

The Resources Agency  
DEPARTMENT OF WATER RESOURCES  
Northern District

Napa River

Trial Distribution Program

1998 Frost Season

February 1999

Gray Davis  
Governor  
State of California

Mary D. Nichols  
Secretary for Resources  
The Resources Agency  
(pending confirmation)

Stephen L. Kashiwada  
Acting Director  
Department of Water Resources

State of California  
The Resources Agency  
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## FOREWORD

This report describes the watermaster service provided by the Department of Water Resources under the Agreement for Trial Distribution on the Napa River during the 1998 frost season. The watermaster prepared this report as required by Paragraph Q of Section III of the Agreement.

Information about 1998 watermaster service for frost protection is presented in three chapters. The first chapter gives general introductory information, summarizes State policy on diversion of water in the Napa Valley for frost protection, and describes the legal action filed in the Superior Court of Napa County. Chapter II covers the trial distribution, including the 1998 Agreement signed by each vineyardist, the frost season summary, streamflow conditions in 1998, and regulations by the watermaster. Chapter III shows the cost apportionment to each participant.

For further information on the Napa River Trial Distribution Program, you may contact Kevin Taylor of DWR's Northern District at (530) 529-7354.

Naser J. Bateni, Chief  
Northern District Office  
Department of Water Resources

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STATE OF CALIFORNIA  
Gray Davis, Governor

THE RESOURCES AGENCY  
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(pending confirmation)

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This report summarizes the operation of the water distribution program conducted by the Department of Water Resources in Napa Valley during the frost damage season in spring 1998. This was the twenty-fourth consecutive season in which a distribution program has been conducted. By signing an agreement, the participating vineyardists agreed to place their Napa River pumps under the control or administration of a representative of DWR acting as a watermaster. Prior orders of the State Water Resources Control Board in 1972 restricted diversion of water from the Napa River and its tributaries by persons holding water right permits. The orders made continued diversion of water for frost protection purposes contingent upon participation in such a control program.

### State Policy

The State policy on diversion of water in the Napa Valley for frost protection is expressed in Sections 659 and 660, Title 23, of the California Administrative Code, which read as follows:

“659. Napa River. Budding grape vines and certain other crops in the Napa Valley may be severely damaged by spring frosts. During a frost, the high instantaneous demand for water for frost protection by numerous vineyardists and other water users frequently exceeds the supply in the Napa River stream system. This results in uncoordinated diversions and possible infringements upon other rights. Therefore, all diversions of water from the stream system between March 15 and May 15 determined to be significant by the board or a court of competent jurisdiction shall be considered unreasonable and a violation of Water Code Section 100 unless controlled by a watermaster administering a board or court approved distribution program. Diversions for frost protection and irrigation during this period shall be restricted to: (1) replenishment of reservoirs filled prior to March 15 under an appropriate water right permit, or (2) diversions permitted by the court.”

“The service area of the distribution program may be revised at any time by order of the board or the court. SWRCB will retain jurisdiction to revise terms and conditions of all frost protection permits should future conditions warrant.”

“660. Replenishment. Diversion of water under the provisions of Section 659 during the spring frost season from March 15 to May 15 to replenish water stored in reservoirs prior to the frost season is "regulation," as defined in Article 6, Section 685(c): Replenishment diversion must be to reservoirs for which a permit or license authorizing winter storage prior to the frost season has been issued.”

On December 21, 1972 SWRCB adopted a resolution whereby execution of the trial distribution agreement for 1973 and continued participation in the program in subsequent years would be accepted as compliance by permittees and would extend their diversion season through the frost season.

### Legal Action

In March 1974, action was brought in the Superior Court of Napa County by SWRCB against 11 diverters which were alleged to be in violation of California Administrative Code Section 659 and Water Code Sections 1052 and 1225. The allegation was that the defendants had constructed sprinkling systems which would depend on direct diversion from the Napa River without using storage. Defendants countered that direct diversion was a reasonable exercise of riparian rights over which the State had no jurisdiction.

In December 1974, the Superior Court issued an order granting summary judgment upholding the defendants and denying the State's allegations. The ruling was appealed and, on January 23, 1976 a decision was handed down by the State Court of Appeals reversing the Superior Court decision. The defendants petitioned the Appellate Court for a rehearing and, on February 20, 1976 the petition was denied. The State Supreme Court refused to hear the case and remanded it to the Superior Court for a trial on the facts.

In October 1976, the suit, PEOPLE OF THE STATE OF CALIFORNIA ex rel., STATE WATER RESOURCES CONTROL BOARD (SWRCB) v. FORNI, et al. was settled by a stipulated judgment which required the 11 defendants to participate in the trial distribution program.

## CHAPTER II. TRIAL DISTRIBUTION

### 1998 Agreement

The 1998 agreement for trial distribution was the same as the 1997 agreement. A copy of the agreement and an information sheet are included in Appendix A.

Thirty-five parties participated in the 1998 trial distribution agreement, representing 2,317 acres of vineyards under sprinklers, combined river pump capacity of 66 cubic feet per second (cfs) at 42 separate diversion points, and total reservoir capacity of 834 acre-feet. The parties were:

Sterling Vineyards	Sawyer Vineyard
Walter Tamagni	St. Suprey Vineyard
Frank S. Emmolo	J. Alex Vyborny
Benessere Vineyards	Swanson Vineyards
Freemark Abbey Winery	Rutherford Bench Vineyards
Theodore I. Laurent	Los Ninos Vineyards
Tom P. and Tae Tripodes	Yount Mill Vineyards
Lewis G. Carpenter	Beringer Wine Estates
J. Lohr Vineyards	Hermosa Vineyard
Dowdell Vineyards	Robert Mondavi Vineyards
Paul F. Pelosi	Rigi Vineyards
P. J. Vineyards	Monticello Vineyards
Fitch Robertson	AWG Vineyards
Valeria Huneeus	Roy H. Elliott, Jr.
Charles Carpy/Conolly	Silverado Hill Cellars
Sutter Home Winery	St. Andrews Vineyard
Frogs Leap Winery	Michael Black
Jaeger Vineyard	

Those parties holding 29 of the 67 applications to appropriate water from the main stem Napa River participated in the program in 1998.

In accordance with the court's directive in PEOPLE OF THE STATE OF CALIFORNIA ex rel., STATE WATER RESOURCES CONTROL BOARD (SWRCB) v. FORNI, et al., the terms of the trial distribution agreement were modified to include the defendants, most of whom have no regulatory storage reservoirs. Six defendants or their successors participated in the 1998 program. They were Benessere Vineyards, Theodore I. Laurent, P. J. Vineyards, Charles Carpy/Conolly, Frank S. Emmolo, and Rutherford Bench Vineyards.

## 1998 Frost Season Summary

The U.S. Weather Service did not maintain any weather stations in the Napa Valley this year. The 1998 season was very wet with 3.19 inches falling in March with a normal being 4.00 inches. In April the precipitation was 3.63 inches with normal being 2.24 inches, and 2.34 inches in May with normal being 0.55 inches. The flow in the Napa River at the U.S. Geological Survey gaging station at Oak Knoll Avenue Bridge (USGS near Napa) varied from a high of 566 cfs on March 24 to a low of 125 cfs on May 10 and was constantly fluctuating because of the abundant precipitation.

The weather was above freezing most of the season except for one week in April when frost protection was needed throughout the valley. The vineyardist sprinkled for frost protection from a low of two times to a high of seven times. Three or four times was average.

## Regulation by the Watermaster

DWR provided watermaster service from March 15 to May 15, 1998. As in past seasons, a combination of low streamflow and sustained frost did not occur.

Prior to the frost season, pumping charts were mailed to participants showing their allotment for each 24-hour period and the approximate number of hours that their river pump could be operated for any given flow in the River. Pump allotments stated in the charts were based on the capacity of each river pump and the acreage served by that pump in proportion to the total acreage being frost protected by diversion from the River by all participants.

A taped message giving the available flow in the River on each day, could be obtained by each participant by telephoning (707) 963-5337. Participants could determine their allotments that day by referring to a chart.

The available flow in the River was estimated by reading the Oak Knoll Avenue gage, determining the amount being diverted from the River, and knowing which pumps were capable of diverting from the River. Thirteen of the 42 diversions were not set up for pumping during the 1998 season. Those 13 pumps had a capacity of about 14.5 cfs.

Of the 42 diversions in the program, 35 were to storage reservoirs and 7 were for direct diversion for frost protection without intermediate storage. Six of the direct diversion participants depend on the River and have no alternative source of supply. Only 12 of the participants do not have wells or another source of supply. Most of the reservoirs in the program were nearly full at the beginning of the season. The majority had been filled from wells, and most were full during the frost season.

On March 17, 1998, only seventeen pumps were installed in the River and ready for use. Twenty-nine were installed and ready for use by April 20, 1998; none were installed after April 20.

During the frost season, the meters were read periodically. The quantity of water diverted by each pump is shown in Table 5 of Appendix B. Total water pumped for the season was 214 acre-feet, all of which was for storage for frost protection, irrigation, and replenishment. Most of the reservoirs have some leakage, requiring them to be topped off periodically during the frost season.

### CHAPTER III. COST APPORTIONMENT

The 1998 agreement provides that the participants reimburse DWR for expenses in providing watermaster service, with the charge to each participant computed according to acreage in the program. The total expenses were apportioned to each party listed in downstream order as follows:

NAME	CONTRACT NUMBER	ACRES	COMPUTED COST
Sterling Vineyards	165892	247	\$3,054.60
Walter Tamagni	165895	15	\$185.50
Benessere Vineyard	165864	34	\$420.47
Freemark Abbey Winery	165871	14	\$173.14
Theodore I. Laurent	165878	22	\$272.07
Tom P. and Tae Tripodes	165896	17	\$210.24
Lewis G. Carpenter	165865	80	\$989.34
J. Lohr Vineyards	165876	34	\$420.47
Dowdell Vineyards	165867	46	\$568.87
Paul F. Pelosi	165884	8	\$98.93
P. J. Vineyards	165883	43	\$531.77
Fitch Robertson	165886	13	\$160.77
Valeria Huneus	165875	76	\$939.88
Charles Carpy/Conolly	165866	76	\$939.88
Sutter Home Winery	165893	21	\$259.70
Frogs Leap	165872	10	\$123.67
Frank S. Emmolo	165870	36	\$445.20
Sawyer Vineyards	165888	32	\$395.74
J. Alex Vyborny	165898	36	\$445.20
St. Suprey Winery	165890	34	\$420.47
Swanson Vineyards	165894	86	\$1,063.54
Yount Mill Vineyards	165901	55	\$680.17
Rutherford Bench Vineyards	165887	3	\$37.10
Los Ninos Vineyards	165879	42	\$519.41
Beringer Wine Estates	165900	335	\$4,142.87
Hermosa Vineyard	165873	20	\$247.34
Robert Mondavi Vineyards	165881	300	\$3,710.04
Rigi Vineyards	165885	100	\$1,236.68
Jaeger Vineyards	165877	176	\$2,176.56
Monticello Vineyards	165882	103	\$1,273.78
AWG Vineyards	165863	43	\$531.77
Roy H. Elliott, Jr.	165869	60	\$742.01
Silverado Hill Cellars	165889	27	\$333.90
St. Andrews Vineyard	165891	70	\$865.68
Michael Black	165902	3	\$37.10
	<b>TOTAL</b>	<b>2,317</b>	<b>\$28,653.86</b>



APPENDIX A

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# AGREEMENT FOR TRIAL DISTRIBUTION

## NAPA RIVER

### 1998 SEASON

#### I. DEFINITIONS

- A. Allotment is each participant's proportionate share of available water supply, which a watermaster appointed by the California Department of Water Resources determines in accordance with Section III, subparagraph I, that each participant has a right to divert for frost protection purposes during any 24-hour period.
- B. Ample streamflow is a condition when the available water supply is great enough to allow all direct diverters to pump at the full capacity of their river pumps throughout a frost and to allow storage to replenish diverters, including nonriparians having appropriative rights to pump at the full capacity of their pumps continuously. The streamflow is considered to be ample when it exceeds 76 cubic feet per second (cfs) measured at the USGS gaging station near Napa, Oak Knoll Road (hereinafter, USGS gage), or when it would exceed that amount in the absence of any diversions by upstream diverters. The figure 76 cfs shall, if necessary, be adjusted yearly by the watermaster and shall depend upon total pumping capacity for frost protection purposes.
- C. Available water supply is that portion of the water flowing in Napa River over and above the amount necessary for the protection of fish in the Napa River. The watermaster will be guided by the requirement of 10 cfs for fish protection in the Napa River superior in priority to appropriative rights and correlative with riparian rights.
- D. Direct diverters are those diverters who pump directly from Napa River onto vineyards for frost protection rather than pumping first into a reservoir of reasonable size; and if only part of their vineyard is so protected, they are direct diverters so far as the part so protected is concerned.
- E. Napa River is that portion of the main stem of the Napa River between the uppermost and lowermost diversion points inclusive of all frost season diverters.

## TRIAL DISTRIBUTION AGREEMENT (continued)

F. Reservoir of reasonable size is a reservoir with capacity of approximately fifty thousand (50,000) gallons or more per acre of vineyard under sprinklers. A reservoir of less capacity may be considered reasonable at the discretion of the watermaster, who shall take into consideration (1) the extent of any supplemental water supply that may be available and (2) whether the capacity of the river pump is sufficiently low per acre of vineyard to have an insignificant effect on the ability of other diverters to pump their allotment.

G. Riparian land is the land of frost season diverters determined on an interim basis to be riparian to Napa River by the watermaster for the purpose of allocating water in 1998. Any land considered to be riparian during the 1997 frost season, shall continue to be so considered unless title search indicates otherwise. For other land, not included in the 1997 program or in a decree or order of a court in a water adjudication proceeding, the watermaster shall use county assessor's parcel maps and conduct a field survey of each new participating vineyard to determine riparian status.

H. Storage replenishment diverters are those diverters who pump water from Napa River to replenish water stored in reservoirs of reasonable size prior to March 15, 1998, where both initially stored water and replenishment water is for later use on vineyards for frost protection.

## II. RECITALS

### WHEREAS:

- A. Many of the vineyardists in Napa Valley are dependent on diversion of water from the Napa River for sprinkling to prevent frost damage to their vineyards during the season from about March 15 to May 15.
- B. The streamflow available in the Napa River is at times insufficient to fulfill all direct diversion requirements, and is occasionally insufficient to permit all frost protection storage reservoirs to be replenished after a frost by continuous pumping from Napa River.
- C. Appropriative water rights administered by the State Water Resources Control Board are conditioned so that diversion of water after March 15 of each year is permitted only so long as the diverter is participating in a water distribution program to assure protection to prior rights.

## TRIAL DISTRIBUTION AGREEMENT (continued)

- D. Section 1051.5 of the Water Code authorizes the Board to conduct trial distribution of water in accordance with agreements. The Board has assigned this authority to the Department of Water Resources.
- E. This agreement for trial distribution during the 1998 frost season shall allow signatory appropriators to divert water under their pending applications, permits, or licenses.
- F. Vineyardists having reservoirs may pump from the river to replenish depleted reservoirs at any time sufficient water is available, whereas the direct diverters can only beneficially pump water during an actual frost.
- G. The proper conduct of this program requires that both the instantaneous rate of discharge and the cumulative total volume of water pumped by each pump be measured.
- H. The Superior Court of State of California, County of Napa entered a Judgment Granting Permanent Injunction in PEOPLE OF THE STATE OF CALIFORNIA ex rel., STATE WATER RESOURCES CONTROL BOARD (SWRCB) v. FORNI et al. No. 31785 which requires that a watermaster appointed by the Board will determine allotments to the defendants and will control the amount, the rate, and times of pumping by defendants and said Judgment included other provisions similar to those in this agreement, including a requirement that defendants pay a proportionate share of the cost of the trial distribution.
- I. It is necessary for the watermaster to conduct the trial distribution provided under this agreement, and under the court injunction referred to in paragraph H next above as one program to meet the objectives of both.

### III. OPERATIONS

NOW, THEREFORE, the parties to this agreement by affixing their signatures hereby agree to divert water during the period March 15 to May 15, 1998, only as directed by the watermaster under the following provisions of this agreement:

- A. A watermaster to be appointed by the Department of Water Resources will determine allotments to the parties and will control the amount, the rate, and times of pumping of all signatory parties.

TRIAL DISTRIBUTION AGREEMENT (continued)

- B. The parties to the agreement shall abide by the instructions given to them by the watermaster.
- C. All reservoirs must be filled and ready for use by March 15, 1998 under the conditions and priorities of their applications to appropriate water, unless additional time for filling is allowed by the watermaster.
- D. All parties will inform the watermaster of the name, address, and phone number of the person responsible for operating the frost protection systems.
- E. Meters shall be installed on each discharge line capable of measuring both the instantaneous pumping rate and the cumulative total volume of water pumped. The meters shall be installed and operable by March 15, 1998, unless granted additional time by the watermaster.
- F. The parties shall reimburse the Department of Water Resources for its actual expenses in providing the watermaster for the period March 15, 1998, to May 15, 1998. The expenses of the Department charged to the parties shall be apportioned according to the proportion each party's acreage under sprinklers bears to the acreage of all parties in the 1998 program.
- G. Knowledge of the following facts is essential to the success of the distribution program:
  - 1. Number of acres to be frost protected in 1998 by each owner.
  - 2. Capacity of reservoir.
  - 3. Capacity of river pump.

Each person shall inform the watermaster of these facts by completing and returning the information sheet by January 15, 1998; and, thereafter, inform him of any changes (See Attachment A).

- H. Each person agrees that the watermaster shall have reasonable right of access across the property and the right to inspect and measure pump capacities, acreages, reservoir storage levels, and sprinkler systems for the purpose of enforcing this agreement.

TRIAL DISTRIBUTION AGREEMENT (continued)

- I. The watermaster will allot the available water supply when it is less than ample to the parties correlatively in proportion to each party's riparian acreage under sprinklers limited by pump diversion capacities. The watermaster will estimate the available water supply for allotments from gaging station data. Additional data, such as channel storage and velocity of flow will be used in estimating future available water supply as it becomes available. Appropriators having nonriparian vineyards will be allowed to pump for this land only when the streamflow is in excess of riparian requirements including replenishment of reservoirs serving riparian lands.
- J. During less than ample streamflow conditions, the watermaster will inform each storage replenishment diverter and each direct diverter defendant in the PEOPLE OF THE STATE OF CALIFORNIA ex rel., STATE WATER RESOURCES CONTROL BOARD (SWRCB) v. FORNI et al. case of the period of time during which the allotment can be pumped. Without interfering with the needs of storage replenishment diverters, the watermaster will prescribe pumping hours for storage replenishment diverters within the period of each day when these diversions will, insofar as possible, conflict least with direct diverter requirements.
- K. Unused allotments shall be considered as an increase in the available water supply for all other parties to this agreement in accordance with the priorities of the various rights.
- L. To conserve water and prevent waste, the watermaster may at times allow diversion of water outside the normal pumping period established to carry out the terms of this agreement provided that such diversion will not deprive others of their allotment.
- M. Compliance by the parties with the instructions from the watermaster will be determined by taking readings of the meter on the discharge line of the pump or by any other reasonable method of determining the amount or rate of pumping.
- N. Minor deviations to the parties from the pumping instructions given them by the watermaster shall be adjusted as promptly as possible after they are discovered.

TRIAL DISTRIBUTION AGREEMENT (continued)

- O. Willful diversion by parties of water not allotted to them by the watermaster will be prima facie evidence of violation of the terms of the agreement and/or the terms of the water right permit or license authorizing the diversion. A violation shall be cause for revocation of any permit or license issued for frost protection and shall be considered to constitute an unreasonable method of diversion within the meaning of Article X, Section 2 of the California Constitution and Sections 100 and 275 of the Water Code.
- P. The watermaster shall have the authority to apply to the Superior Court of Napa County for appropriate relief including specific relief.
- Q. At the end of the frost season, the watermaster shall prepare a report summarizing the 1998 program and shall make available to all parties all factual data collected.
- R. Although this agreement is effective during the 1998 frost season only, the parties understand that experience gained during this season will be drawn on to endeavor to develop similar more refined distribution agreements in subsequent years resulting eventually in a comprehensive control program for all Napa Valley vineyardists dependent on the Napa River and its tributaries for frost protection.
- S. To the extent possible the trial distribution program provided under this agreement and that provided under the court injunction referred to in Section II, paragraph H, will be considered one program as far as operation is concerned.
- T. Signatories to this agreement do not, by entering into this agreement, acknowledge or affirm the existence of riparian rights for any vineyardist signatory hereto.
- U. This agreement is in effect during the 1998 frost season only; when the 1998 frost season is over, the water rights of the signatory vineyardists will be as they existed prior to the execution of the agreement.
- V. The signatory vineyardist's costs are allocated according to acreage as set forth in Section III, subparagraph G, of this agreement.

TRIAL DISTRIBUTION AGREEMENT (continued)

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Naser J. Bateni, Chief  
Northern District  
Department of Water Resources

\_\_\_\_\_  
Printed Name

Date: \_\_\_\_\_

\_\_\_\_\_  
Name of Vineyard

Date \_\_\_\_\_

ATTACHMENT A  
INFORMATION SHEET

NAPA RIVER AGREEMENT FOR TRIAL DISTRIBUTION - 1998 SEASON

Please complete the following, and return it with the signed agreements. PLEASE PRINT CLEARLY.

1. Name of vineyard: \_\_\_\_\_
2. Person to be contacted regarding operation of the frost protection system:  
Name: \_\_\_\_\_  
Telephone: \_\_\_\_\_
3. Total number of acres to be placed under frost protection in 1998: \_\_\_\_\_.
4. Capacity of river pump(s): \_\_\_\_\_ gallons per minute.
5. Location of meter: \_\_\_\_\_  
\_\_\_\_\_
6. Capacity of reservoir: \_\_\_\_\_ acre-feet
7. If you have alternate sources of water, such as wells, please complete following:  
Alternate Source(s): \_\_\_\_\_  
Capacity: \_\_\_\_\_ gallons per minute.
8. If you are diverting from any other sources, please give name of sources and location of pumps.  
Name of Sources: \_\_\_\_\_  
Location of Pumps: \_\_\_\_\_
9. Signature: \_\_\_\_\_  
Participant  
\_\_\_\_\_  
Printed name of participant

APPENDIX B

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TABLE 1

B-1

PARTICIPANTS' SPRINKLING SYSTEMS

<b>Name</b>	<b>Acreage in 1998 Frost Protection Program</b>	<b>Reservoir Capacity (Acre Feet)</b>	<b>River Pump Capacity (gpm)</b>
Sterling Vineyards	247	126	2250
Walter Tamagni	15	4	600
Benessere Vineyard	34	12	350
Freemark Abbey Winery	14	7	500
Theodore I. Laurent	22	0	1100
Tom P. and Tae Tripodes	17	11	150
Lewis G. Carpenter	80	15	900 <u>c/</u>
Dowdell Vineyards	46	30	250
J. Lohr Vineyards	34	5	900
Paul F. Pelosi	8	0	400
P. J. Vineyards	43	0	900
Fitch Robertson	13	0	800
Valeria Huneus	76	120	450
Charles Carpy/Conolly	76	6	1200
Sutter Home Winery	21	0	1200
Frogs Leap Winery	10	0	500
Frank S. Emmolo	36	2	700
Sawyer Vineyards	32	10	1000
St. Suprey Winery	34	10	200
J. Alex Vyborny	36	7	600
Swanson Vineyards	86	12	1,200 <u>c/</u>
Rutherford Bench Vineyards	3	5	120
Los Ninos Vineyards	42	13	1200
Yount Mill Vineyards	55	15	1000
Beringer Wine Estates	335	95	2,400 <u>c/</u>
Hermosa Vineyard	20	5	450
Robert Mondavi Vineyards	300	128	2,100 <u>b/</u>
Rigi Vineyards	100	37	450
Jaeger Vineyards	176	40	1500
Monticello Vineyards	103	35	1500
AWG Vineyards	43	20	450
Roy H. Elliott, Jr.	60	28	575
Silverado Hill Cellars	27	11	500
St. Andrews Vineyard	70	26	2000
Michael Black	3	0	30
<b>TOTAL</b>	<b>2,317</b>	<b>835</b>	<b>\$30,425</b>

**TABLE 2**

DAILY MEAN DISCHARGE OF NAPA RIVER  
AT USGS STATION NEAR NAPA (OAK KNOLL AVENUE)  
MARCH 1 TO MAY 31, 1998  
(in cubic feet per second)

<u>Day</u>	<u>March</u>	<u>April</u>	<u>May</u>
1	672	316	183
2	591	277	188
3	534	307	183
4	478	422	176
5	448	400	172
6	452	346	169
7	405	312	161
8	386	280	157
9	359	272	151
10	339	273	146
11	321	266	148
12	310	245	177
13	407	399	180
14	353	344	157
15	317	317	148
16	298	297	142
17	272	275	136
18	260	258	134
19	250	245	126
20	237	231	120
21	235	220	117
22	232	211	115
23	329	319	115
24	566	482	113
25	410	315	112
26	368	268	109
27	304	242	110
28	286	223	165
29	259	206	481
30	233	190	571
31	280	190	338
Mean	361	292	178
Acre-Feet	22,200	17,370	10,920

TABLE 3

## WATER PUMPED FROM NAPA RIVER DURING 1998 FROST SEASON

<u>Name</u>	<u>Pump Installed in River 1998</u>	<u>Water Pumped (in Acre-Feet)</u>
Sterling Vineyards (Calistoga)-----	X -----	7.81
Sterling Vineyards (Winery)-----	X -----	13.13
Sterling Vineyards (Tamagni)-----	X -----	4.78
Walter Tamagni-----		-----
-----		0.00
Sterling Vineyards (Bear Flat)-----	X -----	7.50
Benessere Vineyard-----	X -----	3.00E
Freemark Abbey Winery-----	X -----	0.55
Theodore I. Laurent -----	X -----	5.17
Tom P. & Tae Tripodes-----	X -----	1.00E
Lewis G. Carpenter (Lodi)-----	X -----	1.21
Lohr Vineyards-----	X -----	3.22
Lewis G. Carpenter (Fulton)-----	X -----	6.55
Dowdell Vineyards -----		0.00
Paul F. Pelosi -----	X -----	1.17
P. J. Vineyards-----		0.00
Fitch Robertson-----	X -----	2.44
Valeria Huneeus-----		-----
-----		0.00
Charles Carpy/Conolly -----	X -----	0.00
Sutter Home Winery-----	X -----	1.59
Frogs Leap Winery -----		-----
-----		0.00
Frank S. Emmolo-----		-----
-----		0.00
Sawyer Vineyard -----		0.00
St. Suprey-----		-----
-----		0.00
J. Alex Vyborny-----		X -----
-----		-----
-----		0.00
Swanson Vineyards -----	X -----	0.59
Yount Mill Vineyard -----	X -----	3.26
Ruthford Bench Vineyards-----		0.00
Los Ninos Vineyards -----		0.00
Beringer Wine Estates (Upper)-----	X -----	10.00E
Hermosa-----		-----
-----		0.00
Robert Mondavi Vineyards (Upper)-----	X -----	23.36
Robert Mondavi Vineyards (Upper)-----		0.00
Rigi Vineyards-----	X -----	12.57
Robert Mondavi Vineyards (Lower)-----		0.00
Jaeger Vineyards (Lower)-----	X -----	63.66
Monticello Vineyards -----	X -----	37.88E
AWG Vineyards -----		X -----
-----		-----
-----		2.09
Roy H. Elliott, Jr.-----		0.00
Silverado Hill Cellars -----	X -----	1.61E

Beringer Wine Estates (Lower)-----	X	-----	0.00
St. Andrews-----			-----
-----		0.00	
Michael Black -----		-----	0.00
	Total	-----	213.52

E = Estimated