comments

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

2011

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Does your Agency implement the School Program? ☐ Yes ☒ No

Are there one or more wholesale agencies performing School Education Programs which can be counted to help your agency comply with the BMP?

Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency

Please provide the name of Agency, contact name and e-mail address if not CUWCC members:

☐ Materials meet state education framework requirements?

Description

☐ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students

Number of students reached

☐ Materials distributed to 7-12 Students? (optional)

Description of materials distributed to 7-12 Students

Annual budget for school education program

Description of all other water supplier education programs

School Program Activities

Classroom presentations:

Number of presentations

Number of attendees

Describe the topics covered in your classroom presentations:

Large group assemblies:

Number of presentations

Number of attendees

Children's water festivals or other events:

Number of presentations

Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations

Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description

Number distributed

Staffing children's booths at events & festivals:

Number of booths | Number of attendees

Water conservation contests such as poster and photo:

Description

Number of Participants

Offer monetary awards/funding or scholarships to students:

Number Offered | Total Funding

Teacher training workshops:

Number of presentations | Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips | Number of participants

College internships in water conservation offered:

Number of internships | Total funding

Career fairs/workshops: Number of presentations | Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description | Number of events (if applicable) | Number of participants

Total reporting period budget expenditures for school education programs(include all agency costs):

Is your Agency implementing an "At least As Effective As" variant of this BMP? ☐ Yes ☐ No

If Yes, please explain in detail why you consider it to be "At Least As Effective As"

Please Upload Document(s)

Exemption Type: Select an Exemption Type | Please Upload Document(s)

Comments

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

2011

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Does your Agency perform Public Outreach? ☐ Yes ☑ No

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP?

Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency

Please provide the name of Agency, contact name and e-mail address if not CUWCC members:

Bureau of Reclamation

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Public Contacts	Public Information Programs
1	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
1	General water conservation information
	Select a public contact
	Select a public contact
	Select a public contact

Contact with the Media

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ☐ Yes ☒ No

Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency

Bureau of Reclamation

Please provide the name of Agency, contact name and e-mail address if not CUWCC members:

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Media Contacts	Did at least one contact take place during each quarter of the reporting year?	Media Contact Types
0		Select a type of media contact
		Select a type of media contact
		Select a type of media contact
		Select a type of media contact
		Select a type of media contact
		Select a type of media contact

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ☐ Yes ☒ No

Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency
Please select the Agency

Bureau of Reclamation

Please provide the name of Agency, contact name and e-mail address if not CUWCC members:

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): www.cityofshastalake.org

Describe a minimum of four water conservation related updates to your agency's website that took place during the year: none

Did at least one Website Update take place during each quarter of the reporting year? ☐ Yes ☒ No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	
Inserts	$ 340.00		☐	price based on $0.10 per copy	
CCR	$ 680.00		☐		
			☐		
			☐		
			☐		
			☐		

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?	
	$ 0.00	☐	If yes, check the check box.
		☐	
		☐	
		☐	

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ☐ Yes ☒ No

Public Outreach Additional Information

Public Information Programs	Importance	

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ☐ Yes ☒ No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ☐ Yes ☒ No

Market Research Topic	
Brand Message	
Brand Mission Statement	

Community Committees

Do you have a community conservation committee? ☐ Yes ☒ No

Enter the names of the community committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description

Partnering Programs - Partners

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☐ Local Colleges?	
☐ Other	
☐ Retail and wholesale outlet; name(s) and type(s) of programs:	

Partnering Programs - Newsletters

Number of newsletters per year	
Number of customers per year	

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new homes

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Additional Programs supported by Agency but not mentioned above:

Is your Agency implementing an "At least As Effective As" variant of this BMP? ☐ Yes ☐ No

If Yes, please explain in detail why you consider it to be "At Least As Effective As"

Please Upload Document(s)

Exemption Type:

Select an Exemption Type

Please Upload Document(s)

Comments:

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

BMP 1.4 Retail Conservation Pricing

View MOU

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to office@cuwcc.org.

2011

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Increasing Block	Single-Family	766,310.46	652,399.61
Increasing Block	Multi-Family	44,985.56	49,334.18
Increasing Block	Commercial	126,971.78	109,467.24
Increasing Block	Industrial	155,387.03	46,242.78
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		

Implementation Option (Conservation Pricing Option)

☒ Use Annual Revenue As Reported ☐ Use CWWA Rate Design Model ☐ Use 3 years average instead of most recent year

If CWWA is select, enter the file name and email the spreadsheet to office@cuwcc.org

Canadian Water & Wastewater association rate design Model Implementation

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service Yes ☒ No ☐

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		
Select a Rate Struc	Select a Customer Ty		

Is your Agency implementing an "At least As Effective As" variant of this BMP? ☒ Yes ☐ No

If Yes, please explain in detail why you consider it to be "At Least As Effective As"

Please Upload Document(s)

Exemption Type: Select an Exemption Type

Please Upload Document(s)

Comments: Institutional included with Commercial. Wastewater charge is a flat fee.

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity

2011

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Implementation

Does your agency have any unmetered service connections? ☐ Yes ☑ No

If YES, has your agency completed a meter retrofit plan? ☐ Yes ☑ No

Enter the number of previously unmetered accounts fitted with meters during reporting year: 0

Are all new service connections being metered? ☒ Yes ☐ No

Are all new service connections being billed volumetrically? ☒ Yes ☐ No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? ☐ Yes ☒ No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts billed by Volume	Billing Frequency per Year	# of estimated per Year	# of Meter Readings per Year
Single-Family	3,442.00	3,442.00	3,442.00	Monthly	12.00	12.00
Multi-Family	101.00	101.00	101.00	Monthly	12.00	12.00
Commericial	198.00	198.00	198.00	Monthly	12.00	12.00
Industrial	10.00	10.00	10.00	Monthly	12.00	12.00
Other	3.00	3.00	3.00	Monthly	12.00	12.00
Select a Custome				Select a Billing Fr		
Select a Custome				Select a Billing Fr		
Select a Custome				Select a Billing Fr		
Select a Custome				Select a Billing Fr		
Select a Custome				Select a Billing Fr		

Number of CII Accounts with Mixed-use Meters: 0

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? ☐ Yes ☒ No

If YES, please fill in the following information:

A. When was the Feasibility Study conducted

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

Is your Agency implementing an "At least As Effective As" variant of this BMP? ☒ Yes ☐ No

If Yes, please explain in detail why you consider it to be "At Least As Effective As"

Please Upload Document(s)

Exemption type: Select an Exemption Type

Please Upload Document(s)

Comments: Institutional connections included with Commercial. Most meters are read by the Orion electronic system except a sma

AWWA WLCC Free Water Audit Software: Reporting Worksheet

WAS v4.2

Back to Instructions

? Click to access definition

Water Audit Report for: City of Shasta Lake
Reporting Year: 2011 (1/2011 - 12/2011)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

<< Enter grading in column 'E'

Volume from own sources:	10	0.000	acre-ft/yr	
Master meter error adjustment (enter positive value):	9	0.000		acre-ft/yr
Water imported:	8	2,493.000	acre-ft/yr	
Water exported:	n/a	0.000	acre-ft/yr	
WATER SUPPLIED:		2,493.000	acre-ft/yr	

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:
Billed metered:	10	2,176.730	acre-ft/yr		
Billed unmetered:	n/a	0.000	acre-ft/yr		
Unbilled metered:	n/a	0.000	acre-ft/yr		
Unbilled unmetered:		31.163	acre-ft/yr	1.25%	

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 2,207.893 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

285.108 acre-ft/yr

Apparent Losses

				Pcnt:	Value:
Unauthorized consumption:		6.233	acre-ft/yr	0.25%	

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	9	0.000	acre-ft/yr	0.00%	
Systematic data handling errors:		0.000	acre-ft/yr		

Systematic data handling errors are likely, please enter a non-zero value; otherwise grade = 5

Apparent Losses: 6.233

Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 278.875 acre-ft/yr

WATER LOSSES: 285.108 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 316.270 acre-ft/yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	7	60.0	miles
Number of active AND inactive service connections:	6	3,988	
Connection density:		66	conn./mile main
Average length of customer service line:	8	0.0	ft (pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	7	105.0	psi

COST DATA

Total annual cost of operating water system:	6	$2,731,419	$/Year
Customer retail unit cost (applied to Apparent Losses):	8	$1.10	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	2	$59.00	$/acre-ft

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume of Water Supplied:	12.7%
Non-revenue water as percent by cost of operating system:	0.8%
Annual cost of Apparent Losses:	$2,986
Annual cost of Real Losses:	$16,454

Operational Efficiency Indicators

Apparent Losses per service connection per day:	1.40	gallons/connection/day
Real Losses per service connection per day*:	62.43	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	0.59	gallons/connection/day/psi
Unavoidable Annual Real Losses (UARL):	108.54	acre-feet/year
From Above, Real Losses = Current Annual Real Losses (CARL):	278.88	acre-feet/year
Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.57	

* only the most applicable of these two indicators will be calculated

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 71 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Variable production cost (applied to Real Losses)
2: Water imported
3: Total annual cost of operating water system

For more information, click here to see the Grading Matrix worksheet

The fields in red are required.

Agency name: City of Shasta Lake

Reporting unit name (District name): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2011

BMP 1.2
Water Loss Control

View MOU

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software ☒ Yes ☐ No

Email to office@cuwcc.org - Worksheets (AWWA Water Audit). Enter the name of the file below:

2011 WaterAudit.xls

Water Audit Validity Score from AWWA spreadsheet

Agency Completed Training In The AWWA Water Audit Method Yes ☐ No ☒

Agency Completed Training In The Component Analysis Process Yes ☐ No ☒

Completed/Updated the Component Analysis (at least every 4 years)? Yes ☐ No ☒

Component Analysis Completed/Updated Date format:mm/dd/yyyy

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective ☒ Yes ☐ No

Recording Keeping Requirements:

Date/Time Leak Reported

Leak Location

Type of Leaking Pipe Segment or Fitting

Leak Running Time From Report to Repair

Leak Volume Estimate

Cost of Repair

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective ☒ Yes ☐ No

Type of Program Activities Used to Detect Unreported Leaks

Review of meter data (see comment)

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? ☒ Yes ☐ No

Does your agency keeps records of each component analysis performed, and incorporates results into future annual standard water balances? ☐ Yes ☒ No

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventions	Water Saved (AF/Year)
53.00			$ 0.00			

Is your Agency implementing an "At Least As Effective As" variant of this BMP? ☐ Yes ☒ No

If Yes, please explain in detail why you consider it to be "At Least As Effective As"

Please Upload Document(s)

Exemption Type: Select an Exemption Type

Please Upload Document(s) for Exemption

Comments: Electronic meters have been installed since 2009. They send up a red flag if the customer's meter doesn't come to a complete stop during the night. It also helps us to identify customers that have an unusually large water usage. Data for value of loss, cost of interventions, and water saved are not available.

The fields in red are required.

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Email: wbishop@cityofshastalake.org

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2011

BMP 1.1
Operations Practices
Retail

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator ☐ Yes ☒ No

Contact Information

First Name	William
Last Name	Bishop
Title	Water Superintendent
Phone	530-275-7450
Email	wbishop@cityofshastalake.org

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

- ◉ a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
- ☐ b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
- ☐ c. Support legislation or regulations that prohibit water waste
- ☐ d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
- ☐ e. Support local ordinances that prohibit water waste
- ☐ f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to office@cuwcc.org

Web address(s) URL: comma-separated list

http://library.municode.com/index.aspx?clientId=16623&stateId=5&stateName=California

Enter a description:

Municipal code 13.12.160.B.: Consumer shall not permit leaks or waste of water.
Municipal code 15.10: Water efficient landscaping

The fields in red are required.

Agency name: City of Shasta Lake

Division name (Reporting unit): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

Water Uses

2011

Non-Potable Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Dedicated Irrigation	1.00	67.30			Cal Trans
Industrial	2.00	39.59			Sierra Pacific, Knauf
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

Non-Potable Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

The fields in red are required.

Agency name: City of Shasta Lake

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Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

Water Uses

2011

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Single-Family	3,442.00	1,550.54	0.00	0.00	
Multi-Family	101.00	88.90	0.00	0.00	
Commercial	198.00	243.29	0.00	0.00	Includes institutional
Industrial	10.00	294.00	0.00	0.00	
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					
Select a Customer Type					

The fields in red are required.

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Primary contact:

First name: William

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Email: wbishop@cityofshastalake.org

WATER SOURCES

2011

Service Area Population: 10,280

Non Potable Water

Imported	AF/YEAR	Water Supply Type	Water Supply Description
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Local Watershed	AF/YEAR	Water Supply Type	Water Supply Description
Reuse	106.89	Recycled	from wastewater treatment plant
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

The fields in red are required.

Agency name: City of Shasta Lake

Division name (Reporting unit): City of Shasta Lake

Reporting unit number: 91

Primary contact:

First name: William

Last name: Bishop

Email: wbishop@cityofshastalake.org

WATER SOURCES

2011

Service Area Population: 10,280

Potable Water

Imported	AF/YEAR	Water Supply Type	Water Supply Description
Reclamation (Shasta Lake)	2,493.00	Surface Water	allotment is 4400 AF/YR
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

Local Watershed	AF/YEAR	Water Supply Type	Water Supply Description
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	
		Select a water type.	

The fields in red are required.

Agency name: City of Shasta Lake

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Reporting unit number: 91

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Email: wbishop@cityofshastalake.org

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

2011

BMP 5 Landscape

View MOU

You must enter all measured water savings manually. For each measure entered, upload a spreadsheet with sufficient information to show the way that water savings were measured and that the measure was adequately tracked (i.e., all relevant data was collected) - in some cases there are specific data point salso requested in form which are necessary to show that the measure was implemented as described.

1) Accounts with Dedicated Irrigation Meters

Flex Track

Traditional

a) Number of dedicated irrigation meter accounts: 1.00

h) Aggregate acreage of recreational areas assigned water budgets: 0.00

b) Number of dedicated irrigation meter accounts with water budgets: 0.00

c) Aggregate water use for all dedicated landscape accounts with water budgets: 0.00

d) Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets: ____ and average ET ____

Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years: ○ Yes ○ No

Water Savings from Accounts with dedicated irrigation meters with water budgets (Acre Feet): ____

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to office@cuwcc.org)

Technical Assistance

Flex Track

Traditional

e) Number of Accounts 20% over-budget: 0.00

f) Number of accounts 20% over-budget offered technical assistance: 0.00

g) Number of accounts 20% over-budget accepting technical assistance: 0.00

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

(Enter the file name and Email file to office@cuwcc.org)

2) Commercial/Industrial/Institutional (CII) Accounts without Meters or with Mixed-Use Meters

Traditional

Number of mixed use and un-metered accounts	0.00		
Number of irrigation water use surveys offered (cumulative, all years)	0.00		
Number of irrigation water use surveys accepted (cumulative)	0.00		
Type: Incentives numbers received by customers	0.00	$ Value	
Type: Rebates numbers received by customers	0.00	$ Value	
Type: no- or low-interest loan offered numbers received by customers	0.00	$ Value	
Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations	0.00		

Flex Track

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured water savings (AF/Year)

Financial Incentives

Traditional

Have you implemented and maintained an irrigation equipment retrofit incentive program? ○Yes ⊙No

Number of incentives	Dollar value of incentives	Incentive Types

Flex Track

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)
(Enter the file name and Email file to office@cuwcc.org)

Measured water savings (AF/Year)

Traditional Reporting Stop Here, Do not continue
Flex Track Reporing Please Continue...

Landscape Flex Track Measure Types

1. Monitor and report on landscape water use

A) Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules (such as faxes, twitter, etc. not included in the previous sections).

Measured water savings (AF/Year)

Enter the Number of sites with:

Dedicated Mixed Meters	
Water Budgets	
Landscape Measurements	
Others (describe)	

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

B) Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Measured water savings (AF/Year)

Enter the Number of sites with:

Dedicated Mixed Meters	
Water Budgets	
Landscape Measurements	
Others (describe)	

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

C) Establish agency-wide water budget. (Note that: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

Measured water savings (AF/Year)

Agency-wide total irrigated area Per-2010		(Acres)
Agency-wide totak irrigated area Post-2010		(Acres)
Amount of Water Used		(AF/Acre)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

D) Establish agency-wide, sector-based irrigation goal to reduce water use, based on seasonality.

Measured water savings (AF/Year)

Number of minimum irrigation goal (AF/Acre)

Amount of Water Used per Period (AF/Period)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

2. Provide technical landscape resources and training

A) **Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.**

Measured water savings (AF/Year)

Enter the Number of:

Contacts In Person

Contacts over the phone

Contacts via Email

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

B) Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Measured water savings (AF/Year)

Enter the Number of:

Audits conducted per year

Measurement of square footage of Turf areas

Measurement of square footage of NON Turf areas

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data)

C) Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Enter the Number of:

Events

Participants

List Type or Title of Events

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

D) Establish Time-of-Day Irrigation Restrictions.

Yes No

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

E) Establish Day-of-Week Irrigation Restrictions. **Yes** **No**

Describe Restrictions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

---

3. Provide incentives

A) Establish Landscape budget-based rates. ◯ Yes ◯ No

Describe Rates:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

B) Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Number of Conversions:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

C) Provide incentives for installing sub-meters to separate landscape water use

Number of meters installed:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

D) Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

Select types of irrigation equipment upgrades:	Number of devices installed
☐ Controllers	
☐ Emitters	
☐ Soil moisture sensors	
☐ Pressure Regulators	
☐ Rain shut off devices	
☐ Other (describe)	

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

E) Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

Acreage of live turf converted to low water-using plants, artificial turf, or permeable surfaces: Acres

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

F) Provide incentives for conversions from potable to recycled water.

Number of Conversions:
Number of Incentives:
Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

G) Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

Number of Conversions:
Number of Incentives:
Funds Invested:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

---

4. Participate in local and regional planning and regulatory activities

A) Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

Measured water savings (AF/Year)

Public Information Programs List

Agency Type	Describe Involvement	If Ohter: Enter Name	Actions

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

B) Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

◯ **Yes** ◯ **No**

Describe Involvement:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

C) Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

◯ Yes ◯ No

Describe Involvement:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

---

5. Develop a holistic approach to landscape water use efficiency

A) Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Describe Program:

Measured water savings (AF/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file to office@cuwcc.org)

---

6. Other Measures

A) Other Landscape Measures.

Describe Other Landscape Measures:

Measured water savings (Af/Year)

If there is Water Savings in this measure, upload the Methodology Spreadsheet (backup data) (Enter the file name and Email file office@cuwcc.org)

RESOLUTION CC-15-19

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SHASTA LAKE ADOPTING THE 2011 WATER MANAGEMENT PLAN

WHEREAS, the Central Valley Improvement Act of 1992 (CVPIA) and Section 210(b) of the Reclamation Reform Act of 1982 requires the preparation and submittal of a Water Management Plan (Plan) from entities that enter into a water service contract with the Bureau of Reclamation; and

WHEREAS, each Plan is required to be updated every 5 years. In compliance with this requirement, the City, with the assistance of SHN Consulting Engineers has completed the update for the 2011 Water Management Plan.

NOW, THEREFORE, BE IT RESOLVED, the City of Shasta Lake Council hereby adopts the 2011 Water Management Plan

PASSED, APPROVED AND ADOPTED this 17th day of March, 2015 by the following vote:

AYES: **CHAPMAN-SIFERS, FARR, KERN, MORGAN, WATKINS**
NOES: **NONE**
ABSENT: **NONE**

GREG WATKINS, Mayor

ATTEST:

TONI M. COATES, CMC
City Clerk