FRAZIER PARK PUBLIC UTILITY DISTRICT

Water Conservation Plan

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Frazier Park PUD
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Introduction

The water supply in California is a precious commodity and plays an important role in determining California's future. California has faced numerous water drought conditions and as recent declared a State of Emergency due to water shortages. California's future, both from an economic and a quality of life view, depends heavily upon the wise management of the water supply.

Typically, groundwater supplies about 30 percent of California's urban and agricultural uses. In dry years, groundwater use increases to about 40 percent statewide and 60% or more in some regions. Groundwater usage may vary considerably from year-to-year as it is sometimes pumped to supplement surface water sources.

Water use in California can be classified as:

- Domestic (household, both indoor and outdoor) – Met by public supply or private supply (e.g. wells).
- Commercial (businesses) – Met by public supply or private supply (e.g. non-community systems).
- Industrial (manufacturing/construction) – Met by public supply or private supply (e.g. non-community systems).
- Thermoelectric (electric/fossil fuel/geothermal power generation) – Met by public supply in a minor fraction.
- Mining (mining processes) – Supply source varies widely from operation to operation and is dependent upon the mineral being recovered and the recovery process employed.
- Irrigation (land use) – Met by self-supplied or supplied by irrigation companies or districts.
- Livestock (farm needs) – Supply source varies.

While all classifications of water usages have shown an increase over the years, it has historically been irrigation water use which has accounted for the majority of the water use in California.

While development of California's surface water storage system has slowed significantly, groundwater development continues at a strong pace. A review of well completion reports submitted to the California Department of Water Resources (DWR) provides data on the number and type of water wells drilled in California since 1987. For the 14-year period, DWR received 127,616 well completion reports for water supply wells that were newly constructed, reconditioned, or deepened—an average of 9,115 annually. Of these, 82 percent were drilled for individual domestic uses; 14 percent for irrigation; and about 4 percent for a combined group of municipal and industrial uses. Although domestic wells predominate, individual domestic use makes up a small proportion of total groundwater use in the State.

The most evident influence on the number of wells constructed is hydrologic conditions. The number of wells constructed and modified increases dramatically with drought conditions. The number of wells constructed and modified annually from 1987 through 1992 is more than double the annual totals for 1995 through 2000. Each year from 1987 through 1992 was classified as either dry or critically dry; water years 1995 through 2000 were either above normal or wet, based on measured unimpaired runoff in the Sacramento and San Joaquin valleys. In addition to providing an indication of the growth of groundwater development, well completion reports are a valuable source of information on groundwater basin conditions.

It is vitally important that all residents understand the fundamental science of water, how it is managed in the state, and the issues affecting its management. Water education must become a priority and must include education of children as they are our future.

Conservation is an essential part of ensuring adequate water supply as it is no longer feasible to develop new sources. It has proven to be a cost-effective way to reduce demands and/or to extend a given water supply. It can easily be pursued by all water users regardless of the water system type. Key to evaluating the program's effectiveness is the water use measurement (through meters and other measurement devices). Various conservation measures can be put into place and the achievement of the goals set with these measures is vital to combating the expected increase in water usage.

Statutory Requirements

The 2009 legislative package requires a statewide 20% reduction in urban per capita water use by 2020. It requires that urban water retail suppliers determine baseline water use and set reduction targets according to specified requirements, and requires agricultural water suppliers prepare plans and implement efficient water management practices.

To assure that all public water supply systems are taking the steps needed to protect and conserve the States drinking water supply resource, CDPH's Drinking Water Program is implementing the following measures. These measures are designed to elevate the need to conserve water as an important programmatic goal in addition to the current efforts to assure that all water supplies are safe and reliable.

1. All public water supply systems are encouraged to keep records of their water system production and delivery activities through metering at the source and at customer connections.

2. All public water supply systems are also encouraged to adopt metered water rates that reflect the full cost of the water production and delivery and which encourage customers to minimize water use through progressively increasing water rates or other measures that penalize excessive water use.

3. All public water supply systems that do not have customer meters and effective metered rates are encouraged to take the steps needed to install meters and adopt effective metered rates. Such water systems are also encouraged to adopt water conservation plans that minimize waste. Such plans should include voluntary and/or mandatory schedules for landscape irrigation, prohibitions on "gutter flooding", and may include restrictions on car washing and other uses if a severe water shortage is anticipated.
4. All public water supply systems requesting funding from infrastructure funding programs such as the Safe Drinking Water Revolving Fund and from Proposition 84 and Proposition 50 are encouraged to implement effective water conservation measures. If appropriate and necessary to preserve or attain sufficient water system capacity, the Department will provide funding for water meters as part of these projects.

5. All public water supply systems are encouraged to regularly conduct evaluations of the water losses in their delivery systems. The difference in water produced versus the water sold to customers should be tabulated and tracked at least on an annual basis. This information should be used to identify badly worn transmission and distribution system pipelines and storage facilities, which contribute to water loss.

6. Letters with advice and guidance on measures that can and should be taken to address water system conservation and drought contingency planning have been sent to all public water systems with special emphasis on the smaller systems that have fewer resources to address these issues.

7. Public water systems that face long-term water shortages are encouraged to explore longer-term management actions that conserve water and minimize drought impacts. These may include increased use of recycled water for non-potable uses, developing new sources by reverse osmosis treatment of saline water supplies, and providing incentives for conversion to drought-tolerant landscaping (e.g., "cash-for-grass" programs).

This water conservation plan was prepared for Frazier Park Utility District with the provisions of this plan including:

a. Public Education
b. Conservation Measures
c. Water Management
d. Contingency Plan
e. Schedule
f. Evaluation Measurements
g. Conservation Estimates

This plan is available for inspection during normal business hours at 4020 Park Drive, Frazier Park, CA 93225

The Water Conservation Plan will be updated when required to meet State requirements.

System Description

The Frazier Park Public Utility District was established on February 14, 1939, when it succeeded the Frazier Mountain Water Company. The newly established FPPUD paid $900.00 for two natural springs, Pine Canyon and Sam Young, and three parcels intended for use as either wells or water tanks. FPPUD now serves approximately 2,834 residents in the Frazier Park community, using two springs, 3 active wells and 12 water tanks.

The springs and wells that provide water to the community are on the South or "shady" side of Frazier Park. There are no sources of water on the "sunny" side. The water that supplies all the businesses and residences on the North side is pumped across Cuddy Creek from the springs and wells on the South side. The springs supply a small portion of the water supply whereas the wells supply the majority of the domestic water supply for the community. Most of the actual watershed from the ridge tops down to the creek is United States Forest Service land. Many private parcels exist between the existing developed areas and the National Forest boundaries that are available for development. Without careful management, developments of these areas have the potential to adversely impact the area's water supplies.

Water pressure is created by water forcing its way through the distribution system to your tap. Gravity is the most efficient way to bring water to your home. The Water District (FPPUD) service area is divided into several "pressure zones" according to the elevation of your neighborhood. Although most household appliances are designed to work with water pressure between 15 and 120 pounds per square inch (psi), the standard for water pressure is between 50-100 psi. The water pressure at your particular home will depend on the elevation of your home and your proximity to the reservoir which serves your home. The closer you are to the elevation of the reservoir serving you, the lower your pressure will be. Similarly, the lower your home is in relation to the reservoir, the higher your water pressure.

Table 1 – Sources of Supply

Well No.	Depth (feet)	Production (gpm)
Pine Canyon	N/A	3.5
Sam Young	N/A	6.5
#3	128	196
#4	140	220
#5	118	496

Each one of our water resources are permitted by the State of California.

Frazier Park PUD requires, at a minimum, a licensed D 1 Water Operator. The plant operator is required to perform monthly and yearly monitoring and testing of water quality. Frazier Park PUD does not have any outstanding water quality issues. The utility charges metered rates for all customers. It currently does not have an inclining tiered rate usage fee; however, with the new regulation to meet 20% reduction for water usage by 2020 an inclining rate structure may be implemented. The current fees are detailed in the table below (Table 2).

Table 2 – Residential Customers and Usage Charges

3/4" meter	$32.34
1" meter	$37.34

Monthly Service Charge - Business

1" meter	$37.34
1-1/2" meter	$52.34
2" meter	$67.34
4" meter	$117.34
6" meter	$167.34

Consumption Fee - $.75 per 100 cubic feet of water--Effective October1, 2007

Wastewater collected from the service area is collected by individual residential septic systems. There are currently no plans to develop wastewater facilities by Frazier Park PUD and there are no plans for the reusing of wastewater.

While there is no formal wellhead protection plan in place, Frazier Park PUD is actively practicing wellhead protection concepts such as having a secured area surrounding all wells.

Current water rates are being reviewed due to the increase in cost of services. The water rate study is anticipated for completion in the middle of April of 2014.

Plan Provisions

Frazier Park PUD will appoint a staff member to oversee the conservation efforts and this staff member will be responsible for implementation of conservation programs, monitoring of water use, and will review /revise the conservation plan when needed.

In an effort to promote voluntary conservation and aid in California's future, Frazier Park PUD will enact the voluntary conservation measures found in the ***Conservation Measures*** section. When more stringent measures are needed the utility will enact the measures found in the ***Contingency Measures*** section. All measures can be found in Appendix A.

As required the water conservation plan must include the following provisions:

a. Public Education
b. Conservation Measures
c. Water Management
d. Contingency Plan
e. Schedule
f. Evaluation Measures
g. Conservation Estimates

Each provision is discussed below.

Public Education

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. Frazier Park PUD recognizes this and, when financially approved, the utility will establish a conservation education program and corresponding budget.

It is the goal of Frazier Park PUD to increase public awareness to conserve water, encourage reduction in lawn sizes, encourage the use of climate-appropriate plants, encourage the use of drip irrigation, and encourage conscious decisions for water use.

The conservation education program includes education materials such as newspaper articles, pamphlets, flyers, and posters. New customers will be provided water conservation materials when service is established, while existing customers will receive these materials periodically through bill inserts or direct mail. Educational pamphlets will be provided to all customers upon request and should include an explanation of all costs involved in supplying drinking water and demonstrate how the water conservation practices will provide water users with long-term savings. Education materials should also encourage reduction of lawn sizes, use of drip irrigation, use of climate-appropriate plants, and conservation tips and techniques (see Appendix B).

Customers should also be able to read and understand their water bills. Bills should be informative, going beyond the basic billing information. Bills should include comparisons to previous bills and tips on water conservation that can help customers make informed choices about their water usage.

Frazier Park PUD may participate in public outreach opportunities such as Earth Day, provide information at a variety of school programs, participate at workshops for plumbers/ suppliers/ builders, and could provide incentives for conservation efforts (e.g. plumbing retrofit rebates, water conservation landscaping rebates, etc.) when deemed appropriate.

Frazier Park PUD could also establish a water conservation advisory committee that would involve the public in the conservation process and provide feedback to the system concerning its efforts, thus fostering support for conservation in the community.

Conservation Measures

In an effort to promote conservation and voluntarily conserve water, Frazier Park PUD is adopting water-use regulations to promote water conservation during **non-emergency** situations. These regulations include the following non-essential water use and are currently voluntary unless specifically noted:

1) No use of water through any connection when the district has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.
2) No use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in excessive run-off or waste.
5) Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
6) Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
7) Use of water for more than minimal landscaping in connection with any new construction.
8) Recommend the use of water for outside plants, lawn, landscape, and turf areas on a Odd/Even Program (Odd numbered addresses Tuesday, Thursday, & Saturday. Even numbered addresses Wednesday, Friday, & Sunday). Watering of plants,

lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. and 6 p.m. Recommend no watering of plants, lawn, landscape, and turf areas allowed on Mondays.

9) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
10) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
11) Use of water for the filling or refilling of swimming pools.

In the event these conservation measures are insufficient to control the water shortage, Frazier Park PUD may wish to implement the mandatory measures discussed in the ***Contingency Plan*** **section**.

The district also promotes the development of water conserving principles into the planning, development, and management of new landscape projects such as public parks, building grounds, and golf course. Customers are encouraged to consult with the local nursery or perform an internet search on the availability of water conservation plants and how to renovate existing landscapes. Customers are also encouraged to evaluate irrigation management systems using metering, timing, and water sensing devices.

Water Management

Frazier Park PUD monitors and records water levels at its tank sites. The system is designed such that water levels are adjusted automatically when the tank's pressure reaches a particular set-point. A back-up generator supplies power in the case of a power outage and will maintain the system.

There are no adjacent water purveyors, so inter-ties with adjacent water purveyors are not possible at this time. Should issues arise with the current well supplies, the district would need to pursue additional water sources and would require approval for all expenditures in support of additional water supplies.

Frazier Park PUD does monitor unaccounted for water losses. Production versus sales and authorized usage allows the determination of unaccounted for water losses. Current-to-historical comparisons are examined and evaluation methods are examined to locate leaks, if significant differences are found. A new water accountability program has been implemented this year for monitoring water losses.

Frazier Park PUD does not currently have a formal leak detection program. All leaks are repaired immediately.

Frazier Park PUD currently has a formal meter replacement program of 15-20 meters being replaced each month. Residential meters are tested when a customer makes such a request. The district has purchased a meter tester to check for errors on meter readings.

All meters are read monthly to obtain usage information and the corresponding billings are issued.

Contingency Plan

The objective of the contingency plan would be to manage the available resources to ensure continued supply of potable water during periods of drought or extended drought.

It is envisioned that voluntary conservation will be sufficient to ensure an adequate supply of water and reduce water usage. However, if a sustained drought (lack of precipitation) is encountered, it may be necessary to implement mandatory restrictions in order to ensure an adequate supply of water to meet essential needs.

Frazier Park PUD plans for drought response would be three (3) stages of drought response: (1) warning stage, (2) alert stage, and (3) emergency stage. The stages are describes as follows:

In Stage 1, the warning stage, Frazier Park PUD would increase monitoring of its water supplies and would begin creating public awareness of the water supply situation and the need to conserve. Conservation measures at this stage would be voluntary. Frazier Park PUD would provide customers with retrofit kits either at cost or free depending on budget constraints and will be evaluated at the time the Stage 1 warning is issued.

In Stage 2, the alert stage, Frazier Park PUD would call for wide-based community support to achieve conservation, limit the use of fire hydrants to fire protection uses (by requiring effluent for construction and dust control purposes), implement water use restrictions, and impose penalties for ignoring the restrictions. Conservation measures at this stage would be mandatory and violations would incur fines.

In Stage 3, the emergency stage, Frazier Park PUD would declare a drought and water shortage emergency, would enforce water use restrictions, impose fines for violations, & implement allocation of water (rationing). Media relations would be activated in order to inform the customers and monetary assistance may need to be secured in an effort to mitigate the effects of the drought (e.g. federal funding assistance). Conservation measures at this stage would be mandatory, rationing would be imposed, and violations would incur fines.

When a drought is declared over, voluntary conservation measures (see ***Conservation Measures*** section) will be reinstated and water supplies would continue to be monitored.

Schedule

All of the provisions listed will be put into in place upon approval of this plan by the Board of Directors.

Evaluation Measurements

An audit comparing water production with metered amounts will be performed prior to the implementation of measures/incentives. Additional audits will then be done every year thereafter. Results from the initial audit will be compared with those of the subsequent annual audits in order to determine the effectiveness of the measures/incentives.

Usage amounts measured will include summer use, average use per connection, and per capita use. If there is a decrease in usage as a result of a particular measure/incentive, that measure/ incentive can be expanded or improved upon, if possible. If it is discovered that a particular measure/incentive is ineffective, it will be discontinued and a new one can then be implemented to take its place.

In addition to changes resulting from audits, updates, and modifications to conservation measures/incentives there will be changes made to meet changing conditions (e.g. customer growth and demand, changing use, new technologies, etc.).

As a plan element is activated (e.g. mailing literature or declaring a drought stage), production figures will be compared to same-month historical data to estimate the plan element's effectiveness. This information will be utilized as a basis for any future water conservation plan revision and plan elements.

Conservation Estimates

During the Stage 1 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 5 to 10 percent reduction in water use.

During the Stage 2 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 10 to 20 percent reduction in water use.

During the Stage 3 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 20 to 30 percent reduction in water use.

The estimated water savings for various end-user efforts can be found in Appendix C.

Rate Analysis

The charging of variable rates for the use of water has sometimes been shown to encourage conservation of water, but not in all systems. Oftentimes the end-user will continue to pay increasing block rates out of necessity for the water used. The use of variable water rates needs to be evaluated on a case-by-case basis.

Frazier Park PUD currently does not have an increasing-block rate structure. It is anticipated a significant reduction of water usage will be experienced when an inclining rate structure is proposed and implemented.

Frazier Park PUD will continue to monitor the water usage and will re-visit this issue each time rates are reviewed. If so warranted a change in rates will occur and this conservation plan will be updated to reflect the new rates.

APPENDIX A

Stage 1 – Warning Stage

1. Frazier Park PUD would increase monitoring of water supplies.
2. Frazier Park PUD would begin creating public awareness of the water supply situation and the need to conserve.
3. Frazier Park PUD would inform customers of voluntary conservation measures (non-essential water uses, listed below).
4. Frazier Park PUD would provide customers with retrofit kits either at cost or free depending on budget constraints and will be evaluated at the time the Stage 1 warning is issued.

Non-essential water uses are:

1) Use of water through any connection when Frazier Park PUD has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.
2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in excessive run-off or waste.
5) Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
6) Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
7) Use of water for more than minimal landscaping in connection with any new construction.
8) Use of water for outside plants, lawn, landscape, and turf areas on a Odd/Even Program (Odd numbered addresses Tuesday, Thursday, & Saturday. Even numbered addresses Wednesday, Friday, & Sunday). Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. and 6 p.m. Recommend no watering of plants, lawn, landscape, and turf areas allowed on Mondays.
9) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
10) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
11) Use of water for the filling or refilling of swimming pools.

In that Water Code Section 375 authorizes the enforcement of this Water Conservation Plan, the following enforcement measures are adopted: for any customer that fails to comply with the foregoing, the following remedies shall be imposed:

-First violation, a warning letter shall be sent under any of the 3 (three) public notice stages listed in the Water Conservation Plan;

-Second violation a fine shall be added to the next month's billing depending on the public notice stage listed in the Water Conservation Plan;

-Third violation the water service is disconnected until compliance is achieved and a reconnection fee will be added to next month's billing;

-Further violation in a year, in addition to termination of water service, the installation of a restrictive device will be placed on the water service connection if so authorized by the Board at the owner's expense;

In addition to the enforcement measures specified in paragraph 2.e, the Board reserves the right to seek enforcement and conviction of repeated violations of this resolution as a misdemeanor as provided at Water Code Section 377, seeking an injunction as authorized by Public Utilities code Section 16472.5 and/or other remedies as provided by law.

Stage 2 – Alert Stage

1. Frazier Park PUD set conservation goals and call for wide-based community support to achieve those goals.
2. Frazier Park PUD would inform customers of mandatory conservation measures (non-essential water uses, listed in Stage 1 are now mandatory).
3. Frazier Park PUD would inform customers of penalties if mandatory conservation measures are not observed (penalties are listed below).
4. Frazier Park PUD would inform customers of mandatory conservation water fees.
5. Frazier Park PUD limit the use of fire hydrants to fire protection uses only.
6. Frazier Park PUD would provide customers with retrofit kits either at cost or free depending on the budget constraints at the time Stage 2 is announced.

Penalties for violation of mandatory conservation measures are:

1st violation – written warning.
2nd violation – $100.00.
3rd violation – turn-off of water services, plus $100 re-connection fee.

Offenses for separate water use restriction violations will each start at the warning stage (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

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Stage 3 – Emergency Stage

1. Frazier Park PUD would declare a drought and water shortage emergency and use media relations to supplement efforts to keep customers informed.
2. Frazier Park PUD would set rationing benchmarks for each customer class.
3. Frazier Park PUD would inform customers of prohibited water uses (non-essential water uses, listed in Stage 1 are now prohibited).
4. Frazier Park PUD would also prohibit all outside watering of landscaping.
5. Frazier Park PUD would inform customers of penalties if prohibited measures are not observed (penalties are listed below).
6. Frazier Park PUD would inform customers of rationing water fees.
7. Frazier Park PUD would limit the use of fire hydrants to fire protection uses only.
8. Frazier Park PUD would seek monetary assistance in an effort to mitigate the drought (e.g. federal funding).

Rationing benchmark is set at 90 gallons per capita per day (gpcpd) and will be adjusted based on water supply available and demand.

Penalties for violation of prohibited water use measures are:

1st violation – written warning and in compliance within 24 hours.
2nd violation – $200.00.
3rd violation – turn-off of water services, plus $100 re-connection fee.

Offenses for separate water use restriction violations will each start at the warning stage (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

If any customer seeks a variance from the provisions of Stage 3, then that customer shall notify Frazier Park PUD in writing, explaining in detail the reason for such a variation. Frazier Park PUD **s**hall respond to each request.

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-First violation, a warning letter shall be sent under any of the 3 (three) public notice stages listed in the Water Conservation Plan;

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-Further violation in a year, in addition to termination of water service, the installation of a restrictive device will be placed on the water service connection if so authorized by the Board at the owner's expense;

In addition to the enforcement measures specified in paragraph 2.e, the Board reserves the right to seek enforcement and conviction of repeated violations of this resolution as a misdemeanor as provided at Water Code Section 377, seeking an injunction as authorized by Public Utilities code Section 16472.5 and/or other remedies as provided by law.

APPENDIX B

PUBLIC EDUCATION MATERIALS

There are several publications available for use at U.S. EPA website for general distribution (currently located at http://epa.gov/watersense/pubs/index.htm#ideas). These publications include such topics as:

- Simple Steps to Save Water,
- Ideas for Residences,
- Ideas for Commercial,
- Using Water Wisely In the Home,
- Outdoor Water Use in the US,
- Toilet Flush Facts,
- Watering Can Be Efficient,
- Irrigation Timers for the Homeowner, and
- Water Efficient Landscaping,

These publications can be utilized until Frazier Park PUD develops system-specific publications.

There are also numerous website that provide tips for conserving water. One of these is: http://www.wateruseitwisely.com/100-ways-to-conserve/index.php. Customers can be directed to this website for tips to conserve water.

Specific tips for landscaping that can be provided to the customers are listed below. During drought conditions outdoor watering restrictions may be imposed, and therefore some of the following tips will not apply.

Tips for Landscaping

Watering:

- Detect and repair all leaks in irrigation systems.
- Use properly treated wastewater for irrigation where available.
- Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants which require smaller amounts of water more often. Check with the local nursery for advice on the amount and frequency of watering needed in your area.
- Set sprinklers to water the lawn or garden only—not the street or sidewalk.
- Use soaker hoses and trickle irrigation systems.
- Install moisture sensors on sprinkler systems.

Planting:

- Have your soil tested for nutrient content and add organic matter if needed. Good soil absorbs and retains water better.
- Minimize turf areas and use native grasses.
- Use native plants in your landscape—they require less care and water than ornamental varieties.
- Add compost or peat moss to soil to improve its water-holding capacity.

Maintaining:

- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- Remove thatch and aerate turf to encourage movement of water to the root zone.
- Raise your lawn mower cutting height to cut grass no shorter than three inches—longer grass blades encourages deeper roots, help shade soil, cut down on evaporation, and inhibit weed growth.
- Minimize or eliminate fertilizing which requires additional watering, and promotes new growth which will also need additional watering.

Ornamental Water Features:

- Do not install or use ornamental water features unless they recycle the water. Use signs to indicate that water is recycled. Do not operate during a drought.

APPENDIX C

END-USER WATER SAVINGS

Here are just a few of the end-user water savings that could be realized:

Leaky Faucets

Issue: Leaky faucets that drip at the rate of one drip per second can waste more than 3,000 gallons of water each year.

Fix: If you're unsure whether you have a leak, read your water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, you probably have a leak.

Leaky Toilets

Issue: A leaky toilet can waste about 200 gallons of water every day.

Fix: To tell if your toilet has a leak, place a drop of food coloring in the tank; if the color shows in the bowl without flushing, you have a leak.

Showering

Issue: A full bath tub requires about 70 gallons of water, while taking a five-minute shower uses 10 to 25 gallons.

Fix: If you take a bath, stopper the drain immediately and adjust the temperature as you fill the tub.

Brushing Teeth Wisely

Issue: The average bathroom faucet flows at a rate of two gallons per minute.

Fix: Turning off the tap while brushing your teeth in the morning and at bedtime can save up to 8 gallons of water per day, which equals 240 gallons a month.

Watering Wisely

Issue: The typical single-family suburban household uses at least 30 percent of their water outdoors for irrigation. Some experts estimate that more than 50 percent of landscape water use goes to waste due to evaporation or runoff caused by overwatering.

Fix: Drip irrigation systems use between 20 to 50 percent less water than conventional in-ground sprinkler systems. They are also much more efficient than conventional sprinklers because no water is lost to wind, runoff, and evaporation. If the in-ground system uses 100,000 gallons annually, you could potentially save more than 200,000 gallons over the lifetime of a drip irrigation system should you choose to install it. That adds up to savings of at least $1,150.

Washing Wisely

Issue: The average washing machine uses about 41 gallons of water per load.
Fix: High-efficiency washing machines use less than 28 gallons of water per load. To achieve even greater savings, wash only full loads of laundry or use the appropriate load size selection on the washing machine.

Flushing Wisely

Issue: If your toilet is from 1992 or earlier, you probably have an inefficient model that uses at least 3.5 gallons per flush.
Fix: New and improved high-efficiency models use less than 1.3 gallons per flush—that's at least 60 percent less than their older, less efficient counterparts. Compared to a 3.5 gallons per flush toilet, a WaterSense labeled toilet could save a family of four more than $90 annually on their water bill, and $2,000 over the lifetime of the toilet.

Dish Washing Wisely

Issue: Running dishwasher partial full and pre-rinsing dishes before loading the dishwasher.
Fix: Run the dishwasher only when it's full and use the rinse-and-hold dishwasher feature until you're reading to run a full load. Pre-rinsing dishes does not improve cleaning and skipping this step can save you as much as 20 gallons per load, or 6,500 gallons per year. New water-saver dishwashers use only about 4 gallons per wash.

Estimated water savings from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-1):

Type	Estimated Usage (gpcpd)	Conservation Usage (gpcpd)	Savings (gpcpd)	Savings (%)
Toilet	18.3	10.4	7.9	43 %
Clothes Washers	14.9	10.5	4.4	30 %
Showers	12.2	10.0	2.2	18 %
Faucets	10.3	10.0	.3	3 %
Leaks	6.6	1.5	5.1	77 %

Benchmarks from selected conservation measures from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-4):

Category	Measure	Reduction of End Use (% or gpcpd)
Universal metering	Connection metering	20 %
	Sub metering	20 – 40 %
Costing and pricing	10% increase in residential prices	2 – 4 %
	10% increase in non-residential prices	5 – 8 %
	Increasing-block rate	5 %
Information and education	Public education and behavior changes	2 – 5 %
End-use audits	General industrial water conservation	10 – 20 %
	Outdoor residential use	5 – 10 %
	Large landscape water audit	10 – 20 %
Retrofits	Toilet tank displacement devices (for toilets using > 3.5 gallons/flush)	2 – 3 gpcpd
	Toilet retrofit	8 – 14 gpcpd
	Showerhead retrofit (aerator)	4 gpcpd
	Faucet retrofit (aerator)	5 gpcpd
	Fixture leak repair	0.5 gpcpd
	Governmental building (indoors)	5 %
Pressure management	Pressure reduction, system	3 – 6 % of total production
	Pressure-reducing valves, residential	5 – 30%
Outdoor water use efficiency	Low water-use plants	7.5 %
	Lawn watering guides	15 – 20 %
	Large landscape management	10 – 25%
	Irrigation timer	10 gpcpd
Replacements and promotions	Toilet replacement, residential	16 – 20 gpcpd
	Toilet replacement, commercial	16 – 20 gpcpd
	Showerhead replacement	8.1 gpcpd
	Faucet replacement	6.4 gpcpd
	Clothes washers, residential	4 – 12 gpcpd
	Dishwashers, residential	1 gpcpd
	Hot water demand units	10 gpcpd
Water-use regulation	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd