

CITY OF RIPON



URBAN WATER MANAGEMENT PLAN

January, 2004

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City of Ripon

2003 Urban Water Management Plan

Contact Sheet

Date plan submitted to the Department of Water Resources: **January 14, 2004**

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The Water supplier is a: **Municipality**

Utility services provided by the water supplier include: **Potable Water, Non-potable Water, Wastewater**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

Chapter 1 - Introduction

The Urban Water Management Plan is prepared in response to the Urban Water Management Planning Act (California Water Code, Section 10610 through 10656). The Act Requires that each urban water supplier providing municipal water to more than 3,000 customers or supplying more than 3,000 acre-feet annually must prepare such a Plan and update it every five years. The City currently has 3,480 connections. In 2002, the City supplied approximately 4,560 acre-feet of water, and is therefore subject to the Act.

When preparing this Act, the California Legislature found that “the conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.” The focus of this document is the planning and efficient use of water supplies for the City of Ripon. This plan is organized according to subject as recommended by the State of California Department of Water Resources. Water code sections are included as appropriate.

Public Participation

Law

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published ... After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

Plan Adoption

The plan is to be adopted by the City and filed with the State Department of Water Resources (DWR) within 30 days after adoption. In accordance with the Act, this plan must be updated at least once every five years on or before December 31 in years ending in five and zero. The updated plan must be readopted by the City and filed with the DWR.

A Public Hearing was held on January 6, 2004 at City Council Chambers, 259 N. Wilma Avenue, Ripon, CA at 7PM; after the Public Hearing was opened, no one from the public wished to speak.

The Urban Water Management Plan was adopted by the Ripon City Council at its regularly scheduled Council Meeting on January 6, 2004 through Resolution 04-2 (A signed copy of Resolution 04-2 is attached as Appendix B).

Agency Coordination

Law

10620 (d) (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.

Coordination Within the City

The City Engineer oversaw the preparation of this Plan, which was done in conjunction with the City's General Plan Update.

The City Engineer oversees the water department, so the City can act quickly and efficiently in regards to domestic water supply concerns. The water department consists of the following three main divisions that work closely together, and participated in the development of this plan:

- Billing/Bookkeeping, consisting of two full time employees, handles all water billing and accounting.
- Engineering, consisting of four full time employees, prepares and/or reviews plans and specifications for new designs and upgrades of the existing system (such as new water wells, water tanks, and mainlines).
- Public Works, consisting of sixteen full time employees, conducts maintenance and monitoring programs of the existing water system.

The City's Planning Department and Administration Department also participated in the development of this plan.

Interagency Coordination

The City participates in regional water management planning efforts, including the preparation of the October 2001 Water Management Plan for San Joaquin County that was conducted under the lead of the San Joaquin County Flood Control and Water Conservation District.

Notice of Public Hearing was published in the Ripon Record on December 24, 2003. This Public Hearing Notice acted as notification to all outside agencies.

Chapter 2 - Supplier Service Area

Law

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

10631. (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.

Location

The City of Ripon is located in the northern San Joaquin Valley, southeast of the Sacramento/San Joaquin Delta. Ripon is located in southern San Joaquin County, adjacent to the Stanislaus River, which also forms the county boundary with adjoining Stanislaus County. Ripon is located approximately 75 miles east of San Francisco, 70 miles south of Sacramento, 20 miles south of the City of Stockton, and four miles north of the City of Modesto.

The Urban Water Management Plan covers all portions of the City that will be served by the City's water department. This includes the existing incorporated area, and the future planning area that is within the City's sphere of influence and covered in its 2040 General Plan.

The City has an adopted potable water master plan that was developed in conjunction with its 2040 General Plan Update. The City also has an adopted Groundwater Preservation Plan that includes a master plan for the non-potable water system. These master plans contain maps showing the service area and master plan facilities.

Climate

The Climate of Ripon is typical of the Central Valley, being hot and dry in the summer and cool and moist in the winter. Average temperatures range from 80 degrees Fahrenheit in July to about 45 degrees Fahrenheit in January, with extremes ranging from 110 degrees to about 26 degrees. Precipitation averages about 13 inches per year with about 85 percent of the annual rainfall occurring between the months of October and March.

Other Demographic Factors

Because of its predominately sandy soil, the Ripon area continues to be a major producer of almonds, grapes, walnuts, peaches, and olives. In addition to these crops, eggs, poultry and milk have also been contributors to the area's economy. Along with the farming operations, Ripon has attracted a variety of agriculturally associated manufacturing, processing, transportation, and chemical businesses.

The City of Ripon was incorporated in 1945. In 1944, the Ripon County Water District was formed and the Water Company was purchased from the Alney J. Nourse Estate at a cost of \$32,500. At the time of acquisition the City had 318 users. Today, the incorporated area comprises about 4.3 square miles (2752 acres). The principal object of incorporation was to get police protection, to operate the water company, and to expand the sanitary district. The Water District voted to have the City operate the water company.

The population of Ripon was 5,131 in 1985, and has increased to 11,500 as of January 1, 2003. The rate of population increase was about 4.3 percent per year during the 1960 to 1980 period, and has averaged about 8 to 9 percent per year since 1980.

Table 1 shows the population projections from 2005 to 2040. The buildout population in 2040 is based on the population estimates in the City's 2040 General Plan. Linear interpolation was used to estimate the projected population for the intervals between current and 2040.

Table 1. Population Projections									
Year	2002	2005	2010	2015	2020	2025	2030	2035	2040
Service Area Population	11,500	14,600	19,700	24,800	29,900	35,000	40,100	45,200	50,300

Chapter 3 - Water Sources (Supply)

Law

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

10631 (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 [to 20 years or as far as data is available.]

Summary of Water Supply Sources

The City of Ripon has its own water system that provides water to all residents and businesses within the City. Groundwater is the source of potable water supply. The City also has non-potable supplies from non-potable City wells, surface water from the South San Joaquin Irrigation District, and treated non-potable groundwater from Nestle groundwater extraction and treatment facilities. Several industries and schools have wells on their own property for irrigation and industrial use. Table 2 summarizes the City's current and projected water supplies, and the rest of this chapter discusses each source in detail.

Table 2. Current and Projected Water Supplies
Acre-Feet Per Year

Water Supply Sources	2002	2005	2010	2015	2020	2025	2030	2035	2040
City potable groundwater wells (potable) (1)	4,565	5,860	8,010	10,160	12,310	14,470	16,620	18,770	20,920
City non-potable groundwater wells (non-potable) (2)	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
SSJID contract surface water (non-potable)	500	500	1,645	2,790	3,935	5,080	5,080 (2)	5,080 (2)	5,080 (2)
Nestle agreement for treated groundwater (non-potable)	0	960	960	960	960	960	960 (3)	960 (3)	960 (3)
TOTAL	6,465	8,720	12,015	15,310	18,605	21,910	24,060	26,210	28,360

- (1) Potable groundwater supply projected from interpolation between 2002 actual production and projected 2040 production requirements, estimated as current production plus the incremental future demand from the City's 2040 Water Master Plan.
- (2) Annual non-potable supply from City non-potable wells assumes that the non-potable wells are pumped at the design production rate for 6 months each year during the dry season for irrigation.
- (3) Current contract with SSJID ends 2029. It is anticipated that the City will either renew the contract in 2029, or obtain another source of non-potable water to replace the SSJID water.
- (4) Agreement with Nestle signed in 2003, covers a period of 25 years, and is renewable. It is anticipated that the City will renew the agreement, or obtain another source to replace it.

Groundwater Basin

The City of Ripon is located within California's Central Valley, at the northern end of the San Joaquin Valley. Groundwater supplies 40 percent of the water used in the San Joaquin Valley during years with normal precipitation, and higher percentages during drought years. In the drought year of 1977, groundwater provided about 80% of agriculture needs in the San Joaquin Valley.

The Central Valley is considered an alluvial basin, which acts as a groundwater resource. There are two primary groundwater aquifers underlying the City of Ripon planning area. The two aquifers have a combined annual recharge of 196,000 to 263,000 acre-feet annually. Using a conservative estimate of 15% of the specific yield, the estimated available groundwater per 1,000 surface acres is approximately 60,000 acre-feet. Over the approximately 10-square mile of planning area, this would amount to nearly 400,000 acre-feet. This analysis has not taken into account surface water infiltration along the Stanislaus River, which would increase the potential groundwater available in the Ripon area.

The City was an active participant in the October 2001 Water Management Plan for San Joaquin County that was conducted under the lead of the San Joaquin County Flood Control and Water Conservation District. The County Study identified that the Eastern San Joaquin County Groundwater Basin, which includes the Ripon area, is critically overdrafted in some parts. The critical overdraft areas are located in the central part of the basin near Stockton, and near the northern boundary north of the Mokelumne River. The study identified that overdraft is not typically a problem in the southern portion of the basin, where Ripon is located, since irrigation districts in that area have sufficient surface water supplies and conveyance facilities and have historically not relied heavily on groundwater for irrigation.

Ripon is located at the southernmost boundary of the basin and has not experienced overdraft due to its location adjacent to the Stanislaus River and its relatively small demand compared with other users. The City has adopted a Groundwater Preservation Plan to proactively address stabilizing and enhancing the groundwater levels in the Ripon area as future growth occurs. This plan provides the planning framework for groundwater recharge basins in the general area around the City.

Potable Municipal Groundwater Wells

All of Ripon's potable water currently is supplied from seven (7) groundwater wells. These wells tap underground reserves or aquifers from approximately 125 to 450 feet below the ground surface. The aquifers are replenished by rainfall, the Stanislaus River, and agricultural irrigation water. Annual water production in Ripon over the last twenty-five years has increased, from 1,067 acre-feet in 1980 to 2,195 acre-feet in 1990, to 4,021 acre-feet in 2000 and finally to 4,565 acre-feet in 2002.

Table 2 shows the City's potable groundwater supply projections from 2002 through 2040. The groundwater supply shown in Table 2 is based on the amount of groundwater that must be produced to meet the projected demands. The projections are estimated by linear interpolation between the current production and the required build out production according to the City's 2040 Water Master Plan.

The City currently has well capacity in excess of their average day demand, and uses the wells to help meet summer peaking needs. In the future, the City will construct additional groundwater wells as needed to meet increased demands. If the City’s existing potable wells were pumped at their maximum capacity over the entire year, the total water supply would be almost 16,000 acre-feet.

Table 3 summarizes key information on the City’s existing potable wells. Currently the total pumping capacity is 11,000 gallons per minute (gpm) for potable water.

Table 3. Potable Well Information							
	Well #3	Well #7	Well #9	Well #10	Well #12	Well #13	Well #14
Location	922 Second Street	Manley Road	Reynolds Drive	Hughes Lane	Jack Tone Road	Corner of River Road and Fulton Ave	East End of Milgeo Ave
Date Drilled	1950	1977	1989	1993	1996	2003	2003
Depth of Well (feet)	156	338	202	462	335	450	240
Static Water Level	20'	34'	39'	31.5'	20'	25'	25'
Production Rate	800 gpm	1,200 gpm	1,000 gpm	2,500 gpm	2,000 gpm	2,500 gpm	1,000 gpm
Treatment	Chlorine disinfection and sand filter	Chlorine disinfection	Chlorine disinfection and granular activated carbon filters	Chlorine disinfection	Chlorine disinfection	Will have chlorine disinfection	Will have chlorine disinfection
Backup Power	No	No	Yes	Yes	Yes	Yes	No

Water distribution pipelines convey the potable water from the wells to customers or storage. Currently the City has a 550,000 gallon storage tank with booster pump, and a 1.55 million gallon (MG) elevated water storage tank built in 2002. Water storage is used to help meet peak hour needs and for fire protection. In 1996 the City completed the upgrade and replacement of all substandard potable water lines per improvements identified in the Ripon Redevelopment Agency Downtown Water System Improvements Projects.

The City has a master plan for expansion of the potable water system to meet the present and future demands of the community. Expansion will consist of additional wells and above ground storage capacity to ensure an adequate supply of potable water. The City plans to construct 10 new 1.5M elevated storage tanks, and 13 new domestic water wells during the planning period covered by the Water Master Plan 2040.

Groundwater Quality

The City chlorinates all its potable groundwater. All wells and storage tanks are designed to allow chlorine injection. Two wells have GAC filters to remove chemicals. The most prevalent chemicals found in groundwater in the Ripon area include: trichloroethylene (TCE), tetrachloroethylene (PCE), a solvent used for dry cleaning; and dibromochloropropane (DBCP), an agricultural pesticide for control of worms.

Other groundwater quality issues faced by the City include hardness, nitrates, arsenic, and total dissolved solids (TDS).

- Hardness is an aesthetic issue, not a health and safety issue. Hard water requires use of more soap for cleaning, and can cause scaling and staining of water heaters and fixtures.
- Nitrates are a health and safety issue. The safe nitrate limit for domestic water is set at 45 mg/L by the U.S. Environmental Protection Agency. The City has found that it is more cost effective to abandon the wells with high nitrate levels and construct new wells and seal the upper aquifers. The City has abandoned a few wells because of nitrate contamination.
- Arsenic at levels close to the new maximum contaminant limit recently adopted by EPA has been found at two wells. The City will provide treatment when required.
- TDS is not an issue for drinking water, but is a potential issue with respect to wastewater disposal. The TDS of the City's potable drinking water is below the secondary limit of 500 mg/l, and well below the maximum of 1,000 mg/l. However, future wastewater disposal requirements for disposal by percolation may require reductions in the TDS of treated wastewater effluent, which is typically higher in TDS than the potable groundwater. This may require additional wastewater treatment or alternative disposal methods in the future.

On all potable wells, the following protection measures are used: sanitary seals at a minimum of 150 feet in depth, well head is set up 2 feet above ground level; and daily visual inspections are made. During construction of new wells, the City ensures that there are no sewer lines within 50 feet.

Non-Potable Municipal Groundwater Wells

The City has two non-potable municipal wells that can be used as supply for the non-potable water system. The water quality of these wells is not suitable for potable use, but can be used for irrigation and other suitable uses.

Table 4 summarizes key information on the City's existing non-potable wells. Well No. 5 and No. 11 have been converted to non-potable use because of high nitrate levels. Currently the total pumping capacity is 1,750 gpm from these non-potable wells.

The well could provide up to 2,800 acre-feet per year of non-potable water if pumped 365 days per year at the design production rate. Assuming that the wells are pumped for 6 months each year for irrigation during the dry season, the annual volume would be 1,400 acre-feet per year.

Table 4. Non-Potable Well Information		
	Well #5	Well #11
Location	Milgeo and Ridge	Doak Blvd.
Date Drilled	1972	1996
Depth of Well (feet)	312	163
Static Water Level	N.A.	18'
Production Rate	1,000 gpm	750 gpm
Treatment	None	None

South San Joaquin Irrigation District Surface Water

The South San Joaquin Irrigation District (SSJID), a 72,000-acre district that surrounds and includes the City, has historically provided water for agricultural irrigation in the Ripon area. SSJID’s major facilities and assets include full or partial ownership in several storage reservoirs, various rights in the Federal New Melones Reservoir project, about 30 miles of water transmission facilities, and more than 350 miles of distribution pipelines and channels located throughout the District.

In 1999, the City of Ripon entered into an agreement with the SSJID for surface water that can be used for groundwater recharge or municipal and industrial (M&I) use. The City intends to use this water for non-potables uses, such as irrigation or for industrial/commercial process or cooling water.

Table 2 summarizes the projected SSJID supply amounts. The City contracted with SSJID for the delivery of 500 acre-feet per year starting in 1999 and running through the year 2029. Beginning in 2006, the initial 500 acre-feet per year can be increased annually by 229 acre-feet per year to a maximum of 6,000 acre-feet per year in 2029.

SSJID has an extensive distribution system in and around Ripon allowing for the delivery of water to locations favorable to groundwater recharge. Currently, the City has two basins used to recharge SSJID water: a quarter-acre water hazard on a golf course and an approximately 3-acre site between the City’s wastewater ponds and the City’s urban area. In the future, the City will distribute the water between groundwater recharge and the City’s non-potable water system.

Other Non-Potable Water Sources

In 2003, the City entered into an agreement with Nestle to receive treated groundwater from its Groundwater Treatment Facilities for conveyance to other parties for non-potable water uses. Nestle currently operates in the City a groundwater extraction and treatment system that is currently discharging to the City’s industrial sewer. Nestle will also be constructing a second groundwater extraction and treatment facility. Treatment includes GAC filters and air

stripping, and the treated groundwater is high quality. Both the City and Nestle desired that such treated groundwater be dedicated to beneficial non-potable uses.

According to the terms of this agreement, Nestle will supply the City with treated groundwater at an average rate of about 600 gallons per minute year-round. To convey the treated groundwater from the Nestle facility, the City is currently completing construction of a pipeline that will tie into the City's existing non-potable system.

Non-Potable Water System

The City has a codified ordinance for the distribution and use of non-potable water in a system entirely separate from the City's potable water supply. The intent of the non-potable water system is to supplement and conserve the City's potable groundwater supply. Water used in the non-potable system does not need to meet current potable water standards and could be either groundwater that is not suitable for domestic use or surface water from SSJID (or other future sources). Non-potable water will be used for landscape irrigation, and for industrial/commercial uses such as cooling water.

The City's current Water Efficient Landscape Ordinance (in Appendix A) specifies that all new or rehabilitated landscapes must include an irrigation design plan including a dual water system to permit non-potable water and future use of recycled water, unless the City grants a written exemption. The irrigation systems must make use of non-potable water unless the City grants a written exemption stating that recycled water is not available and will not be available in the foreseeable future.

The non-potable system currently includes three sections of pipeline north of Highway 99 with four planned phases of expansion. In 1995 the City constructed approximately 6,000 linear feet of 12-inch non-potable water line in a commercial / industrial area. In 1996, a subdivision was constructed with approximately 1,400 linear feet of 12-inch non-potable water line. This section of the non-potable water line was tied into a well site that is no longer used for domestic water due to high nitrate levels. In 2003, the City constructed a pipeline from the Nestle groundwater treatment facility that ties into the existing non-potable lines located on the north and side sides of Highway 99. When this pipeline is completed, there will be about 3 miles of non-potable pipeline in place.

The non-potable system master plan adopted by the City will eventually extend pipelines and reuse throughout the incorporated and unincorporated areas of Ripon.

Chapter 4 - Reliability Planning

Law

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

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631 (c) 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 replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (c) Provide data for each of the following:

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

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

10632 (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.

Reliability

The City's potable drinking water supply is from groundwater wells. As stated in the City's General Plan 2035, dated September 1998, future development within the Planning Area is expected to have only minimal effect on underground aquifers serving the Ripon area. This is because of the natural recharge performed by the Stanislaus River and the availability of good surface water for irrigation of surrounding agricultural uses that minimizes the need for groundwater pumping. The City will be monitoring groundwater levels in order to identify declining groundwater levels if they were to occur and take steps to offset potential impacts of increased future pumping.

The primary vulnerability of the City's potable water supply would be the simultaneous loss of many wells due to catastrophic well collapses or outages, poor water quality, or inability to meet future drinking water regulations. It is unknown how the quality of groundwater may change in the future. If, due to nitrate and/or organic chemical contamination in excess of health standards, the City is forced to abandon an excessive number of its wells as sources of drinking water, there may have to be prohibition of annexations and additional development until an adequate source of good water can be identified and developed.

The City contracts with SSJID for non-potable water supply for groundwater recharge,
Final Draft - January 6, 2004

irrigation of large landscape areas, and industrial/commercial process and cooling water use. The SSJID water is subject to reductions in dry years. The City's contract with SSJID specifies that water delivered for non-potable uses may be reduced based on the annual water supply forecast for inflow to New Melones Reservoir. If the forecast is at least 450,000 but less than 500,000 acre-feet, the water supply may be reduced by 50 percent. If the forecast is less than 450,000 acre-feet, the water supply may be reduced to zero.

Urbanization of existing agricultural lands as Ripon expands would reduce agricultural water demands, which are currently met with waters from upstream Stanislaus River storage facilities, such as New Melones Reservoir, and individual agricultural wells. Actual agricultural water use, and the source of water, on lands to be urbanized are not known. However, agricultural use on the 3,500 acres proposed for urbanization in the Ripon area could range from a total volume of 7,000 to 14,000 acre-feet annually. To the extent agricultural water is drawn from wells, this reduction in use would offset increases in urban water use. Where urbanization occurs on lands irrigated with SSJID water, demands on the irrigation district would be reduced.

The City's non-potable groundwater supply from municipal non-potable wells and from the Nestle groundwater extraction and treatment facilities would not be affected by drought conditions.

Frequency and Magnitude of Supply Deficiencies

Historically, supply deficiencies have not been an issue for the City of Ripon. The City is located near the Stanislaus River, which in turn is fed from the New Melones Reservoir. The river continually recharges the groundwater supply, which is the potable water supply. The current size of Ripon and the projected growth is not anticipated to have a substantial affect on the potable groundwater supply.

Plans to Assure a Reliable Water Supply

The City has an ongoing program to inspect and maintain its groundwater wells and pumps/motors to ensure their structural and mechanical integrity, and to detect and correct problems in order to avoid failures. The City maintains an inventory of key spare parts to facilitate timely repairs. The City has backup power at key wells, as shown on Table 3.

The City also has an ongoing program for monitoring the water quality in all of its wells to provide early detection of recognized potential water quality problems. The City intends to expand this program to regularly monitor and evaluate the physical condition and quality of the groundwater system underlying Ripon.

This monitoring will also allow for early detection of declines in groundwater levels that may impact Ripon's potable water supply. If the need for supplemental water is identified, then the City can develop or acquire alternate source(s) as required. For example, this may require pump improvements at existing wells, deeper wells, or new wells at other locations. If groundwater level declines were to occur due to future increased pumping, the City would also increase its efforts to enhance recharge and obtain additional surface water supplies. For example, the City's agreement with SSJID contains a clause that would allow the City to re-negotiate the terms of the agreement in order to use the SSJID water for municipal potable supply, which would involve higher costs and would require treatment of the water.

In 2003, the City prepared and adopted a Groundwater Preservation Plan. This plan was developed to establish appropriate criteria and locations where groundwater can best be recharged to help stabilize groundwater levels and improve groundwater quality in the Ripon area.

The City is also an active participant in county and regional groundwater resource studies, although it is not directly affected by county/regional groundwater conditions. These studies include the U.S. Army Corps of Engineers Farmington Groundwater Recharge and Seasonal Habitat Study, the Northeast San Joaquin County Groundwater Banking Authority's System Plan Components Inventory, and the San Joaquin County Flood Control and Water Conservation District's Water Management Plan.

If non-potable supply from SSJID were reduced due to drought, then the groundwater recharge program would be temporarily reduced or suspended. If further reductions were needed, then irrigation customers supplied by the non-potable system could be asked to cut back on irrigation use. Another option would be to temporarily use groundwater to provide a minimum amount of water to avoid irreparable damage to landscaping until non-potable supplies are available again.

Reliability Comparison

Table 5 summarizes the current supply reliability for both a normal year and for single or multiple dry years. Because the City's potable supply is from groundwater, there will be no significant impact on the potable supply during drought conditions. Groundwater levels are not anticipated to be significantly affected during a single or multiple (3-year) drought.

The non-potable supply from SSJID, which is surface water, may be affected by drought as specified in the City's contract terms. If the water supply forecast (inflow to the New Melones Reservoir as determined by the US Bureau of Reclamation) is at least 450,000, but less than 500,000 acre-feet, the water supply may be reduced 50%. If the forecast is less than 450,000, the water supply may be reduced to zero. During either a single or multiple dry years, the information available in other studies indicates that the New Melones supply forecast would be less than 450,000 acre-feet, which would mean zero supply to the City.

The non-potable municipal well supply and the treated groundwater supply from Nestle would not be affected by drought.

Table 5. Supply Reliability Acre-Feet Per Year					
Current Sources of Supply	Average/ Normal Water Year 2003	Single Dry Water Year 2003	Multiple Dry Water Years		
			Year 1 2003	Year 2 2004	Year 3 2005
Potable Ground Water (1)	5,000	5,000	5,000	5,430	5,860
SSJID Non-Potable Surface Water	500	0	0	0	0
Non-Potable Groundwater (2)	1,400	1,400	1,400	1,400	1,400
Total Supply	6,900	6,400	6,400	6,830	7,260
<p>1) As discussed in Chapter 3, the City has ample groundwater supply to meet demand increases with from their potable wells. Potable supply assumes that potable groundwater will be used to meet all demands, as the City has ample potable groundwater supply to meet increasing demands even during dry periods.</p> <p>2) Non-potable groundwater supply is the total supply from SSJID and from existing City non-potable wells assuming the wells are pumped at their production capacity for 6 months each year during the dry season. After 2005, it is assumed that non-potable water from the Nestle extraction and treatment facility will become available, which will add another 960 AF of annual non-potable supply.</p>					

According to the Farmington Groundwater Recharge/Seasonal Habitat Study undertaken by the US Army Corps of Engineers in 2001, the New Melones Reservoir has experienced highly variable annual hydrologic conditions over the past decade, including the most severe drought on record for the Stanislaus River watershed. Operations of New Melones Reservoir have been further affected by the passage and implementation of the Central Valley Project Improvement Act (CVPIA), which requires the operation of CVP facilities to improve conditions for the protection and natural production of anadromous fish. The US Bureau of Reclamation is undertaking water management planning action for both the interim and long-term operations of the New Melones Reservoir.

If SSJID non-potable supplies were reduced due to drought, then the groundwater recharge program would be temporarily reduced or suspended. If further reductions were needed, then large irrigation customers would be asked to cut back on irrigation use.

For further information on the Table 5 projections, see the subsequent section on Three-Year Minimum Supply and the chapter on Water Shortage Contingency Plan.

Three Year Minimum Water Supply

The City's potable water supply is from groundwater. There would be no reductions in the potable groundwater supply during dry years. Groundwater has historically been considered a reliable drought supply. There seem to be no short-term (12, 24 or 36 months) problems with water supply. The City has an ongoing program to monitor its groundwater supply. The amount the groundwater levels could drop during a single or multiple dry years will have a relatively insignificant effect on the City's ability to obtain its full groundwater supply.

There would be no reduction during dry years in the non-potable supply from City non-potable groundwater wells or from the Nestle groundwater extraction and treatment facility.

The SSJID non-potable supply would be reduced during dry years. The non-potable supply is used for groundwater recharge, irrigation, and industrial/commercial uses. It is anticipated that there may be zero supply during single and multiple dry years. The groundwater recharge program would be temporarily suspended.

If needed, irrigation customers could be asked to reduce their use to the minimum necessary to avoid irreparable damage to landscaping.

Transfer or Exchange Opportunities

No other transfer or exchange opportunities exist for the City of Ripon at this time, other the SSJID contract water which is currently used as a non-potable supply by the City of Ripon. The City's agreement with SSJID contains a clause that would allow the City to re-negotiate the terms of the agreement in order to use the SSJID water for municipal potable supply, which would involve higher costs and would require treatment of the water.

Chapter 5 - Water Use Provisions

Law

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

10631 (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:

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

Past, Current and Projected Water Use

Table 6 shows past, current and future water use projections through 2040. The customer sectors are divided into single family, multi-family, commercial/industrial (all non-residential uses), and water use for city parks irrigation. This breakdown is based on the available information from the customer billing system.

Table 6. Past, Current and Projected Water Use Customer Sector Use in Acre-Feet Per Year (1)											
Customer Sector	1990	1995	2002	2005	2010	2015	2020	2025	2030	2035	2040
Single Family	1,800	2,020	3,005	3,840	5,225	6,610	8,000	9,385	10,770	12,155	13,540
Multi-Family	130	150	150	270	470	665	860	1,060	1,260	1,455	1,655
Commercial/ Industrial (Non-Residential)	225	285	1,020	1,320	1,820	2,320	2,820	3,330	3,830	4,330	4,830
City Parks - Irrigation (2)	165	185	390	430	495	565	630	695	760	830	895
Totals	2,320	2,640	4,565	5,860	8,010	10,160	12,310	14,470	16,620	18,770	20,920
(1) Water use for sectors includes unaccounted-for water (2) Irrigation of large city parks (neighborhood parks, community parks). Future demands include all existing City parks plus areas identified in the 2040 Water Master Plan as parks, open space or agricultural.											

Residential usage makes about 70 percent of the total current use, and single-family residences comprise about 95 percent of the residential use. At buildout, residential usage is expected to

remain about 70 percent of the total use. The build out residential use will be split about 90 percent for single family and 10 percent for multi-family.

Past, Current and Projected Customers

Table 7 summarizes the past, current and projected number of customer connections through 2040. These connections do not include fire hydrants. Table 7 is based on the same breakdown of customer sectors into residential and non-residential as for the water use projections.

Table 7. Number of Connections											
Customer Sectors with Number of Connections Per Year											
Customer Sector	1990	1995	2002	2005	2010	2015	2020	2025	2030	2035	2040
Single Family	1,960	2,248	3,223	4,001	5,298	6,600	7,902	9,200	10,502	11,805	13,102
Multi-Family	93	95	100	180	310	440	575	705	840	970	1,100
Commercial / Industrial (Non-Residential)	160	160	160	210	290	370	445	525	600	680	760
City Parks - Irrigation	7	7	7	9	12	15	18	20	23	25	28
Totals	2,220	2,510	3,490	4,400	5,910	7,425	8,940	10,450	11,965	13,480	14,990

The projected number of connections is based on the following assumptions:

- Buildout single family and multi-family residential connections are estimated as equal to current connections plus the future increment estimated as the future number of family dwelling units divided by the current unit demand per connection.
- Buildout commercial/industrial (non-residential connections) are estimated as equal to current connections plus future connections estimated as the incremental growth in non-residential demand divided by the current usage per non-residential connection.
- Buildout irrigated parks are estimated as the 7 existing irrigated parks, one future park that is under development, plus 20 future areas identified in the City’s 2040 Water Master Plan as park , open space or agricultural land uses.
- The number of connections for the intervals between current and buildout are estimated using linear interpolation.

Chapter 6 - Supply and Demand Comparison Provisions

Law

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 the state, regional, or local agency population projections within the service area of the urban water supplier.

Supply and Demand Comparison

Table 8 compares current and projected water supply and demand assuming normal conditions. As indicated on Table 8, the City has adequate existing and planned supplies to meet its water supply needs through build out.

Year	2002	2005	2010	2015	2020	2025	2030	2035	2040
Potable Supply	4,565	5,860	8,010	10,160	12,310	14,470	16,620	18,770	20,920
Non-Potable Supply	1,900	2,860	4,005	5,150	6,295	7,440	7,440	7,440	7,440
Total Supply (1)	6,465	8,720	12,015	15,310	18,605	21,910	24,060	26,210	28,360
Total Demand (2)	4,565	5,860	8,010	10,160	12,310	14,470	16,620	18,770	20,920
Difference	1,900	2,860	4,005	5,150	6,295	7,440	7,440	7,440	7,440
(1) Supply information is obtained from Table 2.									
(2) Total demand is obtained from Table 6.									

In Table 8, the potable supply assumes that the City will meet all its demands from potable groundwater. As discussed in Chapters 3 and 9, the City is in the process of implementing a non-potable water system that will meet non-potable demands such as irrigation and industrial uses from non-potable supply sources, thus reducing the amount of potable groundwater that will be needed in the future. The future amount of non-potable use and corresponding reduction in potable demand is not known at this time. It will be determined over time as the non-potable system comes on-line and specific customers are identified for non-potable service.

Table 9 provides a supply and demand comparison for an average/normal year and a single and multiple dry years. Chapter 4 Reliability Planning contains a detailed discussion of reliability issues. Chapter 7 Water Shortage Contingency Plan discusses catastrophic shortages.

Table 9. Supply Reliability and Demand Comparison (Normal and Dry Years)					
Acre-Feet Per Year					
	Average / Normal Water Year 2002	Single Dry Water Year 2003	Multiple Dry Water Years		
			Year 1 2003	Year 2 2004	Year 3 2005
Supply totals (1)	6,465	6,400	6,400	6,830	7,260
Demand totals	4,565	5,000	5,000	5,430	5,860
Difference (2) (3)	1,900	1,400	1,400	1,400	1,400
<p>(1) Total supply includes potable groundwater, and non-potable supply from non-potable wells and SSJID. Potable supply assumes that potable groundwater will be used to meet all demands, as the City has ample potable groundwater supply to meet increasing demands even during dry periods.</p> <p>(2) Difference between supply and demand is the available non-potable supply during dry periods. The future amount of non-potable use and corresponding reduction in potable demand is not known at this time. It will be determined over time as the non-potable system comes on-line and specific customers are identified for non-potable service.</p> <p>(3) After 2005, it is assumed that non-potable water from the Nestle extraction and treatment facility will become available, which will add another 960 AF of annual non-potable supply.</p>					

Chapter 7 - Water Demand Management Measures

Law

10631 (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,...

The City of Ripon is committed to implementing water conservation and water recycling programs. Appendix A contains a copy of the following City of Ripon ordinances relating to water conservation:

- 13.04.310 Wasting water prohibited
- 13.04.320 Garden irrigation – metered
- 13.04.340 Use of water restricted to premises
- 13.04.360 Sprinkling of sidewalk or streets prohibited
- 13.05 Nonpotable water distribution system
- 13.06 Water efficient landscape

This section addresses the 14 Demand Management Measures (DMM) identified in the current law. The current status of the City's conservation program is described below for each DMM.

DMM 1 – Water Survey Programs (Interior and Exterior Water Audits) for Single Family and Multi-Family Customers

The City has a Water Efficient Landscape Ordinance to establish a structure for designing, installing, and maintaining water efficient landscapes in new projects and to establish provisions for water management practices and water waste prevention for established landscapes. Appendix A contains a copy of this ordinance.

As a long-term goal, City staff could perform residential water audits upon request. The purpose of the audit is threefold: 1) to identify areas of water use in and around the home; 2) to provide water conserving fixtures and identify leaks; and 3) to review outdoor landscaping requirements and make recommendations.

If a residential water audit is conducted, conservation fixtures provided at no charge to the customer would include:

Toilet Displacement Bag

These bags will result in approximately one gallon per flush savings when used in the standard toilet.

Leak Detection Tablets

In a study entitled “Water Saved by Low-Flow Toilets and Low-Flow Shower Heads,” estimates were made on the water use of a leaking toilet. In that study, it was estimated that 20 percent of all toilets leak and that the average leak wastes nearly 47 gallons a day.

Low-Flow Shower Heads

Low-flow shower heads have a maximum flow rate of 2.75 gallons per minute while non-conserving ones use between five and eight gallons per minute.

Lawn Watering Guide

The water savings from using lawn watering guides is estimated to be 20 percent per household with automatic sprinklers and 10 percent per household for all others.

While the cost of this proposal would be borne by the City, the benefits are widespread. Depending on the installation rate of the various items, the City would benefit through more efficient water use, reduced pumping costs as water usage declines, and reduced flows at the Wastewater Treatment Plant. Customers may realize lower water and heating bills. As less water is used for outdoor landscaping (through lawn watering guides), they may find that less labor, fertilizers, and pesticides are also needed.

DMM 2 -- Residential Plumbing Retrofit

As a long-term goal, the City could make available a water conservation package to existing residents. The water conservation package would include the following items: two toilet displacement bags, two shower flow restrictors, two leak detection tablets.

The City could advertise the availability of the retrofit packages and the retrofit showerheads as part of an information and education program.

DMM 3 -- Distribution System Water Audits, Leak Detection and Repair

The City has ongoing maintenance programs to ensure that the water distribution system operates at peak efficiency. These programs include:

- Schedule for exercise of valves. Gate valves, located primarily in the downtown area, tend to be older and more susceptible to rusting. To combat water or soil damage, gate valves are exercised regularly. Normally this work will occur during the winter months.
- Well efficiency testing to examine all pumps to determine both maximum pumping capacity and actual pumping rate.
- Routine repair of water line leaks and replacement and repair of meters.

These programs are effective conservation tools in that they provide Ripon residents with a water system that is efficiently operated, and help to reduce system losses (unaccounted-for water).

DMM 4 -- Metering with Commodity Rates

Table 10 shows the current distribution of metered and flat rate service connections within the City.

Table 10. Current Metered and Flat Rate Service Connections			
Type of Connection	# of metered connections	# of flat rate connections	Total # of connections
General and Residential (single and multiple family residential)	120	3,203	3,323
Commercial	135	0	135
Industrial	25	0	25
City Parks - Irrigation (1)	0	7	7
Other Water Utilities	0	0	0
Total	280	3,210	3,490
(1) Large City parks (neighborhood parks, community parks) that are irrigated. Small mini-park and specialty parks, which are typically less than 0.5 acres, are included in the general category.			

All existing commercial and industrial connections are metered, and all future connections will be metered. Water rates for commercial and industrial customers are based on metered use.

The City has a mix of unmetered (older) and metered (newer) residential connections. The current residential water rates are flat rates for all residential customers, since all customers are not yet metered. Metered rates will not be considered for residential customers until all customers are metered.

Currently about 4 percent of the total residential connections are metered. Since 1991, new residential construction has been required to install water meters. The City is currently retrofitting meters older unmetered residential connections, as funding allows. The City's most recent Domestic Water Report conducted by R.W. Siegfried and Associates (1990) indicated that metering could greatly reduce residential consumption of water, conserving from 19% to 73% of existing use based on comparison to other metered systems in San Joaquin County.

In conjunction with water system rehabilitation projects, unmetered services are being replaced with electronically read meters. City Specifications require the use of a remote radio read system. This system will radio in the meter reading at a specific time, and in addition, also track meter consumption and monitor for tampering, unauthorized usage, and potential leaks.

DMM 5 -- Large Landscape Conservation Programs and Incentives

The City has a Water Efficient Landscape Ordinance to establish a structure for designing, installing, and maintaining water efficient landscapes in new projects and to establish provisions for water management practices and water waste prevention for established landscapes. Appendix A contains a copy of this ordinance.

All existing landscaped areas to which the City provides water that are one acre or more, including green belts, common areas, multi-family housing, schools, businesses, parks, cemetery, and publicly owned landscapes are required to have a landscape irrigation audit at least every five years, unless the project's water bills indicate that they are using less than or equal to the maximum water allowance for that project site. Recognition of projects that stay within the maximum water allowance is encouraged. The water department works with the parks department and school district to improve water use efficiency at public landscape areas.

All new and rehabilitated landscapes are required to install automatic control irrigation systems. Separate valves are required for plant groups that require different water regimes or amounts of water. Anti-drain (check) valves must be installed at strategic points to minimize or prevent low-head drainage. Heads and emitters must be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance. Rain sensing devices are required on all irrigation systems, and soil moisture sensing devices are encouraged.

The City's current Water Efficient Landscape Ordinance specifies that all new or rehabilitated landscapes must include an irrigation design plan including a dual water system to permit non-potable water and future use of recycled water, unless the City grants a written exemption. The irrigation systems must make use of non-potable water unless a written exemption has been granted by the City of Ripon stating that recycled water is not available and will not be available in the foreseeable future. The City's non-potable system is discussed in Chapter 3. Chapter 9 discusses recycled water use in the City.

DMM 6 - High Efficiency Washing Machine Rebate Program

Typically, a high efficiency washing machine rebate program offers a \$75 rebate to qualifying customers who install them in their home. The City does not currently offer any financial incentives directly to customers to install water conservation measures. As a long-term goal, the feasibility and effectiveness of instituting such a rebate program will be assessed, including availability of grant funds and the cost-effectiveness of such a program.

DMM 7 -- Public Information

There are several avenues that the City may use for public information/education.

The City's Internet Page is accessible on <http://www.cityofripon.org>. The Internet Page is updated to reflect current information. The City's Annual Water Report is posted on the Internet, and contains information on water quality and water conservation.

All City Public Works employees have been trained regarding water conservation awareness. As part of their normal duties, employees who see evidence of water waste at residences or businesses put out door hangers regarding water conservation and water waste prohibitions.

The City's public access TV is on the local cable channel 14. Currently the City uses this channel for listings of events and notices. This avenue is available if needed for major announcements regarding water conservation or water shortages.

The City is reviewing available brochures and handouts on water conservation that have been prepared by other agencies. Brochures/handouts that would be appropriate for the City of Ripon will be made available upon request at City Hall, area schools, and at community events.

Public service announcements, live interviews, and taped cable programs could provide media coverage of major water conservation or water shortage issues if needed. In addition, the *Ripon Record* (local newspaper) may be an avenue for coverage of water conditions within the Ripon area.

Utility bill inserts could offer water conservation tips and information. The inserts also could be used to announce restrictions on landscape watering if required. All City water and sewer customers receive monthly utility bills.

DMM 8 -- School Education

As a long-term goal, the City will support an in-school educational program that would supplement and enhance the total effort to conserve water, as well as other natural resources. It is anticipated that the program would include water science demonstrations with the objective of instilling water awareness, information about Ripon's water system and water conservation techniques. This program would be developed in conjunction with the school district and interested local environmental groups.

The education program would be aimed at grades K through 6th. It is felt to be most effective to develop water awareness and a sense for water conservation when children are most impressionable during their formative years. These elementary school students would hopefully be receptive to the conservation message and, in turn, share that message with their parents. Publications developed by other agencies, such as the American Water Works "Splash" and the "Story of Drinking Water Supply," could be used for the school programs.

DMM 9 -- Commercial and Industrial Water Conservation

As a long-term goal, the City could provide commercial and industrial water audits upon request. These audits would address the efficiency of process water use and landscape water use. The City could also review the billing records to identify the top 10 to 20 percent of commercial/industrial users and request that a water audit be conducted. It is anticipated that these audits would be coordinated and cost-shared with other agencies, such as the local and regional energy utilities, air quality district, and sewer district. An outside consultant may be needed to conduct the audits.

Restaurants may be asked to serve water only upon request in water shortage conditions. For participating, the restaurant would receive free table tent cards that explain why it helps save water.

The City building department handles the review of new building plans, and the City engineering department reviews improvement plans. The review considers water use efficiency of the proposed plans.

DMM 10 – Wholesale Agency Assistance Programs

This DMM is not applicable to the City. The City's potable water supply is from its own groundwater wells, not from a wholesale agency. All conservative programs are coordinated by the City.

DMM 11 -- Conservation Pricing

For the City's potable water system, the City has an inclining block rate structure for commercial and industrial customers. Commercial/industrial customers are metered and billed monthly based on the meter readings. Customers are billed a base amount for 1,500 cubic feet of water, and then an additional charge per 100 cubic feet above this base amount.

Residential customers are billed a flat rate per month based on lot size - the larger the lot, the higher the cost. The City requires meters on all new residences, and is retrofitting older residences that do not have meters. When all existing residences are metered, then the City will consider implementing an inclining block rate structure based on meter readings.

The City has instituted a new billing system that will provide metered customers with previous year's usage information. This system will also flag readings that are usually high to enable follow up action from staff. The system was installed in September 2003, and will be operational later in the Fall 2003.

For the City's non-potable water system, the non-potable rates will be greatly reduced from potable rates. This rate structure will encourage irrigation and industrial customers to use non-potable water for suitable purposes.

DMM 12 -- Water Conservation Coordinator

The City's Public Works Director has overall responsibility for the water conservation efforts.

DMM 13 -- Water Waste Prohibition

The City has water waste prevention ordinance provisions that are enforced. Relevant provisions include:

- The City of Ripon, as a water purveyor, shall prevent water waste in areas where they provide water.
- Run off, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures shall be prohibited.
- Consumers shall not be permitted to waste water or use water to excess. The city shall have the right, after first notifying the consumer of such waste or use of water to excess, to install a meter if waste continues.

All City Public Works employees have been trained regarding water waste prevention. As part of their normal duties, employees who see evidence of water waste at residences or businesses put out door hangers regarding water waste prohibitions and water conservation. Follow-up

visits and enforcement are conducted for repeat offenses.

DMM 14 -- Ultra Low Flush Toilet Replacement Program

All new construction since January 1, 1994 has been required to install ultra low flush toilets with no more than 1.6 gallons per flush, per State requirements. In addition, permitted remodeling or rehabilitation projects that involve bathroom improvements are also required to install ultra low flush toilets.

As a long-term goal, the City could sponsor an ultra low flush toilet replacement program. This program would promote replacement of older toilets with new lower water use toilets. It is anticipated that such a program would be implemented with assistance from the Chamber of Commerce.

Chapter 8 - Water Shortage Contingency Plan

Law

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:

10632 (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.

10632 (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.

10632 (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.

10632 (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.

10632 (f) Penalties or charges for excessive use, where applicable.

10632 (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 water supplier...

10632 (g) [An analysis of the impacts of each of the] proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

10632 (h) A draft water shortage contingency resolution or ordinance.

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Catastrophic Water Supply Interruption

As discussed in Chapter 4 Reliability Planning, the City is not significantly affected by drought since its potable water supply is from groundwater. Groundwater has historically been considered a reliable drought supply. The City also has an ongoing monitoring program and preventive maintenance program to prevent temporary disruptions in groundwater supply from mechanical or well problems.

A catastrophic water supply interruption for the City would be simultaneous loss of a large number of its municipal wells due to a local or regional disaster. Widespread equipment failures and power outages might occur as a result of major natural disaster, such as earthquake. The number of City wells affected would depend on the severity and extent of the event. It is anticipated that affected wells would be repaired and power restored as soon as possible.

Water quality problems might affect the City's wells. The City monitors production well water on a regular basis to ensure that pumped water meets State drinking water standards. If water quality problems are encountered, alternatives include providing wellhead treatment, constructing new wells in locations with good water quality, and acquiring other sources of potable water.

On a long-term basis, declining groundwater levels countywide may become an issue, although it is not currently a problem. Historically, the groundwater levels in the vicinity of the City have not been significantly affected due to proximity to the Stanislaus River and natural recharge. In addition, the City has instituted a groundwater preservation program to recharge surface water to help maintain water levels and quality. The City is expanding its monitoring program to obtain ongoing information on groundwater levels and conditions for early detection of declining conditions.

Stages of Action

The City's currently has total well pumping capacity in excess of its peak demand requirements. Table 11 compares average day and summer demands, in million gallons per day (mgd) for 2002 and 2005 with the current total maximum well pumping capacity.

As indicated in Table 11, the City's projected average day and average summer demand through 2005 is less than 50 percent of its total well pumping capacity. Therefore, even with loss of 50 percent of its groundwater capacity, the City will be able to meet its average day and average summer demand through 2005.

In addition, the City has 1.5 million gallons of existing elevated storage, which will function by gravity flow even during well outages or power outages. This storage can be used for emergency supply. As development occurs and the water system expands, the City will be building additional elevated storage.

The only impacts of a water shortage on the City's supply ability would be to meet maximum day and maximum demand periods in the summer, when outdoor water use is highest. If well supply is not available during the summer, cutbacks in outdoor water use may be needed depending on the duration of the supply outage. For shorter duration outages, peaking needs during the summer in excess of the available well capacity could be met from elevated storage.

Table 11. Comparison of 2002 and 2005 Demands with Total Well Capacity		
	Average Day Demand (mgd)	Average Summer Demand (1) (mgd)
2002		
2002 Actual Demand	4.1	5.2
Total Well Pumping Capacity	16.0	16.0
Demand as % of Well Capacity	26%	33%
2005		
2005 Projected Demand	5.2	6.5
Total Well Pumping Capacity	16.0	16.0
Demand as % of Well Capacity	33%	41%
(1) Average summer demand estimated at 1.25 times average day demand.		

Table 12 shows the City’s current total well pumping capacity, and the shortages in well supply that would trigger water shortage contingency plan actions. The loss of supply may be caused by well collapse or mechanical failure, water quality problems, or regional/local disaster such as earthquake.

Table 12. Well Capacities for Water Shortage Scenarios	
Shortage Scenario (1)	Total Well Capacity (mgd)
No Cutback (Normal Conditions)	16.0 mgd (2)
15 Percent Loss of Supply	14.0 mgd
30 Percent Cutback	11.0 mgd
50 Percent Cutback (Disaster)	8.0 mgd
1) Shortage scenarios (loss of supply) may be caused by well collapse or mechanical failure, water quality problems, or regional/local disaster such as earthquake. 2) Well capacity for No Cutback Scenario is based on the current total maximum pumping capacity of the City’s 7 existing wells (# 3, 7, 9, 10, 12, 13 and 14) assuming that all wells are pumping simultaneously.	

As demands increase in the future, the City will be constructing additional wells to meet the increased demands. In addition, the City will also be constructing additional elevated storage, which will function as emergency supply. In future plan updates, the ratio of supply to demand will be checked and the water shortage contingency plan modified if needed.

Table 13 shows the stages of action for the City’s water shortage contingency plan. It includes voluntary and mandatory water use restrictions, depending on the causes, severity, and anticipated duration of the water supply shortage. The mandatory restrictions focus on reducing irrigation and outdoor water use, while maintaining essential indoor uses.

Shortage Condition	Stage	Customer Reduction Goal	Type of Program
Up to 15%	I	15%	Voluntary
15 - 30%	II	30%	Mandatory Restrictions on Irrigation at City Parks & Large Public Facilities
30 - 50%	III	50%	Mandatory Restrictions on Outdoor Water Use at City Parks & Large Public & Private Landscape Areas
50% Prolonged Emergency	IV	50%	Mandatory Restrictions on Outdoor Water Use by All Customers

Health and Safety Requirements for Water Consumption

The City must provide the minimum health and safety water needs of the community at all times. Therefore, the water shortage plan is designed to provide a minimum of 50% of normal supply during a severe or extended water shortage.

Based on commonly accepted estimates of interior residential water use in the United States, Table 14 indicates per capita health and safety water requirements for water use. A health and safety allotment of 68 gallons per capita per day (gpcd) is a typical requirement, because that amount of water is sufficient for essential interior water with no habit or plumbing fixture changes. If customers wish to change water use habits or plumbing fixtures, 68 gpcd is sufficient to provide for limited non-essential (i.e. outdoor) uses.

	Non-Conserving Fixtures		Habit Changes (1)		Conserving Fixtures (2)	
Toilets	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min x 4.0 gpm	20.0	4 min x 3.0 gpm	12.0	5 min x 2.0	10.0
Washer	12.5 gpcd	12.5	11.5 gpcd	11.5	11.5 gpcd	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total (gpcd)		68.0		48.0		37.5
(1) Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.						
(2) Fixtures include ultra low flush 1.6 gallons per flush (gpf) toilets, 2.0 gallons per minute (gpm) showerheads and efficient clothes washers.						

During the timeframe of this plan, the City has sufficient well capacity to cover a 50 percent outage of its wells while still meeting all demands except for outdoor irrigation. Under Stage I, customers may adjust either interior or outdoor water use (or both), in order to meet the voluntary water reduction goal. Under Stage II, Stage III and Stage IV, there would be mandatory restrictions on outdoor water use, e.g., irrigation.

Prohibitions, Consumption Reduction Methods and Penalties

The City's current Water Conservation Ordinances in Appendix A contain restrictions and prohibitions on some uses.

The water shortage contingency plan would focus on restricting use of groundwater for irrigation. During Stages II and III, mandatory restrictions would be specified regarding watering days and hours by City parks and other large public and private landscape areas. The extent of the required restrictions would be determined by the extent of the supply reduction and the time of year.

Further mandatory provisions in an emergency could include restrictions on watering days and hours by all customers, restrictions on washing vehicles, restrictions on large water users, restrictions on flushing of water lines, and restrictions on the filling of swimming pools.

The City's current ordinance prohibiting water waste in Appendix A contains penalties. The current penalties/charges could possibly be increased in the case of an emergency. Penalties could be imposed for not complying with any of the specified water shortage restrictions.

Water Shortage Contingency Ordinance

Current water shortage planning needs can be met largely by emergency storage from elevated tanks and restrictions on outdoor water use as needed. The City is also planning to expand well capacity and elevated storage capacity as demands increase.

Appendix C contains example Water Shortage Contingency Ordinance. The City may consider developing and implementing a similar ordinance in the future if needed during an emergency.

Revenue and Expenditure Impacts and Measures to Overcome Impacts

There is no financial impact anticipated. If needed, the City could quickly adjust water rates as needed to cover increased costs.

Reduction Measuring Mechanism

Actual reductions can be determined by review of total water production records, peak water usage records, and individual commercial and industrial water meter usage records.

Chapter 9 - Water Recycling

Law

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. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area...

10633 (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.

10633 (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.

10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

10633 (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.

10633 (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 and to promote recirculating uses.

Wastewater Collection and Treatment System

The City of Ripon owns and operates the wastewater collection and treatment system. The City has an adopted wastewater (sewer) master plan for these facilities.

A sanitary sewer system collects wastewater from customers and conveys it to a wastewater pond treatment system. Municipal wastewater is handled on approximately 100 acres of Stanislaus River floodplain protected by levees. Sewage receives primary treatment in this

pond system. Final disposal is via evaporation or percolation into the alluvium underlying the area.

A new primary facility was completed in 2002 that updated and expanded the previous facility to its current capacity of 2.43 mgd. In the future, the City is planning to implement secondary treatment and then tertiary treatment.

An additional 18 acres, not protected by levees, is used for the industrial water disposal. Industrial effluent is handled in a water-intensive farming operation. When flooding of industrial waste disposal areas is threatened, industrial effluent is routed to the domestic wastewater ponds.

Recycled or Other Non-Potable Water Currently Used

There is currently no reclaimed wastewater use. It will not be possible for the City to beneficially re-use reclaimed wastewater until tertiary treatment is implemented at the wastewater treatment facility.

There is also currently no use of other non-potable water, such as the SSJID water, treated groundwater from Nestle or non-potable water from non-potable City wells. This non-potable use is anticipated to begin in the near future when the non-potable water system facilities are in place, and customers are connected to the system.

Potential Opportunities for Recycled and Other Non-Potable Water Use

To avoid the overdraft of groundwater and to maintain drinking water quality, the City is committed to finding suitable alternative water sources to replace potable drinking water for suitable uses such as irrigation, industrial uses, and groundwater recharge. In the future, in conjunction with future upgrades of the City's wastewater treatment facility to tertiary treatment, the City will explore potential uses for the treated reclaimed wastewater both within the City and regionally.

As discussed in Chapter 3, the City is already implementing a non-potable water system that will convey untreated SSJID water, treated contaminated groundwater, and non-potable water from non-potable municipal wells. The City has an adopted Groundwater Preservation Plan that incorporates a master plan for the non-potable system. The master plan identifies a future city-wide system that will expand the existing system as development occurs and customers are added.

The non-potable water will be provided for irrigation of large municipal parks and public facilities, and industrial uses such as cooling water at existing and proposed power plants. SSJID water will also be used for groundwater recharge, but treated contaminated groundwater and non-potable water will not.

Projected Use of Recycled and Other Non-Potable Water

Table 15 summarizes the City’s current and projected non-potable water use. This includes reclaimed wastewater and other non-potable water sources such as SSJID water, treated contaminated groundwater from Nestle, and non-potable water from municipal wells.

Table 15. Current and Projected Recycled and Other Non-Potable Water Use									
Acre-Feet Per Year									
Year	2002	2005	2010	2015	2020	2025	2030	2035	2040
Reclaimed wastewater	0	0	In the future, when the City’s wastewater treatment facility is upgraded to tertiary treatment, the City will investigate using reclaimed wastewater for non-potable uses. The timeframe for this upgrade is not known.						
Non-potable water from SSJID, Nestle, and non-potable municipal wells (1)	0	930	1,860	2,790	3,720	4,650	5,580	6,510	7,440
(1) By 2040, it is assumed that all available non-potable water could be beneficially used for irrigation, industrial/commercial uses, and groundwater recharge.									

Proposed Actions to Encourage Use of Recycled and Other Non-Potable Water

The City’s current Water Efficient Landscape Ordinance in Appendix A specifies that all new or rehabilitated landscapes must include an irrigation design plan including a dual water system to permit non-potable water use and future use of recycled water, unless the City grants a written exemption. The irrigation systems must make use of non-potable water unless a written exemption has been granted by the City of Ripon stating that recycled or non-potable water is not available and will not be available in the foreseeable future.

Plan to Optimize Use of Non-Potable Water

The City plans to utilize non-potable water for irrigation of all new and rehabilitated landscapes, and commercial/industrial uses. The initial focus will be on irrigation of large public landscape areas, and commercial and industrial customers. In the future, as feasible, irrigation of common areas that are part of multiple family residential areas, and single-family developments will also be considered. The City anticipates having a non-potable water rate that is significantly lower than the potable rate in order to encourage use of non-potable water.

APPENDIX A

City of Ripon Ordinances Relating to Water Conservation

- 13.04 Water Service System
 - 13.04.311 Wasting water prohibited
 - 13.04.321 Garden irrigation - metered
 - 13.04.341 Use of water restricted to premises
 - 13.04.361 Sprinkling of sidewalk or streets prohibited
- 13.05 Nonpotable water distribution system
- 13.06 Water Efficient Landscape

Chapter 13.04 - WATER SERVICE SYSTEM

- 13.04.310 Wasting water prohibited.**
Consumers shall not be permitted to waste water or use water to excess. The city shall have the right, after first notifying the consumer of such waste or use of water to excess, to install a meter if waste continues. (Ord. 456 § 2 (part), 1990)
- 13.04.320 Garden irrigation-Metered.**
On lots, other than those upon which a residence is located, being used for the raising of flowers, vegetables or fruits, a meter service may be installed. (Ord. 456 § 2 (part), 1990)
- 13.04.340 Use of water restricted to premises.**
No person, firm or corporation shall supply water in any way for the use outside the premises to which the service is assigned or appurtenant, unless by written permission of the administrative officer. (Ord. 456 § 2 (part), 1990)
- 13.04.360 Sprinkling of sidewalk or streets prohibited.**
All sprinkler systems installed for irrigation of lawns and flowers shall be so designed and installed that the water shall not be sprayed or permitted to be sprayed over or upon the public sidewalks or streets of the city not permitted to run into the city's storm sewer system. Portable sprinklers shall not be permitted on sidewalks nor shall they be placed in such a manner as to spray water upon sidewalks or pedestrians using the same. (Ord. 456 § 2 (part), 1990)

Chapter 13.05 - NONPOTABLE WATER DISTRIBUTION SYSTEM

13.05.010 Findings, purpose and intent.

The council of the city finds that:

- A. The people of the state of California and the city of Ripon have a primary interest in the development of facilities to utilize nonpotable water in order to supplement the existing surface and underground water supplies and to assist in meeting the future water requirements of the city and state and to conserve potable water supplies.
- B. The conservation of all available water resources includes and requires the maximum use of nonpotable water, including surface water, for beneficial uses of water.
- C. The continued use of potable water for the irrigation of greenbelt areas and for other uses such as decorative ponds and lagoons, watering outdoor plantings, gardens and lawns in the city where the use of nonpotable water is suitable may be an unreasonable use of such water where non-potable water, including surface water, is available.
- D. The policies described in this chapter are in the best interest of the city. This chapter is necessary to protect the common water supply of the city which is vital to the city's residents' public health, safety and well-being, and to prevent endangerment of public and private property. By developing and utilizing available nonpotable water, including surface water where available, the need for additional imported water can be reduced and the present potable water supply can be conserved. In light of all these circumstances, certain uses of potable water may be considered unreasonable or to constitute a nuisance where nonpotable water is available for such use under controlled circumstances. (Ord. 481 § 1 (part), 1991)

13.05.020 Nonpotable water policy.

It is the policy of the city that nonpotable water, including surface water, shall be used within its jurisdiction wherever feasible and consistent with legal requirements and regulations and the preservation of public health, safety and welfare, and the environment. (Ord. 481 § 1 (part), 1991)

13.05.060 Water reclamation master plan.

A. General. Upon adoption of the ordinance codified in this chapter, the city shall prepare and adopt a water reclamation master plan to define, encourage, and develop the use of nonpotable water, including surface water, within its boundaries. The master plan shall be updated every five years. The master plan may be one or more documents covering specific portions of the city or the total planning area of the city.

B. Contents of the Nonpotable Master Plan. The master plan shall include but not be limited to the following:

1. Plants and facilities: an evaluation of the location and size of present and future nonpotable water sources, distribution mains, lines, pump stations, reservoirs and any other related facilities which may be necessary including cost estimates and potential financing methods;

2. Nonpotable water service areas: a designation, based on the criteria set forth in Section 13.05.020 and the information derived from 13.05.060 (B)(1) and this subsection concerning the areas within the city that can or may in the future use nonpotable water in lieu of potable water. Nonpotable water uses may also include, but are not limited to, the irrigation of greenbelt and agricultural areas, the filling of artificial lakes, the watering of lawns, landscaping, gardens and any other appropriate industrial and commercial uses of nonpotable water;

3. Quality of nonpotable water: an evaluation of water quality with respect to the effect on anticipated uses of nonpotable water; an evaluation of possible sources of water contamination, waste discharge and sewer inflow that may, directly or cumulatively, substantially contribute to adverse water quality conditions in nonpotable water, including surface water, or its use. In the event that sufficient data is not available, recommendations on an enhanced sampling and monitoring program to provide additional data for further development of nonpotable water use options or necessary discharge regulations;

4. Tributary protection measures: recommendations of control measures and management practices for any designated area to maintain or improve the quality of nonpotable water;

5. Schedule: a schedule for implementation, including additional planning and predesign steps, institutional arrangements, permits, land acquisition if necessary, design, construction, startup, facility and mains and line phasing for each nonpotable water service area. (Ord. 481 § 1 (part), 1991)

13.05.070 Mandatory nonpotable water use.

A. General. No person or public agency, as used in California Water Code Section 13551, shall use water from any source or of quality suitable for potable domestic use for the irrigation of greenbelt areas, lawns, gardens, or other uses where the use of nonpotable water is suitable, and when nonpotable water, including surface water, is available and its use is required and authorized by city.

B. Identification of Users. Persons or agencies who are mandated to use nonpotable water are to be identified and permitted as described in this section.

C. Existing Potable Water Service.

1. Preliminary Determination. Upon the designation of each nonpotable water service area or the commencement of the design of nonpotable water facilities, the city shall make preliminary determinations as to which existing potable water customers shall be converted to the use of or required to use nonpotable water. Each such water customer shall be notified of the basis for such a determination that the use of nonpotable water service will be required, as well as the proposed conditions and schedule for use.

2. Notice. The notice of such preliminary determination, including the proposed conditions and time schedule for compliance, and a nonpotable water permit application shall be sent to the water customer by certified mail.

3. Objections. The water customer may file an objection with the city administrator within thirty days after any notice of determination to comply is delivered or mailed to the customer, and may request reconsideration of the determination or modification of the proposed conditions or schedule for conversion or use. The objection must be in writing and specify the reasons for the objection. The preliminary determination shall be final if the customer does not file a timely objection. The city administrator shall appoint a panel of three staff members, including the city engineer, who shall review the objection and shall confirm, modify or abandon the preliminary determination. The panel shall make a final determination within thirty days of the filing of the notice of objection.

D. Developments, Annexations, and Water Service Approvals.

1. The owner or developer of any proposed annexation to city where any new development is contemplated, whether residential, commercial or industrial, shall cause to have designed, construction and installed at owner's or developer's expense a nonpotable water system, if required by the city. The actual system and its design and the line sizes required shall be first approved by city before their installation.

For all areas within proposed annexations to the city, including commercial, industrial or residential developments, or any other type of development utilizing water for the irrigation of yards, parks, lawns, other landscaped areas, or ponds and lagoons or lakes, shall have designed and constructed non-potable distribution mains to serve all areas within the proposed development. If nonpotable supply or surface water line are within one thousand feet of the proposed new development, a service line shall be extended and connected to the nonpotable line by owner or developer at no cost to city, if requested by city.

For good cause and with the approval of the city council upon a proper application therefore, a new annexation and development may, however, be allowed to utilize water solely from the potable system of the city for irrigation purposes, rather than being required to use nonpotable water. In the event that such an exemption is granted by the city council, water meter installations may be required, however, by city or by action of the state of California to conserve the use of potable water.

2. Conditions. Upon application by a developer, owner or water customer (herein referred to as "applicant") for a tentative map, subdivision map, land use permit, or any other development project as defined by Government Code Section 65928, the city administrator shall review the master plan and make a preliminary determination whether the current or proposed use of the subject property requires it to be served with nonpotable water, including surface water, or to include facilities designed to accommodate the use of nonpotable water in the future due to its location within an existing or proposed nonpotable water service area. Based upon such determination, a permit for such use may be required as a condition of approval of any such application, in addition to any other conditions of approval or service if the city so determines.

3. Single-Family Home Developments. All single-family home developments and subdivisions constructed after the effective date of the ordinance codified in this chapter shall

provide for and include a nonpotable water distribution system, including any necessary mains and lines and shall connect to the nonpotable water system of city where nonpotable water, including surface water, is available and if the city requires such a connection.

4. Alterations and Remodeling. On a case by case basis, upon application for a permit for the alteration or remodeling of a single-family, multifamily, commercial or industrial structure, the city administrator shall review the master plan and make a preliminary determination whether the subject property is within a nonpotable water service area (existing or proposed) and should be served with nonpotable water, or include facilities designed to accommodate the use of nonpotable water, including surface water, in the future. Based upon such determination that use of nonpotable water and provision of nonpotable water distribution systems or other facilities for the use of nonpotable water, including surface water, is appropriate, a permit for such use may be required as a condition of approval of the application.

5. Voluntary Requested Service. On a case by case basis, upon a voluntary application for a permit to use nonpotable water on a property not covered by subsections D (1–4) of this section, the city administrator shall review the master plan and make a determination whether the subject property should be served with nonpotable water, including surface water, and that such service is available. Based upon such determination, the application for the permit shall be accepted and processed subject to subsection C of this section.

6. Notice of Determination. A notice of the basis for the preliminary determination, proposed conditions of approval and schedule for compliance shall be provided to the applicant prior to approval of the development application or application for water service. (Ord. 481 § 1 (part), 1991)

13.05.080 Implementation program.

A. Rules and Regulations. The city administrator and the city engineer shall establish general rules and regulations governing the use and distribution of non-potable water.

B. Public Awareness Program. The city administrator shall also establish a comprehensive nonpotable water public awareness program.

C. Financing Programs. The city administrator may, through the master plan, or other program, identify resources and adopt measures to assist water users in the financing of necessary conversions mandated by this chapter. (Ord. 481 § 1 (part), 1991)

Chapter 13.06 - WATER EFFICIENT LANDSCAPE

13.06.020 Purpose.

A. The City of Ripon City Council hereby finds as follows:

1. That the present limited water supply is subject to ever-increasing demands;
2. That the City's economic prosperity depends on continued adequate supplies of water;
3. That the City policy promotes conservation and efficient use of water;
4. That landscaping provide recreation areas, clean the air and water, prevent erosion, offer fire protection, and replace ecosystems; and
5. That landscape design, installation, and maintenance should be water efficient.

B. Consistent with these findings, the purpose of this ordinance is to:

1. Promote the values and benefits of landscapes recognizing the need to utilize water and other resources as efficiently as possible;

2. Establish a structure for designing, installing, and maintaining water efficient landscapes in new projects; and
3. Establish provisions for water management practices and water waste prevention for established landscapes. (Ord 508 § 1 (part), 1992)

13.06.040 Provisions for New or Rehabilitated Landscapes.

A. Applicability

- (1) Except as provided in Section 13.06.040 A.(2) this section shall apply to:
 - a) All new and rehabilitated landscaping for public agency projects and private development projects including, but not limited to, industrial, commercial, and recreational projects; and
 - b) Developer-installed landscaping in single-family and multi-family projects.
- (2) This section shall not apply to:
 - a) Homeowner-provided landscaping at single-family and multi-family projects;
 - b) Cemeteries;
 - c) Registered historical sites; or
 - d) Any project with a landscaped area for less than 2,500 square feet.

B. Landscape Documentation Package.

- (1) A copy of the landscape documentation package conforming to this chapter shall be submitted to the City. The City shall review and approve the landscape documentation package.
- (2) A copy of the landscape documentation package shall be provided to the property owner or site manager along with the record drawings and any other information normally forwarded to the property owner or site manager.
- (3) A copy of the water conservation concept statement and the certificate of substantial completion shall be sent by the project manager to the City.

C. Elements to be contained in the Landscape Documentation Package.

- (1) Water conservation concept statement: Each landscape documentation package, along with a narrative summary of the project, shall include a cover sheet, referred to as the water conservation concept statement to verify that the elements of the landscape documentation package have been completed.
- (2) Calculation of the maximum water allowance;
 - a) A project’s maximum water allowance shall be calculated using the following formula:

$$MNA = (ET_o)(ETA)(CF)(LA) \text{ where}$$

MNA = maximum water allowance in gallons per year
 ET_o = reference evapotranspiration in inches per year
 ETA = ET adjustment factor
 CF = conversion factor
 LA = landscaped area in square feet

- b) Portions of landscaped areas in public and private projects such as parks, playgrounds, sports fields, golf courses, or school yards where turf provides a playing surface or serves other recreational purposes may require water in addition to the maximum water allowance. A statement shall be included with the landscape design plan designating areas to be used for such purposes and specifying any needed amount of additional water above the maximum water allowance.

(3) Landscape design plan: A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

a) Plant selection and grouping:

(i) Any plants may be used in the landscape, providing the estimated water use recommended does not exceed the maximum water allowance.

(ii) If possible, plants having similar water use should be grouped together in distinct hydrozones.

(iii) Plants should be selected appropriately based upon their adaptability to the climatic, geologic, and topographic conditions of the site. Protection and preservation of native species and natural areas is encouraged.

b) Water features.

(i) Recirculating water shall be used for decorative water features.

(ii) Pool and spa covers are encouraged.

c) Landscape design plan specifications: The landscape design plan shall be drawn on project base sheets at a scale that accurately and clearly identifies:

(i) Landscape materials, trees, shrubs, groundcover, turf, and other vegetation; planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing, and quantities of each group of plants indicated.

(ii) Property lines and street names.

(iii) Streets, driveways, walkways, and other paved or concrete areas.

(iv) Pools, ponds, water features, fences, and retaining walls.

(v) Existing and proposed buildings and structures including elevation, if applicable.

(vi) Natural features including, but not limited to, rock outcroppings, existing trees, and shrubs that will remain.

(vii) Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details.

(viii) A calculation of the total landscaped area.

(ix) Designation of recreational areas.

(4) Irrigation design plan: An irrigation design plan meeting the following conditions shall be submitted as part of the landscape documentation package.

a) Irrigation design criteria:

(i) Runoff and overspray. Soil types and infiltration rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates, therefore minimizing runoff.

Special attention shall be given to avoid runoff on slopes and to avoid overspray in planting areas with a width less than ten feet, and in median strips.

(ii) Equipment.

Water meters. Separate landscape water meters shall be required for projects other than single family homes or any project with a landscaped area of less than 5,000 square feet.

Controllers. Automatic control systems shall be required for all irrigation systems and must be able to accommodate all aspects of the design as well as multiple water cycles.

Valves. For plant groups which require different water regimes or amounts of water, separate valves are required. Anti-drain (check) valves shall be installed at strategic points to minimize or prevent low-head drainage.

Sprinkler heads. Heads and emitters shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance.

Rain sensing devices. Rain sensing devices are required on all irrigation systems.

Soil moisture sensing devices. Soil moisture sensing devices are encouraged.

b) Nonpotable Water.

(i) A dual water system shall be installed to permit use of water that does not meet drinking water standards and future use of recycled water, unless a written exemption is granted by the City.

(ii) Irrigation systems shall make use of nonpotable water unless a written exemption has been granted by the City of Ripon stating that recycled water is not available and will not be available in the foreseeable future.

c) Irrigation design plan specifications.

The irrigation design plan shall be drawn on project base sheets. It should be separate from, but use the same format as, the landscape design plan. The scale shall be the same as that used for the landscape design plan described in Section 13.06.040 C.(3).

The irrigation design plan shall accurately and clearly identify:

(i) Location and size of separate water meters for the landscape, where required.

(ii) Location, type and size of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, soil moisture sensing devices, rain switches, quick couplers, and backflow prevention devices.

(iii) Static water pressure at the point of connection to the public water supply.

(iv) Flow rate in gallons-per minute, application rate in inches-per-hour, and design operating pressure in pounds-per-square inch for each station.

(v) Nonpotable irrigation systems as specified in Section 13.06.040 C.(4)

b).

(5) Irrigation schedules.

a) Projected irrigation schedules to satisfy the conditions submitted as part of the landscape documentation package.

The estimated water use recommended for the established landscape shall not exceed the project's maximum water allowance.

b) An annual irrigation program with monthly irrigation schedules shall be required for the plant establishment period, for the established landscape, and for any temporarily irrigated areas. The irrigation schedule may include usable precipitation as a factor, however, the estimated water use calculation shall not include usable precipitation.

c) The total amount of water for the project shall include water designated in the annual irrigation schedule, plus water needed for any water features, which shall be considered as a high water using hydrozone.

d) Recreational areas designated in the landscaped design plan shall be highlighted and the irrigation schedule shall indicate if any additional water is needed above the maximum water allowance because of high plant factors (but not due to irrigation inefficiency).

e) Whenever possible, irrigation scheduling shall incorporate the use of evapotranspiration data such as those from the California Irrigation Management System (CIMIS) weather stations.

f) Whenever possible, landscape irrigation shall be scheduled between 11 :00 p.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature, and to assure compliance with the City's water conservation ordinance.

(6) Maintenance. A regular maintenance schedule be included as part of the landscape documentation package.

(7) Landscape Irrigation Audits.

A schedule of landscape irrigation audits shall be submitted as part of the landscape documentation package.

a) Audits shall be in accordance with the State of California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook or as prescribed by the City Engineer.

(8) Grading Design Plan. Grading design plans shall be submitted as part of the landscape documentation package.

a) They shall be drawn on project base sheets, separate but using the same format as the landscape design plan.

b) The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade.

(9) Soils.

a) Soil texture information shall be submitted as part of the landscape documentation package along with the projected infiltration rates.

b) A mulch where desirable shall be utilized in all planting areas.

(10) Certification.

a) Upon completing the installation of the landscaping and the irrigation system, an irrigation audit shall be conducted by personnel acceptable to the City Engineer prior to the final field observation.

b) A licensed landscape architect or contractor, certified irrigation designer, or other qualified professional in the opinion of the City Engineer shall conduct a final field observation and shall provide a certificate of substantial completion to the City. The certificate shall specifically include reference to the landscaping, automatic irrigation system, and the irrigation audit, along with a list of any observed deficiencies to the owner of record.

c) Certification shall be accomplished by completing a Certificate of Substantial Completion and delivering it to the City. A sample of such form to be used will be provided by the City.

D. Public Education.

(1) Publications.

a) The City shall provide information to owners of all new, single family residential homes regarding the design, installation, and maintenance of water efficient landscapes.

b) Information about the efficient use of landscape water shall be provided to water users throughout the community.

(2) Model Homes.

At least one model home in each project consisting of eight or more homes shall demonstrate via signs and information the principles of water efficient landscapes described in this ordinance.

a) Signs shall be used to identify the model as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment and others which contribute to the overall water efficient theme.

b) Information shall be provided about designing, installing and maintaining water efficient landscapes. (Ord. 508 § 1 (part), 1992)

13.06.050 Provisions for Existing Landscapes.

A. Water management

(1) All existing landscaped areas to which the City provides water that are one acre or more, including green belts, common areas, multi-family housing, schools, businesses, parks, cemetery, and publicly owned landscapes shall have a landscape irrigation audit at least every five years.

(2) If the project's water bills indicate that they are using less than or equal to the maximum water allowance for that project site, an audit shall not be required.

(3) Recognition of projects that stay within the maximum water allowance is encouraged.

B. Water Waste Prevention.

(1) The City of Ripon, as a water purveyor, shall prevent water waste in areas where they provide water.

(2) Run off, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures shall be prohibited. (Ord. 508 § 1 (part) 1992)

APPENDIX B

Resolution to Adopt the Urban Water Management Plan

RESOLUTION NO. 04-2

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIPON ADOPTING URBAN WATER MANAGEMENT PLAN

WHEREAS, pursuant to the Urban Water Management Planning Act (California Water Code Sections 10610-10656), the City of Ripon is required to adopt an Urban Water Management Plan; and

WHEREAS, the City Engineer has caused the preparation of a draft Urban Water Management Plan for public review; and

WHEREAS, after conducting a public hearing on the draft Urban Water Management Plan, the City Council is desirous of adopting the draft plan as the Urban Water Management Plan for the City of Ripon.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. The City Council of the City of Ripon does hereby adopt the Urban Water Management Plan dated July, 2003, as the Urban Water Management Plan of the City of Ripon.
2. The City Engineer and/or his designee, is authorized to take such actions as are necessary and appropriate for the implementation of the Urban Water Management Plan.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Ripon this 6th day of January, 2004, by the following vote:

AYES:	Restuccia, Prince, Winn, Jensen, Hern
NOES:	None
ABSENT:	None
ABSTAINING:	None

THE CITY OF RIPON
A Municipal Corporation

By: TIM HERN, Mayor

ATTEST:
By: LYNETTE VAN LAAR, City Clerk

APPENDIX C

Example Water Shortage Contingency Ordinances

EXAMPLE - No Waste Ordinance During Water Shortage

CITY OF

COUNTY, CALIFORNIA

Date

The City Council of the City of _____ does hereby resolve as follows:

The Municipal Code of the City of _____ is hereby amended by adding Section XX to Chapter XX, to read as follows:

XX-1 PROHIBITING WASTEFUL USE OF WATER**REGULATIONS AND RESTRICTIONS ON WATER USE**

It is hereby resolved by the City Council that in order to conserve the City's water supply for the greatest public benefit, and to reduce the quantity of water used by the City's customers, that wasteful use of water should be eliminated. Customers of the City shall observe the following regulations and restrictions on water use:

1. No customer shall waste water. As used herein, the term "waste" means:
 - a. Use of potable water to irrigate turf, ground-cover, shrubbery, crops, vegetation, and trees (agricultural accounts are excluded from the time of irrigation restriction) between the hours of 10:00 o'clock A.M. and 6:00 o'clock P.M. or in such a manner as to result in runoff for more than five (5) minutes;
 - b. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety;
 - c. Allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break;
 - d. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment.
 - e. Use of potable water to clean, fill or maintain decorative fountains, lakes or ponds unless such water is reclaimed.
2. The following restrictions are effective during a declared Water-Shortage Emergency.
 - a. No restaurant, hotel, cafe, cafeteria or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested.
 - b. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is sufficient.
 - c. Use of potable water for sewer system maintenance or fire protection training without prior approval by the Mayor;
 - d. Use of potable water for any purpose in excess of the amounts allocated or each class of service.
3. Other restrictions may be necessary during a declared Water Shortage Emergency, to

safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

Enforcement

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

Penalty for violations

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

Appeals

Variances from the requirements of this Section may be granted by the Board of Directors only after denial of a variance request by the general manager. Appeals of variance request denials shall be made in writing to the secretary of the Board at least 2 weeks prior to the meeting at which they will be heard.. Upon granting any appeal, the Board of directors may impose any conditions it determines to be just and proper. Variances granted by the Board shall be prepared in writing, the furnished to the applicant. The board of Directors may require it to be recorded at applicant's expense.

Remedies/Cumulative

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

EXAMPLE - Resolution to Declare Water Shortage Emergency

CITY OF

COUNTY, CALIFORNIA

Date

The City Council of the City of _____ does hereby resolve as follows:

PURSUANT to California Water Code Section 350 et seq., the Council has conducted duly noticed public hearings to establish the criteria under which a water shortage emergency may be declared.

WHEREAS, the Council finds, determines and declares as follows:

- (a) The City is the water purveyor for the property owners and inhabitants of the city;
- (b) The demand for water service is not expected to lessen.
- (c) When the combined total amount of water supply available to the City from all sources falls at or below the Stage II triggering levels described in the 1995 Urban Water Management Plan, the City will declare a water shortage emergency. The water supply would not be adequate to meet the ordinary demands and requirements of water consumers without depleting the City's water supply to the extent that there may be insufficient water for human consumption, sanitation, fire protection, and environmental requirements. This condition is likely to exist until precipitation and inflow dramatically increases or until water system damage resulting from a disaster are repaired and normal water service is restored.

NOW, THEREFORE, BE IT RESOLVED that the City Council hereby directs the Mayor to find, determine, declare and conclude that a water shortage emergency condition exists that threatens the adequacy of water supply, until the City's water supply is deemed adequate. After the declaration of a water shortage emergency, the Mayor is directed to determine the appropriate Rationing Stage and implement the City's Water Shortage Emergency Response.

FURTHERMORE, the Council shall periodically conduct proceedings to determine additional restrictions and regulations which may be necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

EXAMPLE - Moratorium on New Connections During Water Shortage

CITY OF
COUNTY, CALIFORNIA
Date

The City Council of the City of does hereby resolve as follows:
The Municipal Code of the City of is hereby amended to read as follows:

XX-1 MORATORIUM ON SERVICE COMMITMENTS AND CONNECTIONS

1. When the City declares a water shortage emergency, the following regulations shall become effective immediately and shall continue in full force and effect to prohibit the following while it remains in full force and effect:
 - a. The City shall not issue oral or written commitments to provide new or expanded water service, including will-serve letters.
 - b. The City shall not sell meters for water service connections, despite the prior issuance of will-serve letters or other oral or written service commitments, unless building permits have been issued.
 - c. The City shall not provide new or expanded water service connections, despite the prior issuance of will-serve letters or other oral or written service commitments and meters, unless building permits have been issued.
 - d. The City shall not provide water for use on any new plantings installed after the declaration of a Water Shortage Emergency.
 - e. The City shall not annex territory located outside the City's service boundary.
2. The following uses are exempt from the moratorium and upon application to the City shall receive necessary water service commitments and connections to receive water from the City:
 - a. Uses, including but not limited to, commercial, industrial, single and multifamily residential, for which a building permit has been issued by the City on or before the declaration of a Water Shortage Emergency.
 - b. Uses, including but not limited to, commercial, industrial, single and multifamily residential, for which a retail meter had been purchased from the City before the declaration of a Water Shortage Emergency, as evidenced by a written receipt and for which a building permit has been issued and remains in full force and effect.
 - c. Publicly owned and operated facilities, including but not limited to schools, fire stations, police stations, and hospitals and other facilities as necessary to protect the public health, safety and welfare.

EXAMPLE - Draft Water Shortage Contingency Regulation

7.2 Draft Water Shortage Contingency Regulation (10632)

The following is a draft of an emergency regulation restricting the quantity and use of water supplied by _____ and imposing penalties for non-compliance.

Section 1 Effective Period

These regulations shall be effective during the water shortage emergency condition which the Board declared on _____ and shall continue in effect until such date as the Board may declare that the condition has ended.

Section 2 Allocation of Water

A. Allocation for residential single-unit service

Each single-unit residence is allocated _____ gallons per day from and after _____. Upon application to the District, said allocation may be increased by _____ gallons per day for each resident of the unit in excess of four, and by _____ gallons per day for each horse, cow or other large animal kept at the residence.

B. Allocation for other treated water services

Each treated water service other than a residential single-unit is allocated a percentage of the customer's use during the same months of the previous year as follows:

<u>Type of service</u>	<u>Current Allocation</u>	
Residential multiple unit	_____ percent	.....
Commercial	_____ percent	.....
Industrial	_____ percent	.....
Service to public authorities	_____ percent	.....
Irrigation (residential, commercial, industrial and public authority)	_____ percent	.....
Service through fire hydrants	_____ percent	.....
Temporary service	_____ percent	.....

If the District had not served water to a customer's property during the previous year, the District shall compute a hypothetical use by the customer during that period on the basis of quantities used on similar properties or other information available to the District.

C. Under-Use Carryover

Water savings below a customer's allocation in any month may be carried over and used in a subsequent month.

D. Penalties for excess use

If a customer uses water in excess of its allocation, the customer shall be charged for such excess use at the following rates:

Use in excess	.....
Rate per 100 cubic feet	.....
<u>of allocation</u>	.....
(748.05 gallons)_____	.....
First 10% of excess use	.....
\$_____
Second 10% of excess use	.....
_____
Third 10% of excess use	.....
_____
Fourth 10% of excess use	.....
_____
All additional use	.....
_____

If water use at any connection to the District's system exceeds the ration therefor by more than 20% for two consecutive months the District may install a flow restrictor in the meter serving the property.

Section 3 Prohibited Uses of Water

The following uses of water supplied by the District have been determined to be unreasonable and are prohibited during the effective period of this regulation:

- a. Using water for decorative fountains or filling decorative lakes or ponds.
- b. Washing paved or other hard-surfaced areas, including sidewalks, walkways, driveways, patios, and parking areas.
- c. Outside watering that results in excessive flooding or runoff in a gutter, drain, patio, driveway, walkway or street.

d. Flushing sewers or hydrants, or washing streets except for emergencies, protection of public health or safety, or essential operations.

e. Using potable water for construction except if no other water supply is reasonably available.

Section 4 Exceptions and Waivers

Written applications for exceptions to or waivers of any provision of these regulations shall be received and may be granted in any case where the restriction might create a hazard to the health and safety of any individual or the public, or would cause an undue and unavoidable hardship, including but not limited to adverse economic impacts such as loss of production or jobs. Denial of an application may be appealed in writing to the Appeals Committee appointed by the Board.