

## **Section P**

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# Water Management Opportunities

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### **P.1 Introduction**

This section concludes the IRWM Plan by identifying opportunities to improve regional water management. In doing so, this section:

1. Identifies solutions to stakeholder identified problems
2. Discusses the processes of plan implementation
3. Illustrates project integration to meet multiple resource management objectives

### **P.2 Water Management Opportunities**

#### **P.2.1 Water Supply Augmentation Measures**

There are a number of water supply augmentation measures which are currently being contemplated. Amongst these are programs which are pertinent to other organizations and those which are driven by regulations and guidelines. As is the case with the IRWMP area, these programs have somewhat of a division between municipal and industrial water management issues and those of the agricultural community.

Augmentation measures related to municipal and industrial uses include putting shuttered groundwater extraction facilities back into operation with the assistance of treatment methodologies. As shuttering wells from systems due to contamination often causes a skew within the groundwater reservoir, problems associated with mounding and over-drafting can be partially addressed with a more even distribution of water extraction made available by utilizing mechanisms such as well head treatment.

A water supply augmentation program is currently operated by the Lower Tule River Irrigation District. Under this program, partners of the Lower Tule River Irrigation District participate in the construction of groundwater banking facilities and the purchase of water supplies during wet years to recharge these facilities. The partners have access to this water in dry years when local water supplies are insufficient to meet demand. This program is collaborative, encourages groundwater sustainability, and increases the district's resiliency to drought and climate change. This program could be expanded throughout the IRWMP area to increase supply in other water management planning areas.

Several opportunities exist to address agricultural water supply augmentation. These opportunities vary in terms of their level of development. One developed program involves those related to the San Joaquin River Restoration Settlement actions. This program offers funding assistance for programs which are designed to replace the water supply lost as a result of previously allocated water from the San Joaquin River to the River below Millerton Reservoir for purposes of reintroduction and maintenance of an anadromous fishery. Most, if not all members of DCTRA are affected by the Settlement action and are therefore eligible to participate in the program to mitigate the effects of Settlement implementation.

A program involving the improvement of the surface water distribution system in the northern part of the Porterville Irrigation District is currently in the project development phase. While it would be a paradigm shift for the PID to deliver water directly to all of its landowners/growers, the Board of Directors is considering this program due to the declining levels of groundwater in the subject area. PID would utilize its Friant Division, CVP contract as the principal mechanism to provide water to these facilities, augmented from agreements with mutual water companies with pre-1914 water rights from the Tule River.

Additional programs have been discussed to augment the water supply and improve the delivery of water to concentrated water use areas, such as East Porterville. Augmentation of the groundwater extractions in this area would allow for existing groundwater conditions to remain, to the extent that demand could be offset by an imported supply in lieu of groundwater pumping. This program would provide benefit to East Porterville, a portion of the agricultural community, and downstream municipal and industrial users, such as the City of Porterville.

Programs based on cooperative partnerships between municipal and industrial water consumers are currently being developed. For example, the City of Porterville works with property owners to recycle wastewater for agricultural use outside of town. This augments groundwater supply for municipal and industrial purposes.

Banking programs have been developed which call for partners to supply Central Valley Project water (Friant Division Class 1) for groundwater recharge during above-normal and wet years in exchange for water reimbursement during dry years. The amount of water required from partners during wet years is determined based on negotiated ratios that reflect the value of dry year surface water entitlement.

### **P.2.2 Water Demand Reduction Measures**

A number of water demand reduction measures are already in effect within the DCTRA IRWM area. Principal amongst these are the utilization of rate structures associated with metered deliveries for domestic, commercial and industrial consumption with accompanying rate structures which can be varied to encourage conservation. In addition, household plumbing retrofits and installation of improved technology, including low-flow plumbing devices, are mandated to be installed in new construction, as well as retrofits requiring a building permit.

On the agricultural use side, considerable improvement in agricultural irrigation delivery efficiency has been accomplished over the last several decades. Complete conversion of fields from furrow and flood irrigation to low-volume micro sprinkler and drip irrigation has occurred. These conversions are common within the permanent plantings areas of IRWMP area. The greatest opportunity for demand reduction, however, is that associated with the elimination of multi-cropping in a single year. Double cropping in certain parts of the IRWMP area is common as the growing season is year-round and readily accommodates both summer and winter crops. In some cases, adjustment of crop types and the nature of the harvest has allowed for both triple-cropping and quadruple-cropping. The impacts of these cropping choices on the groundwater reservoir when there is insufficient surface water supply is beginning to be understood. It is likely that demand reduction procedures undertaken in the future will call for the reduction and/or elimination of a significant portion of this multiple-cropping if declining groundwater level trends are to be abated.

### **P.2.3 Flood Control Projects and Programs**

Flood control facilities are being considered for Frashier Creek, Deer Creek and White River. In addition, off-stream storage related to the Friant-Kern Canal and its relationship to flood flows on the San Joaquin River has given rise to the evaluation of Hungry Hollow as a potential off-stream storage site. This concept was included in the proposed East Side Division, CVP, the planning of which was abandoned by the U.S. Bureau of Reclamation. To date, projects on minor stream systems have not been given consideration due to the low-volume discharges from these facilities and the infrequency of storm-water and flood related events. Whether this remains the situation in the future is yet to be determined.

### **P.2.4 Water Quality Improvement Opportunities**

The most significant future opportunities for groundwater quality improvement lie in outreach education and employment of Best Management Practices related to application of pesticides and herbicides. This educational component applies to both the urban and rural development regions of the IRWM area, as well as the agricultural areas. Both areas are potential sources of contamination leading to the degradation of groundwater supplies. Avoidance of contamination is the strongest method to assuring future beneficial use capability of existing surface and groundwater supplies.

The pilot disadvantaged community drinking water outreach program currently being developed by the Kaweah Delta Water Conservation District (KDWCD), will hopefully identify additional water quality improvement opportunities. It is acknowledged that most water quality improvements within both the KDWCD IRWMP area and the DCTRA IRWMP area will be oriented to human consumption purposes. Levels of constituents, such as those of nitrates, may benefit agriculture but are averse to human health. Likewise, pumping groundwater with residual quantities of DBCP and 1,2,3-TCP is not averse to agricultural operations and allows for reduction in the level of these contaminants in the environment, but can lead to volatilization associated with pumping and exposure to sunlight when applied for irrigation application purposes. The pursuit of the implementation of this pilot program is currently a priority of Tule River Basin IRWM and, to date, has received a positive response from the representatives of potential beneficiaries of this process.

## **P.3 Other Water Management Measures**

### **P.3.1 Land Use Policies**

Of critical importance in the water resources management opportunities which exist within the DCTRA IRWMP area, is the matter of improved land use policy decisions. Currently, most land use policy decisions, particularly those which allow for the placement of developed subdivisions and farmworker housing installations in areas with known groundwater contamination, occur without thought to that existing contamination. It is a goal of the DCTRA IRWMP to intensify discussions with land use policy decision makers, bringing attention to the gravity of this situation and providing input as to how their land use planning policies could avoid many of the adverse drinking water situations which are being developed. If the resolution of providing high quality drinking water to rural residents is to be properly addressed, the land use policy decision making process is the first and foremost arena in which attention to improvement needs to be given.

### **P.3.2 Water Supplies for New Development**

In addition to groundwater quality, groundwater quantity should be taken into account when addressing the proper placement of new development to ensure adequate water supplies exist. Policies, such as those that have been developed for the City of Porterville to evaluate the relationship between the development of a project and water balance, will need to be extended to other areas within the region.

These policies have resulted in a recommendation to require impact fees for developed projects to generate funding to for future water purchase. Additional policy considerations associated with the City of Porterville will also need to be given in the future. Their recent policy, calling for maintaining a position of only extracting water from the groundwater reservoir where said extractions are within the safe yield of the groundwater structure, will bring about a myriad of changes in lifestyle. In particular, landscaping considerations under this type of policy adoption would be considerably different than those which currently exist. High volume demands for landscaping during summer months would virtually need to be eliminated. In addition, conservation practices would need to be employed, such as the rural practice of utilizing water supplies to introduce moisture into the dirt for dust abatement and atmospheric cooling conditions. In an over-drafted groundwater basin, it is envisioned that future policies will be directed principally at these two related urban water uses. New developments will lead the way with landscaping requirements and provisions for dust control built into project development considerations. Eventually, it is envisioned that the policies and procedures which are generated as a result of applications for new development will roll over into existing rural development related ordinance restrictions. It is acknowledged that the current groundwater declining trends cannot be sustained into the future with water uses remaining status quo.

### **P.3.3 Agricultural Crop Water Management Measures**

Previously noted, water demand reduction measures potentially exist where multiple cropping patterns contribute high water demands and groundwater overdraft. In addition to exacerbating water quality related concerns, over-drafting can lead to increased power consumption related to pumping, the need to develop additional power grid improvements to accommodate increases in power demand, and falling groundwater conditions which both reduces the useful life of the pumping unit and creates adverse conditions from an aesthetic perspective.

Already existing, but in somewhat an aggravated current condition, is the matter of subsidence. The importation of water, both on the east and west sides of the IRWMP area, has led to groundwater extractions over-drafting principally sand and gravel aquifers, in lieu of pulling water from the clay lenses in groundwater wells. Over-draft conditions currently occurring within the IRWMP planning area are pulling water molecules out of the clay lenses which eliminates the support structure offered by the water molecules and can lead to collapse due to the loss of structural support. Once this happens, the water storage capacity is permanently lost due to the weight of the overburden on the clay lens.

In addition to interference with the gravity delivery of surface water, numerous structural problems associated with roadways, drainage systems and constructed buildings, including single-family residences, occur. Evidence of this subsidence accelerating beyond historic levels is beginning to be documented. An element of the DCTRA Groundwater Management Plan is associated with documentation of this occurrence and the degree to which it exists. Improvements and a more significant outreach in this regard

are anticipated to be incorporated into the next update to the DCTRA Groundwater Management Plan, which is currently in progress.

### **P.3.4 County Systems Infrastructure Improvements**

As the County of Tulare has elected to act in the role as lead agency for several rural hamlet water systems, monthly costs associated with the operation and maintenance of these systems has been observed to be a major issue. At the current time, many of these systems are having their costs subsidized by the General Fund of the County of Tulare and several attempts to correct this trend through Proposition 218 related procedures have met with failure. It should be recognized that this situation will intensify in the future as these systems become older and maintenance costs increase. Additionally, the costs associated with the replacement of obsolete and deteriorated facilities is high.

The affordability of drinking water supplies that meet applicable state and federal drinking water standards is a primary land use should become a critical element in water management planning. Systems deterioration and abandonment due to the lack of proper financial planning and land use planning are situations which are to be avoided based on policies and procedures associated with this IRWMP.

#### Pilot Studies

In an attempt to begin to address the issues related to disadvantaged community water supply and water quality related issues, the County of Tulare acted as lead agency for a multi-county effort to address water and wastewater related issues for disadvantaged communities. Four counties took part in this effort. The pilot studies address issues not only related to water quality, water supply and their related technical issues, but also administrative, managerial and finance issues critical to the maintenance and well-being of rural water supply systems. The fourth pilot study deals with individual household water supply and wastewater treatment and disposal systems. The final report is completed and is available for use.

#### SCADA Expansion

Another water management measure which is increasing in its importance to optimized water management is the installation and maintenance of Supervisory, Control and Data Acquisition Systems. Otherwise known as SCADA Systems, installation of same allows for remote monitoring and remote control of water management related facilities. Whether these facilities are surface water oriented, groundwater oriented or in response to power production, significant efficiencies can be achieved through the utilization of this equipment and its related software systems. Consideration of increased design, installation and maintenance of these systems within the IRWMP area is encouraged and offers opportunity for improved management of available water supply resources.