APPENDIX H

Town of Windsor's Water Shortage Contingency Plan

Section 10632 of the California Water Code states that the Urban Water Management Plan shall provide an urban water shortage contingency analysis that includes information on the estimated three-year minimum water supply, actions in the event of a water shortage, water waste prohibitions, non-essential water uses during a water shortage, mechanisms for determining water use reductions, revenue and expenditure impacts and the emergency preparedness and plans for catastrophic events. The Town of Windsor (Windsor) draft water shortage contingency model ordinance to be enacted during a water shortage is provided in Attachment 1. Attachment 2 contains Section 12-3-361 from the Town's Municipal Code regarding Regulations and Restrictions on Water Use.

Estimate of Minimum Water Supply for Next Three Years (Water Code §10632(b))

The minimum water supply available during the next few years during a multiple dry year drought, based on historical water supply data, is presented in Section 7 (Table 7-2, which is DWR Table 28) of the Town of Windsor's 2010 Urban Water Management Plan.

Stages of Action to be Taken in Response to Water Supply Shortages (Water Code§10632(a))

The Town Manager shall be responsible for monitoring all potential water shortage conditions, and shall make recommendations to the Town Council regarding the implementation of the Water Shortage Contingency Plan stages 1, 2, or 3. It is the responsibility of the Town Council or its designee to declare a water shortage. The specific stages and triggers to activate each stage based on a percentage reduction in water supply will be determined in cooperation with the Sonoma County Water Agency and the other water contractors served by the Russian River aqueduct system. Table 1 summarizes the triggers and degree of water shortage for each stage of action based on the stages defined in the model ordinance (Attachment 1).

Table 1. Water Supply Shortage Stages and Conditions (DWR Table 35)

Stage No.	Rationing Stages Water Supply Conditions	% Shortage
1	Disruptions to the Town's water delivery system or shortages in the amount of water available for delivery by Sonoma County Water Agency and Sonoma County Water Agency has declared a Stage 1 water shortage	15
2	Disruptions to the Town's water delivery system or shortages in the amount of water available for delivery by Sonoma County Water Agency and Sonoma County Water Agency has declared a Stage 2 water shortage.	15-25
3	Disruptions to the Town's water delivery system or shortages in the amount of water available for delivery by Sonoma County Water Agency and Sonoma County Water Agency has declared a Stage 3 water shortage.	25-50

Stage 1 – Introductory Stage - Voluntary Reductions

During Stage 1, the Town shall implement a public information campaign to inform customers regarding the special need to conserve water due to drought conditions, or any other factor which would cause a reduction in the Town's water supply. The public information campaign shall address certain water use restrictions which customers may implement on a voluntary basis. The list of voluntary restrictions is provided in the model ordinance (Attachment 1) and summarized in Table 3.

Stage 2 – Mandatory Rationing-Community Cooperation Method

In the event that further water conservation is necessary the Town will ask customers to reduce their water consumption by 15 to 25 percent dependent upon the specific water supply conditions. Water allotments may be recommended in a resolution or ordinance depending on alternative supplies and the Town's needs. The Town shall inform its customers that water shortage conditions have reached a magnitude that requires the implementation of mandatory restrictions on the uses of water. The Town will implement water reductions by user class, in order of importance, for healthcare and public safety, non-residential use, irrigation use, and residential use – percent of water allotted to them.

In addition, further non-essential water use prohibitions are recommended to meet necessary water consumption reductions. For example, it is suggested that restaurants implement a "water on request" program. The list of restrictions on water use are defined as non-essential uses in the model ordinance (Attachment 1) and summarized in Tables 3 and 4.

Stage 3 – Mandatory Restrictions of Both the Uses of Water and the Amounts of Water Used

If it is determined that further water consumption reductions are necessary or that stage 2 reduction methods are not effective, it may be recommended that water customers implement a water allotment/penalty method. The necessary water consumption reduction will be 25 to 50 percent. Water allotments will be assigned for each water use class depending on the necessary water conservation percent reduction.

To further achieve water consumption reductions the Model Ordinance recommends limits on all new connections, excluding the exemptions listed in the Model Ordinance. Recommendations for construction offset programs are also included in the Model Ordinance. The list of additional nonessential uses for Stage 3 are defined in the Model Ordinance (Attachment 1) and summarized in Tables 3 and 4.

Catastrophic Supply Interruption Plan (Water Code §10632(c))

The Town of Windsor Water System Master Plan describes the mitigation strategies that may be implemented to limit the impact due to catastrophic events resulting in long-term and short-term interruptions of their water supplies, excluding water shortages and interruptions due to drought. Catastrophic events that have been addressed by the Town include toxic spills, earthquakes, floods, fires, and power outages. The preparation actions for these catastrophic events are summarized in Table 2.

In the event of an emergency, a designated Emergency Operations Center (EOC) may be activated to act as a coordination center for all of the District's emergencies. Town personnel will be are required to inspect wells, storage tanks, and transmission lines and file a report with the EOC. The EOC would set an order of priority for repair and shut down projects.

Table 2. Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Earthquake	Shut-off isolation valves and above ground use of flexible piping for ruptured mains
Floods	Use of the Aqueduct, Bluebird Facility, and storage while Russian River Well sites are interrupted
Toxic Spills	Use of the Aqueduct, Bluebird Facility, and storage while Russian River Well sites are interrupted
Fire	Storage supplies for fire flows
Power Outage or Grid Failure	Portable and emergency generators available for Town, Russian River Well Field, and Aqueduct facilities
Severe Winter Storms	Portable and emergency generators available for Town, Russian River Well Field, and Aqueduct facilities
How Weather	Portable and emergency generators available for Town, Russian River Well Field, and Aqueduct facilities

Prohibitions, Penalties, and Consumption Reduction (Water Code §10632(d)-(f))

Table 3 lists the suggested non-essential water uses and water waste prohibitions. For exceptions to prohibitions or non-essential water uses refer to the Town's Municipal Code Section 12-3-361 which contains regulations and restrictions on water use (Attachment 2). Non-essential water use prohibitions in a subsequent stage include the prohibitions from the previous stage.

Table 3. Voluntary Restrictions and Mandatory Prohibitions (DWR Table 36)

Examples of Water Waste Prohibitions and Non-Essential Water Uses	Stage When Prohibition Becomes Mandatory
Washing of sidewalks, walkways, driveways, parking lots, and other hard surfaces	Water Waste Prohibition
Irrigation in a manner that causes run-off or unreasonable overspray	Water Waste Prohibition
Washing cars, boats, trailers, or other vehicles without a hose with a shutoff nozzle	Water Waste Prohibition
Water for non-recycling decorative water fountains	Water Waste Prohibition
Water for non-recycling car and industrial clothes wash systems	Water Waste Prohibition
Water for single pass evaporative cooling systems	Water Waste Prohibition
Un-repaired leaks	Water Waste Prohibition, Stage 1
Refilling a swimming pool	Stage 1
Non-commercial washing of motor vehicles, trailers, and boats except with a bucket and a hose with a shut-off nozzle for a rinse	Stage 1
Use of fire hydrants except for essential needs or by permit	Stage 2
Watering of any existing turf grass, ornamental plant, garden, landscaping or other plants, except using a hand-held container or drip irrigation	Stage 2
Watering of new turf grass or landscaping	Stage 2
Initial filling of a swimming pool	Stage 2
Note: Refer to the Town of Windsor's Municipal Code Section 12-3-361 for their Water Waste Prohibition.	

The actual percent reductions and the stage of action depend on the total water requirement necessary, available supply, and alternative sustainable local supplies. Consumption reduction methods are listed in Table 4.

Table 4. Consumption Reduction Methods (DWR Table 37)		
Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Water waste prohibitions	At all times	
Reduce pressure in the water lines	Stage 1	15
Prohibit non-essential water use	Stage 1	15
Education and outreach program	Stage 1	15
Water conservation plumbing fixture replacement	Stage 1	15
Voluntary rationing	Stage 1	15
Water shortage pricing, rate adjustments	Stage 2	15-14
Mandatory rationing	Stage 2, 3	15-50
Restrict use for irrigation	Stage 2, 3	15-50
Restrict new water connections	Stage 2, 3	15-50
New construction offset programs	Stage 2, 3	15-50
Per capita allotment by customer type	Stage 3	25-50

Table 5 summarizes suggested penalties when the violation has not been remedied or is repeated. Depending on the extent of the water waste the Town may, after written notification to the customer and a reasonable time to correct the violation, as solely determined by the Town, take some or all of the actions in Table 5. The Stage when the penalties take effect is based on the model ordinance (Attachment 1).

Table 5. Penalties and Charges (DWR Table 38)	
Penalties or Charges	Stage When Penalty Takes Effect
Termination of service	Stage 2
Flow restriction	Stage 2
Reconnection fee	Stage 2
Water waste fee	Stage 3
Note: Penalties and charges in this table are based on the Town of Windsor's Municipal Code Section 12-3-361, Regulations and Restrictions on Water Use.	

Analysis of Revenue Impacts of Reduced Sales During Shortages (Water Code §10632(g))

Measures available to the Town to offset impacts during water shortages would include rate adjustments, or revision of the tier levels, and use of financial reserves including the general fund. Due to reduction in water sales the revenue obtained from water sales will be reduced, however much of the operations and maintenance expenses for the Town will remain the same. The Town may experience increased expenditures for public information and outreach campaigns and staffing. A "Revenue Impact Model – Step by Step Instructions" (Attachment 4)

was supplied to the Town by the Agency to assist the Town in analyzing the financial impacts during a water shortage and make decisions on actions to be taken. In the event of a water shortage, the Town would evaluate the financial impact for the needed percent water consumption reduction. Tables 6 and 7 list suggestions to overcome the revenue and expenditure impacts.

Table 6. Proposed Measures to Overcome Revenue Impacts

Names of Measures	Summary of Effects
Rate adjustment	Offset loss in revenue
Use of financial reserves	Offset loss in revenue

Table 7. Proposed Measures to Overcome Expenditure Impacts

Names of Measures	Summary of Effects
Reconnection fees	Support water conservation programs
Excessive use charges	Support water conservation programs
Construction offset programs	Support water conservation programs

Water Shortage Contingency Draft Ordinance and Use Monitoring Procedure (Water Code §10632(h) and (i))

As noted above, the Sonoma County Water Agency Board has approved an allocation methodology for use by the Town in the event of a water supply shortage. The draft model ordinance and allocation methodology are provided as Attachments 1 and 3, respectively. It is recommend by Sonoma County Water Agency that the Town utilize a chart depicting actual community water use compared to overall rationing goal and provide this information to the media and the public to encourage water conservation. Sonoma County Water Agency developed recommendations for the Town to monitor water use reductions as shown in Table 8.

Table 8. Water Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Data Expected
Continuous system data collection	Normal water usage
Review of water use data	Percent reduction based on weather and growth normalized projected demand
Review of production data	Percent reduction based on historical usage normalized for growth and weather
Increased meter reading (Stage 3)	Regular water usage information during shortage
Agency supply meters	Quantity of delivered water

ATTACHMENTS

Attachment 1: Draft Water Shortage Contingency Model Ordinance

Attachment 2: Town of Windsor Municipal Code Section 12-3-361 Regulations and Restrictions on Water Use

Attachment 3: Water Supply Allocation Model

Attachment 4: Revenue Impacts of the Model Ordinance

ATTACHMENT 1

Water Shortage Contingency Model Ordinance

MODEL WATER SHORTAGE EMERGENCY ORDINANCE

ORDINANCE NO.

AN ORDINANCE OF <CITY/DISTRICT> DECLARING THE EXISTENCE OF A WATER SHORTAGE EMERGENCY CONDITION WITHIN THE <CITY/DISTRICT>, PROHIBITING THE WASTE AND NON-ESSENTIAL USE OF WATER, AND PROVIDING FOR THE CONSERVATION OF THE WATER SUPPLY OF THE <CITY/DISTRICT>

BE IT ORDAINED by the <City Council /Board of Directors> as follows:

Section 1. Declaration of a Water Shortage Emergency

The <City Council /Board of Directors> does hereby find and declare as follows:

(a) Pursuant to Resolution No._____ duly adopted by this <Council/Board> on _<date1>_, a public hearing was held on _____<date2>_____, on the matter of whether the <City/District> should declare that a water shortage emergency condition exists within the water service area of the <City/District>.

(b) Notice of said hearing was published in the ___<name of paper>_____, a newspaper of general circulation printed and published within said water service area of the <City/District>.

(c) At said hearing all persons present were given an opportunity to be heard and all persons desiring to be heard were heard.

(d) Said hearing was called, noticed and held in all respects as required by law.

(e) The <City Council /Board of Directors> heard and has considered each protest against the declaration and all evidence presented at said hearing.

(f) A water shortage emergency condition exists and prevails within the territory of the <City/District>. Said water shortage exists by reason of the fact that the ordinary demands and requirements of the water consumers in the <City/District> water service area cannot be met and satisfied by the water supplies now available to this <City/District> without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

Section 2. Purpose and Authority

The purpose of this ordinance is to conserve the water supply of the <City/District> for the greatest public benefit with particular regard to public health, fire protection and domestic use, to conserve water by reducing waste, and to the extent necessary by reason of the existing water shortage emergency condition to reduce water use fairly and equitably. This ordinance is adopted pursuant to Water Code Sections 350 to and including 358, and Sections 31026 to and including 31029.

Section 3. Definitions

The terms used in this ordinance shall have the following meanings:

(a) Corresponding billing period - A similar billing period occurring in a prior designated year to which current water use is compared for the purpose of determining the percent reduction in use.

(b) Drip system - An irrigation system downstream of a reduced pressure device fitted with drip emitters, bubblers or low pressure micro-jet sprayers.

(c) ETo - Evapotranspiration demand reported as reference evapotranspiration for each California Irrigation Management Information System (CIMIS) weather station located in Sonoma and Marin Counties. (Local ETo data is available by calling <insert Local CIMIS hot-line phone number>.

(d) ETo Adjustment Factor - A factor to multiply times ETo to determine the appropriate amount of water to apply to turf grass while rationing is in effect. The amount of water to apply is found by multiplying the area of turf to be irrigated (square ft) times the ETo Adjustment Factor (see percentage in Section 9(c)) times ETo (inches for a given period of time - typically 3 to 7 days) times 7.48/12 to convert to gallons.

(e) Healthcare and public safety use - Use of water by customers whose principal purpose is to provide health services to the public (such as hospitals, clinics, invalid and senior care facilities and homes, and doctor, dentist, optometrist and chiropractor offices, etc.) or which provide vital public safety services (such as police stations, jails, fire stations, utility services, etc.). Not included in this class are office buildings that provide solely administration services (such as health insurance organizations, etc.) or landscaping uses at any healthcare or public safety site.

(f) Irrigation only use - Water use downstream of a <City/District> owned billing meter whose principal purpose and design is to serve irrigation use.

(g) Overall mandatory rationing requirement - The percent reduction in overall withdrawals from the water system determined by the <City Council/Board of Directors> to be necessary in order to achieve and to safely survive the water shortage emergency.

(h) Run-time - The duration in minutes either programmed or set for each valve controlled by an irrigation system clock (controller) or manually operated.

(i) Shop unit - A type of residential unit which is separately metered and which involves a dwelling unit that is incorporated into the premises of a business - sometimes also referred to as a shop house or live/work unit.

(j) Sprinklers - As used in this ordinance the term sprinklers means an irrigation sprinkler connected to a hose, irrigation sprinklers connected to an in-ground pipe system, and soaker

hoses or porous pipelines operating off of normal service pressure.

Section 4. Effect of Ordinance

This ordinance shall take effect immediately, shall supersede and control over any other ordinance or regulation of the <City/District> in conflict herewith, and shall remain in effect until the <City Council /Board of Directors> declares that the water shortage emergency has ended.

Section 5. Suspension of New Connections to the <City's/District's> Water System

(a) From the effective date of this ordinance until the date the <City Council /Board of Directors> by resolution declares that the water shortage has ended, which period is hereinafter referred to as the suspension period, no new or enlarged connection shall be made to the <City's/District's> water system except the following:

(1) Connection pursuant to the terms of connection agreements which prior to <date1>, had been executed or had been authorized by the <City/District> to be executed;

(2) Connection of fire hydrants.

(3) Connection of property previously supplied with water from a private water source (such as a well or spring) upon submittal and approval of the <title of designated official> evidence that the private source has failed or dried up or has otherwise been impaired by the drought or water shortage event to such a degree that the source no longer can meet minimal potable water needs of the applicant.

(4) During Stage 2 and 3 if the overall mandatory rationing requirement is equal to or less than 30%, connection of property for which the applicant has obtained all approvals required for development, except potable water supply, and agrees to defer installation of landscaping until after the suspension period.

(5) During Stage 2 and 3 if the overall mandatory rationing requirement is greater than 30%, connection of property for which the applicant: has obtained all approvals required for development except potable water supply; agrees to defer installation of landscaping until after the suspension period; and, either retrofits good quality water conservation fixtures and devices (1.6 gallon per flush toilets, 2.5 gallon per minute shower heads, and 2.2 gallon per minute faucet aerators for kitchen sinks and lavatories) in five existing single family detached dwelling units served by the <City/District>, or pays the <City/District> $1,500 per equivalent single family detached dwelling unit for which water service is being applied. These payments shall be used by the <City's/District's> to help fund its expanded water conservation program efforts during the suspension period. If an applicant chooses the retrofit option and a selected home already has some water conserving fixtures, applicant shall install conservation fixtures in additional dwellings as determined necessary by the <title of designated official>.

(b) During the suspension period, applications for water service will be processed only if the applicant acknowledges in writing that such processing shall be at the risk and expense of the applicant and that if the application is approved in accordance with the <City's code/District's regulations>, such approval shall confer no right upon the applicant or anyone else until the

suspension period has expired, and that the applicant releases the <City/District> from all claims of damage arising out of or in any manner connected with the suspension of connections.

(c) Upon the termination of the suspension period, the <City/District> will make connections to its water system in accordance with its <code/regulations> and the terms of connection agreements for all said applications approved during the suspension period. The water supply then available to the <City/District> will be apportioned equitably among all the customers then being served by the <City/District> without discrimination against services approved during the suspension period.

(d) Nothing herein shall prohibit or restrict any modification, relocation or replacement of a connection to the <City's/District's> system if the <title of designated official> determines that the demand upon the <City's/District's> water supply will not be increased thereby.

Section 6. Waste of Water Prohibited *(Note: If your City/District has adopted a Water Waste Prohibition ordinance as a permanent feature of your Water Conservation Program, Subsection (a) below can be replaced with a reference to same.)*

(a) No water furnished by the <City/District> shall be wasted. Waste of water includes, but is not limited to, the following:

(1) Washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety.

(2) Escape of water through breaks or leaks within the customers plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy two (72) hours after the customer discovers such a break or leak or receives notice from the <City/District>, is a reasonable time within which to correct such break or leak or, as a minimum, to stop the flow of water from such break or leak (also see Section 7 (2).

(3) Irrigation in a manner or to an extent which allows excessive run-off of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his water system under control at all times, to know the manner and extent of his water use and any run off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner.

(4) Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle.

(6) Water for non-recycling decorative water fountains.

(6) Water for single pass evaporative cooling systems for air conditioning in all connections installed after <date3> unless required for health or safety reasons.

(7) Water for new non-recirculating conveyor car wash systems.

(8) Water for new non-recirculating industrial clothes wash systems.

(b) Waste of water shall also include failure to put to reasonable beneficial use any water withdrawn from the <City's/District's> water system as determined by the <title of designated official>.

Section 7. Prohibition of Non-Essential Use of Water

(a) No water furnished by the <City/District> shall be used for any purpose declared to be non-essential by this ordinance. The restrictions in this section shall not apply to use of recycled wastewater furnished by a government agency.

Stage 1 - Introductory Stage (15% volunteer reduction)

(b) As of the effective date of this ordinance and continuing until Stage 2 is implemented, all customers are asked to voluntarily reduce consumption of water furnished by the <City/District> to 15% and all customers of the <City/District> are requested to:

(1) Apply irrigation water only during the evening and early morning hours to reduce evaporation losses.

(2) Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.

(3) For irrigation valves controlling water applied to turf grass, vary the minutes of run-time consistent with fluctuations in weather.

(4) Reduce minutes of run-time for each irrigation cycle if water begins to run-off to gutters and ditches before the irrigation cycle is completed.

(5) Become informed about and strictly adhere to the <City's/District's> Water Waste Prohibition Ordinance (refer to Section 6 hereof).

(6) Utilize water conservation incentive, rebate and giveaway programs to replace water guzzling plumbing fixtures and appliances with water efficient models.

(7) Take advantage of the free information available from the <City/District> on how to use water efficiently, read a water meter, repair ordinary leaks, and how to apply water efficiently to the landscape.

(c) The following uses are declared to be non-essential from and after <date1>

(1) Refilling a swimming pool drained after <date4>;

(2) Water escaping from a broken pipe or leak once discovered and after passage of a reasonable amount of time to determine how to shut off the water;

(3) Non-commercial washing of motor vehicles, trailers and boats except from a bucket with use of a hose equipped with a shutoff nozzle for a quick rinse.

Stage 2 - Mandatory Rationing - Community Cooperation Method (X1% reduction)

(d) Stage 2 sets forth an overall mandatory rationing requirement of X1% for customers to

collectively meet. In determining compliance, the <City/District> shall rely on water production records comparing current production trends to trends that would normally be expected to occur. Individual customers who can conserve more than the overall mandatory requirement of X1% are requested and strongly encouraged to do so voluntarily in order to help those customers who would incur economic hardship in order to meet the rationing level.

(e) During Stage 2, the following additional uses are declared to be non-essential from and after <date5> :

(1) Any residential use (excluding irrigation only use) in excess of X2% of the amount used by the customer during the corresponding billing period in <year1>.

(2) Any irrigation only use in excess of X3% of the amount used by the customer during the corresponding billing period in <year1>.

(3) Any non-residential use (excluding irrigation only use and healthcare and public safety use) in excess of X4% of the amount used by the customer during the corresponding billing period in <year1>.

(4) Any water used for healthcare and public safety (excluding irrigation only use) in excess of X5% of the amount used by the customer during the corresponding billing period in <year1>.

(5) Any use of water from a fire hydrant except for fighting fires, human consumption, stock water, essential flushing and clean-up purposes, and water used for construction needs. If the overall mandatory rationing requirement is greater than 30%, a permit issued by the <title of designated official> shall be required for all hydrant use except for water used for fighting fires or for other emergency use deemed essential by the a fire chief.

(6) Watering of any existing turf grass, ornamental plant, garden, landscaped area, tree, shrub or other plant except from a hand-held hose or container or drip irrigation system except as provided in Section 9 hereof.

(7) Watering of new turf grass or replacement turf grass. If the overall mandatory rationing requirement is greater than 30%, this restriction is extended and applies to watering of any new landscape or replacement landscape except in cases where the replacement landscapes will use less water than the original landscape.

(8) Initial filling of any swimming pool for which approval of a construction permit issued by the <City/County> was made after <date5>;

(9) Use for service of drinking water at any restaurant, café, cafeteria or other public place where food is sold, served or offered for sale, unless expressly requested by a patron.

(f) Except in cases of blatant non-compliance, as solely determined by the <title of designated official>, individual billing records will generally not be used during Stage 2 to determine compliance with the provisions of Subsections (e) (1), (2), (3) and (4), it being assumed that customers will cooperate to do the best that they can to individually meet or exceed the overall mandatory rationing requirement. Violations of non-essential uses that come to the attention of the <title of designated official>, however, will be enforced pursuant to the provisions of Section 11 hereof.

Stage 3 - Mandatory Rationing - Allotment Method (X1% reduction)

(g) From and after the date that the <City Council/Board of Directors>, by resolution, determines that the Stage 2 rationing method is not working and the overall mandatory rationing requirement of (X1%) is or may not be met, and/or, that it would be more equitable to apportion the available supply by a fixed allotment, water use in excess of the following allotments established for each meter are in addition declared to be non-essential:

(1) Residential meters serving single family detached homes including mother-in-law or second units that are served by the same meter: X6 gallons per capita per day times the number of permanent occupants. Permanent occupants shall be a whole number. Babies, children, adults and senior citizens whose principal place of residence is in the dwelling in question shall each count as one occupant. In determining the number of permanent occupants, the <City/District> shall rely upon data it has acquired from the customer or other sources. Provided sufficient time is available, the <City/District> will attempt to canvas customers to obtain current data on permanent household occupants.

(2) Residential meters serving multiple units: X2% of the amount used by the customer during the corresponding billing period in <year1>.

(3) Irrigation only meters: X3% of the amount used by the customer during the corresponding billing period in <year1>.

(4) Meters serving any non-residential use (excluding irrigation only metered use and healthcare and public safety use): X4% of the amount used by the customer during the corresponding billing period in <year1>.

(5) Meters serving water used for healthcare and public safety (excluding irrigation only use): X5% of the amount used by the customer during the corresponding billing period in <year1>.

(6) Meters serving mixed uses: An allotment to be determined by the <title of designated official> based upon the criteria contained in items (1) through (5) immediately above.

(h) Any customer exceeding their allotment, based on metered billing records, shall be billed and required to pay a penalty of $X7 for each 1,000 gallons of such excess. This penalty charge shall be waived for the first bill received after Stage 3 is implemented and shall terminate the day the suspension period ends.

(i) If a connection to the <City/District> system was not in existence or used in <year1>, the <City/District> will estimate use in such year based on other historic records and/or water use by customers having similar end uses.

(j) The <title of designated official> may increase or decrease the allotment for any customer if he determines that special circumstances exist and that to do so would better achieve equity in allocation of available water or better meet health and safety concerns.

Section 8. Signs on Lands Supplied from Private Sources

The owner or occupant of any land within the water service area of the <City/District> that is

supplied with water from a source not owned or operated by the <City/District> (such as a well, spring or legal surface diversion) which is used to irrigate landscape which is visible to the general public, will be requested to post and maintain in a conspicuous place thereon a sign furnished by the <City/District> giving public notice of the private supply.

Section 9. Use of Sprinklers Conditional

(a) Any customer of the <City/District> may use sprinklers to apply water furnished by the <City/District> to irrigate any turf grass, garden, landscaped area, trees or shrubs provided said application is properly controlled and performed in a non-wasteful and efficient manner confined to the nighttime hours of 7:00 p.m. and 9:00 a.m. of the next day. In the event low pressure micro-jet sprayers are present in a drip system, irrigation by the valve(s) controlling same shall also be confined to the nighttime hours noted above.

(b) The amount of water normally applied for landscape irrigation shall not exceed X3%. This condition shall not apply to residential customers if Stage 3 allotments are implemented.

(c) In determining the amount of water to apply to turf grass, customers are encouraged to use the following formula:

Applied water for turf grass (gallons) = Area of turf grass (square-ft)
x ETo (inches for a given period of time - typically 3 to 7 days)
x ETo Adjustment Factor of X8%
x conversion factor of 0.62

The ETo Adjustment Factor is based on the assumption that overall irrigation efficiency is 65% and that the crop coefficient for turf grass is 0.8. Use of this formula to determine applied water will yield the appropriate amount of water to apply while rationing is in effect.

(d) Water applied by sprinklers shall be applied in short enough cycles to avoid run-off to gutters and drains.

(e) During the suspension period, use of water by sprinklers is a privilege and permission to use water in this way may be withdrawn if it comes to the attention of the <title of designated official> that such use by a given customer is wasteful or in excess of the amount determined in Section 8 (b). A common result of wasteful application of water by sprinklers is evidence of run-off to a gutter.

Section 10. Variances

(a) Any customer of the <City/District> may make written application for a variance. Applications shall be addressed to:

<title of designated official>
<address of City/District>

Said application shall describe in detail why applicant believes a variance is justified. The <title of designated official> may grant a variance to permit a use of water otherwise prohibited by this ordinance, if he determines that failure to do so would cause:

(1) an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or

(2) an unnecessary and undue hardship on the applicant or the public, including but not limited to, adverse economic impacts, such as loss of production or jobs.

(b) The decision of the <title of designated official> to deny an application for variance under this section may be appealed to the <City Council/Board of Directors> by submitting a written appeal to the <City/District> within fifteen (15) calendar days of the date of the decision. Variances granted by the <City Council/Board of Directors> shall be prepared in writing and contain any conditions imposed by the <City Council/Board of Directors> in granting said variance. The City Council/Board of Directors> may require the variance be recorded at applicant's expense.

Section 11. Enforcement and Fees

(a) During Stage 2 or 3, should the <title of designated official> become aware of any violation of any provision of this ordinance, the following enforcement procedure shall be undertaken:

(1) For the first such violation, the customer shall be given a warning, generally by phone or directly in person by a <City/District> employee, or by leaving a door tag notice informing the customer of the problem and asking that it be corrected.

(2) If the violation continues or is repeated, a certified letter shall be mailed to the customer who receives the water bill. Said letter shall describe the violation and request that it be corrected, cured and abated immediately or within such specified time as the <title of designated official> determines is reasonable under the circumstances. Said letter shall state the consequences of non-compliance with the request.

(3) If the violation continues, the <title of designated official> may forthwith order disconnection of the service where the violation occurs.

(b) Before reconnection of a service, the customer must stop the violation, pay all past due charges on the account, and pay a Violation Reconnection Fee.

(c) If, during the suspension period, a water service is disconnected twice because of

violation of this ordinance, a flow restriction device may be installed by the <City/District> before service is reconnected. Furthermore, the customer must stop the violation, pay all past due charges on the account, and pay a Second Violation Reconnection Fee. If a flow restriction device is installed, the <City/District> shall remove same after expiration of the suspension period.

(d) If, during the suspension period, a water service is disconnected more than twice because of violation of this ordinance, a flow restriction device shall be installed by the <City/District> before service is reconnected. Furthermore, the customer must stop the violation or agree to stop the violation, pay all past due charges on the account, and pay a Subsequent Violation Reconnection Fee for each such instance.

(e) It shall be unlawful for any customer to willfully tamper with or in anyway modify or attempt to modify a <City/District> meter or anything within the <City's/District's> meter box. Violation shall result in customer being charged a Meter Tampering Fee plus the cost of labor and materials to remedy any damage caused to the <City's/District's> equipment as a result of such tampering.

(f) Anyone who willfully takes water from the <City/District> water system without the <City's/District's> permission or who willfully tampers with or causes damage to any <City/District> meter or water system appurtenance is liable to the <City/District> in the sum of $500, as a civil penalty, for the first such act and $1,000, as a civil penalty, for each subsequent act during the suspension period. This sum shall be recoverable by civil suit in a court of competent jurisdiction. This section does not limit the <City's/District's> right to recover the cost of any <City/District> water taken without the <City's/District's> permission.

(g) All customer fees required by this section shall be set by a resolution of the <City/District>.

Section 12. Severability

If any section, subsection, sentence, clause, phrase, or word of this ordinance is for any reason held to be invalid, the validity of the remaining portion of this ordinance shall not be affected.

Section 13. Effective Date

This ordinance shall become effective upon its adoption.

Section 14. Publication

Within ten (10) days after its adoption, this resolution shall be published pursuant to Section 6061 of the Government Code in full in a newspaper of general circulation that is printed, published, and circulated in the <City/District>. If there is no such newspaper the resolution shall be posted within ten (10) days after its adoption in three public places within the <City/District>.

ω ω ω ω

I hereby certify that the foregoing is a true and complete copy of an ordinance duly and regularly adopted by the <City/District>> at a regular meeting thereof held on <date> by the following vote:

Ayes:
Noes:
Absent:
Abstained:

(SEAL)

_____

Secretary
<City/District>>

Model Rationing Ord - Draft 5.wpd

ATTACHMENT 2

Town of Windsor Municipal Code
Section 12-3-361 Regulations and Restrictions on Water Use

12-3-361 - Regulations and Restrictions on Water Use.

a. Purpose. The purpose of this section is to promote water conservation and the efficient use of potable water furnished by the Town of Windsor by eliminating all intentional or unintentional water waste when a reasonable alternative solution is available, and by prohibiting use of equipment which is wasteful. Customers of the Town of Windsor shall comply with the following regulations and restrictions on water use:

b. Nonessential Uses. No customer of the Town of Windsor shall engage in or permit the following nonessential uses of potable water from the Town, regardless of whether the purpose is residential, commercial, institutional, industrial, agricultural or other:

1. The washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, to wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;

2. The escape of water through breaks or leaks within the customer's plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the Town, is a reasonable time within which to correct such break or leak or, as a minimum, to stop the flow of water from such break or leak;

3. Irrigation in a manner or to an extent which allows excessive runoff of water or unreasonable over spray of the areas being watered. Every customer is deemed to have his water system under control at all times, to know the manner and extent of his water use and any runoff, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;

4. Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;

5. Water for nonrecycling decorative water fountains;

6. Water for single pass evaporative cooling systems for air conditioning in all new installations unless required for health or safety reasons;

7. Water for new nonrecirculating conveyor car wash systems;

8. Water for new nonrecirculating industrial clothes wash systems.

c. Exempt Water Use. All water use associated with the operation and maintenance of fire suppression equipment or employed by the Town for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by private well or from a reclaimed water, grey water or rainwater utilization system is also exempt.

d. Variances. Any customer of the Town may make written application for a variance. Such application shall describe in detail why applicant believes a variance is justified.

1. The Town Manager or his/her designee may grant variances for the use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public, or that denial would cause an unnecessary and undue hardship on applicant or public, including but not limited to, adverse economic impacts, such as loss of production or jobs.

2. The decision of the Town Manager may be appealed to the Town Council by submitting a written appeal to the Town Clerk within fifteen (15) calendar days of the date of the Town Manager's decision. Upon granting any variance on appeal, the Town Council may impose any conditions it determines to be just and proper. Variances granted by the Town Council shall be prepared in writing and the Town Council may require the variance be recorded at applicant's expense.

e. Enforcement and Fees. Depending on the extent of the water waste the Town may, after written notification to the customer and a reasonable time to correct the violation, as solely determined by the Town, take some or all of the following actions. Penalties, fees and charges noted below shall be established by resolution of the Town:

1. Written notice to the customer of the waste water violation including a specified period of time from notification to correct the violation;

2. Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date by which the violation is to be corrected may be left on the premises and a copy of the notice sent by certified mail to the customer;

3. The Town may install a flow-restricting device on the customer's service line;

4. The Town may levy a water waste fee on the customer, which after service of written notice of the fee, as provided for above shall become a special assessment against the property on which the waste occurred and be collected at the same time and in the same manner as ordinance Town taxes. The procedure for such assessment shall be as provided for Title 3, Chapter 8, Article 3 of this Code;

5.

The Town may cause termination of water service and the charge for same shall be billed to the customer. Except in some cases of extreme emergency as solely determined by the Town Manager, service shall not be restored until the Town verifies that the violation has been corrected and all charges and fees have been paid.

(Ord. No. 99-123 § 1; Ord. No. 2000-129 § 1)

ATTACHMENT 3

Water Supply Allocation Model

Description of Model that Calculates the
Allocation of Water Available to Sonoma County Water Agency for its Customers*
During a Water Supply Deficiency Taking Demand Hardening into Account

April 4, 2006 Version

This EXCEL workbook (040406 Allocation Model.xls) presents two models that calculate allocations to Sonoma County Water Agency (SCWA) Customers during a shortage of water supply in the Russian River. The calculations meet all of the requirements of the Restructured Agreement for Water Supply (Agreement). See **Contents** sheet for layout of sheets in the workbook. Another EXCEL workbook (040406 Customer Water Use.xls) supports this workbook and contains data compiled for the 2005 Urban Water Management Plan.

* "SCWA Customers" or "Customer" is defined as any of the following:
Regular Customers
Water Contractors (sometimes referred to as "Primes"): Cotati, Petaluma, Rohnert Park, Santa Rosa, Sonoma, Windsor (Airport Service Area), North Marin Water District, Valley of the Moon Water District
Other Agency Customers: SCWA, County of Sonoma, Larkfield Water District, Forestville Water District, Lawndale Mutual Water Co., Kenwood Village Water Co., Penngrove Water Co., City of Sebastopol, State of California, and Santa Rosa Jr. College)
Marin Municipal Water District (MMWD)
Russian River Customers (Customers of SCWA that divert water directly from the Russian River or via wells adjacent to the River).

Where to Find Results:

Results for allocating water during a shortage given varying assumed amounts of water available to SCWA in the Russian River are modeled for two cases.

- The **Current Model** is to be employed during a real drought. Inputs to this model must be updated to then current conditions. For current conditions, results are shown on the **Current Recap** sheet.

- The **Future Model** is a "planning" model whose purpose is to predict allocations for various levels of deficiency in the future when all Customers are assumed to have reached there entitlement limits – generally about 20 years from now for most Customers. (Note: This was the type of model prepared by West, Yost & Associates for the City of Santa Rosa and is also the type prepared by Petaluma.) Results are shown on the **Future Recap** sheet.

Required Allocation Methodology:

Section 3.5(a)(3) of the Agreement provides for allocation of water in the event of a water supply deficiency as follows:

- "**First**", Allocation of quantities of water required by each Customer* for human consumption, sanitation and fire protection (HC, S & FP) after taking into consideration all other sources of potable water then available to said customer. (Section 3.5(a)(3)(i)) (Often referred to as Tier 1.)

- "**Second**", Allocation of any additional water available to the SCWA proportionately to its Customers* as follows (Section 3.5(a)(3)(ii)) (Often referred to as Tier 2 allocation.):

  Regular Customers (Water Contractors and Other Agency Customers): Deliveries from aqueduct based on respective average daily rate of flow during any month entitlements. These entitlements are set forth as million gallon per day (mgd) rates in Sections 3.1(a) and 3.2 of the Agreement.

  Russian River Customers: Authorized diversions or rediversions of water based on delivery limits set forth in agreements with the SCWA.

  Marin Municipal Water District (MMWD): Deliveries based on Third Amended Offpeak Agreement and Agreement for Sale of Water (as amended on Jan 25, 1996), and amendments or subsequent agreements between the SCWA and MMWD that have been approved by the Water Advisory Committee.

- **Sum of Two:** The Agreement further requires that the sum of the "First" plus "Second" allocation for a given SCWA Customer not exceed the Reasonable Requirement or entitlement limit/contracted amount, whichever is less (Section 3.5(a)(3)(iii).

"Human Consumption, Sanitation and Fire Protection" Definition:

In determining HC, S & FP amounts, the Agreement provides that SCWA shall take into account the level of water conservation achieved by the Customer and the resulting decrease in end user ability to reduce water use (the hardening of demand) resulting from such conservation. The allocation shall be determined using a methodology which rewards and encourages water conservation; avoids cutbacks based upon a percentage of historic consumption, and, among other things, bases the amounts necessary for HC, S & FP upon no greater than average indoor per capita water use determined from recent retail billing records for winter water use by all of the Water Contractors; and, if necessary or appropriate for equitable purposes, considers commercial, industrial and institutional water uses separately and determines that element of the allocation based on winter water use from recent retail billing records for commercial, industrial and institutional uses. (Section 3.5(c)(1))

"Reasonable Requirements" Definition:

The Agreement states that the fundamental purpose of the Reasonable Requirements limitation is to ensure that no Customer receives more water during a shortage than that Customer reasonably needs. In determining reasonable requirements, the SCWA may take into account the hardening of demand resulting from the level of conservation achieved by the Customer; the extent to which the Customer has developed recycled water projects and local supply projects, and the extent to which the Customer has implemented water conservation programs. The Agreement further states that it is the intention of the

parties that the SCWA make its Reasonable Requirements determinations so as to encourage Customers to implement water conservation, recycled water, and local supply projects. (Section 3.5(c)(2))

Description of Models:

Two models are presented.

- **Current Model:** The Current Allocation Model determines annual allocations based on the assumption the water supply deficiency occurs now and impacts current conditions and levels of use. This is the model that would be used in the event of an actual deficiency in water supply available from the Russian River. It employs estimates of HC, S & FP needs, Reasonable Requirements, and Local supply. In the event of a real perceived water supply deficiency, inputs to the model must be updated to then currently available data. If the shortage persists longer than one year the inputs must again be updated – particularly local supply estimates which should be updated every year of the drought. Customers relying on surface water for local supply, such as North Main Water District, and MMWD, can be expected to have reduced local supply available.

- **Future Model:** The second model is hypothetical and predicts future allocations at a point in time that assumes that all customers of the SCWA have reached their annual entitlement limits. It sets the Reasonable Requirement for each SCWA Customer to that customer's annual entitlement limit (cap). The Future Allocation Model is useful for planning purposes to predict allocations from the SCWA for various assumed water supply deficiencies.

Model Assumptions and Inputs:

1. **Entitlements:** Entitlements (Regular Customers) and contracted amounts (MMWD and Russian River Customers) for both models are as set forth in the Agreement and existing agreements between the SCWA and MMWD and its Russian River Customers. (See **Entitlements** and **RR Cust** sheets.)

2. **Local Supplies:** The estimates of safe yield of local supplies are the same for both models and are based on estimates reported by Water Contractors to West, Yost & Associates in a September 23, 2004 Tech. Memo to the City of Santa Rosa and are generally average local supply that was available for the period 2000 through 2003. A contingency factor is applied by John Olaf Nelson Water Resources Management (JONWRM) to each local supply to account for equipment/maintenance issues or other potential problems. This factor was assumed to be 10% for each Waster Contractor for lack of better data. The safe yield value for MMWD was supplied by MMWD. Local supply estimates for Other Agency Customers were not available and was assumed to be "0". Information on Local supplies needs to be accurately determined and updated by the SCWA. (See **Local** and **TM Data** sheets.)

3. **Water for Human Consumption, Sanitation and Fire Protection:** Water needed to meet HC, S & FP needs for both models is assumed to be equal to total winter level demand of customers served by Customers of the SCWA and is based on metered water sales (billings) for calendar 2004, the base year analyzed in the 2005 Urban Water Management Plan. Winter level demands are then extrapolated to a full year to determine the annual HC, S & FP need. Water available

from local supplies is then determined and net HC, S & FP needs determined in order to calculate the "First" allocation. In determining the "First" allocation, demand hardening is accounted for using winter level per capita demand. (See **GPCD** and **Human** sheets and the footnotes on the Current Model for details.)

4. **Reasonable Requirements:**

- For the Current Model, Reasonable Requirements were assumed to equal average annual aqueduct deliveries to SCWA's Regular Customers and MMWD for FY 2003-04 and FY 2004-05. For Russian River Customers, the average for Water Years 2004 and 2005 was used, as that was the format the data was available in. (Use of a three or four year average would normally be a better choice for calculating Reasonable Requirements, however, this was not done as at least one SCWA customer made a significant policy change in aqueduct usage which would not have been fairly reflected if years prior to FY 2003-04 were used. Also in subsequent analyses, the data should be normalized to common annual periods.) (See **Reasonable** sheet.) Pursuant to Section 3.5(c)(2), Reasonable Requirements were adjusted with a demand hardening factor to account for differing levels of conservation achieved by Customers. The demand hardening factor is derived from total per capita demand (residential, non-residential and unaccounted for water) as determined for the base year (cal. 2004) of the 2005 Urban Water Management Plan. (See **DH Factor** sheet.)

- In the Future Model, Reasonable Requirements are set equal to annual entitlement limits (caps) or contract limits as applicable, it being assumed that each Customer has reached its annual entitlement limit (the same approach taken in the Santa Rosa and Petaluma models). THIS IS THE ONLY INPUT DIFFERENCE BETWEEN THE "CURRENT" AND "FUTURE" MODEL.

Model Design and Workbook Layout:

The two model sheets are totally independent and are designed to automatically calculate water shortage allocations for any SCWA available supply bounded by a low value equal to the sum of water required for HC, S & FP and an upper value equal to the sum of Reasonable Requirements or sum of annual entitlement limits, whichever is less. Cells in both models are linked to the various supporting data sheets.

To operate a model, simply input the assumed available supply in Cell H:4 of the model you are working with. The results – the sum of the "First" (Tier 1) plus "Second" (Tier 2) allocation appear to the far right (Column 42 of the Current Model and Column 39 of the Future Model).

The Current Model sheet is followed by a sheet entitled "Current Recap" that shows the resulting allocations (both in tabular and graph form) for each Customer for various assumed levels of available supply. This recap and the graphs are automatically populated by running the Macro entitled "CurRecap".

Likewise, following the Future Model sheet is a sheet entitled “Future Recap” which shows the tabular and graph results for the Future Model. This recap and the graphs are automatically populated by running the Macro entitled “FutRecap”.

Caution Concerning Data Collection and Maintenance:

With the allocation methodology introduced in the Agreement, it is essential that the SCWA develop and maintain a data base containing information collected from all of its Customers based on application of uniform standards, and containing data on water service area population, portion of population served by private wells (none of the models correct for private well water use by service area population), winter level water consumption, annual consumption, local supplies, unaccounted for water, conservation, recycled water use, etc. Good regional data on evapotranspiration differences may also be needed to modify the Reasonable Requirement demand hardening adjustment factor. A fair and uniform way to determine the safe yield of local supply capacity is especially important. It may be useful to categorize local supply into: (1) normally available and used capacity, and (2) strictly standby capacity that is more expensive to use than aqueduct water or has some non-threatening quality issues, i.e. taste and odor that make it undesirable to use under normal water supply conditions.

John Olaf Nelson Water Resources Management (JONWRM)
1833 Castle Dr, Petaluma, CA 94954
Ph: (707) 778-8620 Email: jonolaf@comcast.net

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Contents of this EXCEL Workbook
Water Shortage Allocation Model w. Demand Hardening Factor (a)
April 4, 2006 Version

Models (Current and Future)

Input Data for Models

* Same data used in both Current and Future Model.

** Based on aqueduct sales and Russian River diversions in recent non-drought years. In the Future Model, reasonable requirements are set equal to annual entitlement limits (caps) or contract delivery limits as applicable in order to estimate allocations at that time in the future when demand has grown to equal the annual entitlement limits.

For questions, contact:

John Olaf Nelson Water Resources Mgt
Ph: (707) 778-8620
Email: jonolaf@comcast.net

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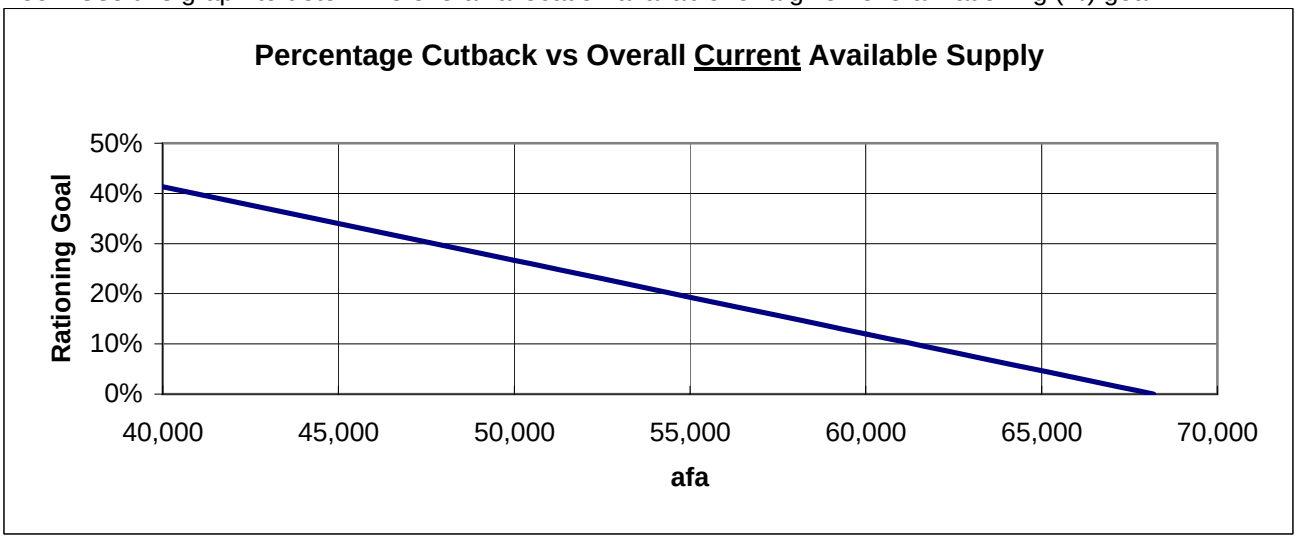
Results for Current Allocation Model vs. Assumed Available Supply

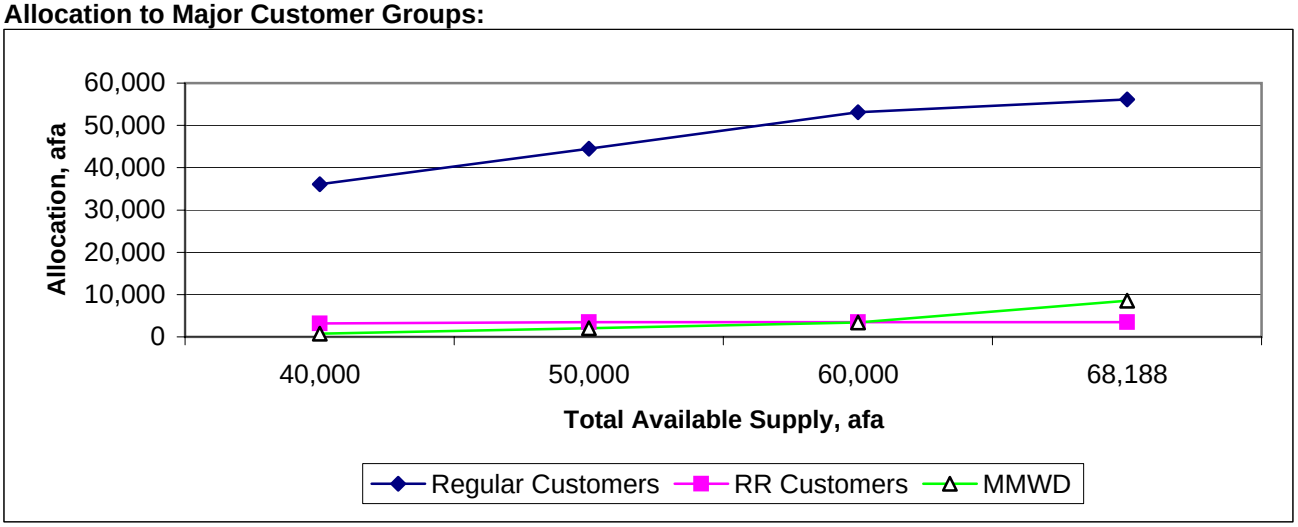
Available RR SCWA Supply, afa >	**40,000**	**50,000**	**60,000**	**68,188** *
Equivalent Cutback in Deliveries >	**41.3%**	**26.7%**	**12.0%**	**0.0%**
Regular Customers				
Cotati	694	928	1,095	1,095
Petaluma	6,155	7,501	8,952	9,735
Rohnert Park	2,924	3,850	4,849	5,246
Sonoma	1,261	1,650	2,069	2,200
Windsor	317	409	410	410
NMWD	4,775	6,004	7,328	8,459
Santa Rosa	16,856	20,351	24,118	24,737
VOM	2,157	2,682	3,086	3,086
Other Agency	949	1,116	1,207	1,207
Sub-Total	36,088	44,491	53,114	56,173
MMWD	737	2,014	3,391	8,520
Russian River Cust's	3,175	3,495	3,495	3,495
Total	**40,000**	**50,000**	**60,000**	**68,188**

* Note: Max. Value is capped at 68,188 afa as this satisfies sum of Reasonable Requirements.

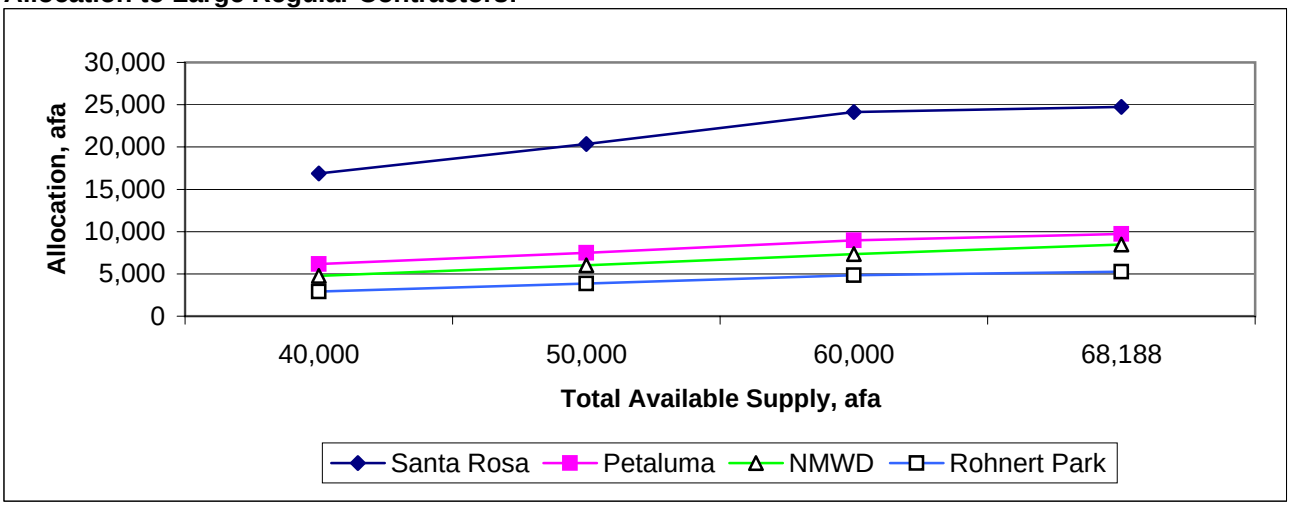
Tool: Use this graph to determine overall allocation available for a given overall rationing (%) goal.



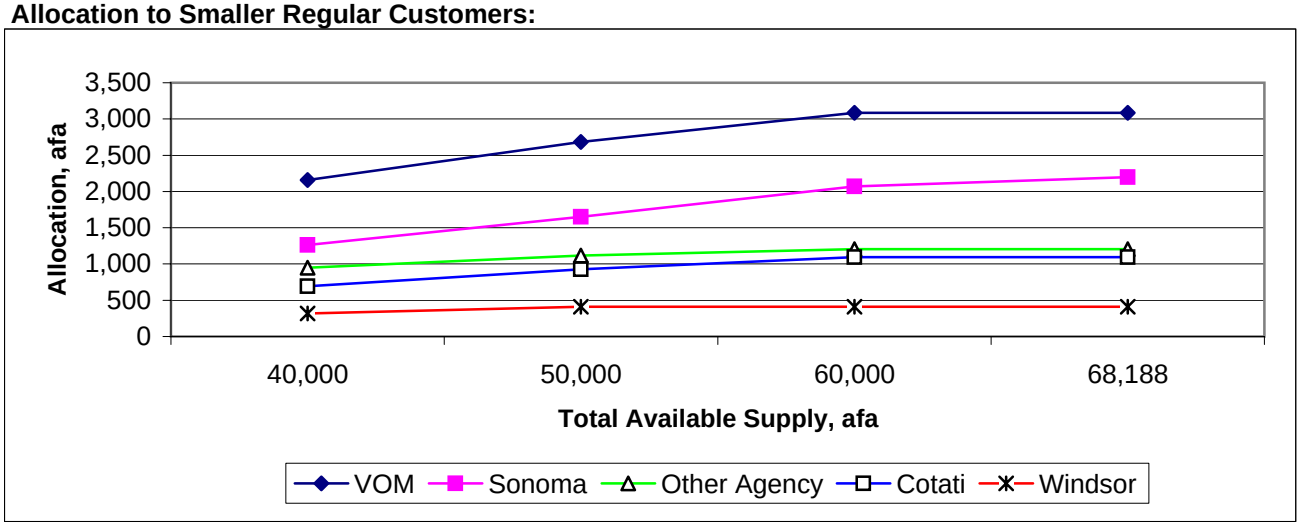
Allocation to Major Customer Groups:



Allocation to Large Regular Contractors:

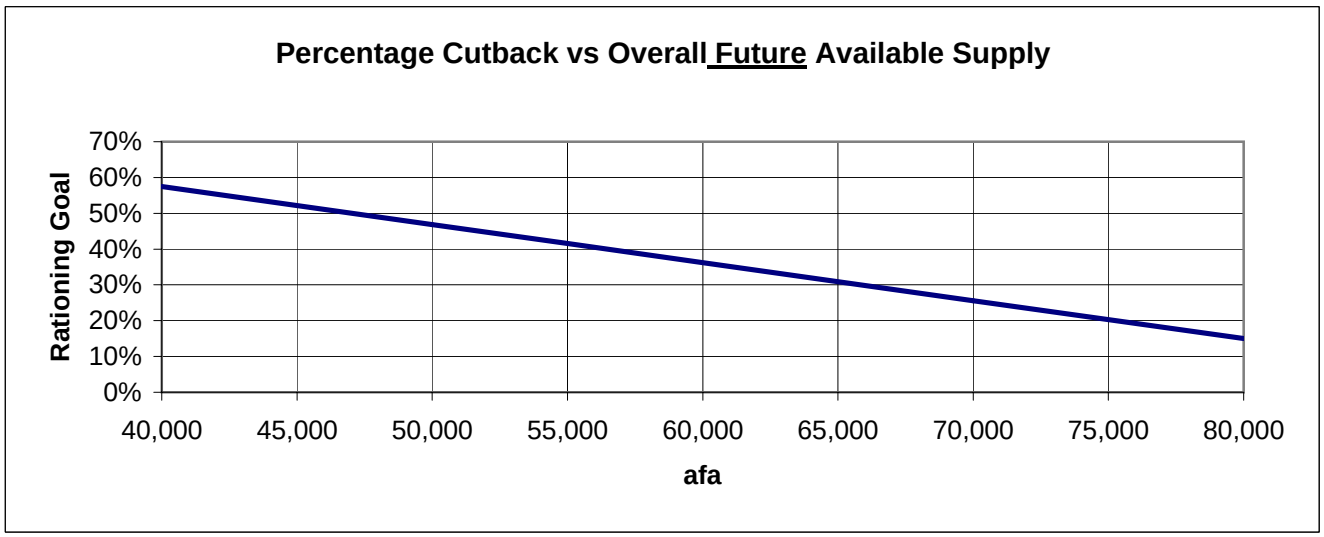


Allocation to Smaller Regular Customers:

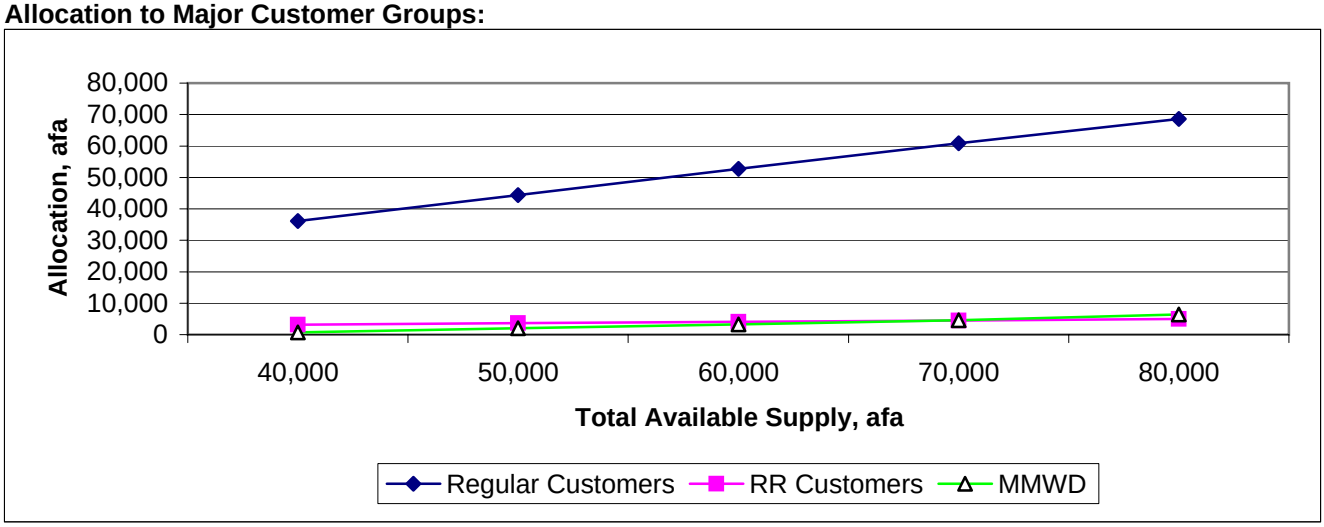


Results for Future Allocation Model vs. Assumed Available Supply

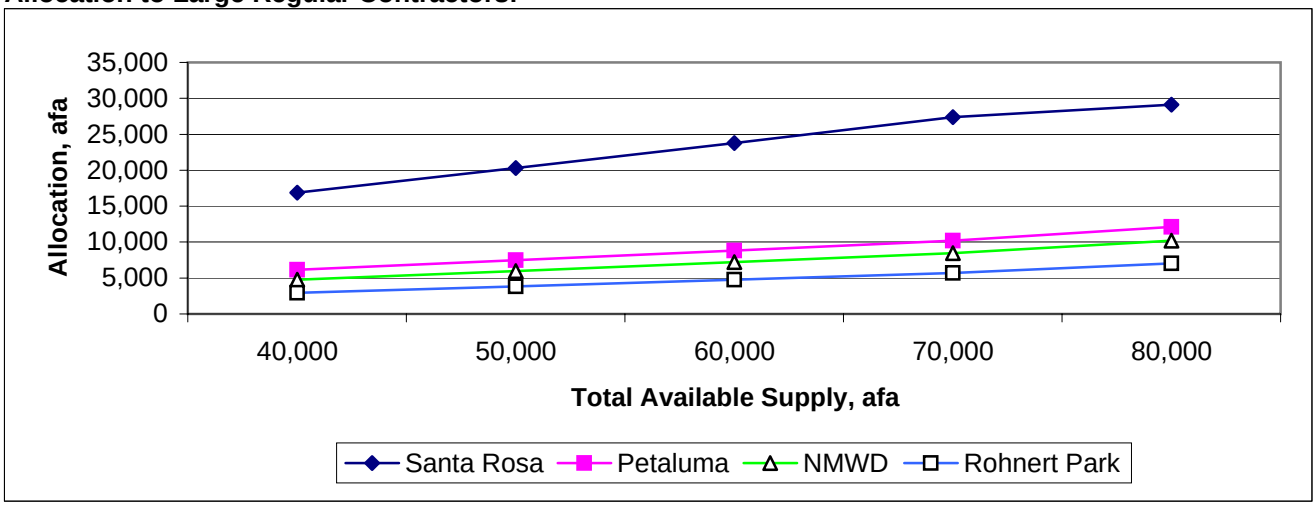
Available RR SCWA Supply, afa >	**40,000**	**50,000**	**60,000**	**70,000**	**80,000**
Equivalent Cutback in Deliveries >	**57.5%**	**46.9%**	**36.2%**	**25.6%**	**15.0%**
Regular Customers					
Cotati	694	925	1,157	1,401	1,520
Petaluma	6,155	7,484	8,813	10,214	12,118
Rohnert Park	2,924	3,838	4,753	5,716	7,027
Sonoma	1,261	1,645	2,029	2,433	2,984
Windsor	317	408	500	596	727
NMWD	4,775	5,988	7,201	8,480	10,218
Santa Rosa	16,856	20,306	23,756	27,393	29,100
VOM	2,157	2,675	3,193	3,200	3,200
Other Agency	949	1,113	1,278	1,451	1,687
Sub-Total	36,088	44,384	52,680	60,884	68,581
MMWD	737	1,998	3,259	4,587	6,394
Russian River Cust's	3,175	3,618	4,061	4,528	5,025
Total	**40,000**	**50,000**	**60,000**	**70,000**	**80,000**



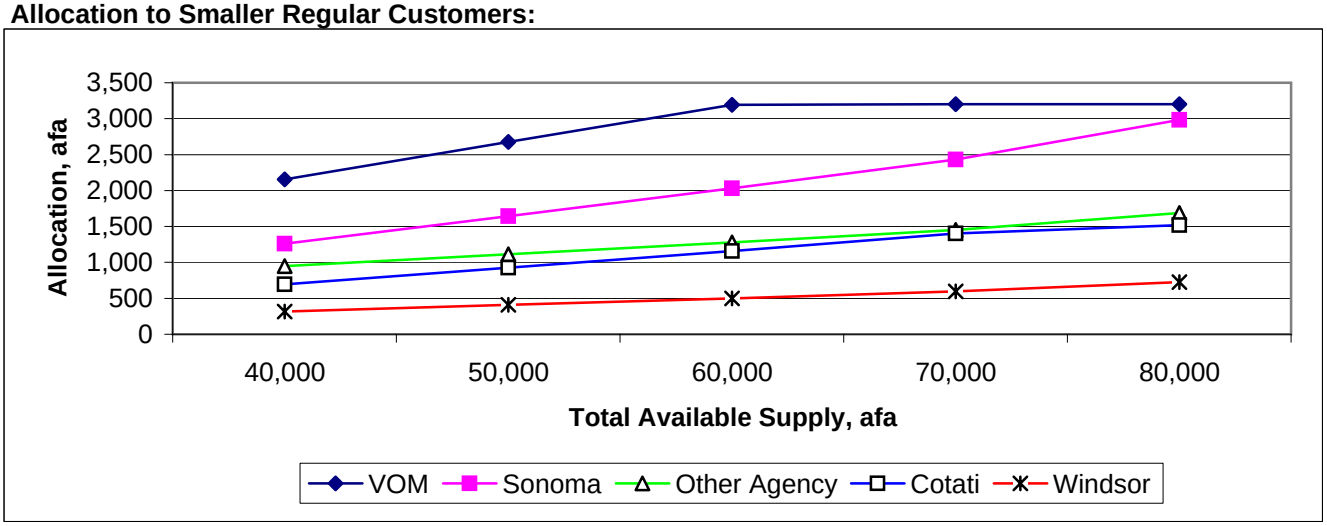
Allocation to Major Customer Groups:



Allocation to Large Regular Contractors:



Allocation to Smaller Regular Customers:



Entitlements of SCWA Customers

SCWA Customer:	Source	Entitlement mgd (any month)	Annual Limit afa
Regular Customers			
Cotati	a	3.8	1,520
Petaluma	a	21.8	13,400
Rohnert Park	a	15	7,500
Sonoma	a	6.3	3,000
Windsor (Airport Service Area)	b	1.5	900
North Marin WD	a	19.9	14,100
Santa Rosa	a	56.6	29,100
Valley of the Moon WD	a	8.5	3,200
Other Agency Cust (Includes FWD)	c	2.7	2,048
Sub-Total		136.1	74,768
Marin Muni. WD	d	0	14,300
Russian River Customers	e	0	5,025
Total		136.1	94,093

Notes:

a Eleventh Amended WS Agree. (Proposed Restructured WS Agree is same)

b Proposed Restructured WS Agree. Applies only to Airport Service Area served from SCWA Aqueduct. Windsor's direct diversions from the RR are covered by an Agreement with the SCWA and potentially via its pending application to the State for Water Rights

c "mgd any month" limit is per Eleventh Amended WS Agree. (Proposed Restructured WS Agree is same). Annual limit is estimated based on avg. annual Other Agency Customer demand (as defined in Restructured Agree) for FY's 2003 and 2004 (1,356 af) projected through 2020 assuming a 2% per year increase for anticipated growth plus a 10% contingency.

d Second Amended WS Agree and Agree for Sale of Water as Amended by The Supplemental WS Agree dated Jan 25, 1996. Note: Annual deliveries are subject to certain prior year minimum purchase provisions. Deliveries are subordinate to Regular Customer Entitlements.

e Various Agreements between SCWA and each of its RR Customers (refer "RR Cust" sheet)

Russian River Customers of SCWA

Entitlements of RR Customers

Source: Chris Murray, SCWA, 3/3/05

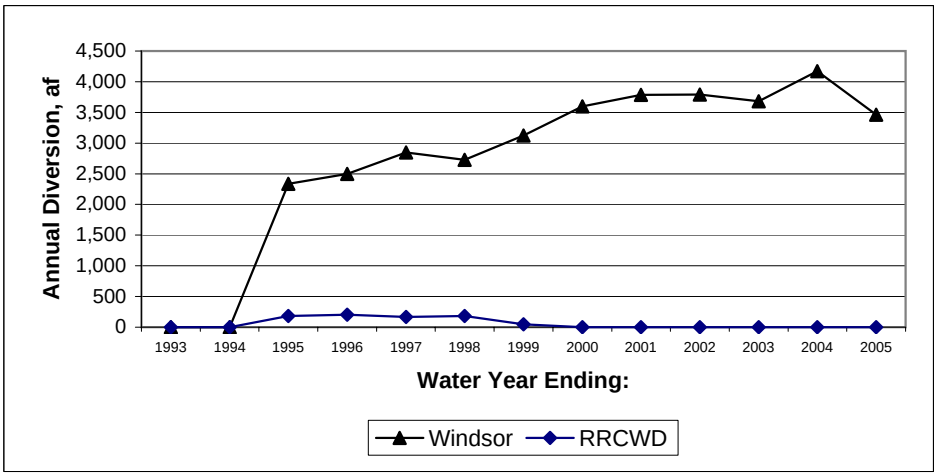
Contractor	Date	Max Diversion Limit, afa	Comments
Currently Approved Points of Diversion *:			
Town of Windsor **	1/8/1991	4,725	Windsor has application pending for its own water rights
Russian River Co. WD	3/14/1991	300	
Sub-total		5,025	
No Points of Diversion Approved*			
City of Healdsburg	11/17/1992	4,440	Healdsburg holds own water rights for other points of diversion
Camp Meeker Parks & Rec. Dist.	7/9/1996	90	
Occidental CSD	4/23/2002	65	
Redwood Valley Co. WD	Pending	?	Agreement pending
Sub-total		4,595	
Potential Total		9,620	

* As pertains to SCWA's water rights.
** Direct diversions via wells situated near the Russian River.

Historic Diversions from the RR, af

Source: Chris Murray, SCWA, 2/15/06 (SCWANTS.xls)

W Yr	RRCWD	Windsor	Total
1993	0	0	0
1994	0	0	0
1995	182	2,337	2,519
1996	203	2,496	2,699
1997	166	2,848	3,013
1998	183	2,728	2,911
1999	47	3,124	3,171
2000	0	3,596	3,596
2001	0	3,786	3,786
2002	0	3,789	3,789
2003	0	3,684	3,684
2004	0	4,173	4,173
2005	0	3,465	3,465
Avg of W Yr's 2004 & 05			3,819
Avg of last 3 W Yrs			3,882



Note: Water Yr extends from Oct 1 through Sept 30 of subsequent yr.

Water Needed for Human Consumption, Sanitation and Fire Protection (a)

	TM Data (b)	6/15/05 Model	2005 UWMP (c)	4/4/06 Model
SCWA Customer:				
Regular Customers				
Cotati	0.62	0.62		0.64 f
Petaluma	5.83	5.83	6.15	6.15
Rohnert Park	4.23	4.23	3.74	3.74
Sonoma	1.45	1.45	0.92	0.92
Windsor (Airport Service Area)		0.13 d		0.24 g
North Marin WD	5.80	5.80	6.04	6.04
Santa Rosa	13.74	13.74	13.48	13.48
Valley of the Moon WD	2.01	2.01	2.14	2.14
Other Agency Cust (Includes FWD)		0.45 d		0.48 g
Sub-Total				
Marin Muni. WD		17.1 e		18.4 h
Russian River Customers		unknown		unknown
Total				

Notes:

a Water needed for HC, S & FP is assumed to be equal to "inside" use for all retail customers. Inside use in turn is estimated by examining retail sales in the Winter months (generally Jan. and

b Estimate by West/Yost contained in Allocation Table prepared for City of Santa Rosa (Sept 23 Tech Memo).

c Total demand including UFW as determined by Maddaus for base year (Cal. 2004) of the 2005 UWMP. Indoor use is based on average of 2 lowest consecutive months in the winter if meters read bimonthly, or single lowest month if meters read monthly. Winter level use for Cotati supplied by Toni Bertolero (see Note f).

d

Avg Jan and Feb Aqueduct Sales* as	Windsor	Other Ag Cust
Avg af/mo (2000->03, SCWA, Kiergan Pegg	11.5	40.6
Avg mgd	0.13	0.45

* In the case of Windsor (ASA only) and Other Agency Customers, winter level demand is unknown and is therefore estimated from Aqueduct sales, it being assumed that all Winter demand is met from the Aqueduct.

e MMWD customer Avg per capita use in Jan and Feb for (2000 - 03), mgd, Dana Roxon,

f Avg. Jan and Feb Aq plus Local use FY 2003 -> FY 2005, Tony Bertolero via Matthew Damos

g Avg. Jan and Feb Aq Sales w. Billing Days for FY 2003 -> FY 2005 from Kiergan Pegg,

h From MMWD Water Watch Reports, avg demand for period noted, mgd

Week Ending:	For period noted to left	For same week one yr earlier
2/26/2006	17.6	17.6
2/19/2006	18.4	18.3
2/12/2006	18.8	19.1
2/5/2006	18.2	18.6
1/29/2006	18.4	18.5
1/22/2006	18.5	18.7
1/15/2006	17.9	18.6
1/8/2006	18.5	18.8
1/1/2006	18.1	18.5
Avg Winter	18.3	18.5
Avg for both yrs	18.4	

Reasonable Annual Need, afa (a)
(Avg. Aq. Sales or RR Diversions for FY's Indicated)

	6/15/05 Model	4/4/06 Model
		Avg for FY 03-04 and
Regular Customers	FY 03-04	FY 04-05
Cotati	1,071	1,045
Petaluma	11,294	10,636
Rohnert Park	4,710	4,835
Sonoma	2,611	2,403
Windsor (Airport Service Area)	474	448
North Marin WD	9,498	9,242
Santa Rosa	24,421	23,584
Valley of the Moon WD	3,157	3,036
Other Agency Cust (Includes FWD) (b)	1,326	1,318
Sub-Total	58,561	56,547
Marin Muni. WD	7,792	7,823
Russian River Customers (c)	3,928	3,819
Total	70,281	68,188

Notes:

a SCWA Aqueduct Sales Records, Kiergan Pegg, SCWA. Note that Surplus sales are not included.

b SCWA Aq. Sales Records. Excludes Windsor and includes FWD as proposed in Restructured WS Agree.

c Average of Water Yr Diversions for 2003 and 2004 was used for 6/15/05 Model and avg. of 2004 and 2005 was used for 4/4/06 Model. (see RR Cust sheet).

Local Potable Water Supply Available to SCWA Customers, afa

	Local Supply (a)	Contingency Factor (b)	Est'd Safe Yield (c)
Regular Customers			
Cotati	240	10%	216
Petaluma	831	10%	748
Rohnert Park	2308	10%	2,077
Sonoma	80	10%	72
Windsor (Airport Service Area)	0	10%	0
North Marin WD	2000	10%	1,800
Santa Rosa	1700	10%	1,530
Valley of the Moon WD	595	10%	536
Other Agency Cust (Includes FWD) (d)	0		0
Sub-Total	7754		6,979
Marin Muni. WD Local Sys. Safe Yield (e)			20,500
Russian River Customers (d)	0		0
Total			27,479

Notes:

a Based on 4-yr avg: 2000-2003 as reported in Sept 33, 2004 Tech. Memo to Santa Rosa

b To account for well equipment problems/maintenance down-time, etc. Estimated by JONWRM

c It is recognized that the quality of Local Supply varies. Presented here is the yield (safe yield) that is expected to be available in the first year of a water supply deficiency based on Local Water Supply capacities..

d Unknown and therefore assumed to be "0" for the purposes of this model. Needs to be determined by SCWA.

e Safe Yield of Local Supply System provided by MMWD. Source: Dana Roxon, 5/31/05.

Most Recent Service Area Population

SCWA Customer:	TM Data for Yr 2003		6/15/05 Model		2005 UWMP	4/4/06 Model	
Regular Customers							
Cotati	6,825		6,825			7,337	e
Petaluma	57,050		57,050		58,057	58,057	
Rohnert Park	42,300		42,300		42,329	42,329	
Sonoma	10,252		10,252		10,502	10,502	
Windsor (Airport Service Area)			1,338	d		2,495	f
North Marin WD	56,000		56,000		55,587	55,587	
Santa Rosa	153,400		153,400		155,121	155,121	
Valley of the Moon WD	23,000		23,000		22,646	22,646	
Other Agency Cust (Includes FWD)	8,000	a	8,000			8,080	g
Sub-Total			358,165			362,154	
Marin Muni. WD	184,999	b	184,999			189,945	h
Russian River Customers	27360	c	27,360			27,634	g
Total			570,524			579,733	

Notes:

a Estimate by West/Yost contained in Allocation Table prepared for City of Santa Rosa (Sept 23 Tech Memo).

b Estimate provided by MMWD to West/Yost and contained in Allocation Table prepared for City of Santa Rosa (Sept 23 Tech Memo).

c Estimate by West/Yost contained in Allocation Table prepared for City of Santa Rosa (Sept 23 Tech Memo). Includes 24,350 I(2003 Department of Finance estimate for the Town of Windsor) and an estimate of 3,000 for the RRCWD service area.

d Windsor Airport Service Area is primarily Commercial and Institutional use. An equivalent population is estimated by dividing avg Winter use by 95 gpcd, the wt'd avg. per capita use determined by West/Yost.

e Cotati pop. per Dept of Finance data as of 1/1/2005, Cristina Goulart, Winzler & Kelly

f Windsor Airport Service Area is primarily Commercial and Institutional use. An equivalent population is estimated by dividing avg Winter use by 94 gpcd, the wt'd avg. per capita use determined in the 2005 UWMP.

g Population estimated for 6/15/05 Model increased by an assumed growth rate of 1%.

h MMWD 2004 Pop., provided by Dana Roxon, MMWD, Mar. 2006.

Other Data:

From 2005 UWMP, population for 2004:

FWD population	2,201
Windsor RR Service Area	24,899

Winter Level Per Capita Demand, gpcd

	TM Data (a)	6/15/05 Model	2005 UWMP (b)	4/4/06 Model	
Regular Customers					
Cotati	89	89		88	c
Petaluma	101	101	106	106	
Rohnert Park	96	96	88	88	
Sonoma	136	136	88	88	
Windsor (Airport Service Area)		95		94	
North Marin Water Dist.	99	99	109	109	
Santa Rosa	87	87	87	87	
Valley of the Moon Water Dist.	87	87	94	94	
Other Agency Cust (Includes FWD)		unknown		94	
Sub-Total					
Marin Muni. Water Dist.		92		97	c
Russian River Customers					
Wt'd Avg	95			94	d

Notes:

a Source: TM Data sheet by West Yost and Assoc. Winter level use is based on avg. use in Jan, and Feb. of 2000 through and including 2003.

b Source: Bill Maddaus Tech. Memos - Includes Unaccounted For Water (UFW). Inside use is calculated from calendar 2004 retail sales records and is based on average of 2 lowest consecutive months in the winter if meters are read bimonthly, or single lowest month if meters read monthly.

c Calc'd from Winter level demand (See Human sheet) and est'd pop. (See Pop Sheet)

d Data for 11th Amend. Agree. Primes:

	gpcd	pop
Cotati	88	7,337
Petaluma	106	58,057
Rohnert Park	88	42,329
Sonoma	88	10,502
NMWD	109	55,587
Santa Rosa	87	155,121
VOM	94	22,646
FWD	99	2,201
Wt'd Avg. (using pop. as weighting factor)	94	

Other Data:

From 2005 UWMP, Winter Level Use, gpcd:

FWD	99

Demand Hardening Factor - Used for Adjusting Reasonable Need in Current Allocation

	Total Demand mgd 1		Total gpcd 2		Use in 3/27/06 Model 3		Lesser of Col. 3 or Average 4	Demand Hardening Adj Factor (Avg / Col. 4) 5
Regular Customers								
Cotati	1.07	b	146	d	146		146	1.14
Petaluma	10.19	c	176	d	176		167	1.00
Rohnert Park	5.95	c	141	d	141		141	1.19
Sonoma	2.25	c	214	d	214		167	1.00
Windsor (Airport Service Area)			172	e	172		167	1.00
North Marin Water Dist.	10.58	c	190	d	190		167	1.00
Santa Rosa	22.57	c	146	d	146		146	1.15
Valley of the Moon Water Dist.	3.40	c	150	d	150		150	1.11
Other Agency Cust (Includes FWD)					167	f	167	1.00
Sub-Total								
Marin Muni. Water Dist.					140	g	140	1.19
Russian River Customers					167	f	167	1.00
Average for Water Contractors (h)			167					

Notes:

a Sec 3.5(c)(2) provides that in determining "reasonable requirements" the SCWA may take into account hardening of demand resulting from the level of conservation achieved by a given customer of the SCWA.

b From Toni Bertolero. Avg of RR Purchases and Ground Water Production for FY 2003->05, mgd

c Total demand including UFW as determined by Maddaus for base year (2004) 2005 UWMP.

d Col 1 divided by population. See Pop sheet.

e There are no residents in Windsor ASA therefore per capita demand set equal to Windsor RR Service Area average value as determined for base year (2004) of 2005 UWMP.

f No data available so assumed equal to average value for Water Contractors.

g From MMWD 2005 Fact Sheet - avg demand for 10 yrs ending 2005, m 26.6 divided by population (See Pop sheet).

Other Data from 2005 UWMP for Base Yr 2004:

	mgd	gpcd
Forestville Water Dist.	0.48	219
Windsor RR Service Area	4.29	172

SUPPORT TABLES
For Tech Memo

Table A-1. Average Monthly Retail Sales (acre-feet) for SCWA Water Contractors in January & February[a]

Contractor	2000	2001	2002	2003	4-Year Average[b]
Santa Rosa	1,263	1,316	1,265	1,154	1,249
Petaluma	553	538	515	514	530
North Marin	563	554	525	468	528
City of Rohnert Park	406	406	356	373	385
Cotati	45	73	58	50	57
Forestville [c]	22	23	24	21	22
City of Sonoma	136	135	133	122	131
Valley of the Moon	182	189	187	174	183

Table A-2. Historical Population[d]

Contractor	2000	2001	2002	2003
Santa Rosa	147,595	149,300	151,700	153,400
Petaluma	53,710	54,510	55,850	57,050
North Marin	55,000	56,000	56,000	56,000
Rohnert Park	42,236	42,200	42,150	42,300
Cotati	6,471	6,600	6,861	6,825
Forestville [e]	1,973	Not Available	Not Available	Not Available
Sonoma	10,091	10,131	10,172	10,252
Valley of the Moon	20,512	21,996	22,923	23,000

Table A-3. Per Capita Demand (gpcd) for SCWA Water Prime Contractor in Winter (January & February) [a,f]

Contractor	2000	2001	2002	2003	4-Year Average [b]
Santa Rosa	90	93	88	79	87
Petaluma	108	104	97	95	101
North Marin	108	104	99	88	99
Rohnert Park	101	101	89	93	96
Cotati [g]	72	116	89	78	89
Forestville	115	123	126	113	119
Sonoma	142	140	138	125	136
Valley of the Moon	93	90	86	80	87
Simple Average [h]	104	109	101	94	102
Weighted Average [i]	99	100	93	87	95

[a] Data obtained from water sales data from the Prime Contractor

[b] Simple average of the last 4 years. Using Santa Rosa in Table A-1: (1,263+...+1,154)/4 = 1,249 acre-feet

[c] Data for Forestville obtained from the SCWA

[d] Data obtained from the Prime Contractor, California Department of Finance Website, or the 2000 UWMP for Sonoma County unless specified otherwise

[e] Population for Forestville obtained from the 2000 SCWA UWMP

[f] Based on populations from Table A-2, if population for particular year was not available, then population for year 2000 was used

[g] For 2001 & 2002, based on Dec/Jan instead of Jan/Feb because Cotati did not provide Feb; 2003 is based on Jan/Feb

[h] Simple average of the eight individual gpcds. Using 2000 of Table A-3: (90+...+93)/8 = 102 gpcd

[i] Weighted average for population. Using 2000 of Table A-3: (90*147,595+…+93*20,512)/(147,595+…+20,512) = 98 gpcd

Current Allocation Model

Allocation of Water During a Period of Deficiency Pursuant to Sec. 3.5 (a) of the Restructured Agreement for Water Supply

Based on CURRENT Level Demands and Water Available from the SCWA of 60,000 afa

This equates to an overall cutback in Russian River water supply of: 12.0%

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	23	41	42	43
		Entitlement Limits		Minimum Needs		Reasonable Requirement					Local Supply		HC, S & FP Per Capita Demand				First Allocation & Test		Second Allocation		Results	
SCWA Customers	Assumed Available Supply afa	Entitlement (Maximum Daily Rate of Flow During any Month) mgd	Annual Entitlement Limit (Cap) afa	Water Needed for Human Consumption, Sanitation and Fire Protection **** mgd	afa	Apparent Reasonable Requirement afa	Demand Hardening (DH) Adjust. Factor	Adjust'd Reason. Req't	Final Reason. Req't	Lesser of Reason. Req't vs Annual Cap afa	Safe Yield of Local Supply afa	Pop. persons	Avg. Winter Level Per Capita Demand gpcd	Weighted Avg Per Capita Demand of Water Contractors gpcd	Portion of Per Capita Demand that can be served by Local Supply gpcd	Per Capita Demand that is not met by Local Supply ("First" Allocation Parameter) gpcd	"First" Allocation (Water req'd for HC, S & FP) afa	TEST Less Than Annual Entitlement Limit?	Normalized Entitlements ("Second" Allocation Parameter) %	"Second" Allocation afa	"First" plus "Second" Allocations afa	TEST Less Than Reasonable Req't ?
Regular Customers																						
Cotati*		3.8	1,520	0.64	720	1,045	1.14	1,196	1,095	1,095	216	7,337	88	94	26	68	558	Yes	2%	536	1,095	Yes
Petaluma*		21.8	13,400	6.15	6,893	10,636	1.00	10,636	9,735	9,735	748	58,057	106	94	11	83	5,379	Yes	13%	3,574	8,952	Yes
Rohnert Park*		15	7,500	3.74	4,186	4,835	1.19	5,731	5,246	5,246	2,077	42,329	88	94	44	50	2,390	Yes	9%	2,459	4,849	Yes
Sonoma*		6.3	3,000	0.92	1,029	2,403	1.00	2,403	2,200	2,200	72	10,502	88	94	6	88	1,036	Yes	4%	1,033	2,069	Yes
Windsor (Airport Service Area) (ASA)*		1.5	900	0.24	263	448	1.00	448	410	410	0	2,495	94	94	-	94	263	Yes	1%	146	410	Yes
North Marin Water Dist. (NMWD)*		19.9	14,100	6.04	6,767	9,242	1.00	9,242	8,459	8,459	1,800	55,587	109	94	29	65	4,066	Yes	12%	3,262	7,328	Yes
Santa Rosa*		56.6	29,100	13.48	15,094	23,584	1.15	27,027	24,737	24,737	1,530	155,121	87	94	9	85	14,840	Yes	35%	9,279	24,118	Yes
Valley of the Moon Water Dist.*		8.5	3,200	2.14	2,397	3,036	1.11	3,372	3,086	3,086	536	22,646	94	94	21	73	1,854	Yes	5%	1,232	3,086	Yes
Other Agency Cust (Includes FWD)		2.7	2,048	0.48	534	1,318	1.00	1,318	1,207	1,207	-	8,080	94	94	-	94	853	Yes	2%	354	1,207	Yes
Sub-Total		136.1	74,768	33.82	37,884	56,547		61,374	56,173	56,173	6,979	362,154					31,239				53,114	
Marin Muni. Water Dist.		0	14,300	18.39	20,605	7,823	1.19	9,309	8,520	8,520	20,500	189,945	97	94	96	0	0	Yes	13%	3,391	3,391	Yes
Russian River Customers***		0	5,025	unknown	2,916	3,819	1.00	3,819	3,495	3,495	-	27,634	unknown	94	-	94	2,916	Yes	4%	579	3,495	Yes
Total		136.1	94,093		61,404	68,188		74,501	68,188	68,188	27,479	579,733					34,155		100%	25,845	60,000	
Reasonable Need Remaining Unmet																	25,845					
Water Available for Allocation	60,000																					

Definitions:

* Defined in Restructured Water Supply Agreement as "Water Contractors"

** FWD = Forestville Water Dist.

*** SCWA Russian River Contractors whose direct diversions and points of diversion have been approved and come under the auspices of the SCWA's Water Rights (Town of Windsor and Russian River County Water Dist.)

**** HC, S & FP = Human Consumption, Sanitation and Fire Protection

TM Data = information set forth in Tech Memo prepared by West, Yost & Associates (West/Yost) dated Sept 23, 2004, "Methodology for Implementation of Water Shortage Provisions in Eleventh Amended Agreement for Water Supply"

UWMP = Urban Water Management Plan

UFW = unaccounted for water (ie water due to losses, leakage, theft and unmetered deliveries, meter inaccuracies, fire hydrant flows, pipeline flushing, etc.)

af = ac-ft mgd = millions of gallons per day

afa = ac-ft per annum (year) gpcd = gallons per capita per day

Column Explanations:

1 All Customers of the SCWA except customers served Surplus Water. Surplus Water users are not allowed an allocation during periods of water deficiency.

2 Water supply assumed to be available to SCWA for delivery to or diversion by its Customers. In the event of a real drought, this value is predicted by SCWA using its Russian River models and including estimated yield from the SCWA's wells and deducting losses from the Aqueduct

3 & 4 Entitlement limits pursuant to Restructured Agreement. Note that agreement does not specify an Annual Entitlement Limit (cap) for Other Agency Customers so this have been estimated by escalating the avg of FY 2003 and FY 2004 demand by 2% per year growth and then adding a 10% contingency. MMWD "annual entitlements" are set forth in agreements between SCWA and MMWD. Russian River Customers entitlements are based on agreements the SCWA has with these respective customers taking into account points of diversion authorized to be covered under SCWA's water rights. See Entitlement sheet and RR Cust sheet for details.

5 Water for HC, S & FP is assumed to be fairly represented by "inside demand" for all metered uses and including an adjustment factor for UFW. Inside demand is in turn estimated by examining winter level demand, a requirement of the Restructured Agreement. Values used in this model are from the base year (cal. yr 2004) compiled for the 2005 UWMP. See "Human" sheet for details.

6 Prior column extended over the entire year and converted to afa.

7 Reasonable Requirement is assumed to be equal to annual deliveries made to Customers in a recent non-drought year. For the purposes of this analysis, The avg. for FY 2003-04 and 2004-05 deliveries were used. In future analyses, an average of the immediate past 3 years is recommended. In the case of this analysis, going back further in time was not done due to significant changes in aqueduct demand by the City of Rohnert Park.

8	Sec 3.5(c)(2) provides that in determining "reasonable requirements" the SCWA may take into account hardening of demand resulting from the level of conservation achieved by a given customer of the SCWA. This column contains a Demand Hardening adjustment factor derived from annual per capita demand taking into account all uses and including UFW. Information compiled for the base year (2004) for the 2005 UWMP was used. See DH Factor sheet for details.
9	Col 8 x Col 7.
10	Col 10 "normalizes" Col 9 such that sum of all adjusted reasonable requirements is equal to original sum of Reasonable Requirements. Col 9 x (sum of Col 7 / sum of Col 9). This column is then used to define the "Reasonable Requirement" that is referred to in Sec. 3.5(a)(3)(iii) of the Restructured Agreement.
11	Lesser value comparing Reasonable Requirement to Annual Entitlement Limit as stipulated in Section 3.5 (2) (3) (iii). This is the value used for testing to see that the total of the "First" and "Second" allocation of water to a given customer is reasonable.
12	Local supplies are based on an estimate by JONWRM of "safe yield" of same. For Water Contractors, the data reported to West/Yost is the basis for the estimate. See Local sheet for details. The "safe yield" used for MMWD was provided by MMWD. It is noted that data is missing fc Other Agency Customers and Russian River Customers. It is important that SCWA develop an on-going data collection system to at all times know potential local supply yield in order to achieve accuracy necessary for the allocation calculatio
13	Detailed population estimates from Census tract data compiled by Maddaus for the base year (cal. 2004) used in the 2005 UWMP. See Pop sheet for details and explanation of exceptions.
14	Winter level per capita demand determined by Maddaus for the base year (cal. 2004) used in the 2005 UWMP. See GPCD sheet for detailed explanation.
15	Weighted avg. of per capita winter level demand for existing Prime contractors. See GPCD sheet.
16	Safe yield of Local Supply expressed as a per capita value using population data shown i.e. Col 12 * 7.48 * 43,560 / (365 * Col 13).
17	HC, S & FP demand not met by Local Supplies and calculated as follows: If Wt'd average per capita demand (Col 15) is greater than the portion of per capita demand met by Local Supply (Col 16), the difference of the two is entered in this column, if not, "0" is entered.
18	"First" allocation calculated as follows: If Local Supply safe yield (Col 12) is greater than Winter level demand extrapolated for the full year (Col 6), then "0" is allotted, if not the portion of per capita demand not met by Local Supply (Col 17) is calculated for the year for the entire population, expressed in afa and entered here. In the case of consecutive drought years, it is important that Col 12 values (safe yield of local supplies) be updated in order for this calculation to be accurate. This is especially true for contractors relying on surface water supplies such as NMWD and MMWD whose surface supplies drop sharply when faced with consecutive drought years.
19	Test to see that "First" allocation does not exceed respective Entitlement Limits as required by Section 3.5 (a)(3)(i).
20-22	These three columns combine the entitlements of the Regular Customers (which pursuant to Sec. 3.5(a)(3)(ii) must be derived from the avg. daily rate during any month - mgd values contained in Sec. 3.1) and the contractual entitlements of MMWD and RR Customers which are expressed in ac-ft per year values contained in their contracts. These relative entitlements are first converted to %'s, then added together.
24	This column "normalizes" the combined entitlement shares such that the sum of all entitlement shares adds to 100%. The resulting %'s are then used to distribute the "Second" allocation of water called for by Sec. 3.5(a)(3)(ii).
25-40	These cells contain the iterative trials necessary to arrive at the "Second" allocation of water. The process is iterative as the Test of whether the "Second" allocation is valid or not is set forth In Section 3.5 (b) (3) (iii) and requires that (in addition to not exceeding the Entitlement Limit) th sum of the "First" allocation (Col 18) and the "Second" allocation not exceed the "Reasonable Requirement" (Col 10)

Future Allocation Model

Allocation of Water During a Period of Deficiency Pursuant to Sec. 3.5 (a) of the Restructured Agreement for Water Supply

Based on FUTURE Level Demands and Water Available from the SCWA of **60,000 afa**

This equates to an overall cutback in Russian River water supply of: **36.2%**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	20	38	39	40	41
		Entitlement Limits		Minimum Needs		Reasonable Requirement		Local Supply		HC, S & FP Per Capita Demand				First Allocation & Test		Second Allocation		Results		
SCWA Customers	Assumed Available Supply afa	Entitlement (Maximum Daily Rate of Flow During any Month) mgd	Annual Entitlement Limit (Cap) afa	Water Needed for Human Consumption, Sanitation and Fire Protection **** mgd	afa	Reasonable Requirement afa	Lesser of Reasonable Requirement vs Annual Cap afa	Safe Yield of Local Supply afa	Pop. persons	Avg. Winter Level Per Capita Demand gpcd	Weighted Avg Per Capita Demand of Water Contractors gpcd	Portion of Per Capita Demand that can be served by Local Supply gpcd	Per Capita Demand that is not met by Local Supply ("First" Allocation Parameter) gpcd	"First" Allocation (Water req'd for HC, S & FP) afa	TEST Less Than Annual Entitlement Limit?	Normalized Entitlements ("Second" Allocation Parameter) %	"Second" Allocation afa	"First" plus "Second" Allocations afa	TEST Less Than Reasonable Req't ?	Amount Falling Short (-) of Reasonable Req't afa
Regular Customers																				
Cotati*		3.8	1,520	0.64	720	1,520	1,520	216	7,337	88	94	26	68	558	Yes	2%	599	1,157	Yes	-363
Petaluma*		21.8	13,400	6.15	6,893	13,400	13,400	748	58,057	106	94	11	83	5,379	Yes	13%	3,434	8,813	Yes	-4,587
Rohnert Park*		15	7,500	3.74	4,186	7,500	7,500	2,077	42,329	88	94	44	50	2,390	Yes	9%	2,363	4,753	Yes	-2,747
Sonoma*		6.3	3,000	0.92	1,029	3,000	3,000	72	10,502	88	94	6	88	1,036	Yes	4%	992	2,029	Yes	-971
Windsor (Airport Service Area) (ASA)*		1.5	900	0.24	263	900	900	0	2,495	94	94	-	94	263	Yes	1%	236	500	Yes	-400
North Marin Water Dist. (MMWD)*		19.9	14,100	6.04	6,767	14,100	14,100	1,800	55,587	109	94	29	65	4,066	Yes	12%	3,135	7,201	Yes	-6,899
Santa Rosa*		56.6	29,100	13.48	15,094	29,100	29,100	1,530	155,121	87	94	9	85	14,840	Yes	35%	8,917	23,756	Yes	-5,344
Valley of the Moon Water Dist.*		8.5	3,200	2.14	2,397	3,200	3,200	536	22,646	94	94	21	73	1,854	Yes	5%	1,339	3,193	Yes	-7
Other Agency Cust (Includes FWD)**		2.7	2,048	0.48	534	2,048	2,048	-	8,080	94	94	-	94	853	Yes	2%	425	1,278	Yes	-770
Sub-Total		136.1	74,768	33.82	37,884	74,768	74,768	6,979	362,154					31,239				52,680		-22,087
Marin Muni. Water Dist.		0	14,300	18.39	20,605	14,300	14,300	20,500	189,945	97	94	96	0	0	Yes	13%	3,259	3,259	Yes	-11,041
Russian River Customers***		0	5,025	unknown	2,916	5,025	5,025	-	27,634	unknown	94	-	94	2,916	Yes	4%	1,145	4,061	Yes	-964
Total		136.1	94,093		61,404	94,093	94,093	27,479	579,733					34,155		100%	25,845	60,000		-34,093
Reasonable Need Remaining Unmet														25,845						
Water Available for Allocation	60,000																			

Definitions:

* Defined in Restructured Water Supply Agreement as "Water Contractors" and often referred to as "Primes"

** FWD = Forestville Water Dist.

*** SCWA Russian River Contractors whose direct diversions and points of diversion have been approved and come under the auspices of the SCWA's Water Rights (Town of Windsor and Russian River County Water Dist.)

**** HC, S & FP = Human Consumption, Sanitation and Fire Protection

TM Data = information set forth in Tech Memo prepared by West, Yost & Associates (West/Yost) dated Sept 23, 2004, "Methodology for Implementation of Water Shortage Provisions in Eleventh Amended Agreement for Water Supply"

UWMP = Urban Water Management Plan

UFW = unaccounted for water (ie water due to losses, leakage, theft and unmetered deliveries, meter inaccuracies, fire hydrant flows, pipeline flushing, etc.)

af = ac-ft mgd = millions of gallons per day

afa = ac-ft per annum (year) gpcd = gallons per capita per day

Column Explanations:

All are same as shown on Current Model sheet except for below:

7 Reasonable Requirement is set equal to the Annual Entitlement limit (cap) in order to estimate the allocation in the future when SCWA Customers reach (or exceed) their Annual Entitlement (or contract) Limits.

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ATTACHMENT 4

Revenue Impacts of the Model Ordinance

Revenue Impact Model - Step by Step Instructions (9/12/00)

Purpose: Determine revenue loss due to rationing and calculated rate surcharge to offset same.

Step	Instructions*
Table 1	
Step 1	Footnote c: Collect monthly production records and enter total production (Aqueduct deliveries and local sources) for base period in Col 1 in units of of millions of gallons.
Step 2	Footnote d: Enter appropriate value for estimated unaccounted for water in the box.
Step 3	Footnote e: Enter uniform commodity rate in box. If utilize a tiered rate, divide total commodity rate revenue by sales (1,000's of gallons) for prior year to calculate weighted average rate and enter this value in box.
Step 4	Footnote g: Enter percentage representing share of total revenue requirement (capital + O&M) that is spent on energy and chemical purchases.
Step 5	Footnote 6: Obtain average single family per capita use value for your service area from Table 4 and enter in footnote box.
Table 2	
Step 7	Read all assumptions and alter as appropriate.
Step 8	Footnote a: Enter balance existing in your Water Shortage Contingency Fund in box on Line 1. If none, enter "0".
Step 9	Footnote b: Follow footnote instructions and enter appropriate rationing requirement for each month in Col 1.
Step 10	Footnote c: From Table 1 obtain corresponding monthly revenue loss values (intersection of month and rationing requirement) and enter in Col 2.
Step 11	As a first approximation of correct Rate Surcharge required to mitigate revenue loss, obtain rate from Table 1 corresponding to the most prevalent Overall Rationing Requirement appearing in Col 1 of Table 2 and enter in the box on Line 20 of Table 2.
Step 12	If the value in the box on Line 19 is negative, increase the Rate Surcharge a cent at a time until a positive value is obtained. Increase the Rate Surcharge even more if a residual Water Shortage Contingency Fund balance is desired.

* In the case of a actual shortage event, the base period and mandatory rationing level for Stage 2 (Stage 3 is the same) need to be determined before using this model.

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Table 1 - Monthly Values of Revenue Loss

Col >	1	2	3	4	5	6	7	8	9	10	11	12	13
Overall Rationing Requirement, % (a) >				15%	25%	30%	35%	40%	45%	50%	55%	60%	65%
	Production in Base Year, mg (b)		Estimated Sales										
Month	Total (c)	Adjusted (d)	Base Year, $ (e)	Estimate of Lost Sales, $ (f)									
Jan	179	166	239,642	35,946	59,910	71,893	83,875	95,857	107,839	119,821	131,803	143,785	155,767
Feb	157	146	210,583	31,587	52,646	63,175	73,704	84,233	94,762	105,291	115,820	126,350	136,879
Mar	179	167	239,911	35,987	59,978	71,973	83,969	95,964	107,960	119,955	131,951	143,947	155,942
Apr	223	208	299,294	44,894	74,823	89,788	104,753	119,718	134,682	149,647	164,612	179,576	194,541
May	372	346	498,746	74,812	124,687	149,624	174,561	199,498	224,436	249,373	274,310	299,248	324,185
Jun	417	388	558,891	83,834	139,723	167,667	195,612	223,556	251,501	279,446	307,390	335,335	363,279
Jul	466	433	623,783	93,567	155,946	187,135	218,324	249,513	280,702	311,892	343,081	374,270	405,459
Aug	442	411	592,007	88,801	148,002	177,602	207,202	236,803	266,403	296,003	325,604	355,204	384,804
Sep	402	374	537,895	80,684	134,474	161,369	188,263	215,158	242,053	268,948	295,842	322,737	349,632
Oct	350	326	469,027	70,354	117,257	140,708	164,159	187,611	211,062	234,513	257,965	281,416	304,867
Nov	198	184	265,016	39,752	66,254	79,505	92,755	106,006	119,257	132,508	145,759	159,009	172,260
Dec	215	200	288,286	43,243	72,071	86,486	100,900	115,314	129,729	144,143	158,557	172,971	187,386
Total	3,601	3,349	$4,823,079	$723,462	$1,205,770	$1,446,924	$1,688,078	$1,929,232	$2,170,386	$2,411,540	$2,652,694	$2,893,848	$3,135,002
Approximate Rate Surcharge required to Offset Revenue Loss (g)				$0.22	$0.41	$0.52	$0.66	$0.82	$1.00	$1.22	$1.50	$1.84	$2.27

Definitions:

mg = million gallons

[ ] = cells for which data unique to water utility must be entered

Notes to Table 1:

a This is "X1" in the Rationing Ordinance, except for 15% value which is applicable during Stage 1.

b For the purposes of this calculation, production records are used to estimate lost sales as they are readily available. The Base Period is the same period selected for the Rationing Ordinance (usually the same period one year earlier).

c Enter total monthly production in the Base Year in this Col 1 (Aqueduct deliveries plus sum of water produced from local sources).

d Enter estimated unaccounted for water percentage) in the box [7.0%] Col. 1 values x (1 - Unaccounted %) yield Col. 2 values (Adjusted Production) which are a fair approximation of water sales in the Base Period.

e If your utility utilizes a uniform commodity rate for all sales, enter it in box as $/1000 gal [$1.44] The model multiplies this value times the values in Col. 2 times 1,000 to obtain Sales Income in Base Period (Col 3 values). If your utility has a tiered rate, divide total revenue from commodity rates by total sales, express in $/1000 gallons and enter in the box.

f In Col 4 through Col 13, the Model automatically calculates lost monthly sales as a function of overall rationing requirement.

g The model reduces the rate surcharge by costs that are avoided. It assumes avoided costs are limited to out of pocket cost of energy + chemicals. The portion of the total annual revenue requirement (capital + O&M + purchases) that is due to the purchase of energy and chemicals is assumed to be: [15%]

Table 2 - Cash Flow Analysis & Mitigation

Line\Column		1	2	3	4	5
1	WSCF Starting Balance (a)					$500,000
		Rationing Level (b)	Revenue Loss (c)	Revenue Surcharge Offset (e)	Contribution from WSCF	WSCF Remaining Balance
2	Jan	0%	0	0	0	500,000
3	Feb	15%	31,587	0	31,587	468,413
4	Mar	40%	95,964	92,966	2,999	465,414
5	Apr	40%	119,718	115,976	3,741	461,673
6	May	40%	199,498	193,264	6,234	455,438
7	Jun	40%	223,556	216,570	6,986	448,452
8	Jul	40%	249,513	241,716	7,797	440,655
9	Aug	40%	236,803	229,403	7,400	433,255
10	Sep	40%	215,158	208,434	6,724	426,531
11	Oct	40%	187,611	181,748	5,863	420,668
12	Nov	40%	106,006	102,694	3,313	417,356
13	Dec	40%	115,314	111,711	3,604	413,752
14	Jan	40%	95,857	92,861	2,996	410,756
15	Feb	40%	84,233	81,601	2,632	408,124
16	Mar	40%	95,964	92,966	2,999	405,125
17	Apr	35%	104,753	0	104,753	300,372
18	May	30%	149,624	0	149,624	150,749
19	Jun	25%	139,723	0	139,723	11,026
21	Rate Surcharge required (d)		$0.93	per 1,000 gallons << Mitigation		

Check:

Sum of Revenue Losses	2,450,883
Sum of Revenue Surcharge Income plus depletions of WSCF	2,450,883

Definitions:

WSCF = Water Shortage Contingency Fund (funds saved and designated for use to mitigate rate impact during water shortages.

Rate Surcharge is the amount the uniform commodity rate needs to be raised to offset revenue losses. In the case of a tiered rate structure, this value represents the weighted average rate.

[ ] = cells for which data unique to water utility must be entered

Assumptions for this Example Water Shortage shown in this table:

1. Shortage is due to lack of rainfall and hence runoff SCWA reservoirs.
2. Shortage is recognized in January. Rationing Ordinance is adopted with Stage 1 effective Feb 1st and Stage 2 effective March 1st. At this point in time it is assumed the shortage will be over at the close of the following winter. Thus the rationing period is assumed to terminate on April 1 of the next year.
3. Uniform Commodity Surcharge is approved and applied to all readings and bills rendered after March 1.
4. By April 1st of the next year, rains have come and stream flow models predict sufficient storage will exist at the end of the runoff season to permit termination of rationing as of April 1st.
5. Water use rebounds at the rate of 5% per month after April 1st.
6. Recovery of lost revenue due to rebound revenue losses outside of the second fiscal year period are ignored and hence are not recovered.
7. WSCF available = $500,000 and fund is exhausted by June 30 of the second fiscal year of the event.

Notes for Table 2:

a. Enter amount of WSCF in box on Line 1. If no reserves are available for water shortage mitigation, enter "0".

b. Enter Stage 1 and Stage 2 rationing requirements in Col 1 opposite each month of the assumed rationing period duration. Enter rebound percentages per assumption No. 5.

c. From Table 1 obtain corresponding monthly revenue loss values (intersection of month and rationing requirement percentage) and enter in Col 2.

d. As a first approximation of correct Rate Surcharge required to mitigate revenue loss, obtain rate from Table 1 corresponding to the most prevalent Overall Rationing Requirement appearing in Col 1 and enter in the box on Line 20 of Table 2 ($0.82 for this example). If the value in the box on Line 19 is negative, increase the Rate Surcharge a cent at a time until a positive value is obtained in the box on Line 19. (In this example, the Rate Surcharge required to just achieve a positive value is $0.93.) Should you want to maintain the WSCF at some higher level, fearing that the shortage event may last more than one year, increase the Rate Surcharge accordingly.