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CALFED Water Transfer Element

DRAFT Discussion Paper No. 7 - Protection of Groundwater Resources

Issue/Question

What should be CALFED policy regarding transfers of groundwater and surface water transfers with groundwater replacement? What policy, rules or criteria are needed to protect local groundwater resources from impairment due to these kinds of transfers?

Background

There are essentially two types of groundwater transfers: direct groundwater transfers (where groundwater is pumped into a conveyance system and transferred) and groundwater substitution transfers (where surface water is transferred and replaced with pumped groundwater).

The general legal rule is that only groundwater which is surplus to the needs of the overlying landowners can be transferred for use on non-overlying lands. (But does this refer to "surplus" in real time, say the immediate water year, or it does mean "surplus" over some longer period of time, allowing for periods of groundwater recharge?) Groundwater generally cannot be transferred from a basin in a condition of overdraft. Note that these rules apply to direct groundwater transfers but do not apply to groundwater substitution transfer where the groundwater is used on overlying lands.

Water Code Section 1220 prohibits groundwater export from the Sacramento or Delta-Central Sierra Basins (as defined in Bulletin 160-74, this appears to include the entire Sacramento Valley and the San Joaquin Valley roughly north of the Stanislaus River), unless the groundwater pumping is in compliance with a groundwater management plan adopted by county ordinance in consultation with affected water districts, and subsequently approved by a vote in the counties or portions of counties that overlie the groundwater basin. It is not clear whether groundwater can be purchased for instream flow purposes within the specified basins. (Is this an export?)

Regarding groundwater substitution transfers, Water Code Section 1745.10 says "replacement pumping" is not permitted unless it is consistent with a groundwater management plan for that area or the water supplier determines there will no be long term overdraft impact. (This section is part of Article 4, Chapter 10.5, Part 2 of the Water Code and applies only to transfers of water by a "water supplier", as defined, or an individual water user who receives water from a "water supplier", so it may not apply to all groundwater substitution transfers).

Section 1745.11 also has application to any discussion of Article 4 transfers (Section 1745 et seq.). This section provides that nothing in [Article 4] "prohibits the transfer of previously recharged groundwater or the replacement of transferred surface water with groundwater previously recharged into an overdrafted groundwater basin, if the recharge was part of a groundwater banking operation carried out by direct recharge, by delivery of surface water in lieu of groundwater pumping, or by other means, for storage and extraction."

A provision of the CVPIA requires that a determination be made that transfers of CVP water will have no long term adverse impact on groundwater conditions in the transferor's service area.

The State Board has no jurisdiction over groundwater transfers but does have authority to prohibit "waste or unreasonable use" of groundwater. Presumably the "no injury" and "no unreasonable impact" rules are applicable to transfers of groundwater and enforceable by legal action. Also, any long term transfer would require CEQA documentation which would include analysis of impacts on groundwater.

Several Sacramento Valley counties have passed ordinances restricting or limiting the export of groundwater. Similar ordinances have been considered by some San Joaquin Valley counties.

Several groundwater basins (probably 14, mostly in southern California) have been adjudicated, in which case the adjudication controls groundwater pumping and transfers.

Also, Water Code section 10750 (AB 3030) authorizes public agencies and mutual water companies to develop groundwater management plans for their service areas.

Discussion

Most transfers involving groundwater have been groundwater substitution transfers. In the San Joaquin Valley there have been some cases of groundwater exchanges, where groundwater is pumped into a conveyance system in exchange for use of surface water elsewhere on the system either concurrently or at a later time.

Ground water transfers or surface water transfers based on groundwater substitution, unless properly regulated, could result in adverse impacts to groundwater resources, with significant adverse environmental and economic effects, in the source water area. Such impacts might include land subsidence, lower groundwater levels and higher pumping costs, degradation of groundwater quality, impacts to vegetation dependant on groundwater, or in extreme cases, losses of existing wells. The potential for adverse impacts to groundwater resources makes transfers politically sensitive in source water areas, such as the Sacramento Valley.

Currently, there is no mechanism in state law for watershed based management of groundwater resources. This may lead to inconsistent approaches to groundwater management by local agencies, with adverse effects on the development of a statewide water transfer market. The absence of any mechanism for watershed based groundwater management makes it more difficult to develop conjunctive use programs and other tools for more effectively managing groundwater and surface water.

There are several specific issues presented by groundwater based transfers. First, when and subject to what conditions can groundwater be directly transferred and exported out of the basin? (A corollary question is whether the rules are or should be different for in-basin groundwater transfers?) What impacts should be considered - water quality, pumping levels, short term overdraft, long term overdraft, impact on surface flows, others? Are there circumstances in which transferred groundwater can be replaced with surface water which becomes available later in the year and used for irrigation or recharge?

Second, when can transferred surface water be replaced with groundwater? Can replacement be done concurrently with the period of the transfer or can the water be pumped later in the year? Most groundwater substitution transfers result in no change in the cropping or irrigation patterns that would have occurred with the use of surface water. In some cases, a water user may want to transfer surface water in the spring or summer, and then pump

groundwater to replace some or all of the surface water later in the year for a different crop than would have been grown with the surface water. Should there be limits on these types of transfer to protect the local groundwater resource from overdraft and to protect other overlying users of the groundwater from the increased costs of pumping groundwater from deeper levels than would have occurred in the absence of the transfer?

In application of the "no injury" rule to a groundwater substitution transfer, the approving agency must consider whether the groundwater to be pumped satisfies the "real water" test. If the groundwater pumping would directly affect accretion to or depletion from a stream, there may not be any true increase in the water supply and thus, no real water. Also, the potential for injury to a downstream user must be analyzed.

Regarding impacts on CVP and SWP specifically, approving agencies must consider whether a transfer of groundwater or a "groundwater substitution" transfer adversely affects stream flow by inducing a depletion from the stream at a time when the Delta is in balanced conditions, thereby compelling the CVP or SWP to increase reservoir releases to maintain outflow or salinity requirements in the Delta. (Balanced conditions occur when releases from upstream CVP and SWP reservoirs plus unregulated flows approximately equal Sacramento Valley in-basin uses plus exports. Balanced conditions are maintained by regulating the rate of export pumping and/or by storage releases from upstream reservoirs.)

This issue raises a corollary question regarding the extent to which the projects are entitled under existing law to protection from the reasonable and beneficial use of groundwater by overlying owners. In other words, are the projects entitled to continued accretions to stream flow from groundwater sources, as against the overlying owner's lawful consumptive use or transfer? Is the answer different if the overlying use is to replace transferred surface water?

Both the CVP and SWP have also expressed concern in the past about the water quality problems associated with using project facilities to convey groundwater. In some cases, groundwater is of significantly lesser quality than the project's surface water supplies and introduction of groundwater into the system may create drinking water treatment problems.

A major set of issues related to groundwater transfers (and surface water transfers with groundwater substitution) is the impact on other groundwater users in the source water area. These "third party impacts" of groundwater transfers may result in lower groundwater levels, or reduced water quality of the remaining groundwater. (See Issue Paper No. 9 on Third Party Impacts.)

One common thread among these issues is the need for more complete data and better understanding about the groundwater - surface water interface, particularly in the Sacramento Valley. Improved understanding of this relationship will be essential to developing conjunctive use and banking programs, as well as enabling local water managers to make informed decisions about groundwater based transfers.

Solution Options

Local water management plans (AB 3030) incorporating rules on groundwater transfers.

Local ordinances to regulate groundwater transfers.

Analysis and public disclosure of groundwater impacts as part of short term transfer approval process.

Adjudication of groundwater basins.

Additional data regarding the Sacramento Valley groundwater basin to enable a better understanding of the relationships between surface water and groundwater and of the recharge capacity of the aquifer (or aquifers).

A regional entity (perhaps a joint powers agency of Sacramento Valley counties), or separate watershed management entities, to study the groundwater resources of a particular area and to provide technical review and advice to local agencies regarding transfers involving groundwater. (CALFED could provide financial support and/or incentives for such an entity or entities).

State legislation to more clearly define the limitations on transfers of groundwater or groundwater replacement or to require broader application of local groundwater management plans.

Other tools to respond to the third party impacts of groundwater based transfers will be discussed in Issue Paper No. 9.