CITY OF AMERICAN CANYON
2005 URBAN WATER MANAGEMENT PLAN

BASIS FOR ESTIMATING WATER DEMANDS

In preparing the 2005 Urban Water Management Plan (UWMP) the City has attempted to use the best available information from which to base future water demand projections within the service area limits. Specifically, historical water use has been used to the greatest extent possible to develop unit demand factors for the various land uses included in the City and County General Plans. Although both General Plans will soon undergo updates, the unit demand factors by land use type will be useful for planning efforts in the near future.

In developing the water demand projections beyond the current year several assumptions were made including the following:

- Buildout will occur in accordance with the current Napa County and City of American Canyon General Plans;
- Buildout will be reached by 2015 and growth will be uniform from 2004 through 2015;
- Incremental growth will occur beyond buildout at an annual rate of 0.5%;
- Future water demands by land use type will be consistent with historical water use in the City between 2000 and 2004; and
- Irrigation demands for vineyards within the water service area will be consistent with projections in the City's Recycled Water Implementation Plan (2005) and Recycled Water Facilities Plan (2003).

EXISTING WATER DEMANDS (2000 and 2005)

The UWMP includes projected water demands at 5-year intervals beginning in 2000 and running through 2025. The water demand reported for 2000 is based on actual measured water usage for that year, and the water demand for 2005 is based on actual measured water usage from October 2004 through September 2005. Existing water demand reported for 2000 and 2005 includes the following:

- State Water Project (SWP) raw water to City treatment plants
- City of Vallejo permit water used by City of American Canyon
- City of Vallejo treated water used by City of American Canyon
- City of Napa treated water used by City of American Canyon

The total water supplied to the City of American Canyon was then compared against meter readings taken at the point of use to estimate the amount of un-metered uses and losses within

the City's service area. This represents about 10 percent of the total water used by the City. It has been previously reported that un-metered uses and losses were as high as 26 percent in the City. However, the previous estimate of 26 percent was based on a 6-month period in 2003, whereas the current estimate of 10 percent is based on 4 complete and separate years between 2000 and 2004. The number used in the UWMP is based on the most complete and reliable data available.

FUTURE WATER DEMANDS

Future water demand projections developed for the City of American Canyon fall into three categories:

- Growth within the City's sphere of influence (non-vineyard)
- Growth outside the City's sphere of influence (non-vineyard)
- Potential vineyard irrigation

Future Demands Within City Sphere of Influence (Non-Vineyard)

Water demand projections for growth within the City's sphere of influence cover planned development in accordance with the City's General Plan and are based on actual water billing data for existing customers, where reasonable correlations exist. The water demand factors for various land use types are based on these historical billing records, or the best available guidelines when the historical data is insufficient. The resulting water demand projections represent the most current forecasts available to the City at this time.

The City provided water billing records from the years 2000 to 2004, which were analyzed to estimate the 5-year average demand for each existing water customer. The average demand was then spatially distributed on a parcel map to identify the location of each customer's demand. Using the City's Traffic Area Zoning Land Use Map (July 2005), each parcel within the City's limits was identified by land use type. The land use types are consistent with the General Plan and include the following:

- Agriculture
- Community Commercial
- Commercial Neighborhood
- Commercial Recreation
- Industrial
- Open Space
- Public
- Residential High
- Residential Medium
- Residential Low
- Residential Estate
- Other

Once the billing data was distributed to parcels and summarized by land use type, a statistical analysis was performed to eliminate data outliers (i.e. abnormally high or low demands). This was accomplished by analyzing unit flows based upon the following methodology:

Step 1
All parcels with a historical water demand were identified by:

- Demand
- Land Use
- Parcel Size

Step 2
Unit demands (gallons per minute/acre and gallons per minute/dwelling unit) for each parcel were calculated and sorted by land use type.

Step 3
Statistical outliers for each land use type were eliminated to normalize the data when developing the unit demands to be applied to future growth. Statistical analysis was used as a starting point, and engineering judgment was also employed to determine if the sample statistics were representative of the population statistics. Where there were an insufficient number of data points or the data was scattered, engineering judgment was used to select an appropriate unit demand factor.

Step 4
Average unit demand factors (by dwelling units and by acres) were then calculated for each land use type.

The methodology described above was most effective for residential land use types, but did not work for all land use types because of small data sets or highly variable demands. The exceptions to the methodology described above are as follows:

1. Agriculture – Data set was too small to be reliable; used unit demand factor from City's Recycled Water Implementation Plan (2005) for consistency with other planning efforts.
2. Industrial – Data is highly variable for existing customers; used City's current requirement for maximum water usage for all new industrial users (650 gpd/acre).
3. Public (Schools) – Data set was too small to be reliable; used unit demand factors used by another Bay Area water retailer for the same land use types (Dublin San Ramon Services District).
4. Commercial – Data set was small and highly variable; used the City's 1996 Water Master Plan unit demand factors.

The findings were reviewed with City staff and the following table of unit demand factors was developed for the UWMP (Table G-1).

Table G-1 – Unit Demand Factors by Land Use Type

TAZ Land Use Designation	Unit Demands	
	(gpd/unit)	Unit
Agriculture (AG)	2,680	acre
Community Commercial (CC)	155	ksf
Hotels/Motels	40	rooms
Commercial Neighborhood (CN)	155	ksf
Commercial Recreation (CR)	1,500	acre
Industrial (I)	650	acre
Open Space (OS)	530	acre
Public (P)		
High School (student portion)	20	student
Middle School (student portion)	15	student
Elementary School (student portion)	10	student
School (land portion)	141	acre
Residential Estate (RE)	342	du
Residential High (RH-1 (12-16 UPA))	210	du
Residential High (RH-2 (16-20 UPA))	210	du
Residential Low (RL)	286	du
Residential Medium (RM)	216	du

Potential development scenarios were then estimated by the City and used as the basis to project water demands under buildout conditions and, although the majority of the developments are not approved as of this time, the scenarios are reliable for the purposes of completing the UWMP. Using the unit demand factors presented in Table G-1, estimated future water demands for proposed/potential developments are as follows:

Oat Hill Partners/Eucalyptus Grove	195 AFY
Town Center	289 AFY
Green Island Road Annexation	199 AFY
Green Island Industrial Park	49 AFY
Vintage Ranch	192 AFY
Other Developments	566 AFY
Total	1,490 AFY

Again, it is recognized that actual development plans approved in the future could differ somewhat from the potential scenarios used for this UWMP but for the purposes of completing the UWMP in 2005, the potential development scenarios are reliable to this end. The Vintage Ranch development is included as a future demand because, although it had been approved by the City, it was not generating demands at the end of 2004.

Future Demands Outside City Sphere of Influence (Non-Vineyard)
The future demands outside of the City's sphere of influence (non-vineyard) are primarily generated from the industrial area between the Napa County Airport and Kelly Road, north of the City. The airfield itself (622 acres) has an existing demand of 15 AFY and that is not expected to change significantly in the future. The remaining area in the County's Airport Industrial Area (1,722 acres) is zoned Industrial and has an existing demand of 354 AFY. Assuming that this area has a potential water demand of 650 gpd per gross acre, the ultimate buildout demand for this area is 1,254 AFY of which the future demand is 900 AFY. The total buildout demand outside the City's sphere of influence (non-vineyard), including existing demands, is 1,268 AFY. Figure 5-1 shows the airfield and industrial areas outside the City's sphere of influence.

The proposed Montalcino Resort is included within the County's Airport Industrial Area as shown in Figure 5-1 of the UWMP, except for the golf course. The Montalcino Resort will be located on 68 acres that is subject to a maximum demand of 650 gpd per acre. The proposed project requires more water than the maximum allowable and the City will require them to purchase additional land zoned Industrial and leave it undeveloped in order to meet the water demands. Therefore, this entire demand is included in the estimated future demands for outside the City's sphere of influence. The golf course will be irrigated with recycled water from Napa Sanitation District. Since the golf course is not zoned Industrial, and would not receive potable water from the City, it was not included in the estimated future water demands.

Potential Vineyard Demands
The City currently supplies raw (untreated) water to a few existing vineyards, including Hess and Sutter Vineyards. Their total existing demand is 171 AFY. As the City's recycled water infrastructure is expanded and the recycled water plan is implemented, the City anticipates that this existing water demand will be supplied by recycled water. This is expected to occur by the year 2010.

Additionally, several other vineyards that do not currently use City water for irrigation are targeted for recycled water use by 2010 in the City's *Recycled Water Implementation Plan* (2005). Although these demands will eventually be offset by recycled water, they still represent water demands within the City's service area that would need to be met regardless of the availability of recycled water, and are therefore included in the UWMP. They total an estimated demand of 347 AFY. The total projected vineyard demand within the City's water service area is 518 AFY.

The vineyards that have been identified as potential water users include the following:

- Green Island Vineyard
- Hess Collection Wineries
- Grgich Hills Cellar
- Gary Clark Vineyards
- Jeager Vineyards
- Raymond Azevedo Vineyard
- Sutter Home Vineyards