State Water Resources Control Board

Water Transfer Program Information

A water transfer is a reallocation of water among water users. Water transfers provide flexibility in the allocation and use of water in California. Historically, water transfers were usually arrangements between two parties, one with surplus water supply and one in need of additional water. These two parties would reach a mutually acceptable arrangement regarding price and quantity. Approval by appropriate state and federal agencies is a necessary part of the process for these water transfers.

Over time, language was added to the Water Code to expedite the review and processing of short-term water transfers; that is, water transfers in effect less than one year. State and federal agencies developed procedures to assist in the processing of water transfers proposed by local or private entities. For example, U.S. Bureau of Reclamation (Reclamation) accommodates water transfer requests within the Central Valley Project (CVP) through the provisions of the Central Valley Project Improvement Act (CVPIA). Department of Water Resources (DWR) allows use of its State Water Project (SWP) facilities by its contractors and others under the provisions of Water Code section 1810. The State Water Resources Control Board (State Water Board) has given priority to processing short-term water transfers to accommodate the changing needs of water users.

The majority of the water transfers are short-term water transfers that are in effect less than one year. In addition, most water transfers seek to move water from northern areas of the state to central and southern areas. To accomplish this, the seller must either: (a) release water from reservoir storage, or (b) forego direct diversion of water. The water flows downstream to the Sacramento/San Joaquin Delta. In the Delta, the water is diverted using either the State or federal pumps and conveyed in the State or federal canals and delivered to the purchaser. One of the difficulties in arranging transfers is that the pumps can only be used to transfer water when Reclamation or DWR have excess pump and canal capacity. Also, the physical plumbing must be available to actually deliver the water to the purchaser. Water is generally transferred in the months of July, August and September each year. In 2013, short-term water transfers totaling 277,283 acre-feet of water were processed by the State Water Board. This was only a fraction of the total transfers for the year because the majority of the transfers are not regulated by the State Water Board.

Types of Transfers Regulated by the State Water Board:

About 95 percent of water transfers are either transfers of water between SWP contractors, or transfers of water between federal CVP contractors. This type of water transfer does not require State Water Board approval except if the point of diversion, purpose of use, or place of use under the CVP's or SWP's water rights need to be changed to accomplish the transfer. However, for a CVP contractor to transfer water to

a SWP contractor outside the CVP service area (or vice-versa), the transferring water right holder (either Reclamation or DWR) must petition the State Water Board for a change in the water rights for either a short-term transfer or a long-term transfer.

The State Water Board regulates water transfers that move water from individuals, water districts and water agencies to South-of Delta purchasers. It also regulates transfers among parties within local watersheds.

A pre-1914 water right holder can change the point of diversion, purpose of use, or place of use, if others are not injured by such change. Thus, pre-1914 water right holders are not required to petition the State Water Board to change the place of use under their right to transfer water. However, there is one situation where a pre-1914 water right holder may choose to petition the State Water Board, and that is for a temporary or long-term change for the dedication of pre-1914 water to instream use under Water Code section 1707. In this case, there are benefits from using a formal process which involves notification of all potential diverters within the instream-use reach of the stream that a portion of the water within that reach of the stream has been dedicated for instream use and is unavailable for diversion. Obtaining State Water Board approval of the change could also protect the water right holder against claims that the water is being abandoned, or that the water right should be forfeited for nonuse during the period of the dedication.

Water Transfers – What is the Water Used For?

In 2013, water was transferred for municipal and industrial use, irrigation, instream use (including salinity control and other instream uses), wildlife enhancement, and to facilitate ongoing groundwater banking programs.

The transfers approved in 2013 did not result in the diversion of additional water from the Delta or the delivery of more water to any individual water supplier or user than has been delivered historically. Instead, the changes provided a limited amount of supplemental water to water purchasers to offset a portion of their water deficiencies due to drought and lowered water deliveries by the SWP and CVP.

For municipal water users, such as the Santa Clara Valley Water District, water transfer provided a means to overcome operational difficulties. Santa Clara obtains water from the CVP at San Luis Reservoir. When the reservoir drops to specific levels, there are operational and/or water quality problems which impact Santa Clara's pumping capacity and potentially impact the ability to meet district demands. In addition, low water levels can result in reduced water quality causing water treatment problems which could result in severe reductions in the quantity of CVP supplies, as well as increased water treatment costs. Santa Clara participated in a water transfer, in order to have its water delivered by DWR. The quantities available to both the SWP and CVP were unchanged, because water was exchanged to prevent any deficits.

For groundwater banking programs, transfers can increase operational flexibility. Metropolitan Water District of Southern California stores a portion of its SWP supply in

the Arvin-Edison Water Storage District groundwater banking facilities. Arvin-Edison is a CVP contractor. If requested to do so, Arvin-Edison returns previously banked water to Metropolitan. One method to recover water in the groundwater basin is by direct groundwater extraction. Expansion of the CVP place of use, however, allows Arvin-Edison the option and flexibility to return Metropolitan's banked water through an exchange of Arvin-Edison available CVP surface water supplies. This provides greater flexibility in scheduling the return of a quantity of water equivalent to the banked supply, and reduces energy costs associated with groundwater extraction. The water provided to Metropolitan had better water quality, because surface water was returned in lieu of previously banked water. The transfer was designed as a balanced exchange of surface and previously banked groundwater, which resulted in a bucket-for-bucket (one-for-one) reduction in Metropolitans' groundwater banking account with Arvin-Edison.

For wildlife refuges, water transfers can provide a valuable supply of water to maintain fish and wildlife during times when water is not otherwise available to them. This plays a role in prevention of waterfowl diseases.

For protection of threatened and endangered species, water transfers provide a means to alter streamflow and provide water when the fisheries need the water most. In 2011, Reclamation purchased water from Merced Irrigation District for use in meeting Delta flow objectives. Under this transfer, water was released from Merced's Lake McClure during April and May of 2012 and 2013 to meet the 31-day pulse flow period in the San Joaquin River at Vernalis. The pulse flow is an enhanced flow to assist the fishery. The water also provided water quality benefits.

Are There Many Types of Water Transfers?

There are a number of types of water transfers. Water transfers are grouped into short and long-term transfers. A short-term transfer is any transfer of one-year or less. A long-term transfer is any transfer longer than one year.

There are surface water transfers and groundwater transfers. For surface water transfers, there are stored water transfers and transfer of direct diversion water. For groundwater transfers, there is use of groundwater in lieu of surface water, transfer of banked groundwater, and direct transfer of groundwater.

There are also transfers of imported water, which were previously described.

Surface Water Transfers:

In a stored water transfer, the seller releases stored water into the stream system for conveyance downstream to the purchaser or foregoes storage during a period when water would typically be stored and allows that water to flow downstream. To prevent the seller from replacing the water in the reservoir to the injury of other water users, the transfer is subject to reservoir refill criteria. Reservoir refill criteria are a set of conditions to ensure that the transfer of stored water does not affect the storage and diversion capability of the SWP and CVP. The refilling of the vacated storage could affect the ability of the SWP and CVP to store or divert water the following winter if the

winter is dry. In normal or wet years there may be sufficient water to allow the reservoir to fill and spill. In these cases, the effects of the transfer are literally washed out.

Stored water transfers may affect fisheries, both positively and negatively. The transfer is evaluated to determine if there will be a negative impact on the cold water pool in the reservoir needed for later fishery releases. The release of stored water may be beneficially timed to provide instream fisheries benefits.

Transferable water involving water that is diverted directly to use is defined as the reduction in consumptive use of water to the extent of the direct diversion rights. From a practical standpoint, transferable water of agricultural direct diversions is the reduction in evapotranspiration of applied water and the savings in water that would not have been available for downstream use. Therefore, if crops are changed or land is fallowed, the resulting reduction in evapotranspiration of applied water could be transferred. Many water conservation efforts typically do not result in changes in evapotranspiration. They often reduce the amount of surface return flow or deep percolation. In most cases these return flows are used by downstream water users and the removal of these flows could adversely affect legal downstream users or fish and wildlife.

The short-term transfer of directly diverted water is limited in Water Code section 1725 to changes in consumptive use or water that has otherwise been removed from the downstream water supply. Therefore, short-term water transfers involving conserved water do not include reduction in surface returns or reductions in deep percolation unless the returns are to a salt sink (or other unuseable source).

Long-term transfer of conversed water can include reductions in returns or deep percolation provided such reductions do not otherwise adversely affect legal users of water and the reductions in returns do not result in unreasonable affect to fish, wildlife and other instream beneficial uses.

Groundwater Transfers:

Transfers of Water Into and Out of Actively Recharged Groundwater Banks:

This type of groundwater banking project generally involves the importation of foreign surface water originating from a source not hydrologically connected to the groundwater banking site. The imported water is then injected underground or is applied to spreading grounds where it percolates into the aquifer. The banked water will then be pumped and transferred to non-overlying users during dryer years. The recharge and recovery will be conducted by (or under contract with) an overlying landowner, water district or groundwater management authority. The Kern Water Bank and the Arvin Edison/Metropolitan arrangement are examples of this type of conjunctive use project. The sequence can also be reversed in the case of full aquifers, most commonly found in the Sacramento Valley, such that native groundwater is first extracted and exported to create storage space, and then subsequently replenished from an imported surface source.

Alternatively, the recharge can be accomplished through substitution of surface water supplies for existing groundwater use; and recovery of the recharged water can be accomplished by reversing this arrangement. In an *in lieu* project, groundwater users would agree to forebear pumping groundwater during some periods and instead use surface water which they would not otherwise use, and the conjunctive use program would then utilize groundwater during drier years, over and above historical extractions, and export it or a like amount of surface water from the basin. This differs from groundwater substitution projects, which do not involve the export of groundwater and its replenishment through imported recharge water. The Semitropic Groundwater Banking Program in the San Joaquin Valley is an example of *in lieu* recharge.

In general, a proponent of a conjunctive management project bears the burden of establishing that the recharge and withdrawal of water will not adversely affect, or injure other legal users of the groundwater basin. Determining injury in the groundwater banking context is difficult due to the different standards governing surface water and groundwater. At a minimum, the groundwater banker must avoid raising the groundwater table to a level that invades the root zones of neighboring crops or neighboring structures, or cause risk of liquefaction. It must avoid unreasonably lowering the groundwater table below the level that would result in the dewatering of neighboring wells or increasing the power requirements for pumping, and/or causing subsidence or seawater intrusion. The banker must also avoid degrading the quality of the *in situ* groundwater.

The impact to water quality should also be considered relative to the no injury criterion. Commingling lower quality recharge water with *in situ* groundwater may constitute a legally cognizable injury to other groundwater users. For instance, this could be a problem with recycled municipal wastewater or surface water routed through the Delta. Even pure recharge water can mobilize salts and agricultural chemicals in groundwater basins that have been heavily irrigated historically. In urban areas, there is a similar concern that the raising of the groundwater table as a result of groundwater banking could inadvertently saturate and mobilize chemical compounds, which were previously trapped in the unsaturated upper portions of the soil strata.

In some circumstances, the project may have to obtain a change order from the State Water Board, authorizing a change in point of diversion, place of use, or purpose of use. Such orders will also require a finding of no injury to legal users of water.

The project may also have to comply with regulatory requirements imposed by a local groundwater management authority—such as an AB 3030 groundwater management authority or a permitting authority created by local government ordinance. The local bodies may potentially assert jurisdiction at both the importation/storage and extraction stages, and generally impose their own version of a no injury rule.

State Water Board Approval for Groundwater Banking:

A water right permit issued by the State Water Board is required for the appropriation of surface water for use in a groundwater recharge project, except where the project can

be carried out based on another valid basis of right. Beneficial use occurs when water is withdrawn from underground storage and put to use. It is important to note that a pre-1914 right cannot be expanded in season or quantity diverted in order to pursue a new groundwater banking project. Also, a riparian right is not suited for storage projects.

Recovering Water Banked Through "In Lieu" Arrangements:

Under an *in lieu* arrangement, the groundwater banker would enter into arrangements with the groundwater basin right holders who already use groundwater for all or a portion of their supply and also have access to surface water deliveries. During periods when the banker desires to recharge groundwater, the overlying landowners would forego pumping and use a substitute surface water supply instead. The aquifer recharges "passively" from natural recharge and, in some cases, from percolation of the applied surface water. When the program desires to extract groundwater for export, the landowner would curtail its surface water use and substitute or increase groundwater pumping. The mass balance in the groundwater basin will be the same whether the water is actively recharged or delivered *in lieu* of groundwater pumping. In both cases during years of storage, more water is contained within the basin than would have been stored absent the program.

One difficulty with in lieu banking is that the program will not be withdrawing groundwater that it has directly and physically put into the aquifer through an active recharge program. Instead, it will require groundwater right holders in some years to forego pumping water that they are otherwise legally entitled to extract and to offset that forbearance by drawing more heavily on the aquifer in other years. California Water Code sections 1005.2 and 1005.4 treat in lieu use of an imported surface water supply as the equivalent of the use of the groundwater, thus legally preserving one's rights to the supply left in situ. As is the case with active recharge, there are problems of enforcement and accounting. In years of forbearance, the other pumpers might extract the water that the program intended to store. In years of extraction, the contracting landowner's rates of withdrawal may impair the rights of the correlative pumpers.

Groundwater Substitution Transfer:

A groundwater substitution transfer occurs when a water user agrees to transfer surface water diverted under a surface water right to another water user and instead pump percolating groundwater (i.e., groundwater not subject to the State Water Board's permitting authority) to satisfy the seller's water needs. The following example illustrates the issues associated with groundwater substitution transfers.

Agency A, an SWP contractor located north of the Delta wants to transfer water to Agency B, another SWP contractor located south of the Delta. Agency A has agreed to pump groundwater to compensate for the reduction in SWP surface water deliveries.

Agency A lies adjacent to the Sacramento River. It uses a mix of SWP contract supply and groundwater to meet water demands. Agency A provides only surface water to

water users within its boundaries. The individual water users maintain and operate their own groundwater pumping systems. Groundwater is pumped from an extensive unconfined to semi-confined aquifer that is hydraulically connected to the Sacramento River. Agency A will not be changing its cropping patterns and will not be fallowing land. Therefore, transfer of its SWP contract supply will result in a shift to increased groundwater pumping to maintain the existing crops.

From a water supply point of view the transfer is straightforward. Agency A foregoes part of its surface water diversion and pumps groundwater to make up the deficit in supply. Agency B receives the transferred water less Delta carriage water required to move the water from Agency A to Agency B. However, to successfully accomplish the water transfer described above, several issues must be addressed.

Agency A does not need a permit from the State to pump percolating groundwater to make up for the reduction in surface water. In certain areas of the State, local ordinances have been enacted to protect local water resources. These ordinances usually require a permit to transfer water, require that the transferor identify and monitor for potential impacts to third parties, and may place conditions or limits on pumping. Pumping may also be limited if the groundwater basin has been adjudicated. Local groundwater management plans adopted under Water Code sections 10750 et seq. (AB 3030) may place further limits on increased pumping from a basin. Water Code section 1745.10 further provides that a water user that makes a short-term or long-term transfer of surface water may not replace that water with groundwater unless the groundwater use is (a) consistent with any groundwater management plan adopted for the affected area, and (b) approved by the water supplier from whose service area the water is to be transferred and the water supplier, if a groundwater management plan for the area has not been adopted, determines that the transfer will not create, or contribute to, conditions of long-term overdraft in the affected basin. A third party could challenge or object to the transfer if the basin is in a state of overdraft, or if the increased pumping adversely impacts the water rights of other overlying owners who pump from the same basin.

As third parties to most transfers through the Delta, the SWP, CVP, and their respective contractors take the position that they could be adversely impacted by groundwater substitution transfers. The issue is whether increased groundwater pumping by the transferring agency results in either reduced groundwater discharge to the river or increased surface water recharge from the river to the aquifer. Either of these scenarios is possible when additional pumping by the transferring agency significantly reduces groundwater levels in aquifers near rivers that are tributary to the Delta. A significant reduction in groundwater levels in turn changes the hydraulic gradient between the river and the aquifer. Either scenario may require DWR and Reclamation to release additional water from upstream storage or reduce Delta exports to meet water quality and flow requirements in the Delta.

Groundwater substitution transfers are reviewed to determine the net amount of additional surface water supply, or transferable water, created through groundwater

substitution. Thus, the transferor must account for: (a) the amount of increased pumping that occurs in support of the transfer during the time that export facilities can convey the water, (b) the extent to which transfer-related groundwater pumping decreases stream flow (resulting from surface water-groundwater interaction), and (c) the timing of those decreases in available surface water supply.

Other Regulations Affecting Groundwater Transfer - Delta Protection:

California Water Code section 122071 prohibits the export of groundwater from the "combined Sacramento and Delta-Central Sierra basin" unless the pumping is in compliance with a groundwater management plan approved by the county board of supervisors and subsequently approved by popular vote. The statute does not distinguish native groundwater from imported, foreign water.

Local Agency Participation:

Local leadership and initiative are important factors in facilitating water transfers. Successful water transfers are typically proposed by local water agencies and benefit from local involvement in the development of these proposals. Some counties have passed local ordinances to regulate groundwater extraction for water transfer purposes. With adequate public notice, disclosure of proposals and meaningful public participation, local communities can best assess their area's need for water supplies and determine if there is a potential for transferring water outside of the local region. They can also develop mitigation monitoring and funding programs to address local concerns with water transfers as they develop. While the state and federal water agencies can assist in moving water from one area to another and ensuring the protection of larger public interests, local agencies can lead in the development of the water transfer proposal.

Also, local government is often concerned about how water transfers affect third parties and the social and economic conditions in the county. Water transfer packages need to take these issues into consideration.

Although the parties to the transfer remain responsible for the mitigation of impacts, the optimal approach would be to design programs that minimize or eliminate impacts. The discussion of options for dealing with third parties impacted by a water transfer, and also options for counties impacted socially and economically by a water transfer, needs to take place during the development of a water transfer program. This participation up front will allow local government to help facilitate water transfers that will address local concerns.

As each water transfer is being developed, the following three factors, set forth in various sections of the Water Code, must be evaluated regardless of the approval process for the water transfer:

(1) prevention of injury to other legal users of water;

(2) avoidance of unreasonable effects on fish and wildlife; and

(3) if water is moved by the SWP or other state, regional, or local public agency, actions needed to avoid the unreasonable effects on the overall economy in the county from which the water is transferred.

Including these actions as part of the water transfer from its initial design, as well as a brief assessment of how the proposed transfer would serve public interests, will assist greatly in making the water transfer succeed.