

City of Waterford Water Supply Report

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INTRODUCTION

The City of Waterford has an adopted policy to acquire the city's water system, the old Del Estes Water Company, now owned and operated by the City of Modesto. This policy goal, which has been in effect since the adoption of the City's General was adopted in November of 1991, has not been implemented due to lack of resources and difficulty of an agreed to value for the system between the Cities of Waterford and Modesto.

Recent events, involving several development proposals under consideration by the City of Waterford, have brought the acquisition of the water system back into the forefront of policy discussion. There are several issues regarding the operation, maintenance and expansion of the water system, which needs to be addressed.

The purpose of this report is to provide the Waterford City Council with background information to support their decision making relative to evaluating and implementing the City's policy goal of acquiring the Waterford water system from the City of Modesto and/or development of a new water system to service residents and businesses (existing and future) of the City.

This report draws heavily upon reports that have previously been prepared relating to the city's water delivery system. These reports are *Water Distribution System Evaluation Study*, July 1997, prepared for the City of Waterford by Nolte and Associates; *Final 2000 Urban Water Management Plan* prepared for the City of Modesto and the Modesto Irrigation District by Black & Veatch Corporation. A list of reports and studies used in the preparation of this review are included at the end of this report. Relevant material has been drawn from these sources and summarized in this report. Some of the material in these studies, including the Nolte & Associates information regarding water quality testing for the City of Waterford's wells and the description of the city's system and deficiencies, is reproduced verbatim or near verbatim in this report.

It should be noted that some of the information is outdated, particularly that which was drawn from the 1997 Nolte & Associates report. However, this report provides a summary of the operations of the water system. Where more current data is available, it has been added to the Nolte conclusions.

Summary and Conclusions:

Based on a review of the various background reports available regarding the Modesto Water System, several conclusions can be drawn regarding water service needs in the City of Waterford:

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1. A total of \$2.87 million (1997 \$s) is needed to upgrade the existing system. This does not include system capacity expansion.
2. Based on the City of Modesto's demands on the River Pointe development, it can be assumed that at least \$2 million in system capacity (new well and storage) needs exist to serve new development in the City.
3. Based on a review of system peak service hour demand requirements at build-out, at least 4 new (1,000 gpm) wells are needed to support build-out of the present City plans.
4. A review of various ground-water reports indicate that the City can rely on ground-water for its present and immediate future water needs but long-term growth and expansion of the City should look toward treated surface water through a negotiated agreement with the Modesto Irrigation District and its current partner, the City of Modesto if it is found to be financially feasible. In the alternative, the City might look at obtaining its own raw water supplies from MID and developing its own treatment facility.
5. Regardless of system ownership, major upgrades to the system are required to maintain the integrity of the system and to avert public health and safety problems. These upgrades will require an increase in existing user rates.
6. System connection fees will need to be re-examined to address system expansion needs for new development.
7. In the event that the City of Waterford assumes operational responsibility of the system, the City can expect at least \$17,400 (1997 \$s) in monthly operational costs and at least \$101,000 (1997 \$s-initial capital investment) in new service equipment purchases.
8. It appears prudent that any negotiation for purchase of the Waterford Water System, from the City of Modesto, must include at least the old Del Este surface water treatment capacity along with associated water rights.

Given the extent of the existing system's deficiencies and the costs that will be incurred by the City to bring the system up to a safe and reliable standard, the economic value of the current system should be modest in any negotiated sale with the City of Modesto. Furthermore, the City of Waterford can expect that there will be a considerable amount of political fall-out on the Waterford City Council over the necessity of imposing user rate increases to address the costs of bringing the system up to safe operating standards.

Even if the City of Waterford were to decide to abandon its policy of water system acquisition, there will be a need to raise user rates to address system deficiencies. Additionally, as has been demonstrated over recent development review and entitlement processes, the City has limited ability to direct land use planning and development policy in Waterford as a result of ownership of the Waterford Water System by the City of Modesto.

History of the Water System's Development

Waterford's water distribution system was founded in approximately 1913 by the Waterford Land and Development Company. This system was purchased by the Del Este Water Company (DEWC) in 1938. The system was originally permitted by the State

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Department of Health Services in 1956. The permit (No. 50-006) was amended twice, in 1964 and 1993. In 1996 the City of Modesto purchased the water systems owned by DEWC, including the system serving the City of Waterford, and Modesto currently owns and operates the system.

The Modesto Irrigation District

The Modesto Irrigation District (MID). has developed numerous water rights and facilities to provide agricultural irrigation water from the Tuolumne River and has also developed groundwater supplies for agricultural uses. In the early 1990s the city, MID and the Del Este Water Company formed a partnership and executed a Treatment and Delivery Agreement to use MID's surface water rights for domestic purposes. The Modesto Domestic Water Project (MDWP) was the result of this partnership and the agreement obligates MID to deliver 30 million gallons per day of treated domestic water from its regional water treatment plant located at the Modesto Reservoir. The plant and storage and delivery facilities were completed in January 1995.

The City of Modesto is MID's only domestic water customer. The implementation of the water treatment facility allowed the City of Modesto to cut its groundwater pumping in half. The city currently supplies approximately 60 percent of its water use in its overall service area from the 118 city owned and operated wells. In the year 2000, the city produced 45,273 acre-feet of water from these wells.

The population of the Modesto/MID joint service area is expected to be 244,000 by 2005 and 315,900 by 2010. The corresponding water demand will increase from the 2000 demand of 72,840 acre-feet per year to 102,390 ac-ft/year by 2010. The total municipal safe yield of the Stanislaus and Tuolumne River Groundwater Basin is estimated at 50,000 ac-ft/year with the portion of the safe yield allocated to the joint service area being 42,625 ac-ft/year. This basin provides the vast majority of the groundwater to the city's system. Currently, the Turlock Groundwater basin provides roughly nine percent of the groundwater to the system.

Surface water supplied by MID's Modesto Regional Water Treatment Plant is supplementing the groundwater supplies. The current design capacity of the treatment plant is 33,607 ac-ft/year. By 2005, the joint service area will require an additional 33,450 ac-ft/year from the treatment plant, and by 2010, an additional 10,000 ac-ft/year will be required, assuming that the full safe yield can be obtained from the groundwater supplies.

The *Final 2000 Urban Water Management Plan*, prepared for the City of Modesto and MID by Black & Veatch Corporation, concluded that in order to assure a safe and reliable water supply for the residents and business owners in the joint service area MID should proceed with plans to construct Phase II of the water treatment plant for start-up in 2005. This expansion would roughly double the capacity of the treatment facility. The report also concluded that the City of Modesto should immediately investigate current and potential groundwater quality issues that could impair the basin's safe yield amounts.

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Existing System Description

Distribution System:

The original system for Waterford went into service before the 1920s utilizing 2-inch to 8-inch dipped and wrapped steel pipe. New subdivision tracts in the city install 4-inch to 12-inch PVC pipe, and it is not known how much of the original pipe has been replaced.

The system is operated as a single pressure zone with design pressures ranging from 45 to 60 pounds per square inch (psi). Reports indicate that there are serious problems in maintain these pressures and some instances of water pressure falling below 20 psi during periods of peak demand. The system does not include storage reservoirs, but all wells have chlorination facilities.

When it purchased the Del Este Water Company in 1995 the City of Modesto became the retail water purveyor to Waterford, Hickman, Del Rio, Salida, Grayson, and parts of Ceres and Turlock. At the time of the purchase, the Del Este Water Company served approximately 30 percent of the municipal customers in the Modesto area. The City of Modesto does not exercise land use powers in areas it serves which were formerly within the Del Este system and outside of the city's sphere of influence.

System Water Production Capacity:

The city is supplied potable water by six (6) groundwater wells which draw water from the underlying deep confined aquifer of the San Joaquin Valley. Two of the wells (Well No. 302 and 303) were constructed in 1991 while the other four wells were constructed and put into operation in the early 1940s and 1960s. The well number, name, address, date of drilling/deepening, and well depth is shown in Table 2 below:

Table 1
Well Identification, Address, Drilling Date and Depth

Well No.	Name	Address	Drill Date	Depth
242	Waterford	12315 Dorsey St.	1945/1985	295
244	Tim Bell	300 Tim Bell Rd.	1949	259
245	Skyline	13601 Skyline Blvd.	1965	300
286	Reinway	546 N. Reinway Ave.	1984	311
302	S. Reinway	200 S. Reinway Ave.	1991	237
303	Northridge	12401 Bonnie Brae Ave.	1991	276

Insert

System Map

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Table 2
Well Depth and Production

Well No.	Data Date	Static Water Level	Pumping Water Level	Pump Flow (GPM)	Discharge Pressure
242	5/29/03	82	86	425	62
244	5/29/03	89	94	475	70
245	5/15/03	93	102	480	55
286	5/15/03	77	83	1000	52
302	5/15/03	85	101	900	62
303	3/11/03	82	91	800	70

The wells produce about 4,080 gallons per minute (gpm), according to the latest production information provided by the City of Modesto.

The Modesto Water System Organization:

The Modesto water system is organized, and data reported, in three Zones; Zone 1 (fund 6100) is the City of Modesto's water service; Zone 2 (Fund 6150) is the portion of the old Del Este system providing service within the City of Modesto; Zone 3, (Fund 6160) is the old Del Este system that includes service in Waterford, Hickman, Del Rio, Salida, Grayson and parts of Ceres and Turlock.

System Fees:

At present, water rates are established by the City of Modesto on a flat rate basis based on lot size. It should be noted that the City of Modesto in initiating a program to move to metered water as a means of water conservation. At present (Dec. 2003) water for a standard 7,000 s.f. residential lot ranges as follows:

Zone 1 (Modesto)	\$263.11 per year
Zone 2 (Del Este-Modesto)	\$324.81 per year
Zone 3 (Outside Modesto)	\$207.48 per year

Water System Fees, according to Modesto Municipal Code Section 11-1.04, is \$0.05 per gross square foot of lot area. For a typical 7,000 s.f. lot, this comes to \$350. The fee schedule notes that in the Del Este service area, there is a charge for the system fees and specific improvements. The Main Connection Charge based on the linear foot of lot frontage adjacent to any city water lateral providing service to the property (\$18 per foot), Water Service Installation Charge that varies based on the size of the service (\$1,156 for 2" service), a Water Meter Fee that varies based on the size service and type of meter (from \$115 to \$3,350), Pavement Fee (\$439 for each trench), Fire Hydrant Installation Fee (\$2,635), Water Connection for Main Extension (\$2,820) and other miscellaneous fees.

A survey of Water Service Fees, prepared by John B. Anderson in November of 2003 showed the cost per dwelling unit for Waterford (under the City of Modesto's system)

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compared with other communities in the region. The fee estimate is based on a standard residential development and is as follows:

City of Waterford (Zone 3)	\$1,608/du
City of Modesto	\$2,983/du
City of Manteca	\$5,340/du
City of Riverbank	\$2,405/du
City of Ceres	\$1,608/du
City of Turlock	\$5,481/du
City of Madera	\$432/du
City of Merced	\$3,976/du
City of Oakdale	\$2,599/du
City of Patterson	\$2,532/du
City of Newman	\$1,297/du
City of Ripon	\$3,734/du

The issue, that precipitated City's review of alternative water solutions, was the water service fees proposed to be charged for new development in the City (Grupe's Riverpointe I) would have resulted in the Grupe development group having to pay the \$1,608 connection fee in addition to other water development costs estimated at approximately \$2 million (\$7,220/du). The City of Modesto would not permit the Grupe investors to apply their normal connection fees to this amount thus resulting in a connection fee of around \$8,828 per dwelling unit. The Grupe Company determined that this cost was not feasible and notified the City of their intent to abandon the Riverpointe Development.

Groundwater Supply and Demand

Ground water studies have concluded that the City of Modesto could not maintain its growth and rely on ground water sources. The ground water levels under the City had declined over the years contributing to the declining water quality problems of the city.

Ground water, in the area, recharges from deep percolation rainfall and irrigation water, seepage from the rivers, underflow from the Sierra Nevada foothills, and upward flow from the formations that underlie the Mehrten Formations. Total average total withdrawals from the groundwater basin is about 313,000 acre-feet per year and the average total recharge, likewise, is about 313,000 acre-feet per year. Overall, the Modesto groundwater basin is in a quasi-equilibrium state according to the *River Ranch Project Evaluation of Groundwater Impacts*.

While groundwater may be in quasi state of equilibrium basin wide, within areas of high ground water withdrawal, there are cones of depression; such a depression exists under the City of Modesto. The Draft EIR for the Modesto Surface Water Treatment Plan (1989) reported that the groundwater levels had declined an average of 18-feet in the downtown Modesto area during the previous 30-year period.

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The groundwater basin under Modesto is made up of three distinct geologic formations that produce water. The Modesto Formation is a shallow formation occupying the area under Modesto proper. The Riverbank Formation underlies the Modesto formation and outcrops along the western edge of the City of Waterford. The Turlock Lake Formation underlies the Riverbank Formation and outcrops along the eastern edge of the foothills near Turlock Lake. The Turlock Formation is underlain by a clay water barrier (Corcoran Clay) that restricts the vertical movement of water and confines the Turlock Formation's water resources.

Ground water tends to flow east to west, according to some reports, with some flows to the southwest and the Tuolumne River. This would imply that the City of Waterford is located at the top of the groundwater basin and less likely to be impacted by overdraft near the City of Modesto.

The *Water Distribution System Evaluation Study* prepared for the City of Waterford in 1997 by Nolte & Associates states that there were 1,940 water service connections (630 metered and 1,310 flat rate) within the city in 1996. The average daily water consumption per connection was 700 gallons per day (gpd) for a total usage of 1,358,630 gpd. The maximum day demand was 2.716 million gallons per day (mgd) and peak hour demand was 4.753 mgd. The City of Modesto reported that for 2002 the City of Waterford used 591.3 million gallons of water to serve 1,719 active connections.

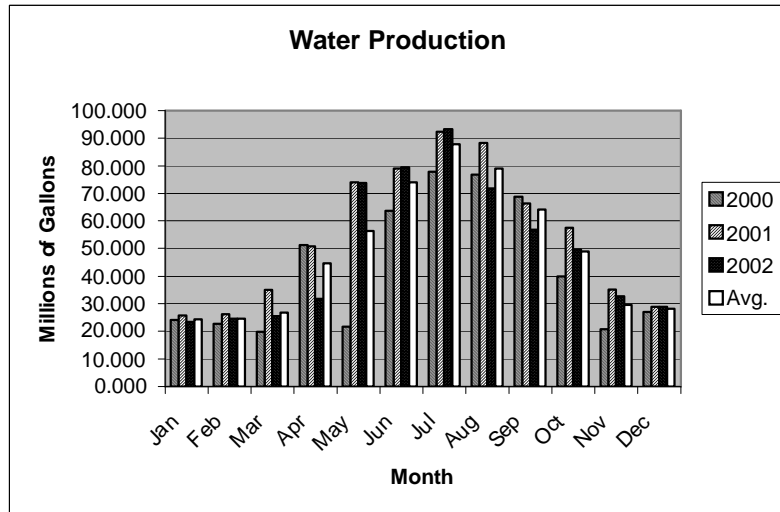
Data supplied by the City of Modesto indicates that the City of Waterford uses an average of 591.9 million gallons per year over the three-year period (2000-2003). Naturally, the peak month of demand is during the summer reaching a peak during July and August.

Table 3
Monthly Water Production in the City of Waterford
Years 2000 –to- 2002
(millions of gallons)

Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2000	24.159	22.802	19.846	51.346	21.625	63.742	77.788	76.841	68.763	39.927	20.845	27.113	514.797
2001	25.727	26.223	35.022	50.875	74.132	79.108	92.368	88.367	66.414	57.645	35.125	28.784	659.790
2002	23.530	24.699	25.463	31.785	73.805	79.558	93.176	71.845	56.927	49.594	32.655	28.839	591.876
Avg.	24.472	24.575	26.777	44.669	56.521	74.136	87.777	79.018	64.035	49.055	29.542	28.245	588.821
2003	64.545	28.121	37.316	37.316									

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**Graph of
Monthly Water Production in the City of Waterford
Years 2000 -to- 2002**



This study then determined the water demand for the city based upon build-out in the city. The study assumed, in the absence at that time of anticipated growth projections, that the city would build out according to the city land use totals.

The study used conservative water demand factors for the land use designations within the city to determine build-out water demand. At build-out, according to this study, the City of Waterford average day water demand is estimated at 2.954 million gpd, roughly 1.6 million gpd more than was consumed during an average day in 1996. The maximum day demand was determined to be 5.909 mgd at buildout, well above the 1996 maximum day demand of 2.716, and peak hour demand was determined to be 10.340 mgd at buildout, well above the 1996 4.753 mgd demand.

According to the Nolte study the total water production exceeded the demand in 1996 even under peak hour demand conditions where 3,300 gpm was required. Even at buildout the production of the six wells would be sufficient to serve the average day demand of 2,050 gpm. Looking at present day production, at the maximum day demand of 4,100 gpm the existing system is working at the limits of its capacity and existing well production would not be sufficient to supply the city with potable water under buildout peak hour conditions where 7,175 gpm would be required.

In order to meet water consumption demand at buildout of current land use zones the water system will need to incorporate new groundwater wells or introduce treated surface water supply into the system.

Water Quality

The Nolte study provided an overview of system water quality. According to the study, each well in the city's supply system is equipped with sodium hypochlorite facilities to

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disinfect the well water. Each well site includes a locked chlorination storage container which houses the sodium hypochlorite solution day tank and the appropriate positive displacement pumps. The water system operators maintain a free chlorine residual of approximately 0.3 to 0.8 parts per million in the water leaving the wells.

The City of Modesto tests the water from these wells on a regular basis. The system's state permit requires sampling the potable water for bacteriological quality on a monthly basis, and chemical quality on a yearly basis.

Monitoring includes the testing for general minerals, trace inorganic and organic compounds, pesticides and herbicides, radiological parameters, and the presence of bacteria. The monitoring data records available at the time of the preparation of the Nolte & Associates study indicate the wells were producing a very high quality groundwater based on the primary and secondary drinking water standards.

The secondary drinking water standard for total dissolved solids (TDS) is 500 mg/L (milligrams per liter). The TDS results from monitoring data were typically in the range of 130 to 250 mg/L. All the secondary drinking water standards are for the purposes of aesthetics and consumer acceptance. The primary drinking water standards are for the purpose of protecting the health of the customer. Nitrate for example is a primary drinking water standard at 45 mg/L (as NO₃), the results from the existing groundwater wells were typically in the range of 7 to 18 mg/L.

Of all the required water quality monitoring, only dibromochloropropane (DBCP) results were significant in the number of positive tests above the maximum contaminant level (MCL). The primary standard for DBCP is 0.2 micrograms per liter. The Modesto Water Department provided data that indicated that two tests (September and December of 2002) tests in Well No. 303 exceeded the DBCP standard. Two subsequent readings in 2003 approached the 0.2 MCL. As a result of these test results, Modesto Water has initiated treatment of the water from Well No. 303. There have been some positive DBCP test results from Well No. 244 and 245 but the tests results have been below the 0.2 MCL standard. These test results varied from non-detectable to 0.150 micrograms per liter.

The Waterford water system has had past occurrences of positive total coliforms. In 1994, two routine coliform samples taken from the water system were confirmed as positive. Subsequent fecal coliform testing was negative. The absence of fecal coliform confirmed that the contamination of the water system was not the result of wastewater contamination. Furthermore, test results were negative for the presence of bacteria since the installation of permanent disinfection facilities.

The Nolte & Associates study concluded that, overall, the Waterford water system was producing a very high quality water from the existing groundwater wells.

The 1997 Nolte & Associates study concluded that supplying the city with treated surface water was not a viable option at that time. When the study was prepared, the City of Modesto and the Modesto Irrigation District had recently completed construction of a 30

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mgd water treatment plant at the Modesto Reservoir located east of Waterford. Future expansion of that facility could provide enough capacity to include the City of Waterford, but that level of expansion has not occurred. In addition, utilization of treated surface water is more costly in terms of operation and maintenance than using the current groundwater resources.

System Deficiencies.

Based on suggested “service design criteria” (See Attachment “B”) the Nolte & Associates study addressed the adequacy of the existing distribution system to meet existing water demand conditions. The study described the layout of the existing pipe network of the Waterford water system and presents some of the deficiencies of the water system. A hydraulic model was used to simulate the system in order to determine deficiencies.

The study concluded that, in general, all groundwater wells appear to be in good condition but lack standby power generators to provide potable water service during a power outage. Additional deficiencies were also noted including the fact that at well nos. 244 (Tim Bell), 245 (Skyline), and 286 (Reinway North) mechanical equipment is too close to existing residences and uncovered making it easily accessible and subject to vandalism. At Well No. 302 (South Reinway) discharge piping, chlorination facilities, and the sand separator are outside the masonry building without any fencing.

The following deficiencies were found at Well No. 242 (Waterford)

- Mechanical facilities (pump, motor, VFD, and controls) are below-ground and susceptible to flooding.
- The existing below-ground concrete block vault is in violation of confined space requirements by the Occupational Safety and Health Administration (OSHA).
- Existing paint on the below-ground concrete block well vault is peeling off excessively.
- Lack of sanitary seal.
- Some rusting of the existing turbine motor base.

Deficiencies in the Distribution System

Nolte & Associates concluded that the major deficiency within the distribution system is the previously noted undersized status of the piping in the central part of town where the piping is 2-inch and 4-inch diameter. The size of this piping limits the fire flow capabilities at the existing fire hydrants. Other deficiencies are as follows:

- Extremely long dead end water main along Skyline Boulevard.
- More fire hydrants necessary along major commercial developments (i.e. highway frontage along Highway 132).
- Maximum spacing between fire hydrants violated at various locations.
- Some fire hydrants lacking minimum requirements (i.e. 2½" outlet and 4½" outlet)

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A computer simulation model of the distribution system was developed to help identify areas of excessively low pressures, water mains with extensively high head losses, and the ability of the water system to meet the existing water demands.

Using the average day water demand figures that have been previously presented in this report, the computer model was executed to evaluate deficiencies under average day demand, maximum day demand plus fire flow at four nodes, and peak hour demand. (Build-out conditions were outside the scope of the study and were not modeled).

The water model simulations indicate the following deficiencies in the existing distribution system:

- Residual pressures above 30 psi cannot be maintained at node J710 and J720 during peak hour demand.
- The available fire flow at Node 240 (Tisdell/End Drive intersection) during maximum day demand conditions (Minimum 20 psi residual) is only 1,300 gpm. The required fire flow for the surrounding land uses (single family residential) is 1,500 gpm.
- The available fire flow at Node 340 (Hickman/Baker Street) during maximum day demand conditions (minimum 20 psi residual) is only 1,280 gpm. The required fire flow for the surrounding land uses (limited industrial) is 2,500 gpm.
- The available fire flow at Node 930 (Bentley Street) during maximum day demand conditions (minimum 20 psi residual) is only 1,300 gpm. The required fire flow for the surrounding land uses (commercial) is 2,000 gpm.
- The available fire flow at Node 1410 (South Reinway Avenue) during maximum day demand conditions (minimum 20 psi residual) is only 1,380 gpm. The required fire flow for the surrounding land uses (single family residential) is 1,500 gpm.

Recommended Water System Improvements

The Nolte & Associates study recommended the following improvements to the Waterford water system:

1. Groundwater Supply Improvements

- Every groundwater well in the Waterford system should have standby power generators to continue providing potable water service in case of a power outage.
- Well No. 242 (Waterford) should be relocated from the existing below-ground concrete block vault to an above ground concrete pedestal inside a masonry block building similar to well nos. 302 and 303.
- Well No. 244 (Tim Bell) equipment should be housed inside a masonry block building similar to well nos 302 and 303.
- Well No. 245 (Skyline) equipment should be housed inside a masonry block building similar to well nos 302 and 303.

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- Well No. 286 (Reinway North) equipment should be housed inside a masonry block building similar to well nos. 302 and 303.
- The existing hydropneumatic tanks in well nos. 244, 245, and 286 should be placed in service so that the system can absorb pressure surges when necessary. Otherwise, using the existing tanks as “pipes” can result in water quality problems due to the time the water is stored in the tanks.

2. Service and/or Fire Protection Improvements

Individual simulations for fire protection analyses at each individual node in the system were not executed. To improve the available fire flows throughout the Waterford system the following improvements are recommended:

- Replace all existing 4-inch and 2-inch diameter pipes with a minimum 6-inch diameter pipe. Large water main sizes (greater than 6-inch) may be necessary to serve future growth within the undeveloped areas of the City of Waterford.
- Complete looped systems are necessary at the following locations to improve water system pressures and to avoid water quality problems with long dead end water mains.
 - ◆ Connect the dead end water main along Yosemite Boulevard with the dead water main along Skyline Boulevard.
 - ◆ Extend a 6-inch diameter water main from the existing water main along La Gallina Avenue to the dead end water main in the alley between “D” and “C” streets.
 - ◆ Extend a 6-inch diameter water main from the existing water main along La Gallina Avenue to the dead end water main in the alley between “C” and “B” streets
 - ◆ Extend a 6-inch diameter water main from the existing water main along Tim Bell Road to the dead end water main in the alley between “B” and “A” streets.

3. Other Improvements

It is estimated the Waterford water system includes a total of 128 fire hydrants, 38 of which did not comply with the design standards of the Stanislaus County Fire Department at the time the Nolte & Associates study was prepared. Any fire hydrant not in compliance must be replaced with hydrants having a minimum of one 2.5-inch outlet and one 4.5-inch outlet.

Capital Improvements Program

The timing of recommended improvements were prioritized in three levels

Priority A: Improvements which are extremely important and necessary to meet the existing maximum day, fire flow, and peak hour demands.

Recommended Priority A improvements are as follows:

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- Replace existing 4-inch pipe with 6-inch pipe
- Replace existing 2-inch pipe with 6-inch pipe
- 6-inch water main along Yosemite Boulevard
- 6-inch water main looped systems in downtown
- Replace existing non-compliant fire hydrants

Priority B: Improvements which are important but can be postponed until the higher priority improvements are constructed.

- Standby power generators (30KW)
- Standby power generators (75 KW)
- *Water Storage of at least 1 million gallons.

Priority C: Improvements which are not as important but can make the system easier to operate or to provide redundancy in the system.

- Relocate Well No. 242 above ground
- Masonry block building (Housing)
- Place existing hydro-pneumatic tanks in service
- Water meters for all existing users to meet Water Conservation requirements.

“*” indicates additional improvement needs identified since the Water Study was prepared.

Total costs for these system improvements was estimated at \$2.9 million in 1997 dollars. The Nolte report included several financing approaches that could be used in paying for these system improvements including an analysis of a revised fees structure and a listing of various funding sources (grants and loans) that are summarized in Attachment “C”

In general, the financial strategy would result in User Fee increases to address existing system deficiencies. System expansion costs, for serving new development, would be borne by an increase in system connection fees. Because system improvement needs are immediate, it was suggested in the Nolte report that the City use federal or state grant and loan resources to finance immediate system improvements.

Water System Operation and Maintenance

As part of the Nolte study, the City of Modesto utilities staff provided an estimate of staffing necessary to operate the Waterford water system. This staffing estimate included: a supervisor or lead person with cross-connection certification, at least one person certified as a Grade 2 water treatment operator, one pump mechanic/water sampler, and two meter readers/service workers. The cost of staffing to operate and maintain the system in 1997 dollars was \$17,400 per month at top salary ranges.

At a minimum, the following vehicles are necessary to operate the Waterford water system: one ½-ton service pickup for meter reading, one ¾-ton service pickup with utility

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boxes and a 2-ton crane, and one small dump truck (1½-ton low profile type for hand shoveling soil from streets).

Beside the everyday use tools, a tapping gun 1-inch to 1½-inch diameter pipe size for serve installations and renewing old services must be purchased for the Waterford system.

The cost in 1997 dollars for the required equipment described above was \$101,000.

Eventual purchase of the water system by the City of Waterford would require evaluation of the possible staffing requirements and purchase of the above-described. An alternative to purchasing the equipment and hiring staff is the contracting with the City of Modesto or other contract service provider to operate and maintain the system. The 1997 study states that the City of Modesto had offered to contract its services to help Waterford with this matter.

Issues That Require Further Review

Other issues that need to be addressed at some future point in time include:

1. *Acquisition Costs/Valuation of the Existing System:*

Valuation of the Waterford system is very complex. Under normal circumstances, the value of the system would be based on the “value” of the in-ground infrastructure or the potential cost of replacement. Another approach is to value the system based on income. As the system is not a “for-profit” enterprise, income valuation is not applicable. Using “value” or “replacement cost” approaches assume that this value is “owned” and paid for by someone other than the system users. This is not, in fact the case. Furthermore, the system’s deficiencies need to be factored into any valuation based on system infrastructure costs. The City will need to negotiate with the City of Modesto to determine the value of the system.

2. *Alternatives to System Operations:*

At present, the Waterford water system is operated and maintained by the City of Modesto. The City will need to explore the various alternatives to system operations from the standpoint of cost effectiveness. There are private sector operators that can contract with the City for operation and maintenance of the system. The City could operate the system with its own staff or contract with another public agency, such as the City of Modesto, for operations and maintenance of the system.

3. *Legal/Licensing Requirements of Water Systems*

Public water system are closely regulated by the State of California and where they provide “potable” water for human consumption, they must adhere to a variety of state and federal standards. The definition of “public” vs. “private” water system, under state law has little to do with the ownership of the system but rather the number of connections or customers the system has. The City will need

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to research the appropriate state and federal permitting requirements for operating a water system.

References:

Draft Environmental Impact Report for the Modesto Surface Water Treatment Plant, By URS Consultants, Inc for Modesto Irrigation District, March, 1990

Final Environmental Impact Report for the Modesto Surface Water Treatment Plant, By URS Consultants, Inc for Modesto Irrigation District, October, 1989

Water Distribution System Evaluation Study, By Nolte & Associates for City of Waterford, July, 1997

River Ranch Project Evaluation of Groundwater Impacts, By EIP Associates/Timothy J Durbin Inc. for The County of Stanislaus, February, 2003

Final 2000 Urban Water Management Plan, By Black & Veatch Corporation for The City of Modesto Engineering & Transportation Department-Capital Planning Division and the Modesto Irrigation District, September, 2001

Monthly Water Production Tables-Waterford, by the City of Modesto Engineering & Transportation Department-Capital Planning Division-June 2003.

Waterford Report, by the City of Modesto Engineering & Transportation Department-Capital Planning Division-June 2003

2002 Annual Report to the Drinking Water Program, by the City of Modesto Engineering & Transportation Department-Capital Planning Division-March 2003

Attachment “A”
Water Management Planning

Senate Bills 610 and 210 amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and 221 are companion measures that seek to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. Both statutes also require this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Both measures recognize local control and decision-making regarding the availability of water for projects and the approval of projects.

SB 610 (Chapter 643, Statutes of 2001)

Under SB 610, water assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912[a]) subject to the California Environmental Quality Act. Key operating provisions of SB 610 are:

1. The project must be subject to CEQA,
2. The project must be a “project” as defined by Water Code section 10912, and

If these two questions are answered in the affirmative, then the public water supplier must have an SB 610 Assessment or an Urban Water Management Plan. If the project is not served by a “public” water system, then the Lead Agency will be responsible for the preparation of an SB 610 or an Urban Water Management Plan if one does not exist. If the project is served by a “public” water system, the water supplier is responsible for preparation of the SB 610 assessment (or UWMP). A “public” water, as per Water Code section 10912, has 3,000 or more service connections and either collection, treats, stores or distributes water to the public for human consumption.

California Water Code Section 10912 defines a project as follows:

- a. *“Project” means any of the following:*
 - 1) *A proposed residential development of more than 500 dwelling units.*
 - 2) *A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
 - 3) *A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
 - 4) *A proposed hotel or motel, or both, having more than 500 rooms.*

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- 5) *A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40-acres of land, or having more than 650,000 square feet of floor area.*
 - 6) *A mixed-use project that includes one or more of the projects specified in this subdivision.*
 - 7) *A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.*
- b. *If a public water system has fewer than 5,000 service connections, then “project” means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of public water system’s existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system’s existing service connections.*

SB 610 Water Assessment:

Under the Water Assessment requirements of SB 610, the assessment must address whether the projected supply for the next 20-years, based on normal, single-dry and multiple-dry years forecasts, will meet the demand projected for the project plus existing and planned future uses (including agricultural and manufacturing). Three areas must be addressed in reaching the answer to this question:

- A. The assessment shall include and quantify water received in prior years from (1) existing water supply entitlements; (2) water rights; and (3) water service contracts held by the Water Supplier. These must be demonstrated by (a) written contracts; (b) capital outlay/financing program for delivery adopted by the Water Supplier; (c) Federal/State/Local permits for delivery infrastructure; (d) regulatory approval required to convey or deliver water.
- B. If no water received in prior years by Water Supplier under items identified per (A) above, identify other water suppliers or water service contract holders that receive supply or have rights to the same source identified by the Water Supplier or Agency.
- C. If the source for the project includes groundwater, factors and specifications related to groundwater source must be included. The following information must be included in the water assessment under this area as per California Water Code Section 10910, Subdivision (f):
 - 1) *A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.*
 - 2) *A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the*

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order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as over drafted or has projected that the basin will become over-drafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of groundwater basin, and a detailed description by the public water system, or the City or County if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

- 3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*
- 4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*
- 5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631*

SB 221 (Chapter 642, Statutes of 2001)

SB 221 is intended as a “fail safe” mechanism to ensure that collaboration on finding the needed water supplies to serve a new large development occurs prior to development approval and construction. The tests for determining the applicability of SB 211 are tied to the creation of subdivision of property:

1. The proposal for a Development Agreement includes a “subdivision” as defined by Government Code Section 66473.7(a)(1) that is not exempt under Government Code Section 66473.7(i).
2. The development includes a subdivision as defined by Government Code Section 66473.7(a)(1) that is not exempt under Government Code Section 66473.7(i).

A “subdivision” under 66473.7(a)(1) is a residential development of more than 500 dwelling units except, where the public water system has fewer than 5,000 service

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connections, a “subdivision means any proposed residential development that would account for an increase of 10 percent or more in the number of service connections. The exemption under Government Code Section 66473.7(i) applies to “infill” or “low-income or very-low-income” housing subdivisions within urbanized areas surrounded by urban uses.

If the project includes a (non-exempt) residential subdivision, the agency approving the map shall adopt a condition the project with the requirement that a sufficient water supply shall be available” before the map can be recorded. I

If the project is not served by a “public” water system, then the Lead Agency will be responsible for the preparation of SB 221 “Water Supplier” requirements. If the project is served by a “public” water system, the water supplier is responsible for preparation of the SB 221 “verification” of a sufficient water supply.

SB 221 “Verification” of Sufficient Water Supply

The “Verification” must conclude whether a water supplier is able or unable to provide a sufficient water supply based on an analysis as to whether water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection will meet the projected demand associated with the proposed Subdivision, in addition to existing and planned future uses, including, but not limited to, agriculture and industrial uses. All of the following must be considered in the “Verification”:

- A. Historical record for the last 20 years,
- B. Urban Water Shortage Contingency Analysis,
- C. Supply reduction for “specific water use sector” per Water Supplier’s resolution, ordinance, or contract, and
- D. Amount of water that can be reasonably relied upon from specified supply project, subject to the determination outlined in Government Code Section 66473.7(d), 66473.7(a)(2) and 66473.7(c)

A “Verification” must be based upon “substantial evidence” which may include an applicable Urban Water Management Plan or Assessment prepared per SB 610. The “Verification shall be consistent with the Water Supplier’s obligation to grant priority for water to lower-income housing projects pursuant to Government Code Section 66473.7(j).

The “Verification must describe, subject to data availability, impacts on agricultural and industrial water demand. To the extent that the “Verification” relies on “projected water supplies”, analysis must be based upon specified criteria:

GC Section 66473.7(d) When the written verification pursuant to subdivision (b) relies on projected water supplies that are not currently available to the public water system, to provide a sufficient water supply to the subdivision, the written verification as to those projected water supplies shall be based on all of the following element, to the extent each is applicable:

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- 1) *Written contracts or other proof of valid rights to the identified water supply that identify the terms and conditions under which the water will be available to serve the proposed subdivision.*
- 2) *Copies of a capital outlay program for financing the delivery of sufficient water supply that has been adopted by the applicable governing body.*
- 3) *Securing of applicable federal, state, and local permits for construction of necessary infrastructure associated with supplying a sufficient water supply.*
- 4) *Any necessary regulatory approval that are required in order to be able to convey or deliver a sufficient water supply to the subdivision.*

To the extent that the verification relies on groundwater, it must include specified criteria:

GC Section 66473.7(h) Where a water supply for a proposed subdivision includes groundwater, the public water system serving the proposed subdivision shall evaluate, based on substantial evidence, the extent to which it or the landowner has the right to extract the additional groundwater needed to supply the proposed subdivision. Nothing in this subdivision is intended to modify state law with regard to groundwater rights.

The “Verification” must be provided within 90-days of date of request by the subdivision applicant. The “Verification” must be sent to the public agency approving the subdivision and is to be included in the Department of Real Estate filing.

Bridging the “Sufficiency” Gap

If a water provider concludes in the “Verification” that water supplies are not “sufficient” the city or county government may bridge any gap from the verification’s “insufficient” determination with additional supplies not accounted for by the water supplier, based on substantial evidence and findings on the record. In bridging any sufficiency gap, whether before or after issuance of the “Verification”, the city or county government may coordinate with others to identify and secure sources of supply. The “gap” supplies must be acceptable and approved by the water supplier and the city or county must work with the public water system to implement a plan to deliver the water supply to satisfy the long-term demands of the proposed subdivision.

Urban Water Management Plan

A foundational document for compliance with both SB 610 and SB 221 is the Urban Water Management Plan (UWMP). Both of these statutes repeatedly identify the UWMP as the planning document that, if properly prepared, can be used by the water supplier to meet the standards set forth in both statutes.

The Department of Water Resources DWR provides urban water management planning services to local and regional urban water suppliers. In 1983, the California Legislature enacted the *Urban Water Management Planning Act* (Water Code Sections 10610 - 10656). The Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make

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every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act describes the contents of the UWMPs as well as how urban water suppliers should adopt and implement the plans. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

DWR has designed its urban planning assistance program to assist urban water suppliers to meet the requirements of the Act. Program staff assists urban water suppliers with preparing comprehensive and useful water management plans, implementing water conservation programs, and understanding the requirements of the Act.

DWR staff reviews all of the urban water management plans that are submitted to DWR in accordance with the Act. Results are provided to local and regional water suppliers through a review letter. Results are also compiled into a Legislative Report provided to California Legislature one year after plans are due to DWR.

The following is the portion of the California State Water Code, Division 6, Part 2.6 regarding the requirements for Urban Water Management Plan (UWMP).

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620

- (a) *Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).*
- (b) *Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*
- (c) *An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.*
- (d)
 - (1) *An urban water supplier may satisfy the requirements of this part by participation in area-wide, regional, watershed, or basin-wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*
 - (2) *Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. (e) The urban water supplier may prepare the plan with its own staff, by contract, or in*

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cooperation with other governmental agencies. (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. 10621.

- (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
- (c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

- (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.
- (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision
- (a) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
 - (1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.
 - (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree

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adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as over-drafted or has projected that the basin will become over-drafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

- (1) An average water year.*
- (2) A single dry water year.*
- (3) Multiple dry water years.*

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

- (A) Single-family residential.*
- (B) Multifamily.*
- (C) Commercial.*
- (D) Industrial.*

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- (E) Institutional and governmental.*
 - (F) Landscape.*
 - (G) Sales to other agencies.*
 - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*
 - (I) Agricultural.*
- (2) The water use projections shall be in the same five-year increments described in subdivision (a).*
- (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
- (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:*
 - (A) Water survey programs for single-family residential and multifamily residential customers.*
 - (B) Residential plumbing retrofit.*
 - (C) System water audits, leak detection, and repair.*
 - (D) Metering with commodity rates for all new connections and retrofit of existing connections.*
 - (E) Large landscape conservation programs and incentives.*
 - (F) High-efficiency washing machine rebate programs.*
 - (G) Public information programs.*
 - (H) School education programs.*
 - (I) Conservation programs for commercial, industrial, and institutional accounts.*
 - (J) Wholesale agency programs.*
 - (K) Conservation pricing.*
 - (L) Water conservation coordinator.*
 - (M) Water waste prohibition.*
 - (N) Residential ultra-low-flush toilet replacement programs.*
 - (2) A schedule of implementation for all water demand management measures proposed or described in the plan.*
 - (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.*
 - (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.*

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- (g) *An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:*
- (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.*
 - (2) Include a cost-benefit analysis, identifying total benefits and total costs.*
 - (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.*
 - (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.*
- (h) *Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*
- (i) *Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).*
- (j) *Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b),*

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available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

- (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*
- (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*
- (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*
- (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.*
- (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*
- (f) Penalties or charges for excessive use, where applicable.*
- (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban*

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water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

- (h) A draft water shortage contingency resolution or ordinance.*
- (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
 - (b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*
 - (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*
 - (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*
 - (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*
 - (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote re-circulating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*
- 10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

Article 2.5 Water Service Reliability

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10635.

- (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*
- (b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*
- (c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.*
- (d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.*

Attachment “B”
Waterford Water System
Suggested Design Criteria

In order to determine system deficiencies, a set of system design standards is necessary. The Nolte & Associates study recommended design criteria for the water system facilities in the City of Waterford. The following summarizes those recommendations.

a. Upper and Lower Elevation Limits of the Pressure Zone

The city’s water system operates as a single pressure zone with ground elevations varying from 150 feet up to 170 feet. Topography in the city is fairly flat and the water system will continue to operate as a single pressure zone. Currently the system operates at pressures from 45 psi to 65 psi and the need for another pressure zone is not warranted. The true limits of the existing pressure zone are undetermined and should be verified once the system includes storage reservoirs.

b. Minimum Conditions for Fire Protection Planning

The city’s water system is within the jurisdiction of the Stanislaus County Fire Department, which determines fire flow requirements and appropriate fire protection mitigation for construction in the city. Fire flow and the duration of the flow is determined by the type of development undertaken. Development in the residential zones in the city will require fire flows of 1,500 gpm for a duration of two hours. Development in the commercial, Planned Community and Public Facility zones in the city requires flows of 2,000 gpm for a duration of three hours, and development in the Limited Industrial zone requires fire flows of 2,500 for a duration of four hours.

The Stanislaus County Fire Department design standards require a minimum of 6-inch diameter pipelines to provide required fire flows and fire hydrant spacing of 500 feet for single family residences and 300 feet for all other uses.

c. Distribution System Pipeline Sizing

Pipeline sizing in the water distribution system is based upon anticipated water demand, fire flows, and hydraulic characteristics of the distribution system. The following are a set of recommendations for selecting alignment and pipeline sizes in the distribution system.

Pipeline Network: Single dead end pipelines supplying a given area should be avoided, and “looped” systems should be required whenever possible. Looped systems avoid a cutoff of water to an area where a single pipeline may fail and also improve water quality within the distribution system. They also minimize system head loss between the points of supply and demand during a fire or other high localized demand, and the occurrence and effects of hydraulic transients (surges or water hammer) are greatly reduced.

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Major Transmission Lines: Large size mains (12-inch and larger) should be sized, selected, and aligned based on a hydraulic analysis of the distribution system.

Local Distribution System Pipelines: Lines which deliver water to local areas must be at least eight inches in diameter, providing the size meets fire flow requirements. The existing system has 2-inch, 4-inch, and 6-inch diameter lines which do not meet the proposed criteria.

Water Valves: Valves must be located on all pipelines so that if a pipeline fails or needs service, it can be isolated on both side of the failure at the nearest tee or cross.

Distribution System Storage

The City of Waterford's water system does not include water storage facilities. Typically, water system's must have adequate storage capacity to provide the sum of operational, fire, and emergency needs. The city's system relies upon the underlying groundwater aquifer to provide the required storage. Although the system has apparently been able to meet the existing water demands, the Nolte & Associates study recommends that above-ground storage facilities be further studied. Benefits of above ground storage include greater system operation flexibility, system redundancy, water availability for fire or other emergency conditions, and the provision of water when demands exceed pumping capacity.

Pipeline Materials of Construction

Ductile iron pipe should be allowed in all development applications throughout the city and required for critical transmission mains, groundwater well tie-ins, and other applications subject to high pressure and hydraulic surges. At a minimum the pipe should be class 150, and should be wrapped in a polyethylene film in accordance with AWWA C-105. Additional strength and cathodic protection should be provided as necessary in the opinion of the City Engineer. For local distribution through subdivisions and other areas, AWWA C-900 PVC pipe is recommended, and should be at a minimum class 150.

Miscellaneous Criteria

All weather access roads shall be provided to all mechanical facilities such as groundwater facilities. The access road to all the existing mechanical facilities are in good condition with the exception of Well No. 245 (Skyline) which does not have a defined access road. All water system facilities shall be within city property and all distribution facilities shall be within City of Waterford street right-of-ways. If the Director of Public Works approves, some distribution system facilities can be placed within dedicated easements. Currently all existing water system facilities are within street right-of-ways or approved easements. Additions to the water system shall be contingent on submission of hydraulic calculations to the city based on fire flow test results confirming that the design criteria are met.

Attachment “C”
Funding Sources

The following is a summary excerpt from the Nolte Study regarding funding financing options for the City of Waterford.

There are a number of possible sources available to fund the identified capital improvements and costs. The financing techniques best suited for the City of Waterford water system improvements include state and county grants, loans repaid from revenue, and assessments. Possible funding options are as follows:

a. Grant funding Sources

Loans and grants are available for water conveyance and treatment works from Farmer’s Home Administration (FmHA). These grants are available only for the poorest of rural communities. Community Development Block Grants are also a possibility, but as with FmHA, the community must be poor and it is not certain Waterford would qualify for such funding.

Loans and grants are targeted for poor, rural, unincorporated areas with a population of less than 10,000 people. In addition, the majority of service must be residential.

b. Revenue based Financing Tools

Revenue-based financing includes any method involving borrowing funds repaid from the revenue of the water enterprise. Such tools include revenue bonds, certificates of participation, state or federal loan programs, non-profit corporation bonds, or any combination of the above with a joint powers or Mello-Roos authority.

The City of Waterford could apply for a loan from the State Revolving Fund program which provides low interest loans and other types of assistance to public drinking water systems to make necessary improvements to those systems.

c. Benefit Assessment Financing

Benefit assessment financing is performed under the 1913 and 1915 Acts (Streets and Highways Code). The costs of the facilities are levied against each property within the area of benefit according to the property’s direct benefit.

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