
Chapter 6. Water

BACKGROUND

Water Supply

The City's Public Works Department maintains the water supply and distribution system for the City. The system consists of twenty-one water supply wells, one elevated water storage tank with a 200,000 gallon capacity, and over 145 miles of water distribution piping ranging in size from 6" through 14". The supply system produces an average of 11 million gallons per day. The production capacity is considered adequate to supply the current demand with sufficient reserve to meet peak demand and fire demand requirements. The City is proceeding with plans to construct a 4 million gallon water storage tank by 1998, followed by a second tank projected for 2000. Twenty of the wells are operated by electric motors, and one well is operated by a natural gas engine. Two portable generators are currently available for stand-by power.

The City water system supplies water to areas within the city limits, to the El Macero County service area, and to a number of individual customers with whom special arrangements have been made and authorized by the City Council. The City also has one service connection installed to provide water to a mobile home park outside the city, and has two connections to the UC Davis water system, which can be opened for mutual aid during emergency situations. The remainder of the Planning Area is served by either private water wells or County Service Areas.

Groundwater studies are currently in progress by the State Department of Water Resources and are planned to be conducted throughout the County in cooperation with other water agencies and districts. These studies will be used extensively in the overall regional and city water planning and water management programs.

The water supply and distribution system is being expanded as the city grows. New development is required to pay for all water system improvements required as a result of development. Any major surface water projects with high costs, if considered, would require more broad-based financing mechanisms.

In accordance with the Yolo County Water Plan endorsed by the Board of Supervisors in 1984 and updated in 1992, the City of Davis has developed specific water management programs to protect existing supplies while exploring alternative sources to augment current supplies. A study entitled "Supplemental Surface Water Supply Development Program" recommends several surface supply options.

In 1996, the City adopted a Water Supply Master Plan, which outlines a series of actions for the City to take in responding to meeting future water quantity and quality needs. The City also recently completed a study entitled "Future Water Supply Study (Phase II)" that projects future water demand and identifies supply options for meeting future water needs.

Water Demand

Assuming buildout of this General Plan, water demand for the city in 2010 has been projected to be 15, 531 acre-feet (af).¹ This would require a projected average day water production of 13.9 million gallons per day or 9,628 gallons per minute. For comparative purposes, the average water production for the City of Davis in 1996 was 11.2 million gallons per day.

Water systems are generally designed to accommodate a peak water demand that would occur when maximum water usage is taking place. As part of the 1993 City of Davis water system hydraulic model, a maximum day peaking factor of 1.70 and a peak hour factor of 2.42 were developed. When applied to the 2010 projections, this would result in a maximum day water production of 23.57 million gallons per day (mgd) and a peak hour water production of 23,299 gpm.

Water Conservation

As required by State law, an Urban Water Management Plan was completed in January, 1990 to guide efficient water use in the City. This plan includes new construction requirements, the water meter retrofit project, a water shortage contingency plan, customer rebate programs, upgrading of irrigation systems and new practices for city facilities to ensure efficient use of water.

In 1991, during a multi-year drought, Davis residents reduced per capita water consumption by about 10 percent as compared to the historic average. The City has established a water conservation goal of twenty percent, which is to result from the water meter retrofit project, the metered rate program and the annual Summer Use Reduction Effort (SURE) program. The 1995 Urban Water Management Plan updates these activities, and will be submitted to the California Department of Water Resources by December 1996.

Water Quality

The taste, odor and hardness characteristics of the tap water in Davis are often debated. In general, groundwater in the vicinity of Davis is very hard and high in dissolved solids. Samples from 19 of the 21 City wells tested through 1995 were

¹ *Future Water Supply Study (Phase II)*.

classified as “very hard,” causing over half of the single family homes in the city to use water softeners. Overall groundwater quality in Davis is of fair quality when measures against current drinking water regulations, but may exceed acceptable standards for certain contaminants in the future.

Long-term development of deep wells over 1,500 feet deep is planned to improve the aesthetic characteristics of Davis’ water and to meet drinking water regulations. A secondary benefit of deep wells is improved quality that helps the City comply with its NPDES permit for operating its wastewater treatment plant.

The City will continue toward the use of deep aquifers unless there are quality or quantity reasons to not use these aquifers. Deep aquifers are being studied by the City and UC Davis and initial testing is to be completed in the Summer of 1998.

Wastewater Collection and Treatment

The City's Public Works Department provides sewer service to the City and portions of the unincorporated areas of the Planning Area. The City's wastewater treatment plant is located in the northeast portion of the Planning Area.

In 1992, the average daily flow to the City's sewer system was 4.3 million gallons per day (MGD). The average daily flow for 1993 through July was 4.7 MGD. The capacity is currently 5.3 MGD. Improvements planned for 1995-96, will expand the capacity to 7.5 MGD. The capacity of the plant will need to be increased to 7.5 MGD to accommodate the growth in the current General Plan by the year 2010.

Planned sewage collection improvements include a repair of the 48" sewer trunk line located near County Roads 105 and 30. New development is required to pay for trunk and all other lines needed to accommodate new development, so that the only cost borne by the City will be for maintenance of the lines.

The City is constructing a 396-acre "wetlands demonstration project" at the Yolo Basin Wetlands Davis Site immediately east of the wastewater treatment plant. The intent of the project is to combine treated wastewater with storm water runoff, in order to create a restored wetlands and wildlife habitat and improve the wastewater treatment process prior to discharging into the environment.

Background information on the city’s drainage system to prevent flooding is provided in Chapter 19, Hazards.

GOALS, POLICIES AND ACTIONS

WATER CONSERVATION

GOAL WATER 1. Minimize increases in water use. Reduce per capita water consumption by 20 percent as compared to historic use through programs encouraging water conservation.

Policy WATER 1.1 Give priority to demand reduction and conservation over additional water resource development.

Standards

- a. Water-conserving plumbing is required in all new residential construction as required per state legislation.
- b. Implement a water meter-based billing system.
- c. Water usage meter rates shall include economic disincentives for excessive usage, without penalties for average water users.

Actions

- d. Determine specific water use requirements for all proposed projects and programs within the City.
- e. Continue to enforce and support water conservation ordinances.
- f. Explore incentives to retrofit water conserving plumbing in existing residences and businesses.
- g. Complete the residential water meter retrofit program by 1996.
- h. Continue to expand the public-information program for citizens on water-conserving practices, including landscaping.
- i. Develop an education program to inform residents of their typical water usage, so that voluntary conservation practices are encouraged.
- j. Show a comparison of the current period's water usage, the usage during the same period in the previous year and the average Davis usage on each utility bill.
- k. Develop a program to encourage appropriate, cost-effective and environmentally sound reuse of treated wastewater, gray water and other suitable drainage water. Identify specific opportunities for

reuse and incorporate them into City's Urban Water Management Plan.

- l. Develop an education program regarding water quality and conservation.
- m. Continue to implement water conservation programs and best management practices as detailed in the Urban Water Management Plan and other adopted water plans.

Policy WATER 1.2 Require water conserving landscaping.

Standards

- a. City projects shall include water-conserving landscaping and irrigation practices.
- b. Developers and builders shall install water-conserving landscaping and irrigation systems in accordance with the City's water conservation in landscaping requirements. Provide homeowners information on water conserving landscaping and irrigation systems, if not provided in construction.

Actions

- c. Continue to enforce requirements for water-conserving landscaping and encourage developers and property owners to exceed these basic requirements.
- d. Continue the best management practices and policies related to water conserving landscaping as detailed in the Urban Water Management Plan and other adopted water plans. Review and update the Urban Water Management Plan every five years.
- e. Implement in the public sector and promote, through the Urban Water Management Plan, the implementation in the private sector of Demand-Side Management methods that are proven and cost effective. For instance, programs or ordinances from the Plan could advance improved irrigation distributional uniformity, use of the California Irrigation Management Information System (CIMIS) in irrigation scheduling, and inclusion of Xeriscape principles in landscaping planning, installation and management.

Policy WATER 1.3 Do not approve future development within the City unless an adequate supply of quality water is available or will be developed prior to occupancy.

MUNICIPAL WATER SUPPLY

GOAL WATER 2. Ensure sufficient supply of high quality water for the Davis Planning Area.

Policy WATER 2.1 Provide for the current and long-range water needs of the Davis Planning Area, and for protection of the quality and quantity of groundwater resources.

Actions

- a. Study the full costs and benefits (including point-of-origin costs) of importing surface water as a supplemental source for municipal use for the purpose of improving water quality or preserving the integrity of the water supply.
- b. Periodically update the Water Supply Master Plan.
- c. Periodically review and update the Urban Water Management plan as established by the California Urban Water Management Planning Act. This plan chronicles the City's past/current/projected water supply and water use as well as detailing the conservation programs and best management practices adopted by the City.
- d. When opportunities arise, plan and design water demand uses to be matched with appropriate water supply qualities. For example, larger areas of landscape or some non-residential uses may be able to use water from lower quality supplies which would reduce demand on higher quality supplies needed for other urban uses.

Policy WATER 2.2 Manage groundwater resources so as to preserve both quantity and quality.

Actions

- a. Continue to monitor the quality of water produced by City wells and take corrective actions as needed to maintain or improve groundwater quality.
- b. Continue to distribute to residents the results of water quality testing and compliance with State and Federal standards.
- c. Develop a Groundwater Management Ordinance to ensure maintenance of groundwater quality.
- d. Identify the primary areas of groundwater recharge for the City.

- e. Support efforts to implement conjunctive water use (coordinated surface and groundwater uses) to stabilize long-term groundwater levels and improve water quality in the Davis Planning Area.
- f. Where feasible and consistent with General Plan land-use policies, locate stormwater-retention ponds in areas where soil is suitable for groundwater recharge.
- g. Study the impact of injection wells.
- h. Prohibit use of injection wells as a means of waste disposal.

Policy WATER 2.3 Maintain surface water quality.

Actions

- a. Continue to implement best management practices and policies incorporated in the Urban Water Management Plan and other adopted plans.
- b. Continue to monitor and enforce, at the local level, provisions to control non-point source water pollution contained in the United State Environmental Protection Agency NPDES program.
- c. Continue to enforce provisions to control erosion and sediment from construction sites.

DRAINAGE

GOAL WATER 3. Design stormwater drainage and detention facilities to maximize recreational, habitat and aesthetic benefits.

Policy WATER 3.1 Coordinate and integrate development of storm ponds and channels City-wide, to maximize recreational, habitat and aesthetic benefits.

Standards

- a. Flood retention and detention facilities should be integrated with parks, athletic fields and natural areas.

Actions

- b. Prepare management plans for storm drains and channels that stress recreation, long-term landscape maintenance and wildlife habitat.

Policy WATER 3.2 Coordinate and integrate design, construction, and operation of proposed stormwater retention and detention facilities City-wide, to minimize flood damage potential and improve water quality.

Standards

- a. All new development shall include drainage facilities that are designed to accommodate a minimum of a 10-year recurrence design flow. In addition, all new development shall route the 100-year recurrence event and appropriately mitigate for both the increase in flows from the site due to development, and for runoff volumes which have historically occurred on the site.

Storm drainage facilities with open, naturalistic channels are encouraged, where feasible. Such facilities can minimize impacts on the city's system, add to the water table, and provide an open space amenity, although long term maintenance costs must be considered. In addition, properly designed plantings within and adjacent to drainage facilities can serve to treat urban runoff, reducing downstream impacts.

- b. New development's detention and retention facilities shall be designed so as not to cause significant negative impact to other drainage facilities in the watershed.

Actions

- c. Implement on-site storm drainage treatment facilities in City projects wherever feasible.
- d. Operate City storm drainage treatment facilities as demonstration projects, and include long term water quality monitoring.

REGIONAL COORDINATION

GOAL WATER 4. Monitor issues in the region that affect quality and quantity of water in the Davis Planning Area.

Policy WATER 4.1 Research, monitor and participate in issues in Yolo County and the area of origin of the City's groundwater that affect the quality and quantity of water.

Policy WATER 4.2 Maintain contact with other appropriate State, Federal and local agencies.

Actions

- a. Continue to work cooperatively with UC Davis, Yolo County, the Flood Control District and other cities through the Water Resources Association (WRA) and other means to address regional water issues.
- b. Continue to take a leadership role in the region regarding appropriate management of water resources in Yolo County.
- c. Continue participation with other agencies and landowners to evaluate conjunctive water use alternatives in the Davis Planning Area.
- d. Coordinate with Yolo County to explore a regional water policy that discourages permanent out-of-area transfers and sales of groundwater.
- e. Establish cooperative agreements with public entities having jurisdiction over Davis' groundwater recharge areas. These agreements should protect and preserve the city's groundwater.

WASTEWATER

GOAL WATER 5. Remain within the capacity of the City wastewater treatment plant.

Policy WATER 5.1 Evaluate the wastewater production of new large scale development prior to approval to ensure that it will fall within the capacity of the plant.

Policy WATER 5.2 Provided that the existing plant capacity is not exceeded, require new large scale development to pay its fair share of the cost of extending sewer service to the site.

Action

- a. Require new large scale development to include a funding mechanism for the installation and maintenance of sewer service to the site.

