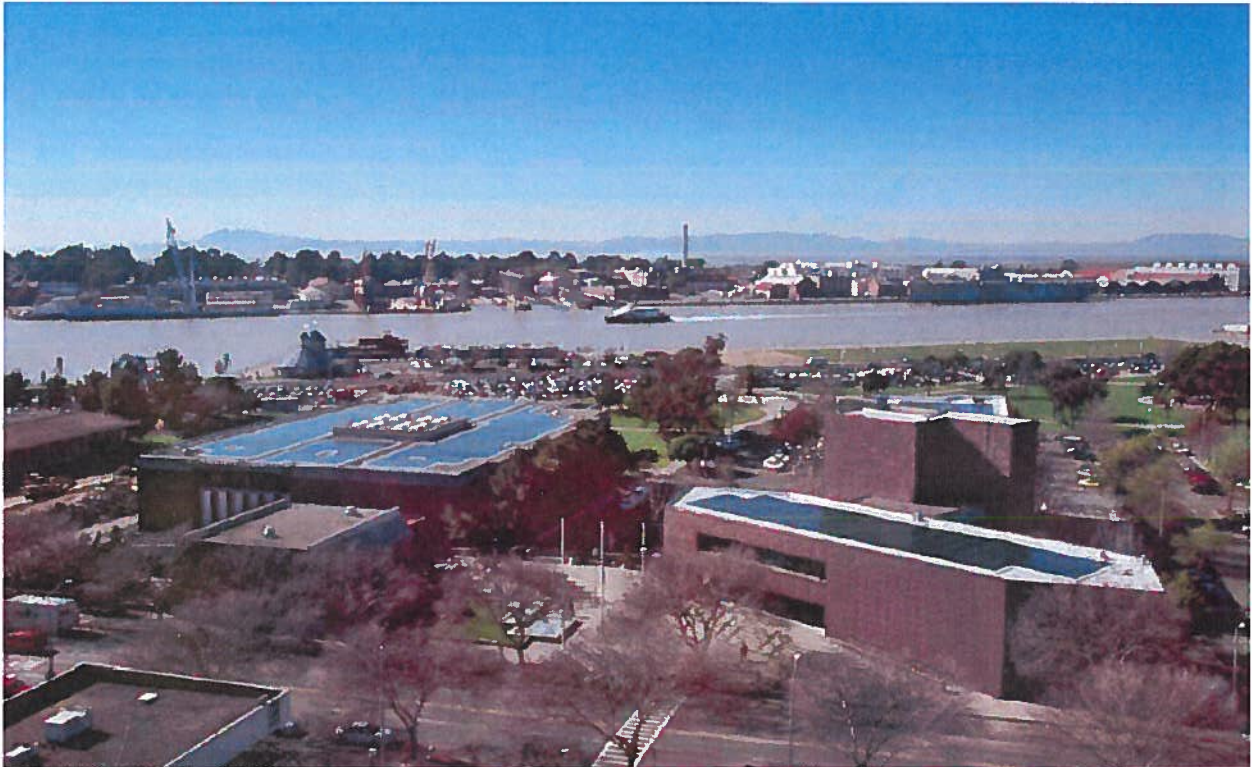


**CITY OF VALLEJO
WATER MANAGEMENT PLAN
USBR Mid-Pacific Region 2011 Standard Criteria**



Prepared By

City of Vallejo Water Division

September 19, 2014

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Section I: Description of the District

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A. History

The City is located in western Solano County along the San Francisco Bay approximately 30 miles northeast of the City of San Francisco. The City has a current estimated population of 121,377. The City is located on Highway 80, and is also served by Highways 29 and 780.

Accepting an offer of 166 acres of land from General Mariano Vallejo, the newly elected State legislature established the state capital for a very brief period beginning in 1851. Lack of adequate housing and meeting facilities soon ended Vallejo's term as capital.

The importance of Vallejo's waterfront was soon recognized for commercial and military facilities. In 1854, the United States Navy established the first west coast naval facility on Mare Island. The coming of the railroad to Vallejo in the 1860's spurred a dramatic period of growth that lasted into the mid-1880's. A variety of industries and commercial enterprises kept the City growing at a moderate rate with spurts of growth at the onset of World Wars I and II.

Initially, the City of Vallejo relied on wells, and water tanks for its water supply. Water was also purchased off of water barges. The Vallejo City Water Company (not the current municipal system) began to build its system in August 1868. In 1883 Anthony Chabot began the Vallejo Water Co. A watershed reservoir, Lake Chabot, was constructed to supply the City by gravity feed. In July 1876 Mare Island Naval Shipyard connected to the water system. Frustrated by poor water quality, by June 1892, the citizens of Vallejo passed a measure for \$250,000 for land purchase and construction of a municipal water system. Watershed and right-of-way land purchases proceeded confidentially and on January 27, 1894, Vallejoans got their first taste of Green Valley water. Vallejo now had one of the state's first municipally-owned water systems.

Between 1976 and 1980, Vallejo experienced rapid development, unusual because it was not connected to growth of the Mare Island Naval Shipyard. Large tracts of vacant land, availability of water and sewer capacity, and City policies encouraging growth all provided an impetus for new growth.

In the early 1990's, the growth and economy of the city slowed as it did throughout California and the rest of the nation. The most profound change in Vallejo during this period of time was the decision made in 1993 to close Mare Island Naval Shipyard by 1996. The closure would not only mean a loss of employment opportunities but a loss of residents as well. (City of Vallejo, July 1999)

The City’s General Plan describes the future growth area boundaries. For the purposes of this Plan, the ultimate growth boundary of the City over the life of the City’s general plan will be used to describe the future City water system service area. The current water service area is characterized by a mixture of residential and commercial land use. The City currently serves about 37,122 connections (including 385 fire services). The terrain is moderately varied.

The Vallejo Water System serves the City of Vallejo and unincorporated areas in Solano County. The City also provides potable water to the former Mare Island Naval Shipyard, which is now undergoing redevelopment, and operates a separate water treatment plant for Travis Air Force Base.

With the build out of the Hiddenbrooke (formerly Sky Valley) and Northgate residential areas, future development will be in the form of in-fill, reuse projects, in such areas as the Waterfront, Downtown, Mare Island, and Solano Fair Grounds.

1. Date district formed and original size

*Date City formed: 1894
Original size (acres): ___NA___*

*Date of first Reclamation contract: 1958
Current date (date of data entered): 2011*

2. Size, population, and irrigated acres

Size (square miles)	27.85
Population served(1)	121,173
Irrigated acres	NA

Note (1) Source = 2010 Census for Incorporated Vallejo and number of accounts X persons per household for all other service areas.

3. Water supplies received (Acre-Feet). [See Water Tables 1, 2, 3, and 6]

Water Source	Date 2011
Federal urban water (Solano Project/Lake Berryessa)	13,741
Federal agricultural water NA	NA
State water (State Water Project)	6,140
Local/other (Vallejo Permit Water)	1,141
Local surface water (Vallejo Lakes Watershed – Lakes Madigan and Frey)	429
Local surface water (Vallejo Lake Curry)	1,500
Upslope drain water	NA
District ground water	NA
Transferred water Bought, Sold, or Traded	0
Reclaimed water (VSFCD)	0
Other (define)	0
Total	22,951

The City brings water from the five different sources to three treatment plants in order to serve customers in two counties, an active military base and a former military base. The three water treatment plants (WTP) consist of Fleming Hill WTP, Green Valley WTP and Travis WTP.

The Fleming Hill WTP treats water from the Sacramento River Delta through the North Bay Aqueduct (NBA) and Lake Berryessa (Solano Project). This water is pumped to the Fleming Hill WTP, where it is treated and pumped into the distribution system. The Fleming Hill WTP is the main water treatment facility for the City. This WTP is a conventional surface water treatment plant, but with the addition of a preozonation and intermediate ozonation process. The 1996 upgrade and expansion project for this plant increased the design flow rate from 27 to 42 million gallons per day (mgd).

The Green Valley WTP treats water from City-owned Lake Madigan and Lake Frey and with supplemental water from Lake Berryessa. After the 1998 upgrade and expansion project for this plant, the new capacity is 1 mgd. This plant serves the Lake subsystem, including the Gordon Valley area.

Travis WTP treats NBA water, and with the recent installation of pumping facilities, has added Lake Berryessa water. The 1993 upgrade and expansion project for this plant increased the design flow rate to 7.5 mgd.

The City operated a fourth WTP at Gordon Valley but it has been closed and out of service since 1992. Potable water customers that were served by the WTP are now served by the Green Valley WTP.

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

Urban	AF	Source	Contract #	Contract Restrictions
USBR (Solano Project - Berryessa)	14,600	Lake Berryessa	14-06-200-4090	Subject to drought reductions
State Water Project/NBA	5,600	Sacramento River	160260	Subject to drought reductions
Vallejo Permit Water ^a Sacramento Delta	22,800	Sacramento River	7848	Subject to drought reductions
Lake Curry ^b	3,750	Lake Curry	5728	Equals safe yield
Lakes Madigan, Frey	400	Lakes Madigan, Frey	Pre-1914 rights	Equals safe yield
Other AF/Y				
TOTAL	47,150 AF			

^a Vallejo Permit Water supply should increase from 17,200 ac-ft/yr to 22,800 ac-ft/yr by 2015, when agreements required to allow Vallejo's full conveyance of the 22,800 ac-ft/yr through the NBA are expected to be in place.

^b Lake Curry is currently being used only for instream flow until such time as a new conveyance system is in place.

Solano Water Project. Solano Project Water is delivered from Lake Berryessa via the Putah South Canal to either Cordelia where it is pumped into Vallejo or the Travis WTP, or via Solano Irrigation District's distribution system to an intertie in Green Valley. The majority of Vallejo's

Solano Project water entitlement is delivered to Fleming Hill WTP from USBR terminal reservoir via the Cordelia reservoir.

State Water Project. State Water Project water is delivered from Lake Oroville through the Sacramento River to the North Bay Aqueduct Pumping facility at Barker Slough where it is pumped to the DWR Forebay at Cordelia.

Sacramento Delta Entitlement. Delivery of this entitlement has been through the intake of the NBA facilities at Barker Slough. NBA water is also treated at the Travis WTP.

Lakes Frey, Madigan, and Curry. Lakes Frey and Madigan are located in northern Solano County. The City owns both lakes and the surrounding watershed land. Water flows from Lake Madigan into Lake Frey and then into the Diversion Dam, from which the water continues to flow under gravity through a pipe into the Green Valley WTP located at the end of Green Valley Road. Lake Curry is currently being used for instream flow and anticipated to only be used for this purpose until such time when plans are in place for a conveyance system to deliver water to the City’s Fleming Hill water treatment plant.

5. Describe anticipated land-use changes (e.g., agricultural to municipal, etc.).

No land annexations are planned. New development can be described as infill or redevelopment within existing urbanized areas. The former Mare Island Naval Base is undergoing gradual reuse, although ultimate water demand will be less than what it was at the height of U.S. Navy use. Conceptual plans have also been prepared for the redevelopment of the Solano County Fair Grounds, under the project name Solano360.

6. Cropping patterns. Not Applicable for Urban M&I System

List crops with 5 percent or more of total acreage.

Crop	Acres
Not Applicable	0

7. Major irrigation methods (by acreage). Not Applicable for Urban M&I System

Irrigation Method	Acres
All other	0
Total	

B. Location and Facilities

See Attachment A for maps containing the following: incoming flow locations, turnouts (internal flow), conveyance system, storage facilities, and water quality monitoring locations.

1. Incoming flow location and measurement methods

Location Name	Physical Location	Type of Measurement Device	Accuracy(a)
NBA-Barker Slough PS	Barker Slough	Accusonic 7500 Flowmeter	+/- 0.5%
NBA-Reach 1-Northgate PS	'AKA Travis Pump Station, N of TAFB	Flo-Probe Magmeter Sensor (Model 88L)	Approx. +/- 1.0%
Travis Water Treatment Plant	Travis AFB	Electromagnetic Flowmeter (Danfoss Mag 3100) (Plant Influent)	+/- 0.25%
NBA-Reach 3-Forebay	Cordelia	Venturi Meter	+/- .5%
Cordelia Complex, P#1,2	Cordelia	Venturi Meter	+/- .5%
Cordelia Complex, P#3	Cordelia	Venturi Meter	+/- .5%
Cordelia Complex, P#4,5,6	Cordelia	Venturi Meter	+/- .5%
Solano Project Terminal Reservoir	AKA Monticello Pump Station, End of Putah South Canal, Green Valley	Venturi Meter	Approx. +/- 0.5%
Travis Beck Avenue PS	Beck Avenue, Fairfield	Magnetic Flow Meter 16"	+/- 0.25%
Fleming Hill Wtr Trtmnt Plant Blending Structure	Fleming Hill Rd., Vallejo	Magnetic Flowmeter (Plant Influent)	+/- 0.25%
Lakes Madigan & Frey	Solano County	Weir - meter	Unknown
Lake Curry	Napa County	Weir – water level sight gauge	Unknown

The above table includes the City's source raw water incoming measurement methods and levels of accuracy. Background information, typically in the form of manufacturers' specifications, is included in Attachment C. The City will report in the next annual plan update on those measuring methods (weir and weir water level sight gauge) for which accuracy is currently unknown.

2. Current Agricultural Conveyance System (Not Applicable for Urban M&I System)

3. Current Urban Distribution System

Miles AC Pipe	Miles Steel Pipe	Miles Pipe Ductile/Cast Iron	Miles - Plastic
124	12	62 / 345	62

There are approximately 605 miles of distribution mains in the system.

4. List storage facilities.

A map of the entire Vallejo Water Systems is included as Attachment A.

There are currently two separate distribution systems: City of Vallejo service area and the Vallejo Lakes service area. This section discusses the distribution systems including pipelines, storage, pump stations, and interconnections.

City of Vallejo Service Area Distribution System. The existing distribution system serving the City originates at the clearwell reservoir of the Fleming Hill WTP. It consists of facilities for pumping, pressure regulation, storage, and transmission.

The City's raw water is pumped from Cordelia through a single 27-inch pipeline that parallels Interstate 80. The Jameson Canyon pump station and pipeline project provides a secondary raw water supply through a new 30-inch pipeline. The pump station is built at the existing Cordelia Reservoir Complex, and the pipeline is aligned along Highway 12. The project assures reliable delivery of water to the City.

Fourteen pump stations in the Vallejo distribution system are currently active. Seven new pump stations have come online since 1985: Columbus Parkway, Fulton Avenue, Miravista, Shadow Ridge, Sky Valley, Swanzy Dos Reis, and Hollywood Avenue. Three pump stations--Fairgrounds Avenue, Henry Street and Magazine Street--have been taken out of service since that time. Nineteen pressure-reducing stations are used in the transfer of water to lower zones. The Swanzy station has a remotely-operated butterfly valve operated in conjunction with a flow meter. All others have diaphragm-actuated valves.

Vallejo Lakes Service Area Distribution System. The Lakes Water System began in 1893 with the construction of the Green Valley Diversion Dam on Wild Horse Valley Creek. Water trapped by the dam was once conveyed to Vallejo via a 14-inch diameter pipeline (Green line) through Jameson Canyon. In 1894, Lake Frey was constructed upstream of the Green Valley Diversion Dam. Lake Madigan was constructed further upstream in 1911. In 1924, the Gordon Valley system began with the construction of diversion facilities at the Lake Curry site and a 24-inch-diameter pipeline (Gordon line). The Gordon line connects to the Green line near Cody Hill at Highway 12.

The Green Valley distribution system consists of a water treatment plant and four distribution system pressure zones. At the Mankas Corner Pump Station water from the Green Valley WTP is pumped to serve customers in the Gordon Valley area.

There are currently a total of 3 treated water storage reservoirs, with a combined capacity of 1.09 million gallons (mg). The reservoirs are distributed throughout the system to provide storage in nearly every pressure zone.

Travis Water Transmission System. The City provides a combination of three water sources to the Travis AFB Water Treatment Plant which the City operates for the U.S. Air Force: State Water Project and Vallejo Permit Water are conveyed via the North Bay Aqueduct and Northgate Pump Station; Solano Project water, added to improve raw water quality, is pumped via the Travis-Beck Ave. Pump Station. The Travis-Beck Ave. Pump Station was constructed to provide a permanent means of conveyance of an alternate source water (Solano Project) to Travis WTP.

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RESERVOIR NAME	RESERVOIR LOCATION	STORAGE (mg)
RAW WATER RESERVOIRS		
Cordelia Complex	McGeary Road, Cordelia	15.00
Summit	Borges Lane, Vallejo	58.60
<i>SUBTOTAL RAW WATER</i>		<i>73.60</i>
TREATED WATER RESERVOIRS (Vallejo Distribution System)		
Alta Loma Tank No. 1	Temple Way	0.50
Alta Loma Tank No. 2	Temple Way	0.50
Burnham	Burnham St.	0.10
Burnham (Hydropneumatic)	Burnham St.	0.005
Cimarron	Vanessa Wy.	0.54
Columbus Parkway	Columbus Prkwy.	6.00
Capitol (Hydropneumatic)	Capitol St.	0.005
Dos Reis Tank No. 1	Bayhurst Dr.	1.00
Dos Reis Tank No. 2	Bayhurst Dr.	1.30
Dos Reis Tank No. 3	Bayhurst D.	1.60
Fleming Hill Clearwell	Fleming Hill WTP	10.89
Georgia Tank No. 1	Country View Ct.	0.50
Georgia Tank No. 2	Country View Ct.	0.50
Georgia Tank No. 3	Country View Ct.	1.20
Glen Cove 292	Chesapeake Dr.	1.50
Hunter Ranch No. 1	Redwood & Ascot Prkwys	1.00
Hunter Ranch No. 2	Redwood & Ascot Prkwys	2.50
Mare Island	Club Dr.	6.00
Northgate 600	Columbus Prkwy	1.70
Shadow Ridge IV (Hydropneumatic)	Bayhurst Dr.	0.008
Sky Valley 600 Tank	Mockingbird Ct.	2.30
Sky Valley 736 Tank	Quicksilver Ln.	0.99
Skyview	Goheen Circle	6.00
Somerset Tank No. 1	Ascot Prkwy	1.00
Somerset Tank No. 2	Ascot Prkwy	1.90
Swanzy	Swanzy Dam Road	37.40
<i>SUBTOTAL TREATED WATER (Vallejo)</i>		<i>86.92</i>
(Lakes Distribution System)		
Siebe	Siebe Lane	.003
Rockville		.085
Green Valley WTP Reservoir		1.00
<i>SUBTOTAL TREATED WATER (Lakes)</i>		<i>1.088</i>

All raw water conveyance facilities are pipelines, except for the open Putah South Canal. All distribution lines are pressurized pipelines.

Every raw or treated water pump station has a discharge water meter (venturi, mag meter, or turbine). A list of pump stations is included below.

PUMP STATION NAME
Raw Water Transmission
Terminal Reservoir (owned by USBR)
Monticello
NBA PS @ Barker Slough (owned by DWR)
Vallejo (Travis WTP) Raw Water Transmission
North Gate
Vallejo Raw Water Distribution
Hiddenbrooke Irrigation
Chabot
Vallejo System Potable Water Distribution
Capital St.
Carter St.
Columbus Parkway
Dos Reis
Fleming Hill Grid
Fleming Hill TV
Fulton Avenue
Georgia St.
Hiddenbrooke Domestic
Hollywood Ave.
Mira Vista
Redwood Parkway
Shadow Ridge
Swanzy Road
Tennessee St.
Lakes System Raw Water Transmission
Green Valley- Solano Irrigation Dist. Booster Pump
Lakes System Potable Water Distribution
Green Valley
Mankas Corner
Rockville
Siebe

5. *Describe agricultural spill recovery system. Not Applicable for Urban M&I System*

6. *Agricultural delivery system operation. Not Applicable for Urban M&I System*

All customers are served on demand. Treated water is introduced to the distribution pipeline and storage system where it is available for customers to draw at any time without notice. Untreated (raw) water is available to a small number of customers who can draw it metered at any time without notice from the transmission pipeline system.

7. *Describe restrictions on the district's water source(s).*

Restriction	Cause of Restriction	Effect on District Operations
Lake Curry (Gordon) WTP Closure	Inability to economically meet Surface Water Treatment Rules led to WTP closure, and thus closure of the only pipeline available to convey lake water.	Inability to access Lake Curry as M&I supply until Lake Curry Water Reuse Project is completed. Ongoing in-stream contribution to support fisheries likely, though amount uncertain.
NBA conveyance restriction to full use of Vallejo Permit Water	Clerical error deprived Vallejo of some of the capacity it had purchased.	Full entitlement not available until agreement reached with NBA users, estimated to be completed by 2015.
NBA water quality issues	Winter run off into Sacramento Delta.	Scheduled greater use of Solano Project water in Vallejo to avoid peak turbidity events. Provided alternative source conveyance to Travis AFB.

8. *Describe proposed changes or additions to district's facilities and operations for the next 5 years.*

Capital expenditures are not for system expansion but for equipment and facilities rehabilitation or replacement, or minor upgrades to improve operational flexibility, reliability, and safety (instruments, controllers, chemical systems, pumps, valves, pipelines, corrosion control, reservoir tanks, access roads,). The City also has an ongoing program of meter replacement for improved accuracy and appropriate revenue collection.

By the end of the next five years the City anticipates being able to utilize its Lake Curry water source if a water conveyance project is completed, and also to have negotiated for the full conveyance of Vallejo Permit Water through the North Bay Aqueduct, as originally understood and purchased.

C. Topography and Soils

1. *Describe topography of the district and its impact on water operations and management.*

The Vallejo area is underlain by sedimentary bedrock consisting of sandstone and shale. The units are part of the “Great Valley Sequence.” The sandstone usually has good slope stability, while the shale is often weaker and tends to be more landslide prone. Alluvium covers bedrock throughout much of the area. (VSFCD)

Vallejo is characterized by rolling hillsides and flatland with water draining to the Napa River or Carquinez Strait. Elevated water storage tanks are needed to serve customer located above the “grid” (gravity fed) zone.

Expansive soils and creek crossings are a transmission line and distribution system maintenance concern, especially in the Vallejo Lakes Water System. There are no known soil limitations that affect the use of water.

2. Describe district’s soil associations. (Not Required for Urban M&I System)

Soil Association	Estimated Acres	Effect on Water Operations and Management
Soil Maps are available upon request.		NA

3. Describe limitations resulting from soil problems. (Not Required for Urban M&I System)

Soil Problem	Estimated Acres	Effect on Water Operations and Management
Localized Corrosive Soil	Unknown (Vallejo Waterfront)	Increased expense for corrosion control. Replacement with plastic pipe.
Expansive Soils	Unknown	Expansive soils increase the cost of pipeline maintenance.

D. Climate

1. General climate of the district service area.

The climate of Vallejo is characterized by cool, rainy winters and warm, dry summers. Like the rest of the Bay Area, the Vallejo region is classified as a Marine West Coast Climate type with Mediterranean characteristics.

Climate and air quality data for the Vallejo area are provided in the Vallejo General Plan and by the Bay Area Air Quality Management District. Vallejo is located in the North Basin, which includes all of the nine-county Bay Area north of the San Rafael-Richmond Bridge and Suisun Bay. From west to east, it encompasses climates varying from the cool marine coastal climate to the warm continental Sacramento delta climate. Summer maximum temperatures average in the low 80's, with summer minimums in the low 50's. Winter maximums are in the mid-50's, with minimums in the mid-30's. Sunshine is plentiful, and annual precipitation averages 20 inches, most of it falling between November and May. (VSFCD)

Mean annual runoff data from the San Francisco Bay Region has been recorded by the U. S. Geological Survey. Using a 40-year period, 1931 to 1970, the values range from 3.0 to 3.5 inches per year.

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Prevailing wind direction in the Vallejo area is westerly, reflecting exposure to marine air intrusion via Carquinez Strait and San Pablo Bay. A southerly wind flow precedes winter storms. Light winds (i.e. less than 5 mph) are typical of fall and winter while wind speeds of about 10 mph occur mainly in spring and summer. During nighttime and early morning hours, light winds are maintained. (VSFCD)

Provide National Weather Service (or other source).

The following precipitation and temperature data is from Station 045333 for Mare Island, which is the closest available station to City of Vallejo.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg Precip.	4.63	2.63	2.50	1.40	0.11	0.20	0.06	0.04	0.15	1.53	3.27	3.24	19.78
Avg Temp.	47.9	51.8	54.3	57.6	62.1	66.6	68.6	68.5	67.5	62.7	53.5	47.7	59.1
Avg. Max. Monthly Temp.	57.8	62.4	66.2	70.9	75.8	80.5	82.8	82.6	82.1	76.9	63.1	57.8	71.8
Avg. Min. Monthly Temp.	39.2	41.6	43.1	44.8	48.6	52.5	54.6	54.4	52.9	48.8	41.7	38.6	46.9
Eto	0.74	1.52	3.08	4.27	5.44	6.82	7.82	6.91	4.90	3.52	2.03	0.83	47.88

Weather Station ID: NOAA, Mare Island (#045333)

Data Period: Jan. 1961 thru Dec. 1975

ET Station ID: CIMIS, Suisun Valley (#123)

Data Period: Dec. 2004 to Nov. 2005

Predominant wind direction: Westerly

Average annual frost-free days: 365

2. Impact of any microclimates on water management within the district.

Within the Vallejo service area there are no significant microclimates which impact overall water management.

E. Natural and Cultural Resources

Vallejo is bordered by San Pablo Bay and the Carquinez Straits and is divided into Mare Island and Vallejo proper by the Napa River. The Napa River marsh is one of the most important remaining estuarine and marine habitats in the San Francisco Bay System. Every anadromous

fish that spawns in the Sacramento River System passes through Carquinez Strait. Three rare and/or endangered species exist in the vicinity of Vallejo — the San Francisco Bay salt marsh harvest mouse, the black rail, and the clapper rail.

Within the Vallejo area there are five distinct floral communities. The largest area consists of grassland and is found throughout the area. The other floral communities are found in specific locations. Creek vegetation is associated with the constantly wet soils and muds of creeks and minor drainage channels. The woodlands usually consist of eucalyptus groves, and in some locales oak trees and associated grasses are found. Along the City’s southern boundary bordering the Carquinez Strait and in Glen and Elliot Coves the vegetation is typical of waterfront, bay muds, and salt marshes. No known rare or endangered plant species are known to exist.

The City of Vallejo municipal water system has not been involved in the management of natural resources in the Vallejo area. There are no plans for its future involvement.

The Greater Vallejo Recreation District (GVRD) oversees 453 acres of parkland and 481 acres of open space land in the Vallejo area. Dan Foley and Blue Rock Springs Park are two of the better known parks.

The Vallejo area contains a number of buildings of historical significance dating back to the City’s founding as the site for the State’s first capitol in 1850. Many of the downtown’s early 20th century buildings have been restored or rehabilitated. Mare Island, a former Naval base is on the National Register and contains many historic sites and structures.

1. Natural resource areas within the district.

Name	Estimated Acres	Description
Suisun Creek	Unknown	Lake Curry Dam releases into Suisun Creek.
Solano Project Action Area	Unknown	Subject of a Habitat Conservation Plan (Solano County Water Agency)

2. Description of district management of these resources in the past or present

Suisun Creek

Water has been released from Lake Curry into Suisun Creek since 1992 to support studies of steelhead trout habitat.

Habitat Conservation Plan

The U.S.B.R., S.C.W.A., and the member agencies agreed to implement conservation measures for the protection of listed species and their habitats in the action area as defined in the biological opinion (March 1999) addressing the effects of the renewal of the water service contracts, continued delivery of the water, and continued operations and maintenance of the Solano Project based on then current operating parameters.

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

Name	Estimated Acres	Description
Mare Island Historic District	Unknown	National Register of Historic Places (#75002103), closed former Naval base.

Greater Vallejo Recreation District, manages and operates park facilities for the City of Vallejo. See above.

F. Operating Rules and Regulations

1. *Operating rules and regulations.*

The City of Vallejo Water System is an enterprise-funded operational unit of the City of Vallejo. The City Charter and Vallejo Municipal Code Chapter 11 contain rules and regulations "... adopted to govern the general operation of the Vallejo municipal water system to provide an efficient and economical water supply." (Section 11.08.010 VMC) See Attachment B, "Water System Rules and Regulations," for the City's water supply and use policies.

Other pertinent sections of the Vallejo Municipal Code governing the use of water include Section 16.74.030, Water Conservation Guidelines, which states that "all vegetation and landscaping required by the zoning regulations shall employ drought resistant species," and Chapter 16.71, Water Efficient Landscape Requirements, a copy of which is included in Attachment B.

Updates to the City's rules and regulations can be found at the City's website www.ci.vallejo.ca.us.

- 2. *Water allocation policy. (Agriculture only) NA*
- 3. *Official and actual lead times necessary for water orders and shut-off. (Agriculture only) NA*
- 4. *Policies regarding return flows (surface and subsurface drainage from farms) and outflow. (Agriculture only) NA*
- 5. *Policies on water transfers by the district and its customers.*

Sections of the City's rules and regulations pertaining to water transfers, including resale or redelivery of water within the City service area are listed below and included in Attachment B.

By City policy any long term water transfers or sales outside the City's established service areas or between neighboring water agencies require City Council approval and City Manager signature.

The City restricts the resale of water.

Section 11.08.100, "Selling Water," of the Vallejo Municipal Code.

“It is unlawful for any person or entity to sell water within the corporate limits of the city of Vallejo without having first received permission to do so from the city council of the city of Vallejo.

Section 11.08.110, “Reselling and/or redelivery of water,” of the Vallejo Municipal Code
“A. The water system shall not serve or supply water to any customer if the same is to be resold or redistributed to other customers, except only in the case of the federal government, state or local public entities including municipalities, or nonprofit mutual water companies and homeowners’ associations, whether incorporated or unincorporated, purchasing water from the water system pursuant to contract approved by the city council for use within the boundaries of the property that the water service connection was approved to supply, unless otherwise provided by contract.

B. It is a violation of these regulations if water received from this system is resold or redelivered to premises other than those stipulated in the water service application.”

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers NA. No Ag customers

2. Urban Customers

a. Total number of connections:

As of mid-2011 the City had 37,122 metered water service connections, including 385 fire services. Some customers have multiple connections and therefore multiple accounts.

Examples of customers with many multiple accounts:

Landscape Maintenance Districts (managed by the City of Vallejo)

Vallejo Unified School District

City of Vallejo

Greater Vallejo Recreation District

b. Total number of metered connections: 37,122 connections.

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: 100%

f. Measurement device table.¹ City of Vallejo and Vallejo Lakes Systems

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Meter Size	Meter Type ²	Number	Accuracy (+/- percentage)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
5/8-3/4"	PD	33,928	85-99	30 or 60	As Needed	As Needed
1"	PD	1,456	85-99	30 or 60	As Needed	As Needed
1 1/2"	PD	646	90-99	30 or 60	As Needed	As Needed
2"	T or C	636	90-99	30 or 60	As Needed	As Needed
3"	T or C	222	90-99	30 or 60	As Needed	As Needed
4"	T or C	125	90-99	30 or 60	As Needed	As Needed
6"	C	135	90-99	30 or 60	As Needed	As Needed
8"	C	41	95-99	30 or 60	As Needed	As Needed
10"	C	15	95-99	30 or 60	As Needed	As Needed
12"	C	3	95-99	30 or 60	As Needed	As Needed
Total		37,207				

¹ Source of meter number by size: H.T.E. Utility Billing, Water Accounts as of December 2004. Other information provided by B. Wooden, Asst. Maintenance Superintendent/Utilities.

² Meter Type Code is most prevalent meter type for that size water service connection: PD – positive displacement, T – turbo, and C – compound.

The City’s Meter Maintenance Branch is currently updating its meter inventory and formalizing its meter testing program to meet best management practices. A meter testing and replacement program design and implementation time table (July 2014 to November 2015) has been prepared and is included in Attachment C. Major milestones are data collection by January 2015, and preparation of final action plan with policies and procedures by August 2015.

The majority of meter testing has been reactive to customer or agency billing concerns. Currently residential meters are tested based on Meter Reader or customer request or if consumption patterns indicate problematic meter performance, inaccuracy or malfunction. This can include field testing, replacement and in-shop meter bench testing. All meters removed from operation are tested. In recent years, no systematic testing of smaller, operational meters has been undertaken. The City replaces targeted commercial meters due to age and accuracy concerns. Periodically, larger meters (1-1/2-inch to 10-inch) are monitored for accuracy by observing usage patterns and if suspect are tested for proper performance. Larger high consumption meters are given priority for replacement. Change out to newer meters is done automatically for any service call on a meter installed prior to 1987. To date more than 90 percent of meters installed prior to 1987 have been replaced. Based on the above activity, statistics indicate that our average accuracy is 90-95 percent.

Documentation verifying the accuracy of the City’s measurement devices, based on manufacturers’ specifications, has been compiled and is included in Attachment C.

Fire services have backflow prevention devices and 5/8-inch “flow” meters which indicate that water has flowed through the fire service connection, but do not accurately measure water volumes at higher flows. For this reason, fire services could theoretically be considered “unmetered;” The City recorded 385 fire services in 2011.

3. Agriculture and Urban Rates

a. Current year agriculture and/or urban water charge – including rate structures and billing frequency

See Attachment B, Vallejo Municipal Code, Chapter 11.48, Water Rates and Charges, for current year rates.

A detailed five-year water rate study was completed in 2009. New water rates and service charges were adopted for raw and treated water services and the first phase went into effect on July 1, 2009.

Meters are read either every month (non-residential, large multi-family) or every two months (small non-residential, single family residential) depending on the customer classification, typical water usage volume, and route location. All meters are read, even those with inactive accounts. (See chart below.)

A copy of Title 11, “Water,” of the Vallejo Municipal Code is included under Attachment B. Chapters 11.44, “Billing,” and 11.48, “Water Rates and Charges,” include descriptions of applicable charges. In summary, all billed customers are charged a service charge and a charge for water volume, and if applicable, a backflow prevention device charge. A copy of the City of Vallejo Municipal Water System Rates Table covering July 1, 2009 through July 1, 2013 effective water rate implementation dates is also included as the final section of Attachment B.

Monthly service charges are flat and based on the category of customer and on meter size. Water charges have an inclining block rate structure for single family residential customers of two tiers, with tier break points at 2,200 ccf bimonthly in the City system and 2,600 ccf bimonthly in the Lakes system. By contract, water rate charges for multi-family and non-residential customers are uniform. See sections b and c below for further information on billing and bill format.

RATE CLASS	VOLUME CHARGE	SERVICE CHARGE	BILL FREQUENCY
Single Family Residential	Inclining block rate (2-tiers) Tier break at annualized average for rate class	By meter size	Bimonthly
Multi-Family Residential	Uniform rate	By meter size	Monthly, Bimonthly
Commercial, Industrial, and Institutional	Uniform rate	By meter size	Monthly, Bimonthly
Dedicated Irrigation	Uniform rate	By meter size	Monthly, Bimonthly
Construction	Uniform rate	Standardized to 3" Hydrant	Monthly, Bimonthly

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b. Annual charges collected from customers (FY2010-2011 current year financial data).

UTILITY BILLING DATA			
Rate Category	Fixed Service Charges	Volumetric Charges	HCF Units Billed during FY
Single Family	\$5,932,278	\$10,565,480	3,606,445
Multi-Family	\$737,877	\$2,602,992	873,539
Commercial/Institutional	\$1,056,973	\$3,303,459	1,469,162
Landscape Irrigation	\$359,362	\$2,093,805	758,819
Other (Raw & Temp)	\$45,775	\$242,980	122,664
ALL	\$8,132,265	\$18,808,715	6,830,629

See Attachment D, for an example of the City’s water bill format. Information on the bill format itself is included in section c below.

A breakdown of the number of billed units of 100 cubic feet by meter size and basic water service category is included below:

METER SIZE	FIRE SERVICE	IRRIGATION	WATER
5/8-inch	0	8,575	2,972,126
¾-inch	0	8,615	662,242
1-inch	0	51,813	381,600
1-1/2 inch	10	201,752	237,039
2 inch	36	199,867	603,291
3 inch	0	3,816	89,071
4 inch	48	47,245	180,086
6 inch	198	148,685	173,578
8 inch	186	187,244	71,490
10 inch	2	0	76,335
Total	480	857,612	5,446,858

At this time the City is unable to extract billing data in the format spelled out in the plan preparation criteria, including the number of units billed by meter size for fixed and volumetric charges. There is no quantity of water associated with a fixed charge. There are no staff remaining in the I.T. Division who know the utility billing system well enough to perform the needed data extraction programming. The Water Division, in order to address this plan element, has submitted an I.T. Division work order request to work directly with the utility billing software developer, and will continue to work with I.T. and the Finance Dept. Progress on this effort will be provided in the annual plan updates.

c. Describe the contractor’s record management system

Water customers are provided with past water usage information (past billing period, and same billing period of the previous year) on the water bill. See Attachment D, for an example of the

City's current water bill format. Information is provided in units of 100 cubic feet. Volume rates are not included on the bill; however, the current water rate table (a copy of which is included as the last section of Attachment B) is readily available on the City's website. Customer service representatives and other water staff answer account-specific questions for customers, and analyze their water use patterns. Customers can request a printout of their consumption data at no charge. Records are available back to year 2000.

The Water Division will continue to request improvements in water bill format and access to water billing data that will provide additional information and pricing signals to customers on their water consumption and associated costs. Potential areas of bill format improvement include, but are not limited to: adding uniform rates; adding tiered rates and volume available at each tier; converting water use to gallons, and providing current and historical average water demand during the billing period in gallons per day. The Division will continue to work with I.T. and the Finance Dept. Progress on this effort will be provided in the annual plan updates.

The City's meter record keeping program inventories the following items: meter size in inches, meter manufacturer, date of repair, date of installation or removal, location identification number, physical address, serial number, MXU number and any pertinent comments. The system does not contain an inventory of the type of meter (compound, turbo, positive displacement, or electromagnetic "Mag"). The existing maintenance program has capacity to store this additional data on metering type, if needed.

The City of Vallejo currently uses a proprietary utility billing software from Sunguard H.T.E. (Note: Historic system-wide information, however, is available but not readily accessible.) Water Division staff are trained on how to create queries to extract data. Customer records, however, are typically available for up to twelve previous years, and are provided upon request. This may be subject to change as the City formalizes a records retention policy and program. Information on any future changes will be included in the annual plan updates.

H. Water Shortage Allocation Policies

1. Current year water shortage policies or shortage response plan – specifying how reduced water supplies are allocated.

On February 28, 2006 the Vallejo City Council adopted a Water Shortage Contingency Plan (WSCP) as part of the City's 2005 Urban Water Management Plan. A copy of the adopted WSCP and a proposed implementing ordinance are included in Attachment E.

Golf course agreements (Hiddenbrooke, Blue Rock) are interruptable. In the past, during short term water shortages, calls were placed to managers of large turf areas and voluntary cut backs were requested and achieved.

Most water transfer agreements are subject to proportional delivery reductions.

2. Current year policies that address wasteful use of water and enforcement methods.

A "Wasteful Water Use Prohibition" ordinance [Ordinance No. 1567 N.C. (2d)] was adopted by the Vallejo City Council on March 7, 2006. A copy is included in Attachment B as Vallejo Municipal Code Chapter 11.54.

The City has had a policy of following up on customer complaints of water runoff onto other property or right-of-way. The customer may be contacted by phone. There is however, no enforcement or penalties, if the water bills are paid and the runoff is not creating a hazardous condition, or threatening public safety.

I. Policies of Regulatory Agencies that Inhibit Good Water Management

No policies of regulatory agencies affecting the City water system have been identified at this time as policies that inhibit good water management.

Section II: Inventory of Water Resources

A. Surface Water Supply

All Vallejo source water is surface water.

- 1. *Acre-foot amounts of surface water delivered to the district by each of the district's sources.*
Amount of water received under each right and/or contract in the data year (2011).

See Urban Table 1 included in Section V, Water Inventory Tables.

Amount of water received under each right and/or contract for the last 10 years.

See Urban Table 8 included in Section V, Water Inventory Tables.

B. Groundwater Supply

The City has no plans at this time to seek groundwater supply.

- 1. *Acre-foot amounts of groundwater pumped and delivered by the district.* None.
See Urban Table 2 attached in Tab 1.

- 2. *Ground-water basin(s) that underlie the district.*

Name	Size (Acres)	Usable Capacity (AF)	Safe Yield (AF/Y)
Napa Sonoma Lowlands (2-2.03)	40,500	Unknown	Unknown

Note: DWR classifies this subbasin as "Groundwater Budget Type C" meaning there is not enough information to provide either an estimate of the basin's groundwater budget or groundwater extraction from the basin.

- 3. *Map of contractor-operated wells and managed ground-water recharge areas.* NA.
- 4. *If there is conjunctive use of surface and ground water, describe it.* NA
- 5. *For managed ground-water basins, attach a copy of the management plan.* NA

No groundwater management plan has been adopted for the Napa Sonoma Lowlands (Subbasin 2-2.03).

- 6. *For participation in ground-water banking, attach a description of the banking agreement.* NA

C. Other Water Supplies

- 1. *Acre-foot amounts of "Other" water used as part of the district's water supply.* NA

See Urban Tables 1 (data year = 2011) and 8 (10 years) included in Section V, Water Inventory Tables, for quantities of “Other Water.” For the purposes of this plan, “other” is described as Vallejo Lakes Watershed water. Lakes Madigan and Frey provide water for treatment and delivery to customers in the Vallejo Lakes service area. Lake Curry water is released into Suisun Creek for fisheries habitat enhancement.

D. Source Water Quality Monitoring Practices

1. Potable Water Quality (Urban only)

The City of Vallejo’s 2012 Annual Water Quality Report (based on 2011 data) is included as Attachment H.

If there are water quality concerns and/or problems, describe how they affect the district’s water treatment process and its customers.

Multiple water sources are available for treatment at the Fleming Hill WTP, Green Valley WTP, and Travis WTP. Due to seasonal water quality shifts, water treatment staff must select and treat a changing mix of source water in order to optimize use of available sources and minimize treatment costs.

No available supplies to the Fleming Hill WTP are impacted by source water quality impairment, as that plant has the ability to treat even degraded water.

As mentioned above, the only significant water problems pertain to North Bay Aqueduct water deliveries to the Travis WTP. Occasionally, the Travis WTP, which until recently used only an NBA supply, had to be shut down due to excessive turbidity, color, and total organic content (TOC) of the source water supply. The City provides Solano Project water to the plant via the Travis – Beck Avenue Pump Station as an alternative source during NBA water quality-impaired events. During plant shutdowns, Travis Air Force Base is fed from storage reservoirs and may use its wells.

2. Agricultural districts. NA

3. Description of the water quality testing program and the role of each participant in the program.

4. Current year water quality monitoring programs

Current year water quality monitoring programs for surface water.

Analyses Performed	Frequency Range	Concentration Range	Average
Bacti samples	10 times per week	See attached.	Report.
Turbidity	Continuous	See attached.	Report.
Title 22	Twice per year	See attached.	Report.

Current year water quality monitoring programs for groundwater. NA- no use of groundwater.

The Vallejo Water System uses only surface water sources. Some of these sources pose treatment challenges, especially during periods of winter runoff into the source waters resulting in higher turbidity levels, higher organic content. This is an issue for the Green Valley WTP and Travis WTP, and to a lesser extent the Fleming Hill WTP. The only significant surface source water problems pertain to North Bay Aqueduct water treatment at the Travis WTP. To the extent practical, the City will reduce use of a problematic water source, and increase use of an alternative water source; i.e. multiple water sources allow flexibility to use best quality water available.

Source Water Assessments evaluate the quality of the water used as drinking water supplies for local communities. The Assessment examines activities associated with the specific waterway and surrounding areas to determine their contribution to contamination. These potential contributors are then compiled into a Vulnerability Summary. Vulnerability Summaries were completed for the Putah South Canal and Lake Frey in 2001 and for the Sacramento Delta in 2002. The results of the Assessments and information about how to obtain copies of the Assessments are summarized in a table in the City of Vallejo's Annual Water Quality Report (AWQR) based on water testing performed in 2011, a copy of which is included as Attachment H..

Quarterly tests for MTBE were performed in 2003 (coordinated by Solano County Water Agency – SCWA) and none was detected. Although only an annual test is required, the City monitors for Methyl tert butylether (MTBE) at the Terminal Reservoir and NBA Cordelia Forebay every month. The City conducts all required water quality tests. See the City's AWQR, Attachment H.

The City has purchased equipment for use at the Travis WTP to monitor UV254, a surrogate for TOC (total organic content). After two years of intensive monitoring of NBA water quality, NBA users applied for and obtained a \$580,000 grant from CALFED to improve the watershed of Barker Slough, the location of the intake for the NBA. The grant will be used for pilot programs to initiate best management practices with local landowners. The water quality deterioration is primarily linked to cattle-raising land use practices and riparian erosion.

The City has a three-part monitoring program for Title 22 compliance.

1. Under a cooperative agreement with other NBA users, quarterly monitoring done through the North Bay Regional water treatment plant, which does collection, analysis (or outlab, if any).
2. Under a cooperative agreement with the Solano Irrigation District (SID) and CMF, Vacaville monitor SID water. This is coordinated by SID.
3. Vallejo monitors Lakes water sources in Green Valley (ie. Lakes Madigan and Frey).

E. Water Uses Within the District (City Water Systems)

1. *Agricultural* *Not Applicable* No Ag
2. *Types of irrigation systems used for each crop.* *Not Applicable* No Ag
3. *Urban* *City of Vallejo and Vallejo Lakes Service Areas*

Customer Type	Number of Connections	Fiscal Year 2010_2011 Use (AF)
Single-family ¹	32,241	8,279
Multi-family / Mobilehome Parks ¹	2,069	2,005
Commercial / Industrial/Institutional ¹	1,871	3,223
Landscape irrigation ¹	527	1,742
Wholesale (Raw & Potable)	1	1,798
Recycled	0	0
Other – Construction ¹	20	19.7
Other – Fire Services ^{1, 2}	375	1.2
Other – Raw Water ¹	14	260.7
Other – Raw, Golf Crs. ³	2	829 Est.
Other – Fish Habitat	0	1,500
Unaccounted for Water ⁴	0	1,900 Est.
Total	37,122	

¹ Source: City of Vallejo Utility Billing System.

² Other - Fire Services includes fire service connections, not fire fighting usage.

³ Contractual water use at 4 Golf Courses is 270 mg per year.

⁴Unaccounted for water is estimated at 1.7 mgd and includes the following:
fire fighting, sewer cleaning, some construction meters, watermain flushing, watermain break and leakage/spill, illegal connections, and meter inaccuracies.

3. *Urban Wastewater Collection and Treatment Systems serving the district service area*

Treatment Plant	Treatment Level (1, 2, 3)	Year 2011 (AF)	Discharge to
Vallejo Sanitation & Flood Control District Waste Water Treatment Plant	Secondary (up to 35 mgd)	12,006.27	Carquinez Straits
Vallejo Sanitation & Flood Control District Waste Water Treatment Plant	Blended disinfected primary & secondary (above 35 mgd)	380.76	Carquinez Straits
Vallejo Sanitation & Flood	Disinfected Secondary	405.09	Mare Island Straits

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Control District Waste Water Treatment Plant	(above 30 mgd)		
Vallejo Sanitation and Flood Control District Wastewater Treatment Plant	Secondary (Recycled Waste Water)	0	Very minor use at the Wastewater Treatment Plant for the small-scale propagation of native plants by drip irrigation.
	Total	12,792.12	Discharged to ocean/bay (salt water)
	Saline sink	0	

Source: Vallejo Sanitation and Flood Control District, Dec. 2012

4. *Ground-water recharge/management/banking.* NONE

Contractor operated ground-water recharge areas

Recharge Area	Method of Recharge	Year _____ (AF)	Year _____ (AF)	Year _____ (AF)
NONE				
	Total			

5a. *Transfers and exchanges into the district service area.*

[SID-Green Valley/Tolenas Exchange (operational trades based on locational advantages), City of Fairfield emergency] Water Inventory Table 1 included in Section V.

5b. *Transfers and exchanges out of the district service area.*

[SID-Green Valley/Tolena Exchange (operational trades based on locational advantages). American Canyon. Travis. Benicia] Water Inventory Table 6 included in Section V.

Transfers into or out of the City of Vallejo's service area

From Whom	To Whom	Year	(AF)	Use
City of Vallejo	City of American Canyon	2011	638.87	Municipal
City of Vallejo	Travis Air Force Base WTP	2011	2,978.67	Governmental
City of Vallejo	City of Benicia	2011	1,827.00	Municipal
TOTAL			5,444.54	

6. *Wheeling or other transactions.*

The City has a wheeling agreement with the City of American Canyon, as explained under “Existing Water Service Agreements” below.

7. Any other uses of water

The City does not plan any long-term water supply projects to provide additional water supplies, other than to regain use of its Lake Curry water. The City, in conjunction with the Vallejo Sanitation and Flood Control City, has considered reclaimed water. Reclaimed, secondary-treated water is available, but studies have repeatedly shown that its distribution is cost prohibitive. Lake Curry water is used, at this time, for in-stream flow to Suisun Creek to support scientific studies and to enhance fisheries habitat.

Other Uses	Year	AF
Instream Flow from Lake Curry to Suisun Creek	2011	1,500

Existing Water Service Agreements

City of American Canyon.

A water service agreement exists between the City and the City of American Canyon, dated May 1, 1996. The agreement gives American Canyon the right to purchase up to 1.0 mgd of potable water from Vallejo. Possible additional capacity purchases. American Canyon will try to supply excess raw water to Vallejo at \$75/acre-foot, which Vallejo shall treat and transmit to American Canyon. Existing Vallejo transmission facilities in American Canyon’s water service area are available to wheel American Canyon raw water with reimbursement of costs.

Per Addendum No. 1 to the Water Service Agreement between the City and the City of American Canyon, dated July 18, 1996, American Canyon wants an alternative source of raw water to supply water for agricultural, golf course and landscaping purposes. Vallejo agrees to sell raw water to American Canyon during emergencies, such as reduction in NBA entitlement, in quantities up to 500 acre-feet per year at 90% of what American Canyon charges their customers outside the city limit.

Per Addendum No. 2 to the Water Service Agreement between the City and the City of American Canyon, dated June 4, 1998, Vallejo agrees to sell and transfer 500 acre feet of water entitlement to American Canyon from Vallejo’s permit water for domestic use as a cost of \$1,000 per acre-foot. American Canyon will transfer to the City of Calistoga 500 acre-feet of American Canyon’s NBA entitlement. American Canyon will reimburse Vallejo for previously incurred capacity investments, and other costs associated with conveyance of the permit water. Restrictions on Vallejo’s permit water will be passed along to American Canyon proportionally.

Addendum No. 3 to the Water Service Agreement between the City and the City of American Canyon dated May 4, 2000 is for American Canyon’s fire supply storage and flow to the Montevino Subdivision in American Canyon and has no impact on Vallejo’s water supplies. This agreement does not provide storage on the Vallejo side. It was needed by American Canyon so that it can achieve the required fire flow and storage requirements in their service area.

Addendum No. 4 to the Water Service Agreement between the City and the City of American Canyon, would have allowed 250 AF of Vallejo Permit Sacramento Delta Entitlement to be permanently transferred to American Canyon for domestic use. American Canyon would sell 250 AF of its State Water Project contract amount to the City of Yountville, in kind. However, not all conditions were met before the December 2005 deadline and the agreement is null and void.

Addendum No. 5 to the Water Service Agreement between the City and the City of American Canyon dated July 21, 2009 provides for temporary fire, domestic, and irrigation water supply storage and supply flow for the needs of the new high school in American Canyon. This addendum will expire and water service will be terminated after no more than five years, or no later than July 2014.

City of Benicia.

Per Amendment No. 2 to the 1962 Vallejo / Benicia Water Agreement, dated April 28, 1989, Vallejo is to deliver 1,100 acre feet per year. The City of Vallejo's raw water supply at Terminal Reservoir is sold at the current, calculated charge of \$37.55/ac-ft.

City of Fairfield.

An agreement exists for temporary potable water service between the City of Fairfield and the City, dated March 20, 1992. Fairfield is to serve potable water to Vallejo's Lake System. Vallejo provides the raw water supply and pays for the cost of service (lease payment and user charge). Demand is not to exceed 1,120 acre-feet in 12 months.

Per an agreement for mutual water exchange or sale and temporary standby water service between the City of Fairfield and the City, dated May 4, 1993, Vallejo will provide surplus permit water to Fairfield at either an exchange rate of 2:1 for Solano Project water or at a price of \$50/ac-ft (initially). Fairfield will serve potable water into Vallejo system. Raw water used will be added to Vallejo's Solano Project use. Vallejo will be charged for water service at Fairfield's in-city general service rate.

Per Amendment No. 1 to the agreement for mutual water exchange or sale and temporary standby water service between the City of Fairfield and the City, dated August 4, 1993, a second connection will be added through which Fairfield will serve potable water into the Vallejo system. Vallejo pays Fairfield a user charge.

8. Trades, wheeling, or other transactions.

From Whom	To Whom	Year	(AF)	Use
City of Vallejo	City of American Canyon	2011	639	Municipal
City of Vallejo	City of Benicia	2011	1,827	Municipal
City of Vallejo	Travis Air Force Base	2011	2,979	Municipal & Industrial
Total			5,445	

F. Outflow from the District (Ag only) NA

G. Water Accounting (Inventory)

1. *Quantify district water supplies.* All Urban tables are included in Section V.
 - a. Surface water supplies, imported, and originating within the district, by month (Table 1). See Attached Table 1 in Section V.
 - b. Ground water extracted by the district, by month (Table 2). – NA. No Groundwater
 - c. Effective precipitation by crop (Ag Table 5). – NA. No Ag
 - d. Estimated annual ground water extracted by non-district parties (Ag Table 2). NA. No Ag.
 - e. Recycled water, by month (Table 3). See Attached Table 3 in Section V.
 - f. Other supplies, by month (Table 1). See Attached Table 1 in Section V.

2. *Quantify Water Used*

- a. Conveyance losses, including seepage, evaporation, and operational spills (Table 4). See Attached Table 4

The City is taking steps to improve its ability to report accurately on system water losses as a best management practice and to meet regulatory reporting requirements. The Water Distribution Branch is formalizing its water loss control program and data collection practices and the City's has purchased a new maintenance system – MaintStar. Information on system losses, such as leaks, breaks, flushing, and fire fighting should be easier to obtain and more accurate in the future.

- b. Consumptive use by riparian vegetation (Table 6). See Attached Table 6 in Section V.
- c. Applied irrigation water, crop ET, water used for leaching, and cultural practices (e.g., frost protection, soil reclamation, etc.) (Table 5). None. NA. No Ag.
- d. Urban water use (Table 6). See Attached Table 6 in Section V.
- e. Ground-water recharge (Table 6). None
- f. Water exchanges and transfers (Table 6). See Attached Table 6 in Section V.
- g. Estimated deep percolation within the district (Ag Table 7). None
- h. Flows to perched water table or saline sink (Ag Table 7). None

- i. Agricultural irrigation drain water leaving the district (Table 6). NA. None
- j. Other (Table 6). See Attached Table 6

Overall Water Inventory

See Attached Water Balance – Table 6 in Section V.

Section III – Best Management Practices for Agricultural Contractors NA

This section does not apply as the City is not an agricultural contractor.

Section IV – Best Management Practices for Urban Contractors

A. Urban BMPs

1. Overview

This section includes an overview of the City of Vallejo’s Water Conservation Program, including program priority guidelines, and descriptions of 14 best management practices and the correlation between the State of California’s Urban Water Management Planning (UWMP) Act and the California Urban Water Conservation Committees (CUWCC) Memorandum of Understanding’s practice nomenclature and format.

Since the CUWCC revised and updated its BMP program in December 2008, its BMPs no longer correlate identically to the demand management measures (DMMs) listed in the UWMP Act. The 2010 UWMP Guidebook uses the terms DMMs and BMPs interchangeably and contains a useful table which shows the correlation between the two sets of water demand reduction activities. That table is included as Attachment L to this plan.

As a participating member of the Solano Project, the City, although not a signatory to the voluntary CUWCC MOU, is required by the United States Bureau of Reclamation to utilize on-line BMP reporting and available water savings calculation tools on the CUWCC website. The City of Vallejo files and completes annual program updates for the U.S. Bureau of Reclamation by filling in the information for urban BMPs on the CUWCC website, via the CUWCC's BMP Reporting Database located on their web site at <http://www.cuwcc.org/>.

Foundational and programmatic best management practices included in CUWCC’s updated BMP program are listed below with descriptions of the programs and whether the City’s practices are “on track” or not yet on track for compliance under the CUWCC MOU BMP program, as of the reporting base year 2011 (City of Vallejo uses FY2010-2011). The descriptions also include methods to evaluate effectiveness and estimate water savings, and the proposed actions the City will take to improve compliance and achieve CUWCC BMP “on track” status. Budgets for each BMP, covering FY2010-2011 through FY2012-2013, follow in Section IV. B. “Three Year Budget for Implementing Best Management Practices.”

The success of some of the practices depends on cooperative work with other entities. To the maximum extent possible, the City will design programs in coordination with other agencies to leverage agency resources, reduce program costs, and improve cost-effectiveness. The City has participated in regional grants through the Solano County Water Agency – Urban Water Conservation Committee.

BMP reports for fiscal years 2008/2009, 2009/2010 and 2010/2011 are available for viewing at the City Water Division office and online at <http://www.cuwcc.org/>.

Foundational BMPs

1. Utility Operations Programs

1.1 Operations Practices – On Track

A.1) Conservation Coordinator – On Track

Description of Program

The City has a Water Conservation Coordinator who spends an average of 30 - 40 percent time on water conservation. An analyst position, which provides staff support to the Water Conservation Coordinator in addition to other duties, was filled at the end of 2005 and continues to be filled full-time. A student intern is periodically assigned to the water conservation program to assist with various program duties. The student intern position is funded either directly by the City of Vallejo or by the SCWA with respective costs reimbursed by the City. In addition, other Water Admin staff are periodically called upon to assist at large public events.

The Water Conservation Coordinator, Pamela Sahin, Administrative Analyst II/Water Conservation Practitioner, can be reached at (707) 648-4479 (telephone), (707) 648-4060 (fax), or E-mail waterinfo@ci.vallejo.ca.us. Program support is provided by Roger Judy, Administrative Analyst I/ Water Conservation Practitioner, who can be reached at (707) 648-5299 (telephone) or E-mail rjudy@ci.vallejo.ca.us.

The coordinator develops and manages the conservation program and directs best management practice implementation. The coordinator is also responsible for the preparation and submittal of an annual implementation status report to the U.S. Bureau of Reclamation. Other duties of the coordinator include: communication and promoting water conservation issues; coordinating City conservation programs with other City divisions; preparing annual and multi-year water conservation budgets; monitoring program impacts and recommending improvements. The coordinator is responsible for training support staff and managing the efforts of consultants and contractors acquired by the City to implement conservation measures under the City's water conservation program.

The position also coordinates preparation of the City's UWMP and the Water Management Plan updates for adoption by the City Council and submittal to the California Department of Water Resources and the U.S. Bureau of Reclamation, respectively.

The City plans to maintain the current level of water conservation staffing through 2015. However, the State legislative requirements under the recent Water Conservation Act of 2009 may impact future staffing requirements, depending on the level of effort needed to meet water demand reduction goals and the availability of SCWA-administered county-wide conservation programs.

Methods for Effectiveness Evaluation, if any

No effectiveness evaluation conducted.

Estimate of existing conservation savings, if any
Conservation savings not estimated.

A.2) Water Waste Prevention – On Track

Description of Program

The City Council adopted a water waste prohibition ordinance on March 7, 2006. A copy of the ordinance is included in Appendix F.3. The ordinance provides for City staff to respond to complaints of water waste, or observed water waste. In responding to observed water waste, City staff may visit or call customers to inform them of their wasteful activity and request that the activity be corrected. City staff maintains a log of advisories and actions taken. This ordinance is enforced at all times, rather than only during water shortages.

Prohibitions include:

- Gutter flooding
- Single-pass cooling systems for new connections
- Non-recirculating systems in all new conveyor car wash systems
- Use of hose for washing cars, boats, trailers and other vehicles without a nozzle

Water Waste Prohibition Activity 2006-2010

Actual	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (09/10) Actual
Waste Ordinance in effect?	yes	yes	yes	yes	yes
No. of contacts	-	6	4	3	8

Water Waste Prohibition Activity Actual and Projected 2011-2015

Planned	2011 (10/11) Actual	2012 (11/12) Actual	2013 (12/13) Actual	2014 (13/14) Actual	2015 (14/15) Actual
Waste Ordinance in effect?	yes	yes	yes	yes	yes
No. of contacts	6	As needed	As needed	As needed	As needed

In addition, in March of 2010, the City adopted an ordinance incorporating the State Model Water Efficient Landscape Ordinance requirements for new development. The requirements are detailed in Chapter 16.71 of the City’s municipal code (included in Attachment B to this plan.)

Methods for Effectiveness Evaluation, if any

Follow-up visits are made to assess whether the water wasting activity has ceased. Notices are tracked for repeat “offenders.”

Estimate of existing conservation savings, if any
Conservation savings are not estimated.

A.3) Wholesale agency assistance programs - Not Applicable

The City is a wholesale water supplier to the Cities of American Canyon and Benicia, but does not provide a wholesale agency assistance program since each of the cities has prepared an Urban Water Management Plan and is running its own water conservation program. In addition, the City operates the Travis Air Force Base Water Treatment Plant on behalf of the U.S. Air Force, but has no responsibility for the distribution system and no influence over end users on the base. Staff also works with the SCWA, the regional wholesaler. The City contributes funds to SCWA, and reimburses some of the joint program expenditures on a proportional basis.

1.2 Water Loss Control – Not Yet on Track

The City is not yet on track for all elements of this practice.

Description of Program

Although attempts have been made, a Standard Water Audit Using American Water Works Association Water Loss Control Committee’s water audit software has not been completed due to insufficient information. A record keeping system tracks several parameters of leak repair, but does not yet capture the full range of required data, including leak running time from report to repair. The City reviews its water system statistics and continues to make progress in collecting the data needed for a full system water audit. Water Conservation staff are working with the Water Distribution Section to make sure that all needed data is recorded and retained.

Leak detection equipment with “dataloggers” has been purchased and training offered to staff.

Several Water Conservation and Water Distribution staff were sent to training on the AWWA Audit Method and Component Analysis, and have more recently viewed a webinar; however new management and supervisory staff need to be trained. Funds for employee training in regulatory requirements is included elsewhere in the Water Enterprise Fund budget and is not included in the Water Conservation budget.

Water main repairs are ongoing. In addition, the City undertakes an annual water main replacement program to replace aging infrastructure.

The City’s program consists of the following actions:

- a) Ongoing water meter calibrations; and
- b) Advising customers (by door hanger) whenever it appears that leaks exist on the customer’s side of the meter;
- c) Performing distribution system leak detection when warranted and cost-effective; and
- d) Repairing leaks when found.

The City’s Distribution Maintenance Section is currently updating an Operations Plan to meet industry standards and requirements of the California Department of Public Health. The City’s Water Conservation Coordinator will provide the detailed requirements for water loss control for

inclusion in the plan. Progress on the Ops Plan, with a detailed timeline for implementation of water loss control measures and data reporting will be included in the next annual plan update.

Methods for Effectiveness Evaluation, if any

Effectiveness is measured by monitoring the change in the percent of unaccounted water for the entire water system.

Estimate of existing conservation savings, if any

Estimates of conservation savings will be available when the City fully completes its first Standard Water Audit using AWWA software.

1.3 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections – Not Yet on Track

The City is not yet on track for all elements of this practice.

There are no unmetered accounts in the City's system. All accounts are billed by volume of use.

The number of CII accounts with mixed use meters is estimated at 287. The City has not yet conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters.

In Fiscal Year 2014-2015, the City will conduct a study to identify any barriers or disincentives to retrofitting mixed-use commercial industrial and institutional (CII) accounts with dedicated landscape meters and will assess the merits of a program to provide incentives to switch mixed use accounts to separate dedicated indoor and landscape meters. Staff will utilize the California Urban Water Conservation Council's BMP 1.3 Feasibility Study Worksheet to determine whether such a program does or does not have merit for the City of Vallejo and will submit the results to the CUWCC website by June 30, 2015. The City will report on its progress on these studies in its next annual update.

The City's Water Meter Shop has not completed a written plan, policy or program to test, repair and replace meters. The shop has a non-written practice of reactive testing of meters pulled from service due to agency or customer complaint or concern. The City's Meter Maintenance Branch is currently updating its meter inventory and formalizing its meter testing program to meet best management practices. A meter testing and replacement program design and implementation time table (July 2014 to November 2015) has been prepared and is included in Attachment C. Major milestones are data collection by January 2015, and preparation of final action plan with policies and procedures by August 2015.

1.4 Retail Conservation Pricing – On Track

Description of Program

This BMP is complete. The City undertook a rate study in 1999 which considered uniform, inclining block, and seasonal rates. Rate studies in 2004 and 2009 retained the current rate structure which has an inclining block rate structure for single-family residential water usage and

a uniform water rate per hundred cubic foot for multi-family residential and non-residential usage. All customers pay a fixed fee service charge. The fixed portion of bills dropped and variable water use charges were increased, providing more incentive to save water and money.

An inclining block rate structure is considered a water conserving rate structure by providing a negative pricing signal since each unit of water consumed beyond the first tier rate allotment carries an additional incremental cost. The City's volume charge is per one hundred cubic feet and is applied to two rate blocks for single family customers in the Vallejo service area as follows: 0-2,200 cubic feet, and over 2,200 cubic feet.

Methods for Effectiveness Evaluation, if any

No effectiveness evaluation conducted.

Estimate of existing conservation savings, if any

Conservation savings not estimated.

2. Education Programs – On Track

2.1 Public Information Programs – On Track

Description of Program

The City has expanded its public information program since the 1980's. Current program elements include purchasing and providing educational materials, newspaper display ads and public information notices in Spring Home and Garden newspaper inserts, and TV-based water savings tips at Earth Day, during Water Awareness Month at offices and library displays (adult and children's), and other events, such as Kaiser Hospital's Earth Day, and Public Works' Week. Financial support is provided annually for the Vallejo Downtown Earth Day event, the California Water Awareness Campaign and Loma Vista Farm. Estimates for water savings resulting from the City's public information and education programs are not conducted by the City due to the difficulty in making a direct correlation to savings.

Additional public outreach activities included:

- Distribution of multiple water savings-related articles including Sunset Magazine's "Water & Energy Savings in the West," "How to Water Your Garden" and "Water-Wise Gardening for California" through utility offices, at community events and upon request.
- Water staff (administrative, billing, meter, maintenance) answered customers' questions on leaks and reducing water use.
- Annual City-sponsored workshops in partnership with the City of Benicia, known as Water-Wise Gardening. Each year since 2006, a series of three workshops have been offered two separate times. One series is offered in the City of Vallejo and the other in the City of Benicia. They are taught by educational consultants and Master Gardeners. (An optional fourth weekend workshop was later added to provide hands-on training at a garden site.)
- Water conservation web page link at: www.vallejowater.org.
- Two "Project Wet" teacher training workshops and financial support for teacher participation.

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- Partnerships with Loma Vista Farm, Vallejo Sanitation and Flood District, Valcore Recycling, East Bay Municipal District, City of Benicia, and PG&E.

The City also participates in a regional public information program through the SCWA’s urban water conservation committee. Regional information and outreach include:

- Climate-appropriate demonstration garden at Six Flags Amusement Park in Vallejo
- Water Conservation web page link at: www.solanosaveswater.org.
- Advertising published in local newspapers for Water-Wise gardening workshops.

The tables below summarize the City’s past and future activities. The SCWA’s regional outreach efforts are summarized in the SCWA’s Urban Water Management Plan. In 2006, the City did not track its public information activities except for the number of attendees at the Water-Wise gardening workshops. For the Speaker’s Bureau, the City sends staff to conduct speaking engagements, upon request.

Actual Public Information Activities 2006 - 2010

	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (10/11) Actual
Media campaign (contacts)	Unavailable	150,000	150,000	153,069	141,391
Paid advertisements	Unavailable	4	6	4	4
Flyers, brochures or bill inserts distributed to residential customers	Unavailable	1,000	1,000	1,000	1,000
General water conservation brochures	Unavailable	388	2,788	2,656	3,846
Website hits	Unavailable	0	0	730	630
Newspaper contacts	Unavailable	Unavailable	0	5	4
Articles resulting from outreach	Unavailable	Unavailable	0	0	1
News releases	Unavailable	Unavailable	2	0	1
WaterWise Gardening Workshop (no. of attendees)	56	88	146	169	130
Speaker’s bureau	Unavailable -	3	5	0	0
Teacher Workshops (attendees)	Unavailable	Unavailable	25	7	19

Public Information Activities Actual and Projected 2011 - 2015

Planned	2011 (10/11) Actual	2012 (11/12) Projected	2013 (12/13) Projected	2014 (13/14) Projected	2015 (14/15) Projected
Media campaign (contacts)	141,391	141,391	141,391	141,391	141,391
Flyers and brochures given	1,000	1,000	1,000	1,000	1,000

General water conservation	3,846	32,300	32,300	32,300	32,300
Website hits	750	750	750	750	750
Newspaper contacts	3	3	3	3	3
Articles resulting from outreach	2	2	2	2	2
News releases	2	2	2	2	1
Water Wise Gardening Workshop (no. of attendees)	160	150	150	150	150
Speaker's Bureau	0	1	1	1	1
Teacher Workshops (attendees)	18	36	25	25	25

2.2 School Education Programs – On Track

Description of Program

The City has its own school education and outreach program and participates in a regional program through the SCWA's regional school education and outreach program. The City's program consists of in-classroom presentations, field trips, sponsoring teacher training workshops (outlined in the public information section) and provision of educational materials.

The City also participates in the implementation and planning of the regional education program through the Solano County Urban Water Conservation Committee, Solano Water Education Program. The regional program consists of:

- In-classroom presentations
- High school video contest
- Bookmark art contest
- School assembly programs by professional presenters
- Providing educational materials to schools
- Attendance at regional and state-sponsored water education conferences

School Materials and Programs Provided 2006 - 2010

	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (09/10) Actual
Educational materials K-6	Yes	Yes	3,313	4,620	1,101
Educational materials 7-12	Yes	Yes	478	513	122
Classroom presentations	Yes	Yes	26	47	40
Students attended	Unavailable	Unavailable	3,791	1,074	919
School assemblies	Unavailable	Unavailable	Unavailable	23	0
Attendees at	Unavailable	Unavailable	Unavailable	4,060	0

assemblies					
Booth staffing at school events	Unavailable	Unavailable	Unavailable	2	2
Attendees	Unavailable	Unavailable	Unavailable	1,250	1,900
Field trips	-	-	-	-	10
Attendees on field trips	Unavailable	Unavailable	Unavailable	-	584

School Materials and Programs Provided and Projected to be Provided 2011 - 2015

	2011 (10/11) Actual	2012 (11/12) Projected	2013 (12/13) Projected	2014 (13/14) Projected	2015 (14/15) Projected
Educational materials K-6	1,537	900	900	900	900
Educational materials 7-12	170	1,200	1,200	1,200	1,200
Classroom presentations	47	40	40	40	40
Students attended	1,255	1,200	1,200	1,200	1,200
Booth staffing at school events	1	1	1	1	1
Attendees	1,200	1,200	1,200	1,200	1,200
Field trips	11	11	10	10	10
Attendees on field trips	1,549	700	700	700	700

Methods for Effectiveness Evaluation, if any

Teacher surveys are conducted and returned to the City for feedback.

Programmatic BMPs

3. Residential – Not Yet on Track

The City is not yet on track for all elements of this practice.

A.1) Residential assistance program

A.2) Landscape water survey

Residential Water Use Survey Program

Description of Program

Residential water use surveys in Vallejo are conducted for single family homes and multi-family buildings with a maximum of four units by a program jointly operated and funded by the Solano County Water Agency (SCWA) and the retail agencies' urban water conservation committee.

The City of Vallejo began participating in the regional program in Fiscal Year 2008/2009. SCWA provides program oversight and tracks the number of surveys offered as well as the number of surveys performed. The surveys include:

- An interview with the homeowner;

- An historical water use report;
- An irrigation system check for malfunctioning sprinkler heads or other system parts;
- A review of irrigation scheduling and recommendations;
- Leak checks;
- Providing homeowners with information about rebate programs offered including turf replacement, high-efficiency toilets, high efficiency clothes washers, and weather-based irrigation controllers; and
- Providing high-efficiency showerheads and low flow faucet aerators.

The program focuses on the highest residential water users by sending letters to the top 20 percent of water users each year. The surveys are also provided as a customer service to homeowners requesting a survey due to high bill or water saving concerns.

In FY 2006/2007 the City offered Resource Action Programs' WaterWise in-class program to several fifth grade classrooms in Vallejo. Students received a retrofit kit and instructions on performing a home water use survey. Students engaged in classroom activities related to the program and reported on their home surveys. This approach can be used again in the future to augment other types of residential surveys, if required to meet BMP requirements.

In FY 2013/2014 the City entered into an agreement with the Rising Sun Energy Center to perform home water and energy audits through a local hiring and training program aimed at Vallejo youth. The program projects 250 audits will be performed during summer 2014. It is anticipated that the program will be repeated in summer 2015.

In order to further increase the number of surveys provided, in FY2014-2015, the City will: 1) encourage the Solano County Water Agency to extend the survey season for the region-wide survey program; 2) broaden promotion of the program within the City; 3) use the City intern to perform surveys; 4) engage the Rising Sun Energy Center for additional summers; 5) partner with the City of Vallejo Housing Authority to promote water use surveys to property owners and program participants; 6) research whether the County Green Business certification extends to multi-family residential businesses, and if so, promote the program with local multi-family housing owners; and 7) research the current cost of school classroom-based survey programs to determine feasibility.

Residential Surveys Performed 2006 - 2010

Audits performed	2006(05/06) Actual	2007(06/07) Actual	2008(07/08) Actual	2009(08/09) Actual	2010 (09/10) Actual
Single-family	0	172	9	65	473
Multi-family	0	106	0	0	0

Residential Surveys Performed and to be Performed 2011 - 2015

Audits performed	2011(10/11) Actual	2012(11/12) Actual	2013(12/13) Projected	2014(13/14) Projected	2015(14/15) Projected
Single-family	228	109	250	350	350
Multi-family	0	0	0	100	100

Methods for Effectiveness Evaluation, if any

SCWA has conducted small scale reviews of water use at homes before and after receiving a water use survey. The program appears to be effective at reducing water use in those homes receiving a water use survey and for this reason, the surveys are planned to continue.

Estimate of existing conservation savings, if any

The City does not currently have estimates of total water savings obtained from this program. The above tables show the surveys that have been performed and projected to be performed.

Residential Plumbing Retrofit Program

Description of Program

Residents participating in the county-wide residential survey program receive high efficiency showerheads and aerators at the time of their surveys. In FY 2013/2014 the City also entered into an agreement with the Rising Sun Energy Center to perform home water and energy audits and retrofit device distribution through a local hiring and training program aimed at Vallejo youth. The program projects device distribution to 250 residential units will be performed during summer 2014. It is anticipated that the program will be repeated in summer 2015. In Fiscal Year 2014-2015, the City will conduct a random survey in its service area to determine whether a minimum threshold of device saturation has been reached.

The City also provides high-efficiency showerheads and aerators to water customers upon request and at community events.

Per the CUWCC website, Vallejo’s progress on the Residential Programmatic BMP is rated as “Not on Track.” Since device distribution goes hand in hand with surveys, please reference future actions listed under Residential Water Survey Program above.

Plumbing Devices Distributed 2006 to 2010

	2006(05/06) Actual	2007(06/07) Actual	2008(07/08) Actual	2009(08/09) Actual	2010(09/10) Actual
Single-family Devices	Not Currently Available	Not Currently Available	762	934	833
Multi-family Devices	Not Currently Available	Not Currently Available	326	65	53
Total Devices	0	0	1,088	999	886

Plumbing Devices Distributed and Projected to be Distributed 2011 - 2015

Devices Installed or Distributed	2011(10/11) Actual	2012(11/12) Projected	2013 (12/13) Projected	2014(13/14) Projected	2015(14/15) Projected
Single-family	1,205	800	800	1000	1000
Multi-family	77	40	40	140	200
Total	1,282	840	840	1,140	1,200

Methods for Effectiveness Evaluation, if any

The City tracks the number of devices distributed.

Estimate of existing conservation savings, if any

The City does not currently have estimates of total water savings obtained from this program.

A.3) High-efficiency clothes washers (HECWs)

Description of Program

The City participates in a clothes washer rebate program through its wholesaler, SCWA. The program currently provides a \$100 rebate for clothes washers purchased within the service area receiving water supplied by SCWA. The new clothes washers must meet specified water efficiency standards to qualify. The rebate amounts may vary from year to year and customers are encouraged to contact the local electrical utility for additional rebates.

It is estimated that the number of rebates will increase in the years 2012 and 2013 due to the City's participation in the Integrated Regional Water Management Plan (IRWMP) water conservation program. This is a two-year program funded by a Proposition 84 grant.

Rebates Paid 2006 - 2010

Actual	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (09/10) Actual
\$ per rebate	\$0	\$125	\$125	\$125	\$125
Number of Rebates Paid	0	34	169	477	775
Actual / Estimated Water Savings (AFY)	0	.53	2.6	7.4	12

Notes:

1. Savings not cumulative.
2. Savings based on 2.88 persons per household, .37 loads of laundry per day, standard 8 pound load.
3. Assumed 13 gallons per load savings = 5,056 gallons saved per year per household by upgrading to an efficiency washer.
4. Data source: Handbook of Water Use and Conservation by Amy Vickers.

Rebates Paid and Projected to be Paid 2010 - 2015

Planned	2011(10/11) Actual	2012 (11/12) Projected	2013 (12/13) Projected	2014 (13/14) Projected	2015 (14/15) Projected
\$ per rebate	\$100	\$100	\$100	\$100	\$100
Number of Rebates Paid	114	185	185	185	185
Actual Water Savings	1.8	2.9	2.9	2.9	2.9

Methods for Effectiveness Evaluation, if any

Currently, effectiveness of the program is based on the level of participation. Participation in the clothes washer rebate program has leveled since the very active years of 2009 and 2010.

Estimate of existing conservation savings, if any

Estimates of water savings are based on national averages of number of loads of laundry washed per person per day as well as the standard size of a load of laundry. Estimated savings are shown in the tables that follow.

A.4) WaterSense Specification (WSS) toilets

Description of Program

The City is participating in a regional high-efficiency toilet retrofit program, which began in 2007 and which is managed by the Solano County Water Agency. The rebate currently offered per toilet is up to \$100; however, rebates may vary from year to year.

There is no ordinance requiring a toilet retrofit upon resale in the City of Vallejo, though one has been considered. Effective January 1, 2014, State law (SB407, 2009) requires that all residential buildings which undergo alterations, additions, or improvements requiring a permit (not maintenance activities), must replace non-compliant plumbing fixtures with conserving fixtures. More stringent aspects of the law will take effect in the future.

Residential Toilet Program Summary 2006-2010

	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (09/10) Actual
No. of ULFT / HET rebates	0	1	31	34	89
Amount of Rebates	0	\$125	\$125	\$125	\$125
Estimated water savings -AFY	0	.03	1	1.1	2.9

Residential Toilet Program Summary Actual and Projected 2011-2015

	2011 (10/11) Actual	2012 (11/12) Actual	2013 (12/13) Actual	2014 (13/14) Actual	2015 (14/15) Actual
No. of ULFT / HET rebates	90	120	120	90	90
Amount of Rebates	\$125	\$100	\$100	\$100	\$100
Estimated water savings -AFY	2.9	3.9	3.9	2.9	2.9

Methods for Effectiveness Evaluation, if any

The City tracks the number of toilets rebated in its service area. These numbers are provided to the City by the SCWA.

Estimate of existing conservation savings, if any

It is estimated that the number of rebates will increase in the years 2012 and 2013 due to the City's participation in the Integrated Regional Water Management Plan (IRWMP) water conservation program. This is a two-year program funded by a Proposition 84 grant. State legislation regarding retrofit upon resale of single family homes may drive the number of rebates higher.

Water savings estimates included in the table above assume a 10.1 gpcd savings per toilet replaced in a single-family home. This is based on findings of the EBMUD July 2003 “Residential Indoor Water Conservation Study.”

A.5) WaterSense Specifications for residential development

The City has not adopted a discrete resolution and/or ordinance addressing WaterSense specifications for residential development. The City does, however, update its building-related codes with changing state regulations that do address available water efficient fixtures. California’s Green Building Code, CalGreen, specifies flow rates for bathroom and kitchen faucets, water closets, urinals, and showerheads identical to those of the WaterSense Program. CalGreen requires that water closets be WaterSense labeled, and the 2013 code requires the same of showerheads. CalGreen and WaterSense both require the use of weather- or soil moisture-based irrigation controllers.

The Vallejo Municipal Code’s requirements governing the use of water include Section 16.74.030, Water Conservation Guidelines, which states that “all vegetation and landscaping required by the zoning regulations shall employ drought resistant species,” and Chapter 16.71, Water Efficient Landscape Requirements, a copy of which is included in Attachment B.

4. Commercial, Industrial, and Institutional – Not Yet on Track

The City is not yet on track for all elements of this practice.

Description of Program

The City has participated in regional CII programs through the Solano County Water Agency.

In Fiscal Year 2004/2005 and early Fiscal Year 2005/2006 the City participated in the Pre-Rinse Spray Valve Installation program through SCWA and the CUWCC. The program provided direct site visit and installation at participating restaurants.

In 2007, through SCWA’s CII program, commercial water customers were offered a free water survey to determine the efficiency of their existing facility. Typically, the surveys included irrigation system audits as well as audits of indoor water fixtures and appliances. The number of irrigation surveys is tracked under the landscape DMM section and shown in Table 6.5.

During the surveys, surveyors install faucet aerators and high efficiency showerheads, ensuring immediate water savings. Initially, pre-rinse spray valves were installed as well, however, because of the previous efforts by PG&E and other local programs, it was found that most restaurants had already had their pre-rinse spray valves retrofitted to efficiency models. After each survey is completed, a report is generated and provided to the customer, which includes an inventory of water using fixtures and appliances, recommendations for improving water efficiency at the site, and estimated water savings to be realized from implementing those recommendations.

Those sites found to have pre-1992 toilets are offered participation in a direct installation program of high-efficiency toilets (HET) and high-efficiency urinals (HEU).

In 2008 the CUWCC revised its BMP requirements. The CII BMP requirements shifted from an emphasis on conducting surveys, to an emphasis on implementing water savings measures as appropriate for each agency. Surveys continue to be conducted as a customer service, as well as a required basis for participation in CII rebate programs. Surveys are offered to customers in the top 10 list of water users as well as customers requesting a survey, customers requesting participation in HET and HEU installation, and participation in rebate programs.

In response to those changes in the BMPs, the Solano County Urban Water Conservation Committee developed a “Water Savings Incentive Program.” This is a program designed to provide CII customers with assistance in upgrading fixtures, appliances, and irrigation systems for greater efficiency. The assistance comes in the form of rebates for equipment and appliances. This program is in addition to the HET, HEU, and weather-based irrigation controller rebate programs. The key element of the Water Savings Incentive Program is flexibility. Rather than being limited to the specific items typically rebated, such as toilets, urinals, or irrigation controllers, a water customer can make water efficiency repairs and/or upgrades to existing irrigation systems and apply for rebates for equipment based on specific site conditions.

Challenges

At the outset of the program, the committee chose to focus its outreach efforts on schools, parks and other public properties, although commercial accounts could also participate. However, participation has been limited. The challenge facing the implementation of the program is that the rebates apply to parts and equipment only, and not to labor. Although outreach to schools and other public facilities in the City’s service area has been conducted, the requirement that the participating water customer provide or pay for the involved labor has been a limiting factor.

Per the CUWCC website, Vallejo’s progress on the CII Programmatic BMP is rated as “Not on Track.” In Fiscal Year 2014-2015, the City will work with Solano County Water Agency to promote the program more widely and expand participation in the Vallejo service area by reaching out to the Chamber of Commerce, and investigate the use of SCWA interns for CII site inspections. Progress on these efforts will be reported in the annual plan update. A summary of number of surveys and water savings devices installed is presented in the table below.

CII Surveys Completed 2006 - 2010

Planned	2006 (05/06) Actual	2007 (06/07) Actual	2008 (07/08) Actual	2009 (08/09) Actual	2010 (09/10) Actual
No. of surveys completed	-	22	12	4	3
Aerators installed	-	54	51	84	87
Showerheads installed	-	-	-	7	50
HETs (direct installation)	-	-	18	206	79

CII Surveys Completed and Projected to be Completed 2011 - 2015

Planned	2011 (10/11) Actual	2012 (11/12) Projected	2013 (12/13) Projected	2014 (13/14) Projected	2015 (14/15) Projected
No. of surveys completed	1	4	4	4	4
Aerators installed	22	85	85	85	85
Showerheads installed	37	40	40	40	40
HETs	192	100	100	100	100

Methods for Effectiveness Evaluation, if any

SCWA has conducted random reviews of water use for CII customers before and after receiving a water use survey. The program appears to be effective at reducing water use, particularly for those sites where surveys act as incentives for rebates or direct installation of HETs and HEUs.

Estimate of existing conservation savings, if any

The City does not currently have estimates of total water savings obtained from this program.

5. Landscape – On Track (as of 2012)

The City’s program was deemed “Not on Track” as of 2011, but “On Track” as of 2012.

Description of Program

The City financially supported a regional pilot program in Fiscal Year 1999/2000 to establish and implement an effective landscape water audit program design.

In Fiscal Years 2001/2002 and 2002/2003, the City participated in a successful regional Proposition 13 grant request for centralized ET (evapotranspiration)-based irrigation controller installation at selected sites (Jesse Bethel High School in Vallejo). In addition to the controller, computer control and a weather station were also installed. The project was coordinated with the Vallejo Unified School District and City landscape staff.

Follow-up reviews of the school’s water consumption indicated that irrigation water consumption dropped dramatically in the three years after the installation; by nearly 30 percent overall. After the third year, consumption began to increase and eventually reached the irrigation use previously recorded prior to the installation of the weather-based irrigation system. It was discovered that the staff that had been trained to use the system were no longer with the School District, and the system controller had since been disengaged by other staff. School District staff is currently making efforts to reinstall the system.

Based on cost-benefit analyses, the City is exempt from full CUWCC BMP (DMM) implementation but offers the listed measures to assist its large landscape water customers. For example, landscape audits will be offered to a small percentage of dedicated irrigation accounts through the SCWA’s regional landscape audit program. Through Fiscal Year 2009/2010 a total of 14 audits have been performed in the Vallejo service area. The audits consist of the following:

- Evaluation of the efficiency and distribution uniformity of the irrigation system;

- Evaluation of the condition of the system components: water pressure; broken, tilted or obstructed heads; over-spray;
- Development of a water budget based on square footage of various hydrozones and average ETo;
- Evaluate the irrigation scheduling and volume applied;
- Recommend improvements in irrigation practices; and
- A written report provided to the City as well as to the water customer.
- Over the next five years, the City will focus its efforts on conducting surveys at sites with the greatest potential for obtaining water savings.

In addition, the City has initiated the first phase of a large landscape irrigation water budget calculation program. City staff have identified the largest landscapes in the City’s service area and utilizing aerial photography and surface area measurements have calculated preliminary water budgets for a total of 97 dedicated irrigation accounts. Phase two will involve meeting with representatives from the park and school districts to review findings. Phase three will include regular periodic communication of water budget information to customers.

Per the CUWCC website, as of the 2012 reporting period, Vallejo’s progress on the Landscape Programmatic BMP is rated as “On Track.” Starting in FY2014-2015, the retail agencies of Solano County will be participating in a regional pilot project to calculate landscape water budgets. This will augment what the City of Vallejo has already done, and should increase the overall number of budgets prepared. In order to increase the number of large landscape surveys performed, in FY14-15 the City will do the following: 1) work with City and park district grounds crews to determine whether in-house surveys can be performed; 2) work with the Solano County Water Agency to ascertain whether the existing crew of interns can assist with large landscape surveys; and 3) work with SCWA and member agencies to expand the existing program.

Large Landscape Surveys Performed 2006 - 2010

	2006(05/06) Actual	2007(06/07) Actual	2008(07/08) Actual	2009(08/09) Actual	2010(09/10) Actual
Number of dedicated irrigation meters (including raw water accounts)	517	513	514	533	530
CII Landscape Surveys completed	0	2	3	6	3
Number of Water Budgets	0	0	0	0	49
Accounts 20% over-budget	Undetermined	Undetermined	Undetermined	Undetermined	19
Accounts 20% over-budget offered technical assistance	Undetermined	Undetermined	Undetermined	Undetermined	4

Large Landscape Surveys Performed 2006 - 2010

	2006(05/06) Actual	2007(06/07) Actual	2008(07/08) Actual	2009(08/09) Actual	2010(09/10) Actual
Accounts 20% over-budget accepted technical assistance	Undetermined	Undetermined	Undetermined	Undetermined	3
Water savings incentives provided	0	0	0	0	1 @ \$10,000
Number of follow up visits	0	0	0	0	0
Number of follow up calls	0	0	1	3	2

Number of Large Landscape Surveys Performed or Projected 2011 - 2015

	2011 (10/11) Actual	2012(11/12) Actual	2013(12/13) Projected	2014(13/14) Projected	2015(14/15) Projected
Surveys completed	2	3	3	3	3
Budgets Developed	97	121	200	300	400
Number of follow up visits	0	1	1	1	1

Methods for Effectiveness Evaluation, if any

A comparison of water use records before and after a water audit is completed to evaluate whether water savings are realized as a result of the water audits.

Estimate of existing conservation savings, if any

The City does not currently have estimates of water savings obtained from this program. However, the City (through SCWA) has performed and will continue to perform these surveys over the next five years. Above tables show the surveys that have been performed and estimated to be performed. Source information for the tables is from SCWA and CUWCC annual reports.

Estimated Water Savings

The City has conducted limited water conservation program savings evaluations. Periodically, the City will select water accounts having received rebates and/ or site surveys and review water use before and after participation in the water conservation program. The City anticipates that tracking the gpcd usage, particularly for the residential sector, will be a useful measure of the effectiveness of the City's and the region's water conservation programs.

An estimate of total water savings due to water conservation is not currently available. CII program savings vary depending on the level of implementation of survey recommendations, but can be estimated at 10 percent. Landscape surveys are assumed to result in a 15% reduction in demand for landscape uses by surveyed accounts (CUWCC, March 2001). The water savings already achieved by existing conservation measures will have some impact on the City's ability to further reduce demand. The City will research past and current program water savings and anticipates achieving additional water savings by further implementation of the BMPs.

B. Three Year Budget for Implementing Best Management Practices

The City of Vallejo will complete annual updates by filling in the information for urban BMPs on the CUWCC website, via the CUWCC's *BMP Reporting Database* located on their web site at www.cuwcc.org.

Conservation Budget and Staffing 2011

CUWCC BMP #	Best Management Practice	2011 (10/11) *Actual Budget (\$)	2011 (10/11) Estimated Staff Hours
1.1	Operations Practices	42,600	600
1.2	Water Loss Control	0	60
1.3	Metering with Commodity Rates	0	20
1.4	Conservation Pricing	0	10
2.1	Public Information Programs	15,000	200
2.2	School Education	16,000	340
3	Residential Programs	18,000	260
4	Commercial, Industrial, Institutional Prgrms	20,000	100
5	Large Landscape Programs	12,000	80
TOTAL		123,600	1,670
FTE	Full Time Equivalent Staffing		95%

* Budget does not include City of Vallejo staff costs.

Conservation Budget and Staffing 2012

CUWCC BMP #	Best Management Practice	2012 (11/12) *Projected Expenditures (\$)	2012 (11/12) Projected Staff Hours
1.1	Operations Practices	38,000	600
1.2	Water Loss Control	0	80
1.3	Metering with Commodity Rates	0	30
1.4	Conservation Pricing	0	10
2.1	Public Information Programs	16,000	200
2.2	School Education	17,500	380
3	Residential Programs	18,000	260
4	Commercial, Industrial, Institutional Prgrms	20,000	120
5	Large Landscape Programs	16,000	80
TOTAL		125,500	1,760
FTE	Full Time Equivalent Staffing		100%

* Projected Expenditures do not include City of Vallejo staff costs.

**City of Vallejo
2012 Water Management Plan**

Conservation Budget and Staffing 2013

CUWCC BMP #	Best Management Practice	2013 (12/13) *Projected Expenditures (\$)	2013 (12/13) Projected Staff Hours
1.1	Operations Practices	25,000	640
1.2	Water Loss Control	500	80
1.3	Metering with Commodity Rates	500	40
1.4	Conservation Pricing	500	10
2.1	Public Information Programs	16,000	200
2.2	School Education	26,000	400
3	Residential Programs	17,500	280
4	Commercial, Industrial, Institutional Prgrms	20,000	120
5	Large Landscape Programs	24,000	80
TOTAL		130,000	1,850
FTE	Full Time Equivalent Staffing		105%

* Projected Expenditures do not include City of Vallejo staff costs.

Section V – Water Inventory Tables

Year of Data **Enter data year here**

Table 1

Surface Water Supply

2011 Month	Federal Urban (acre-feet)	Federal Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (Permit Water) (acre-feet)	Transfers into District (acre-feet)	Other Water (Lakes Wtrshed) (acre-feet)	Total (acre-feet)
Method		Not Applicable					
January	1201	0	0	0	0	151	1,352
February	1137	0	48	36	0	149	1,370
March	1184	0	0	35	0	151	1,370
April	1362	0	30	19	0	157	1,568
May	1818	0	291	36	0	163	2,308
June	1553	0	418	17	0	163	2,151
July	1695	0	715	221	0	175	2,806
August	1638	0	732	234	0	173	2,777
September	971	0	1297	134	0	174	2,576
October	675	0	953	0	0	165	1,793
November	14	0	1220	0	0	153	1,387
December	493	0	436	409	0	154	1,492
TOTAL	13,741	0	6,140	1,141	0	1,929	22,951

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			Not Applicable	
January	1,352	0	0	1,352
February	1,370	0	0	1,370
March	1,370	0	0	1,370
April	1,568	0	0	1,568
May	2,308	0	0	2,308
June	2,151	0	0	2,151
July	2,806	0	0	2,806
August	2,777	0	0	2,777
September	2,576	0	0	2,576
October	1,793	0	0	1,793
November	1,387	0	0	1,387
December	1,492	0	0	1,492
TOTAL	22,951	0	0	22,951

*Recycled M&I Wastewater is treated urban wastewater that is used for agriculture.

Table 4

Urban Distribution System

2011 Area or Line	Length (feet)	Leaks (acre-feet)	Breaks (acre-feet)	Flushing/Fire (acre-feet)	Total (acre-feet)
Vallejo Service Area	0	0	0	1.5	1.5
Vallejo Service Area	0	0	2.5	0.0	2.5
Vallejo Service Area Streets	0	0	0	3.4	3.4
Vallejo Service Area (Fire) Est.	0	0	0	16.2	16.2
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
	0	0	0	0.0	0.0
TOTAL	0	0	2.5	21.1	23.6

Table 5

Table 6

2011 District Water Inventory

Water Supply	Table 3		22,951	
Environmental Consumptive Use		minus	1,500	(A)
Groundwater Recharge	Perc ponds & recharge wells	minus	0	x
Transfers out of District		minus	5,445	(B)
Flushing / Fire	Table 4b	minus	21	
Distribution System Leaks & Breaks	Table 4b	minus	3	
Water Available for sale to customers			15,982	
Actual Water Sale: 2011	From District Records		14,620	
Inside Use	Feb urban use x 12		9,417	
Landscape / Outside Use	(calculated)		5,203	
Unaccounted for Water	(calculated)		1,362	

(A) Release from Lake Curry to Suisun Creek

(B) American Canyon, Benicia, Travis AFB

Table 7

Table 8

Annual Water Quantities Delivered Under Each Right or Contract

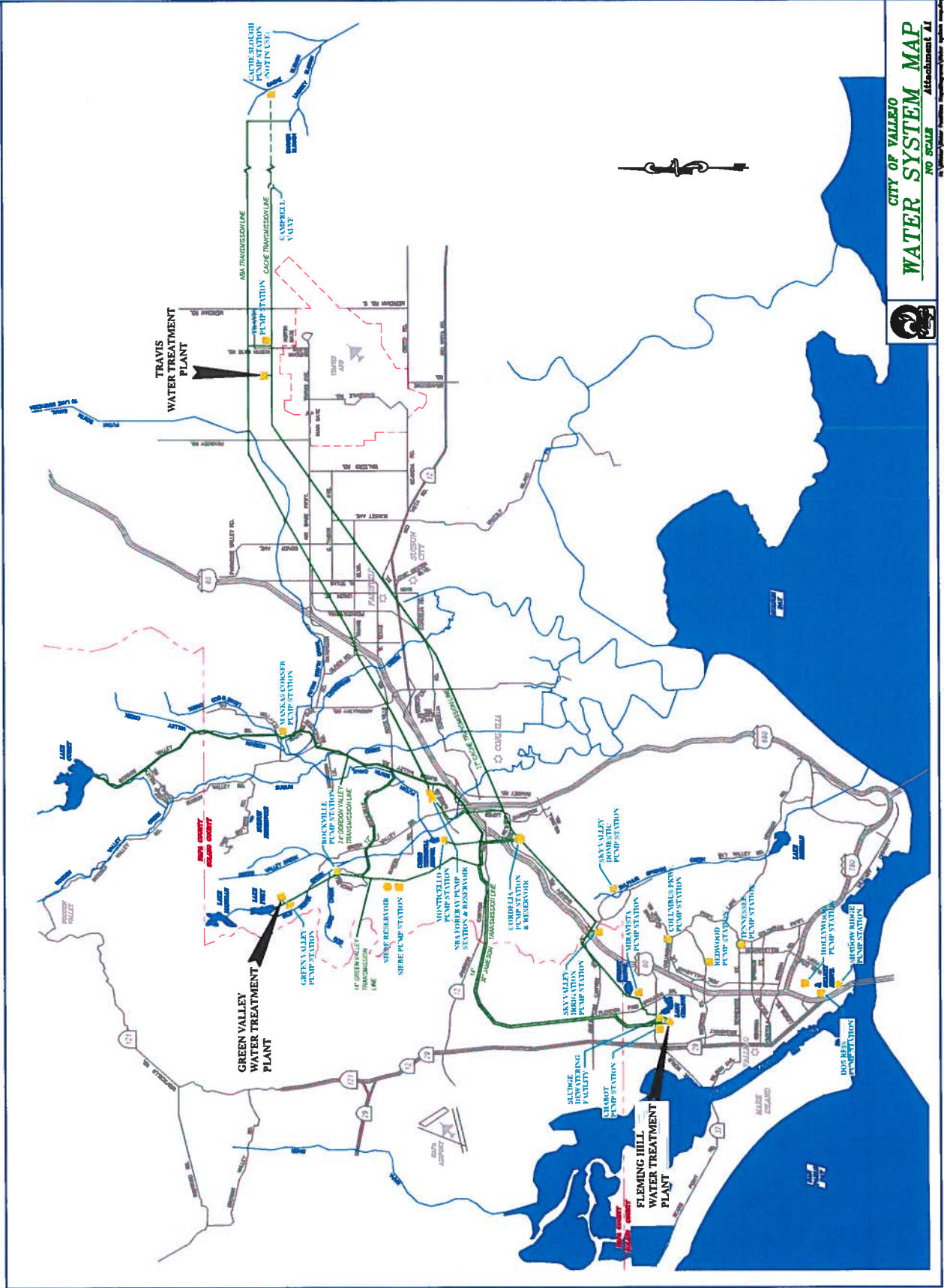
Year	Federal Urban (acre-feet)	Federal Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (Permit Water) (acre-feet)	Transfers into District (acre-feet)	Other Water (acre-feet)	Total (acre-feet)
2002	13,702	0	9,051	3,538	0	1,657	27,948
2003	13,517	0	5,894	3,740	0	1,629	24,780
2004	12,536	0	5,543	8,511	0	1,676	28,266
2005	12,430	0	8,200	3,668	0	1,994	26,292
2006	12,427	0	9,340	944	0	2,010	24,721
2007	5,193	0	7,027	11,388	0	2,062	25,670
2008	12,696	0	2,761	8,049	0	2,048	25,554
2009	13,471	0	3,131	3,854	0	2,011	22,467
2010	14,672	0	4,394	2,693	0	1,927	23,686
2011	13,741	0	6,140	1,141	0	1,929	22,951
Total	124,385	0	61,481	47,526	0	18,943	252,335
Average	12,439	0	6,148	4,753	0	1,894	25,233

ATTACHMENTS

**ATTACHMENTS
TO
CITY OF VALLEJO
WATER MANAGEMENT PLAN
USBR Mid-Pacific Region 2011 Standard Criteria**

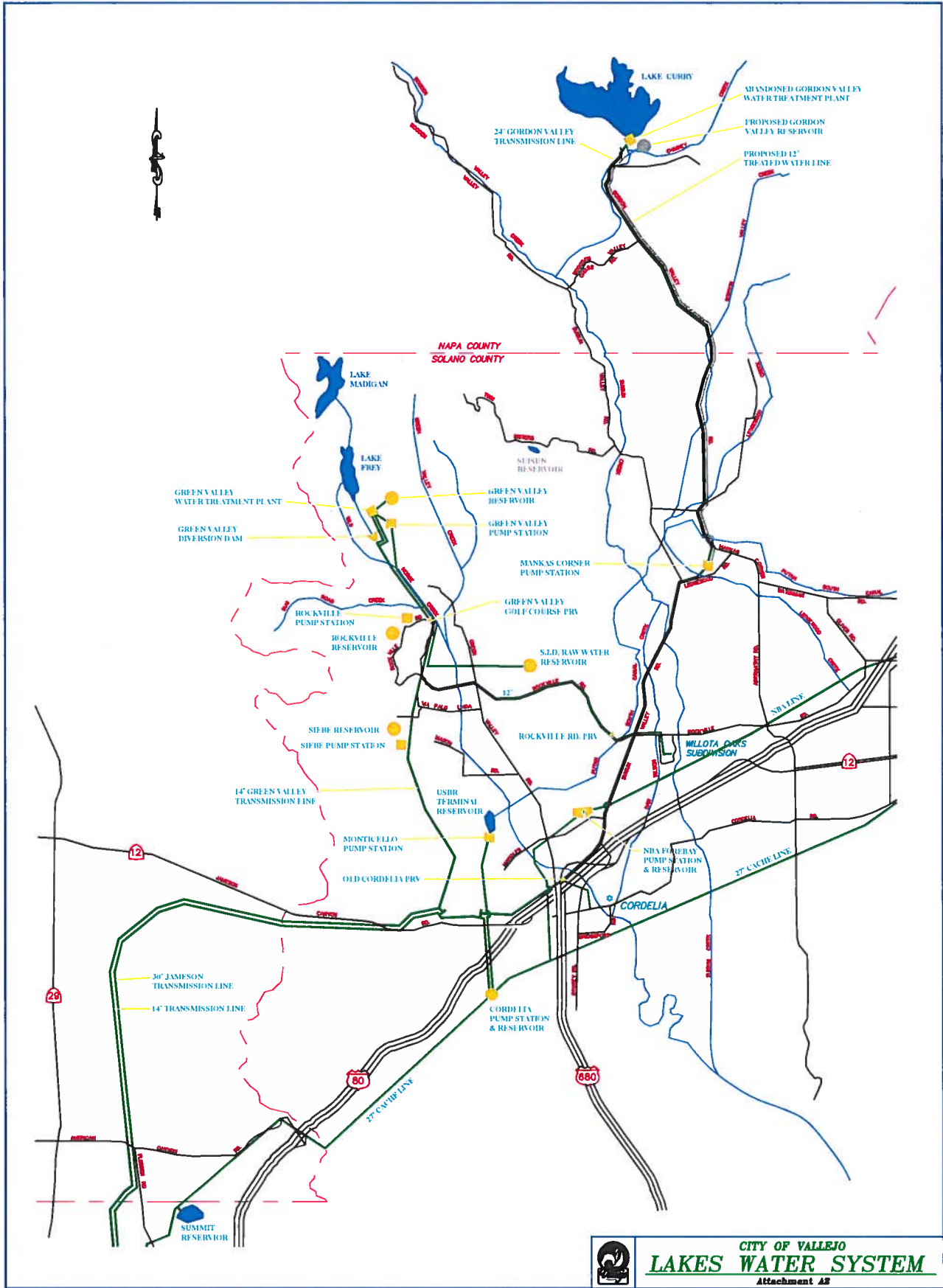
Attachment A – Water System Maps

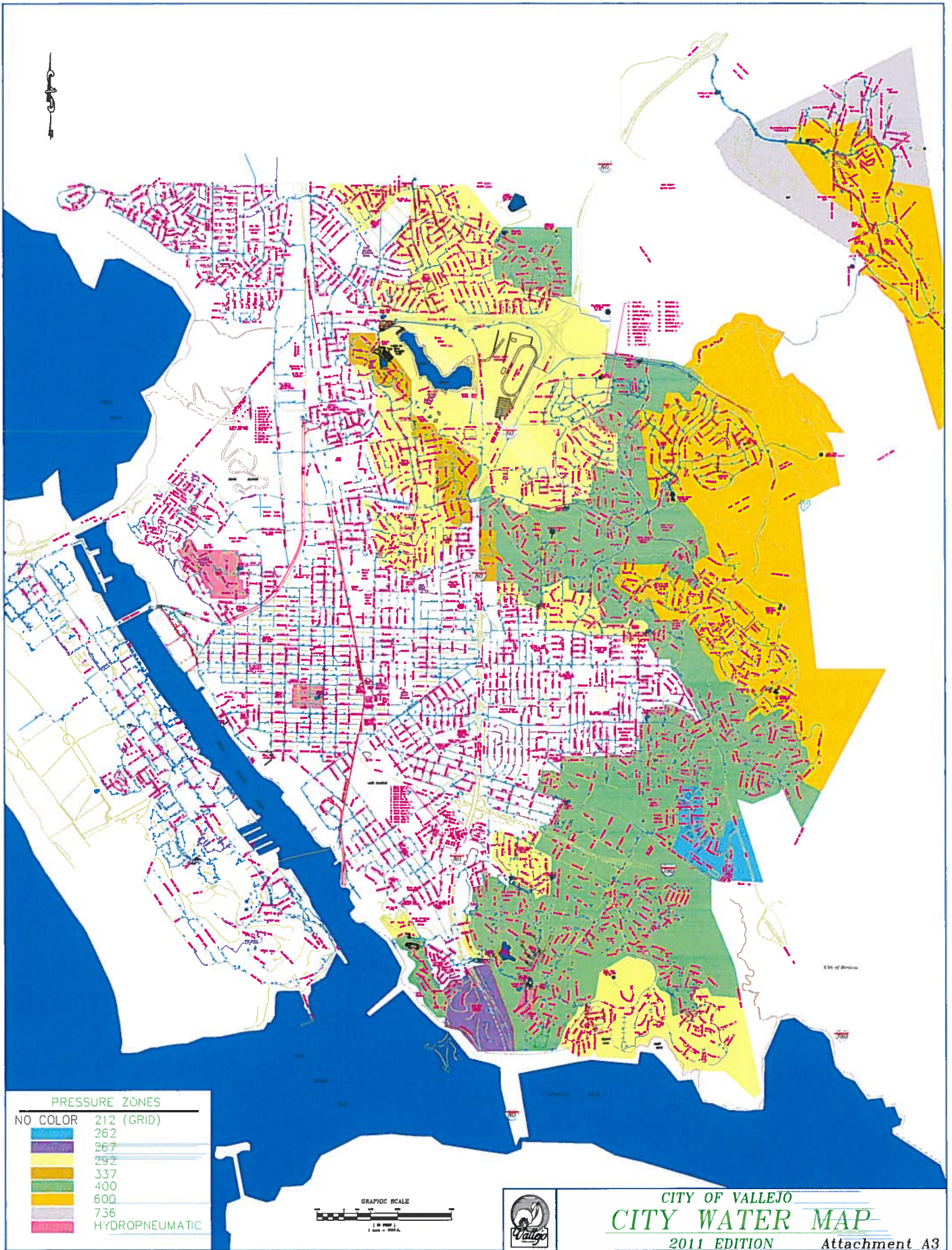
- A.1. City of Vallejo Water System Map
- A.2. City of Vallejo Lakes Water System Map
- A.3. City of Vallejo City Water Map (showing pressure zones)



CITY OF VALLEJO
WATER SYSTEM MAP
 NO SCALE Attachment A1







PRESSURE ZONES

NO COLOR	212 (GRID)
	262
	267
	292
	337
	400
	600
	736
	HYDROPNEUMATIC

GRAPHIC SCALE



CITY OF VALLEJO
CITY WATER MAP

2011 EDITION

Attachment A3

Attachment B – Water System Rules and Regulations

Vallejo, California, Code of Ordinances, Title 11, Water, Section I, Municipal Water System

Vallejo, California, Code of Ordinances, Title 11, Water, Section II, Miscellaneous Water Regulations

Vallejo, California, Code of Ordinances, Title 16, Zoning, Part IV, General Regulations, Chapter 16.71, Water Efficient Landscape Requirements

City of Vallejo Water Rates Table (July 1, 2009 through July 1, 2013)

Vallejo, California, Code of Ordinances >> Title 11 - WATER >> I. - Municipal Water System >>

I. - Municipal Water System 

[Chapter 11.04 - DEFINITIONS](#)

[Chapter 11.08 - GENERAL RULES](#)

[Chapter 11.12 - APPLICATION FOR SERVICE](#)

[Chapter 11.16 - WATER SERVICE CONNECTIONS](#)

[Chapter 11.18 - ELEVATED STORAGE FEES](#)

[Chapter 11.20 - SPECIAL SERVICE CONNECTIONS](#)

[Chapter 11.24 - EXTENSION OF FACILITIES](#)

[Chapter 11.28 - WATER BENEFIT DISTRICTS](#)

[Chapter 11.32 - WATER METERS](#)

[Chapter 11.36 - CUSTOMER'S EQUIPMENT](#)

[Chapter 11.38 - CONTROL OF BACKFLOW AND CROSS-CONNECTION TO MUNICIPAL WATER SYSTEM](#)

[Chapter 11.40 - FIRE HYDRANTS](#)

[Chapter 11.44 - BILLING](#)

[Chapter 11.48 - WATER RATES AND CHARGES](#)

Chapter 11.04 - DEFINITIONS¹

Sections:

[11.04.010 - Applicant.](#)

[11.04.020 - City.](#)

[11.04.030 - Commercial office.](#)

[11.04.040 - Consumer.](#)

[11.04.050 - Costs.](#)

[11.04.060 - Customer.](#)

[11.04.070 - Demand.](#)

[11.04.080 - Fire chief.](#)

[11.04.090 - Main extension.](#)

[11.04.100 - Mains.](#)

[11.04.110 - Premises.](#)

[11.04.120 - Service.](#)

[11.04.130 - Superintendent.](#)

[11.04.140 - Water service.](#)

[11.04.150 - Water service connection.](#)

[11.04.160 - Water system.](#)

11.04.010 - Applicant.

"Applicant" means the person, persons or entity or authorized agent applying for water service, water service connection or water main extension.

(Ord. 324 N.C. § 2.01, 1958.)

11.04.020 - City.

"City" means the city of Vallejo, a municipal corporation, and its duly authorized representatives.

(Ord. 334 N.C. § 2.02, 1958.)

11.04.030 - Commercial office.

"Commercial office" means the business office of the water division, located in the city hall of the city of Vallejo.

(Ord. 324 N.C. § 2.03, 1958.)

11.04.040 - Consumer.

"Consumer" means a person, persons, or entity receiving or taking water.

(Ord. 324 N.C. § 2.04, 1958.)

11.04.050 - Costs.

"Costs" mean the actual or estimated value of materials, equipment rentals, personal services and other expenses incurred, including taxes, engineering and overhead.

(Ord. 324 N.C. § 2.05, 1958.)

11.04.060 - Customer.

"Customer" means a person, persons or entity of record receiving water service or other services from the water system.

(Ord. 324 N.C. § 2.06, 1958.)

11.04.070 - Demand.

"Demand" means the rate of draft of water for a specified period of time; the total quantity of water delivered or received during the month, season and/or year.

(Ord. 324 N.C. § 2.07, 1958.)

11.04.080 - Fire chief.

"Fire chief" means the chief officer of the city fire department.

(Ord. 324 N.C. § 2.08, 1958.)

11.04.090 - Main extension.

"Main extension" means extension of distribution pipe lines, exclusive of service connections, beyond existing facilities.

(Ord. 324 N.C. § 2.10, 1958.)

11.04.100 - Mains.

"Mains" means the transmission and/or distribution pipelines of the water system.

(Ord. 324 N.C. § 2.09, 1958.)

11.04.110 - Premises.

"Premises" means that separate identifiable and transferable lot or parcel of real property, including the improvements thereon, except that portions thereof having well-defined boundaries, such as walls, fences, or hedges which prevent the common use of the property by all occupants, for the purpose of Chapters [11.08](#) through [11.48](#), shall be determined separate premises.

(Ord. 324 N.C. § 2.11, 1958.)

11.04.120 - Service.

"Service" means the delivering or receiving of water, a water service connection or an act or duty performed by the water system.

(Ord. 324 N.C. § 2.12, 1958.)

11.04.130 - Superintendent.

"Superintendent" means the city water superintendent charged with the responsibility of administering, directing and representing the water system.

(Ord. 324 N.C. § 2.13, 1958.)

11.04.140 - Water service.

"Water service" means the delivery and/or receipt of water or a water service connection.

(Ord. 324 N.C. § 2.14, 1958.)

11.04.150 - Water service connection.

"Water service connection" means the connection, including service pipes, meters and appurtenances through which water delivery is made.

(Ord. 324 N.C. § 2.15, 1958.)

11.04.160 - Water system.

"Water system" means the water division of the public works department of the city of Vallejo, and the entire physical plant of the water division, including but not limited to real property, reservoirs, treatment plants, pumping stations, transmission and distribution pipelines, and appurtenances thereto.

(Ord. 324 N.C. § 2.16, 1958.)

Chapter 11.08 - GENERAL RULES

Sections:

- [11.08.010 - Purpose.](#)
- [11.08.020 - Rates, fees and charges—Purpose.](#)
- [11.08.030 - Inspection.](#)
- [11.08.040 - Construction or street work—Notice.](#)
- [11.08.050 - Emergency shut off.](#)
- [11.08.060 - System not liable for certain damages.](#)
- [11.08.070 - Tapping by authorized persons only.](#)
- [11.08.080 - Fire chief's authority.](#)
- [11.08.090 - Conditions of service.](#)
- [11.08.100 - Selling of water.](#)
- [11.08.110 - Reselling and/or redelivery of water.](#)
- [11.08.120 - Responsibility for damage to water service connections.](#)

11.08.010 - Purpose.

The rules and regulations herein contained are adopted to govern the general operation of the Vallejo municipal water system to provide an efficient and economical water supply.

(Ord. 324 N.C. § 1.01, 1958.)

11.08.020 - Rates, fees and charges—Purpose.

The rates, fees and charges herein contained are adopted as conditions to obtaining water supply and other services from the Vallejo municipal water system.

(Ord. 324 N.C. § 1.02, 1958.)

11.08.030 - Inspection.

The water system or its duly authorized agents shall at all reasonable times have the right to enter or leave the customer's premises for any purpose properly connected with service to the customer.

(Ord. 324 N.C. § 11.01, 1958.)

11.08.040 - Construction or street work—Notice.

All persons engaged in construction or street work shall give at least ten days' written notice to the water system for the removal or displacement of water system facilities that may interfere or conflict with street work, and any damage resulting to the facilities from such failure to give notice shall be charged against the person engaged in such work. All costs involved in the removal or displacing of water facilities shall be paid by the person engaged in such work, except where provisions of county or state encroachment permits or city permits or contracts state otherwise.

(Ord. 324 N.C. § 11.02, 1958.)

11.08.050 - Emergency shut off.

In case of fire, or alarm of fire, or in making repairs, or in constructing new work, the water system shall have the right to shut off water from any customer or number of customers without notice and to keep it shut off as long as it may be necessary. In case of fire, or alarm of fire, the use of fountains or yard sprinklers is prohibited, should circumstances warrant.

(Ord. 324 N.C. § 11.03, 1958.)

11.08.060 - System not liable for certain damages.

The water system shall not be liable for damages resulting from:

- A. Any interruption of service or damage caused by spigots, valves, and/or other equipment or fixtures that are open when water is turned on, either when water is turned on originally or when turned on after a temporary shut off;
- B. Any increase or decrease in delivery pressure, since the water service is subject to such variations in pressure as may be from time to time required or which may occur in the operation of the distribution system.

(Ord. 324 N.C. § 11.04, 1958.)

11.08.070 - Tapping by authorized persons only.

No person except an employee of the water system shall tap any of the water pipes of the main line or distribution system or insert tees, stopcocks or ferrules therein. Where service pipes are found disconnected at the corporation cock, they shall be reconnected only by an employee of the water system.

(Ord. 324 N.C. § 11.05, 1958.)

11.08.080 - Fire chief's authority.

In the event of fire or alarm of fire, the fire chief shall have full authority to request the setting of gates and valves in water mains to secure the possible pressure at the points required. When the need for such changes has passed, the fire chief shall notify the superintendent in order that the system may be restored to its normal operating condition.

(Ord. 324 N.C. § 11.06, 1958.)

11.08.090 - Conditions of service.

- A. Every person, firm or corporation taking water shall be considered as having expressed his consent to be bound by this chapter and Chapters 11.12 through 11.48, and whenever any one of these rules and/or regulations is violated, the right is reserved to discontinue water service for noncompliance. Unless otherwise provided, the water system shall discontinue water service if the customer fails to comply within five days after the date of written notice of violation. If such noncompliance affects matters of health or safety, or affects the operation, maintenance or other costs of the water system, water service may be discontinued immediately and without notice.
- B. The person, firm or corporation whose water is thus discontinued shall forfeit all deposits made, and the water shall not be turned on again until all unpaid fees and charges are paid and other requirements of this chapter and Chapters 11.12 through 11.48 are fulfilled.

(Ord. 377 N.C.(2d) § 1, 1977; Ord. 324 N.C. § 11.07, 1958.)

11.08.100 - Selling of water.

It is unlawful for any person or entity to sell water within the corporate limits of the city of Vallejo without having first received permission to do so from the city council of the city of Vallejo.

(Ord. 324 N.C. § 11.08, 1958.)

11.08.110 - Reselling and/or redelivery of water.

- A. The water system shall not serve or supply water to any customer if the same is to be resold or redistributed to other consumers, except only in the case of the federal government, state or local public entities including municipalities, or nonprofit mutual water companies and homeowners' associations, whether incorporated or unincorporated, purchasing water from the water system pursuant to contract approved by the city council for use within the boundaries of the property that the water service connection was approved to supply, unless otherwise provided by contract.
- B. It is a violation of these regulations if water received from this system is resold or redelivered to premises other than those stipulated in the water service application.

(Ord. 377 N.C.(2d) § 3, 1977; Ord. 324 N.C. § 11.09, 1958.)

11.08.120 - Responsibility for damage to water service connections.

- A. The customer and the owner of every parcel of real property served by a water service connection shall be responsible for damage, injury or loss of whatever kind occurring to said water service connection, including the meters, pipes, meter boxes and enclosures used in supplying water service to said property, unless said customer or owner, or both, can establish to the satisfaction of the water superintendent that the damage, injury or loss was not caused or occasioned by their neglect or wrongful conduct or that of anyone under their direction or control.
- B. Whenever it becomes necessary to make repairs to water service connections, the city shall bill the actual cost of the work, including labor and materials, to the customer, with a copy of said billing to the property owner if different than the customer, giving written notice of the opportunity to refute their responsibility for such damage, injury or loss within ten days of delivery of said billing and notice. If responsibility is not so refuted, and the billing is not paid within thirty days of its delivery, the cost of said repairs may be assessed against and made a lien upon the real property after notice and hearing in accordance with the procedures set forth in Sections [10.04.040](#) to [10.04.080](#) inclusive of the Vallejo Municipal Code, or said obligation may be declared a debt and collected by the city using any lawful means of collection for a debt owed by such customer or owner.
- C. Nothing herein shall be construed to relieve any third party from liability or responsibility for damage, injury or loss to any water service connection caused or occasioned by his act or omission.

(Ord. 377 N.C.(2d) § 2, 1977.)

Chapter 11.12 - APPLICATION FOR SERVICE

Sections:

[11.12.010 - Procedure.](#)

[11.12.020 - Contents.](#)

[11.12.030 - Refusal of service.](#)

[11.12.040 - Limit of service.](#)

[11.12.050 - Changes in customer's facilities.](#)

[11.12.060 - Water used without application.](#)

[11.12.070 - Liability for service.](#)

[11.12.080 - Former customer owing bills.](#)

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11.12.010 - Procedure.

All persons or entities desiring water service from the water system shall make application therefor at the commercial office. The application shall be in the manner prescribed by the superintendent and shall be signed by the applicant or his authorized agent. Receipt of such application shall not obligate the water system to provide water service until the application has been approved by the superintendent or his authorized agent. The application, a request water for water service, shall not obligate the applicant to take such service for any period of time in excess of that upon which the minimum charges for such account are based.

(Ord. 324 N.C. § 3.01, 1958.)

11.12.020 - Contents.

All applications for water service shall set forth:

- A. The definite boundaries of the premises to be served water;
- B. The purpose and use of the water to consumed;
- C. An estimate of the maximum instantaneous water demand; and
- D. Such other information and details as may be deemed proper or necessary by the superintendent.

(Ord. 324 N.C. § 3.02, 1958.)

11.12.030 - Refusal of service.

The water superintendent shall have the right to refuse to furnish water or may discontinue water service to any premises for the following reasons:

- A. To protect the city and/or the water system from fraud and abuse;
- B. The requested water service demand may be detrimental or injurious to the water service of other customers;

- C. The distribution facilities are inadequate to supply the requested water service demand.

(Ord. 324 N.C. § 3.03, 1958.)

11.12.040 - Limit of service.

The water superintendent shall have the right to limit the total quantity of water furnished to any premises or to establish the times and the rates of draft at which water may be taken or will be furnished to any premises, although a limit or maximum use may or may not appear on the application or permit for the water service. Should conditions seem to warrant the limiting of water service, the superintendent shall be guided by but not restricted to:

- A. The past seasonal water use at the premises;
- B. The effect of current use on other customers; and
- C. The effect of current use on the water system facilities.

(Ord. 324 N.C. § 3.04, 1958.)

11.12.050 - Changes in customer's facilities.

Customers making any material change in the size, character or extent of their facilities utilizing the water service, or whose change in operations results in a large or unusual increase in the use of water, shall immediately give the commercial office written notice of the nature of the change and, if necessary, amend their application for water service. Any request for change in the size, location or number of water service connections to premises previously receiving water service will require the filing of a new application for water service, and all conditions and requirements of new water service and water service connections shall apply.

(Ord. 324 N.C. § 3.05, 1958.)

11.12.060 - Water used without application.

A person or firm taking possession of premises and using water without having made application to the commercial office for water service, shall be held liable for all the water delivered from the date of the last recorded meter reading. If proper application for service is not made within seven calendar days after notification to do so by the superintendent or if accumulated bills for water service are not paid upon presentation, the water service shall be discontinued without further notice.

(Ord. 324 N.C. § 3.06, 1958.)

11.12.070 - Liability for service.

After water service is commenced, the service applicant shall be liable for payment for all water delivered through that particular service and all other charges applicable to the service. Whenever two or more persons jointly make application for service, they shall receive a single periodic bill but shall be jointly and individually liable for payment of all charges appearing on such bills.

(Ord. 324 N.C. § 3.07, 1958.)

11.12.080 - Former customer owing bills.

When an application for water service is made by a former customer who has failed to pay all bills for water service previously received or charges in relation to any other service received from the water

system, the superintendent shall refuse to wish water service to the applicant until the outstanding bills and/or charges are paid; and shall also require a cash deposit as a guarantee for the payment of future bills.

(Ord. 324 N.C. § 3.08, 1958.)

11.12.090 - Deposit.

- A. Each applicant may be required to furnish and maintain a cash deposit for payment of charges in connection with the provision of water service where it appears to the finance director that the applicant's credit is insufficient to assure payment of any such charges as they become due. The deposit shall be applied as payment only to the final bill. An applicant will not need to furnish and maintain a cash deposit if the applicant has been a customer of record of the city of Vallejo for water service for twenty-four months or more within the past three years preceding application and having demonstrated a good credit history, which is defined as follows:
1. No delinquent notices within the last twenty-four months, and
 2. No service disconnection for nonpayment of a bill or deposit within the previous twenty-four months; and
 3. Has not had a check returned to the city for insufficient funds from his/her bank within the past twenty-four months and,
 4. Has not filed for bankruptcy within seven years of the date of application.
- B. Where the applicant is required to make a deposit, the amount shall be set as follows:
1. Residential Applicants. The amount shall not exceed a sum equal to twice the estimated periodic bill and in any event, the amount shall not be less than a minimum amount to be determined by the finance director.
 2. Commercial Applicants. The amount shall not exceed a sum equal to three times the estimated average monthly bill. In any event, the amount shall not be less than three hundred dollars and which may be adjusted from time to time by the finance director.

Each applicant that is required to make a cash deposit may receive a reduction, as determined by the finance director, in the deposit requirement if, at the time of application, the applicant signs up for the city's electronic Automated Clearing House (ACH) debit program. If the applicant terminates their participation in the ACH debit program, or if the applicant's ACH debit is rejected or otherwise not paid by their financial institution, the applicant must, within thirty days of notice by the city, increase their deposit by the amount of the reduction they received.

(Ord. 1503 N.C.(2d) § 1, 2003; Ord. 587 N.C.(2d) § 1, 1981; Ord. 324 N.C. § 3.09, 1958.)

11.12.100 - Refund of deposit.

When a customer has furnished a deposit to guarantee payment of water bills, and service has been terminated, such deposit will be refunded to the customer after deduction of any unpaid charges.

(Ord. 1503 N.C.(2d) § 2, 2003; Ord. 324 N.C. § 3.10, 1958.)

11.12.110 - Discontinuance of service.

- A. Requests to discontinue water service shall be submitted in writing at the commercial office not less than two working days before the date on which the discontinuance is desired. The request shall stipulate a definite date, the same being a working day, during which water service shall be discontinued, and a proper forwarding address at which the customer will receive closing billing.
- B.

After the effective date of such discontinuance, all charges accruing shall cease for the period during which service shall be shut off, providing the shut off is for a period of not less than one month.

(Ord. 324 N.C. § 3.11, 1958.)

Chapter 11.16 - WATER SERVICE CONNECTIONS

Sections:

- [11.16.010 - Minimum connection.](#)
- [11.16.020 - Water facilities payments.](#)
- [11.16.021 - Purpose.](#)
- [11.16.022 - Definitions.](#)
- [11.16.023 - Payments—Vallejo service area water connections.](#)
- [11.16.024 - Payments—Lakes service area water connections.](#)
- [11.16.025 - Exceptions.](#)
- [11.16.026 - Existing services.](#)
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- [11.16.029 - Nontransferable.](#)
- [11.16.030 - Special water facilities tax.](#)
- [11.16.035 - New service installation charges.](#)
- [11.16.040 - Changes in meter or service pipe size.](#)
- [11.16.050 - Changes in location.](#)
- [11.16.060 - Charges payable in advance.](#)
- [11.16.070 - Title to connections.](#)
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- [11.16.090 - Connection to separate premises.](#)
- [11.16.100 - Connections to separate consumers.](#)
- [11.16.110 - Connections requiring main extension—Installation.](#)
- [11.16.120 - Connections requiring main extension—Deposit in certain cases.](#)

11.16.010 - Minimum connection.

The minimum water service connection shall be a three-fourth inch service pipe and five-eighth inch meter. Whenever a water service connection or revision is requested, the city water superintendent shall determine the size of the service pipe and meter to be installed. The determination shall be predicated on, but not limited to, the applicable sections of the city's building, fire and plumbing codes, federal, state and local laws and regulations, governing public health, and any other lawful authority having jurisdiction over such matter.

(Ord. 194 N.C.(2d) § 1 (part), 1973.)

11.16.020 - Water facilities payments.

Each and every applicant for a water service connection to the city municipal water system shall pay a water facilities payment in the amount applicable to the particular classification of the premises to be supplied water as hereinafter set forth in Sections [11.16.021](#) through [11.16.030](#); water facilities payments shall be in addition to any and all other taxes, fees or charges of any nature whatsoever relative to a supply of water, water service or water service connection.

(Ord. 1334 N.C.(2d) § 9, 1995; Ord. 1127 N.C.(2d) § 2, 1990; Ord. 194 N.C.(2d) § 1 (part), 1973.)

11.16.021 - Purpose.

The purpose of the water facilities connection ordinance codified in this chapter is to create revenue to assist in providing for capital costs of additions and improvements to the municipal water system. To accomplish this objective, all moneys received under Sections [11.16.020](#) through [11.16.030](#) shall be deposited in the capital reserve account of the municipal water system fund as the same is established and designated by Ordinance No. 47 N.C.(2d). That money shall be used, after approval of the city council, to pay for acquisition, installation, or construction of components (including easements, rights-of-way and/or land) of the municipal water system. Those components must be of benefit to the overall municipal water system or supply the water demands required of or anticipated for the municipal water system.

(Ord. 1334 N.C.(2d) § 10, 1995: Ord. 1127 N.C.(2d) § 3, 1990: Ord. 194 N.C.(2d) § 1(a), 1973.)

11.16.022 - Definitions.

The amount of water facilities payment applicable to a particular water service connection shall be based on the definitions set forth in [Section 11.48.070](#).

(Ord. 1127 N.C.(2d) § 4, 1990: Ord. 194 N.C.(2d) § 1(b), 1973.)

11.16.023 - Payments—Vallejo service area water connections.

For water service to premises in the Vallejo service area as defined in [section 11.40.010A](#) the amounts set forth below shall be imposed at the time an applicant for a water service connection or for change of service applies for a building permit at the premises that is the subject of the connection or change.

- A. Residential. For premises consisting of one or more residential units, an applicant shall pay the following water facilities payment for each residential unit to be supplied water by that water connection, effective on the date indicated.

7/1/2009:	\$7,590.00
7/1/2010:	\$7,810.00
7/1/2011:	\$8,050.00
7/1/2012:	\$8,290.00
7/1/2013:	\$8,540.00

- B. Mobile Home. For premises consisting of one or more mobile home units an applicant shall pay the following water facilities payment for each mobile home unit to be supplied water by that water connection, effective on the date indicated.

7/1/2009:	\$7,590.00
7/1/2010:	\$7,810.00
7/1/2011:	\$8,050.00
7/1/2012:	\$8,290.00
7/1/2013:	\$8,540.00

- C. Commercial. For premises consisting of one or more commercial units an applicant shall pay the following water facilities payment for each commercial unit to be supplied water by that water connection or connections, effective on the date indicated; however, in all instances, the payment shall not be less than hereinafter set forth for the meter size installed on the particular water service connection, effective on the date indicated:

<u>7/1/2009:</u>	\$7,590.00
<u>7/1/2010:</u>	\$7,810.00
<u>7/1/2011:</u>	\$8,050.00
<u>7/1/2012:</u>	\$8,290.00
<u>7/1/2013:</u>	\$8,540.00

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 inch	\$ 7,590	\$ 7,810	\$ 8,050	\$ 8,290	\$ 8,540
¾ inch	\$ 7,590	\$ 7,810	\$ 8,050	\$ 8,290	\$ 8,540
1 inch	\$ 15,170	\$ 15,620	\$ 16,090	\$ 16,570	\$ 17,070
1-½ inch	\$ 30,330	\$ 31,240	\$ 32,170	\$ 33,140	\$ 34,130
2 inch	\$ 48,520	\$ 49,980	\$ 51,480	\$ 53,020	\$ 54,610
3 inch	\$ 90,970	\$ 93,700	\$ 96,510	\$ 99,410	\$ 102,390
4 inch	\$ 151,620	\$ 156,170	\$ 160,850	\$ 165,680	\$ 170,650
6 inch	\$ 303,240	\$ 312,330	\$ 321,700	\$ 331,350	\$ 341,300
8 inch	\$ 485,180	\$ 499,730	\$ 514,720	\$ 530,160	\$ 546,070
10 inch	\$ 697,440	\$ 718,360	\$ 739,910	\$ 762,110	\$ 784,970
12 inch	\$ 1,303,900	\$ 1,343,020	\$ 1,383,310	\$ 1,424,810	\$ 1,467,550

- D. Combination. For premises consisting of any combination of residential units, mobile home units, or commercial units, an applicant shall pay the following water facilities payment for each residential or mobile home unit, effective on the date indicated, plus the amount set forth in subsection C. for the commercial unit(s).

<u>7/1/2009:</u>	\$7,590.00
<u>7/1/2010:</u>	\$7,810.00
<u>7/1/2011:</u>	\$8,050.00
<u>7/1/2012:</u>	\$8,290.00
<u>7/1/2013:</u>	\$8,540.00

- E. Schools. For premises used or occupied as a school, an applicant shall pay the following water facilities payment, effective on the date indicated; however, in all instances, the payment shall not be less than the amount recited in subsection C. for the meter size installed on the particular water service connection.

<u>7/1/2009:</u>	\$7,590.00
<u>7/1/2010:</u>	\$7,810.00
<u>7/1/2011:</u>	\$8,050.00
<u>7/1/2012:</u>	\$8,290.00
<u>7/1/2013:</u>	\$8,540.00

F. The rate of payment shall annually escalate the same percentage that the latest "Engineer News Record Construction Costs Index" for the San Francisco Bay Area annually escalates. Any escalation shall be presented annually prior to July 1 for consideration and approval by the city council.

(Ord. 1620 N.C.(2d) § 1, 2009: Ord. 1543 N.C.(2d) § 1; 2005: Ord. 1334 N.C.(2d) § 11, 1995: Ord. 1269 N.C. § 2, 1993: Ord. 1127 N.C.(2d) § 5, 1990: Ord. 877 N.C.(2d) § 1, 1986: Ord. 760 N.C.(2d) § 1, 1984: Ord. 539 N.C.(2d) § 1, 1980: Ord. 496 N.C.(2d) § 2, 1979: Ord. 435 N.C.(2d) § 4, 1978: Ord. 379 N.C.(2d) § 4, 1977: Ord. 194 N.C.(2d) § 1(c), 1973.)

11.16.024 - Payments—Lakes service area water connections. 

For water service to premises in the Lakes service area as defined in [section 11.48.010B](#), the amounts set forth below shall be imposed at the time an applicant for a water service connection or for change of service applies for a building permit at the premises that is the subject of the connection or change.

A. Residential. For premises consisting of one or more residential units, an applicant shall pay the following water facilities payment for each residential unit to be supplied water by that water connection, effective on the date indicated.

<u>7/1/2009:</u>	\$16,660.00
<u>7/1/2010:</u>	\$17,300.00
<u>7/1/2011:</u>	\$17,970.00
<u>7/1/2012:</u>	\$18,630.00
<u>7/1/2013:</u>	\$19,330.00

B. Mobile home. For premises consisting of one or more mobile home units an applicant shall pay the following water facilities payment for each mobile home unit to be supplied water by that water connection, effective on the date indicated.

<u>7/1/2009:</u>	\$16,660.00
<u>7/1/2010:</u>	\$17,300.00
<u>7/1/2011:</u>	\$17,970.00
<u>7/1/2012:</u>	\$18,630.00
<u>7/1/2013:</u>	\$19,330.00

C. Commercial. For premises consisting of one or more commercial units an applicant shall pay the following water facilities payment for each commercial unit to be supplied water by that

water connection or connections, effective on the date indicated; however, in all instances, the payment shall not be less than hereinafter set forth for the meter size installed on the particular water service connection, effective on the date indicated:

<u>7/1/2009:</u>	\$16,660.00
<u>7/1/2010:</u>	\$17,300.00
<u>7/1/2011:</u>	\$17,970.00
<u>7/1/2012:</u>	\$18,630.00
<u>7/1/2013:</u>	\$19,330.00

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 inch	\$ 16,660	\$ 17,300	\$ 17,970	\$ 18,630	\$ 19,330
¾ inch	\$ 16,660	\$ 17,300	\$ 17,970	\$ 18,630	\$ 19,330
1 inch	\$ 33,310	\$ 34,590	\$ 35,930	\$ 37,250	\$ 38,660
1-½ inch	\$ 66,620	\$ 69,170	\$ 71,860	\$ 74,250	\$ 77,310
2 inch	\$ 106,590	\$ 110,680	\$ 114,970	\$ 119,200	\$ 123,690
3 inch	\$ 199,850	\$ 207,510	\$ 215,560	\$ 223,500	\$ 231,910
4 inch	\$ 333,080	\$ 345,850	\$ 359,270	\$ 372,500	\$ 386,520
6 inch	\$ 666,150	\$ 691,680	\$ 718,530	\$ 744,990	\$ 773,030
<u>8 inch</u>	\$ 1,065,860	\$ 1,106,690	\$ 1,652,600	\$ 1,713,500	\$ 1,778,000
<u>10 inch</u>	\$ 1,532,170	\$ 1,590,870	\$ 1,652,600	\$ 1,713,500	\$ 1,778,000
<u>12 inch</u>	\$ 2,864,490	\$ 2,974,230	\$ 3,089,640	\$ 3,203,500	\$ 3,324,080

- D. Combination. For premises consisting of any combination of residential units, mobile home units, or commercial units, an applicant shall pay the following water facilities payment for each residential or mobile home unit, effective on the date indicated, plus the amount set forth in subsection C. for the commercial unit(s).

<u>7/1/2009:</u>	\$16,660.00
<u>7/1/2010:</u>	\$17,300.00
<u>7/1/2011:</u>	\$17,970.00
<u>7/1/2012:</u>	\$18,630.00
<u>7/1/2013:</u>	\$19,330.00

- E. Schools. For premises used or occupied as a school, an applicant shall pay the following water facilities payment, effective on the date indicated; however, in all instances, the payment shall not be less than the amount recited in subsection C. for the meter size installed on the particular water service connection.

<u>7/1/2009:</u>	\$16,660.00
<u>7/1/2010:</u>	\$17,300.00

7/1/2011:	\$17,970.00
7/1/2012:	\$18,630.00
7/1/2013:	\$19,330.00

- F. The rate of payment shall annually escalate the same percentage that the latest "Engineer News Record Construction Costs Index" for the San Francisco Bay Area annually escalates. Any escalation shall be presented annually prior to July 1 for consideration and approval by the city council.

(Ord. 1620 N.C.(2d) § 2, 2009; Ord. 1334 N.C.(2d) § 12, 1995.)

11.16.025 - Exceptions.

Water facilities payment requirements shall not be applicable to a water service connection for the following classifications:

- A. Fire protection service connections under [Section 11.20.010](#)
- B. Temporary service connections under [Section 11.20.050](#)
- C. Existing water service connections described in [Section 11.16.025](#)

(Ord. 1334 N.C.(2d) § 13 (part), 1995; Ord. 1127 N.C.(2d) § 6, 1990; Ord. 194 N.C.(2d) § 1(d), 1973.)

11.16.026 - Existing services.

All existing water service connections described below shall deemed to have paid the applicable water facilities payments. Water service connections of the following categories shall be held to be existing water service connections.

- A. Water service connections installed prior to the effective date of the ordinance codified in this chapter to supply premises previously completed and suitable for occupancy;
- B. Water service connections installed prior to the effective date of the ordinance codified in this chapter to supply premises then under construction or alteration, evidenced by a then valid building permit, if the construction or alteration was completed and the premises suitable for use or occupancy within six months after the effective date of the ordinance codified in this chapter. The six months applicable to a particular water service connection may be extended by the city council for a period of time equal to that resulting from delay caused by acts of God, strikes or other unusual circumstances, providing such delay was not the consequences of the act, or failure to act, of owners or their contractors.

(Ord. 1334 N.C.(2d) § 13 (part), 1995; Ord. 1127 N.C.(2d) § 7, 1990; Ord. 194 N.C.(2d) § 1(e), 1973.)

11.16.027 - Changes of service.

In the event of any change involving an existing water service connection, the following shall be the basis for determining any water facilities payment then due and payable:

- A. When there is a change in the classification or number of units on them, the payment shall be reduced by the amount of the payment applicable to the connection immediately before such a change;
- B.

- When there is a change in the connection's meter size, the payment shall be reduced by the amount of the payment applicable to the connection immediately before such a change;
- C. When there is a change in the connection's physical location, but the connection continues to supply the same premises, the payment shall be reduced by the amount of the payment applicable to the connection immediately before such a relocation;
 - D. However, in any of the above instances, the maximum credit shall not exceed the payment applicable to the revised connection; and, further, no refund or future credit shall accrue to any person as a result of the credit.

(Ord. 1334 N.C.(2d) § 13 (part), 1995: Ord. 1127 N.C.(2d) § 8, 1990: Ord. 612 N.C.(2d) § 4, 1981: Ord. 194 N.C.(2d) § 1(f), 1973.)

11.16.028 - Abandonment of service.

Whenever any improvement on a premises has been damaged, dismantled or removed so that the premises may not accommodate use, and there has been no active water service customer account during a twelve consecutive month period, such water service connection shall be deemed abandoned. In that case any water facilities payments shall be without effect and no refund or credit shall accrue to any person associated with the premises.

(Ord. 1543 N.C.(2d) § 2, 2005: Ord. 1334 N.C.(2d) § 13 (part), 1995: Ord. 1127 N.C.(2d) § 9, 1990: Ord. 194 N.C.(2d) § 1(g), 1973.)

11.16.029 - Nontransferable.

Water facilities payments paid, or deemed to have been paid shall not be transferable or creditable to the water facilities payments applicable to any other premises.

(Ord. 1334 N.C.(2d) § 13 (part), 1995: Ord. 1127 N.C.(2d) § 10, 1990: Ord. 194 N.C.(2d) § 1(h), 1973.)

11.16.030 - Special water facilities tax.

The city council reserves the right to find and determine that for the public and community benefit, good and/or welfare, the water facilities tax for a particular water service connection shall be different than those expressed and set forth in any subsection, paragraph or subparagraph of Sections [11.16.020](#) through [11.16.028](#) and that such different water facilities tax, then so determined, shall then be applicable to the water service connection and take precedence over any other water facilities tax set forth in any subsection, paragraph or subparagraph of Sections [11.16.020](#) through [11.16.028](#).

(Ord. 1334 N.C.(2d) § 13 (part), 1995: Ord. 194 N.C.(2d) § 1(i), 1973.)

11.16.035 - New service installation charges.

The water system shall collect charges for the installation of the following new water service connections:

- A. Water Service Connections. Installed, complete in place, by water system forces, connected to an existing water main and consisting of the service piping and meter of the particular sizes required with meter box or other appropriate housing. This subsection covers the following water service connections:

Service Connection

¾" service pipe & 5/8" meter

¾" service & ¾" meter

1" service pipe & 1" meter

1 ½" service pipe & 1 ½" meter

2" service pipe & 2" meter

- B. Meter Sets. Whenever, in the course of constructing new water mains, the service piping has been installed by others, the water system is to install only the water meter, complete with meter connections and box. This subsection covers the following meter sets:

Meter Size

5/8" × ¾" meter

¾" meter

1" meter

1 ½" meter

2" meter

- C. Extra Large Connections. On new service connections requiring service pipe and/or meter larger than two-inch internal diameter or greater than fifty feet in length or otherwise different from the service pipe and meter combinations listed above, or wherever unusual conditions prevail, the charges to be collected by the water system for such service connections shall be on an actual cost basis.
- D. Rate Adjustments. The charges for water service connections and meter sets presented in this section shall be established by resolution or resolutions adopted by the city council. The charges for water service connections and meter sets may annually escalate the same percentage that the latest ("Engineering News Record Construction Costs Index" for the San Francisco Bay Area annually escalates. The escalation, if any, shall be presented annually prior to July 1st, the first complete year after the passage of the ordinance codified in this section, and each year thereafter, for consideration and approval by the city council. The city council may also from time to time at its discretion, revise, alter and/or amend any of the charges set forth in this section by adoption of the appropriate resolution or resolutions.

(Ord. 1334 N.C.(2d) § 13 (part), 1995: Ord. 924 N.C.(2d) § 1, 1987: Ord. 539 N.C.(2d) § 2, 1980: Ord. 496 N.C.(2d) § 3, 1979: Ord. 435 N.C.(2d) § 5, 1978: Ord. 374 N.C.(2d) § 1, 1977: Ord. 15 N.C.(2d) § 1, 1971: Ord. 324 § 4.03, 1958.)

11.16.040 - Changes in meter or service pipe size. 

Changes in size of meter, service pipe or both of existing service connections shall be at the expense of the customer. The expense shall be computed on the basis of the actual cost of the new installation less the value of any material salvaged. The value of salvaged material shall be the market value less the cost of salvaging the same.

(Ord. 324 N.C. § 4.04, 1958.)

11.16.050 - Changes in location. 

When relocation of an existing meter or service connection has been requested for the customer's convenience, such location shall be at the customer's expense for the actual cost thereof. The relocation of existing meters or service connections, when done to protect the property of the water system or the city's interests, will be done without charge to the customer.

(Ord. 324 N.C. § 4.05, 1958.)

11.16.060 - Charges payable in advance. 

Charges for new service connections, changes in size and changes in location for customer's benefit shall be due and actually paid before any work is commenced or material ordered. Whenever said charges are to be the actual costs, the estimated cost shall be deposited with the commercial office before any work is commenced or material ordered, and upon completion of the work the actual cost shall be compiled and any difference between the actual and estimated cost shall be billed or refunded for the customer's account.

(Ord. 324 N.C. § 4.06, 1958.)

11.16.070 - Title to connections.

- A. Title to all meters, service pipes and appurtenances used in providing a water service connection shall vest in the water system and the charges hereinbefore set forth are for connection and do not convey any right of title to said facilities.
- B. The water service connection is for a water supply to the premises stipulated on the application and is not transferable to any other properties or premises.
- C. If the water service is discontinued or abandoned, no right of refund of connection charges or credit in any manner accrues to the applicant or customer or his successor.

(Ord. 324 N.C. § 4.07, 1958.)

11.16.080 - Location of connections.

- A. Water service connections shall be installed only in public streets and/or easements or rights-of-way under the control of the water system.
- B. Where the premises to be served front on more than one street, the superintendent shall have the right to designate on which frontage the service connection shall be installed.
- C. New or relocated meters shall be installed in the public sidewalk near the street curb or behind and adjacent to the public sidewalk within the publicly owned and controlled right-of-way.
- D. It is unlawful for anyone to enclose a water meter with a fence, wall or hedge or otherwise obstruct access to water service meters. Upon the failure or refusal of the owner or customer to remove any such unlawful obstruction within a reasonable time after written request to do so, the superintendent shall, at his option, order:
 - 1. The discontinuance of water service to the premises until the obstruction is removed; or
 - 2. The customer to pay an additional charge of two dollars, as penalty, for each meter reading taken until the obstruction is removed.

(Ord. 324 N.C. § 4.08, 1958.)

11.16.090 - Connection to separate premises.

- A. A single service connection shall not serve more than one premises. Separate premises under a single ownership, control or management shall only be supplied water through separate service connections unless the superintendent, for good and sufficient reasons, shall determine otherwise.
- B. When investigating requests for a single service connection to provide service to more than one premises, the superintendent shall be guided by but not be restricted to the following considerations:
 - 1. That the service connection will not violate the regulations against reselling or redelivery to other consumers;
 - 2. That the service connection will not establish a private distribution system;
 - 3. That the service connection will not avoid main extension requirements;
 - 4. That the service connection will not be a means of avoidance of meter service charges and/or securing an advantageous water price without an equivalent guaranteed minimum.

(Ord. 324 N.C. § 4.09, 1958.)

11.16.100 - Connections to separate consumers.

- A. Each separate consumer shall only be supplied water through a separate service connection unless the superintendent shall determine otherwise.
- B. Where more than one consumer is supplied through a single service connection, the owner of the property, or other person agreed upon, shall be liable for payment for all water furnished through said single service connection.
- C. Wherever it is practical to serve separate customers through separate service connections, the superintendent shall require separate service connections for each separate customer.

(Ord. 324 N.C. § 4.10, 1958.)

11.16.110 - Connections requiring main extension—Installation.

In no event shall a water service connection be installed unless a water main of adequate capacity and delivery pressure extends in a public street or right-of-way across the entire frontage of the property to be served water. Wherever as a prerequisite to service a water main must be extended, the same shall be installed in compliance with the provisions hereinafter set forth.

(Ord. 740 N.C.(2d) § 2 (part), 1984; Ord. 324 N.C. § 4.12, 1958.)

11.16.120 - Connections requiring main extension—Deposit in certain cases.

Whenever a water main extension is a prerequisite of water service but a portion of the property frontage abuts on an existing water main and/or construction of the entire extension is not immediately necessary to provide a water service to the particular property requesting service, the service applicant can comply with the obligation to extend a water main by:

- A. Depositing in cash with the city of Vallejo an amount equal to the prorated share of the cost of extending such water main, as such cost is estimated by the water superintendent; or
- B. Executing a recordable agreement, supported by a bond of faithful performance, obliging the owner of the property to pay the prorated share of the cost of such water main extension, upon demand of the water system.

(Ord. 740 N.C.(2d) § 2 (part), 1984; Ord. 437 N.C. § 1, 1961; Ord. 324 N.C. § 4.13, 1958.)

Chapter 11.18 - ELEVATED STORAGE FEES

Sections:

[11.18.010 - Payment of fee.](#)

[11.18.020 - Purpose.](#)

[11.18.030 - Definitions.](#)

[11.18.040 - Rates.](#)

[11.18.050 - Exceptions.](#)

[11.18.060 - Changes of service.](#)

[11.18.070 - Abandonment of service.](#)

[11.18.080 - Nontransferability.](#)

[11.18.090 - Special fees.](#)

11.18.010 - Payment of fee.

Each and every applicant for water service connection to the elevated water storage system of the city municipal water system shall pay an elevated storage fee in the amount applicable to the particular classification of the premises to be supplied water as set out in this chapter. Said elevated storage fee shall be in addition to any and all other taxes, fees and/or charges of any nature whatsoever relative to a supply of water, water service, facilities tax or water service connection.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.020 - Purpose.

The purpose of the elevated storage fee is to create revenue to assist in providing for capital costs of additions and improvements to the municipal water system with respect to storage vessels, pump stations, control equipment, and those portions of pipelines above or beyond the serviceable areas of an elevated storage system. To accomplish this objective, all moneys received as payments of the elevated storage fee shall be deposited in an administrative trust fund (elevated storage). Moneys so deposited shall only be expended and/or withdrawn from said fund, to pay the cost of acquisition, installation, and/or construction of appurtenances and/or components (including easements, rights-of-way and/or land) of the municipal water service found or determined to be of benefit to the elevated portions of the municipal water system, or major sections thereof, or vital and necessary to supply the water demands and/or flows then required or anticipated to be required of the municipal water service.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.030 - Definitions.

When determining the amount or amounts of the elevated storage fee applicable to a particular water service connection, the definitions set forth in [Section 11.48.070](#) shall be utilized to establish the classification of the premises to be served.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.040 - Rates.

Simultaneously with the application for the installation of water service connection or connections, or any change of service, the applicant shall pay an elevated storage fee in the amount or amounts applicable to the particular classifications as follows:

- A. Residential. One thousand three hundred dollars for each residential unit to be supplied by that water service.
- B. Mobile Home. One thousand three hundred dollars for each mobile home unit to be supplied by that water service connection or connections.
- C. Commercial. One thousand three hundred dollars for each commercial unit to be supplied water by that water connection or connections; however, in all instances, the elevated storage fee shall be not less than that hereafter set forth for the meter size installed on the particular water service connection:

Meter Size	Elevated Storage Fees
5/8"	\$ 1,300.00
3/4"	1,781.00
1"	1,976.00
1 1/2"	4,056.00
2"	6,149.00
3"	11,247.00
4"	17,238.00
6"	29,068.00
<u>8"</u> or larger	To be computed by the city water superintendent

- D. Combination. One thousand three hundred dollars for each unit consisting of any combination of residential, mobile home, or commercial units, or the fee computed as meter size for commercial units as set out above.
- E. Schools. One thousand three hundred dollars except that the elevated storage fee shall be not less than the fee for commercial units computed on meter size.
- F. The rate of payment shall annually escalate the same percentage that the latest "Engineer News Record Construction Costs Index" for the San Francisco Bay Area annually escalates. Any escalation shall be presented. annually prior to July 1st for consideration and approval by the city council.

(Ord. 1269 N.C. § 3, 1993; Ord. 759 N.C.(2d) § 1, 1984; Ord. 538 N.C.(2d) § 1, 1980; Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.050 - Exceptions.

The elevated storage fee shall not be applicable to a water service connection of the following classifications:

- A. Fire protection service connections as set forth in [Section 11.20.010](#)
- B. Temporary service connections as set forth in [Section 11.20.050](#)
- C. Existing water service connections as the same are hereinafter described in [Section 11.16.025](#)

- D. A water service connection for which an elevated storage fee has previously been paid.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.060 - Changes of service.

In the event of any change involving an existing water service connection, the following shall be the basis for the determination of the amount of the elevated storage fee, if any, then due and payable:

- A. Changes of classification of the premises and/or number of units on the premises:
The elevated storage fees applicable shall be reduced by the amount of the elevated storage fees applicable to the particular water service connection immediately prior to such change.
- B. Changes of the meter size of the water services connection:
The elevated storage fees applicable shall be reduced by the amount of the elevated storage fees applicable to the particular water service connection immediately prior to such change.
- C. Changes of the physical location of a water service connection continuing to supply the same premises:
The elevated storage fees applicable to the relocated water service connection shall be reduced by the amount of the elevated storage fees applicable to the particular water service connection immediately prior to such change or relocation.
- D. However, in any and all instances of changes of service set forth above, the maximum credit of elevated storage fees applicable to the particular water service connection prior to such change shall never exceed the elevated storage fees applicable to the changed or revise premises or water service connection and further, no right of refund or future credit of any excess shall accrue to the applicant or to any previous or subsequent owner, tenant or occupant of the premises.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.070 - Abandonment of service.

Whenever, for any reason whatsoever, the building, structure or improvement on a premises has been damaged, dismantled or removed so that the premises is not suitable for or capable of accommodating use or occupancy and when there has not been an active customer account for the water service connection delivering water to said premises during a twelve-month period, such water service connection shall be conclusively deemed abandoned and any and all elevated storage fees paid, or deemed to have been paid, shall thereafter be without effect and no right of refund or credit of any nature shall accrue to any previous owner or subsequent owner, tenant or occupant of the premises. Any such abandoned water service connection shall be severed from the distribution pipeline upon the written order of the city water superintendent.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.080 - Nontransferability.

The elevated storage fees paid, or deemed to have been paid, applicable to a particular water service connection installed to serve a particular premises or lot or parcel of land shall not be transferable or creditable to the fees applicable for any other or different premises or lot or parcel of land.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

11.18.090 - Special fees.

The city council reserves the right to find and determine that for the public and community benefit, good and/or welfare, the elevated storage fees for a particular water service connection shall be different than those expressed and set forth in this chapter, and that such different elevated storage fees, then so determined, shall be applicable to said water service connection and take precedence over any other elevated storage fees set forth in this chapter.

(Ord. 503 N.C.(2d) § 1 (part), 1979.)

Chapter 11.20 - SPECIAL SERVICE CONNECTIONS

Sections:

- [11.20.010 - Fire service connections—Installation.](#)
- [11.20.020 - Fire service connections—Unauthorized use.](#)
- [11.20.030 - Fire service connections—Water for fire storage tanks.](#)
- [11.20.040 - Temporary service connections—Metering—Permit.](#)
- [11.20.050 - Temporary service connection—Deposits.](#)
- [11.20.060 - Temporary service connections—Refund of deposit.](#)
- [11.20.070 - Street construction water service.](#)
- [11.20.080 - Subdivision construction water service.](#)

11.20.010 - Fire service connections—Installation.

- A. When an application is made for fire service connections, such sprinkler and fire service installation shall not be less than four inches in size and shall be approved by the fire chief and by the Inspection Bureau of the Board of Fire Underwriters of the Pacific before water service is commenced.
- B. Each fire service shall have installed therein a detector check valve of such pattern and design as approved by the superintendent.
- C. A "detector check-valve" is defined as a spring-loaded or weight-loaded swing check valve equipped with a metered by-pass.
- D. Water furnished through fire services shall be used only for extinguishing fires or for authorized testing of the fire fighting system. Whenever a consumer wishes to test he shall notify the commercial office at least two working days before making such test.

(Ord. 324 N.C. § 5.01, 1958.)

11.20.020 - Fire service connections—Unauthorized use.

Where an existing fire service connection is not equipped with a detector check valve, the following applies. If it is found an unauthorized connection has been made or that an unauthorized use has been made of the fire service connection, the consumer shall be notified to discontinue such unauthorized connection or use, and if the consumer fails or refuses to do so, the water to the service shall be shut off, and not turned on again until a proper detector check valve has been installed.

(Ord. 324 N.C. § 5.02, 1958.)

11.20.030 - Fire service connections—Water for fire storage tanks.

Water may be obtained through fire service connection for filling a storage tank for fire protection purposes, but only if written permission is secured from the commercial office in advance, and if an approved means of measurement is available. The standard water rates hereinafter set forth shall be applied to the quantity of water so furnished.

(Ord. 324 N.C. § 5.03, 1958.)

11.20.040 - Temporary service connections—Metering—Permit.

Whenever practical, all water furnished through a temporary service connection shall be metered. Permits for temporary service connections shall be valid for a period not exceeding sixty days after installation. The superintendent may extend such permit for one additional sixty day period only. Upon the discontinuance of use or termination of the period allowed by the permit, the temporary service shall be disconnected and dismantled or removed.

(Ord. 324 N.C. § 5.04, 1958.)

11.20.050 - Temporary service connection—Deposits.

- A. The applicant shall make a cash deposit with the commercial office prior to issuance of a permit for a temporary service connection.
- B. The deposit shall equal the estimated costs of installing and removing the facilities necessary to provide such service, including the value of materials,
- C. Unless the applicant has otherwise established credit, the cost of water estimated to be used during the entire period of service.

(Ord. 324 N.C. § 5.05, 1958.)

11.20.060 - Temporary service connections—Refund of deposit.

Upon discontinuance of the temporary service and upon the completion of dismantling of the connections, the deposit shall be refunded without interest (upon application therefore) less any charges then unpaid, including the value of materials used (less salvage value) and materials lost or damaged beyond repair.

(Ord. 324 N.C. § 5.06, 1958.)

11.20.070 - Street construction water service.

Unless otherwise provided, contractors engaged in street construction work shall not take water from the water system except under the terms and conditions above set forth for temporary service connections.

(Ord. 324 N.C. § 5.07, 1958.)

11.20.080 - Subdivision construction water service.

When it is impractical in the opinion of the superintendent to install a temporary water service connection for the building construction work in a subdivision or to otherwise meter the water required for such building construction, the superintendent may allow the subdivider or developer to install water service connections without meters, provided that:

- A. The subdivider or developer pays an amount as upon by the contract, but not less than the minimum monthly charge for regular service multiplied by 1.5 times the number of lots in the subdivision from the date of the installation of the first unmetered water service connection until the completion of the construction work, not to exceed six months in any event;
- B. All of the temporary service connections shall be disconnected from the house piping and a meter installed prior to selling or transferring any title or interest to the premises or otherwise permitting occupancy of the premises.

(Ord. 324 N.C. § 5.08, 1958.)

Chapter 11.24 - EXTENSION OF FACILITIES

Sections:

[11.24.010 - Water main extensions.](#)

[11.24.020 - Water mains—Minimum size.](#)

[11.24.030 - Fire hydrants.](#)

[11.24.040 - Estimate of cost.](#)

[11.24.050 - Installation by water system.](#)

[11.24.060 - Installation by applicant.](#)

[11.24.070 - Standard specifications.](#)

[11.24.080 - Surety bonds.](#)

[11.24.090 - Bill of sale.](#)

[11.24.100 - Refunding procedure.](#)

11.24.010 - Water main extensions.

Applications for water main extensions shall be made at the commercial office and shall be accompanied by a deposit of ten dollars for each lot to be served in the case of a subdivision, or otherwise sixty dollars for each acre to be served. The superintendent shall cause a survey to be made to determine the adequacy of existing mains, if any, to serve the property of applicant, and if it is found and determined that a main extension should be installed, the city engineer shall prepare plans therefor, taking into consideration estimated future needs and the general plan of serving water to the vicinity surrounding the property of applicant.

(Ord. 324 N.C. § 6.01, 1958.)

11.24.020 - Water mains—Minimum size.

The inside diameter of every water main to be installed shall not be less than six inches except as may be otherwise determined by the superintendent.

(Ord. 324 N.C. § 6.02, 1958.)

11.24.030 - Fire hydrants.

- A. In preparing plans to extend water mains to serve property within the city, the city engineer shall provide for the installation of fire hydrants. The cost of such hydrants shall be included as a part of the water main extension and shall be paid for by applicant.
- B. In preparing plans to extend mains to serve property outside the city, but within a fire protection district, and it is recommended by the fire protection district that fire hydrants be provided, the city engineer shall provide for the installation of fire hydrants in such number and location as recommended by the fire protection district, the cost of such hydrants shall be included as a part of the water main extension and shall be paid for by applicant.
- C. In such case, a fire hydrant service charge shall be made against the fire protection district as hereinafter provided.

(Ord. 324 N.C. § 6.03, 1958.)

11.24.040 - Estimate of cost.

Upon receipt of the plans, the superintendent shall cause an estimate of installation costs to be prepared. The plans, specifications and cost estimates shall be furnished to applicant who shall within sixty days elect to proceed with the installation or abandon the same. If the applicant withdraws the application for the water main extension, all deposits made by applicant less engineering costs (including costs of survey, plans, specifications and estimates) shall be refunded to him.

(Ord. 324 N.C. § 6.04, 1958.)

11.24.050 - Installation by water system.

In the case applicant elects to proceed with the water main installation, the water system shall install the same; provided, however, the water system shall not order the materials required until the applicant has deposited an amount equal to the estimated cost of such materials, nor shall said system install the facilities until the applicant has deposited an amount which, when added to any previous deposits on the same application, is equal to the estimate of installation costs.

(Ord. 324 N.C. § 6.05, 1958.)

11.24.060 - Installation by applicant.

- A. If the superintendent determines that it is impossible for the water system to install water main extension within a reasonable time, or that it is not economical for the water system to install the water main extension, the superintendent may permit applicant to install the facilities in accordance with the plans and specifications.
- B. However, when the water main extension will be of benefit to properties other than that owned by the applicant and therefore the cost of the main extension will be the basis for calculating charges to other customers and for calculating refunds to the applicant, the applicant shall obtain not less than two bids for the work and the superintendent shall approve the cost prior to the beginning of any construction.

(Ord. 324 N.C. § 6.06, 1958.)

11.24.070 - Standard specifications.

The superintendent shall prepare specifications for the construction of water system facilities. A copy of the standard specifications shall be filed with the city clerk and after their approval and adoption by resolution of the city council, they shall govern all extension, additions and revisions to the water distribution system.

(Ord. 324 N.C. § 6.07, 1958.)

11.24.080 - Surety bonds.

In the event the applicant installs water main extension facilities, he shall furnish the water system a surety company bond in an amount equal to at least one-half the superintendent's estimate of the installation costs, to guarantee faithful performance by the applicant, and a surety company bond in an equal amount to guarantee claims of persons employed by applicant and claims of persons who furnish materials, supplies and implements used by applicant on such work.

(Ord. 324 N.C. § 6.08, 1958.)

11.24.090 - Bill of sale.

When water main extension facilities are installed and upon the execution and delivery by applicant of a good and sufficient bill of sale of said facilities to the city, water shall be furnished to applicant's property.

(Ord. 324 N.C. § 6.09, 1958.)

11.24.100 - Refunding procedure.

- A. Whenever an applicant applies for a permit to connect property fronting a main the installation cost of which main was paid by a previous applicant and approved by the water system, such subsequent applicant shall pay to the water system prior to the granting of such permit, an amount calculated as "A" in the following formula:

$$A = F \times C \times .60$$

wherein

F	=	number of feet of applicant's property fronting on main
C	=	cost per foot of installing main
.60	=	factor composed of .50 (for one of two sides fronting on main) and .10 (for intersection allowance)

- B. Provided, however, when the superintendent determines that only one side of a street can be benefited by a main installed by a previous applicant, subsequent applicants for permits to connect thereto shall pay to the water system prior to the granting of such permits, an amount calculated as "A" in the following formula:

$$A = F \times C \times \underline{1.10}$$

wherein

F	=	the number of feet of applicant's property fronting on such main
C	=	cost per foot of installing such main
<u>1.10</u>	=	a factor composed of 1.00 (the total cost of the installation) and .10 (for intersection allowance)

- C. Amounts collected as provided herein shall be paid by the water system to the applicant who paid the cost of installing the main until the applicant has received an amount calculated as "R" in the following formula:

$$R = T - (.60 \times C \times F)$$

wherein

T	=	total cost of installing main
C	=	cost per foot of installing main
F	=	number of feet of installing applicant's property fronting on main

- D. Provided, however, when the superintendent has determined that only one side of a street can be benefited and has made collection on that basis, amounts so collected shall be paid by the water

system to the applicant who paid the cost of installing the main until the applicant has received an amount calculated as "R" in the following formula:

$$R = T - (1.10 \times C \times F)$$

wherein

T	=	total cost of installing main
C	=	cost per foot of installing main
F	=	number of feet of installing applicant's property fronting on main

- E. Provided further, that the water system shall not make charges to subsequent applicants and refunds to installing applicants after the tenth anniversary of the date the main was placed in service.
- F. Any surplus remaining in water system funds, after installing applicant has been reimbursed in accordance with the provisions hereof, may be expended for construction or reconstruction of water mains.

(Ord. 324 N.C. § 6.10, 1958.)

Chapter 11.28 - WATER BENEFIT DISTRICTS

Sections:

[11.28.010 - Designation procedure.](#)

[11.28.020 - Refunding.](#)

[11.28.030 - Charges.](#)

11.28.010 - Designation procedure.

- A. When the city engineer, in connection with water main extensions, finds that it is necessary to install a major main of not less than twelve inches inside diameter and not less than one thousand feet in length, the superintendent shall delineate the area which may be served from the major main and thereby be benefited (said area to exclude existing streets, highways and public ways).
- B. The superintendent may designate such area as a "Water Benefit District" if:
 - 1. Other refunding procedures for main extensions are not economically feasible for the applicant;
 - 2. It will be more equitable to establish a benefit district therefore;
 - 3. The administration of such benefit district will not result in overlapping of water benefit districts.

(Ord. 324 N.C. § 7.01, 1958.)

11.28.020 - Refunding.

If the applicant elects to install the required mains under benefit district procedures, and does install the major mains in accordance with regulations concerning main extensions, the superintendent shall establish and administer reimbursement procedures as follows:

- A. The superintendent shall establish an acreage fee by dividing the total installation costs of said major main (excluding costs of any system connected to said major main) by the number of acres in the benefit district.
- B. The superintendent shall pay to the installing applicant all acreage fees collected until the applicant has been reimbursed for the total cost of installing the major main less acreage charges for the applicant's property within said district. Provided, however, that the water system shall not make or collect charges to subsequent applicants or pay refunds to installing applicants after the tenth anniversary of the date the water main was accepted by the city as completed.

(Ord. 324 N.C. § 7.02, 1958.)

11.28.030 - Charges.

An applicant for water service within the benefit district shall pay to the water system the acreage charges for each acre to be served before water service is commenced. If the premises to be served is less than one acre, the acreage charge shall be prorated in direct ratio to fractions of acres, but in any case the charges shall not be less than that for one-sixth acre.

(Ord. 324 N.C. § 7.03, 1958.)

Chapter 11.32 - WATER METERS

Sections:

[11.32.010 - Seal required.](#)

[11.32.020 - Maintenance.](#)

[11.32.030 - Testing.](#)

[11.32.040 - Erroneous meters.](#)

[11.32.050 - Connection to meter.](#)

11.32.010 - Seal required.

All water meters will be sealed at the time of installation and no seal shall be altered or broken except by authorized employees of the water system.

(Ord. 324 N.C. § 8.01, 1958.)

11.32.020 - Maintenance.

- A. All water meters shall be maintained, repaired and replaced by the water system.
- B. Where replacements or adjustments for any meter are necessary by the act, neglect or carelessness of the owner or occupant of any premises, any expense thereby caused to the water system shall be charged against and collected from the customer.

(Ord. 324 N.C. § 8.02, 1958.)

11.32.030 - Testing.

- A. Customers shall have the right to request a test be made of the meter serving their premises. The water system shall arrange for such test within three working days after receipt of the request and shall notify the customer twenty-four hours before the time set for the test in order that the customer may witness the same. The request for meter tests must be accompanied by a cash deposit based on meter size as adopted by city council resolution.
- B. If the results of the meter test determine that the meter is:
 - 1. Registering not more than two percent fast or slow than the actual quantity of water passing through it, the deposit shall be retained by the water system;
 - 2. Registering more than two percent over registration, an accurate meter shall be installed, the deposit refunded and the water bills adjusted to correct the error discovered;
 - 3. Registering more than two percent under registration, an accurate meter shall be installed, the deposit refunded and the customer billed for the amount of the undercharge;
 - 4. In any event, the adjustment for overcharge or undercharge shall not exceed a period of six months or that during which it was measuring service to the customer, whichever is the lesser.

(Ord. 1436 N.C. (2nd) § 1, 2000; Ord. 324 N.C. § 8.03, 1958.)

11.32.040 - Erroneous meters.

Whenever a meter fails to register correctly, the customer shall be charged for a minimum service charge or for an estimated amount of water used, based upon the customer's prior consumption during the same season of the year, if conditions were unchanged, or upon a reasonable comparison with use of other customers during the same period receiving the same class of service under similar circumstances.

(Ord. 324 N.C. § 8.04, 1958.)

11.32.050 - Connection to meter.

Whenever any person connecting service pipes to the property side of the meter uses the water for testing pipes, he shall shut the water off from unoccupied premises before leaving same, and in all cases leave the meter box properly installed to full depth in the ground or sidewalk, with the cover securely fastened in place.

(Ord. 324 N.C. § 8.05, 1958.)

Chapter 11.36 - CUSTOMER'S EQUIPMENT

Sections:

[11.36.010 - Customer's responsibility.](#)

[1136.020 - Control valve.](#)

[11.36.030 - Check valve.](#)

[11.36.040 - Pressure relief valve.](#)

11.36.010 - Customer's responsibility.

The customer shall, at his own risk and expense, furnish, install and keep in good and safe condition all equipment that may be required for receiving, controlling, applying and utilizing water, and the water system shall not be responsible for any loss or damage caused by the improper installation of such water equipment, or the negligence, want of proper care or wrongful act of the customer or of any of his tenants, agents, employees, contractors, licensees or permittees in installing, maintaining, using, operating or interfering with such equipment. The customer shall be responsible for determining the pressure operation limits of his fixtures and equipment and shall properly protect the same from any variance of water delivery pressures, including periods when for any reason whatsoever there is no water available.

(Ord. 324 N.C. § 9.01, 1958.)

1136.020 - Control valve.

The owner of premises to be served shall install a control valve on the house piping between the water meter and the first fixture outlet on the premises. When old premises, to which a service connection has previously been installed, are being altered, a control valve shall be installed by the owner, if such is not already provided. The customer shall not operate the curb stop in the meter box at any time.

(Ord. 324 N.C. § 9.02, 1958.)

11.36.030 - Check valve.

The owner of the premises to be served shall install a suitable check valve on the house lead pipe as close to the meter location as practical. When old premises, to which a service connection has previously been installed are being altered, a check valve shall be installed by the owner, if such is not already provided. Such single check valves are merely to prevent the draining of the customer's piping and plumbing in the event the water need be shut off temporarily and shall not be considered adequate if a back flow protection device is required.

(Ord. 324 N.C. § 9.03, 1958.)

11.36.040 - Pressure relief valve.

Each water heater shall be equipped with a suitable pressure relief valve of a type and nature required by the Uniform Plumbing and Building Codes.

(Ord. 324 N.C. § 9.04, 1958.)

Chapter 11.38 - CONTROL OF BACKFLOW AND CROSS-CONNECTION TO MUNICIPAL WATER SYSTEM

Sections:

[11.38.010 - Purpose.](#)

[11.38.020 - Responsibility.](#)

[11.38.030 - Definitions.](#)

[11.38.040 - Requirements.](#)

[11.38.050 - Fees.](#)

11.38.010 - Purpose.

The purpose of this chapter is:

- A. To 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) such contaminants or pollutants which could backflow or back-siphon into the public water supply system; and
- B. To promote the elimination or control of existing cross-connections, actual or potential, between its customers inplant potable water system(s) and nonpotable water systems, plumbing fixtures and industrial piping systems; and
- C. To 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.

(Ord. 922 N.C.(2d) § 2 (part), 1987.)

11.38.020 - Responsibility.

The director shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or backsiphonage of contaminants or pollutants through the water service connection. If, in the judgment of the director, an approved backflow prevention device is required, at the city's water service connection to any customer's premises, for the safety of the water system, the director or his/her designated agent shall give notice in writing to the customer to do one of the following:

- A. For standard installations pay to the city the fee specified by council resolution for the purchase and installation of a protective device required under the terms of this chapter; and a failure, refusal or inability on the part of the customer to pay for the installation of the device or devices immediately shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.
- B. For nonstandard installations install an approved backflow prevention device at each service connection to his/her premises. The customer shall immediately install such approved device or devices at his/her own expense; and a failure, refusal or inability on the part of the customer to install the device or devices immediately shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

11.38.030 - Definitions.

In this chapter:

- A. "Approved" means accepted by the director as meeting an applicable specification stated or cited in this chapter, or as suitable for the proposed use.
- B. "Auxiliary water supply" means any water supply on or available to the premises other than the city's approved public potable water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source(s) such as a well, spring, river, stream, harbor, etc., or "used waters" or "industrial fluids." These waters may be polluted or contaminated or they may be objectionable and constitute an unacceptable water source over which the city does not have sanitary control.
- C. "Backflow" means the flow of water or other liquids, mixtures or substances under pressure into the distributing pipes of potable water supply system from any source or sources other than its intended source.
- D. "Back-siphonage" means the flow of water or other liquids, mixtures or substances into the distributing pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.
- E. "Backflow preventer" means a device or means designed to prevent backflow or back-siphonage.
- F. "Air-gap" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the vessel. An approved air-gap shall be at least double the diameter of the supply pipe, and, in no case, less than one inch. When an air-gap is used at the service connection to prevent the contamination or pollution of the public potable water system, an emergency bypass shall be installed around the air-gap system and an approved reduced pressure principle device shall be installed in the bypass system.
- G. "Reduced pressure principle device" means an assembly of two independently operating approved check valves with an automatically operating differential relief valve between the two check valves, tightly closing shutoff valves on either side of the check valves, plus properly located test cocks for the testing of the check and relief valves. The entire assembly shall meet the design and performance specifications and approval of a recognized and city approved testing agency for backflow prevention assemblies. The device shall operate to maintain the pressure in the zone between the two check valves at the level less than the pressure on the public water supply side of the device. At cessation of normal flow, the pressure between the two check valves shall be less than the pressure on the public water supply side of the device. In case of leakage of either of the check valves, the differential relief valve shall open to the atmosphere. To be approved, these devices must be readily accessible for in-line maintenance and testing and be installed in a location where no part of the device will be submerged.
- H. "Double check valve assembly" means an assembly of two independently operating approved check valves with tightly closing shutoff valves on each side of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specifications and approval of a recognized and city-approved testing agency for back flow prevention devices. To be approved, these devices must be readily accessible for in-line maintenance and testing.
- I.

- "Contamination" means an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates an actual hazard to the public health through poisoning or through the spread of disease.
- J. "Cross-connection" means any physical connection or arrangement of piping or fixtures between two otherwise separate piping systems, one of which contains potable water and the other nonpotable water or industrial fluids of questionable safety, through which, or because of which backflow or back-siphonage may occur into the potable water system. A water service connection between a public potable water distribution system and a customer's water distribution system which is cross-connected to a contaminated fixture, industrial fluid system, or with a potentially contaminated supply or auxiliary water system constitutes one type of cross-connection. Other types of cross-connections include connectors such as swing connections, removable sections, four-way plug valves, spools, dummy sections of pipe, swivel or changeover devices, sliding multiport tube, solid connections, etc.
- K. "Cross-connections - Controlled" means a connection between a potable water system and a nonpotable water system with an approved backflow prevention device properly installed that will continuously afford the protection commensurate with the degree of hazard.
- L. "Cross-connection control by containment" means the installation of an approved backflow prevention device at the water service connection to any customer's premises where it is physically and economically infeasible to find and permanently eliminate or control all actual or potential cross-connections within the customer's water system; or it shall mean the installation of an approved backflow prevention device on the service line leading to and supplying a portion of a customer's water system where there are actual or potential cross-connections which cannot be effectively eliminated or controlled at the point of cross-connection.
- M. "Director" means the director of the public works department of the city or his/her designee.
- N. "Hazard, degree of" means the elevation of the potential risk to public health and the adverse effect of the hazard upon the potable water system as:
1. Hazard — Health. Any condition, device or practice in the water supply system and its operation which could create, or in the judgment of the director may create a danger to the health and well-being of the water consumer. An example of a health hazard is a structural defect, including cross-connections, in a water supply system.
 2. Hazard — Plumbing. A plumbing type cross-connection in a consumer's potable water system that has not been properly protected by a vacuum breaker, air-gap separation, or backflow prevention device. Unprotected plumbing type cross-connections are considered to be a health hazard.
 3. Hazard — Pollutional. An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be dangerous to health.
 4. Hazard — System. An actual or potential threat of severe damage to the physical properties of the public potable water system or the consumer's potable water system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.
- O. "Industrial fluids system" means any system containing a fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollutional or plumbing hazard if introduced into an approved water supply. This may include, but not be limited to, polluted or contaminated waters; all types of process waters and "used waters" originating from the public potable water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating

acids and alkalis, circulated cooling waters connected to an open cooling tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc.; oils, gases, glycerine, paraffins, caustic and acid solutions, and other liquid and gaseous fluids used in industrial or other purposes or for firefighting purposes.

- P. "Nonstandard installation" means an installation of an approved backflow prevention device at the water service connection to any customer's premises at a location, other than at or near the property line or immediately outside the building being served, to conform with design standards adopted by the city council, or due to site constraints making a standard installation physically infeasible, as determined by the water superintendent; but in all cases before the first branch line leading off the service line. The cost of installation and all future maintenance and inspection shall be borne by the water user or property owner of a nonstandard installation.
- Q. "Pollution" means the presence of any foreign substance (organic, inorganic or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably affect such waters for domestic use.
- R. "Standard installation" means an installation of an approved backflow prevention device at or near the property line or immediately outside the building being served; but in all cases located outside the building being served and before the first branch line leading off the service line.
- S. "Water — Potable" means any water which, according to recognized standards, is safe for human consumption.
- T. "Water — Nonpotable" means water which is not safe for human consumption or which is of questionable potability.
- U. "Water service connection" means the terminal end of a service connection from the public potable water system; i.e. where the water purveyor loses jurisdiction and sanitary control over the water to its point of delivery to the customer's water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer's water system. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system.
- V. "Water — Used" means any water supplied by the city through its potable water system to a consumer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

(Ord. 1579 N.C. (2d) § 2, 2007; Ord. 922 N.C. (2d) § 2 (part), 1987.)

11.38.040 - Requirements.

- A. Water System.
 - 1. The water system shall be considered as made up of two parts: The city system and the customer system.
 - 2. The city system shall consist of the source facilities and the distribution system, and shall include, all those facilities of the water system under the complete control of the city, from the source of supply up to the point where the customer's system begins. The source shall

include all components of the facilities utilized in the production, treatment, storage and delivery of water to the distribution system.

3. The distribution system shall include the network of conduits used for the delivery of water from the source to the customer's system, and shall extend to the downstream end of the water meter. In the case of fire service connections, the city system shall cease at the property line intersected by the water service.
4. The customer's system shall include those parts of the facilities beyond the termination of the city distribution system which are utilized in conveying city-delivered domestic water to points of use.

B. Policy.

1. No water service connection to any premises shall be installed or maintained by the water purveyor unless the water supply is protected as required by state laws and this chapter. Service of water to any premises shall be discontinued by the water purveyor if a backflow prevention device required by state law or this chapter is not installed, tested or maintained, or if it is found that a backflow prevention device has been removed, by-passed, or if an unprotected cross-connection exists on the premises. Service will not be restored until such conditions or defects are corrected.
2. The customer's system should be open for inspection at all reasonable times to authorized representatives of the public works department to determine whether cross-connections or other structural or sanitary hazards, including violations of this chapter exist. When such a condition becomes known, the director shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with state and city laws relating to plumbing and water supplies and the regulations adopted pursuant thereto.
3. An approved backflow prevention device shall also be installed on each service line to a customer's water system at or near the property line or immediately outside the building being served; but in all cases before the first branch line leading off the service line wherever the following conditions exist:
 - a. In the case of premises having an auxiliary water supply which is not or may not be of safe bacteriological or chemical quality and which is not acceptable as an additional source by the director, the public water system shall be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard.
 - b. In the case of premises on which any industrial fluids or any other objectionable substance is handled in such a fashion as to create an actual or potential hazard to the public water system, the public system shall be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard. This shall include handling of process waters and waters originating from the city system which have been subject to deterioration in quality.
 - c. In the case of premises having any internal cross-connection that cannot be permanently corrected and controlled, or intricate plumbing and piping arrangements, or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross-connections exist, the public water system shall be protected against backflow from the premises by installing a backflow prevention device in the service line.
4. The type or protective device required under subsections (B)(3)(a), (b) and (c) of this section, shall depend upon the degree of hazard which exists as follows:
 - a. In the case of any premises where there is an auxiliary water supply as stated in subsection (B)(3)(a) of this section, which is not otherwise subject to the provisions of

this chapter, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principal backflow prevention device.

- b. In the case of any premises where there is any water or substance that would be objectionable but not hazardous to health if introduced into the public water system, the public water system shall be protected by an approved double check valve assembly.
 - c. In the case of any premises where there is any material dangerous to health, which is handled in such a fashion as to create an actual or potential hazard to the public water system, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device. Examples of premises where these conditions will exist include sewage treatment plants, sewage pumping stations, chemical manufacturing plans, hospitals, mortuaries and plating plants.
 - d. In the case of any premises where there are "uncontrolled" cross-connections, either actual or potential, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device at the service connection.
 - e. In the case of any premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impracticable to make a complete in-plant cross-connection survey, the public water system shall be protected against backflow or back-siphonage from the premises by the installation of a backflow prevention device in the service line. In this case, maximum protection will be required; that is, an approved air-gap separation or an approved reduced pressure principle backflow prevention device shall be installed in each service to the premises.
5. The following specific types of uses and other uses as designated by the director shall be required to install a backflow prevention indicated as a minimum.

Use	Type of Device
Auxiliary water systems (interconnected)	Reduced pressure
Auxiliary water systems (not interconnected)	Double check valve
Beverage bottling plants	Double check valve
Buildings with booster pump systems and/or water storage tanks	Double check valve
Canneries, packinghouses or reduction plants	Reduced pressure
Buildings with sewage ejectors	Air-gap separation
Car washes	Reduced pressure
Chemical processing or storage facilities	Reduced pressure
Laundries	Reduced pressure
Dairies	Double check valve
Dye works	Reduced pressure
Film processing laboratories	Reduced pressure
Fire systems (no auxiliary supply)	Double detector check valve
Fire systems (auxiliary supply)	Reduced pressure
Frozen food processing plants	Reduced pressure
Schools (lab facility, auxiliary supply)	Reduced pressure
Schools (no lab facility, no auxiliary supply)	Double check valve
Schools (no lab facility, auxiliary supply)	Reduced pressure

Hospitals	Reduced pressure
Mortuaries, medical/dental buildings	Reduced pressure
Irrigation systems (all)	Double check valve
Laboratories—Commercial	Reduced pressure
Manufacturing or processing using toxic materials	Reduced pressure
Mobilehome parks	Double check valve
Multistory buildings (three or more stories)	Double check valve
Oil or gas production facilities	Reduced pressure
Pulp and paper processing	Reduced pressure
Plating plants	Reduced pressure
Sand and gravel plants	Double check valve
Sewage and storm drain pumping facilities	Air-gap separation
Swimming pools	Reduced pressure
Boat docks—Marinas	Reduced pressure
Tank trucks using hydrant supply	Double check valve
Portable insecticide and herbicide spray tanks	Air-gap separation

6. Any backflow prevention device required in this chapter shall be of a mold and size approved by the director. The term "approved backflow prevention device" means a device that has been manufactured in full conformance with the standards established by the American Water Works Association (AWWA) entitled:

AWWA C506-69 Standards for Reduced Pressure Principle and Double Check Valve Backflow Prevention Devices:

and have met completely the laboratory and field performance specifications of the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California (FCCC&HR) established by:

Specifications of Backflow Prevention Devices-No. 69-2 dated March, 1969, or the most current issue.

The AWWA and FCCC&HR standards and specifications have been adopted by the director. Final approval of any device or system proposed for installation under the terms of this chapter shall be evidenced by a "Certificate of Approval" issued by an approved testing laboratory certifying full compliance with said AWWA standards and FCCC&HR Specifications.

The following testing laboratory has been qualified by the director to test and certify backflow preventers:

Foundation for Cross-Connection Control and Hydraulic Research
University of Southern California
University Park
Los Angeles, California 90007

Testing laboratories other than the laboratory listed above will be added to an approved list as they are qualified by the director. Backflow preventers which may be subject to back pressure or back siphonage that have been fully tested and have been granted a certificate of approval by such

qualified laboratory and are listed on the laboratory's current list of "Approved Devices" may be used without further test or qualification.

7. It shall be the duty of the city at any premises where backflow prevention devices are installed to ensure a certified inspection or operation test is made at least once per year. These inspections and tests shall be at the expense of the customer and shall be performed by city maintenance division personnel for standard installations after applicable fees are paid, or by a certified tester, approved by the director, hired by customer, for nonstandard installations.

Certified testers shall:

- a. Maintain current American Water Works Association certification;
- b. Perform field testing in accordance with the test procedures outlined in the State of California Department of Health Services' Manual of Cross-Connection Control;
- c. Use a differential pressure gauge that is calibrated annually;
- d. Use and submit required city certification forms; and
- e. Have a business license to operate in the city of Vallejo prior to conducting any tests.

In those instances where the director deems the hazard to be great enough he may require certified inspections at more frequent intervals. These additional inspections and tests shall be at the expense of the customer and shall be performed by a certified tester approved by the director. It shall be the duty of the director to see that these timely tests are made. Those devices found to be defective shall be repaired, overhauled or replaced at the expense of the customer. Records of all such tests, repairs and overhaul shall be submitted to the city water maintenance division within seven days of testing.

(Ord. 1579 N.C. (2d) § 3, 2007; Ord. 922 N.C. (2d) § 2 (part), 1987.)

11.38.050 - Fees.

- A. The customer or property owner of a standard installation shall pay to the city the fee specified by council resolution for each initial and/or annual inspection and maintenance of a backflow prevention device made under the terms of this chapter and performed by city personnel. The customer or property owner shall pay the city the fee specified for any inspection that reveals a failure to comply with the provisions of this chapter. Any request by a customer or property owner to inspect a backflow prevention device shall be accompanied by the fee specified. The inspecting official shall have the discretion to waive or reduce fees in the event that unusual circumstances, not the fault of the customer or property owner, necessitate repeated inspection.
- B. The customer or property owner of a nonstandard installation shall pay to the city the administrative fee specified by council resolution for the city's collection and maintenance of submitted testing, maintenance, and certification records for each initial and/or annual inspection and maintenance of a backflow prevention device performed by a certified tester other than city personnel.

(Ord. 1579 N.C. (2d) § 4, 2007; Ord. 922 N.C. (2d) § 2 (part), 1987.)

Chapter 11.40 - FIRE HYDRANTS

Sections:

[11.40.010 - Purpose.](#)

[11.40.020 - Operation.](#)

[11.40.030 - Temporary service.](#)

[11.40.040 - Relocation.](#)

11.40.010 - Purpose.

Fire hydrants are provided for the sole purpose of extinguishing fires and are to be opened and used only by the water system and fire department or such persons as may officially be authorized to do so.

(Ord. 324 N.C. § 10.01, 1958.)

11.40.020 - Operation.

To insure the safety of fire hydrants for fire protection, any person authorized to open fire hydrants shall use only an approved spanner wrench and shall replace the caps on the outlets when not in use.

(Ord. 324 N.C. § 10.02, 1958.)

11.40.030 - Temporary service.

If temporary service is to be supplied through a fire hydrant, a permit for same must be obtained from the commercial office, and such permit must be exhibited upon the work while taking water. If the hydrant is outside the city limits, the fire chief or other person of authority must approve the permit by signing same before it is validated by the commercial office.

(Ord. 324 N.C. § 10.03, 1958.)

11.40.040 - Relocation.

- A. Property owners and/or others desiring the removal or change in location of a fire hydrant or hydrants shall first make a request, in writing, of the water system. After obtaining the approval of the fire chief of the proposed removal or relocation, the superintendent shall prepare an estimate of cost of the proposed work. Before the water system can proceed with the work or order materials for same, the person or persons requesting the removal or relocation must deposit an amount equal to the estimated cost with the commercial office. Upon completion of the work the actual cost shall be compiled and any difference between the actual and the estimated cost shall be billed or refunded for the applicant's account.
- B. If the hydrant in question is outside the city limits, the applicant must first obtain written approval of the fire district having jurisdiction over the same.

(Ord. 324 N.C. § 10.04, 1958.)

Chapter 11.44 - BILLING

Sections:

- [11.44.010 - Billing periods.](#)
- [11.44.020 - Billing of separate meters.](#)
- [11.44.030 - Back-billing.](#)
- [11.44.040 - Opening and closing bills.](#)
- [11.44.050 - Payment.](#)
- [11.44.060 - Delinquent accounts.](#)
- [11.44.061 - Delinquent charges—Constitute lien.](#)
- [11.44.070 - Delinquent at one service location.](#)
- [11.44.080 - Delinquency—Shut off.](#)
- [11.44.081 - Reestablishment of credit.](#)
- [11.44.090 - Unauthorized turn on.](#)
- [11.44.100 - Disputed bills.](#)
- [11.44.110 - Bill adjustment for leak or loss.](#)
- [11.44.120 - Inspections for excessive use.](#)

11.44.010 - Billing periods.

- A. Bills for all metered service will be rendered monthly or bimonthly as determined by the water system. Meters shall be read at approximately equal intervals for the preparation of periodic billing. Special readings shall be taken for opening or closing bills.
- B. Monthly billing periods shall apply to the following classes of customer accounts:
 - 1. Accounts having a usage of twenty thousand cubic feet or more of water used during any two consecutive months of the preceding twelve month period;
 - 2. Accounts of water service outside the boundaries of Vallejo judicial township;
 - 3. Accounts of "temporary service connections";
 - 4. Accounts of "fire service connections";
 - 5. Accounts under "contract;"
- C. Bi-monthly billing periods shall apply to all accounts not listed in subsection B of this section.

(Ord. 324 N.C. § 12.01, 1958.)

11.44.020 - Billing of separate meters.

Each meter on a customer's premises shall be billed separately and the readings of two or more meters will not be combined unless the water system shall, for operating convenience or necessity, install two or more meters in place of one.

(Ord. 324 N.C. § 12.02, 1958.)

11.44.030 - Back-billing.

If a consumer is found to be using water for which no bills have been issued, the water system shall install a meter and render an average bill for a period of twelve months last past or for as much of the past twelve months as the consumer has been occupying or in possession of the premises without paying bills.

(Ord. 324 N.C. § 12.03, 1958.)

11.44.040 - Opening and closing bills.

If the total period of service is less than thirty days, monthly minimum charges shall be applied to the account. If the total period of service is greater than thirty-six days but less than sixty-six days the bi-monthly minimum charges shall be applied to the account. Except in either case if the quantity of water consumed is greater than that for the periodic minimum, the charges shall be calculated on the actual water consumption.

(Ord. 324 N.C. § 12.04, 1958.)

11.44.050 - Payment.

Bills are due and payable on presentation. Payment shall be made at the commercial services division of the finance department or other place(s) designated by the finance director.

(Ord. 1503 N.C.(2d) § 3, 2003; Ord. 324 N.C. § 12.05, 1958.)

11.44.060 - Delinquent accounts.

All bills become delinquent thirty days after the date shown on the bill and a late payment penalty, as established by city council resolution, shall be assessed. In addition to the late payment penalty assessed, a finance charge shall be assessed, at the rate established by city council resolution, from the date on which the bill became delinquent until paid. Service may be discontinued for nonpayment of a bill for services rendered if said bill, including penalty and interest owed, has not been paid within five days after the delinquent date.

(Ord. 1503 N.C.(2d) § 4, 2003; Ord. 1212 N.C.(2d) § 1, 1992; Ord. 324 N.C. § 12.06, 1958.)

11.44.061 - Delinquent charges—Constitute lien.

When the water service customer is also the owner of the property for which water service is being supplied, then charges that remain unpaid forty-five days following the past due date may be recovered through a lien on the property.

(Ord. 1503 N.C.(2d) § 5, 2003.)

11.44.070 - Delinquent at one service location.

If a customer receives service at more than one service location and the bill for any one of that customer's accounts becomes delinquent and service is discontinued, service at all other locations may also be discontinued.

(Ord. 324 N.C. § 12.07, 1958.)

11.44.080 - Delinquency—Shut off.

When water service has been discontinued because of delinquency in payment of a water bill the customer shall pay a disconnection fee, as established by city council resolution. The water service shall not be turned on until all charges together with a reconnection fee, as established by city council resolution, has been paid, and a cash deposit is made to reestablish credit pursuant to [Section 11.44.081](#).

(Ord. 1503 N.C.(2d) § 6, 2003; Ord. 897 N.C.(2d) § 1, 1986; Ord. 324 N.C. § 12.08, 1958.)

11.44.081 - Reestablishment of credit.

- A. Any customer shall be required to reestablish credit in any of the following cases:
1. If the customer's service was discontinued for nonpayment;
 2. If the customer has had a check for water services returned to the city for insufficient funds;
 3. If for any reason, the deposit furnished by the customer becomes inadequate under the provisions of this title; or
 4. If the customer files for bankruptcy.
- B. When a customer is required to reestablish credit, the deposit amount shall be set as follows:
1. Residential Customers. The deposit shall be the lesser of: a) an amount not to exceed a sum equal to twice the estimated periodic bill, based on the customer's prior twelve months of consumption, or b) two hundred dollars, which may be adjusted from time to time by the finance director. At least one-half of the deposit required to reestablish credit must be paid at the time service is reestablished, with the remaining amount to be due with the next regularly scheduled billing.

Should a residential customer be required to reestablish credit for a second time, the deposit amount shall not be less than a sum equal to twice the estimated periodic bill based on the customer's prior twelve months of consumption and which may be adjusted from time to time by the finance director.

2. Commercial Customers. The deposit amount shall be the greater of: a) the sum equal to four times the estimated average monthly bill based on the customer's prior twelve months of consumption, or b) six hundred dollars which may be adjusted from time to time by the finance director.

Should a commercial customer be required to reestablish credit for a second time, the finance director shall fix the amount so that the city will not be required to risk a loss as a result of nonpayment of bills by the customer.

(Ord. 1503 N.C.(2d) § 7, 2003)

11.44.090 - Unauthorized turn on.

If, after service is discontinued for delinquency in payment, service is resumed without authorization, the city may remove the meter or take other actions to prevent the unauthorized use of water. If a request for restoration of service is made, the service shall not be turned on until the customer has paid the city for the actual cost of the work, including labor and materials, performed to prevent the unauthorized use of water and an unauthorized turn on fee, as established by city council resolution.

(Ord. 1503 N.C.(2d) § 8, 2003; Ord. 897 N.C.(2d) § 2, 1986; Ord. 324 N.C. § 12.09, 1958.)

11.44.100 - Disputed bills.

In case of dispute as to payment of a bill previously rendered, the customer will be required to present the receipted bill, canceled check or other satisfactory evidence before adjustment or correction shall be made.

(Ord. 324 N.C. § 12.10, 1958.)

11.44.110 - Bill adjustment for leak or loss.

- A. No allowance will be made for a leak or loss of water except upon findings in writing by the water superintendent that there are extenuating circumstances for the leak or loss clearly beyond the

control of the customer; and, in addition, that imposition of the full charge for the water would work an extreme economic or financial hardship on the customer, and approval of said written findings by the city manager. An adjustment will only be granted after repairs have been made and it is certain such leak or loss will not again occur. No adjustment or allowance will be made covering more than two consecutive billing periods, including the one in which the same was requested. Not more than one adjustment or allowance shall be made to the same customer for the same premises in any twelve-month period.

- B. The water system shall determine the amount of excess delivery by calculating the average bill in accordance with their standard method and subtracting that amount from the total water delivered.
- C. Adjustments ordinarily will be made on the basis of one half of the excess delivery but, in the case of concealed leaks in underground or unexposed pipes, full excess may be allowed.
- D. The quantity of water for which an adjustment is to be made shall be charged to the customer at the lowest rate applicable to the particular water service connection affected.
- E. All other water delivered shall be charged at the regular rates applicable to that customer's account.

(Ord. 377 N.C.(2d) § 4, 1977; Ord. 324 N.C. § 12.11, 1958.)

11.44.120 - Inspections for excessive use.

After the water system has made a complete inspection of a customer's premises on account of excessive water bills, or upon the request of the customer, or for other reasons, no further inspections shall be made for a period of six months; provided, however, the superintendent may order an inspection at any time if in his opinion conditions warrant.

(Ord. 324 N.C. § 12.12, 1958.)

Chapter 11.48 - WATER RATES AND CHARGES²

Sections:

- [11.48.005 - Reserved.5](#)
- [11.48.010 - Application of rates.](#)
- [11.48.015 - Reserved.6](#)
- [11.48.020 - Vallejo service area water rates.](#)
- [11.48.030 - Reserved.7](#)
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11.48.005 - Reserved.⁵

11.48.010 - Application of rates.

- A. The Vallejo service area water rates as set forth in [Section 11.48.020](#) shall apply to all water service to premises served treated water from the Fleming Hill Water Treatment Plant distribution system regardless of whether the premises are located inside or outside the boundaries of the city.
- B. The Lakes service area rates as set forth in [Section 11.48.040](#) shall apply to water service to premises served treated water from the Green Valley Water Treatment Plant distribution system.
- C. The raw water rates as set forth in [Section 11.48.050](#) shall apply to water service to premises served through connections delivering untreated, raw water.
- D. The construction water rates as set forth in [Section 11.48.055](#) shall apply to all temporary water service to premises served through temporary connections delivering treated water for construction purposes. Construction water users are encouraged to utilize treated effluent, if available, for allowable uses.

(Ord. 1542 N.C.(2d) § 1, 2005; Ord. 1334 N.C.(2d) §§ 1, 2, 1995; Ord. 1211 N.C.(2d) § 1, 1992; Ord. 1203 N.C.(2d) § 1, 1992; Ord. 26 N.C.(2d) § 1, 1971; Ord. 324 N.C. § 13.01, 1958.)

11.48.015 - Reserved.⁶ 

11.48.020 - Vallejo service area water rates. 

For water service to premises as defined in Section 11.48.010A, rates shall be as follows and shall be effective on the dates indicated:

- A. Single Family Residential Service. Each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following monthly consumption charges for water supplied:

7/1/2009:

- 0-1,100 cubic feet: \$2.25 per 100 cubic feet.
- Over 1,100 cubic feet: \$4.05 per 100 cubic feet.

7/1/2010:

- 0-1,100 cubic feet: \$2.37 per 100 cubic feet.
- Over 1,100 cubic feet: \$4.31 per 100 cubic feet.

7/1/2011:

- 0-1,100 cubic feet: \$2.55 per 100 cubic feet.
- Over 1,100 cubic feet: \$4.68 per 100 cubic feet.

7/1/2012:

- 0-1,100 cubic feet: \$2.71 per 100 cubic feet.
- Over 1,100 cubic feet: \$5.03 per 100 cubic feet.

7/1/2013:

- 0-1,100 cubic feet: \$2.88 per 100 cubic feet.
 - Over 1,100 cubic feet: \$5.40 per 100 cubic feet.
- The minimum monthly charge is the monthly service charge.

- B. Multi-Family Residential Service and Non-Residential (Commercial, Industrial, and Institutional) Service. Each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following consumption charge for water supplied:

7/1/2009:

- Actual consumption - \$2.76 per 100 cubic feet.

7/1/2010:

- Actual consumption - \$2.91 per 100 cubic feet.

7/1/2011:

- Actual consumption - \$3.13 per 100 cubic feet.

7/1/2012:

- Actual consumption - \$3.33 per 100 cubic feet.

7/1/2013:

- Actual consumption - \$3.53 per 100 cubic feet.
- The minimum monthly charge is the monthly service charge.

(Ord. 1619 N.C.(2d) § 2, 2009; Ord. 1542 N.C.(2d) § 2, 2005; Ord. 1435 N.C. (2nd) § 3, 2000; Ord. 1379 N.C.(2d) § 2, 1997; Ord. 1211 N.C.(2d) § 2, 1992; Ord. 1203 N.C.(2d) § 2, 1992; Ord. 875 N.C.(2d) § 1, 1986; Ord. 805 N.C.(2d) § 1, 1985; Ord. 748 N.C.(2d) § 1, 1984; Ord. 537 N.C.(2d) § 1, 1980; Ord. 374 N.C.(2d) § 3(m), 1977; Ord. 26 N.C.(2d) § 2, 1971; Ord. 324 N.C. § 13.02, 1958.)

11.48.030 - Reserved.⁷

11.48.040 - Lakes service area water rates.

For water service to premises as defined in Section 11.48.010B, rates shall be as follows and shall be effective on the dates indicated:

- A. Single-Family Residential Service. Each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following monthly consumption charges for water supplied:

7/1/2009:

- 0-1,300 cubic feet: \$6.07 per 100 cubic feet.
Over 1,300 cubic feet: \$9.48 per 100 cubic feet.

7/1/2010:

- 0-1,300 cubic feet: \$7.30 per 100 cubic feet.
Over 1,300 cubic feet: \$11.41 per 100 cubic feet.

7/1/2011:

- 0-1,300 cubic feet: \$8.77 per 100 cubic feet.
Over 1,300 cubic feet: \$13.69 per 100 cubic feet.

7/1/2012:

- 0-1,300 cubic feet: \$9.38 per 100 cubic feet.
Over 1,300 cubic feet: \$14.61 per 100 cubic feet.

7/1/2013:

- 0-1,300 cubic feet: \$10.02 per 100 cubic feet.
Over 1,300 cubic feet: \$15.59 per 100 cubic feet.

The minimum monthly charge is the monthly service charge and any applicable surcharge.

- B. Multi-Family Residential Service and Nonresidential (Commercial, Industrial, and Institutional) Service. Each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following consumption charge for water supplied:

7/1/2009:

- Actual consumption - \$7.35 per 100 cubic feet.

7/1/2010:

- Actual consumption - \$8.82 per 100 cubic feet.

7/1/2011:

- Actual consumption - \$10.55 per 100 cubic feet.

7/1/2012:

Actual consumption - \$11.23 per 100 cubic feet.

7/1/2013:

Actual consumption - \$11.95 per 100 cubic feet.

The minimum monthly charge is the monthly service charge and any applicable surcharge.

(Ord. 1619 N.C.(2d) § 5, 2009; Ord. 1542 N.C.(2d) § 4, 2005; Ord. 1435 N.C. (2nd) § 5, 2000; Ord. 1379 N.C.(2d) § 4, 1997; Ord. 1334 N.C.(2d) § 3, 1995; Ord. 1211 N.C.(2d) § 4, 1992; Ord. 1203 N.C.(2d) § 4, 1992; Ord. 875 N.C.(2d) § 3, 1986; Ord. 805 N.C.(2d) § 3, 1985; Ord. 748 N.C.(2d) § 3, 1984; Ord. 537 N.C.(2d) § 3, 1980; Ord. 386 N.C.(2d) § 1, 1977; Ord. 374 N.C.(2d) § 3 (part), 1977; Ord. 26 N.C.(2d) § 4, 1971; Ord. 324 N.C. § 3.035, 1958.)

11.48.050 - Raw water rates.

For raw water service as defined in Section 11.48.010C, each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following charges per unit of one hundred cubic feet for the raw water source supplied, effective on the dates indicated:

Source of Raw Water	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
Lakes	\$3.28	\$3.91	\$4.69	\$4.89	\$5.17
Madigan/Frey					
Other Sources	\$1.48	\$1.58	\$1.75	\$1.89	\$2.04

(Ord. 1619 N.C.(2d) § 5, 2009; Ord. 1542 N.C.(2d) § 5, 2005; Ord. 1379 N.C.(2d) § 5, 1997; Ord. 1211 N.C.(2d) § 5, 1992; Ord. 1203 N.C.(2d) § 3, 1992; Ord. 875 N.C.(2d) § 4, 1986; Ord. 805 N.C.(2d) § 4, 1985; Ord. 748 N.C.(2d) § 4, 1984; Ord. 537 N.C.(2d) § 4, 1980; Ord. 374 N.C.(2d) § 3 (part), 1977; Ord. 26 N.C.(2d) § 5, 1971; Ord. 324 N.C. § 13.04, 1958.)

11.48.055 - Construction water rates.

For temporary treated water service for construction purposes as defined in Section 11.48.010D, each customer shall pay the applicable monthly service charge as hereinafter set forth in Sections 11.48.060 through 11.48.120 and the following charges per unit of one hundred cubic feet for water supplied in the service areas, as defined in Section 11.48.010 A and B, effective on the dates indicated:

	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
Vallejo service area	\$2.76	\$2.91	\$3.13	\$3.33	\$3.53
Lakes service area	\$7.35	\$8.82	\$10.55	\$11.23	\$11.95

(Ord. 1619 N.C.(2d) § 6, 2009; Ord. 1542 N.C.(2d) § 6, 2005; Ord. 1379 N.C.(2d) § 6, 1997; Ord. 1211 N.C.(2d) § 6, 1992; Ord. 875 N.C.(2d) § 5, 1986.)

11.48.060 - Service charges—Generally.

Each customer account for water service shall pay a service charge in the amount or amounts applicable to the particular account as hereinafter set forth in this section and Sections [11.48.070](#) through [11.48.110](#); said service charge shall be in addition to any and all other taxes, fees, and/or charges of any nature whatsoever for water delivered; provided, however, that the service charge shall not be applicable to customer accounts for a fire service connection, as the same is described in [Section 11.20.010](#), if the customer account qualifies for monthly charges as set forth in paragraph A of [Section 11.48.120](#).

(Ord. 195 N.C.(2d) § 1 (part), 1973: Ord. 84 N.C.(2d) § 1 (part), 1972: Ord. 324 N.C. § 13.05 (part), 1958.)

11.48.065 - Service charges—Purpose.

The purpose of the service charge is to create sufficient revenue to provide for essential maintenance, restoration and/or upgrading of water system treatment and distribution facilities and to equitably distribute the basic cost of assuring that at all times the facilities are capable of properly distributing the maximum and/or instantaneous water demands or flows in the distribution areas. To accomplish these objectives the moneys received as payment of the service charges set forth in this section shall be set aside for capital facilities replacement and shall be utilized only upon approval of the city council to pay costs associated with the installation, construction, replacement and/or rehabilitation of pipelines, appurtenances and/or components of the municipal water system.

(Ord. 1211 N.C.(2d) § 7, 1992: Ord. 374 N.C.(2d) § 4, 1977: Ord. 195 N.C.(2d) § 1(a), 1973.)

11.48.070 - Service charges—Definitions.

The following descriptions and/or definitions shall be used to determine the service charge applicable to all customer accounts:

- A. "Residential unit" means a single-family residence; a room or suite of rooms capable of human habitation or occupancy and providing accommodations for cooking, sleeping and living separately and independently of the occupants or tenants of any other residential unit or residential units in the same building or other buildings on the same premises; excluding and excepting therefrom hotels, motels and auto courts as the same are defined herein;
- B. "Mobilehome unit" means a pad or stall improved, prepared or equipped to accommodate occupancy or use as a mobilehome (trailer) lot as defined in Section 18210 of the Health and Safety Code of the state of California;
- C. "Commercial unit" means an establishment, enterprise or entity, having a business or professional license or other separate identity engaged in trade, business, professional activities, providing service and/or the processing or manufacturing of material or product; and/or a hotel, motel or auto court as the same are defined herein;
- D. "Hotel" means lodging house, rooming house, or other building or structure maintained, advertised, or held out to the public as a place where sleeping or rooming accommodations are furnished to the whole or any part of the public whether with or without meals;
- E. "Motel" means a building of not more than two stories containing six or more guest rooms or apartments, or combination thereof, each of which has a separate, individual entrance leading directly from the outside of the building and is designed, used, or intended wholly or in part for the accommodation of motor vehicle transients;
- F. "Combination units" means each unit or the combination of one or more residential units and/or one or more mobile home units and/or one or more commercial units on the same premises;
- G. "School" means premises used or occupied as a school or classroom for educational purposes and operated or accredited by a governmental authority or agency and/or any

premises used or occupied as an extension or supporting facility or integral function of such school or classroom.

(Ord. 1435 N.C.(2nd) § 6, 2000: Ord. 195 N.C.(2d) § 1(b), 1973: Ord. 84 N.C.(2d) § 1 (part), 1972: Ord. 324 N.C. § 13.05(a), 1958.)

11.48.080 - Service charges—Vallejo service area customer accounts.

All customer accounts which qualify for water rates as set forth in [section 11.48.020](#) shall pay the following monthly service charges based on the meter size installed on the particular water service connection, effective on the dates indicated:

A. Single-Family Residential. Premises consisting of one residential unit:

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$13.40	\$14.35	\$14.80	\$15.60	\$16.4530
1 inch	\$20.15	\$21.50	\$22.25	\$23.45	\$24.70
1 ½inch	\$33.55	\$35.90	\$37.15	\$39.10	\$41.20
2 inch	\$49.70	\$53.10	\$55.05	\$57.90	\$61.00

B. Multi-Family Residential. Premises consisting of two or more residential units, and/or two or more mobilehome units:

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$ 18.70	\$ 19.10	\$ 20.00	\$ 21.10	\$ 22.20
1 inch	\$ 25.40	\$ 26.90	\$ 28.00	\$ 29.60	\$ 31.10
1 ½inch	\$ 39.90	\$ 42.50	\$ 44.20	\$ 46.50	\$ 49.00
2 inch	\$ 57.50	\$ 61.10	\$ 63.60	\$ 66.90	\$ 70.50
3 inch	\$ 98.30	\$ 104.70	\$ 108.90	\$ 114.50	\$ 120.60
4 inch	\$ 158.30	\$ 166.90	\$ 173.60	\$ 182.40	\$ 192.20
6 inch	\$ 313.60	\$ 322.40	\$ 335.20	\$ 352.30	\$ 371.10
<u>8</u> inch	\$ 500.00	\$ 509.00	\$ 529.30	\$ 556.20	\$ 585.80
<u>10</u> inch	\$ 717.40	\$ 726.70	\$ 755.60	\$ 794.00	\$ 836.30
<u>12</u> inch	\$1,338.60	\$1,348.70	\$1,402.30	\$1,473.50	\$1,552.10

C. Non-Residential. Premises consisting of one or more commercial or combination units, including hotels, motels, and institutional uses such as schools and churches.

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$ 19.80	\$ 20.30	\$ 21.20	\$ 22.40	\$ 23.60
1 inch	\$ 29.70	\$ 29.70	\$ 30.60	\$ 32.20	\$ 33.90
1 ½inch	\$ 56.40	\$ 56.40	\$ 56.40	\$ 56.40	\$ 56.40
2 inch	\$ 88.40	\$ 88.40	\$ 88.40	\$ 88.40	\$ 88.40
3 inch	\$ 163.10	\$ 163.10	\$ 163.10	\$ 163.10	\$ 163.10
4 inch	\$ 269.70	\$ 269.70	\$ 269.70	\$ 269.70	\$ 269.70

6 inch	\$ 536.50	\$ 536.50	\$ 536.50	\$ 536.50	\$ 536.50
<u>8</u> inch	\$ 856.60	\$ 856.60	\$ 856.60	\$ 856.60	\$ 856.60
<u>10</u> inch	\$1,230.00	\$1,230.00	\$1,230.00	\$1,230.00	\$1,230.00
<u>12</u> inch	\$2,296.90	\$2,296.90	\$2,296.90	\$2,296.90	\$2,296.90

(Ord. 1619 N.C.(2d) § 7, 2009: Ord. 1542 N.C.(2d) § 7, 2005: Ord. 1435 N.C.(2nd) § 7, 2000: Ord. 1211 N.C.(2d) § 8, 1992: Ord. 806 N.C.(2d) § 1 (part), 1985: Ord. 374 N.C.(2d) § 5 (part), 1977: Ord. 195 N.C.(2d) § 1(c), 1973: Ord. 84 N.C.(2d) § 1 (part), 1972: Ord. 324 N.C. § 13.05(b), 1958.)

11.48.090 - Reserved.⁸

11.48.100 - Service charges—Lakes service area customer accounts.

All customer accounts which qualify for water rates as set forth in Section 11.48.040 shall pay the following monthly service charges based on the meter size installed on the particular water service connection, effective on the dates indicated:

A. Single-Family Residential. Premises consisting of one residential unit:

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$22.45	\$26.65	\$31.45	\$ 33.00	\$ 34.75
1 inch	\$31.10	\$36.85	\$43.55	\$ 45.75	\$ 48.10
1 ½inch	\$48.45	\$57.30	\$67.70	\$ 71.20	\$ 74.80
2 inch	\$69.20	\$81.85	\$96.70	\$101.70	\$106.80

B. Multi-Family Residential. Premises consisting of two or more residential units, and/or two or more mobilehome units:

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$ 22.50	\$ 26.70	\$ 31.50	\$ 33.00	\$ 34.80
1 inch	\$ 31.10	\$ 36.90	\$ 43.60	\$ 45.80	\$ 48.10
1 ½inch	\$ 48.50	\$ 57.30	\$ 67.70	\$ 71.20	\$ 74.80
2 inch	\$ 69.20	\$ 81.90	\$ 96.70	\$ 101.70	\$ 106.80
3 inch	\$ 117.70	\$ 139.10	\$ 164.40	\$ 173.00	\$ 181.60
4 inch	\$ 187.00	\$ 220.90	\$ 261.10	\$ 274.80	\$ 288.40
6 inch	\$ 360.10	\$ 425.40	\$ 502.80	\$ 529.20	\$ 555.40
<u>8</u> inch	\$ 573.00	\$ 670.80	\$ 792.80	\$ 834.50	\$ 875.70
<u>10</u> inch	\$ 821.50	\$ 957.10	\$1,131.20	\$1,190.70	\$1,249.50
<u>12</u> inch	\$1,531.60	\$1,775.10	\$2,097.90	\$2,208.50	\$2,317.40

C.

Nonresidential. Nonresidential. Premises consisting of one or more commercial or combination units, including hotels, motels, and institutional uses such as schools and churches.

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$ 31.50	\$ 37.40	\$ 44.20	\$ 46.40	\$ 48.80
1 inch	\$ 40.20	\$ 47.70	\$ 56.30	\$ 59.10	\$ 62.20
1 ½inch	\$ 57.50	\$ 68.10	\$ 80.40	\$ 84.50	\$ 88.90
2 inch	\$ 78.30	\$ 92.70	\$ 109.40	\$ 115.10	\$ 120.90
3 inch	\$ 126.80	\$ 149.90	\$ 177.10	\$ 186.30	\$ 195.70
4 inch	\$ 196.00	\$ 231.70	\$ 273.80	\$ 288.10	\$ 302.40
6 inch	\$ 369.20	\$ 436.20	\$ 515.50	\$ 542.50	\$ 569.40
<u>8</u> inch	\$ 576.90	\$ 681.80	\$ 805.50	\$ 847.90	\$ 889.80
<u>10</u> inch	\$ 821.50	\$ 967.90	\$1,143.90	\$1,204.10	\$1,263.60
<u>12</u> inch	\$1,531.60	\$1,785.90	\$2,110.70	\$2,221,80	\$2,331.50

(Ord. 1619 N.C.(2d) § 9, 2009: Ord. 1542 N.C.(2d) § 9, 2005: Ord. 1435 N.C.(2nd) § 9, 2000: Ord. 1334 N.C.(2d) § 4, 1995: Ord. 1211 N.C.(2d) § 10, 1992: Ord. 806 N.C.(2d) § 1 (part), 1985: Ord. 374 N.C.(2d) § 5 (part), 1977: Ord. 195 N.C.(2d) § 1 (e), 1973: Ord. 84 N.C.(2d) § 1 (part), 1972: Ord. 324 N.C. § 13.05(e), 1958.)

11.48.110 - Service charges—Raw water customer accounts.

Customer accounts for water service which qualify for water rates as set forth in [Section 11.48.050](#) shall pay the following monthly service charges based on the source of raw water and the meter size installed on the particular water service connection, effective on the dates indicated:

Lakes Madigan/Frey raw water source

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
5/8 or ¾ inch	\$ 26.00	\$ 29.00	\$ 31.00	\$ 32.00	\$ 34.00
1 inch	\$ 36.00	\$ 39.00	\$ 43.00	\$ 45.00	\$ 46.00
1 ½inch	\$ 56.00	\$ 61.00	\$ 67.00	\$ 69.00	\$ 72.00
2 inch	\$ 79.00	\$ 86.00	\$ 95.00	\$ 98.00	\$ 102.00
3 inch	\$ 134.00	\$ 146.00	\$ 161.00	\$ 166.00	\$ 173.00
4 inch	\$ 213.00	\$ 231.00	\$ 254.00	\$ 264.00	\$ 274.00
6 inch	\$ 410.00	\$ 444.00	\$ 489.00	\$ 507.00	\$ 527.00
<u>8</u> inch	\$ 646.00	\$ 700.00	\$ 771.00	\$ 799.00	\$ 830.00
<u>10</u> inch	\$ 921.00	\$ 999.00	\$1,110.00	\$1,139.00	\$1,184.00
<u>12</u> inch	\$1,708.00	\$1,852.00	\$2,040.00	\$2,113.00	\$2,195.00

Other raw water sources

Meter Size	<u>7/1/2009</u>	<u>7/1/2010</u>	<u>7/1/2011</u>	<u>7/1/2012</u>	<u>7/1/2013</u>
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5/8 or ¾ inch	\$ 14.00	\$ 15.00	\$ 16.00	\$ 17.00	\$ 18.00
1 inch	\$ 21.00	\$ 23.00	\$ 23.00	\$ 25.00	\$ 26.00
1 ½inch	\$ 35.00	\$ 37.00	\$ 39.00	\$ 41.00	\$ 44.00
2 inch	\$ 52.00	\$ 55.00	\$ 58.00	\$ 61.00	\$ 64.00
3 inch	\$ 91.00	\$ 97.00	\$ 101.00	\$ 107.00	\$ 113.00
4 inch	\$ 147.00	\$ 156.00	\$ 163.00	\$ 172.00	\$ 182.00
6 inch	\$ 287.00	\$ 305.00	\$ 318.00	\$ 336.00	\$ 356.00
8 inch	\$ 454.00	\$ 483.00	\$ 504.00	\$ 532.00	\$ 564.00
10 inch	\$ 650.00	\$ 691.00	\$ 721.00	\$ 762.00	\$ 807.00
12 inch	\$1,209.00	\$1,285.00	\$1,341.00	\$1,417.00	\$1,500.00

(Ord. 1619 N.C. (2d) § 10, 2009; Ord. 1542 N.C.(2d) § 10, 2005; Ord. 1211 N.C. (2d) § 11, 1992; Ord. 806 N.C.(2d) § 1 (part), 1985; Ord. 374 N.C.(2d) § 5 (part), 1977; Ord. 195 N.C.(2d) § 1(f), 1973; Ord. 84 N.C.(2d) § 1 (part), 1972; Ord. 324 N.C. § 13.05(e), 1958.)

11.48.115 - Service charges—Construction water customer accounts.

Customer accounts which qualify for water rates as set forth in [Section 11.48.055](#) shall pay a monthly service charge of \$105.00.

(Ord. 1619 N.C. (2d) § 11, 2009; Ord. 1542 N.C.(2d) § 11, 2005; Ord. 1211 N.C.(2d) § 12, 1992.)

11.48.120 - Service charges—Fire protection service customer accounts.

For each fire protection service connected to the municipal water system pipelines separately of the customer's domestic water service connection, excepting residential single-family dwellings, such customer shall pay the following monthly service charges based on the meter size installed on the particular fire protection service connection, effective for the service areas, as defined in Sections [11.48.010 A](#) and [B](#), and on the dates indicated:

Vallejo Service Area

Meter Size	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
5/8 or ¾ inch	\$ 13.30	\$ 14.10	\$ 14.70	\$ 15.60	\$ <u>16.40</u>
1 inch	\$ 15.90	\$ <u>16.70</u>	\$ 17.60	\$ 18.60	\$ 19.50
1 ½inch	\$ 21.10	\$ 22.10	\$ 23.30	\$ 24.60	\$ 25.80
2 inch	\$ 27.30	\$ 28.50	\$ 30.20	\$ 31.80	\$ 33.40
3 inch	\$ 41.70	\$ 43.50	\$ 46.20	\$ 48.60	\$ 51.10
4 inch	\$ 62.30	\$ 65.00	\$ 69.00	\$ 72.60	\$ 76.30
6 inch	\$113.90	\$118.50	\$126.20	\$132.60	\$139.40
8 inch	\$175.80	\$182.80	\$194.80	\$204.60	\$215.10
10 inch	\$248.10	\$257.80	\$274.80	\$288.60	\$303.50

Lakes Service Area

Meter Size	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
5/8 or ¾ inch	\$ 23.50	\$ 27.90	\$ 32.90	\$ 34.50	\$ 36.30
1 inch	\$ 24.00	\$ 28.60	\$ 33.70	\$ 35.30	\$ 37.20
1 ½inch	\$ 25.20	\$ 29.90	\$ 35.20	\$ 37.00	\$ 38.90
2 inch	\$ 26.60	\$ 31.50	\$ 37.10	\$ 39.00	\$ 41.00
3 inch	\$ 29.80	\$ 35.30	\$ 41.50	\$ 43.60	\$ 45.80
4 inch	\$ 34.40	\$ 40.60	\$ 47.80	\$ 50.20	\$ 52.70
6 inch	\$ 45.90	\$ 54.10	\$ 63.40	\$ 66.80	\$ 70.00
<u>8</u> inch	\$ 59.70	\$ 70.20	\$ 82.20	\$ 86.70	\$ 90.70
<u>10</u> inch	\$ 75.80	\$ 89.00	\$104.20	\$109.90	\$114.90

(Ord. 1619 N.C.(2d) § 12, 2009; Ord. 1580 N.C. (2d) § 1, 2007; Ord. 1542 N.C.(2d) § 12, 2005; Ord. 1211 N.C.(2d) § 13, 1992; Ord. 799 N.C. §§ 1 (part), 2 (part), 1967; Ord. 324 N.C. § 13.06, 1958.)

11.48.130 - Contractual rates.

The city council reserves the right to negotiate by contract rates and/or charges different than those expressed in any paragraph or section of this chapter, and such contractual rates and/or charges shall take preference over any other rates and/or charges set forth in any paragraph or section of this chapter.

(Ord. 799 N.C. §§ 1 (part), 2 (part), 1967; Ord. 324 N.C. § 13.07, 1958.)

11.48.140 - Reduction in service charges upon retirement of 1992 water system revenue bond issue.

Upon retirement of the water system revenue bond issue (Fleming Hill Treatment Plant Improvements), scheduled for 2018, or at an earlier date if sooner retired, the service charges shall be reduced on the date of the next succeeding billing cycle by the amount representing the debt service on the aforementioned bond issue.

(Ord. 1211 N.C.(2d) § 14, 1992.)

11.48.170 - Service call charge.

A service call charge (to be established by city council resolution) shall be assessed on the water bill for any service call occasioned by the necessity to make a call to the service address for reasons other than providing initial water service or discontinuation of service for reasons other than nonpayment.

(Ord. 1212 N.C.(2d) § 2, 1992.)

11.48.180 - Lakes Water System upgrade surcharge—Generally.

Each customer account for water service within the Lakes Water System shall pay a monthly surcharge in the amount applicable to the particular account as hereinafter set forth in Sections [11.48.181](#) through [11.48.183](#); said surcharge shall be in addition to any and all taxes, fees, or charges of any nature whatsoever relative to a supply of water, water service or water service connection.

(Ord. 1334 N.C.(2d) § 5, 1995.)

11.48.181 - Lakes Water System upgrade surcharge—Purpose.

The surcharge is assessed to generate sufficient revenue to construct improvements in the Lakes Water System; primarily, water treatment facilities improvements and requirements that will comply with the new surface water treatment required by the U.S. Environmental Protection Agency and the State of California, Department of Health Services, and associated debt service. The moneys received shall be deposited into a dedicated account, and shall be expended and/or withdrawn from said account only for the purposes herein indicated.

(Ord. 1334 N.C.(2d) § 6, 1995.)

11.48.182 - Lakes Water System upgrade surcharge—Payments.

Customer accounts for water service which qualify for water rates as set forth in Section 11.48.040 shall pay the following monthly surcharge, in addition to the monthly service charge as set forth in Section 11.48.100, for each water service connection.

A. Residential Service. Premises consisting of one or more residential units; surcharges are for each unit supplied by that water service connection:

	<u>7/1/95</u>	<u>7/1/96</u>
Single-family	\$30.00	\$40.00
Mobilehome	30.00	40.00
Multifamily	27.00	36.00

B. Commercial. Premises consisting of one or more commercial units; surcharges are for each unit supplied by that water service connection; however, in all instances, the surcharge shall not be less than hereinafter set forth for the meter size installed on the particular water service connection.

Meter Size	<u>7/1/95</u>	<u>7/1/96</u>
5/8 or 3/4"	\$30.00	\$ 40.00
1 inch	120.00	160.00
1 1/2 inch	300.00	400.00
2 inch	450.00	600.00
3 inch	810.00	1080.00
4 inch	1260.00	1680.00
6 inch	3000.00	4000.00

<u>8</u> inch	6300.00	8400.00
<u>10</u> inch	10500.00	14000.00
<u>12</u> inch and larger	To be computed by the city water superintendent	

- C. Combination. For premises consisting of any combination of residential units and/or mobile home units and/or commercial units; the applicable monthly surcharge for each residential unit shall be added to the surcharge for the commercial unit or units supplied by that water service connection as set forth in subsection B of this section.
- D. Schools. Premises used for school purposes as defined by [Section 11.48.070H](#); surcharges are for each unit supplied by that water service connection; however, in all instances, the surcharge shall not be less than the amount recited in subsection C of this section for the meter size installed on the particular water service connection.

(Ord. 1334 N.C.(2d) § 7, 1995.)

11.48.183 - Removal of Lakes Water System upgrade surcharge. 

The Lakes Water System upgrade surcharge shall expire on September 30, 2015. The surcharge shall be removed on the date of the next succeeding billing cycle.

(Ord. 1334 N.C.(2d) § 8, 1995.)

Vallejo, California, Code of Ordinances >> Title 11 - WATER >> II. - Miscellaneous Water Regulations >>

II. - Miscellaneous Water Regulations 

[Chapter 11.52 - WATER WELLS](#)

[Chapter 11.53 - WELL REGULATION AND MONITORING](#)

[Chapter 11.54 - WASTEFUL WATER USE PROHIBITION ORDINANCE](#)

[Chapter 11.56 - WATER POLLUTION](#)

[Chapter 11.60 - RESERVOIR KEEPERS](#)

Chapter 11.52 - WATER WELLS³

Sections:

[11.52.010 - Use for drinking—Using after notice to close.](#)

[11.52.020 - Pollution—Notice to close.](#)

11.52.010 - Use for drinking—Using after notice to close.

It is unlawful for any person, firm or corporation to maintain or use any well for the purpose of drawing therefrom any water intended for drinking purposes without first obtaining from the board of health a permit so to do; or to use any well after notice from the board of health to close or fill it.

(Ord. 96 N.S. § 1, 1912.)

11.52.020 - Pollution—Notice to close.

Whenever it appears to the satisfaction of the board of health that any well, the water of which is used for domestic purposes, has come polluted, or in anywise rendered unsafe for domestic or drinking purposes, or has become otherwise prejudicial to health or dangerous to life, the board of health shall give to the owner or his agent, lessee, tenant or other person in charge of such well, written notice to close and to fill it within a time to be specified in such notice. If such notice is not complied with, the board of health shall cause such well to be closed and filled up at the cost and expense of the owner thereof.

(Ord. 96 N.S. § 2, 1912.)

Chapter 11.53 - WELL REGULATION AND MONITORING

Sections:

[11.53.010 - County code adopted—Violations, penalties and inspections.](#)

[11.53.020 - Fees.](#)

[11.53.030 - Amendments.](#)

11.53.010 - County code adopted—Violations, penalties and inspections.

That certain document entitled Ordinance 1348 adopted by the Solano County board of supervisors to regulate the construction, reconstruction, destruction and inactivation of water, cathodic protection, and monitoring wells is adopted by the city of Vallejo and incorporated herein as though set forth in full and is made a part of this chapter except for the additions, revisions and omissions as set forth below. A copy of said county ordinance is on file in the office of the public works director of the city. The city authorizes the Solano County Department of Environmental Management, Division of Environmental Health, or any successor agency to undertake the inspections and other activities encompassed within said ordinance and to enforce the provisions of the ordinance codified in this chapter within the corporate limits of the city.

(Ord. 1077 N.C.(2d) § 2 (part), 1990.)

11.53.020 - Fees.

Those fees and charges established by the Solano County board of supervisors in County Resolution 89-179 relating to Ordinance 1348 and modified hereafter by said board from time to time are likewise adopted and incorporated herein as though set forth in full. Said fees and charges shall apply to any person, firm or corporation subject to the provisions of this chapter.

(Ord. 1077 N.C.(2d) § 2 (part), 1990.)

11.53.030 - Amendments.

Ordinance 1346, as adopted and incorporated herein is amended as follows:

A. The definition of "person" found in Section 13.10.101 is amended to read as follows:

Person shall mean any individual, firm, partnership, general corporation, association or governmental entity. "Governmental entity," as used herein, shall not include the City of Vallejo, an irrigation district, nor any local agency exempt from the application of the Ordinance pursuant to state law, and shall include the United States to the extent authorized by federal law.

B. The third full sentence of Section 13.10-104(a) **Well sites** is amended to read as follows, and in all other respects said section remains the same:

Water wells may be located in public utility easements, provided that written permission is obtained from the utility.

(Ord. 1077 N.C.(2d) § 2 (part), 1990.)

Chapter 11.54 - WASTEFUL WATER USE PROHIBITION ORDINANCE

Sections:

[11.54.010 - Purpose and intent.](#)

[11.54.020 - Short title.](#)

[11.54.030 - Regulations and restrictions on water use.](#)

[11.54.040 - Water efficient landscaping.](#)

11.54.010 - Purpose and intent.

The purpose of this chapter is to ensure that the water supply of the city of Vallejo is put to maximum beneficial use and that waste or unreasonable use or unreasonable method of use be prevented.

(Ord. 1567 N.C.(2d) § 1 (part), 2006.)

11.54.020 - Short title.

This chapter shall be known and cited as the Wasteful Water Use Prohibition Ordinance.

(Ord. 1567 N.C.(2d) § 1 (part), 2006.)

11.54.030 - Regulations and restrictions on water use.

It is unlawful for any customer to intentionally waste water. As used herein, the term "waste" means:

- A. Use of potable water to irrigate turf, groundcover, shrubbery, crops, vegetation, and trees in such a manner as to result in runoff for more than fifteen minutes;
- B. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except by hose equipped with a shutoff nozzle and where necessary for public health or safety;
- C. Allowing potable water to escape from breaks within the customer's plumbing system for more than thirty-six 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 except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment;
- E. Operating decorative water fountains without water recirculation;
- F. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where nonpotable or recycled water is available in sufficient quantities;
- G. Use of single-pass cooling systems; and
- H. Use of nonrecirculating systems in new conveyor car wash facilities.

(Ord. 1567 N.C.(2d) § 1 (part), 2006.)

11.54.040 - Water efficient landscaping.

Landscaping shall be installed and maintained in accordance with Section 16.74.030 Water Conservation Guidelines and Chapter 16.71 Water Efficient Landscape Regulations of the Vallejo Municipal Code.

(Ord. No. 1634 N.C.(2d), § 1, 3-23-2010)

Chapter 11.56 - WATER POLLUTION⁴

Sections:

[11.56.010 - Unlawful.](#)

11.56.010 - Unlawful.

It is unlawful for any person to put or place in or on, or to allow to run into or on, any public reservoir of water, or the bank, border or margin thereof, or into any water pipe, aqueduct, conduit, canal, stream, tank, or excavation therewith connected, any animal, vegetable; or mineral substance; or to do, perform, or commit any act or thing which will pollute the purity and wholesomeness of any water intended for human consumption. Nothing contained in this section shall prohibit any officer or employee of the city acting within the course and scope of this employment, or any person, firm, or corporation acting with express authorization of the city of Vallejo from introducing any substance into the public water supply deemed essential by the city to maintain or preserve such water supply.

(Ord. 144 N.C.(2d) § 1, 1973.)

Chapter 11.60 - RESERVOIR KEEPERS

Sections:

[11.60.010 - Designation.](#)

[11.60.020 - Duties.](#)

[11.60.030 - Powers.](#)

[11.60.040 - Identification.](#)

[11.60.050 - Other powers.](#)

11.60.010 - Designation.

The city manager shall have the authority to designate certain employees to be reservoir keepers.

(Ord. 317 N.C.(2d) § 1 (part), 1976.)

11.60.020 - Duties.

While they are on duty on reservoir property owned and operated by the city, in addition to other duties which may be specified by the water department, reservoir keepers shall have the duty to enforce all statutes of the state and/or ordinances of the county in which the reservoir is located relating to trespass, vandalism, and water pollution.

(Ord. 317 N.C.(2d) § 1(part), 1976.)

11.60.030 - Powers.

A reservoir keeper may arrest a person without a warrant whenever he has reasonable cause to believe that the person to be arrested has committed a misdemeanor in his presence which is in violation of a statute or ordinance which the keeper has the duty to enforce. If the person arrested does not demand to be taken before a magistrate, the reservoir keeper shall prepare a written notice to appear and release the person on his promise to appear, as prescribed by [Chapter 5C](#) (commencing with Section 853.6) of the Penal Code. Reservoir keepers shall have any other power granted by Section 836.5 of the Penal Code, or successive legislation, and shall be immune from civil liability as specified in that Penal Code section.

(Ord. 317 N.C.(2d) § 1 (part), 1976.)

11.60.040 - Identification.

The city manager may authorize reservoir keepers to carry such badges, shields, or other identification, and to wear such uniforms as he shall from time to time consider to be appropriate.

(Ord. 317 N.C.(2d) § 1(part), 1976.)

11.60.050 - Other powers.

Nothing in this chapter shall prevent a reservoir keeper from making a citizen's arrest for violation of any statute or ordinance which is beyond his designated duty to enforce.

TITLE 11 FOOTNOTES

1. For statutory provisions pertaining to municipal operation and/or regulation of the city's water supply, see Gov. Code § 38730 et seq.
2. For statutory provisions regarding the power of cities to prescribe, revise, and collect charges for the water furnished by it, see Gov. Cod § 54344.
3. For statutory provisions defining water wells, see Water Code § 13710.
4. For statutory provisions pertaining to poisoning of springs, wells or reservoirs of water, see Pen. Code § 347. For statutory provisions regarding pollution of water supply, see Health & Safe. Code §§ 4450—4461.
5. Former [Section 11.48.005](#), Annual adjustment of water rates, previously codified herein and containing portions of Ordinance No. 1379 N.C.(2d) was repealed in its entirety by Ordinance No. 1435 N.C.(2nd).
6. Former [Section 11.48.015](#), Multiple unit water rates, previously codified herein and containing portions of Ordinance No. 374 N.C.(2d) was repealed in its entirety by Ordinance No. 1435 N.C.(2nd).
7. Former [Section 11.48.030](#), outside water rates, previously codified herein and containing portions of Ordinance Nos. 324, N.C. 26 N.C., 374 N.C.(2d), 537 N.C. (2d), 748 N.C. (2d), [805](#) N.C.(2d), 875 N.C.(2d), 1203 N.C.(2d), 1211 N.C.(2d), 1379 N.C.(2d), 1435 N.C.(2d) and 1542 N.C.(2d) was repealed in its entirety by Ordinance No. 1619 N.C.(2d).
8. Former [Section 11.48.090](#), Service charges—Outside customer accounts, previously codified herein and containing portions of Ordinance Nos. 324 N.C., 84 N.C.(2d), 195 N.C.(2d), 374 N.C.(2d), [806](#) N.C.(2d), 1211 N.C.(2d), 1434 N.C.(2d) and 1542 N.C.(2d) was repealed in its entirety by Ordinance No. 1619 N.C.(2d).

Chapter 16.71 - WATER EFFICIENT LANDSCAPE REQUIREMENTS

Sections:

[16.71.010 - Title and purpose.](#)

[16.71.020 - Applicability.](#)

[16.71.030 - Definitions.](#)

[16.71.040 - Provisions for new construction or rehabilitated landscapes.](#)

[16.71.041 - Compliance with landscape documentation package.](#)

[16.71.042 - Penalties.](#)

[16.71.043 - Elements of the landscape documentation package.](#)

[16.71.044 - Water efficient landscape worksheet.](#)

[16.71.045 - Soil management report.](#)

[16.71.046 - Landscape design plan.](#)

[16.71.047 - Irrigation design plan.](#)

[16.71.048 - Grading design plan.](#)

[16.71.049 - Certificate of completion.](#)

[16.71.050 - Irrigation scheduling.](#)

[16.71.051 - Landscape and irrigation maintenance schedule.](#)

[16.71.052 - Irrigation audit, irrigation survey, and irrigation water use analysis.](#)

[16.71.053 - Irrigation efficiency.](#)

[16.71.054 - Recycled water.](#)

[16.71.055 - Stormwater management.](#)

[16.71.056 - Public education.](#)

[16.71.057 - Environmental review.](#)

[16.71.060 - Provisions for existing landscapes.](#)

[16.71.061 - Irrigation audit, irrigation survey, and irrigation water use analysis.](#)

[16.71.062 - Water waste prevention.](#)

[16.71.070 - Effective precipitation.](#)

[16.71.080 - Appendices.](#)

16.71.010 - Title and purpose.

The provisions of [Section 16.71.010](#) through [Section 16.71.080](#), inclusive, shall be known as the "water efficient landscape regulations." These regulations acknowledge that the waters of the state of California are of limited supply, are subject to ever increasing demands and continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses. Because of this, it is the policy of the city of Vallejo to promote the conservation and efficient use of water, to prevent the waste of this valuable resource, and to recognize that landscapes are essential to the quality of life in the city by providing areas for active and passive recreation, and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development, thereby acknowledging that landscape design, installation, maintenance and management can and should be water efficient.

The purpose of these provisions is to maintain consistency with Section 2 of Article X of the California Constitution which specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use. These provisions promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible; establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects; establish provisions for water management practices and water waste prevention for existing landscapes; use water efficiently without waste by setting a maximum applied water allowance as an upper limit for water use and reduce water use to the lowest practical amount; promote the benefits of consistent landscape ordinances with neighboring local and regional agencies; encourage use of economic incentives that promote the efficient use of water, such as implementing a tiered-rate structure; and encourage cooperation between the city of Vallejo and local agencies to implement and enforce these regulations.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65593, Government Code. Reference: Sections 65591, 65593, 65596, Government Code.)

16.71.020 - Applicability.

- A. After January 1, 2010, these regulations shall apply to all of the following landscape projects:
1. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than two thousand five hundred square feet requiring a building or landscape permit, plan check or design review;
 2. New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects with a landscape area equal to or greater than thousand five hundred square feet requiring a building or landscape permit, plan check, or design review;
 3. New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than five thousand square feet requiring a building or landscape permit, plan check or design review;
 4. Existing landscapes limited to Sections [16.71.060](#), [16.71.061](#) and [16.71.062](#), which includes landscapes that were installed prior to January 1, 2010, and are over one acre in size; and
 5. Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections [16.71.044](#), [16.71.051](#) and [16.71.052](#); and existing cemeteries are limited to Sections [16.71.060](#), [16.71.061](#) and [16.71.062](#)
- B. This ordinance does not apply to:
1. Registered local, state or federal historical sites;
 2. Ecological restoration projects that do not require a permanent irrigation system;
 3. Mined-land reclamation projects that do not require a permanent irrigation system; or
 4. Plant collections, as part of botanical gardens and arboretums open to the public.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.030 - Definitions.

In addition to the definitions contained in the Vallejo Municipal Code, the following terms, for the purposes of this chapter, shall have the meaning set forth below:

- A. "Applied water" means the portion of water supplied by the irrigation system to the landscape.
- B.

- "Automatic irrigation controller" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.
- C. "Backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
- D. "Certificate of completion" means the document required under [Section 16.71.049](#)
- E. "Certified irrigation designer" means a person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency's Water Sense Irrigation Designer Certification program and Irrigation Association's Certified Irrigation Designer program.
- F. "Certified landscape irrigation auditor" means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the U.S. Environmental Protection Agency's Water Sense Irrigation Auditor Certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.
- G. "Check valve" or "anti-drain valve" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.
- H. "Common interest developments" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.
- I. "Conversion factor (0.62)" means the number that converts acre-inches per acre per year to gallons per square foot per year.
- J. "Drip irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.
- K. "Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.
- L. "Effective precipitation" or "usable rainfall" (Eppt) means the portion of total precipitation which becomes available for plant growth.
- M. "Emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.
- N. "Established landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.
- O. "Establishment period of the plants" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.
- P. "Estimated total water use" (ETWU) means the total water used for the landscape as described in [Section 16.71.044](#)
- Q. "ET adjustment factor" (ETAF) means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is $(0.7) = (0.5/0.71)$. ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.
- R. "Evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

- S. "Flow rate" means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.
- T. "Hardscapes" means any durable material (pervious and non-pervious).
- U. "Homeowner-provided landscaping" means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.
- V. "Hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.
- W. "Infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).
- X. "Invasive plant species" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.
- Y. "Irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a certified landscape irrigation auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.
- Z. "Irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this chapter is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.
- AA. "Irrigation survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.
- BB. "Irrigation water use analysis" means an analysis of water use data based on meter readings and billing data.
- CC. "Landscape architect" means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.
- DD. "Landscape area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the maximum applied water allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).
- EE. "Landscape contractor" means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.
- FF. "Landscape documentation package" means the documents required under [Section 16.71.043](#)
- GG. "Landscape project" means total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance, meeting requirements under [Section 16.71.020](#)
- HH.

- "Lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.
- II. "Local water purveyor" is referred to as the water division in this chapter.
- JJ. "Low volume irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.
- KK. "Main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.
- LL. "Maximum applied water allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in [Section 16.71.044](#). It is based upon the area's reference evapotranspiration, the ET adjustment factor, and the size of the landscape area. The estimated total water use shall not exceed the maximum applied water allowance. Special landscape areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.
- MM. "Microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.
- NN. "Mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
- OO. "Mulch" means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.
- PP. "New construction" means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.
- QQ. "Operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
- RR. "Overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., spray heads and rotors).
- SS. "Overspray" means the irrigation water which is delivered beyond the target area.
- TT. "Permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.
- UU. "Pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.
- VV. "Plant factor" or "plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this chapter are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".
- WW. "Precipitation rate" means the rate of application of water measured in inches per hour.
- XX. "Project applicant" means the individual or entity submitting a Landscape Documentation Package required under [Section 16.71.043](#), to request a permit, plan check, or design review from the City of Vallejo. A project applicant may be the property owner or his or her designee.
- YY.

- "Rain sensor" or "rain sensing shutoff device" means a component which automatically suspends an irrigation event when it rains.
- ZZ. "Record drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.
- AAA. "Recreational area" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.
- BBB. "Recycled water", "reclaimed water", or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation and water features. This water is not intended for human consumption.
- CCC. "Reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Section 16.071.044, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.
- DDD. "Rehabilitated landscape" means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Section 16.71.020, and the modified landscape area is equal to or greater than two thousand five hundred square feet, is fifty percent of the total landscape area, and the modifications are completed within one year.
- EEE. "Runoff means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.
- FFF. "Soil moisture sensing device" or "soil moisture sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.
- GGG. "Soil texture" means the classification of soil based on its percentage of sand, silt, and clay.
- HHH. "Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
- III. "Sprinkler head" means a device which delivers water through a nozzle.
- JJJ. "Static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.
- KKK. "Station" means an area served by one valve or by a set of valves that operate simultaneously.
- LLL. "Swing joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.
- MMM. "Turf means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.
- NNN. "Valve" means a device used to control the flow of water in the irrigation system.
- OOO. "Water conserving plant species" means a plant species identified as having a low plant factor.
- PPP. "Water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of

water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

QQQ. "Watering window" means the time of day irrigation is allowed.

RRR. "WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Sections 65592, 65596, Government Code.)

16.71.040 - Provisions for new construction or rehabilitated landscapes.

The city manager shall designate the planning division, public works department, water division, or any other agency as deemed appropriate to implement some or all of the requirements contained in these regulations.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.041 - Compliance with landscape documentation package.

- A. Prior to construction, the planning division shall:
 - 1. Provide the project applicant with these regulations and procedures for permits, plan checks, or design reviews;
 - 2. Review the landscape documentation package submitted by the project applicant;
 - 3. Approve or deny the landscape documentation package;
 - 4. Approve the plan check or design review for the project applicant; and
 - 5. Upon approval of the landscape documentation package, submit a copy of the water efficient landscape worksheet to the water division.
- B. Prior to construction, the project applicant shall:
 - 1. Submit a landscape documentation package to the planning division;
- C. Upon approval of the landscape documentation package by the planning division, the project applicant shall:
 - 1. Receive approval of the plan check or design review and record the date of the permit in the certificate of completion;
 - 2. Submit a copy of the approved landscape documentation package along with the record drawings, and any other information to the property owner or his/her designee; and
 - 3. Submit a copy of the water efficient landscape worksheet to the water division.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.042 - Penalties.

Landscaping that is installed, constructed, altered, enlarged, converted, moved or maintained contrary to these regulations is a violation of the Vallejo Municipal Code and subject to enforcement action by the city which may result in a citation and imposition of a fine as established by a city council resolution or any other legal remedy.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

16.71.043 - Elements of the landscape documentation package.

- A. The landscape documentation package shall include the following six elements:
1. Project information:
 - a. Date;
 - b. Project applicant;
 - c. Project address [if available, parcel and/or lot number(s)];
 - d. Total landscape area (square feet);
 - e. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
 - f. Water supply type (e.g., potable, recycled, well) and identify the water division if the applicant is not served by a private well;
 - g. Checklist of all documents in landscape documentation package;
 - h. Project contacts to include contact information for the project applicant and property owner;
 - i. Applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package".
 2. Water efficient landscape worksheet:
 - a. Hydrozone information table;
 - b. Water budget calculations:
 - i. Maximum applied water allowance (MAWA);
 - ii. Estimated total water use (ETWU).
 3. Soil management report.
 4. Landscape design plan.
 5. Irrigation design plan in compliance with the planning division and/or public works landscape maintenance recommended standards.
 6. Grading design plan.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.044 - Water efficient landscape worksheet.

- A. A project applicant shall complete the Water Efficient Landscape Worksheet which contains two sections (see sample worksheet in Appendix B):
1. A hydrozone information table (see Appendix B, Section A) for the landscape project; and
 2. A water budget calculation (see Appendix B, Section B) for the landscape project. For the calculation of the maximum applied water allowance and estimated total water use, a project applicant shall use the ETo values from the Reference Evapotranspiration Table in Appendix A. For projects within the city of Vallejo, use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.
- B. Water budget calculations shall adhere to the following requirements:
1. The plant factor used shall be from WUCOLS. The plant factor ranges from zero to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.
 - 2.

All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

3. All special landscape areas shall be identified and their water use calculated as described below.
 4. ETAF for special landscape areas shall not exceed 1.0.
- C. Maximum applied water allowance. The maximum applied water allowance shall be calculated using the equation:
- MAWA = (ET_o) (0.62) [(0.7 × LA) + (0.3 × SLA)] Where:
- MAWA = Maximum Applied Water Allowance (gallons per year)
 ET_o = Reference Evapotranspiration (inches per year)
 0.62 = Conversion Factor (to gallons)
 0.7 = ET Adjustment Factor (ETAF)
 LA = Landscape Area including SLA (square feet)
 0.3 = Additional Water Allowance for SLA
 SLA = Special Landscape Area (square feet)
- Examples of how to use this calculation are provided in Appendix A.I.
- D. Estimated Total Water Use. The estimated total water use shall be calculated using the equation below. The sum of the estimated total water use calculated for all hydrozones shall not exceed MAWA.

ETWU =	(ET _o)(0.62)	(PF×HA	+SLA)
		IE	

Where:

- ETWU = Estimated Total Water Use per year (gallons)
- ET_o = Reference Evapotranspiration (inches)
- PF = Plant Factor from WUCOLS (see [Section 16.71.030](#))
- HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
- SLA = Special Landscape Area (square feet)
- 0.62 = Conversion Factor
- IE = Irrigation Efficiency (minimum 0.71)

Examples of how to use this calculation are provided in Appendix A.I.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.045 - Soil management report.

- A. In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:
1. Submit soil samples to a laboratory for analysis and recommendations.
 - a. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
 - b. The soil analysis may include:
 - i. Soil texture;
 - ii. Infiltration rate determined by laboratory test or soil texture infiltration rate table;

- iii. pH;
 - iv. Total soluble salts;
 - v. Sodium;
 - vi. Percent organic matter; and
 - vii. Recommendations.
2. The project applicant, or his/her designee, shall comply with one of the following:
 - a. If significant mass grading is not planned, the soil analysis report shall be submitted to the planning division as part of the landscape documentation package; or
 - b. If significant mass grading is planned, the soil analysis report shall be submitted to the planning division as part of the certificate of completion.
 3. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
 4. The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the planning division with the certificate of completion.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.046 - Landscape design plan.

- A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the landscape documentation package.
 1. Plant material.
 - a. Any plant not within a "required landscaped area," may be selected for the landscape, providing the estimated total water use in the landscape area does not exceed the maximum applied water allowance. Plants to be located within a required landscaped area must be of a drought tolerant variety. To encourage the efficient use of water, the following is highly recommended:
 - i. Protection and preservation of native species and natural vegetation;
 - ii. Selection of water-conserving plant and turf species;
 - iii. Selection of plants based on disease and pest resistance;
 - iv. Selection of street trees based on city of Vallejo approved street tree list; and
 - v. Selection of shrub plants based on city of Vallejo recommended shrub plant list;
 - b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in [Section 16.71.044\(A\)\(c\)\(ii\)](#).
 - c. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended:
 - i. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
 - ii. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); and
 - iii. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

- iv. Turf is not allowed on slopes greater than twenty-five percent where the toe of the slope is adjacent to an impermeable hardscape and where twenty-five percent means one foot of vertical elevation change for every four feet of horizontal length (rise divided by run x 100 = slope percent).
 - d. A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.
 - f. The use of invasive and/or noxious plant species shall not be permitted.
 - g. The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.
2. Water features.
- a. Recirculating water systems shall be used for water features.
 - b. Where available, recycled water shall be used as a source for decorative water features.
 - c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.
 - d. Pool and spa covers are highly recommended.
3. Mulch and amendments.
- a. A minimum two inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
 - b. Stabilizing mulching products shall be used on slopes.
 - c. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
 - d. Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see [Section 16.71.045](#)).
- B. The landscape design plan, at a minimum, shall:
- 1. Delineate and label each hydrozone by number, letter, or other method;
 - 2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
 - 3. Identify recreational areas;
 - 4. Identify areas permanently and solely dedicated to edible plants;
 - 5. Identify areas irrigated with recycled water;
 - 6. Identify type of mulch and application depth;
 - 7. Identify soil amendments, type, and quantity;
 - 8. Identify type and surface area of water features;
 - 9. Identify hardscapes (pervious and non-pervious);
 - 10. Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
 - a. Infiltration beds, swales, and basins that allow water to collect and soak into the ground;

- b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
- c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff;
- d. Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);
- e. Contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan"; and
- f. Bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 6 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— *(Section 65595, Government Code. Reference: Section 65596, Government Code and Section 1351, Civil Code.)*

16.71.047 - Irrigation design plan.

- A. For the efficient use of water, an irrigation system shall meet the planning division and/or public works recommended standards and all the requirements listed in this section as well as manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the landscape documentation package.
 - 1. System.
 - a. Dedicated landscape water meters are highly recommended on landscape areas smaller than five thousand square feet to facilitate water management.
 - b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.
 - c. The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
 - i. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
 - ii. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
 - d. Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather, or during rain.
 - e. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to

minimize water loss in case of an emergency (such as a main line break) or routine repair.

- f. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to [Chapter 11.38](#) of this code for additional backflow prevention requirements.
- g. High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.
- h. The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.
- i. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- j. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- k. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in [Section 16.71.044](#) regarding the maximum applied water allowance.
- 1. It is highly recommended that the project applicant inquire with the water division about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- m. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- n. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- o. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- p. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.
- q. Check valves or anti-drain valves are required for all irrigation systems.
- r. Narrow or irregularly shaped areas, including turf, less than eight feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.
- s. Overhead irrigation shall not be permitted within twenty-four inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:
 - i. The landscape area is adjacent to permeable surfacing and no runoff occurs; or
 - ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
 - iii. The irrigation designer specifies an alternative design or technology, as part of the landscape documentation package and clearly demonstrates strict adherence to irrigation system design criteria in [Section 16.71.047](#) A(1)(h).
Prevention of overspray and runoff must be confirmed during the irrigation audit.
- t. Slopes greater than twenty-five percent shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as

part of the landscape documentation package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

2. Hydrozone.
 - a. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
 - b. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
 - c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
 - d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:
 - i. Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
 - ii. The plant factor of the higher water using plant is used for calculations.
 - e. Individual hydrozones that mix high and low water use plants shall not be permitted.
 - f. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table (see Appendix B, Section A). This table can also assist with the irrigation audit and programming the controller.

B. The irrigation design plan, at a minimum, shall contain:

1. Location and size of separate water meters for landscape;
2. Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
3. Static water pressure at the point of connection to the public water supply;
4. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
5. Recycled water irrigation systems as specified in [Section 16.71.054](#)
6. The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and
7. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.048 - Grading design plan.

- A. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the landscape documentation package. A comprehensive grading plan prepared by a civil engineer for other permits satisfies this requirement.
 1. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

- a. Height of graded slopes;
 - b. Drainage patterns;
 - c. Pad elevations;
 - d. Finish grade; and
 - e. Stormwater retention improvements, if applicable.
2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:
 - a. Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
 - b. Avoid disruption of natural drainage patterns and undisturbed soil; and
 - c. Avoid soil compaction in landscape areas.
 3. The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.049 - Certificate of completion.

- A. The certificate of completion (see Appendix C for a sample certificate) shall include the following six elements:
 1. Project information sheet that contains:
 - a. Date;
 - b. Project name;
 - c. Project applicant name, telephone, and mailing address;
 - d. Project address and location; and
 - e. property owner name, telephone, and mailing address;
 2. Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved landscape documentation package;
 - a. Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
 3. Irrigation scheduling parameters used to set the controller (see [Section 16.71.050](#));
 4. Landscape and irrigation maintenance schedule (see [Section 16.71.051](#));
 5. Irrigation audit report (see [Section 16.71.052](#)); and
 6. Soil analysis report, if not submitted with landscape documentation package, and documentation verifying implementation of soil report recommendations (see [Section 16.71.045](#)).
- B. The project applicant shall:
 1. Submit the signed certificate of completion to the planning division for review;
 2. Ensure that copies of the approved certificate of completion are submitted to the water division and property owner or his or her designee.
- C. Prior to building permit issuance, the planning division shall:
 1. Receive the signed certificate of completion from the project applicant;
 2. Approve or deny the certificate of completion. If the certificate of completion is denied, the planning division shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

16.71.050 - Irrigation scheduling.

- A. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:
1. Irrigation scheduling shall be regulated by automatic irrigation controllers.
 2. Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from the water division, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
 3. For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the estimated total water use. Total annual applied water shall be less than or equal to maximum applied water allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.
- [B.]
1. Parameters used to set the automatic controller shall be developed and submitted for each of the following:
 - a. The plant establishment period;
 - b. The established landscape; and
 - c. Temporarily irrigated areas.
 2. Each irrigation schedule shall consider for each station all of the following that apply:
 - a. Irrigation interval (days between irrigation);
 - b. Irrigation run times (hours or minutes per irrigation event to avoid runoff);
 - c. Number of cycle starts required for each irrigation event to avoid runoff;
 - d. Amount of applied water scheduled to be applied on a monthly basis;
 - e. Application rate setting;
 - f. Root depth setting;
 - g. Plant type setting;
 - h. Soil type;
 - i. Slope factor setting;
 - j. Shade factor setting; and
 - k. Irrigation uniformity or efficiency setting.

16.71.051 - Landscape and irrigation maintenance schedule.

- A. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the certificate of completion.
- B. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

- C. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.
- D. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.052 - Irrigation audit, irrigation survey, and irrigation water use analysis.

- A. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.
- B. For new construction and rehabilitated landscape projects installed after January 1, 2010, as described in [Section 16.71.020](#)
 - 1. The project applicant shall submit an irrigation audit report with the certificate of completion to the planning division that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule;
 - 2. The water division shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the maximum applied water allowance.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.053 - Irrigation efficiency.

For the purpose of determining maximum applied water allowance, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.054 - Recycled water.

- A. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in [Section 16.71.054\(B\)](#).
- B. Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the water division stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.
- C. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and state laws.
- D. Landscapes using recycled water are considered special landscape areas. The ET adjustment factor for special landscape areas shall not exceed 1.0.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.055 - Stormwater management.

- A. Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged.

- B. Project applicants shall be referred to the Vallejo Sanitation and Flood Control District for information on any applicable stormwater ordinances and stormwater management plans.
- C. Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.056 - Public education.

- A. Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.
 - 1. The water division shall provide to owners of new, single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes.
- B. Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this chapter.
 - 1. Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme.
 - 2. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.057 - Environmental review.

All projects must comply with the California Environmental Quality Act (CEQA), as appropriate.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 21082, Public Resources Code. Reference: Sections 21080, 21082, Public Resources Code.)

16.71.060 - Provisions for existing landscapes.

The city manager shall designate the planning division, public works department, water division, or any other agency as deemed appropriate to implement some or all of the requirements contained in this chapter.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.061 - Irrigation audit, irrigation survey, and irrigation water use analysis.

- A. This section shall apply to all existing landscapes that were installed before January 1, 2010, and are over one acre in size.
 - 1. For all landscapes in [Section 16.71.061\(A\)](#) that have a water meter, the water division shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the maximum applied water allowance for existing landscapes. The maximum applied water allowance for existing landscapes shall be calculated as: $MAWA = (0.8) (ET_o)(LA)(0.62)$.
 - 2.

For all landscapes in [Section 16.71.061](#)(A) that do not have a meter, the water division shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

B. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.062 - Water waste prevention.

A. The water division shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions may be established and administered to the project applicant.

B. Restrictions regarding overspray and runoff may be modified if:

1. The landscape area is adjacent to permeable surfacing and no runoff occurs; or
2. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65594, Government Code. Reference: Section 65596, Government Code.)

16.71.070 - Effective precipitation.

The city may consider effective precipitation (twenty-five percent of annual precipitation) in tracking water use and may use the following equation to calculate maximum applied water allowance:

$$\text{MAWA} = (\text{ETo} \text{ \− } \text{Eppt}) (0.62) [(0.7 \times \text{LA}) + (0.3 \times \text{SLA})].$$

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

State law reference— (Section 65595, Government Code. Reference: Section 65596, Government Code.)

16.71.080 - Appendices.

Appendices for this chapter shall be maintained by the planning division under separate cover.

(Ord. No. 1634 N.C.(2d), § 4, 3-23-2010)

City of Vallejo Municipal Water System Rates Table

Customer Class and Rate Type	Vallejo Service Area					Lakes Service Area				
	Rates (Effective on Dates Listed)					Rates (Effective on Dates Listed)				
	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
SINGLE FAMILY RESIDENTIAL										
<u>Bi-Monthly Service Charge</u>										
5/8-Inch or 3/4-Inch	\$26.80	\$28.70	\$29.60	\$31.20	\$32.90	\$44.90	\$53.30	\$62.90	\$86.00	\$69.50
1-Inch	\$40.30	\$43.00	\$44.50	\$46.90	\$49.40	\$62.20	\$73.70	\$87.10	\$91.50	\$98.20
1 1/2-Inch	\$87.10	\$71.80	\$74.30	\$78.20	\$82.40	\$96.90	\$114.60	\$135.40	\$142.40	\$149.60
2-Inch	\$99.40	\$106.20	\$110.10	\$115.80	\$122.00	\$138.40	\$163.70	\$193.40	\$203.40	\$213.60
<u>Bi-Monthly Water Rates (Per Ccf)</u>										
0-2,600 Cubic Feet	N/A	N/A	N/A	N/A	N/A	\$6.07	\$7.30	\$8.77	\$9.36	\$10.02
OVER 2,600 Cubic Feet	N/A	N/A	N/A	N/A	N/A	\$9.48	\$11.41	\$13.69	\$14.81	\$15.59
0-2,200 Cubic Feet	\$2.25	\$2.37	\$2.55	\$2.71	\$2.88	N/A	N/A	N/A	N/A	N/A
OVER 2,200 Cubic Feet	\$4.05	\$4.31	\$4.68	\$5.03	\$5.40	N/A	N/A	N/A	N/A	N/A
<u>Bi-Monthly Surcharge Fee</u>										
Per Residential Unit	N/A	N/A	N/A	N/A	N/A	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00
MULTIPLE FAMILY RESIDENTIAL										
<u>Monthly Service Charge</u>										
5/8-Inch or 3/4-Inch	\$18.70	\$19.10	\$20.00	\$21.10	\$22.20	\$22.50	\$26.70	\$31.50	\$33.00	\$34.80
1-Inch	\$25.40	\$26.80	\$28.00	\$29.80	\$31.10	\$31.10	\$36.90	\$43.60	\$45.80	\$48.10
1 1/2-Inch	\$39.90	\$42.50	\$44.20	\$46.50	\$49.00	\$48.50	\$57.30	\$67.70	\$71.20	\$74.80
2-Inch	\$57.50	\$61.10	\$63.60	\$66.90	\$70.50	\$69.20	\$81.90	\$96.70	\$101.70	\$106.60
3-Inch	\$98.30	\$104.70	\$108.90	\$114.50	\$120.80	\$117.70	\$139.10	\$164.40	\$173.00	\$181.60
4-Inch	\$158.30	\$166.90	\$173.60	\$182.40	\$192.20	\$187.00	\$220.90	\$261.10	\$274.80	\$288.40
6-Inch	\$313.60	\$322.40	\$335.20	\$352.30	\$371.10	\$360.10	\$425.40	\$502.80	\$529.20	\$555.40
8-Inch	\$509.00	\$509.00	\$529.30	\$556.20	\$585.80	\$573.00	\$670.80	\$792.80	\$834.50	\$875.70
10-Inch	\$717.40	\$726.70	\$755.60	\$794.00	\$836.30	\$821.50	\$957.10	\$1,131.20	\$1,190.70	\$1,249.50
12-Inch	\$1,338.60	\$1,348.70	\$1,402.30	\$1,473.50	\$1,552.10	\$1,531.80	\$1,775.10	\$2,097.90	\$2,208.50	\$2,317.40
<u>Monthly Water Rates (Per Ccf)</u>										
ALL CONSUMPTION	\$2.76	\$2.91	\$3.13	\$3.33	\$3.53	\$7.35	\$8.82	\$10.55	\$11.23	\$11.95
<u>Monthly Surcharge Fee</u>										
Per Residential Unit	N/A	N/A	N/A	N/A	N/A	\$36.00	\$36.00	\$36.00	\$36.00	\$36.00

City of Vallejo Municipal Water System Rates Table

Customer Class and Rate Type	Vallejo Service Area					Lakes Service Area				
	Rates (Effective on Dates Listed)					Rates (Effective on Dates Listed)				
	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
FIRE SERVICE										
<u>Monthly Service Charge</u>										
5/8-Inch or 3/4-Inch	\$13.30	\$14.10	\$14.70	\$15.60	\$16.40	\$23.50	\$27.90	\$32.90	\$34.50	\$36.30
1-Inch	\$15.90	\$18.70	\$17.60	\$18.60	\$19.50	\$24.00	\$28.60	\$33.70	\$35.30	\$37.20
1 1/2-Inch	\$21.10	\$22.10	\$23.30	\$24.60	\$25.80	\$25.20	\$29.90	\$35.20	\$37.00	\$38.90
2-Inch	\$27.30	\$28.50	\$30.20	\$31.80	\$33.40	\$26.60	\$31.50	\$37.10	\$39.00	\$41.00
3-Inch	\$41.70	\$43.50	\$46.20	\$46.60	\$51.10	\$29.80	\$35.30	\$41.50	\$43.60	\$45.80
4-Inch	\$62.30	\$65.00	\$69.00	\$72.60	\$76.30	\$34.40	\$40.60	\$47.80	\$50.20	\$52.70
6-Inch	\$113.90	\$118.50	\$126.20	\$132.60	\$139.40	\$45.90	\$54.10	\$63.40	\$66.80	\$70.00
8-Inch	\$175.80	\$182.80	\$194.80	\$204.60	\$215.10	\$59.70	\$70.20	\$82.20	\$86.70	\$90.70
10-Inch	\$248.10	\$257.80	\$274.80	\$286.80	\$303.50	\$75.80	\$89.00	\$104.20	\$109.90	\$114.90
CONSTRUCTION WATER										
<u>Monthly Service Charge</u>										
Fire Hydrant Temporary Meter	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00
<u>Monthly Water Rates (Per Ccf)</u>										
ALL CONSUMPTION	\$2.78	\$2.81	\$3.13	\$3.33	\$3.53	\$7.35	\$8.82	\$10.55	\$11.23	\$11.95
RAW WATER										
<u>Monthly Service Charge</u>										
5/8-Inch or 3/4-Inch	\$14.00	\$15.00	\$16.00	\$17.00	\$16.00	\$26.00	\$29.00	\$31.00	\$32.00	\$34.00
1-Inch	\$21.00	\$23.00	\$23.00	\$25.00	\$26.00	\$36.00	\$39.00	\$43.00	\$45.00	\$46.00
1 1/2-Inch	\$35.00	\$37.00	\$39.00	\$41.00	\$44.00	\$56.00	\$61.00	\$67.00	\$69.00	\$72.00
2-Inch	\$52.00	\$55.00	\$58.00	\$61.00	\$64.00	\$79.00	\$86.00	\$95.00	\$98.00	\$102.00
3-Inch	\$91.00	\$97.00	\$101.00	\$107.00	\$113.00	\$134.00	\$146.00	\$161.00	\$166.00	\$173.00
4-Inch	\$147.00	\$156.00	\$163.00	\$172.00	\$182.00	\$213.00	\$231.00	\$254.00	\$264.00	\$274.00
6-Inch	\$287.00	\$305.00	\$318.00	\$336.00	\$356.00	\$410.00	\$444.00	\$489.00	\$507.00	\$527.00
8-Inch	\$454.00	\$483.00	\$504.00	\$532.00	\$564.00	\$646.00	\$700.00	\$771.00	\$799.00	\$830.00
10-Inch	\$650.00	\$691.00	\$721.00	\$762.00	\$807.00	\$921.00	\$999.00	\$1,100.00	\$1,139.00	\$1,184.00
12-Inch	\$1,209.00	\$1,285.00	\$1,341.00	\$1,417.00	\$1,500.00	\$1,706.00	\$1,852.00	\$2,040.00	\$2,113.00	\$2,195.00
<u>Monthly Water Rates (Per Ccf)</u>										
Raw Water	\$1.48	\$1.58	\$1.75	\$1.89	\$2.04	\$3.28	\$3.91	\$4.69	\$4.89	\$5.17
Raw Water Contracts	\$1.29	\$1.38	\$1.53	\$1.65	\$1.78	N/A	N/A	N/A	N/A	N/A

Attachment C – Measurement Device Documentation

Documentation verifying the accuracy of the City’s measurement devices includes:

Manufacturers’ product specification sheets

List of Facilities by Service Area with Frequency of Calibration

City of Vallejo Meter Testing and Replacement Program Time Table
(July 2014 – November 2015)

PRODUCT SUMMARY



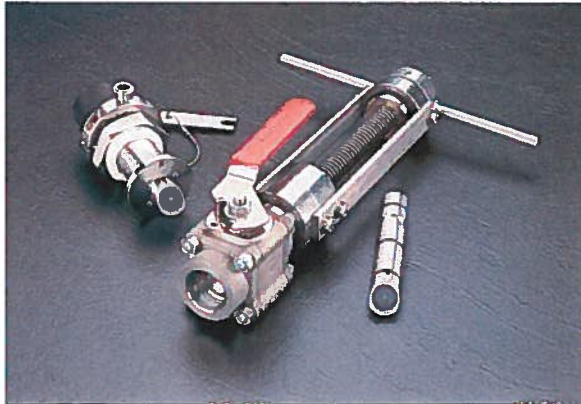
Model 7657 / 7658 intrinsically safe transducer



Model 7500 flowmeter in NEMA 4 enclosure



Open channel transducer arrangement



Model 7601 / 7641 fully removable transducer assembly with jacking mechanism



Hot-tap transducer installation



Model 7510 flowmeter in NEMA 4 enclosure

Accusonic 18-path Flowmeter Provides State-of-the-Art Accuracy in Short Hydro-Turbine Intakes

About Accusonic

Accusonic® Technologies, a division of ADS® LLC, designs and manufactures ultrasonic transit-time flow measurement systems that are renowned for their precise accuracy and reliability in difficult operating environments. Accusonic flowmeter systems can be found in hydroelectric plants, thermal power plants, water and wastewater treatment facilities, sewage collection systems and other types of water flow conveyance pipelines and channels. With over 35 years of experience and over 3000 systems installed worldwide, Accusonic offers a full range of services including installation, system integration, turbine performance testing services, and field training.



View of the Three Gorges Dam tailrace from the Right Bank entrance.

Strategic Value

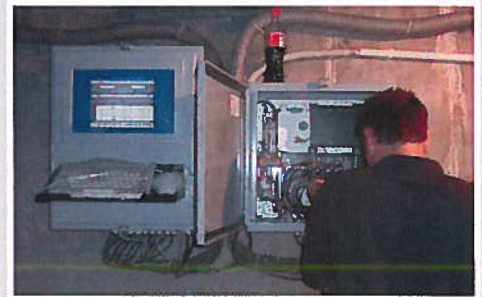
An Accusonic 18-path ultrasonic transit-time flowmeter was installed in the Unit G18 penstock of the Right Bank Powerhouse at Three Gorges Dam in Hubei Province, China, providing flowrate measurement accuracy within +/- 0.5% of actual flowrate. Commissioned in late 2008, this Accusonic Model 7500-XP flowmeter system successfully overcame flow measurement challenges at the power plant and exceeded test requirements established to maximize power generation efficiency and optimize overall plant operation.

Flow engineering and measurement experts from Accusonic helped design and implement a test measurement program commissioned by China Three Gorges Power Corporation (CTGPC). Accusonic has years of experience in engineering successful installations of 18-path transit-time flowmeters in large penstocks. They are skilled in the art of overcoming application challenges and delivering flow measurement accuracy that meets or exceeds specified requirements.

"Installation of the Accusonic state-of-the-art 18-path penstock flow measurement system in unit # G18 has enabled us to accurately evaluate the hydro-turbine unit power generation performance and efficiency for one of the world's largest hydropower generating units in use today. This is a critical capability for any large hydroelectric power company, necessary to ensure that contractually specified performance criteria are met for large, expensive hydro-turbine generating units. There really is no substitute for true and actual real-world unit performance measurement and evaluation."

Operation Department of China Yangtze Power Co., Ltd.

The Three Gorges Project (TGP) is the world's largest hydropower complex located in one of the three gorges of the Yangtze River, Xilingxia Gorge in Hubei Province, China. The gorge controls about 1 million km² of drainage area and averages a runoff of 451 billion m³ annually. CTGPC acts as the legal entity for TGP. CTGPC is responsible for the construction and financing of the project. China Yangtze Power Co., Ltd. is responsible for the operation of the project.



Accusonic Engineer verifying cable termination in crossed plane 7520-XP enclosure located in the penstock coupling gallery. The 7500-XP is to the left which displays the total 18-path flowrate. The normal plane is connected to the 7500-XP (left) and the cross plane is connected to the 7520-XP (right...opened enclosure).

Services Provided by Accusonic

In addition to providing flow engineering review and feedback to TGP during the planning stages for this project, Accusonic provided engineering support to its distributor in China during the transducer installation activities, calculated as-built parameters, and provided on-site commissioning services for the flowmeter system to verify the operation and accuracy of the 18-path transit-time flowmeter system.



View of the completed Left Bank Powerhouse.

Situation

Managers at Three Gorges were concerned that the traditional 8-path transit-time flow measurement configuration specified by the IEC 60041 Hydraulic Turbine Test Code might not meet the accuracy requirements they needed for absolute turbine performance testing of the large hydro-turbine units that had been newly installed in the Right Bank Powerhouse. The traditional 8-path configuration consists of four symmetrically crossed pairs of chordal acoustic paths at four elevations across the penstock. Flowrate measurement accuracy concerns arose because of the short turbine intake penstock configuration immediately downstream from a vertical bend in the 12.4-m-diameter penstock.

Without accurate penstock flow measurement capability, it is difficult for hydroelectric power plants to accurately determine and fully quantify the actual efficiency of hydraulic turbines for contractual acceptance of new turbine units. Accurate flow measurement is also critical for on-going operational use at multi-unit power plants in order to properly utilize all turbine units to optimize overall plant operation and maximize power generation efficiency.

Solution

The goal was to overcome the difficult hydraulic conditions that exist in the large penstocks because of the short intake penstock configuration and provide flow measurement with better than $\pm 0.5\%$ flowrate uncertainty. This flowrate accuracy would allow the real power generation efficiency of individual turbine units to be tested and verified for acceptance of turbine units from each turbine manufacturer.

CTGPC contracted with three manufacturers of multiple-path ultrasonic transit-time flowmeter systems to install three different sets of flowmeter discharge measurement systems in three separate unit penstocks located in TGP's Right Bank Powerhouse. There are a total of twelve units in the Right Bank Plant of Three Gorges Power Corporation, supplied by three different turbine manufacturers, four units for each turbine manufacturer.

The units to be tested were selected from each turbine manufacturer's block of four turbine units respectively; i.e., at units #G18, #G22, and #G23. CTGPC specified a flowrate measurement accuracy better than $\pm 0.5\%$ and required flowmeter configurations with more than ten acoustic paths.

CTGPC required the transit-time flowmeter manufacturers to supply a multiple chordal path transit-time flowmeter with greater than the traditional symmetrically crossed paths located at four chordal elevations (8-path configuration). Accusonic had developed and provided 18-path flowmeters (symmetrically crossed paths at nine chordal elevations) for a number of years and was instrumental in getting this configuration added to the North American hydro-turbine test code (ASME PTC 18-2002). Basically, an additional five chordal elevations are interleaved with the traditional four elevations having a pair of symmetrically crossed acoustic paths at each of nine elevations.

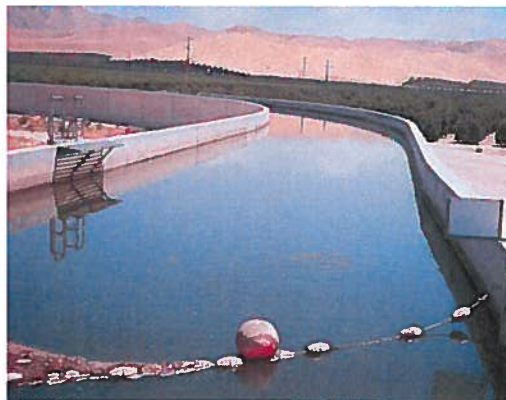
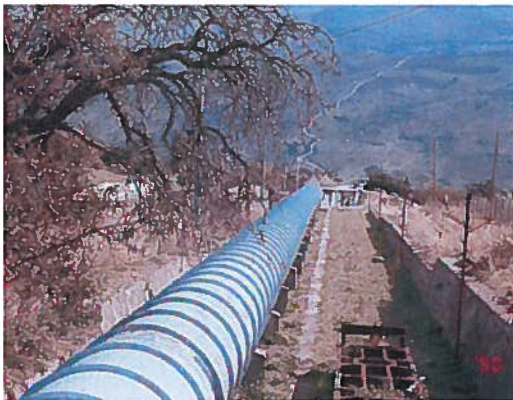
Results

CTGPC was satisfied with the Accusonic 18-path flowmeter performance and have specified Accusonic to supply two additional 18-path flowmeters for further evaluation in their Underground Powerhouse at Three Gorges Dam. The 16-path and 18-path flowmeter systems provided by the other selected flowmeter manufacturers both experienced problems which resulted in less than desired flow measurement performance.

www.accusonic.com

ACCUSONIC
A Division of ADS LLC
An IDEX Water & Wastewater Business. **IDEX**

PRODUCT SUMMARY



FLOWMETER SYSTEMS

Accusonic Flowmeters are used in large pipes, channels, buried conduits and rivers for high-accuracy flowrate measurement. The systems use the multiple-parallel-path acoustic transit-time method to measure flow velocities at discrete elevations in the measurement section. Real-time flowrates are determined by integration of the flow velocity profile achieving accuracy of up to 0.5% of flowrate.

Accusonic delivered its first multipath system in 1968. Since then over 2500 systems have been installed in pipelines 0.5-15 meters in diameter, and in open channels up to 500 meters wide. A wide range of transducers is available to accommodate installation in virtually any pipe or channel. Typical applications include:

1 Hydroelectric and Thermal Power Plants

Multipath systems have been installed in over 700 hydroelectric penstocks and low-head intakes worldwide. Installations include those in buried and exposed penstocks, pumped-storage plants, and new and existing plants. Systems are used to determine performance curves, establish dispatch guidelines, document plant discharge and evaluate upgrade projects on a before and after basis. At thermal power plants, the meters are used for determining condensers performance and thermal loading of cooling water and receiving waters.

2 Water Transport and Treatment

Major water distribution projects and municipal systems, including the California Aqueduct, Central Arizona Project, New York DEP, City of Chicago, Los Angeles Department of Water and Power and Metropolitan Water District of So. California, have selected Accusonic as their supplier for large pipe and channel flowmeter systems. The systems display, record, and output data for both local and remote (via telemetry) data collection.

3 Wastewater Treatment, Collection Systems, and CSOs

NPDES and related regulations require accurate measurement of major wastewater and Combined Sewer Overflow (CSO) discharges. The multipath method is particularly well suited for compound sites that flow from partially full to surcharged and provides high-accuracy data over the full range of flows.

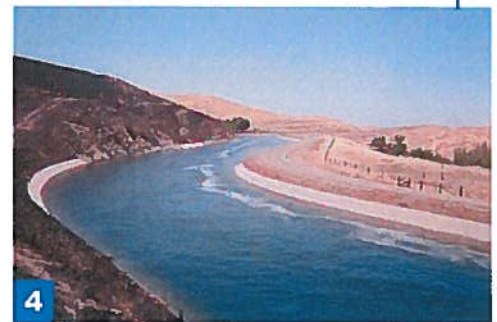
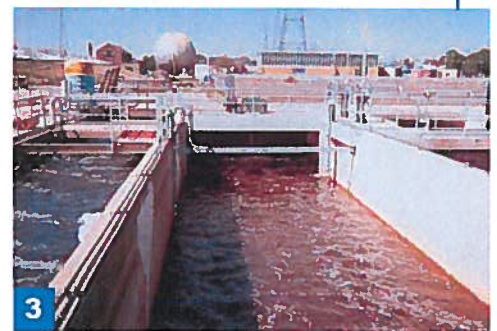
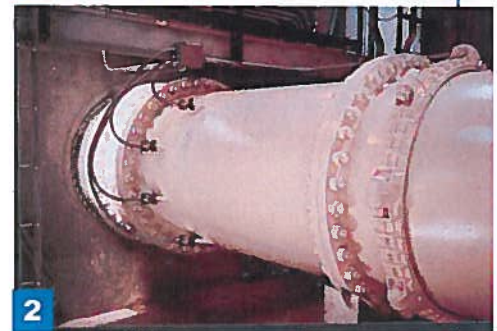
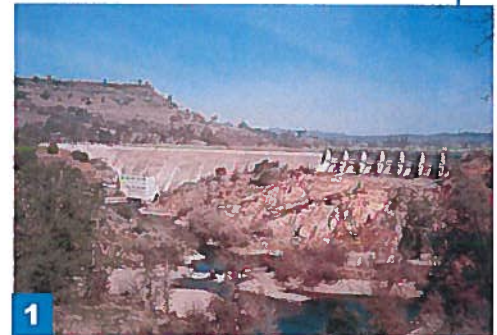
Accusonic flowmeters also provide bi-directional flow measurement capability, which makes them ideal for monitoring tidally influenced sites or conduits subject to reverse-flow conditions. Accusonic flowmeters have been installed in treatment plants, discharge tunnels, CSOs and sewer pipes up to 7 meters in diameter. Intrinsically safe transducers are available for installations in hazardous environments.

4 Irrigation and Waterways

Irrigation districts and large water projects use Accusonic flowmeters for accurate accounting of canal flows. With open channel flow-measurement accuracy up to $\pm 1.5\%$, Accusonic meters are excellent in system control and revenue billing applications.

Users such as the U.S. Geological Survey have installed Accusonic systems in rivers up to 500 meters wide as part of their nationwide river monitoring system.

Accusonic low frequency, high-power transducers are designed for operation in silt-laden and wide rivers. Over 400 river systems have been installed throughout the world.



MONITORING SYSTEMS AND SERVICES

In addition to precision flowmeter systems, Accusonic offers associated technical products and services to support hydroelectric, water resource and wastewater project requirements. These include fully integrated data collection, monitoring and analysis systems for pumps, turbines and hydraulic conveyance works. Systems are designed for application where maximizing efficiency and ensuring continued high performance are primary concerns.

5 Leak Detection

Pipeline leaks can be detected quickly and easily by establishing a communications link between flowmeters placed at opposite ends of the pipeline. The system continuously compares flows at both ends. When the difference exceeds a preset threshold, an alarm contact is actuated, providing a valve closure signal. Pipelines and entire hydroelectric plants have been protected in this manner.

6 Turbine Efficiency Monitoring System (TEMS)

The Accusonic TEMS is used in a portable mode or as a permanently installed system for measurement of hydro turbine (or pump) efficiency. The system collects data from the flowmeter, power meter, and pressure sensors and computes unit efficiency in real-time. The system is used to improve plant operation and to provide contractually accepted pre- and post-upgrade performance data, and is designed to meet ASME PTC-18 and IEC Pub. 41 codes.

7 Cavitation Monitoring System (CMS)

The Accusonic CMS uses a non-intrusive sensor that detects the inception and severity of hydro turbine (or pump) blade cavitation. Erosive operation zones (gate position vs. head) are determined to allow the operator to avoid excessive damage. Condition of the runner is externally monitored over time to indicate when rework or other maintenance is required.

8 Field Service

Accusonic field engineers are available on a world-wide basis to install equipment or perform field tests. A network of offices and representatives in 25 countries provides prompt support services for our installations. Our turbine performance test team is available to conduct acceptance tests in accordance with ASME and IEC standards on Kaplan, Francis and Pelton turbines.



ACCUSONIC
TECHNOLOGIES

The detector check meter is the appropriate device for most commercial and industrial fire systems. If, however, the water is from an outside source or additives are present for antifreeze, regulatory agencies for fire-protection systems require a testable backflow preventer. These double check or reduced pressure devices are also available with metered bypasses. AWWA Manual M14, *Recommended Practice for Backflow Prevention and Cross-Connection Control*, contains more information.

Like all measurement devices, detector check meters require some maintenance to ensure proper operation. While the main valve assembly can be virtually maintenance-free, the bypass meter requires examination to ensure continued operation. By opening the meter test valve located downstream of the meter, a small amount of water is vented to the atmosphere, and the dial should be checked to ensure proper meter operation. Because the meter is being used as a tattletale and not as an accurate consumption-measuring device, volumetric accuracy is of less importance. It is very important that the meter register a small flow to detect leaks and unauthorized use. The main check valve elastomer sealing can be tested by setting up a differential pressure (DP) gauge to ensure that a differential pressure of 1 to 2 psi is maintained. This test is done by simply removing the meter and installing the appropriate DP gauge fittings.

Detector check meters can be installed inside a building or outside in a vault. Weight-loaded check valves require horizontal installation for proper operation, whereas spring-loaded valves can be installed horizontally or vertically on the fire-system standpipe.

It is common for utilities to ask building owners to remove a detector check and install a fire-service meter if consumption is registered more than once annually. Normal consumption should occur during the annual fire system test. The selection of the proper device for each application and an understanding of the limitations of a metering device will ensure that the highest value is obtained.

Other types of meters for large lines include the Venturi or its modifications, the flow tube, or the flow nozzle. These meters differ from the other meters because they measure by differential pressure instead of by velocity or quantity. Flow ranges for accuracy vary with size and with details of design, so information should be obtained from the manufacturer of the meter. Although built in smaller sizes, these meters usually are used in 6-in. (150-mm) or larger lines.

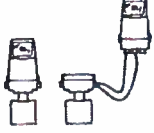
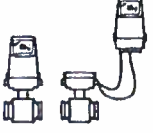
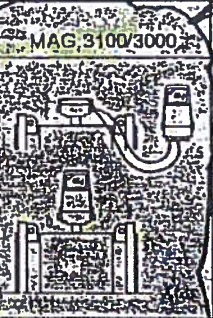
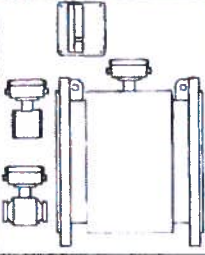
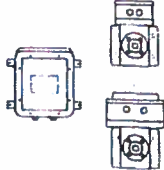
Improvements in the microprocessor readouts for both electromagnetic and ultrasonic large electronic velocity meters have enabled these devices to have not only raw and wastewater applications, but also to apply to nonrevenue measurement of finished water and water treatment chemicals. Both meters offer the advantage of an unobstructed flow tube with no moving parts and high accuracy; both, however, require electronic power.

For temporary measurements, the Pitot tube may be used in main lines. In the hands of skilled operators, the meter is valuable in making surveys to ascertain rates of flow in large lines, to locate leaks, and to measure the flow from fire hydrants.

Manifolding of Meters

For 3-in. (80-mm) or larger lines, instead of using one meter to measure the entire flow, multiple smaller-sized meters are installed in a manifold (also called a battery). Typically, a manifold should consist of two meters or more, with each meter one pipe size or more smaller than the main line (e.g., two 2-in. [50-mm] meters in a 3-in. [80-mm] manifold). For example, on a 3-in. (80-mm) line, the manifold may consist of two displacement meters. On a 6-in. (150-mm) or 10-in. (250-mm) line, the manifold

Travis Treatment Plant

	MAG 1100/3000	FOODMAG® MAG 2100/3000	MAG 3100/3000	MAG 1100-2100-3100/1000	MAG 380/490
MAGFLO® electromagnetic flowmeter					
Size (In)	DN ½" - 4"	DN ¾" - 4"	DN ½" - 48"	DN ½" - 4" DN ¾" - 4" DN 4" - 24"	DN ½" - 64"
Connection	Sandwich (no flange)	Hygienic ISO 2852 clamp, DIN 11851 screwed entry	Flange	Sandwich Hygienic screwed entry Flange	Flange
Maximum working pressure	580 psi	145 psi	232 psi (option up to 5075 psi)	580 psi, 145 psi 232-5075 psi	232 psi (option 187-5075 psi) 14500 psi to order
Temperature	-4 to 392°F	-22 to 212°F Steam cleaning: 284°F	-4 to 356°F	-4 to 392°F -22 to 212°F -4 to 356°F	-4 to 356°F
Liner	Al ₂ O ₃	FEP (teflon)	Neoprene EPDM Ebonite, Teflon (PTFE) Natural rubber Polyurethane	-	Neoprene EPDM Ebonite, Teflon (PTFE) Natural rubber Polyurethane
Electrodes	Platinum	Hastelloy C	ASTM 316Ti Hastelloy C, Platinum Monel, Titanium	-	ASTM 316 Hastelloy C, Platinum Monel, Titanium
Outputs	Current, frequency and pulse output Fault indication and flow direction relay	Current, frequency and pulse output Fault indication and flow direction relay	Current, frequency and pulse output Fault indication and flow direction relay	Current, frequency and pulse output	Current, frequency and pulse output
Display/counter	Alphanumeric: Flow, volume, fault, etc.	Alphanumeric: Flow, volume, fault, etc.	Alphanumeric: Flow, volume, fault, etc.	0-100% display	Various options
Enclosure	NEMA 6 /IP 67	NEMA 6 /IP 68	NEMA 6 /IP 68	NEMA 4/NEMA 6/ NEMA 6/ IP 65/IP 67/IP 68	NEMA 4/NEMA 6/ IP 65/IP 68
Ex-version	-	-	-	MAG 1100/1000 EEx ia ib IIB	EEx e ia IIC T4
Accuracy	±0.25%	±0.25%	±0.25%	±0.5%	±0.5%
Data sheet	LK.27.F2.22	IK.27.G1.02	LK.27.C2.22	LK.27.E2.22	LK.27.D2.02

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Installation.....	15
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Dimensions: (NEMA 4 Standard Enclosure)

12-5/8" (305 mm) high x 10-1/2" (254 mm) wide
x 5-3/8" (140 mm) deep

Weight: Indicating Transmitter

Approx. 17 lbs. (7.7 kg)

Shipping Weight:

Approx. 30 lbs. (14 kg), Flo-Probe and
Indicating Transmitter

FLO-PROBE MAGMETER SENSOR (MODEL 88L)

Operating Velocity:

0 to 30 feet (0 to 9 m) per second

Probe Wetted Material:

316 Stainless Steel, epoxy, and Monel

Operating Temperature:

220 degrees F (104 degrees C) maximum

Operating Pressure:

0 to 300 PSIG (21 bars)

Minimum Fluid Conductivity:

2 micromho-cm

Cable Length:

Standard: 50 feet (15 m)

Optional: Extension cable up to 50 feet
(15.2 m) maximum

Cable Type:

Submersible, polyurethane jacket

Travis NSA North Gate

Probe Diameter:

7/8" (22 mm)

Weight:

Approx. 8 lbs. (3.6 kg) with 50 ft. cable

LOCAL TOTALIZER

Display:

8 digit, non-resettable counter

Output Signal:

Relay contact, isolated SPDT (Form C), rated at 5 amperes 120 VAC resistive.

Measurement Range:

Adjustable 0.001 to 10 counts per second at full scale flow

Range Adjustment Controls:

1, 10, 100, 1000 Multiplier Switch and Binary Switch Divider select any integer from 2 through 1025.

Accuracy:

+ or - 1% plus + or - one count.

Power Supply:

From Model 63B Indicating Transmitter

1.3

OPTIONS

Indicating Transmitter Enclosure

NEMA 1 - Panel Mount

Explosion-proof - conforms to Class 1, Group D, Division 1



Instrument Data Sheet

Project Name: City of Vallejo
Travis Beck Ave Pump Station

Date: 09/19/07

Job Number: T-34898

Rev. No.:

Rev. Date:

Instrument type: Magnetic Flow Meter 16"

Loop No. : 101

Manufacturer: Rosemount

Loop Description: Pump Station Discharge Flow

Process Data

Process Medium: Water

Process Connection: 16" Flange ANSI Class 150

Process Range: 0-6 MGD

Instrument Range: 0-16524

Engineering Units: GPM

Instrument Span: 0-2083

Transmitter Data

Transmitter Tag Ref. No.: FIT-101

Transmitter Model No.: 8712DR12N0M4

Discrete Outputs: N/A

Enclosure: NEMA 4X

Signal Input: N/A

Device Power: 90-250VAC

Mounting: WALL

Signal Output: 4-20mA

Display: LCD

Sensor Data

Sensor Tag Ref. No.: FE-101

Sensor Model No.: 8705NSA160P1W0NAG1

Primary Element: Electrode

Sensor Material: 316L SS

Cable Length: 60FT

Accuracy: +/-0.25%

	<u>Flow</u>	<u>Temperature</u>	<u>Pressure</u>
Minimum:	22	0°F	0 PSI
Maximum:	16524 GPM	185°F	275 PSI

Options

Option 1: GROUNDING RINGS: (2 EA)

Option 1 Model No.: Included with Sensor

Option 2: Signal Cable 60 Feet

Option 2 Model No.: Belden 8762

Option 3: Coil Cable 60 Feet

Option 3 Model No.: Belden 8720

Special Notes: Stainless Steel Tag: FIT-101, FE-101

iPERL™ Water Management System

Electromagnetic Flow Measurement System

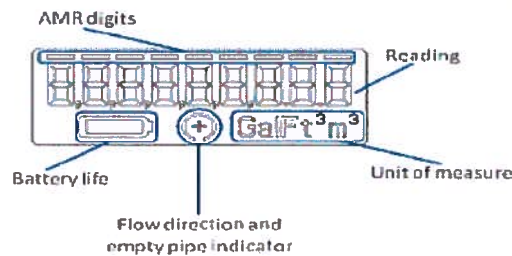
Description

5/8" (DN 15mm), 3/4" (DN 20mm) and 1" (DN 25mm) Sizes

With no moving parts, the Sensus iPERL water management system is based on innovative electromagnetic flow measurement technology. The iPERL system family has an operating range as low as 0.03 gpm (0.007 m³/hr) to 55 gpm.



Electronic Register LCD Display



Features

CONFORMANCE TO STANDARDS

The iPERL system far exceeds the most recent revision of ANSI/AWWA Standard C-700 and C-710 for accuracy and pressure loss requirements. All iPERL systems are NSF/ANSI Standard 61 Annex F and G compliant and tested to AWWA standards.

PERFORMANCE

The patented measurement technology of the iPERL system allows enhanced accuracy ranges at both low and high flows and perpetual accuracy over the life of the product and can be installed horizontally, vertically or diagonally.

CONSTRUCTION

The iPERL system is an integrated unit that incorporates an electronic register and measuring device encased in an external housing. The measuring device is comprised of a composite alloy flowtube with externally-threaded spud ends. Embedded in the flowtube are

magnetic flow sensors. The all electronic, programmable register is hermetically sealed with a tempered glass cover. The iPERL system has a 20 year life cycle, along with a 20 year battery life guarantee.

ELECTRONIC REGISTER

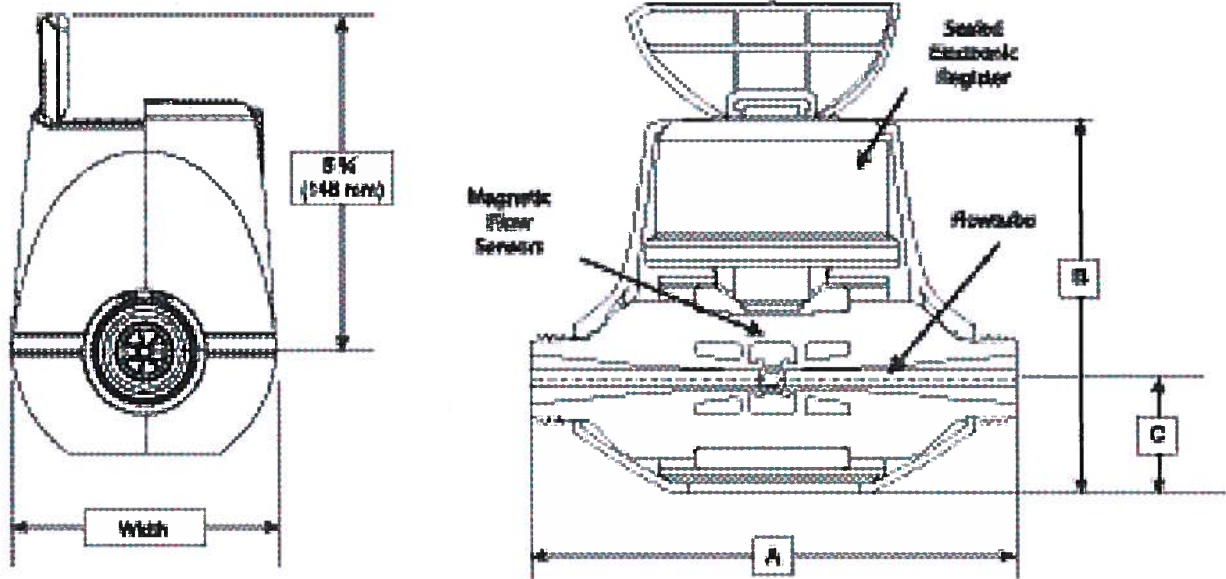
The high resolution 9-digit hermetically sealed electronic register with LCD display was designed to eliminate dirt, lens fogging issues and moisture contamination in pit settings with built in tamper protection. The tempered glass register cover displays readings with the AMR digits highlighted. Direction of flow and units of measure are also easily readable on the register display. The iPERL register features; AMR resolution and unit of measure that are fully programmable, integral customer data logging compatible with UniPro software tools. The large, easy to read display also includes battery life, empty pipe and forward/reverse flow indicators.

TAMPERPROOF FEATURES

The integrated construction of the iPERL system prevents removal of the register to obtain free water. The magnetic tamper and low field alarms will both indicate any attempt to tamper with the magnetic field of the iPERL system.

AMR / AMI SYSTEMS

iPERL systems are compatible with current Sensus AMR/AMI systems.



DIMENSIONS AND NET WEIGHTS

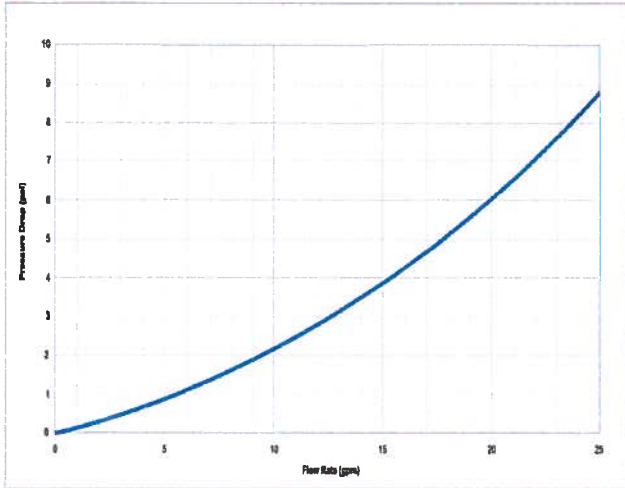
Size	A (lay length)	B	C	Spud Ends	NPSM Thread Size	Width	Net Weight
5/8" (DN 15 mm)	7-1/2" (190 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	5/8" (15 mm)	3/4" (19 mm)	4-1/2" (114 mm)	3.1 lb. (1.4 kg)
3/4"S (5/8" x 3/4") (DN 20 mm)	7-1/2" (190 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	3/4" (20 mm)	1" (25 mm)	4-1/2" (114 mm)	3.1 lb. (1.4 kg)
3/4" (DN 20 mm)	9" (229 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	3/4" (20 mm)	1" (25 mm)	4-1/2" (114 mm)	3.2 lb. (1.5 kg)
1" (DN 25 mm)	10-3/4" (273 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	1" (25 mm)	1-1/4" (32 mm)	4-1/2" (114 mm)	3.3 lb. (1.6 kg)

SPECIFICATIONS

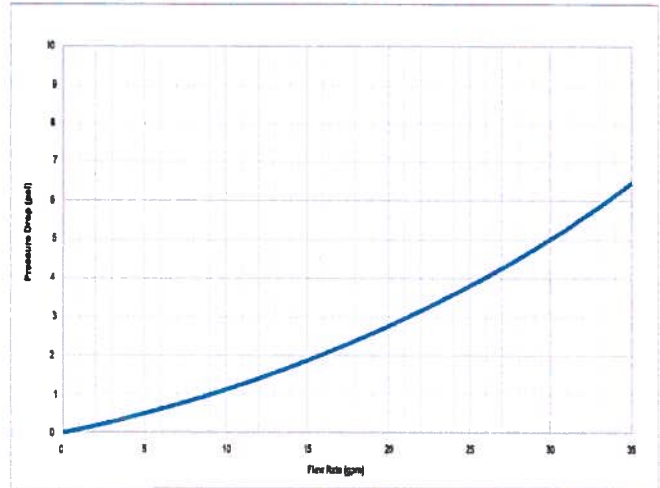
SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (0.56 °C) - 150 °F (65.6 °C)	MEASUREMENT TECHNOLOGY	Solid state electromagnetic flow
NORMAL OPERATING FLOW RANGE (±1.5%)	5/8" (DN 15mm) size: 0.18 to 25 gpm (0.04 to 5.7 m ³ /hr) 3/4" (DN 20mm) size: 0.18 to 35 gpm (0.04 to 8.0 m ³ /hr) 1" (DN 25mm) size: 0.4 to 55 gpm (0.09 to 12.5 m ³ /hr)	REGISTER	Hermetically sealed, 9-digit programmable electronic register AMR/AMI compatible iPERL system register programmable using the UniPro programming package
LOW FLOW RANGE (±3%)	5/8" (DN 15mm) size: >0.11 gpm (0.025 m ³ /hr) to <0.18 gpm (0.041 m ³ /hr) 3/4" (DN 20mm) size: >0.11 gpm (0.025 m ³ /hr) to <0.18 gpm (0.041 m ³ /hr) 1" (DN 25mm) size: >0.3 gpm (0.068 m ³ /hr) to <0.4 gpm (0.09 m ³ /hr)	MATERIALS	External housing – Thermal plastic Flowtube – Polyphenylene sulfide alloy Electrode – Silver/silver chloride Register cover – Tempered glass
STARTING FLOW	5/8" (DN 15mm) size: 0.03 gpm (0.007 m ³ /h) 3/4" (DN 20mm) size: 0.03 gpm (0.007 m ³ /h) 1" (DN 25mm) size: 0.11 gpm (0.025 m ³ /h)	ALARM DEFAULTS	Alarm Duration – 90 days Leak Duration – 24 hours Datalog Interval – 1 hour Alarm Mask – All alarms reported History Mask – All event types reported
MAXIMUM OPERATING PRESSURE	200 psi (13.8 bar)		



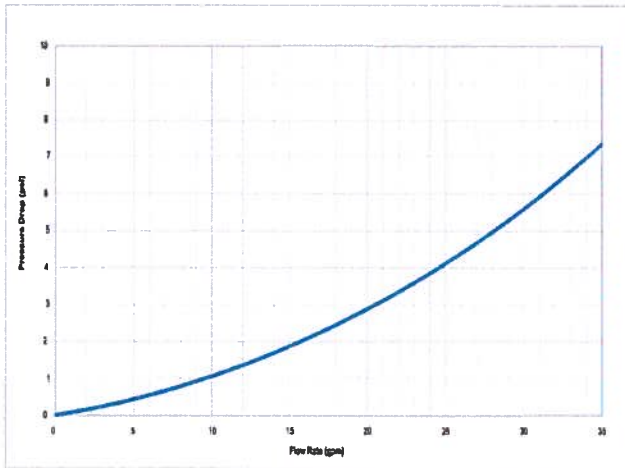
HEADLOSS CURVES



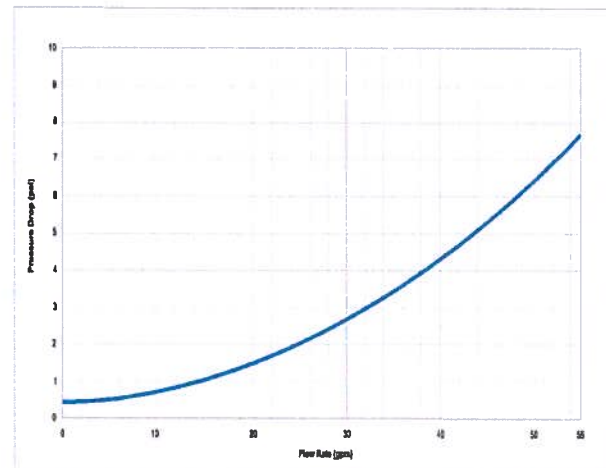
5/8" Headloss Curve



3/4" Short Headloss Curve



3/4" Headloss Curve



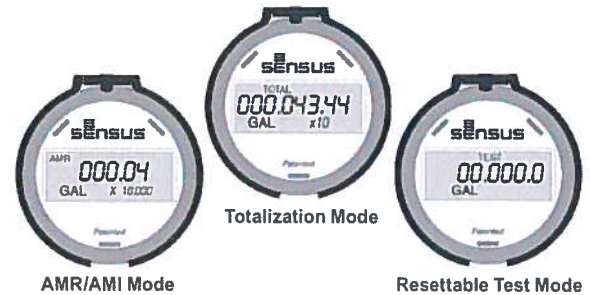
1" Headloss Curve

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OMNI™ C²1-1/2", 2", 3", 4", 6", 8" and 10" OMNI C² Meter**Description****1-1/2", 2", 3", 4", 6", 8" and 10" Sizes**

The OMNI C² meter operation is based on advanced Floating Ball Technology (FBT).

**Features****CONFORMANCE TO STANDARDS**

The OMNI C² meter meets and far exceeds the most recent revision of AWWA Standard C701 and C702 class II. Additionally, the meter does not require a valve to meet these standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved latest standards.

PERFORMANCE

The patented measurement principles of the OMNI C² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The OMNI C² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without undue wear or accuracy degradation when installed in any orientation.

CONSTRUCTION

The OMNI C² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the "floating ball" impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable measuring chamber, unique chamber seal to the

maincase using a high pressure o-ring, testing port and an AWWA compliant strainer.

OMNI ELECTRONIC REGISTER

The OMNI C² electronic register is hermetically sealed with an electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the "floating ball" impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydrodynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without friction or wear, thus creating the extended upper and lower flow ranges capable on only the OMNI C² meter.

STRAINER

The OMNI C² with the AWWA compliant "V" shaped strainer using a stainless steel screen along with Floating Ball Technology (FBT) create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance.

MAINTENANCE

The OMNI C² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and / or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers are available for the OMNI C² meters and may also be utilized for retrofitting to competitive meters to achieve increased accuracy and extended service life.

AMR / AMI SYSTEMS:

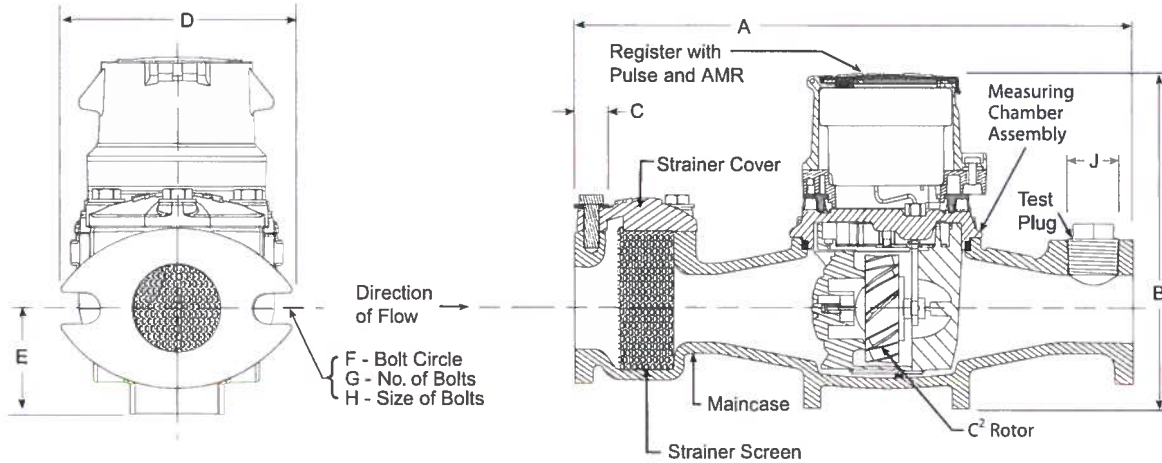
Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE:

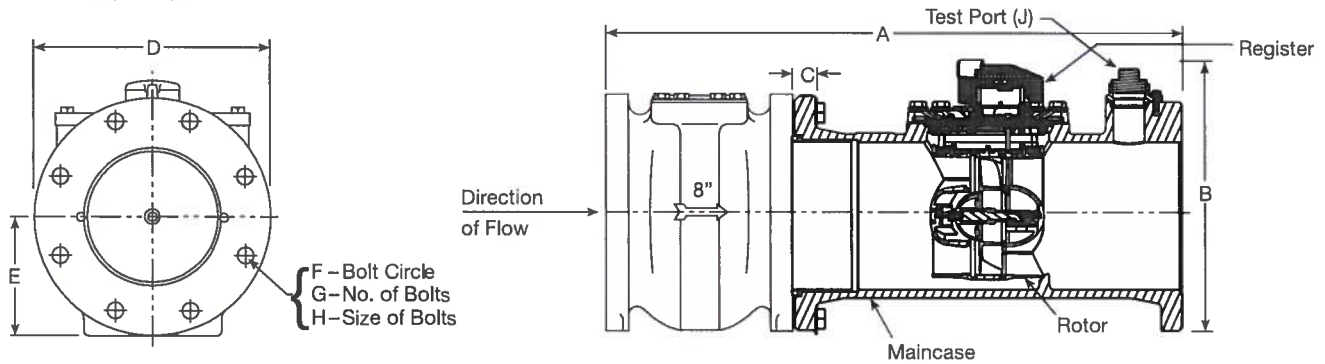
Sensus OMNI C² Meters are backed by "The Sensus Guarantee." Ask your Sensus representative for details or see Bulletin G-500.

OMNI C²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

OMNI C²: 1 1/2" - 6"



OMNI C²: 8" - 10"



DIMENSIONS AND NET WEIGHTS

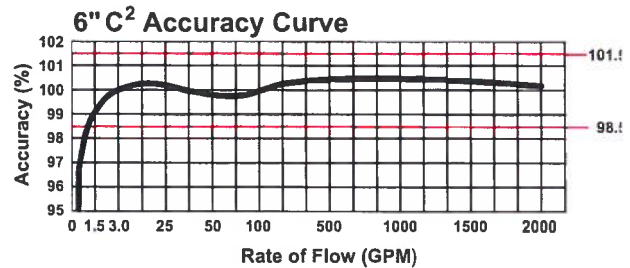
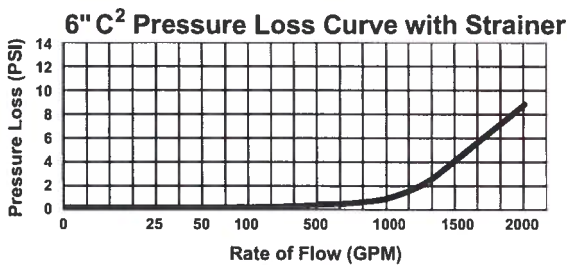
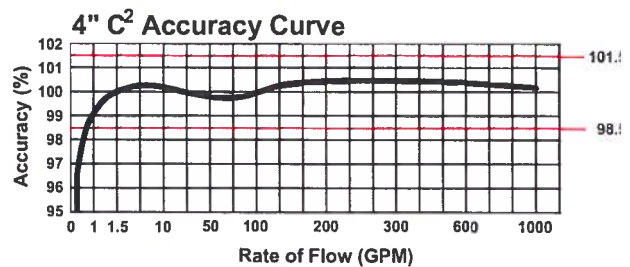
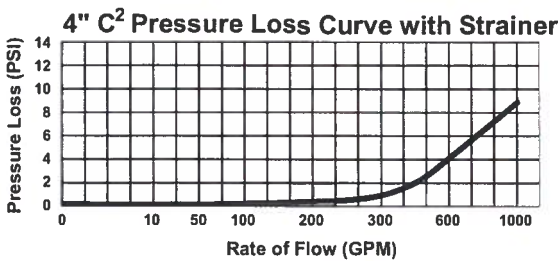
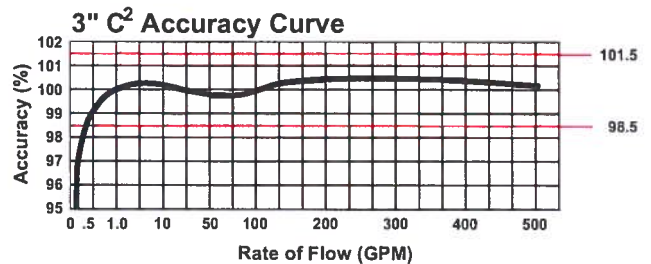
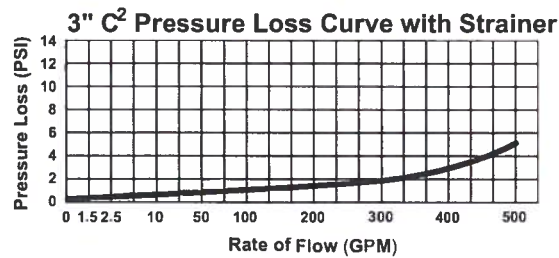
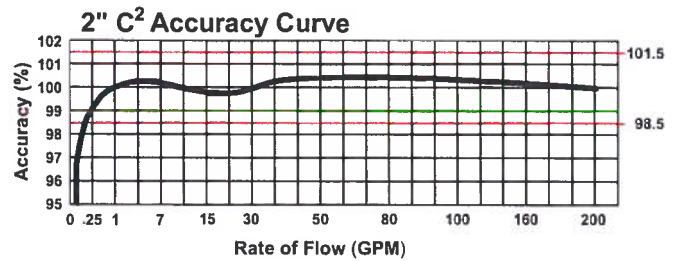
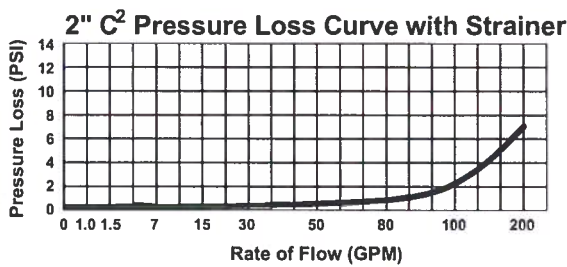
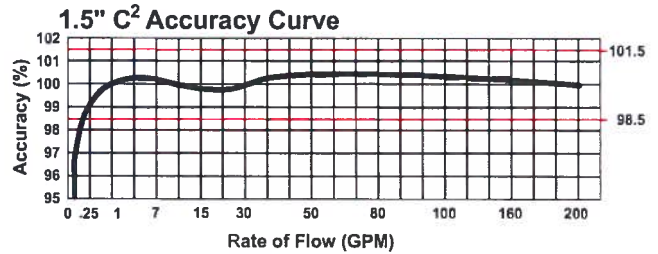
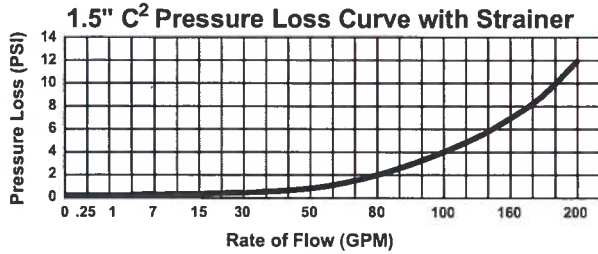
Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight
1-1/2" DN 40mm	.5 gpm .11 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	13" 330mm	7-7/8" 200mm	15/16" 24mm	5-1/8" 130mm	2-5/16" 59mm	4" 102mm	2	5/8" 16mm	1" 25mm	18.8 lbs. 8.53 kg.	22.5 lbs. 10.20 kg.
2" DN 50mm	.5 gpm .11 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	15-1/4" 387mm	7-7/8" 200mm	1" 25mm	5-3/4" 146mm	2-5/16" 59mm	4-1/2" 114mm	2	3/4" 19mm	1" 25mm	25.4 lbs. 11.39 kg.	32.5 lbs. 14.74 kg.
3" DN 80mm	1 gpm .23 m ³ /hr	500 gpm 114 m ³ /hr	Flanged	17" 432mm	8-3/4" 222mm	3/4" 19mm	7-7/8" 200mm	4-1/8" 105mm	6" 153mm	4	5/8" 16mm	1" 25mm	45 lbs. 20.41 kg.	72.8 lbs. 33.02 kg.
4" DN 100mm	1.5 gpm .34 m ³ /hr	1000 gpm 227 m ³ /hr	Flanged	20" 508mm	11-3/16" 284mm	15/16" 24mm	9-1/8" 232mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	1-1/2" 40mm	64.9 lbs. 29.44 kg.	72.8 lbs. 33.02 kg.
6" DN 150mm	3 gpm .68 m ³ /hr	2500 gpm 5687 m ³ /hr	Flanged	24" 610mm	13-1/4" 336mm	15/16" 24mm	11" 279mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	1-1/2" 40mm	130 lbs. 48.5 kg.	155 lbs. 57.8 kg.
8" DN 200mm	4 gpm .91 m ³ /hr	2700 gpm 614 m ³ /hr	Flanged	30-1/8" 765 mm	15" 381 mm	11/16" 17 mm	13-1/2" 343 mm	6-3/4" 172 mm	11-3/4" 300 mm	8	3/4" 19 mm	2" NPT	471 lbs. 214 kg.	521 lbs. 236 kg.
10" DN 250mm	5 gpm 1.1 m ³ /hr	4000 gpm 908 m ³ /hr	Flanged	41-1/8" 1045mm	19" 485mm	11/16" 17mm	16" 406mm	8-1/2" 216mm	14-1/4" 362mm	12	7/8" 22mm	2" NPT	685 lbs. 311 kg.	745 lbs. 338 kg.

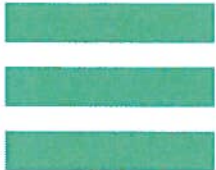
OMNI C²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes**SPECIFICATIONS**

SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (56 °C) - 150 °F (65.6 °C)
OPERATING RANGE (100% ± 1.5%)	1-1/2": .5 – 200 GPM (.11 - 45 m ³ /hr) 2": .5 – 200 GPM (.11 - 45 m ³ /hr) 3": 1.0 – 500 GPM (.23 - 114 m ³ /hr) 4": 1.5 – 1000 GPM (.34 - 227 m ³ /hr) 6": 3 – 2000 GPM (.68 - 454 m ³ /hr) 8": 4 – 2700 GPM (0.91 – 614 m ³ /hr) 10": 5-4000 GPM (1.1-908 m ³ /hr)
LOW FLOW (95% – 101.5%)	1-1/2": .25 GPM (.06 m ³ /hr) 2": .25 GPM (.06 m ³ /hr) 3": .5 GPM (.11 m ³ /hr) 4": .75 GPM (.17 m ³ /hr) 6": 1.5 GPM (.34 m ³ /hr) 8": 2.5 GPM (0.57 m ³ /hr) 10": 3.5 GPM (0.8 m ³ /hr)
MAXIMUM CONTINUOUS OPERATION	1-1/2": 160 GPM (36m ³ /hr) 2": 160 GPM (36 m ³ /hr) 3": 400 GPM (91 m ³ /hr) 4": 800 GPM (182 m ³ /hr) 6": 1600 GPM (363 m ³ /hr) 8": 2700 GPM (614 m ³ /hr) 10": 4000 GPM (908 m ³ /hr)
MAXIMUM INTERMITTENT OPERATION	1-1/2": 200 GPM (45 m ³ /hr) 2": 200 GPM (45 m ³ /hr) 3": 500 GPM (114 m ³ /hr) 4": 1000 GPM (227 m ³ /hr) 6": 2000 GPM (454 m ³ /hr) 8": 3400 GPM (773 m ³ /hr) 10": 5000 GPM (1136 m ³ /hr)
PRESSURE LOSS	1-1/2": 6.9 psi @ 160 GPM (48 bar @ 36 m ³ /hr) 2": 4.3 psi @ 160 GPM (.30 bar @ 36 m ³ /hr) 3": 3.2 psi @ 400 GPM (.22 bar @ 91 m ³ /hr) 4": 6.4 psi @ 800 GPM (.51 bar @ 182 m ³ /hr) 6": 5.5 psi @ 1600 GPM (.56 bar @ 363 m ³ /hr) 8": 4 psi @ 2700 GPM (.27 bar @ 614 m ³ /hr) 10": 4.5 psi @ 4000 GPM (.31 bar @ 908 m ³ /hr)
MAXIMUM OPERATING PRESSURE	200 PSI (13.8 bar)
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft. / Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life
NSF APPROVED MATERIALS	Maincase: Coated Ductile Iron Measuring Chamber: Thermoplastic Rotor "Floating Ball": Thermoplastic Radial Bearings: Hybrid Thermoplastic Thrust Bearings: Sapphire/Ceramic Jewel Magnets: Ceramic Magnet Strainer Screen: Stainless Steel Strainer Cover: Coated Ductile Iron Test Plug: Coated Ductile Iron

OMNI C²: 1-1/2", 2", 3", 4", and 6" Sizes

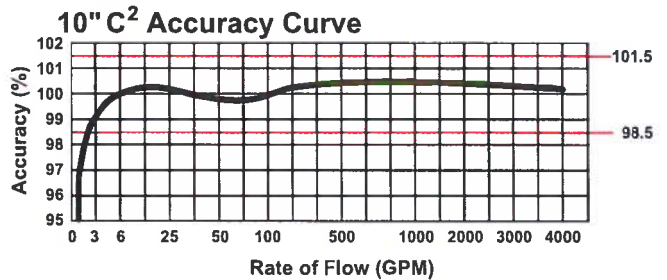
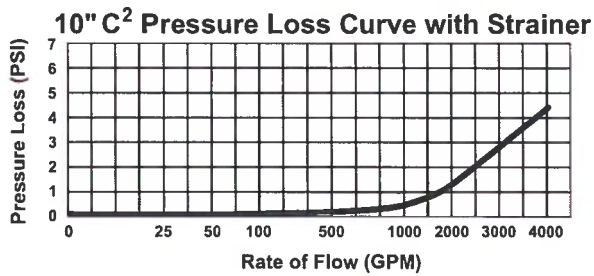
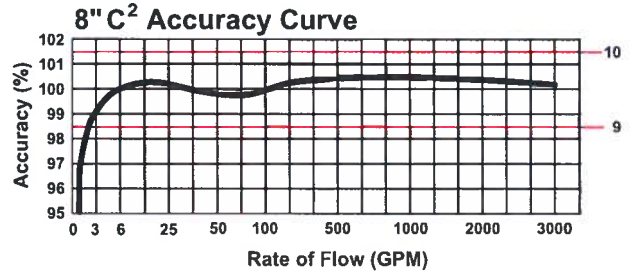
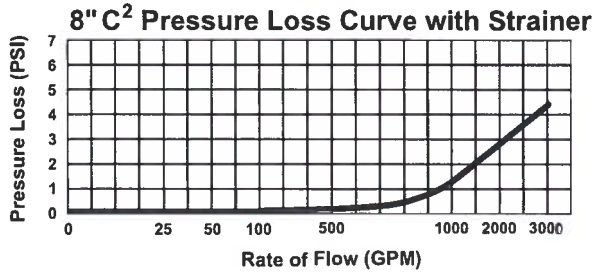
Headloss Curves





OMNI C²: 8" and 10" Sizes

Headloss Curves



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

SCOPE

These specifications set forth the minimum acceptable design criteria and performance requirements for Compound-type cold water meters including the following potential service applications and general considerations:

- Intended where a wide flow range is anticipated
- Measurement of water usage for critical billing applications
- Measurement intended for typical commercial and industrial applications requiring lower flow sensitivities
- Measurement of low flow usage below OMNI T² Meter threshold levels
- Measurement of constant low to medium flows up to high flow usage

CONFORMANCE TO STANDARDS

The meter package shall meet or exceed all requirements of ANSI/AWWA Standard C701 and C702 for Class II compound and turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

The meter package shall meet or exceed all requirements of NSF/ANSI Standard 61, Annex F and G.

MAINCASES

The meter maincase shall be of epoxy coated ductile iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for non-lead regulation compliance.

PERFORMANCE

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter / strainer assembly shall not exceed those listed in the following table per meter size.

OPERATING CHARACTERISTICS

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
1-1/2"	.25 GPM	.5 to 160 GPM	200 GPM	6.9 PSI @ 160 GPM
2"	.25 GPM	.5 to 160 GPM	200 GPM	4.3 PSI @ 160 GPM
3"	.5 GPM	1.0 to 400 GPM	500 GPM	3.2 PSI @ 400 GPM
4"	.75 GPM	1.5 to 800 GPM	1000 GPM	6.4 PSI @ 800 GPM
6"	1.5 GPM	3.0 to 1600 GPM	2000 GPM	5.5 PSI @ 1600 GPM
8"	2.5 GPM	4 to 2700 GPM	3400 GPM	4 PSI @ 2700 GPM
10"	3.5 GPM	5 to 4000 GPM	5000 GPM	4.5 PSI @ 4000 GPM

MEASURING CHAMBER

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal, stationary stainless steel shaft with sleeve bearings and be essentially weightless in water. The measuring element comes integrated with the advanced Floating Ball Technology design. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above, without the requirement of an automatic valve.

DIRECT MAGNETIC DRIVE SYSTEM

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The OMNI direct drive system with Floating Ball Technology is designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly. Any and all additional intermediate, magnetic or mechanical, drive couplings are not acceptable.

ELECTRONIC REGISTER

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register includes the following partial list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee



MAXIMUM OPERATING PRESSURE

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

STRAINERS

The meter strainer shall be integral and cast as part of the meter's maincase. The strainer's screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter's maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure ratings and physical dimensions:

Meter Size	Maximum Working Pressure	Centerline to Strainer Base	Overall Length (Not to Exceed)
1-1/2"	200 PSIG	2-5/16 INCHES	13 INCHES
2"	200 PSIG	2-5/16 INCHES	15-1/4 INCHES
3"	200 PSIG	4-1/8 INCHES	17 INCHES
4"	200 PSIG	4-3/4 INCHES	20 INCHES
6"	200 PSIG	5-3/4 INCHES	24 INCHES
8"	200 PSIG	6-3/4 INCHES	30-1/8 INCHES
10"	200 PSIG	8-1/2 INCHES	41-1/8 INCHES

STRAIGHTENING VANES

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

CONNECTIONS

Flanges for the 1-1/2" and 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3", 4", 6", 8" and 10" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

CERTIFICATIONS AND MARKINGS

All sizes of meter packages shall display the sizes, model, manufacturer name, and direction of flow. Such display shall be cast on the side of the meter maincase.

GUARANTEE AND MAINTENANCE PROGRAM

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

INTENT

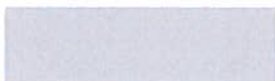
Subject meter specifications are designed to establish minimum guidelines for selecting an extremely critical metering device. Areas of concern to be evaluated in the selection process include, but are not limited to, ease of installation, operational features and benefits, readability and future system maintenance expense. A design, which reflects longevity of proper operation in all elements and high degree of sustained accuracy within the entire range of the meter assembly, is to be considered mandatory. Enhanced accuracy levels and performance are desired and will not be compromised.

RECOMMENDATION

Sensus OMNI C² Meter

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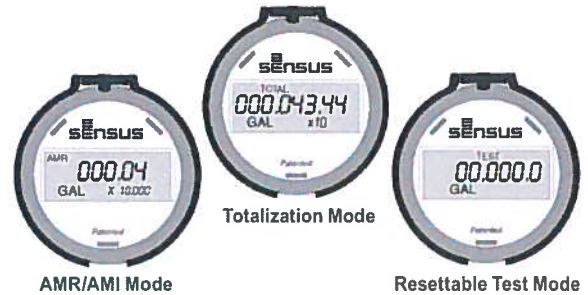
OMNI™ T²

1-1/2", 2", 3", 4", 6", 8" and 10" OMNI T² Meter

Description

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

The OMNI T² meter operation is based on advanced Floating Ball Technology (FBT).



Features

CONFORMANCE TO STANDARDS

The OMNI T² meter meets and far exceeds the most recent revision of AWWA Standard C701 class II standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved.

PERFORMANCE

The patented measurement principles of the OMNI T² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The OMNI T² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without affecting undue wear or accuracy degradation when installed in any orientation.

CONSTRUCTION

The OMNI T² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the "floating ball" impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable measuring chamber, unique chamber seal to the maincase using a high pres-

sure o-ring, testing port and a convenient integral strainer.

OMNI ELECTRONIC REGISTER

The OMNI T² electronic register consist of a hermetically sealed register with an electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with the UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the "floating ball" impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydro dynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without friction or wear, thus creating the extended

upper and lower flow ranges capable on only the OMNI T² meter.

STRAINER

The OMNI T² with the "V" shaped integral strainer using a stainless steel screen along with Floating Ball Technology (FBT) create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance.

MAINTENANCE

The OMNI T² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and / or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers Exchange are available for the OMNI T² meters and may also be utilized for retrofitting to competitive meters to achieve increased accuracy and extended service life.

AMR / AMI SYSTEMS:

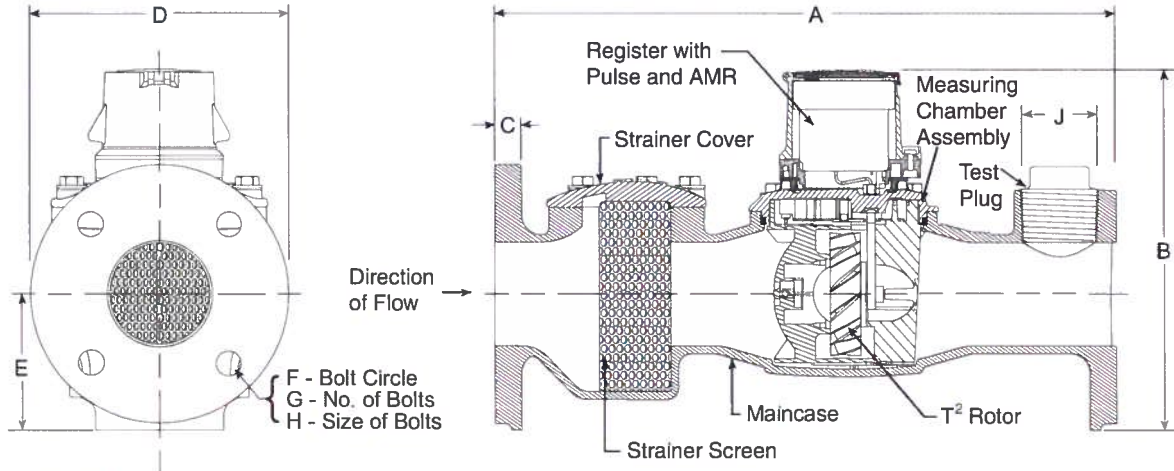
Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE:

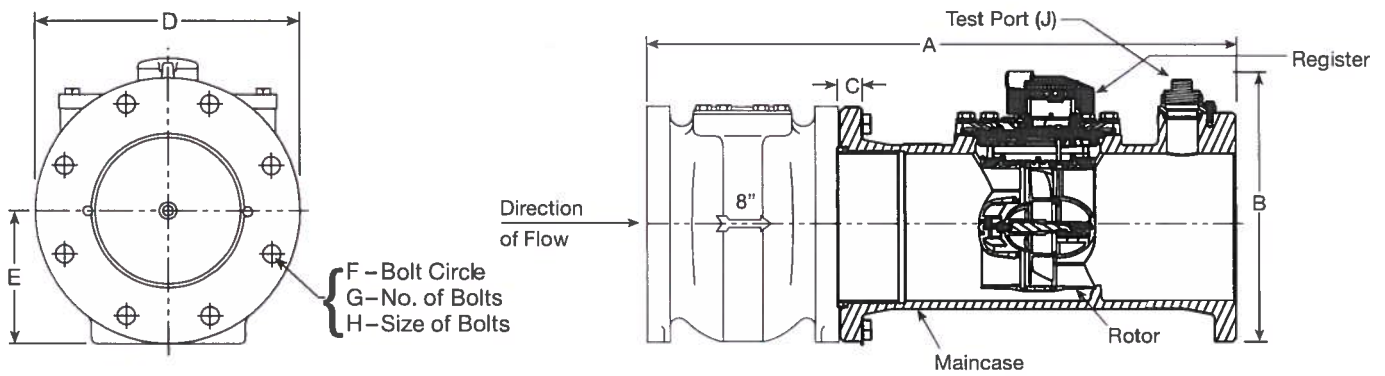
Sensus OMNI T² Meters are backed by "The Sensus Guarantee." Ask your Sensus representative for details or see Bulletin G-500.

OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

OMNI T²: 1 1/2" - 6"



OMNI T²: 8" - 10"



DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight
1-1/2" DN 40mm	1.25 gpm .28 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	13" 330mm	7-7/8" 200mm	15/16" 24mm	5-1/8" 130mm	2-5/16" 59mm	4" 102mm	2	5/8" 16mm	1" 25mm	18.8 lbs. 8.53 kg.	22.5 lbs. 10.20 kg.
2" DN 50mm	1.5 gpm .34 m ³ /hr	250 gpm 57 m ³ /hr	Flanged	17" 432mm	7-7/8" 200mm	1" 25mm	5-3/4" 146mm	2-5/16" 59mm	4-1/2" 114mm	2	3/4" 19mm	1-1/2" 40mm	27.4 lbs. 12.42 kg.	34.5 lbs. 15.65 kg.
2" without Strainer DN 50mm	1.5 gpm .34 m ³ /hr	250 gpm 57 m ³ /hr	Flanged	10" 254mm	7-7/8" 200mm	1" 25mm	5-3/4" 146mm	2-5/16" 59mm	4-1/2" 114mm	2	3/4" 19mm	N/A	17.4 lbs. 7.9 kg.	24.5 lbs. 11.11 kg.
3" DN 80mm	2.5 gpm .57 m ³ /hr	650 gpm 148 m ³ /hr	Flanged	19" 432mm	8-3/4" 222mm	3/4" 19mm	7-7/8" 200mm	4-1/8" 105mm	6" 153mm	4	5/8" 16mm	2" 50mm	48.5 lbs. 22.00 kg.	57.4 lbs. 26.04 kg.
4" DN 100mm	3.0 gpm .68 m ³ /hr	1250 gpm 284 m ³ /hr	Flanged	23" 584mm	11-3/16" 284mm	15/16" 24mm	9-1/8" 232mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	2" 50mm	67.9 lbs. 30.80 kg.	75.8 lbs. 34.38 kg.
6" DN 150mm	4 gpm .91 m ³ /hr	2500 gpm 568 m ³ /hr	Flanged	27" 685mm	13-1/4" 336mm	15/16" 24mm	11" 279mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	2" 50mm	140 lbs. 52.3 kg.	165 lbs. 61.6 kg.
8" DN 200mm	5 gpm 1.1 m ³ /hr	3500 gpm 795 m ³ /hr	Flanged	30-1/8" 765 mm	15" 381 mm	11/16" 17 mm	13-1/2" 343 mm	6-3/4" 172 mm	11-3/4" 300 mm	8	3/4" 19 mm	2" NPT	471 lbs. 214 kg.	521 lbs. 236 kg.
10" DN 250mm	6 gpm 1.4 m ³ /hr	5500 gpm 1249 m ³ /hr	Flanged	41-1/8"	19"	11/16"	16"	8-1/2"	14-1/4"	12	7/8" 22mm	2" NPT	685 lbs. 311 kg.	745 lbs. 338 kg.

OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

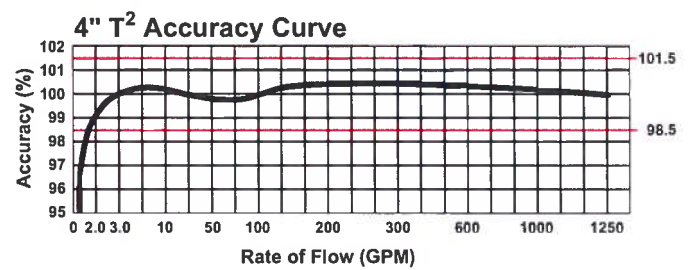
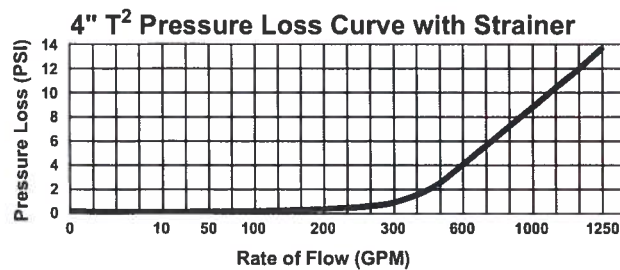
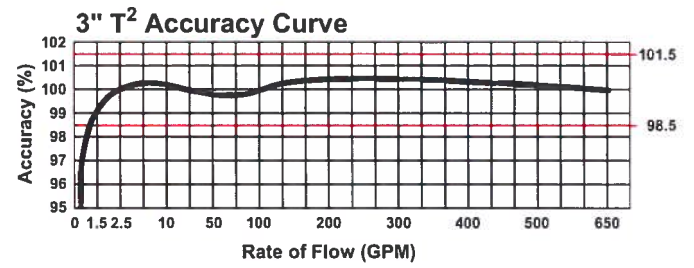
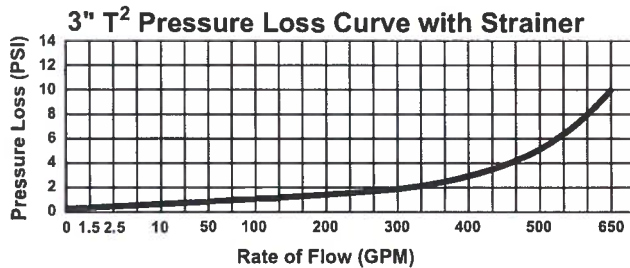
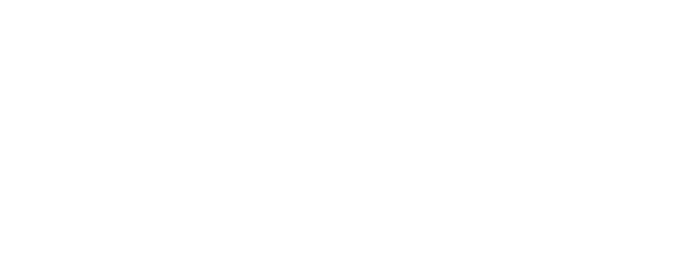
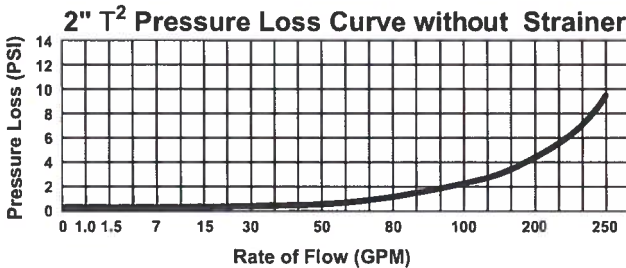
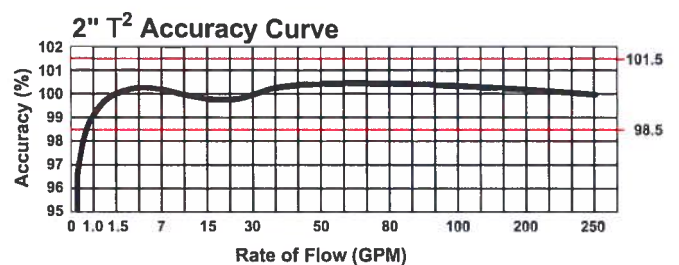
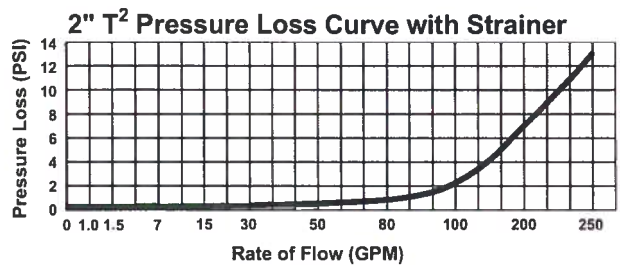
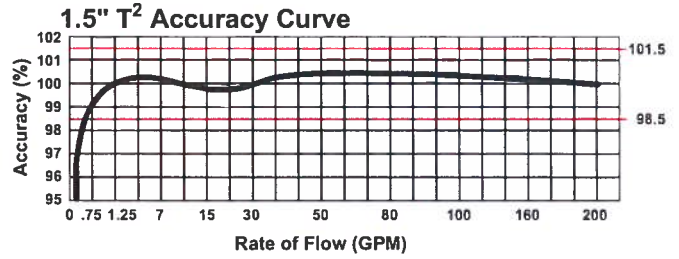
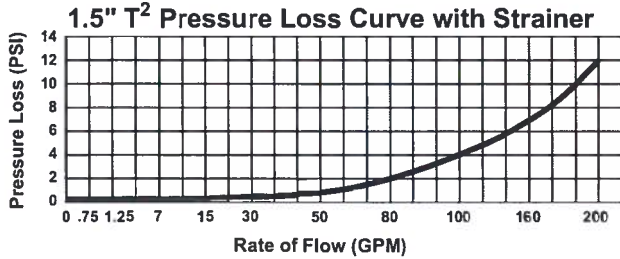
SPECIFICATIONS

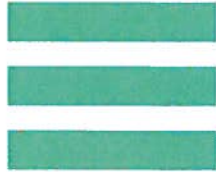
SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (56 °C) - 150 °F (65.6 °C)
OPERATING RANGE (100% ± 1.5%)	1-1/2": 1.25 – 200 GPM (.28 - 45 m ³ /hr) 2" and 2" without Strainer: 1.5 – 250 GPM (.34 – 57 m ³ /hr) 3": 2.5 – 650 GPM (.57 – 148 m ³ /hr) 4": 3 – 1250 GPM (.68 – 284 m ³ /hr) 6": 4 – 2500 GPM (.91 – 568 m ³ /hr) 8": 5 – 3500 GPM (1.1-795 m ³ /hr) 10": 6 – 5500 GPM (1.4 - 1249 m ³ /hr)
LOW FLOW (95% – 101.5%)	1-1/2": .75 GPM (.17 m ³ /hr) 2" and 2" without Strainer: 1.0 GPM (.23 m ³ /hr) 3": 1.5 GPM (.34 m ³ /hr) 4": 2.0 GPM (.45 m ³ /hr) 6": 2.5 GPM (.57 m ³ /hr) 8": 4 GPM (0.9 m ³ /hr) 10": 5 GPM (1.1 m ³ /hr)
MAXIMUM CONTINUOUS OPERATION	1-1/2": 160 GPM (36 m ³ /hr) 2" and 2" without Strainer: 200 GPM (45 m ³ /hr) 3": 500 GPM (114 m ³ /hr) 4": 1000 GPM (227 m ³ /hr) 6": 2000 GPM (454 m ³ /hr) 8": 3500 GPM (795 m ³ /hr) 10": 5500 GPM (1249 m ³ /hr)
MAXIMUM INTERMITTENT OPERATION	1-1/2": 200 GPM (45 m ³ /hr) 2" and 2" without Strainer: 250 GPM (57 m ³ /hr) 3": 650 GPM (148 m ³ /hr) 4": 1250 GPM (284 m ³ /hr) 6": 2500 GPM (568 m ³ /hr) 8": 4700 GPM (1067 m ³ /hr) 10": 7000 GPM (1590 m ³ /hr)
PRESSURE LOSS	1-1/2": 6.9 psi @ 160 GPM (48 bar @ 36 m ³ /hr) 2" and 2" without Strainer: 7.0 psi @ 200 GPM (.48 bar @ 45 m ³ /hr) 3": 5.1 psi @ 500 GPM (.35 bar @ 114 m ³ /hr) 4": 8.7 psi @ 1000 GPM (.60 bar @ 227 m ³ /hr) 6": 8.2 psi @ 2000 GPM (.56 bar @ 454 m ³ /hr) 8": 5.1 psi @ 3500 GPM (.35 bar @ 795 m ³ /hr) 10": 7.2 psi @ 5500 GPM (.50 bar @ 1249 m ³ /hr)
MAXIMUM OPERATING PRESSURE	200 PSI (13.8 bar)
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft. / Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life
NSF APPROVED MATERIALS	Maincase: Coated Ductile Iron Measuring Chamber: Thermoplastic Rotor "Floating Ball": Thermoplastic Radial Bearings: Hybrid Thermoplastic Thrust Bearings: Sapphire/Ceramic Jewel Magnets: Ceramic Magnet Strainer Screen: Stainless Steel Strainer Cover: Coated Ductile Iron Test Plug: Coated Ductile Iron



OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

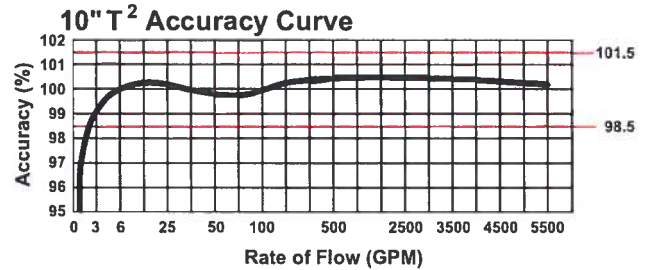
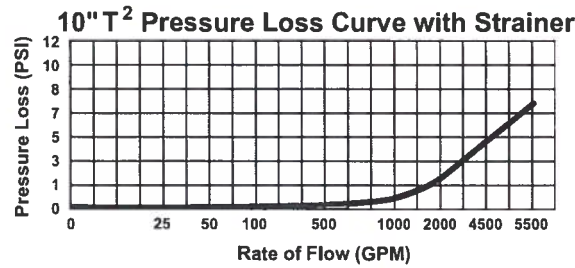
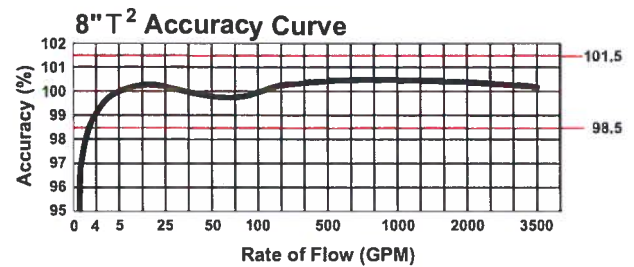
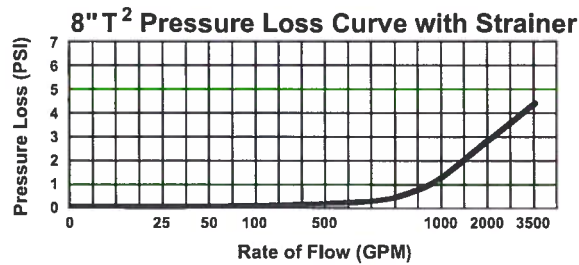
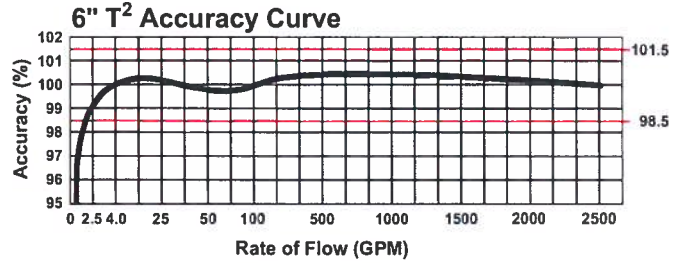
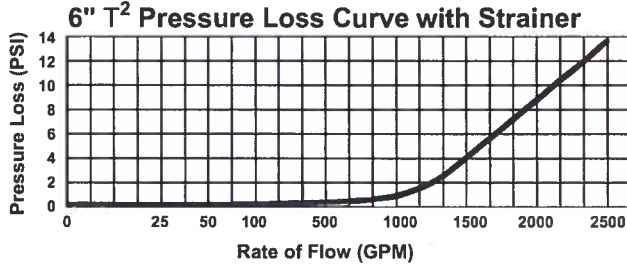
Headloss Curves





OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

Headloss Curves



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

SCOPE

These specifications set forth the minimum acceptable design criteria and performance requirements for Turbine-type cold water meters including the following potential service applications and general considerations:

- Intended where a moderately wide flow range is anticipated
- Measurement of water usage for typical billing applications
- Measurement intended for typical commercial and industrial applications
- Measurement of low flow usage above OMNI C² Meter threshold levels
- Measurement of constant medium to extended high flow usage

CONFORMANCE TO STANDARDS

The meter package shall meet or exceed all requirements of ANSI/AWWA Standard C701 for Class II turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

The meter package shall meet or exceed all requirements of NSF/ANSI Standard 61, Annex F and G.

MAINCASES

The meter maincase shall be of epoxy coated ductile iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for non-lead regulation compliance.

PERFORMANCE

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter/strainer assembly shall not exceed those listed in the following table per meter size.

OPERATING CHARACTERISTICS

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
1-1/2"	.75 GPM	1.25 to 160 GPM	200 GPM	6.9 PSI @ 160 GPM
2"	1.0 GPM	1.5 to 200 GPM	250 GPM	7.0 PSI @ 200 GPM
3"	1.5 GPM	2.5 to 500 GPM	650 GPM	5.1 PSI @ 500 GPM
4"	2.0 GPM	3.0 to 1000 GPM	1250 GPM	8.7 PSI @ 1000 GPM
6"	2.5 GPM	4.0 to 2000 GPM	2500 GPM	8.2 PSI @ 2000 GPM
8"	4 GPM	5 to 3500 GPM	4700 GPM	5.1 PSI @ 3500 GPM
10"	5 GPM	6 to 5500 GPM	7000 GPM	7.2 PSI @ 5500 GPM

MEASURING CHAMBER

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal, stationary stainless steel shaft with sleeve bearings and be essentially weightless in water. The measuring element comes integrated with the advanced Floating Ball Technology design. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above.

DIRECT MAGNETIC DRIVE SYSTEM

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The OMNI direct drive system with Floating Ball Technology is designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly. Any and all additional intermediate, magnetic or mechanical, drive couplings are not acceptable.

ELECTRONIC REGISTER

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register includes the following partial list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee



MAXIMUM OPERATING PRESSURE

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

STRAINERS

The meter strainer shall be integral and cast as part of the meter's maincase. The strainer's screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter's maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure ratings and physical dimensions:

Meter Size	Maximum Operating Pressure	Centerline to Strainer Base	Overall Length (Not to Exceed)
1-1/2"	200 PSIG	2-5/16 INCHES	13 INCHES
2"	200 PSIG	2-5/16 INCHES	17 INCHES
3"	200 PSIG	4-1/8 INCHES	19 INCHES
4"	200 PSIG	4-3/4 INCHES	23 INCHES
6"	200 PSIG	5-3/4 INCHES	27 INCHES
8"	200 PSIG	6-3/4 INCHES	30-1/8 INCHES
10"	200 PSIG	8-1/2 INCHES	41-1/8 INCHES

STRAIGHTENING VANES

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

CONNECTIONS

Flanges for the 1-1/2" and 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3", 4", 6", 8" and 10" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

CERTIFICATIONS AND MARKINGS

All sizes of meter packages shall display the sizes, model, manufacturer name, and direction of flow. Such display shall be cast on the side of the meter maincase.

GUARANTEE AND MAINTENANCE PROGRAM

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

INTENT

Subject meter specifications are designed to establish minimum guidelines for selecting an extremely critical metering device. Areas of concern to be evaluated in the selection process include, but are not limited to, ease of installation, operational features and benefits, readability and future system maintenance expense. A design, which reflects longevity of proper operation in all elements and high degree of sustained accuracy within the entire range of the meter assembly, is to be considered mandatory. Enhanced accuracy levels and performance are desired and will not be compromised.

RECOMMENDATION

Sensus

OMNI T² Meter

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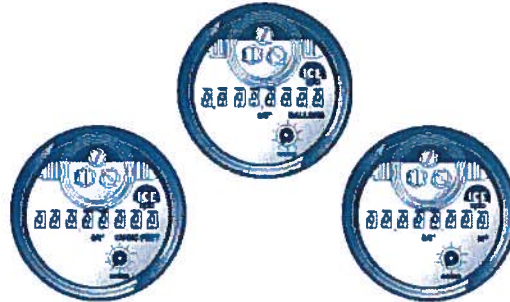
SR II® Low Lead Meters

Displacement Type Magnetic Drive Cold Water Meters

Description

5/8" (DN 15mm), 3/4" (DN 20mm) and 1" (DN 25mm) Sizes

Measurement of cold water where flow is in one direction only; in residential, commercial and industrial services.



5/8" AMR / AMI System Dials Shown

Features

CONFORMANCE TO STANDARDS

Sensus SR II Low Lead Water Meters meet the requirements of NSF Standard 61, Annex F and G and comply with ANSI/AWWA Standard C700-latest revision. Each meter is tested to insure compliance with AWWA standards.

CONSTRUCTION

Sensus SR II Low Lead Water Meters consist of three basic components: maincase; measuring chamber; and sealed register. Maincases are made of Bismuth BiAlloy CDA89836 or EnviroBrass™ II C89520 with externally-threaded spuds. Registers are housed in a bonnet of synthetic polymer. Measuring chambers are of Rocksyn®, a corrosion-resistant, tailored thermoplastic material formulated for long-term performance and especially suitable for aggressive water conditions. Maincase bottom plates are available in Bismuth BiAlloy, EnviroBrass II or, if frost protection is desired, in cast iron or synthetic polymer¹.

SEALED REGISTER

Hermetically sealed; proven magnetic drive design eliminates dirt and moisture contamination, tampering and lens fogging problems. Standard register includes a straight-reading, odometer-type totalization display; a 360° test circle with center sweep hand; and a low flow (leak) de-

tor. Gears are self-lubricating, molded plastic for long life and minimum friction.

No change gears are required for accuracy calibration. Encodertype remote reading systems are available for all SR II Low Lead Water Meters. (See other side of sheet for additional information.)

TAMPERPROOF FEATURES

A unique locking system prevents customer removal of the register to obtain free water. The register can only be removed by breaking the register bonnet.

MAGNETIC DRIVE

The SR II Low Lead features a hydrodynamically cushioned design that eliminates premature wear of components. The meter utilizes a patented positive, reliable drive coupling. The high-strength magnets used will eliminate "drive slip" in normal use and also provide adequate strength to drive remote register units.

OPERATION

Water flows through the meter's strainer and into the measuring chamber where it drives the piston. The hydrodynamically balanced piston oscillates around a central hub, guided by the division plate.

A drive magnet transmits the motion of the piston to a driven magnet located within the hermetically sealed register.

The driven magnet is connected to the register gear train. It reduces the piston oscillations into volume totalization units displayed on the register dial face.

MAINTENANCE

Sensus SR II Low Lead Water Meters are engineered to provide long-term value and virtually maintenance-free operation. Simplicity of design allows interchangeability of parts of like-size meters, reduced parts inventory requirements, and ease of maintenance. The register can be removed without relieving the water pressure or removing the maincase from the installation.

CONNECTIONS

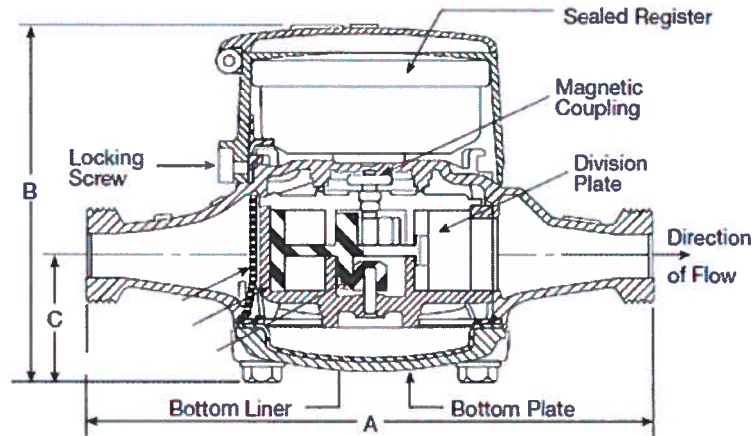
Tailpieces/Unions for installing the meters on a variety of pipe types and sizes are available.

AMR / AMI SYSTEMS

Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE

Sensus SR II Water Meters are backed by "The Sensus Guarantee." Ask your Sensus representative for details or see Bulletin G-500.



DIMENSIONS AND NET WEIGHTS

Meter Size	A	B (Direct Read Register)	C	Width	Net Weight ¹
5/8" (DN 15mm)	7-1/2" (190mm)	5.0" (127mm)	1-3/4" (44mm)	3-7/8" (98mm)	4.3 lb. (1.97 kg)
5/8" x 3/4" (DN 15mm X 33mm)	7-1/2" (190mm)	5.0" (127mm)	1-3/4" (44mm)	3-7/8" (98mm)	4.4 lb. (2.00 kg)
3/4" (DN 20mm)	9" (229mm)	5-1/2" (140mm)	2-3/16" (56mm)	4-1/2" (114mm)	6.4 lb. (2.90 kg)
3/4" Short (DN 20mm)	7-1/2" (190mm)	5-1/2" (140mm)	2-3/16" (56mm)	4-1/2" (114mm)	6.2 lb. (2.81 kg)
1" (DN 25mm)	10-3/4" (273mm)	6-9/16" (167mm)	2-7/16" (62mm)	6-1/2" (165mm)	11.9 lb. (5.4 kg)

¹ With Rocksyn® measuring chamber

SPECIFICATIONS

SERVICE	Measurement of potable and reclaim water.
NORMAL OPERATING FLOW RANGE ¹ <small>(100% ±1.5%)</small>	5/8" (DN 15mm) size: 1 to 20 gpm (0.25 to 4.5 m ³ /hr) 3/4" (DN 20mm) size: 2 to 30 gpm (0.45 to 7.0 m ³ /hr) 1" (DN 25mm) size: 3 to 50 gpm (0.7 to 11.0 m ³ /hr)
LOW FLOW REGISTRATION <small>(95% - 101.5%)</small>	5/8" size: 1/4 gpm (0.06 m ³ /hr) 3/4" size: 1/2 gpm (0.10 m ³ /hr) 1" size: 3/4 gpm (0.15 m ³ /hr)
MAXIMUM PRESSURE LOSS	5/8" size: 7.0 psi at 20 gpm (0.5 bar at 4.5 m ³ /hr) 3/4" size: 9.0 psi at 30 gpm (0.6 bar at 7.0 m ³ /hr) 1" size: 7.3 psi at 50 gpm (0.5 bar at 11.0 m ³ /hr)
MAXIMUM OPERATING PRESSURE	150 psi (10.0 bar)
MEASURING ELEMENT	Oscillating piston
REGISTER ²	Straight reading, hermetically sealed, magnetic drive. Remote reading unit optional.
STANDARD METER REGISTRATION ³	10 gallons, 1 cubic foot, or 0.01 m ³ or 0.1 m ³ /sweep hand revolution. 10,000,000 gallons, 1,000,000 cubic feet or 100,000 m ³ capacity. 8 odometer wheels

METER CONNECTIONS ³	5/8" (DN 15mm) size: 3/4" (26.4mm) threads 5/8" x 3/4" (DN 15mm x 33mm) size: 1" (33.25mm) threads 3/4" (DN 20mm) size: 1" (33.25mm) threads 1" (DN 25mm) size: 1-1/4" (41.9mm) threads (All threads are straight pipe, external type, conforming to ANSI B1.20.1 or ISO R228, if specified.)
MATERIALS	Maincase: Bismuth BiAlloy CDA89836 or EnviroBrass II C89520 Register box: Synthetic polymer Measuring chamber: Rocksyn® Bottom plate: Bismuth BiAlloy CDA89836 Magnets: Plasticized material Casing bolts: Stainless steel Strainer: Synthetic polymer

¹ Maximum rates listed are for intermittent flow only. Maximum continuous flow rates as specified by AWWA are:

5/8" (DN 15mm)—10 gpm (2.3 m³/hr)
3/4" (DN 20mm)—15 gpm (3.4 m³/hr)
1" (DN 25mm)—25 gpm (5.7 m³/hr)

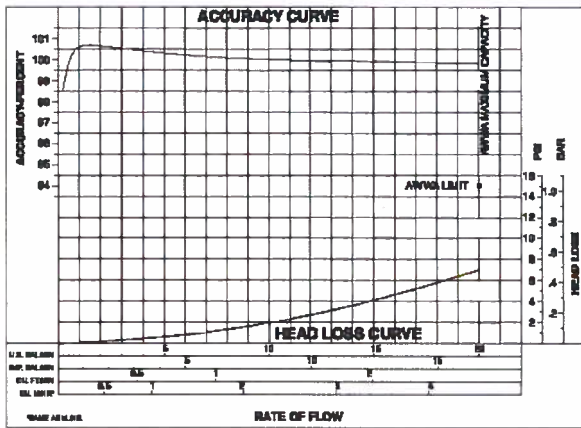
² Unless otherwise noted, 5/8" size and 5/8" x 3/4" characteristics are identical. 5/8" x 3/4" designates 5/8" with 3/4" connection thread. Metric designation is the normal bore x the outside diameter.

³ See ICE-Opto Register Datasheet or Electronic Register Datasheet for details specifications.

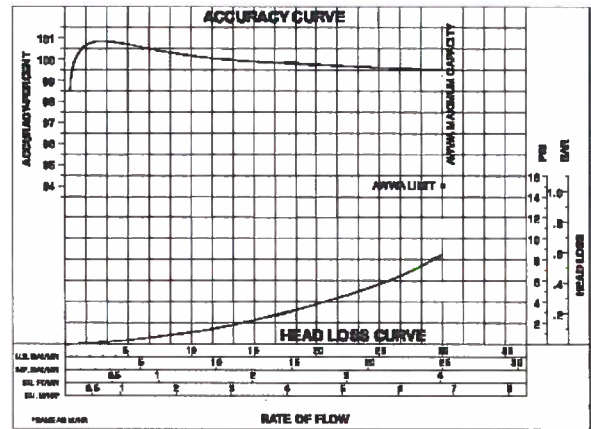
TYPICAL PERFORMANCE CURVES

SR II Meter

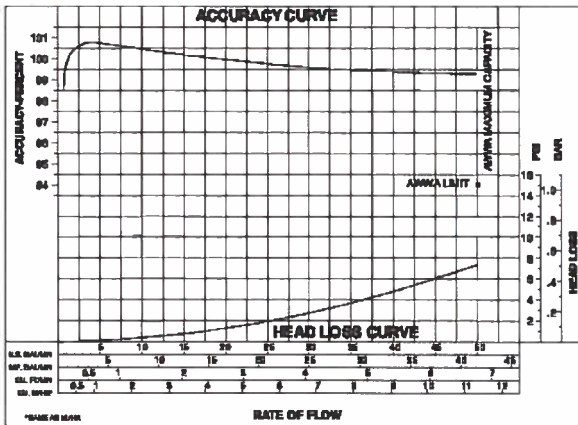
5/8" and 5/8" x 3/4" SR II Meter
UA-5833



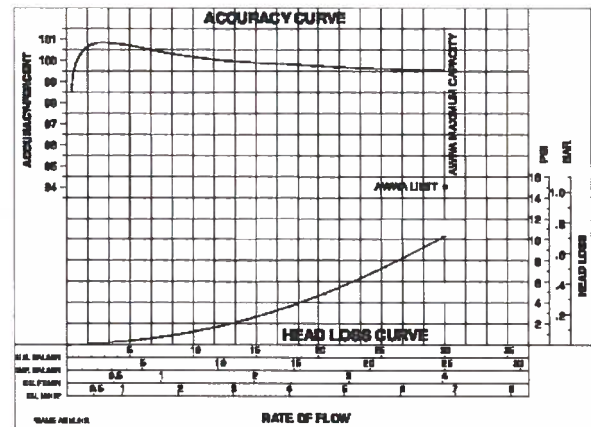
3/4" and 3/4" x 1" SR II Meter
UA-5834



1" SR II Meter
UA-5835



3/4" SR II Meter 7-1/2" Laying Length
UA-5838



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SR II® Meters

Specifications (Low Lead Maincase)

For Cold Water Meters Displacement Type with Direct Read Registers 5/8" - 1" SR II Sizes

TYPE

Magnetic Drive, Sealed Register, Positive Displacement Type Oscillating Piston only.

SIZE

Must conform to American Water Works Standard C-700 as most recently revised.

LENGTH

Must conform to American Water Works Standard C-700 as most recently revised. CASES All Meters shall have a non-corrosive Bismuth BiAlloy CDA89836 or EnviroBrass™ II C89520 alloy outer case with a separate measuring chamber which can be easily removed from the case. All Meters shall have cast on them, in raised characters, the size and direction of water flow through the meter. Cast Iron frost bottoms, EnviroBrass II or Bismuth BiAlloy bottoms shall be provided on 5/8", 3/4", and 1" Meters. Maincase will be marked with a "BA" or "EB" to denote the material used which meets the requirements of ANSI/NSF Standard 61, Annex F and G.

EXTERNAL BOLTS AND WASHERS

All external bolts and washers shall be of corrosion resistant material and be easily removed from the maincase. All threaded maincase bolt holes must be covered, to aid in removal of the bolts for repair.

REGISTER

The register must be of the straight reading type with a large red test or sweep hand and shall include a low flow indicator on the dial face. The numeral wheel assembly shall be located at the bottom of the dial face with reading obtained from left to right. All reduction gearing shall be contained in a permanently hermetically sealed, tamperproof enclosure made from a stainless steel material, covered with a heat tempered glass lens.

The register shall be attached to the meter utilizing a plastic bonnet register box. The register shall be secured to the maincase by means of a tamper-resistant bonnet so that the register cannot be removed without the bonnet being destroyed. The register must be field replaceable.

MEASURING CHAMBER

The measuring chamber shall be a suitable synthetic polymer and shall not be cast as part of the maincase. All piston assemblies shall be interchangeable in all measuring cham-

ber assemblies of the same size. The measuring chamber piston shall operate against a replaceable control roller, allowing for repair to AWWA standards. The control roller shall rotate on a stainless measuring chamber steel pin, to provide added strength, wear resistance and corrosion resistance. There shall be an elastomeric seal or seals between measured and unmeasured water, preventing leakage around the measuring element.

MAGNETIC COUPLING

The motion of the piston will be transmitted to the sealed register through the use of a magnetic coupling.

STRAINERS

All meters must be provided with a corrosion-resistant strainer, with an effective straining area at least twice the bore diameter which can be easily removed from the meter without the meter itself being disconnected from the pipeline.

CHANGE GEARS

Change gears will not be allowed to calibrate the meter. All registers of a particular registration and meter size shall be identical and completely interchangeable. Should meters arrive with registers containing more than one gear combination, the entire shipment will be returned to the manufacturer freight collect and the next responsible bidder will receive the award.

ACCURACY AND HEADLOSS TESTS

Meters shall conform to current AWWA C-700, current revision, test flows, headloss and accuracy standards.

PRESSURE CAPABILITY

Meters shall operate up to a working pressure of 150 pounds per square inch (psi), without leakage or damage to any parts. The accuracy shall not be affected by variation in pressure up to 150 psi.

PERFORMANCE WARRANTIES

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

SHIPMENT VERIFICATIONS

A statistically controlled sample of each meter shipment will be tested by the utility to insure each shipment meets the utility performance and materials specifications.

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CITYWIDE WATER SYSTEM

Location	Quantity	Frequency	Type of Equipment
Alta Loma .54 Tank	1	Semi-annually	Level Transmitter
Burnham Street Pump Station	1	Semi-annually	Flow Transmitter
Burnham Street Pump Station	1	Semi-annually	Level Transmitter
Burnham Street Pump Station	1	Semi-annually	Pressure Switch - Discharge
Burnham Street Pump Station	1	Semi-annually	Pressure Switch - Suction
Carter Street Pump Station	1	Semi-annually	Pressure Switch - Discharge
Carter Street Pump Station	1	Semi-annually	Pressure Switch - Suction
Chabot Pump Station	2	Semi-annually	Chart Recorder - Discharge Pressure
Chabot Pump Station	2	Semi-annually	Chart Recorder - Suction Pressure
Chabot Pump Station	2	Semi-annually	Flow Transmitter
Chabot Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Chabot Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Chabot Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Chabot Pump Station	1	Semi-annually	Pressure Transmitter - Suction
Cimarron .54 MG Tank	1	Semi-annually	Level Transmitter
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Chart Recorder - Discharge Pressure
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Chart Recorder - Flow
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Chart Recorder - Suction Pressure
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Flow Transmitter
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Columbus Pkwy 400 zone Pump Station	1	Semi-annually	Pressure Transmitter - Suction
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Chart Recorder - Discharge Pressure
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Chart Recorder - Flow
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Chart Recorder - Suction Pressure
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Flow Transmitter
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Pressure Switch - Low Discharge
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Columbus Pkwy 600 zone Pump Station	1	Semi-annually	Pressure Transmitter - Suction
Cordelia Pump Station	1	Semi-annually	Flow Transmitter
Cordelia Pump Station	1	Semi-annually	Level Transmitter
Cordelia Pump Station	1	Annually	Pressure Switch - High Discharge
Cordelia Pump Station	1	Annually	Pressure Switch - Low Discharge
Cordelia Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Dos Reis Reservoirs	1	Semi-annually	Level Transmitter
Fleming Hill WTP	2	Weekly	Chlorine Analyzer (Hach)
Fleming Hill WTP	1	Weekly	Combined filtered water turbidimeter
Fleming Hill WTP	2	Weekly	Fluoride Analyzer
Fleming Hill WTP	1	Weekly	Turbidity Meter
Fleming Hill WTP	1	Monthly	A.I.T Scrubber Exhaust
Fleming Hill WTP	4	Monthly	Chlorine Leak Detector
Fleming Hill WTP	1	Monthly	Conductivity Analyzer
Fleming Hill WTP	4	Monthly	Effluent Flow Meter
Fleming Hill WTP	1	Monthly	Flow Transmitter (Clearwell)
Fleming Hill WTP	2	Monthly	Fluoride Analyzer
Fleming Hill WTP	2	Monthly	O3 Dissolved Analyzer
Fleming Hill WTP	1	Monthly	pH Analyzer
Fleming Hill WTP	2	Monthly	pH Analyzer
Fleming Hill WTP	4	Monthly	Pressure Transmitter (Gas House)

Fleming Hill WTP	2 Monthly	Streaming Current
Fleming Hill WTP	21 Monthly	Turbidity Meter
Fleming Hill WTP	3 Monthly	UPS
Fleming Hill WTP	1 8 Weeks	Fluoride Analyzer
Fleming Hill WTP	16 Quarterly	Filter Head Loss Indicators
Fleming Hill WTP	1 Quarterly	Hydro Battery Set
Fleming Hill WTP	2 Quarterly	Influent Flow Meter
Fleming Hill WTP	1 Quarterly	Level Transmitter - Lox
Fleming Hill WTP	2 Quarterly	O3 Gas Analyzer Ambient
Fleming Hill WTP	3 Quarterly	O3 Gas Analyzer Concentration
Fleming Hill WTP	8 Quarterly	O3 Off Gas Analyzer
Fleming Hill WTP	12 Quarterly	O3 Pressure Transmitter
Fleming Hill WTP	1 Semi-annually	Fluoride Analyzer
Fleming Hill WTP	15 Semi-annually	Metering pump motors
Fleming Hill WTP	15 Semi-annually	Metering Pumps
Fleming Hill WTP	6 Semi-annually	Metering Pumps - DC
Fleming Hill WTP	3 Semi-annually	O3 Press Sending Unit Rotometer
Fleming Hill WTP	1 Semi-annually	Pressure Transmitter - Plant
Fleming Hill WTP	3 Semi-annually	UPS
Fleming Hill WTP	1 Annually	Hydro Battery Set
Fleming Hill WTP	1 Annually	Main Disconnect
Fleming Hill WTP	9 Annually	MCC
Fleming Hill WTP	4 Annually	O3 Destruct T.I.T. & Gen
Fleming Hill WTP	10 Annually	O3 Destruct T.I.T. & Gen
Fleming Hill WTP	1 Annually	Pressure Transmitter - Scrubber Exhaust
Georgia 2.2 MG Tank	1 Semi-annually	Level Transmitter
Glen Cove 1.5 MG Tank	1 Semi-annually	Level Transmitter
Grid Pressure Site #1	1 Semi-annually	Level Transmitter
Grid Pressure Site #2	1 Semi-annually	Level Transmitter
Hiddenbrooke 0.99 MG Tank	1 Semi-annually	Level Transmitter
Hiddenbrooke 2.3 MG Tank	1 Semi-annually	Level Transmitter
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Chart Recorder - Discharge Pressure
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Chart Recorder - Flow
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Chart Recorder - Suction Pressure
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Flow Transmitter
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Pressure Switch - High Discharge
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Pressure Switch - Low Discharge
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Pressure Switch - Low Suction
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Hiddenbrooke Domestic Pump Station	1 Semi-annually	Pressure Transmitter - Suction
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Chart Recorder - Discharge Pressure
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Chart Recorder - Suction Pressure
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Chart Recorder - Flow
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Flow Transmitter
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Pressure Switch - High Discharge
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Pressure Switch - Low Discharge
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Pressure Switch - Low Suction
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Hiddenbrooke Irrigation Pump Station	1 Semi-annually	Pressure Transmitter - Suction
Hiddenbrooke Raw Water Lake	1 Semi-annually	Level Transmitter
Hollywood 292 Zone Pump Station	1 Semi-annually	Flow Transmitter
Hollywood 292 Zone Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Hollywood 400 Zone Pump Station	1 Semi-annually	Flow Transmitter
Hollywood 400 Zone Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Hollywood Pump Station	1 Semi-annually	Pressure Transmitter - Suction

Hunter Ranch Tank	1	Semi-annually	Level Transmitter
Hydrogenerator Plant	1	Quarterly	Pressure Transmitter
Hydrogenerator Plant	2	Quarterly	Valve Position Transmitter
Jamison Canyon Pump Station	1	Semi-annually	Chart Recorder - Discharge Pressure
Jamison Canyon Pump Station	1	Semi-annually	Chart Recorder - Flow
Jamison Canyon Pump Station	1	Semi-annually	Chart Recorder - Level
Jamison Canyon Pump Station	2	Semi-annually	Flow Transmitter
Jamison Canyon Pump Station	1	Semi-annually	Level Transmitter (Wet Well)
Jamison Canyon Pump Station	1	Semi-annually	Pressure Switch - Low Discharge
Jamison Canyon Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Kathy Ellen Pump Station	1	Monthly	Pressure Transmitter - Discharge
Mare Island 5.7 MG Tank	1	Semi-annually	Level Transmitter
Mira Vista Pump Station	1	Semi-annually	Flow Transmitter
Mira Vista Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Mira Vista Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Mira Vista Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Monticello Pump Station	1	Semi-annually	Chart Recorder - Discharge Pressure
Monticello Pump Station	1	Semi-annually	Chart Recorder - Flow
Monticello Pump Station	1	Semi-annually	Chart Recorder - Level
Monticello Pump Station	1	Semi-annually	Flow Transmitter
Monticello Pump Station	1	Semi-annually	Level Transmitter
Monticello Pump Station	1	Semi-annually	Pressure Switch
Monticello Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Monticello Pump Station	1	Semi-annually	Pressure Switch - Low Discharge
Monticello Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Monticello Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Northgate 1.7 MG Tank	1	Semi-annually	Level Transmitter
Northgate 6 MG Tank	1	Semi-annually	Level Transmitter
Redwood St. Pump Station	1	Semi-annually	Flow Transmitter
Redwood St. Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Redwood St. Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Redwood St. Pump Station	1	Semi-annually	Pressure Transmitter - High Discharge
Shadow Ridge Pump Station	1	Semi-annually	Pressure Transmitter - Suction
Shadow Ridge Pump Station	1	Semi-annually	Chart Recorder - Flow
Shadow Ridge Pump Station	1	Semi-annually	Chart Recorder - Discharge Pressure
Shadow Ridge Pump Station	1	Semi-annually	Chart Recorder - Suction Pressure
Shadow Ridge Pump Station	1	Semi-annually	Flow Transmitter
Shadow Ridge 0.01 MG Tank	1	Semi-annually	Level Transmitter
Shadow Ridge Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Shadow Ridge Pump Station	2	Semi-annually	Pressure Switch - Low Suction
Shadow Ridge Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Skyview 6 MG Tank	1	Semi-annually	Level Transmitter
Somerset Tank	1	Semi-annually	Level Transmitter
Summit Reservoir	1	Semi-annually	Level Transmitter
Tennessee St. Pump Station	1	Semi-annually	Flow Transmitter
Tennessee St. Pump Station	2	Semi-annually	Pressure Switch - High Discharge
Tennessee St. Pump Station	1	Semi-annually	Pressure Transmitter - Discharge
Tennessee St. Pump Station	1	Semi-annually	Pressure Transmitter - Suction

TRAVIS AFB WATER SYSTEM

Location	Quantity	Frequency	Type of Equipment
Travis AFB WTP	6	Weekly	Turbidity Meter
Travis AFB WTP	1	Weekly	Fluoride A.I.T.
Travis AFB WTP	1	Bimonthly	Fluoride A.I.T.

Travis AFB WTP	1 Bimonthly	Fluoride A.I.T.
Travis AFB WTP	1 Monthly	Conductivity A.I.T.
Travis AFB WTP	1 Monthly	Streaming Current Monitor
Travis AFB WTP	2 Monthly	pH Analyzer
Travis AFB WTP	3 Monthly	Flow Meter
Travis AFB WTP	1 Quarterly	Chlorine Analyzer (W.T.)
Travis AFB WTP	1 Quarterly	Level Monitors
Travis AFB WTP	2 Quarterly	Filter Differential P.I.T.
Travis AFB WTP	2 Quarterly	Pressure Transmitter - Potable H2O
Travis AFB WTP	1 Annual	Dew Point Monitor
Travis AFB WTP	1 Annual	O3 Ambient Air Monitor
Travis AFB WTP	10 Annual	Pressure Switch - O3 Flow
Travis AFB WTP	2 Annual	MCC
Travis AFB WTP	1 Annual	Generator Transfer Switch
Travis Beck Ave Pump Station	1 Semi-annually	Flow Transmitter
Travis Beck Ave Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Travis Beck Ave Pump Station	1 Semi-annually	Pressure Transmitter - Suction
Travis Northgate Pump Station	1 Semi-annually	Pressure Switch - High Discharge
Travis Northgate Pump Station	1 Semi-annually	Pressure Switch - Low Suction
Travis Northgate Pump Station	1 Semi-annually	Pressure Transmitter - Discharge
Travis Northgate Pump Station	1 Semi-annually	Pressure Transmitter - Suction

LAKES WATER SYSTEM

Location	Quantity	Frequency	Type of Equipment
Green Valley Tank	1	Semi-annually	Level Transmitter
Green Valley WTP	1	Weekly	Combine Filtered Turbidity
Green Valley WTP	1	Weekly	Post Chlorine Analyzer
Green Valley WTP	1	Monthly	TOC Analyzer
Green Valley WTP	1	Monthly	UPS
Green Valley WTP	9	Monthly	Turbidity
Green Valley WTP	2	Monthly	pH Meter
Green Valley WTP	1	Monthly	Streaming Current Meter
Green Valley WTP	2	Monthly	Chlorine Analyzer
Green Valley WTP	1	Quarterly	Influent Pressure Transmitter
Green Valley WTP	2	Annually	MCC
Mankas Corner Pump Station	2	Semi-annually	Pressure Transmitter - Discharge
Mankas Corner Pump Station	1	Semi-annually	Pressure Transmitter - Suction
Mankas Corner Pump Station	1	Semi-annually	Flow Transmitter
Mankas Corner Pump Station	1	Semi-annually	Chlorine Analyzer
Mankas Corner Pump Station	1	Semi-annually	Pressure Switch - Low Suction
Mankas Corner Pump Station	1	Semi-annually	Pressure Switch - High Discharge
Mankas Corner Pump Station	1	Semi-annually	Flow Chart Recorder
Mankas Corner Pump Station	1	Semi-annually	Discharge Pressure Chart Recorder
Mankas Corner Pump Station	1	Semi-annually	Suction Pressure Chart Recorder
Mankas Corner Pump Station	1	Semi-annually	Chlorine Chart Recorder
Rockville Pump Station	1	Semi-annually	Discharge Pressure Transmitter
Rockville Pump Station	1	Semi-annually	Suction Pressure Transmitter
Rockville Pump Station	1	Semi-annually	Flow Transmitter
Rockville Pump Station	1	Semi-annually	Flow Recorder
Rockville Tank	1	Semi-annually	Level Switches
Siebe Pump Station	1	Semi-annually	Level Transmitter
Siebe Pump Station	1	Semi-annually	Low Suction Pressure Switch
Siebe Pump Station	1	Semi-annually	High Discharge Pressure Switch

Siebe Tank

1 Semi-annually Level Transmitter

Meter Testing and Replacement Program Time Table

Schedule devised by Eric Jansen, Senior Civil Engineer (6/30/2014)
 Work will proceed with periodic "Meter Group" meetings consisting of Maintenance Managers, Meter Shop Personnel, and Water Engineering staff
 This effort has the full support of the Asst Public Works Director - Water, and the Asst. Public Works Director - Maintenance

Phase	Description	Period
A.	Research and, with involvement of stakeholder group, prepare Draft Action Plan with Policies and Procedures (with Stakeholders)	July 2014 - September 2014
B.	Data Collection (Meter Characteristics by Records and Statistical Sample Testing)	September 2014 - January 2015
C.	Analysis of Data (With Stakeholders and Outside Experts, as needed)	January 2015 - May 2015
D.	Preparation and Approval of Final Action Plan with Policies and Procedures	May 2015 - August 2015
E.	Implementation of Action Plans	August 2015 - November 2015
F.	Ongoing periodic meetings of Meter Group with recommendations for improvements in the Action Plans and/or Policies and Procedures	Ongoing after November 2015

Attachment D – Water System Sample Bills



CITY OF VALLEJO
 COMMERCIAL SERVICES DIVISION
 P.O. BOX 3088 • 555 SANTA CLARA STREET
 VALLEJO, CA 94590

For billing inquiries, call:
 (707) 648-4345

MUNICIPAL SERVICES BILL

SERVICE ADDRESS			
ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
	77-18	8/15/14	9/15/14

LAST BILL AMOUNT	44.42
PAYMENTS RECEIVED	.00
CURRENT CHARGES	76.10
ADJUSTMENTS	0.00
TOTAL AMOUNT DUE	124.96

Rate Class : RESIDENTIAL BI-MONTHLY

SERVICE CHARGES						
SERVICE PERIOD		DAYS	CURRENT READING	PREVIOUS READING	CURRENT USAGE	PRIOR YEAR USAGE
FROM	TO					
6/04/14	8/01/14	58	291.00	276.00	15.00	.00
WA Service Charge			32.90			
WA Water Consumption			43.20			

A copy of the water system rate table is included in Attachment B to the plan. It is identical to that found on the City's website.

Information on water rates and charges can be found on the City's website: www.ci.vallejo.ca.us under City Hall menu "Water Division"

BILL MESSAGE:
 Attention Water Customers: Payments by phone are currently unavailable as we are upgrading to a new "Interactive Voice Response" system which should be available in October 2014. To make a payment online visit our website at <https://egov.ci.vallejo.ca.us/click2gov.index.jsp>

BUSINESS HOURS: 8:30 A.M. to 5:15 P.M. MONDAY THRU FRIDAY

GI141606 TXT-1537-00002540
 PLEASE DETACH HERE AND RETURN THIS PORTION WITH YOUR PAYMENT
 MAKE CHECKS PAYABLE TO: CITY OF VALLEJO

CHARGES ARE SUBJECT TO INTEREST AND PENALTIES IF PAYMENTS ARE RECEIVED AFTER 11:00 A.M. ON THE DUE DATE. TO AVOID ADDITIONAL FEES PAY TOTAL BY 11.00 A.M. : 9/15/14



CITY OF VALLEJO
 P.O. BOX 3088 • 555 SANTA CLARA STREET
 VALLEJO, CA 94590
 BILLING INQUIRES: (707) 648-4345

SERVICE ADDRESS			
ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
	77-18	8/15/14	9/15/14

TOTAL CURRENT CHARGES	76.10
B LANCE FORWARD	48.86
TOTAL AMOUNT DUE	124.96
AMOUNT ENCLOSED	

1537 000002540



000261607000049674000000124966

Attachment E – Water Shortage Plan

SECTION 7 - WATER SHORTAGE CONTINGENCY PLAN

This section of the Urban Water Management Plan presents the City's Water Shortage Contingency Plan (WSCP). Although included as a section of the UWMP, the WSCP, upon its adoption by the City Council, can be separately cited as a stand-alone plan.

7.1 Summary of Water Code Sections

This WSCP serves to comply with the requirements of the Urban Water Management Act (Act), which became part of the California Water Code with the passage of Assembly Bill 797 during the 1983-1984 California legislative session, and addresses the elements of the California Water Code Chapter 3, Article 2, Section 10632.

7.2 Plan Adoption and Implementation

State regulations require that a properly noticed public hearing be held prior to the adoption of the Vallejo Water Shortage Contingency Plan. Prior to adopting a plan, the City will make the plan available for public inspection and hold a public hearing. The time and place of the hearing will be published prior to conducting the hearing pursuant to Section 6066 of the Government Code.

This Water Shortage Contingency Plan, adopted on February 28, 2006 by Council Resolution No. 06-62 N.C., replaces all previous versions of the Draft Water Shortage Contingency Plan.

Copies of the WSCP are available at the Water Superintendent's office. In addition, the City shall provide customers with periodic updates on the results of the institution of this WSCP. Updates may be by bill insert, newspaper, television, or other appropriate method(s). Should a water shortage emergency occur, the City will immediately notify customers when supplies have returned to adequate operational levels and the water shortage is over.

Other implementation steps that will be taken include pursuing additional supplies and the initiation of possible coordinated planning with local agencies and organizations. In the event of a water shortage, the City shall notify outreach organizations listed in Table 7-1 to inform the public of the necessary actions to take before enforcement begins. This list will continue to be modified as additional organizations are identified which may be helpful in the dissemination of information in a timely manner. The City shall notify the public when the WSCP is implemented and the corresponding stage of shortage.

Table 7-1. Organization Notification List

Vallejo City Council	Hiddenbrooke Home Owners Association	Green Valley Landowners Association
Vallejo Times Herald Newspaper	City of Vallejo Landscape Maintenance Districts	Gordon Valley Water Crisis Committee
Vallejo City Unified School District	Vallejo Chamber of Commerce	County of Solano, Water Resources Department
Vallejo and Cordelia Fire Departments	Glen Cove Home Owners Association	County of Solano, Sheriffs Department
Fairfield Daily Republic Newspaper	Regional Television News Stations	10 Largest Consumption Accounts
Solano County Board of Supervisors		

7.3 Preparation for Catastrophic Water Supply Interruption

Aside from drought-caused water shortages, the City is also vulnerable to other potential disaster situations that could result in a catastrophic interruption of water supplies including, but not limited to, regional power outages, landslides, earthquakes, and water contamination.

Below is a brief summary of how catastrophic events, other than extreme drought, may affect the State Water Project (delivery of both State Water Project Table A and Vallejo Permit Water) and Solano Project facilities, as provided by SCWA, the City's wholesale supplier of water through these regional supply facilities.

The North Bay Aqueduct (NBA) supplies water to the City from the SWP, this includes transit of both Table A allotments and Vallejo Permit water entitlements. Potential catastrophic outages may occur from earthquakes that cause major damage to the NBA facilities, prolonged loss of PG&E power required for pumping water through the NBA, or contamination at the intake to the NBA. The NBA is an underground pipeline and not subject to landslide damage.

In the event of loss of NBA supply for any reason, the City would immediately switch to Solano Project water supplies while the emergency condition was being resolved and normal water supply restored. This high level of redundancy is possible due to the geographical separation of the two sources.

The Solano Project supplies nearly half of all water to the City under normal conditions. In the event of an earthquake, the Solano Project Emergency Response Plan is invoked. The Plan, developed in coordination with the U.S. Bureau of Reclamation, provides a detailed response for various levels of seismic activities both at the Monticello Dam site and within a specified geographical area surrounding the Solano Project. No actions are necessary from the City of

Vallejo, which will be notified at the time of the condition of the Solano Project and its ability to deliver.

The Putah South Canal is susceptible to a landslide which could either block or damage its ability to deliver Solano Project water. SCWA recently invested in a \$3 million project to provide an underground pipeline bypass of an area that is most susceptible to a landslide. Any detection of contamination of Solano Project water may result in a shut-down of the Solano Project deliveries. The City of Vallejo receives its supply at the end of the delivery canal and, as such, is more exposed to potential supply interruptions due to canal impairment. Solano Project is a gravity system and is not dependent upon power to operate.

In the event of loss of Solano Project water, the City would attempt to shift to supplies delivered through the NBA including SWP water and Vallejo permit entitlements.

Delivery of water from the Vallejo Lakes – Frey, Madigan, and Curry – is via gravity systems which are susceptible to earthquake damage. Each Lakes supply is inspected after earthquakes to assure public safety and determine the viability of the supply after an event. Damage may require changeover to the Solano Project through an exchange agreement with the Solano Irrigation District.

The City has engineered all critical pump stations, and reservoirs constructed within the last 17 years, to meet all California seismic safety standards for critical facilities, and has removed most pumping facilities built prior to this date from operation. In addition, the City has, as required by law, completed and filed a Vulnerability Assessment (VA) addressing security of the City's distribution system facilities. Regional power outages are not expected to prevent the City from receiving adequate water supplies due to the multitude of facilities and the fact that due to the geographical separation of the facilities they are fed from different power grids. It is highly unlikely that all water supplies will be simultaneously affected and prevent water delivery. The main pump station which supplies raw water to Vallejo has a diesel emergency backup pump to provide up to 50% of total water need in time of power outage. Combined with available in-town treated water storage the City should be able to function until regional power is available.

The City has continued to work cooperatively with SCWA to investigate regional funding opportunities for measures to improve the reliability of key water supply facilities through participation in the Solano Water Agencies Committee. Through this committee, recommendations for water supply quality monitoring and modeling have been forwarded, and hydrologic studies have been undertaken to determine water quality and quantity parameters of the NBA facilities in Barker Slough.

This type of modeling is necessary to determine the sources of water being pumped at the NBA intake during different times of the year and different hydrologic conditions. It will also show how NBA water quality will be affected by changes in the Delta, such as levee failures. Failures of the levees are predicted to drastically reduce the ability of the NBA pump station to provide water, and as with earthquake damage, will necessitate a changeover to Solano Project Water until mitigated.

In addition to the above listed major disruptions which may occur and must be dealt with, to properly prepare for and respond to catastrophic water supply interruptions, the City believes the following additional actions are warranted.

Increase existing water storage.

The City has over 50 million gallons (mg) of treated water storage currently available, with up to 50 mg of raw water available by gravity which may be treated during an emergency. This translates to greater than a 3 day supply at maximum day usage, or greater than 7 days with notification of water shortages. Opportunities for greater storage volume are being investigated.

Obtain additional water supplies.

The City is in the process of bringing back the Lake Curry water supply of approximately 3,750 Acre-feet. The restored Lake Curry supply is expected to be back online by 2010.

Coordinate with other agencies for additional water supply funding sources.

The City, as noted above, participates in regional planning and grant applications with the Solano County Water Agency.

Put employees/contractors on-call.

Water maintenance and engineering currently have on-call and after hours contact lists available for use in emergencies.

Develop public communication methods/plans.

The City currently employs a Public Information Officer for timely distribution of City policies and announcements.

Adopt a City Disaster Preparedness Plan.

The City has a comprehensive disaster response plan. Water service for both domestic and fire fighting needs is a component of this plan. Operational plans for contacts, notification, and emergency actions are included. Additionally, the City is required to file a report with the state demonstrating the methodology to be used to inform the public of a mandatory boil water order or unsafe water conditions.

Water Shortage Response Measures.

Because water supply is a sensitive and extremely valuable resource in California, all water utilities in the region practice water conservation programs. Beyond these normal practices, additional water shortage response measures are often needed when unforeseeable droughts and emergencies reduce water supplies. This WSCP includes proposed water shortage response measures which can be put into effect by the City Council.

7.4 Water Supply and Demand Analysis

This subsection provides a brief overview of the City's water supply and demand projections. For further discussion of these topics, refer to Sections 3 and 4 of the UWMP.

7.4.1. Water Supply

The City of Vallejo has several water supply sources which are summarized in Table 7-2. These sources are described in more detail in Section 4 of the Urban Water Management Plan.

Table 7-2. Normal Water Year Supplies

WATER YEAR & SUPPLY (All volumes in Acre-Feet)	Entitlement Reduction	2005	2010	2015	2020	2025
State Water Project	10%	5,040	5,040	5,040	5,040	5,040
Vallejo Permit Water	0%	17,200	22,800	22,800	22,800	22,800
Lakes Madigan/Frey	0%	400	400	400	400	400
Lake Curry	0%	1,500	3,750	3,750	3,750	3,750
Solano Project Water	1%	<u>14,454</u>	<u>14,454</u>	<u>14,454</u>	<u>14,454</u>	<u>14,454</u>
Normal Year Total		38,594	46,444	46,444	46,444	46,444

7.4.2 Water Demand

Table 7-3 shows the City's past, present, and estimated future water demand from 2000 through 2025. Future water consumption assumes annual growth in the City, Lakes, and Travis AFB categories, normal rainfall, and normal consumption patterns adjusted for post-drought practices. For more information on demand projections refer to Section 3 of the UWMP.

Table 7-3. Past, Present, and Projected Water Demands by Service Category

Category (All volumes in Acre-Feet)	2000	2005	2010	2015	2020	2025
City of Vallejo System	21,920	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	320	330	340	350	360	370
Travis AFB Deliveries ^d	3,200	3,400	3,860	4,330	4,790	5,250
City of Benicia	1,100	1,100	1,100	1,100	1,100	1,100
City of American Canyon	750	750	750	750	750	750
Other Demands ^e	1,500	1,500	1,000	1,000	1,000	1,000
Total for all categories	28,790	30,110	31,340	33,220	35,140	35,610

7.4.3 Water Supply and Demand Comparison

The projected annual normal water supply and demand for the Vallejo system is compared and summarized in Table 7-4. Surface water supplies are sufficient but subject to reductions in deliveries in dry years. It is anticipated that the current 38,594 ac-ft/yr normal available water supply will climb to 46,444 beginning in 2010. The table shows that in average precipitation years, the City of Vallejo has sufficient water to meet its customers' needs, through 2025.

Table 7-4. Normal Water Year Supply and Demand Comparison, ac-ft/yr

NORMAL YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	38,594	46,444	46,444	46,444	46,444
Demand	30,110	31,340	33,220	35,140	35,610
Difference = Surplus or (Deficit)	8,484	15,104	13,224	11,304	10,834
Difference (as a percentage of supply)	22%	33%	28%	24%	23%

7.4.4 Minimum Supply Estimate – 3 Year Worst Case Drought

The City is required to provide an estimate of the water supply available for the next three years using the worst case historic drought delivery for each separate supply source. The three year worst case delivery may not coincide for each supply source due to differing watershed characteristics and storage availability for each supply. Table 4-6 shows the driest three year sequence for each of the City's supply sources.

Table 7-5. Driest Three-Year Historic Water Supply Sequence

Supply Source	Entitlement (Acre-Feet)	3 Year Sequence - Minimum Delivery	Percentage of Entitlement Available in Each Year
Solano Project ^(a)	14,600	1932, 1933, 1934	100%, 34%, 44%
State Water Project (NBA) ^(b)	5,600	1990, 1991, 1992	27%, 26%, 35%
Vallejo Permit Water ^{(c)(e)}	17,200 (through 2006) 22,800 (by 2007)	1990, 1991, 1992	75%, 75%, 75%
Lakes Madigan & Frey ^(c)	400	1990, 1991, 1992	75%, 75%, 75%
Lake Curry ^(d)	1,500	1990, 1991, 1992	100%, 100%, 100%

a. Source: Ultimate level of development of Lake Berryessa watershed at 30,000 AF/yr.

b. Source: DWR Study 6, 2001 Level of Development, 2004 OCAP, using Sacramento Valley Index from 1922 through 1993.

c. Permit Water and Lakes source supply have the worst estimated reduction due to drought or environmental constraints. No historical constraints to full supply availability exist, however, the City has chosen to conservatively reduce available yield.

d. Lake Curry is calculated as a 1,500 AF yearly demand for fisheries, with no delivery potential to the City until 2010. Actual entitlement is 3,750 AF/Yr. As such, 1,500 AF is considered 100% reliable until 2010 to satisfy instream flow.

e. Pumping capacity is 22,800 AF/Yr., current maximum contractual delivery through State Water Project is 17,200 AF/Yr. Contract amendment to be signed by 2007 to allow full 22,800 AF/Yr. delivery.

Table 7-6 displays a very conservative estimate of the minimum water supply available during the next three water years based on the driest three-year historic sequence for each of the City's water sources. These worst case supply quantities were calculated by applying the percentage of entitlement available in each of the three consecutive years from Table 7-5 for each source to the available water entitlements projected for years 2006, 2007, and 2008. This would not be expected to accurately describe the actual water available due to the geographic separation of the supply watersheds. As shown in Table 7-5, the reliability of each supply is relatively independent, and as such it is highly unlikely that all sources would experience simultaneous worst case drought conditions.

Table 7-6. Minimum Water Supply Estimate over the Next Three Years (Ac-Ft)

SUPPLY SOURCE	Year 1 (2006)	Year 2 (2007)	Year 3 (2008)
Solano Project	14,600	4,964	6,424
State Water Project (NBA) Table A	1,512	1,456	1,960
Vallejo Permit Water	12,900	17,100	17,100
Lake Madigan & Frey	300	300	300
Lake Curry	1,500	1,500	1,500
Total Available Supply	30,812	25,320	27,284

Under the three year worst case drought supply delivery scenario, the City would experience reductions in water supply delivery of 20 percent in Year 1 (from 38,594 Ac-ft), 43 percent in Year 2 (from 44,194 Ac-ft), and 38 percent in Year 3 (from 44,194 Ac-ft). This takes into account an anticipated increase in water supply entitlement in 2007 for Vallejo Permit Water from 17,200 to 22,800 acre feet. The Water Shortage Contingency Plan provides for actions to address up to a 50% reduction in supply due to drought or catastrophic events.

7.5 Water Shortage Response Stages

The City of Vallejo employs a five stage water-shortage response plan (Table 7-7 below), which is triggered at prescribed levels. Water-shortage stages are monitored, reported and acted upon according to the plan set out in the reduction-measuring mechanism for each stage. Each stage consists of specific prohibitions, regulations, fines, penalties, and rate structure to encourage the appropriate level of conservation. Though all five stages have both voluntary and mandatory components, none can be considered a rationing program because they do not strictly limit water use. However, Stages IV and V are most restrictive primarily due to the landscape irrigation component, which prohibits irrigation of any decorative landscaping. Under drought conditions the City is not anticipated to have to implement any conservation above Stage II. Conservation Stages IV and V are prepared to meet emergency conditions brought upon by catastrophic events.

Table 7-7. Water Shortage Response Stages

Stage	Demand Reduction Goal
Stage I – Normal Conditions	0% Normal Usage
Stage II – Water Warning	Up to 10% reduction of normal usage
Stage III – Water Shortage	Up to 20% reduction of normal usage
Stage IV – Water Crisis	Up to 35% reduction of normal usage
Stage V – Water Emergency	Up to and Above 50% reduction of normal usage

Given the potential requirement for various levels of demand reduction due to catastrophic events and drought scenarios, prioritization of use of the available water resource must be considered. The principle of maximum beneficial usage must be implemented and plans created to efficiently produce such a result. Conservation measures for each stage are based on the priorities set in the California Water Code Chapter 3 and through public input.

- Priority 1: Maintain essential public health and safety uses.

Uses include minimum drinking, sanitation, food preparation activities, and fire protection requirements. These uses are considered the core minimum water use of the community and are estimated at approximately 50 gallons per day.

- Priority 2: Maintain the existing economic and job base of the community.

Acceptable uses would include water sufficient to allow restaurant operation, water necessary for existing industrial uses, and additional commercial uses which protect the employment base of the communities served. All these activities would be under condition of efficient water usage or penalty.

- Priority 3: Continued discretionary uses for existing customers.

Existing customers make use of large quantities of non essential water use through such activities as outdoor landscaping, swimming pools, car washing. These activities would be heavily discouraged and would be expected to account for a large percentage of demand reductions. Provisions may be made to allow continued irrigation of heritage trees and plants which benefit the community.

- Priority 4: New Service Connections

New connections would not be permitted during times of severe shortage. Only those approved connections permitted before supply reduction events occurred would be allowed to be connected to the system. Any additional service requests would be conditioned to fund demand reduction measures which produce verifiable savings greater than the proposed connection impacts.

The primary components of each stage consist of a tiered rate structure, regulations/prohibitions, and penalties/fines. Details of each response are summarized in Table 7-8 below.

Table 7-8. Stage Components

	Stage I Normal	Stage II Water Warning	Stage III Water Shortage	Stage IV Water Crisis	Stage V Water Emergency
RATE STRUCTURE	Normal	Potentially Modified	Potentially Modified	Potentially Modified	Potentially Modified
Consumption Rate Surcharge	None	(2.0*Rate) Usage between 100%-110% of Stage II Allotment	(2.0*Rate) Usage between 100%- 110% of Stage III Allotment	(2.0*Rate) Usage between 100%-110% of Stage IV Allotment	(2.0*Rate) Usage between 100%-110% of Stage V Allotment
Consumption Rate Surcharge	None	(3.0*Rate) Usage between 110%-120% of Stage II Allotment	(3.0*Rate) Usage between 110%- 120% of Stage III Allotment	(3.0*Rate) Usage between 110%-120% of Stage IV Allotment	(3.0*Rate) Usage between 110%-120% of Stage V Allotment
Consumption Rate Surcharge	None	(4.0*Rate) Usage above 120% of Stage II Allotment	(4.0*Rate) Usage above 120% of Stage III Allotment	(4.0*Rate) Usage above 120% of Stage IV Allotment	(4.0*Rate) Usage above 120% of Stage V Allotment
Service Charge Surcharge	0%	Up to 5%	Up to 10%	Up to 20%	Up to 50%
PROHIBITIONS	Controllable Water Leaks New installation of single pass cooling systems Uses included in an adopted Wasteful Water Use Prohibition Ordinance	Normal prohibitions plus .. Washing of paved areas except to protect public health and safety	Stage I prohibitions plus .. Running water for washing buildings, etc.	Stage II prohibitions plus .. Landscape irrigation (none) Hydrant flushing Construction of new pools, spas, etc.	Stage III prohibitions plus .. New construction (Without existing permit) Filling of pools, spas, decorative fountains, etc.

	Stage I Normal	Stage II Water Warning	Stage III Water Shortage	Stage IV Water Crisis	Stage V Water Emergency
REGULATIONS		Washing of vehicles to be done at commercial car wash or with controllable water source such as a bucket or hose with shut-off nozzle.	Stage II regulations plus .. Restaurants to serve water only upon request Hotels, etc. to post notice of drought condition Reclaimed water for construction, if feasible	Stage III regulations plus Reclaimed water only for construction projects	Stage IV regulations plus ..
FINES/PENALTIES					
1st Offense	Warning	Warning	Warning	Warning	Warning
2nd Offense	\$100.00 fine	\$100.00 fine	\$100.00 fine	\$100.00 fine	\$100.00 fine
3rd Offense	\$200.00 fine	\$200.00 fine	\$200.00 fine	\$200.00 fine	\$200.00 fine
4th Offense	\$300.00 and installation of flow restrictor	\$300.00 and installation of flow restrictor	\$300.00 and installation of flow restrictor	\$300.00 and installation of flow restrictor	\$300.00 and installation of flow restrictor

Any or all of these components in each stage may be enacted by determination of the City Council in order to meet the demand reduction goal for that response stage.

The current water shortage stage is based upon available water supply versus baseline supply or current demand versus current available supply. Baseline supply is defined to be equal to available supply with the largest unit out of service. Current demand and current available supply are defined to equal the current demand and available supply at the time of the water shortage stage analysis. System performance, such as water system pressure, although not listed as a trigger from one stage to another, is directly related to the supply and demand relationship, and can indicate water shortage conditions.

7.6 Supply Shortage Triggering Levels

In order to protect the City’s health and safety and minimize the social and economic impacts of water shortages, the City has established “triggers” to implement the various stages of conservation based on the City’s water supply analysis. The “water supply analysis” is based on State Water Project deliveries, rainfall, storage levels, continuous years of drought, current consumption levels, existing water contracts, water supply deficiency declarations, and/or any other factors significantly impacting the integrity of the City’s water supply. Each stage will be declared by the Vallejo City Council in accordance with findings based on the water supply analysis. The water supply analysis will recommend a percent reduction. The stages are defined as follows.

- Stage I — Where the City water supply appears adequate but prudent water use is encouraged.
- Stage II — Where the City water supply analysis demonstrates the need for up to a 10% reduction in water consumption.
- Stage III — Where the City water supply analysis demonstrates the need for up to a 20% reduction in water consumption.
- Stage IV — Where the City water supply analysis demonstrates the need for a 35% or more reduction in water consumption.
- Stage V — Where the City water supply analysis demonstrates the need for a 50% or more reduction in water consumption.

For each of these stages, the following sections define the:

- City's ability to meet the customer demands.
- Triggering mechanism that directs each particular stage to begin.
- Consumption limits that define the amount of water consumption to be reduced.
- City actions to be implemented.
- Requested consumer actions to reduce demand.

In addition, penalties for customer misuse of water and reduction measuring mechanisms to track the City water use during each stage are defined. Note that all normal water conservation measures also remain in effect. Also note that all water shortage response measures defined in each shortage stage carry-over into more severe shortage stages. In this way, more serious water supply emergencies are met with a staircase of more stringent water shortage response measures.

7.6.1 Stage I - Normal Supply

The City's supply or distribution system is able to meet all the water demands of its customers in the immediate future.

Triggering Mechanism: Full deliveries of water supply to all City customers and the ability to meet maximum day demand with largest unit out of service.

Consumption Limits: No percentage cutback required. All normal water efficiency programs are in place.

City Actions: During Stage I, all normal water use efficiency programs will continue.

Requested Consumer Action: During this stage all normal water efficiency programs will continue. Voluntary participation in water waste restrictions requested.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Reduction Measuring Mechanism: Production figures are recorded daily within each system and monitored by the Water Superintendent monthly during normal water supply conditions.

7.6.2 Stage II - Water Warning

There is a probability that the City supply or distribution system will not be able to meet all the water demands of its customers.

Triggering Mechanism: A cutback in supply by up to 10 percent of baseline supply and the inability to obtain additional water, or demand is greater than 90 percent of available supply.

Consumption Limits: All customers would be required to reduce consumption by 10% for the duration of the water warning.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of the calculated base year 2004 usage (per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of ninety five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
3. In addition to the above mandatory water use reductions of subdivisions 1 and 2 of this subsection, the following restrictions shall apply to all persons.
 - a. the use of water from hydrants shall be limited to fire fighting and other activities necessary to maintain the health, safety, and welfare, of the citizens of Vallejo.
 - b. All "waste of water" elements as defined in Stage I shall remain in effect in Stage II.

City Actions: City will implement the following actions:

- Initiate public information campaign explaining water supply condition, water shortage stages, and water shortage response measures. Campaign will consist of a combination of distribution of literature, direct mailers, bill inserts, restaurants message tents, and weekly water shortage status update and conservation messages printed in local newspapers.
- Notify local jurisdictions of Stage II implementation within 10 working days after implementation of Stage II. The notification shall be in the form of a letter to the appropriate contact person for each agency found by calling agencies as listed in Table 7-1.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage II.
- Continue ongoing educational program in area schools.
- Maintain a Water Conservation Hotline with specially trained conservation representatives to answer customer questions about conservation and water use efficiency.
- Provide free water conservation kits at the Water Billing Office for customer pickup.

- Initiate “conservation monitor” duties to existing personnel to identify and document excessive water use and advise customers regarding the appropriate watering schedule.
- Implement rate changes to penalize excess usage.

Requested Consumer Actions: Customers will be required to implement the following water shortage response measures:

- There shall be no hose washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, except flammable or other similar dangerous substances may be washed from said areas by direct hose flushing for the benefit of public health and safety. This prohibition shall not apply where hosing of sidewalks or driveways is required by law.
- No water shall be used to clean, fill, operate or maintain levels in decorative fountains unless such water is part of a recycling system.
- No customer shall permit water to leak from any facility on his/her premises. Such facilities shall include sprinklers and irrigation systems, faucets, toilets, water heaters or any other fixture used in providing water service. Any leak shall be repaired in 72 hours.
- No customer shall sprinkle, water or irrigate any shrubbery, trees, lawns, grass, ground cover, plants, vines, gardens, vegetables, flowers, or any other landscaped or vegetated area between the hours of 9:00 a.m. and 6:00 p.m. Such watering shall not be in excess of needs nor be of a manner that allows water to flow into streets.
- Non-commercial washing of privately owned vehicles, trailers, buses, boats and equipment, except from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse, and only on a surface, which will allow water to be returned to the ground.
- Any use of water from a fire hydrant, except for fire protection purposes, is prohibited, unless authorized by the City.
- Use of water for construction purposes, such as consolidation of backfill, unless no other source of water or method can be used, is prohibited.
- Water will be available only for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
- Water efficient plumbing fixtures, water efficient appliances and high efficiency irrigation techniques such as drip irrigation, are encouraged.
- Mow less frequently allowing grass to grow longer, inducing hydration.
- Check the soil moisture in the root zone to determine when irrigation is required.
- Restaurants shall serve water only upon request.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a “door hanger” for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to \$300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.3 Stage III - Water Shortage

The City's supply or distribution system will not be able to meet all the water demands of its customers.

Triggering Mechanism: A cutback in supply of 20 percent and the inability to obtain additional water, or demand is greater than 105 percent of available supply.

Consumption Limits: Customers would be required to reduce consumption by 20 percent for the duration of the water shortage condition.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of ninety percent of residential base allotment usage, per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage II shall remain in effect in Stage III.

City Actions: The City will implement the following actions:

- Continue City actions listed through Stage I and II.
- Continue public information and education programs.
- Notify local jurisdictions of Stage III implementation within 10 working days.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage III.
- Mandate compliance to Stage II requested customer actions.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be notified that Stage III water conservation measures are in effect and compliance with the following water shortage response measures will be required:

- All Stage I and II actions remain in force.
- Further reduction in landscape irrigation required. Reduce watering time; tolerate some plant wilting.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of three days per week when necessary based on the following schedule:
 - Customers with street addresses that end with an odd number may irrigate only on Tuesdays, Thursdays, and Saturdays.

- Customers with street addresses that end with an even number may irrigate only on Monday, Wednesdays, and Fridays.
- Common areas and street medians may irrigate only on Mondays, Wednesdays, and Fridays.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a “door hanger” for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to \$300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.4 Stage IV - Water Crisis

The City supply or distribution system is not able to meet all the water demands of its customers under Stage III requirements.

Triggering Mechanism: A cutback in supply by 20-35 percent and the inability to obtain additional water, or demand is greater than 120 percent of available supply.

Consumption limits: All customers would be required to reduce consumption by 35% for the duration of the water crisis.

1. No residential customer shall make, cause, or commence the use of water received from the city for any purpose in an amount in excess of eighty percent of residential base allotment usage, per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer’s premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.
3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage III shall remain in effect in Stage IV.

City Actions: The City will implement the following actions:

- Continue all conservation program and agency action elements through Stage III.
- Maintain public information campaign explaining water shortage conditions.
- Notify local jurisdictions of Stage IV implementation within 10 working days.

- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage IV.
- Mandate adherence to all water conservation measures required under Stage III of requested customer actions.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of two days per week based on the following schedule.
 - Common areas and street medians may irrigate only on Mondays and Fridays.
- Institute a rationing program through percentage cutbacks.
- Request assistance from local agencies with available water supplies.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be requested to comply with all Stage III water shortage response measures as listed below.

- All Normal and Stage I, II, and III actions remain in force.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of two days per week based on the following odd-even schedule.
 - Customers with street addresses that end with odd numbers may irrigate only on Tuesdays and Saturdays.
 - Customers with street addresses that end with even number may irrigate only on Monday and Fridays.
 - Common areas and street medians may irrigate only on Mondays and Fridays.
- Water use for ornamental ponds and fountains is prohibited.
- Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.
- Water shall not be used for cooling mists.
- Flushing of sewers or fire hydrants is prohibited except in case of any emergency and for essential operations.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a “door hanger” for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to \$300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: Daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.5 Stage V - Water Emergency

The City is experiencing a major failure of a supply, storage or distribution facilities.

Triggering Mechanism: A cutback in supply of up to or greater than 50 percent and the inability to obtain additional water, or demand is greater than 125 percent of available supply.

Consumption Limits: All customers would be required to reduce consumption by 50% for the duration of the water emergency.

1. No residential customer shall make, cause, use, or commence the use of, water received from the city for any purpose in an amount in excess of sixty five percent of residential base allotment usage per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of seventy percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be fifty percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage IV shall remain in effect in Stage V.

City Actions: The City will implement the following actions:

- Continue all water shortage response measures and City action elements through Stage IV.
- Continue public information outreach program with regular updates on the state of the emergency.
- Notify local jurisdictions of Stage V implementation within 10 working days.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage V.
- Mandate that all Stage V conservation measures be implemented immediately and strictly enforced.
- Request assistance from local agencies with available water supplies.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be required to comply with all of the following Stage V water shortage response measures:

- Landscape and pasture irrigation is prohibited.
- Activation of additional water service connections to the City will not be allowed.
- Flushing of sewers or fire hydrants is prohibited except in case of any emergency and for essential operations.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to \$300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.7 Revenue and Expenditure Impacts

This subsection describes the revenue and expenditure impacts that a water shortage may have on the City and the measures the City has in place to overcome these impacts. Table 7-9 below contains predictions of Vallejo's revenues and expenditures at 10, 20, 35, and 50 percent reduction levels (in consumption) in relation to each staged response.

Table 7-9. Estimated Revenues & Expenditures (1,000 Dollars)

Water Sales (A-F)	Normal	Stage I	Stage II	Stage III	Stage IV
% Reduction	0.0%	10.0%	20.0%	35.0%	50.0%
Revenues 06/07					
Water Sales (Base)	15,941	14,347	12,752	10,361	7,970
Water Sales (Avoidable)	1,486	1,337	1,189	966	743
Service Charge	6,086	6,086	6,086	6,086	6,086
Non-Rate Rev	5,755	5,455	5,155	4,705	4,255
Connection Fees	1,723	1,723	1,723	1,723	862
Revenue Total	30,991	28,948	26,905	23,841	19,916
% Reduction	0	9.3%	13.2%	23.1%	35.8%
Expenses 06/07					
Operations & Maintenance	19,616	19,116	18,616	17,616	16,616
Return to Base	2,793	2,568	2,394	2,132	1,871
Capital Projects	1,751	1,500	875	500	200
Debt Service	5,454	5,454	5,454	5,454	5,454
Non Operating	318	286	254	206	158
Expense Total	29,932	28,924	27,593	26,908	25,299
% Reduction	0	9.3%	11.0%	16.5%	18.4%
Available for Reinvestment or Reserve	1,059	24	(688)	(2,067)	(5,383)

This analysis includes the following assumptions:

- City of Vallejo Water Utility Financing Plan and Rate Study (2004), Fiscal Year 06/07 Calculations.
- Volume and daily service rates remain static.
- Limited pre-permitted new connections at Stage V.
- New capital projects will be deferred at Stage II through V.
- Return to Base Expense Proportional to Revenue.
- Operation and Maintenance Expenses Reduced.

The table above indicates the magnitude of revenue reductions to be expected due to a water supply shortage. As shown, during a minor 10% reduction, current City rates are adequate to meet expenses with no revenue remaining to fund reserves. Beyond declaration of a Stage II Shortage Contingency event, both volume and meter charges may be raised at each stage by the commensurate amount to make up the deficiency but will remain revenue neutral. City Council action will be required to adjust (lower or raise) water rates and/or charges if necessary to balance revenues and expenses per the draft Ordinance.

7.8 Monitoring of Water Usage and Revenue

The success of the City's response to a water shortage depends on its ability to accurately monitor water usage, to determine if current stage mandatory water use reductions are being met and project ongoing water supply adequacy. It also depends on the City's careful review of revenue levels to ensure steps are taken, as needed, to maintain adequate water system funding during times of reduced water sales.

7.8.1 Water Consumption Monitoring

Billing data for the City of Vallejo lags approximately 1-2 months behind usage. Given the nature of standard rotating meter reading and the inability to hire and train meter reading personnel to increase the speed of data collection, the City will use water treatment plant production volume data to monitor water use reduction goals. Depending on the level of supply reduction and the corresponding requirement for demand reduction, water plant production will be monitored on a monthly, weekly, or daily schedule as described below to ensure that the necessary level of demand reduction is being achieved.

During Stage I periods, water production/consumption is reported by the Water Superintendent monthly to the Public Works Director to ensure adequate demand and supply balance is maintained.

During Stage II and III periods, water production/consumption is reported by the Water Superintendent weekly to the Public Works Director to ensure adequate demand and supply balance is maintained. If sufficient reductions are not being realized to ensure balance of supply and demand, recommendations will be presented to the City Manager for corrective actions to be taken.

During Stage IV and V periods, water production/consumption will be monitored on a daily basis with recommendations given daily if shortages are projected.

7.8.2 Water Fund Financial Monitoring

During Stage I periods, water revenue figures are provided quarterly for review by department and division heads. The Water Superintendent will report monthly to the Public Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs.

During Stage II and III periods, water revenue figures will be provided monthly for review by department and division heads. The Water Superintendent will report monthly to the Public Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs. If revenues are projected to be inadequate, recommendations will be presented to the City Manager for corrective actions to be taken. Such actions may include increases or decreases in either or both the service charge and consumption charge, to ensure adequate funds are collected to maintain the financial stability of the water fund.

During Stage IV and V periods, water revenue figures will be provided weekly for review by department and division heads. The Water Superintendent will report monthly to the Public

Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs. If revenues are projected to be inadequate, recommendations will be presented to the City Manager for corrective actions to be taken. Such actions may include increases or decreases in either or both the service charge and consumption charge, to ensure adequate funds are collected to maintain the financial stability of the water fund.

Appendix G – Draft City of Vallejo Water Shortage Contingency Plan Ordinance

DRAFT ORDINANCE

ORDINANCE NO. _____ N.C. (2d)

AN ORDINANCE AMENDING TITLE 11, WATER, OF THE VALLEJO MUNICIPAL CODE BY ADDING CHAPTER 11.XX CONCERNING A WATER SHORTAGE CONTINGENCY PLAN.

THE COUNCIL OF THE CITY OF VALLEJO DOES ORDAIN AS FOLLOWS:

SECTION 1. Section 11.xx.010 is hereby added, and shall read as follows:

“11.xx.010 Scope.

There is established a city water shortage contingency plan.”

SECTION 2. Section 11.xx.020 is hereby added, and shall read as follows:

“11.xx.020 Declaration of policy.

It is declared that, because of the conditions prevailing in the city, the general welfare requires that the water resources available to the City be put to the maximum beneficial use to the extent to which they are capable, and that the waste or unreasonable use, or unreasonable method of use of water be prevented, and the conservation of such water is to be extended with a view to the reasonable and beneficial use thereof in the interests of the people of the city and for the public welfare.”

SECTION 3. Section 11.xx.030 is hereby added, and shall read as follows:

“11.xx.030 Definitions.

- A. The “city” means the city of Vallejo acting by and through the city of Vallejo public works department as operator of the city of Vallejo and Lakes water system.
- B. “Director” means the director of the public works department of the city.
- C. “Person” means any person, firm, partnership, association, corporation, company, organization, or, governmental entity.
- D. “Customer” means any person, whether within or without the geographic boundaries of the city of Vallejo, who uses water supplied by the city.
- E. “GPD” means gallons per day.
- F. “HCF” means one hundred cubic feet.”

SECTION 4. Section 11.xx.040 is hereby added, and shall read as follows:

“11.xx.040 Authorization.

The city manager or his designate, upon the recommendation of the director is authorized and directed to implement the applicable provisions of this chapter upon their determination that such implementation is necessary to protect the public welfare and safety.”

SECTION 5. Section 11.xx.050 is hereby added, and shall read as follows:

“11.xx.050 Application.

The provisions of this chapter shall apply to all persons, customers and property served by the city.”

SECTION 6. Section 11.xx.060 is hereby added, and shall read as follows:

“11.xx.060 Water Shortage Stages.

No customer of the city shall knowingly make, cause, use, or permit the use of water from the city for residential, commercial, industrial, irrigation, agricultural, institutional, governmental, or any other purpose in a manner contrary to any provision of this chapter, or in amount in excess of that use permitted by the water shortage stage in effect pursuant to action taken by the city manager, or his designate in accordance with the provisions of this chapter.

A. Stage I. Normal Supply - Voluntary Conservation.

1. Customers of the city are requested to voluntarily limit the amount of water used to that amount necessary for health, business, and irrigation.
2. In addition to the above voluntary water use reductions, the following restrictions shall apply to all persons;
 - a. All prohibitions within the adopted Wasteful Water Use Prohibition Ordinance. [Ord. No. ____ N.C. (2d)]

B. Stage II. Mandatory Compliance – Water Warning.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 300gpd (two thousand four hundred cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of ninety five percent of the amount used during the base period defined as the amount of water used on a customer’s premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during

the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

3. In addition to the above mandatory water use reductions of subdivisions 1 and 2 of this subsection B and in compliance with Section 11.xx.070, the following restrictions shall apply to all persons.
 - a. the use of water from hydrants shall be limited to fire fighting and other activities necessary to maintain the health, safety, and welfare of the citizens of Vallejo.
 - b. All "waste of water" elements as defined in Stage I shall remain in effect in Stage II.

C. Stage III. Mandatory Compliance - Water Shortage

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 270 gpd (two thousand one hundred and sixty cubic feet per sixty day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section. 11.xx.110.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.
3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection C, and in compliance with Section 11.xx.070, all elements of Stage II shall remain in effect in Stage III.

D. Stage IV. Mandatory Compliance – Water Crisis

1. No residential customer shall make, cause, or commence the use of water received from the city for any purpose in an amount in excess of 240gpd (one thousand nine hundred and twenty cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in

Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.
3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection D, and in compliance with Section 11.xx.070, all elements of Stage III shall remain in effect in Stage IV.

E. Stage V. Mandatory Compliance – Water Emergency

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 195gpd (one thousand five hundred and sixty cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.
2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of seventy percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be fifty percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.
3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection E, and in compliance with Section 11.xx.070, all elements of Stage IV shall remain in effect in Stage V except that:
 - a. Section 11.xx.110.A.4 does not apply in this stage. The customer of record may still apply for exceptions as outlined in Section 11.xx.110, but the reason for applying for an exception cannot be based on economic hardship.”

SECTION 7. Section 11.xx.070 is hereby added, and shall read as follows:

“11.xx.070 Mandatory water shortage stage implementation.

- A. The department of public works shall monitor the projected supply and demand for water by its customers and shall recommend to the city manager the extent of the conservation required in order for the department to prudently plan for and supply water to its customers. Thereafter, the city manager may order that the appropriate water shortage stage be implemented in accordance with the applicable provisions of this section. Said order shall be made by public announcement and shall be published a minimum of one time in a daily newspaper of general circulation and shall continue to be published on a weekly basis until such time as all restrictions are removed. Said order shall become effective immediately upon the first publication.
- B. Water shortage stages. The various water shortage stages shall be implemented by the city manager as directed by resolutions of the city council.”

SECTION 8. Section 11.xx.080 is hereby added, and shall read as follows:

“11.xx.080 Duration of water shortage stages.

Stage I shall be effective upon the effective date of the ordinance codified in this chapter and the restrictive provisions of Stage I as set forth above shall apply to all water consumption on and after said date. Stage I will be rescinded at such time that conditions as set forth in Section 11.xx.070 indicate a more restrictive stage is necessary.”

SECTION 9. Section 11.xx.090 is hereby added, and shall read as follows:

“11.xx.090 Water shortage excess use penalty.

- A. Customers will receive prior individual notification of the standard allotment basis, applicable rates, and the opportunity to request exceptions to the standard allotment basis.
- B. Water use beyond the maximum allowed for each water shortage stage shall be subject to a drought penalty pursuant to the schedule set forth below. The customer of record may request an increase in this basic allotment as set forth in Section 11.xx.110. Application forms and instructions will be provided to customers and will also be available at the city water billing office.
- C. In addition to the normal water service rates, each customer shall pay, during each billing period a drought penalty for water delivered in excess of the water allotment. The drought penalty is as follows:
 - 1. For water delivered up to ten percent in excess of allotment there shall be a drought penalty equal to 2.0 times the applicable volume charge, in addition to the applicable service charge and volume charge;

2. For water delivered from 10.01 percent to twenty percent in excess of allotment there shall be a drought penalty of 3.0 times the applicable volume charge levied on this excess only, in addition to the drought penalty on the first ten percent and the applicable service charge and volume charge;
 3. For water delivered over 20.01 percent in excess of allotment, there shall be a drought penalty of 4.0 times the applicable volume charge levied only on this excess over twenty percent, in addition to all drought penalties described above for the first twenty percent and the applicable service charge and volume charge.
- D. In addition to the drought penalty, if drought usage exceeds the allowed allotment, a warning will be issued and enforcement actions may be taken as described in Section 11.xx.120.”

SECTION 10. Section 11.xx.100 is hereby added, and shall read as follows:

“11.xx.100 Water shortage service charge surcharge.

- A. A water shortage service charge surcharge may be imposed by resolution of the city council upon the recommendation of the finance director, to compensate for a loss of water revenue or to pay an additional cost for the purchase of water by the city.
- B. The water shortage service charge surcharge shall be in effect until rescinded after the finance director states that the water emergency costs have been fully recovered.”

SECTION 11. Section 11.xx.110 is hereby added, and shall read as follows:

“11.xx.110 Exceptions and application for exception.

- A. Any customer of record may apply to the director to increase the amount of water which may be used without exceeding the basic allotment based on any one or more of the following reasons:
 1. Medical requirements;
 2. More than four residents in a single family residential household. The additional amount allotted shall be fifty gpd per person;
 3. Incorrect customer classification based on predominant use;
 4. When failure to do so would cause severe economic hardship to the applicant, including, but not limited to, threat of imminent insolvency;
 5. When failure to do so would cause an emergency condition affecting the health, sanitation, fire protection, or safety of the applicant or the public.
- B. Written applications for such exceptions may be granted by the director based upon clear and convincing evidence that any one or more of the foregoing conditions has been satisfied and it is in the public interest to grant such application.

- C. The quantity of water allowed in addition to the basic allotment shall be determined by the director, said shall not exceed that quantity necessary to alleviate the condition which justified granting of the application for an exception. “

SECTION 12. Section 11.xx.120 is hereby added, and shall read as follows:

“11.xx.120 Violation Enforcement.

The violation of each provision of this chapter, and each separate violation thereof, shall be deemed a separate offense, and shall be enforced accordingly.

- A. Except for the imposition of the drought penalty, as a condition of enforcement of any violation of this chapter, any customer that violates any provision of this chapter shall be given a written warning or notice to refrain from further violations.
- B. Written warning or notice shall be given to the violator either by mailing said warning or notice to the address given to the city by the customer of record, by personal service on the violator, or by leaving said warning or notice in a conspicuous place on the served property wherein the violation occurred.
- C. If after issuance of the written warning or warnings, the director determines that the customer has continued or is continuing to violate the provisions of this chapter, the director may authorize and implement installation of a flow restricting device on the service line or reduce the amount of water available to the customer. Any costs incurred by the city to authorize, implement, and remove the installation of a flow restricting device on the service line or reduce the amount of water available to the customer shall be borne by the customer. The flow restricting device shall be removed and the prior water supply amount resumed no sooner than sixty days after the date of the installation of the flow restricting device, or a reduction in water available, provided that no further violations have occurred within that time.
- D. If after implementation of a flow restricting device or reduction of water available to a customer, the customer continues to violate the provisions of the chapter, the director may authorize disconnection of water service to the customer for a period of three days. All costs or expenses incurred by the city for enforcement of this section shall be borne by the customer.”

SECTION 13. Section 11.xx.130 is hereby added, and shall read as follows:

“11.xx.130 Violation - Penalties.

In addition to all other remedies provided herein, any person who violates any provision of this chapter after having received a written notice to refrain as provided in Section 11.xx.120, is guilty of an infraction. The violation of each provision of this chapter and each separate violation thereof shall be deemed a separate offense and shall be punished accordingly. Each offense shall be punishable by (1) a fine not exceeding one hundred dollars for the first violation; (2) a fine not exceeding two hundred dollars for a second violation of this chapter within one year; and (3) a fine not exceeding five hundred dollars for each additional violation of this chapter within one year.”

SECTION 14. Section 11.xx.140 is hereby added , and shall read as follows:

“11.xx.140 Violation - Additional remedy.

As an additional remedy, the violation of any provision of this chapter by any person who has received more than one written warning pursuant to Section 11.xx.120 to refrain from the same or any other violation under this chapter in one calendar year shall be deemed and is declared to be a public nuisance and may be subject to abatement by a restraining order, or injunction issued by a court of competent jurisdiction.”

SECTION 15. This ordinance shall take effect and be in full force and effect from and after _____ days after its final passage.

RESOLUTION NO. 06 – 62 N.C.

BE IT RESOLVED by the Council of the City of Vallejo as follows:

WHEREAS, the Urban Water Management Planning Act requires all urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet annually to update their Urban Water Management Plan (UWMP) at least every five years and to submit the UWMP to the Department of Water Resources; and

WHEREAS, an UWMP is required in order for a water supplier to be eligible for State administered grants, loans, and drought assistance; and

WHEREAS, the City is an urban supplier providing water to approximately 37,800 customer connections; and

WHEREAS, the City has updated its UWMP in compliance with the California Water Code; and

WHEREAS, the City is required to adopt a Water Shortage Contingency Plan as part of an Urban Water Management Plan; and

WHEREAS, the adoption of an UWMP is statutorily exempt from the requirements of the California Environmental Quality Act pursuant to Water Code section 10652 and section 15282(w) of Title 14 of the California Code of Regulations; and

WHEREAS, the UWMP was available for public review and comment; and

WHEREAS, a properly noticed public hearing was held on February 28, 2006, to receive oral or written statements regarding the UWMP; and

WHEREAS, the City Council finds that the adoption and implementation of the Urban Water Management Plan, including the Water Shortage Contingency Plan will meet the existing and projected future water demand through 2025 during normal years and during the third year of multiple dry years either through existing water supplies or through the implementation of the Water Shortage Contingency Plan.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Vallejo hereby approves and adopts the City of Vallejo's 2005 Urban Water Management Plan, dated February 2006, with revisions as outlined in the City Manager's memo dated February 28, 2006.

BE IT FURTHER RESOLVED that the City Manager or his designee is directed to submit the revised Plan to the California Department of Water Resources, the California State Library and to any city or county in which the City of Vallejo provides water within 30 days of the date of adoption.

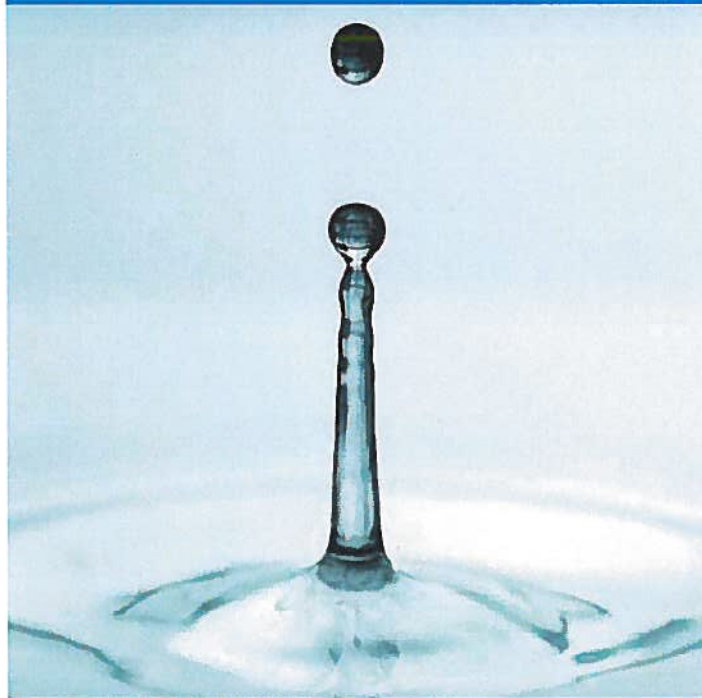
Attachment F – Groundwater Management Plan (NA)

Attachment G – Groundwater Banking Plan (NA)

Attachment H – Annual Potable Water Quality Report - Urban

Annual Water Quality Report

Water Testing Performed in 2011



City of Vallejo System, CA4810007
City of Vallejo Lakes System, CA4810021

30073-I-0009



The City of Vallejo welcomes this yearly opportunity to provide our customers with the Annual Water Quality Report. We have included information so you know where your drinking water comes from, how it is treated and how its quality compares to drinking water standards.

This report tells you that in 2011, after testing for more than 100 different constituents, your drinking water met all primary and secondary standards established by the California Department of Public Health and the U.S. Environmental Protection Agency. Primary standards are health related standards whereas secondary standards relate to consumer acceptance of the water supply and govern qualities such as taste, odor and color.

The tables in this report show each constituent found, the level at which they occur, how their level compares with standards and their most likely source. For more information about this report, or for any questions relating to your drinking water, please call Sue Littlefield, City of Vallejo, Laboratory Supervisor, at (707) 649-3473.

Public Participation

You are invited to participate in our public forum and voice your opinions and concerns about your drinking water. The Vallejo City Council meets on various Tuesdays, throughout the year, at 7:00 p.m. at 555 Santa Clara Street, Vallejo. You may call the City Clerk at (707) 648-4527 for specific meeting dates.

Your Water Treatment Process

The **City of Vallejo** water system and service area receives its finished water from the forty-two million gallons per day Fleming Hill Water Treatment Plant. This conventional treatment facility utilizes a multi-barrier process to ensure compliance with all State and Federal drinking water regulations and standards.

Initially, ozone is added to help remove dissolved organic matter and to aid in downstream processes. The water then flows to mixing basins where coagulants are added and the water is gently agitated so that fine suspended particles come together to form large 'floc' particles that settle out of the water. This process, known as coagulation, flocculation and sedimentation is followed by the addition of more ozone to disinfect and remove unwanted color, taste and odor.

The next step is filtration, where the water flows through multimedia filters consisting of granular activated carbon and sand in order to meet strict standards for clarity and to reduce the levels of microbial contaminants that could be in the untreated source water. Following filtration, the water receives additions of caustic soda, for pH and alkalinity control; fluoride, for the prevention of dental caries; and finally, chlorine to provide microbial protection throughout Vallejo's distribution system. Quality control and assurance is maintained at all times through uniform adherence to standard operating procedures and a meticulous schedule of laboratory analyses.

The **City of Vallejo Lakes System's** Green Valley Water Treatment Plant, which provides water service to the Lakes service area, can treat up to one million gallons a day providing customers with drinking water meeting all drinking water regulations and standards.

First, the MIEX™ pretreatment process removes naturally occurring dissolved organic matter. This treatment, using ion exchange resin, enables us to meet the Disinfectant/Disinfection By-products Rule by sufficiently lowering the levels of total organic carbon, therefore limiting the formation of disinfection by-products such as total trihalomethanes. Total trihalomethanes are chemicals formed over time in the distribution system when dissolved organic matter combines with chlorine. Regulations require we use chlorine to disinfect surface water.

The treatment plant's conventional treatment process uses polymer to promote coagulation, flocculation and sedimentation that remove the majority of soil particles from the water. Then, the water gravity flows through multimedia filters consisting of anthracite and sand so that it will meet clarity standards required to decrease microbial contaminants and to aid the disinfection process. Depending on which

water source or blend of sources we are treating (Lakes Madigan and Frey and/or Putah South Canal), we may add soda ash in order to increase alkalinity and pH. The last step of the treatment process adds chlorine to disinfect the water supply and to provide continual protection in the distribution system. This treatment plant does not add fluoride to your water.

A Message From the United States Environmental Protection Agency

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.

Contaminants that may be present in source water include:

- Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife;

continued on outside panel



Environmental Protection Agency continued from inside

- Inorganic Contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming;
- Pesticides and Herbicides, that may come from a variety of sources such as agriculture, urban storm water runoff and residential uses;
- Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural applications and septic systems; and
- Radioactive Contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

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 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.



Lake Madigan Source Water for the Lakes Service Area

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

Ang ulat na ito ay nagtataglay ng mahalagang inpormasyon. Kung kayo ay may tanong o nangangailangan ng karagdagang kaalaman ukol sa ulat na ito sa wikang Pilipino, mangyari lamang na tawagan si Jun Malit sa telepono (707) 648-4309.



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Your Water Sources

The City of Vallejo owns and operates two permitted public water systems for the benefit of our customers in two major service areas. The City of Vallejo Water System and service area provides drinking water to customers within the city limits, to some customers in the unincorporated areas adjacent to City boundaries and to a limited number of customers in the City of American Canyon.

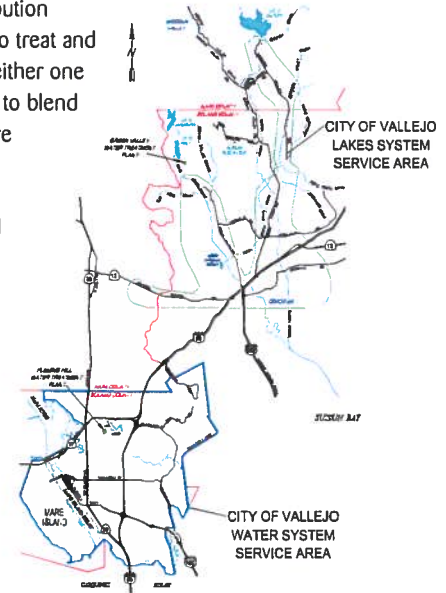
The City of Vallejo Water System customers are fortunate because they enjoy an abundant water supply from two surface water sources. The Solano Project provides source water from Lake Berryessa, transported to our facilities by the Putah South Canal. The City also receives surface water from the State Water Project. This water, from Lake Oroville, travels through the Sacramento River to the State's North Bay Aqueduct pumping facilities. Our source water

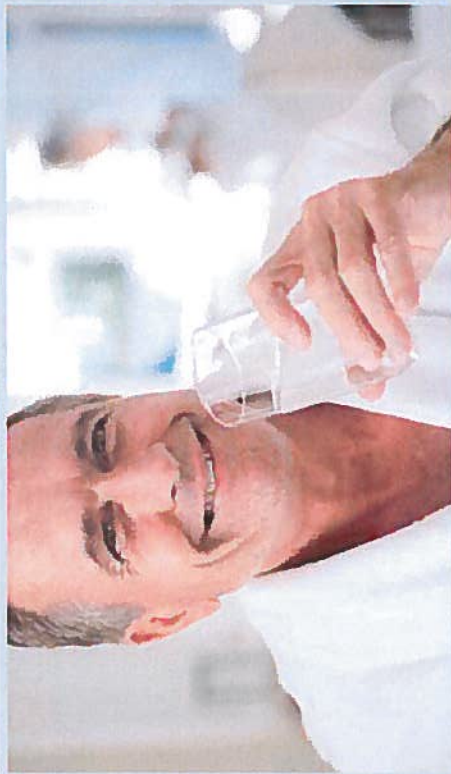
pumping and distribution facilities enable us to treat and deliver water from either one of these sources or to blend these sources before treatment at the Fleming Hill Water Treatment Plant and distribution to the Vallejo service area.

The City of Vallejo Lakes System and service area is a public water system with its own treatment plant and distribution system that delivers drinking water to

customers residing in the Green Valley, Old Cordelia, Jameson Canyon, Suisun Valley, Willotta Oaks and Gordon Valley areas.

This system and service area also has water available from two distinct surface water sources. In addition to the Solano Project's Lake Berryessa water delivered from the Putah South Canal by agreement with the Solano Irrigation District, this system treats water from Lakes Frey and Madigan, which are two interconnected lakes owned by the City of Vallejo. The Green Valley Water Treatment Plant can either treat these two sources separately or blend these two sources before treatment and delivery to our customers. In case of emergencies, portions of this system can receive treated water from the City of Fairfield. For a copy of their Annual Water Quality Report, please call (707) 428-7594.





PRIMARY DRINKING WATER STANDARDS - Health Related Standards

PARAMETER/CONSTITUENTS (units of measurement)	STATE MCL	PHG (MCLG)	VALLEJO SERVICE AREA		LAKES SERVICE AREA		MAJOR SOURCES IN DRINKING WATER
			RANGE	AVG	RANGE	AVG	
INORGANICS							
FLUORIDE (ppm)	2	1	0.3 - 1.2	1	0.0 - 0.2	0.1	Water additive or natural minerals
MICROBIAL							
TOTAL COLIFORM (% positive samples)	5% or 1 sample	(0)	ND - 1.2%	ND	ND - 1	ND	Naturally present in the environment
For the City of Vallejo Water System, no more than 5% of all samples taken during a single month may be positive for total coliform. For the Lakes System, no more than one sample per month may be positive for coliform bacteria.							
FECAL COLIFORM (E. coli)		(0)	ND - 1	ND	ND	ND	Human and animal fecal waste
MCL: A routine sample and a repeat sample are total coliform positive, and one of these is also fecal coliform or E. coli positive.							
CLARITY							
TURBIDITY (NTU)	TT = 95% of samples ≤ 0.3 Maximum ≤ 1 TT = % reduction ≥ 80%		100% of samples ≤ 0.3 Maximum = 0.07 99% - 100%	100%	100% of samples ≤ 0.3 Maximum = 0.30 97% - 100%	99%	Soil runoff
Turbidity is a measurement of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. MCL compliance is based on all samples taken each month. All samples were in compliance.							
RADIOLOGICAL							
RADIUM 228 (pCi/L)	5	0.019	1.58 - 1.58	1.58	ND	ND	Erosion of natural deposits
Last sampled in 2007. The state requires us to monitor for certain substances less than once a year because their concentration does not change frequently.							
DISINFECTANT	MRDL	EPA MRDLG					
CHLORINE, Free Residual as Cl ₂ (ppm)	4.0*	4*	ND - 1.6	0.9	ND - 2.2	0.5	Disinfectant for water supply
DISINFECTION BY-PRODUCTS							
TRICHALOMETHANES, TOTAL (ppb)	80*	N/A	14 - 69	49	33 - 107	62	Drinking water disinfection
HALOACETIC ACIDS (ppb)	60*	N/A	ND - 18	13	ND - 40	15	Drinking water disinfection
DISINFECTION BY-PRODUCTS PRECURSOR							
TOTAL ORGANIC CARBON (%Removal Ratio)	TT = Running Annual Average (RAA) ≥ 1*		All RAA ≥ 1 minimum = 1.6		All RAA ≥ 1 minimum = 0.8		Decay of natural organic matter

MONITORING for CRYPTOSPORIDIUM



Beginning in 2006, federal regulations required us to monitor our raw, untreated water sources (the Putah South Canal and the North Bay Aqueduct) for levels of *Cryptosporidium* contamination for two years. *Cryptosporidium* is a microbial parasite commonly found in surface water throughout the U.S. After analyzing twenty-four monthly samples from each source, we did not find *Cryptosporidium* in the North Bay Aqueduct water and the Putah South Canal had low levels in only two samples. Results from this monitoring program demonstrated that currently, our water treatment processes are sufficient to treat the levels of *Cryptosporidium* possibly encountered in our raw water supplies. The filtration process removes *Cryptosporidium*, although commonly used methods cannot guarantee 100% removal. Please refer to the article "Special Health Concerns" for more information regarding *Cryptosporidium*.

Your water system meets all primary and secondary drinking water standards.

* Compliance levels for the four parameters listed above are based on an running annual average determined quarterly. This means that every three months, we average all the

PRIMARY STANDARDS—LEAD and COPPER STUDY—Monitoring of Customers' Tap Water

PARAMETER/CONSTITUENTS (units of measurement)	AL	PHG	Vallejo Service Area 90th % Number of Homes > AL Results are from 56 homes sampled in 2009	Lakes Service Area 90th % Number of Homes > AL Results are from 10 homes sampled in 2011	MAJOR SOURCE IN DRINKING WATER
COPPER (ppm at the 90th Percentile)	1.3	0.3	ND	0	Internal corrosion of household plumbing
LEAD (ppb at the 90th Percentile)	15	0.2	ND	0	Internal corrosion of household plumbing

Every three years the City is required to sample at the customers' faucets for lead and copper. This monitoring ensures our water is not too corrosive and does not leach unsafe levels of these metals into your drinking water. Compliance measurements are from the 90th percentile (the highest level measured from 90% of the homes sampled). The latest monitoring, for both water systems, did not detect lead or copper from 90% of the homes sampled.

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 Vallejo 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 drinking 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/salewater/lead>.

SECONDARY DRINKING WATER STANDARDS - Aesthetics Related Standards

PARAMETER/CONSTITUENTS (units of measurement)	STATE MCL	PHG or (MCLG)	VALLEJO SERVICE AREA WATER		LAKES SERVICE AREA WATER		MAJOR SOURCES IN DRINKING WATER
			RANGE	AVG	RANGE	AVG	
CHLORIDE (ppm)	500	none	10 - 26	16	12 - 89	16	Natural minerals
ODOR THRESHOLD (units)	3	none	1.0 - 4.0	1.0	1.0 - 2.0	1.4	Natural organic matter
SPECIFIC CONDUCTANCE (µS/cm)	1,600	none	252 - 525	400	219 - 607	280	Natural minerals
SULFATE (ppm)	500	none	29 - 73	43	16 - 48	17	Natural minerals
TOTAL DISSOLVED SOLIDS (ppm)	1,000	none	158 - 328	250	137 - 379	180	Natural minerals

MONITORING FOR SODIUM and HARDNESS

PARAMETER/CONSTITUENTS (units of measurement)	AL	PHG	RDGL-Residual Disinfectant Level Goal:
SODIUM (ppm)	none	none	29
TOTAL HARDNESS (ppm as CaCO ₃)	none	none	72 - 194
TOTAL HARDNESS (grains/gallon as CaCO ₃)	none	none	4 - 11

DEFINITION OF TERMS USED IN THIS REPORT

- AL-Regulatory Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- MCL-Maximum Contaminant Level:** 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 economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.
- MCLG-Maximum Contaminant Level Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. EPA.
- MRDL-Maximum Residual Disinfectant Level:** 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.

- MRDLG-Maximum Residual Disinfectant Level Goal:** 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.
- n/a:** Not applicable
- ND:** Not detected
- NTU-Nephelometric Turbidity Units:** Particles in water that make it appear cloudy
- pCi/L: picoCuries per liter:** A measure of radioactivity
- PHG-Public Health Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to

Special Health Concerns

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.



Source Water Assessments and Vulnerability Summaries

Source Water Assessments evaluate the quality of the water used as a drinking water supply for local communities and examine the water's vulnerability to possible contamination from activities within the watershed. Source Water Assessments were completed in 2001 for the Putah South Canal and Lakes Frey and Madigan. The North Bay Aqueduct's (Sacramento Delta) assessment was completed in 2002. The adjacent table summarizes the vulnerability of each water source and provides a contact name if you would like copies of the complete assessments.

Vulnerability Assessments Table

Source	Most Vulnerable Activities	Moderately Vulnerable Activities	Contact
Lakes Frey and Madigan	Illegal body contact* Wild animal access* Agricultural drainage*	Other animal operations Wildfires	Franz Nestlerode City of Vallejo (707) 648-4308
Putah South Canal	Illegal activities/ Dumping Herbicide applications	Road/Streets Storm drain discharge Recreational area	Alex Rabidou Solano County Water Agency (707) 451-6090
North Bay Aqueduct	Grazing animals* Runoff from grazing land	Runoff from agricultural land	Alex Rabidou Solano County Water Agency (707) 451-6090

*Associated with detected contaminants

health. PHGs are set by the California EPA.
ppb: parts per billion or micrograms per liter
(ug/L)

ppm: parts per million or milligrams per liter
(mg/L)

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

Secondary Drinking Water Standards: MCLs for aesthetic characteristics of water (such as color, taste, and odor) that may affect the consumer's acceptance of their water supply.

TT-treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

µS/cm-Microsiemens per Centimeter: A measure of electrical conductivity

City of Vallejo Water Conservation Program

Contact us for information on free water-saving devices and services or rebates to help reduce water use.

www.vallejowater.org

(707) 648-5299

or

(707) 648-4479

Attachment I – Notices of District Education Programs & Services Available to Customers



[Urban Water Management Plan](#)

[Annual Water Quality Reports](#)

[Water Conservation Program](#)

[Water Rates](#)

[New Water Service Cost Schedule](#)

[New Water Service Application](#)

[Temporary Water Service Meter Application \(Hydrant Meter\)](#)

[Misc. Fees \(Backflow, Meter Sets, Etc.\)](#)

[Five Year Water Rate Study Information](#)



The Water Division provides the administrative, engineering, water treatment, and maintenance support needed to ensure our water customers, now and in the future, will receive potable water meeting all applicable water treatment regulations and sufficient water for fire suppression.

Franz Nestlerode
Water Superintendent
202 Fleming Hill Road
Vallejo, CA 94589-2337
(707) 648-4307

Important Phone Numbers

Water Billing (707) 648-4345

Water Leak Reporting

Business Hours (Monday – Friday 8:00am to 4:00pm) (707) 648-4556

Non-Business Hours (707) 648-4313

Water Quality (707) 649-3473

Water Administration and Engineering (707) 648-4307

Water Conservation Program (707) 648-4479

555 Santa Clara Street, Vallejo, California 94590



Every Drop Counts - Use Water Wisely









Local Water Information & Resources

Curious about Vallejo water quality?

Click [here](#) to view a copy of the most current water quality report.

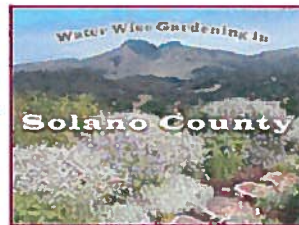
Vallejo water customers are eligible to receive any of these "free" household water conservation gadgets.

Call (707) 648-5299 to find out how to get yours.

					
Low Flow Shower Heads	Bathroom & Kitchen Aerators	5-Minute Shower Timer	Water Hose Flow Meter	Soil Moisture Meter	Water Hose Spray Nozzle

Need help with a landscape or gardening project?

Check out the [Solano Waterwise Gardening Program](#). It's a free on-line landscaping and plant selection resource guide designed specifically for those living in Solano County's diverse climate zones. It's great for.....
Seeing what a mature plant looks like
Grouping plants based on size, water, and soil needs
Selecting plants that fit your landscape setting



Residential Landscape Workshops:

Held every Spring in April / May. A series of three 2-hour training sessions are taught by local Master Gardeners covering topics in: Landscape Basics (soil prep & design), Irrigation design (drip system basics), Plant Selection (drought tolerant plants). Click on the links below to view a sample of information presented in each session.

[The Basics](#)



[Irrigation Design](#)



[Plant Selection](#)



[Back...](#)



Every Drop Counts - Use Water Wisely



Rebates

In partnership with the Solano County Water Agency, the City of Vallejo currently offers its water customers these moneysaving cash rebates!

Click [Here](#) for information or to apply for any of the rebate programs listed below, or call us with questions at 707-648-5299

Rebate Title	Program Dates	Cash Amount	Available To
High Efficiency Toilet	Ongoing since 2008 – Ends June 30, 2013	Up To \$100 each (limit 3 per household)	Residential & Commercial Customers
Smart Irrigation Controller	Ongoing since 2009 – Ends June 30, 2013	Varies by type	Residential & Commercial Customers
High Efficiency Washing Machine	July 1, 2011 – Ends June 30, 2013	Up To \$75	Residential Customers
Water Efficient Landscape (Turf Removal Program)	July 1, 2011 – Ends June 30, 2013	Up To \$1000	Residential Customers

Note: Funding for all rebates is limited and programs may end if funds are depleted before the scheduled end date.



Toilets



Washers



"Smart" Timers



Turf Removal

Got Questions? - Call the City Water Division at (707) 648-5299

[Back...](#)



Every Drop Counts- Use Water Wisely



Residential & Commercial Programs

Outdoor/Landscape Water Use Surveys



Outdoor water use can account for up to 55% of all residential water consumption. This free program for all City of Vallejo residents will evaluate the condition of an existing landscape irrigation system and help identify costly water leaks.

During the water survey, we will schedule an appointment with you to:

- Review water usage on your water account over a 3-year period
- Locate & read your water meter and demonstrate leak detection practices
- Activate the irrigation system and inspect equipment
- Inspect sprinkler heads for obstruction, condition, and spray pattern
- Review automatic sprinkler timer schedule
- Inspect shut-off valves for leaks
- Look for system breaks
- Evaluate soil and ground cover condition
- Test your static water pressure
- Provide a written report listing suggestions for improving the efficiency of the system
- Provide free literature and water saving devices to help promote water efficient landscaping and indoor water use

Indoor Water Use Surveys



During the indoor water use survey, water conservation staff will:

- Provide you with a detailed water consumption history report
- Check toilets and water fixtures for leaks
- Determine flow rate of shower heads and faucets
- Install high-efficiency showerheads and faucet aerators as requested and needed
- Provide a written report with recommendations on how to conserve water
- Provide free literature and water saving devices to help promote water efficient landscaping and indoor water use

Call 648-5299 to schedule an appointment

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Every Drop Counts- Use Water Wisely



School Education Program

CALL US TO TAKE ADVANTAGE OF THESE FREE WATER EDUCATION SERVICES

Roger Judy
School Water Education Program Manager
(707) 648-5299

Click [here](#) to download a printable education services brochure
Pennycook Elementary wins 2010 Water Survey Competition. Congratulations!



Classroom Presentations

These interactive hands-on water-related activities are taught by professional Water Education Specialists. Each activity takes about 50 minutes to present and is packed with essential information that meets stringent Science Content Standards for California Public Schools.

Our selection of interactive classroom activities include:

The Life Box: Used to introduce the four essential factors for life (soil, sun, air, water), with special focus on how plants, wildlife and human communities have formed around water. (50 minutes)

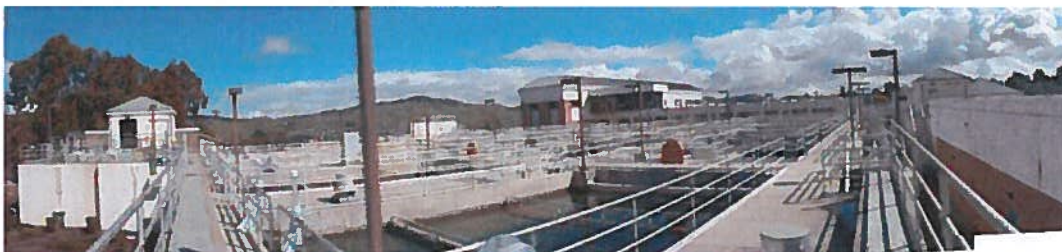
Sum of The Parts: Students demonstrate how humans contribute to the pollution of a river as it flows through a water-shed. They learn to recognize the sources of water pollution and how everyone's "contribution" can be reduced. (50 minutes)

The Incredible Journey: With a roll of the die, students interactively simulate the movement of water as it moves through the water cycle. They record their journey and identify and describe the movement of water through the water cycle as it circulates and changes its molecular state. (50-90 minutes)

Who Dirtied The Bay: Students participate in an interactive history lesson that demonstrates how California settlers contributed to the pollution of San Pablo Bay and California's waterways. This lesson teaches children to interpret, analyze and come up with solutions to prevent urban water pollution. (50 minutes)

A House of Seasons: By constructing (cutting and pasting) a collage of pictures, students learn the role water plays in each of Earth's changing seasons. This activity engages students to think critically about the four seasons and how water use changes throughout the year. (50 minutes)

Water Facts: Using a "slide glide" and colorful handouts, students identify water use processes and calculate how much water is routinely used around the house and in the agricultural community. The activity emphasizes simple ways to conserve water by modifying daily water use habits. (30-45 minutes)



Field Trips and Tours

Our water treatment field trip & plant tour is currently being developed. Very soon we plan to offer guided tours of the City's drinking water treatment plant that is centrally located in the City of Vallejo on Fleming Hill Road. Transportation services will be included. We need to know your school's level of interest and demand for this type of activity. Please contact us directly via phone or email if you are interested in this form of educational experience.

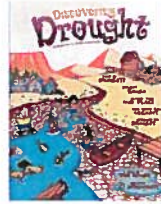


Teacher Training

We provide free Water Education for Teachers (Project WET) training. These popular 6-hour seminars for K-12 educators promote awareness, appreciation, knowledge and stewardship of water resources through the development and use of interactive teaching activities. Participants receive a free 500-page Project WET Curriculum and Activity Guide that is packed full of innovative activities that are hands-on, easy to use, and fun!



Posters



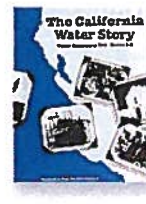
Student Hand-outs



Games



Booklets



Videos

Resource Library

Teaching professionals can take advantage of our growing water [education library](#) that is packed with informative books, periodicals, maps and videos. If we don't have something you need in the classroom, we will use our extensive network of water conservation specialists to locate it for you.



Water-Saving Devices and Classroom Supplies

Teachers can take advantage of our large selection of free water-saving gadgets and teaching supplies that can be integrated into any earth science or environmental learning experience.

Information

We have many personal contacts with water conservation professionals in the local community and around the State. Let us know what your water conservation teaching needs are and there is a good chance we can help!

Who Pays for This?

State mandates require local water purveyors to implement and promote water conservation measures. The services provided through our School Education Program are paid for through a combination of grant funding and local water rate revenue.

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555 Santa Clara Street, Vallejo, California 94590

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Attachment J – District Agricultural Water Order form (NA)

Attachment K – Drainage Problem Area Report (NA)

Attachment L – Correlation Between DMMs and BMPs

The 2010 UWMP Guidebook prepared by the Department of Water Resources includes a useful table which is included here.

Table E-1 Demand management measures and California Urban Water Conservation Council BMP names

CUWCC BMP Organization and Names (2009 MOU)				UWMP DMMs	
Type	Category	BMP #	BMP name	DMM #	DMM name
Foundational	Operations Practices	1.1.1	Conservation Coordinator	L	Water conservation coordinator
		1.1.2	Water Waste Prevention	M	Water waste prohibition
		1.1.3	Wholesale Agency Assistance Programs	J	Wholesale agency programs
		1.2	Water Loss Control	C	System water audits, leak detection, and repair
		1.3	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	D	Metering with commodity rates for all new connections and retrofit of existing connections
		1.4	Retail Conservation Pricing	K	Conservation pricing
	Education Programs	2.1	Public Information Programs	G	Public information programs
		2.2	School Education Programs	H	School education programs
Programmatic	Residential	3.1	Residential assistance program	A	Water survey programs for single-family residential and multifamily residential customers ¹
				B	Residential plumbing retrofit
		3.2	Landscape water survey	A	Water survey programs for single-family residential and multifamily residential customers ¹
		3.3	High-Efficiency Clothes Washing Machine Financial Incentive Programs	F	High-efficiency washing machine rebate programs
	3.4	WaterSense Specification (WSS) toilets	N	Residential ultra-low-flush toilet replacement programs	
	Commercial, Industrial, and Institutional	4	Commercial, Industrial, and Institutional	I	Conservation programs for commercial, industrial, and institutional accounts
	Landscape	5	Landscape	E	Large landscape conservation programs and incentives

¹ Components of DMM A (Water survey programs for single-family residential and multifamily residential customers) applies to both BMP 3.1 (Residential assistance program) and BMP 3.2 (Landscape water survey)