

# DRAFT

## CALFED CONJUNCTIVE USE PROGRAM

### I. Introduction

The CALFED Bay-Delta Program is developing a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. Three alternatives to accomplish this mission have been developed as described in the draft EIS/EIR released in March 1998. Each of the alternatives includes varying configurations of system storage, including surface storage and conjunctive use of surface water and groundwater.

The conjunctive use element of CALFED's program is being pursued through outreach to local communities to determine which areas would be interested in participating in a locally-controlled conjunctive use program. The first phase of these efforts is described in the November 12, 1997 Status Report on the CALFED Groundwater Outreach Program prepared by Anthony M. Saracino, CALFED's groundwater consultant.

CALFED's proposed Conjunctive Use Program is designed to facilitate voluntary conjunctive use and groundwater banking opportunities as one way to help achieve system storage goals while protecting groundwater resources. This report provides background information on California's groundwater conditions and describes the elements of CALFED's proposed conjunctive use program.

### II. California Groundwater Overview

Groundwater is a crucial component of California's water supply, providing about 30 percent of the urban and agricultural water used in California. During drought years groundwater provides up to two-thirds of the water used. The total amount of groundwater stored in California's 450 basins is estimated by the California Department of Water Resources (DWR) to be 850 million acre-feet. But only about half of this water is useable, because:

- additional extraction would induce saline water intrusion
- the groundwater is already too poor in quality
- the depth to groundwater makes it uneconomical to pump to the surface

- extraction could cause subsidence.

That leaves about 425 million acre-feet of available and useable groundwater in this state. When full, California's surface water reservoirs store about 43 million acre-feet of water. Groundwater basins, therefore, store almost 10 times as much useable water as surface water reservoirs.

The table below, derived from DWR's Bulletin 160-98, summarizes the estimated 1995 annual groundwater extractions by hydrologic region, expressed in thousands of acre feet (taf).

Hydrologic Region	Average Year Supply (taf/yr)	Drought Year Supply (taf/yr)
North Coast	263	294
San Francisco Bay	68	92
Central Coast	1045	1142
South Coast	1177	1371
Sacramento River	2672	3218
San Joaquin River	2195	2900
Tulare Lake	4340	5970
North Lahontan	157	187
South Lahontan	239	273
Colorado River	337	337
TOTAL	12,493	15,784

As the above table shows, the greatest extractions of groundwater in California are from Central Valley basins. These extractions have led to long-term declines in groundwater levels in many of these Central Valley basins, a condition known as overdraft. CALFED is proposing to help develop projects that will result in up to 750 taf of potential groundwater storage in the Central Valley. These projects will help to increase local water supply reliability and mitigate overdraft conditions. CALFED recognizes, however, that it is important to understand groundwater basin conditions in areas contemplated for conjunctive use projects in order to prevent adverse impacts,

such as subsidence, water quality degradation, and depletion of stream flows. As described later in this report, CALFED's conjunctive use program is centered around implementation principles that require conjunctive use projects to be voluntary, locally controlled, and designed to either prevent or adequately compensate for third-party impacts resulting from project operations.

### III. California Groundwater Law<sup>1</sup>

The law of groundwater rights is essentially a system of rules developed in court decisions that are designed to assign priorities and allocate a scarce natural resource during shortages. Prior to 1949, these decisions primarily focused on issues related to interference between wells. Within the last forty to fifty years, however, much of the state's groundwater law has been developed in the context of groundwater basin adjudications through the courts.

When California was admitted to the union in 1850, the legislature adopted the English common law as the governing law of the state courts. Under the common law rule, the landowner owns everything beneath the surface of his land and is entitled to whatever groundwater can be pumped from beneath the land. The quantity of water thus available for extraction by the overlying landowner was virtually unlimited.

In the 1903 case of *Katz v. Walkinshaw*, the California Supreme Court adopted the rule of "correlative rights." Under this rule, each overlying landowner is entitled only to his reasonable correlative share of the common supply. The *Katz* court found disputes between overlying landowners, where the supply was insufficient for all, were to be settled by giving each landowner a "just and fair proportion" of the groundwater supply. This rule of correlative rights was subsequently imposed on the doctrine of reasonable use, resulting in what is now known as the doctrine of correlative rights.

Despite this doctrine, groundwater is a "common pool" resource and problems of excessive pumping commonly lead to a "tragedy of the commons." When each overlying owner calculates the cost and benefits of increased pumping and determines that the advantage of additional water exceeds the disadvantage of a slightly lowered water table and increased pumping costs, the tragedy is that the "commons" is depleted and everyone suffers the consequences. The current scheme has consequently resulted in uncertainty over the existence, extent and priority of groundwater rights between users which in some basins has led to adjudication of the groundwater basin.

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<sup>1</sup>This section is adapted from *California Groundwater Management*, Groundwater Resources Association of California, 1998

California has developed a system of groundwater rights in which overlying rights (similar to

riparian), appropriative rights and prescriptive rights are recognized. Overlying rights attach to percolating groundwater and are the prior and paramount rights to groundwater, usually held by property owners who hold an interest in property overlying a groundwater basin. Appropriative rights to percolating groundwater are based on the concept that an entity uses water for reasonable and beneficial purposes on non-overlying land. The appropriator is limited, however, to the use of "surplus" water, which is the water in excess of the cumulative water requirements of all overlying owners.

Public use of groundwater, such as sales to retail customers, is characterized as an appropriative use and not as an overlying use. Municipalities and water districts typically hold appropriative rights to groundwater because they generally do not possess an ownership interest in land overlying a groundwater basin. A municipality, including private water companies which supply municipal water, can exercise an overlying right only to the extent that it uses groundwater on city-owned land overlying the groundwater basin.

Overlying rights are also considered correlative with all other similarly situated property owners who overlie the common groundwater supply. A correlative right simply means that all overlying owners have equal rights to pump groundwater from the basin. Where the overlying owners do not fully utilize the available safe yield of the basin, a surplus exists which is available for appropriation by others.

All groundwater rights, whether overlying or appropriative, are limited by the concept known as "safe yield." The term "safe yield" is a technical definition of basin yield that has been adopted by the courts to delineate the legal rights to extract groundwater in a basin. Safe yield is generally characterized as being equivalent to the annual replenishment the groundwater basin receives from all hydrologic sources. Safe yield is reached when the amount of water being pumped equals the replenishment coming to the basin by rainfall, return waters, runoff and underflow. Overdraft of the groundwater basin begins whenever extractions increase to the point where the surplus ends and the safe yield is exceeded. The generally accepted legal definition for safe yield is "the maximum quantity of water which can be withdrawn annually from a groundwater supply under a given set of conditions without causing an undesirable result."

An undesirable result is commonly characterized as a falling water table as total extractions exceed the amount of recharge or inflow to the basin, resulting in eventual depletion of the supply. In turn, the falling water table may induce adverse environmental impacts such as water

quality degradation or land subsidence. To evaluate whether an undesirable result has occurred, the impact of the withdrawals on water levels is usually measured over several years (or major hydrologic (wet-dry year) cycles) to establish a trend. If the trend is a continual drop in water levels, even after wet year conditions, then the results are considered undesirable. It is possible to increase the safe yield of a basin by inducing additional inflow and minimizing rejected recharge.

A groundwater basin's lack of storage space combined with a limitation of extractions to safe yield does not allow for the capture of additional available water and may result in a potential waste of water in wet years. Under those circumstances, the amount of water which, if withdrawn, would create the storage space necessary to avoid the waste and not adversely affect the groundwater basin's safe yield is a "temporary surplus" available for appropriation. Thus, modern courts allow parties to exceed the hydrologic budget for a basin where a temporary surplus can be extracted resulting in enhanced operation of the basin and an increase in the amount of water available for extraction by all parties.

#### **IV. California Groundwater Management**

The concept of "groundwater management" means different things to different people because it generally incorporates the political, institutional, legal, and technical issues that vary from area to area. In its most basic sense, management refers to the control and supervision of groundwater resources. Relatively little regulation of groundwater extractions has occurred beyond the 16 adjudicated basins in Southern California. Typically, groundwater management has been limited to local physical operations, such as water level monitoring, water quality monitoring and water replenishment.

In addition to the physical and chemical control and operation of the resource is the question of governance, including the act, manner, function or power of government. In developing any type of groundwater management plan, the jurisdictional question of *who* is going to govern and *how* management will be accomplished is typically at the core of groundwater management controversies. Representation of various stakeholders in the act of management of the groundwater resource is often the critical component in achieving any degree of consensus in the development and implementation of a plan.

Faced with the variety of political, institutional, legal, and technical restraints, yet still recognizing the need for effective groundwater management, water professionals over the years have utilized several types of institutional mechanisms to implement traditional groundwater management practices: overlying property rights, local agencies, adjudicated basins, special legislation districts, AB 3030, and city and county ordinances.

### **Overlying Property Rights**

Overlying property rights, as described in the above section, allow anyone in California to build a well and extract their correlative share of groundwater, which is not defined until the basin is adjudicated. The availability and use of groundwater has increased local prosperity in some areas, and in some areas, has provided enough money to construct a water project that can convey surface water into the local area. Even though the management of groundwater may not have been closely coordinated, this has been called a form of "management."

### **Local Agencies**

Twenty-two types of districts or local agencies are identified in the California Water Code with specific statutory provisions to manage surface water. Some of these agencies have statutory authority to impose some forms of groundwater management. Some of the agencies have done so; others have not.

### **Adjudicated Basins**

In basins where a suit is brought to adjudicate the basin (e.g., Alhambra vs. Pasadena) the groundwater rights of all the overlayers and appropriators are determined by the court. The court also decides: (1) who the extractors are; (2) how much groundwater those well owners can extract; and (3) who the watermaster will be to ensure that the basin is managed in accordance with the court's decree. The watermaster must report periodically to the court. There are 16 adjudicated groundwater basins in California.

### **Special Legislation Districts**

In some parts of California, special legislation has been enacted to form groundwater management districts, or water management agencies. This legislation allows such districts to

enact ordinances to limit or regulate extraction. There are 9 of these water management agencies in California and 3 agencies that have acquired similar authority through amendments to the Water Code.

*where?*

### AB 3030

Section 10750, et seq. of the California Water Code (AB 3030, Chapter 947, Statutes of 1992) provides a systematic procedure for an existing local agency to develop a groundwater management plan. This section of the code provides such an agency with the powers of a water replenishment district to raise revenue to pay for facilities to manage the basin (extraction, recharge, conveyance, quality). Nearly 150 agencies are developing an AB 3030 groundwater management plan.

### City and County Ordinances

In 1995 the California Supreme Court declined to review a lower court decision (Baldwin vs. Tehama County) that holds that State law does not occupy the field of groundwater management and does not prevent cities and counties from adopting ordinances to manage groundwater. Tehama County retains its ordinance and Butte, Imperial, San Benito, San Diego, San Joaquin, and Yolo counties have adopted ordinances. The nature and extent of the police power of cities and counties to regulate groundwater is presently uncertain.

## V. Status of Groundwater Management

DWR is required to publish a report on the status of groundwater management plans adopted and implemented pursuant AB 3030 and other provisions of statutory and case law. A summary of the draft report, which contains information derived from an Association of California Water Agencies (ACWA) survey of member agencies, is presented below:

- over 300 agencies or districts have responded to the ACWA survey
- about 150 agencies have adopted AB 3030 plans to date
- at least 39 agencies overlie an adjudicated groundwater basin
- at least 86 agencies are located in areas where groundwater is managed by another agency, or is managed under an authority other than AB 3030

- 37 agencies do not overlie a groundwater basin
- 24 agencies reported no interest in AB 3030.

DWR recently mailed a questionnaire to the over 1000 water districts on their mailing list; responses to their survey have not yet been tabulated.

## VI. Conjunctive Use Program Linkages

Important linkages exist between the conjunctive use program and other components of a comprehensive long-term solution to resource problems in the Bay-Delta. Some of these include:

- **Storage and Conveyance.** The overall cost of new storage and conveyance projects will help set the cost of new supplies for many water suppliers. This, in turn, will influence the cost-effectiveness of conjunctive use projects for local agencies.
- **Water Transfers.** The effectiveness of conjunctive use as a means to improve overall water reliability will be dependent on a viable water transfer program that facilitates the transfer of water while avoiding or mitigating third-party impacts. Water transfers involve many political, institutional, legal and technical issues, as discussed below. CALFED is currently developing a water transfer program that will be closely linked with the conjunctive use program.
- **Ecosystem Quality.** Increased water use efficiency as a result of conjunctive use can reduce Bay-Delta water diversions, thus reducing impacts on aquatic organisms.

CALFED's conjunctive use program will be compatible with the solution principles that the program has identified to guide development of a Bay-Delta solution. These principles state that a Bay-Delta solution must:

- Reduce conflicts in the system
- Be equitable
- Be affordable
- Be durable
- Be implementable
- Not exhibit significant redirected impacts.

## VII. Groundwater Transfers

Over the last several years, greater emphasis has been encouraged by the state on moving water from where it is presently used to areas where users are willing to pay more for the water. The California legislature has in fact declared that voluntary transfers between water users can result in more efficient use of water benefiting both buyers and sellers and that such transfers can help to alleviate water shortages, save capital outlay development costs, and conserve water and energy. In the context of groundwater, experience demonstrates that effective management of the resource is not possible without the ability to regulate the terms and conditions under which water is transferred within the basin or exported from the basin. There are, however, few institutional means for determining when a transfer of groundwater should be permitted. While groundwater transfers are implemented in several of the adjudicated basins, there remains uncertainty in most basins regarding the extent of groundwater rights and the present and future needs for the groundwater resource.

Local agencies will be faced with a political dilemma over transfer issues as there will be both pressure to permit the export of groundwater and pressure to prohibit exports entirely. For example, impacts on local water needs such as the environment and the local economy of the area from which water is transferred must be considered. A groundwater management plan should accordingly address how and when groundwater transfers will be allowed. Public consensus building is therefore requisite to the adoption of a groundwater management plan which regulates transfer requests. The extent to which groundwater management plans can actually impact transfers is unclear and has not yet been tested in a court of law, with the exception of certain county imposed regulatory restrictions. Several counties are considering ordinances that require any potential exporter to obtain an export permit from the county. A permit may be denied where extractions adversely affect water levels or water quality and permit conditions may be imposed to protect the health, safety and welfare of the people of the county.

### Water Rights Considerations

Water transfers are not possible unless one of the parties holds an actual water right or has a contractual relationship with the holder of the water right. A groundwater management plan itself cannot provide the basis of the water right which is the subject of the transfer. The holder of the water right must satisfy the common law restriction applicable to water rights transfers.

The export of groundwater from land overlying a groundwater basin to land not overlying a basin is considered to be an appropriation of water. As an appropriator, the exporter has the right to use surplus water in excess of the cumulative needs of all of the overlying owners within the basin. If surplus water is not available within the basin, overlying right holders and prior appropriators are entitled to injunctive relief to prohibit the export of water which would result in injury to his or her rights.

CALFED recognizes the many concerns regarding the potential impact on water rights as a result of conjunctive use programs, and is committed to protecting landowner water rights. CALFED will address this issue, including specific protection measures, as conjunctive use projects are developed with stakeholder support and input.

### **Legislative Response**

Although there are common law restrictions related to the transfer of groundwater, the legislature has responded by promoting the transfer of water. For example, temporary transfers of water are found not to prejudice the water rights of the transferor. Water may also be available for transfer as a result of the use of conservation efforts, conjunctive use and water supply contracts. In an effort to protect local resources, county groundwater ordinances may require assurances before a water transfer market can be developed. Such ordinances may require prospective exporters of groundwater to obtain permits where groundwater pumping may affect the available water supply. The ordinance may also prohibit groundwater mining for use outside of the groundwater basin. CALFED will comply with and support county groundwater ordinances as they relate to conjunctive use projects.

## **VIII. Implementation Objectives**

CALFED has established implementation objectives to guide the development of conjunctive use

projects. These objectives, as stated below, are intended to reflect and protect the various stakeholder interests regarding conjunctive use that were identified during CALFED's groundwater outreach program.

- **Ensure that conjunctive use projects are voluntary** - One of the primary themes that developed during CALFED's groundwater outreach program is that conjunctive use projects should be voluntary. CALFED is committed to voluntary participation in conjunctive use projects and supports stakeholder participation as discussed below.
- **Provide funding support for feasibility studies** - Many water districts and agencies need funding support for feasibility studies. These studies would help determine the benefits and costs of implementing local conjunctive use projects.
- **Ensure that local water needs are met** - CALFED supports the concept that water needs within the area of origin should be met prior to developing a program for water transfer. Conjunctive use projects can be designed to benefit users within the area of origin, as well as optimize water management for transfer of surplus water outside the basin.
- **Develop appropriate compensation parameters for transferred water** - in addition to increasing total water supply and enhancing reliability, conjunctive use projects can provide income from the surplus water transferred outside the basin. The value of the water transferred will depend on a number of factors. It will be important to develop a means to determine the value of transferred water so that appropriate compensation can be made, including for mitigation of third-party impacts.
- **Coordinate the development of pilot projects** - Pilot projects have proven effective in helping to identify issues that need to be addressed for a full-scale project. CALFED will help to develop pilot projects by identifying potential projects, meeting with interested parties and stakeholders, providing available data, and conducting workshops to help educate the public.
- **Identify third-party impacts** - Numerous potential third-party impacts have been identified during the CALFED groundwater outreach program. These impacts include:
  - » Reduced well yields

- » Subsidence
- » Water quality degradation
- » Increased pumping costs
- » Costs for lowering pumps or deepening wells
- » Changes in streamflow
- » Overdrafted basins
- » Loss of water supply or water rights.

CALFED recommends that all conjunctive use projects include a detailed evaluation of potential third party impacts. Once identified, mitigation strategies and threshold parameters should be established for each potential impact.

- **Emphasize "interest-based negotiation" to ensure stakeholder input** - Stakeholder involvement and input during the development and implementation of local conjunctive use projects is a critical component. Every attempt should be made to identify all stakeholders who would be involved or potentially impacted by the proposed project.

## **IX. Recommended Steps to Implementation**

Each conjunctive use project will require a series of steps during design and implementation of the project. While the specific steps will vary from project to project, a general guide to implementation can be based on the preliminary conjunctive use principles and objectives established by CALFED. Based on these objectives, the recommended steps to implement a conjunctive use project include the following:

- **Form a steering committee** - the steering committee generally consists of those individuals initially responsible for identifying the potential conjunctive use project.
- **Identify stakeholders** - the steering committee will identify all of the stakeholder that would participate or be affected by the project. The stakeholders would be notified of the proposed project and a schedule would be established for stakeholder meetings to discuss their issues and concerns.

- **Create a local operating entity** - an entity would be created that consists of local stakeholders having direct involvement in the project. This entity would essentially be a Board of Directors that directs development and implementation of the project. The Board would include stakeholders representing third-party concerns.
- **Develop goals and objectives** - public meetings would be held to develop goals and objectives for the program. Goals can be reached by general agreement or consensus, using a facilitator if necessary. The goals should also address local concerns, such as "provide basin users with a reliable and high quality groundwater supply."
- **Evaluate existing technical data and determine what additional data are needed** - after goals have been established, a review of existing data should be performed so that data gaps can be determined. As stated previously, quality baseline data of basin conditions are crucial to the success of a conjunctive use program.
- **Perform necessary technical studies** - additional studies may be necessary to develop adequate baseline data, such as groundwater levels, water quality parameters, and streamflow measurements. A schedule and funding mechanism for the necessary studies should be established.
- **Identify potential third-party impacts** - historical data, stakeholder input and technical evaluations should be used to identify potential third-party impacts. Computer modeling also may be helpful in identifying potential impacts such as water quality degradation or subsidence.
- **Develop a monitoring program** - a good monitoring program will be essential to the success of any conjunctive use program. A well designed monitoring system will allow early identification of any potential impacts and will allow for quick modifications to the program. Every conjunctive use program should allocate sufficient funds for monitoring prior to and during project implementation.
- **Establish threshold criteria for each potential impact** - potential impacts caused by the conjunctive use program should have threshold criteria. For example, a maximum depth could be established for groundwater levels. Project operations would be



stopped if that threshold was exceeded. Threshold criteria could be established for each of the potential physical impacts, such as water quality, subsidence, streamflow changes, and well yields.

- **Prepare a written plan** - a written plan should be prepared that states the goals of the program, schedule, monitoring plan, and threshold criteria. The plan should be submitted for review by the local operating entity and revised as appropriate.
- **Modify the program based on monitoring data** - monitoring data gathered during the pilot project or during early implementation of the full project may reveal the onset of undesired impacts. These data should be used to modify the conjunctive use program to prevent the impacts from occurring. This may include stopping the project altogether if the impacts can not be prevented or mitigated to the satisfaction of all stakeholders.

## X. Goals for Phase 2 of the CALFED Program

Phase 2 of the CALFED program will continue with outreach efforts to various stakeholders, including public workshops. The information gained from these efforts will be used to further refine CALFED's conjunctive use principles and objectives. In addition to the outreach efforts, CALFED has identified the following goals for Phase 2:

- Thoroughly evaluate existing conjunctive use projects in California to help identify successful strategies and potential pitfalls
- Establish a conjunctive use advisory committee *Purpose for...*
- Research funding mechanisms for conjunctive use feasibility studies and projects
- Identify areas and stakeholders for potential conjunctive use pilot projects

The primary purpose in accomplishing the above objectives will be to better understand the issues faced during conjunctive use projects, and to use that information to help identify and implement additional projects through a committee format.

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