

# RECLAMATION

*Managing Water in the West*

**Record of Decision**

## **Long-Term Water Transfers**

*Prepared by*

**United States Department of the Interior  
Bureau of Reclamation  
Mid Pacific Region**



**U.S. Department of the Interior  
Bureau of Reclamation  
Sacramento, California**

May 2015

## **Mission Statements**

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

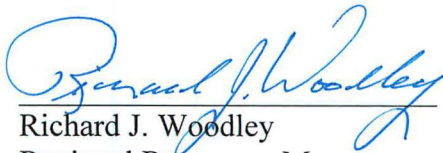
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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

# Record of Decision

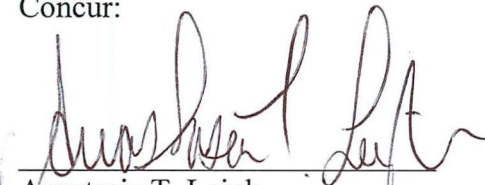
## Long-Term Water Transfers

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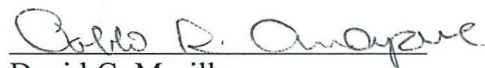
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FOR

# Summary of Action

The Bureau of Reclamation (Reclamation) and the San Luis & Delta-Mendota Water Authority (SLDMWA) prepared the Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to evaluate the potential impacts of approving a range of potential water transfers from water contractors north of the Delta to Central Valley Project (CVP) water contractors south of the Delta. The alternatives evaluated in this EIS/EIR include potential transfers of CVP and non CVP water from north of the Delta to CVP contractors south of the Delta (certain members of the SLDMWA, East Bay Municipal Utility District, or Contra Costa Water District) requiring the use of CVP and SWP facilities. Water could be made available for transfer through groundwater substitution, cropland idling, crop shifting, reservoir release, and conservation. The EIS/EIR evaluates potential impacts over a 10-year period, 2015 through 2024. Reclamation's Federal Action is to (1) review any proposed transfers and approve them (if appropriate); and (2) facilitate the conveyance of proposed and approved transfers through the Delta.

## Decision

Reclamation's decision is to implement Alternative 2, Full Range of Transfers (Proposed Action), involves reviewing, approving, and facilitating proposed transfers over a ten year period. Transfer water may be made available from groundwater substitution, reservoir release, cropland idling, crop shifting, and conservation. This decision does not directly approve any specific transfer, but approves a set of criteria that must be met to transfer water. Buyers and sellers must implement measures incorporated into the Proposed Action to avoid or reduce potential environmental impacts to obtain Reclamation approval of the transfer. Reclamation technical experts review all proposed transfers prior to approval of the transfer to ensure that impacts of the proposed transfer are within the scope of analysis in the EIS/EIR and include all environmental commitments and mitigation measures.

## Alternatives Considered

### No Action Alternative

Under the No Action/No Project Alternative, Central Valley Project (CVP) related water transfers through the Delta would not occur during the period 2015-2024. However, other transfers that do not involve CVP water or facilities could occur under the No Action/No Project Alternative. Additionally, CVP transfers within basins could continue with Reclamation's approval. Under the No Action/No Project Alternative, some agricultural and urban water users may

face potential shortages in the absence of water transfers. To the extent transfer water is not available, there would be demand that would be unmet by surface water. Demand may be met by increasing groundwater pumping, idling cropland, reducing landscape irrigation, land retirement, or rationing water.

## Action Alternatives

The measures that moved forward for more detailed analysis in the EIS/EIR were those that responded to the NEPA purpose and need and CEQA objectives, minimize negative effects, were potentially feasible, and represented a range of reasonable alternatives. The measures remaining after the initial screening were combined into three action alternatives that were selected to move forward for detailed analysis in the EIS/EIR (in addition to the No Action/No Project Alternative). Table 1 presents the alternatives carried forward for analysis in the EIS/EIR. Analysis of these alternatives provided the information needed to make a decision, and provided the potential to mix and match elements of the alternatives, if needed, to create an alternative that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any significant environmental effects.

**Table 1 - Alternatives Analyzed in the EIS/EIR**

Alternative Number	Alternative Name	Description
Alternative 1	No Action/ No Project	The No Action/No Project Alternative represents the state of the environment without the Proposed Action or any of the alternatives.
Alternative 2	Full Range of Transfers (Proposed Action)	Water made available for transfer through <ul style="list-style-type: none"> <li>• Groundwater substitution</li> <li>• Reservoir release</li> <li>• Cropland idling and shifting</li> <li>• Conservation</li> </ul>
Alternative 3	No Cropland Modifications	Water made available for transfer through <ul style="list-style-type: none"> <li>• Agricultural conservation (Seller Service Area)</li> <li>• Groundwater substitution</li> <li>• Reservoir release</li> </ul>
Alternative 4	No Groundwater Substitution	Water made available for transfer through <ul style="list-style-type: none"> <li>• Agricultural conservation (Seller Service Area)</li> <li>• Cropland idling transfers – rice, field crops, grains, alfalfa</li> <li>• Crop shifting</li> <li>• Reservoir release</li> </ul>

A water transfer temporarily moves water from a willing seller to a buyer. To make water available, the seller must implement a measure(s) to reduce consumptive use or use water in storage. Potential measures to make water available for transfer include:

- *Groundwater substitution*: groundwater substitution transfers occur when sellers choose to pump groundwater in lieu of diverting surface water supplies, thereby making water available for transfer. Sellers making water available through groundwater substitution actions are agricultural and M&I users.
- *Reservoir release*: buyers could acquire water by purchasing surface water stored in reservoirs owned by non-Project entities (not part of the CVP or SWP). To ensure that purchasing this water would not affect downstream users, Reclamation would limit transferred water to what would not have otherwise been released downstream absent the transfer. Additionally, the reservoir can only refill storage when downstream users would not have otherwise captured this water, either in downstream reservoirs or at the CVP and SWP or other pumps in the Delta.
- *Cropland idling*: cropland idling makes water available for transfer that would have been used for agricultural production.
- *Crop shifting*: water is made available when farmers shift from growing a higher water use crop to a lower water use crop. The difference between the water used by the two crops would be the amount of water that can be transferred.
- *Conservation*: conservation transfers must include actions to reduce the diversion of surface water by the transferring entity by reducing irrecoverable water losses. The amount of reduction in irrecoverable losses determines the amount of transferrable water.

Table 2 lists the agencies that have expressed possible interest in selling water and the potential maximum quantities available for sale under Alternative 2. Actual quantity of water sold could be less, depending on hydrology, the amount of water the seller is interested in selling in any particular year, the interest of buyers, and compliance with Central Valley Project Improvement Act (CVPIA) transfer requirements, among other possible factors. Alternative 3 would not include cropland idling or crop shifting transfers, and the amount of water potentially available for sale is reduced (maximum potential of 390,595 acre-feet). Alternative 4 would not include groundwater substitution transfers, and the upper limit for potential transfers would be a maximum potential of 277,462 acre-feet.

**Table 2. Potential Sellers (Upper Limits)**

<b>Water Agency</b>	<b>Maximum Potential Transfer</b>
<b><i>Sacramento River Area of Analysis</i></b>	
Anderson-Cottonwood Irrigation District	5,225
Conaway Preservation Group	35,000
Cranmore Farms	8,000
Eastside Mutual Water Company	2,230
Glenn-Colusa Irrigation District	91,000
Natomas Central Mutual Water Company	30,000
Pelger Mutual Water Company	3,750
Pleasant Grove-Verona Mutual Water Company	18,000
Reclamation District 108	35,000
Reclamation District 1004	17,175
River Garden Farms	9,000
Sycamore Mutual Water Company	20,000
Te Velde Revocable Family Trust	7,094
<b><i>American River Area of Analysis</i></b>	
City of Sacramento	5,000
Placer County Water Agency	47,000
Sacramento County Water Agency	15,000
Sacramento Suburban Water District	30,000
<b><i>Yuba River Area of Analysis</i></b>	
Browns Valley Irrigation District	8,100
Cordua Irrigation District	12,000
<b><i>Feather River Area of Analysis</i></b>	
Butte Water District	17,000
Garden Highway Mutual Water Company	14,000
Gilsizer Slough Ranch	3,900
Goose Club Farms and Teichert Aggregates	10,000
South Sutter Water District	15,000
Tule Basin Farms	7,320
<b><i>Merced River Area of Analysis</i></b>	
Merced Irrigation District	30,000
<b><i>Delta Region Area of Analysis</i></b>	
Reclamation District 2068	7,500
Pope Ranch	2,800
<b>Total</b>	<b>511,094</b>

Water transfers must be consistent with State and Federal law. Transfers involving water diverted through the Delta are governed by existing water rights, applicable Delta pumping limitations, reservoir storage capacity and regulatory requirements.

The EIS/EIR analyzed potential transfers to CVP contractors. These potential transfers could be conveyed through the Delta using either CVP or SWP facilities, depending on availability. Some transfers may not involve CVP

contractors as sellers, but they may use CVP facilities. Any non-CVP water that would use CVP facilities would need a Warren Act contract.

## **Environmentally Preferable Alternative**

Section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision (ROD) must identify all alternatives that were considered, specifying the alternative or alternatives which were considered to be environmentally preferable. The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (CEQ 40 Most Asked Questions number 6(a)).

In choosing the environmentally preferable alternative, Reclamation considered impacts to all resources, and on balance Alternative 3, No Cropland Modifications, would have the least environmental effects associated with cropland idling. In addition, Alternative 3 has a lower potential to affect vegetation and wildlife, particularly the giant garter snake, by idling rice fields and reducing habitat. Conversely, Alternative 4, No Groundwater Substitution, would reduce the potential for environmental effects associated with groundwater substitution transfers. Alternative 4 would have a reduced potential to effect groundwater levels, water quality, streamflow, and land subsidence. For this reason, Alternatives 3 and 4 are considered environmentally preferable before mitigation is applied.

## **Basis of Decision**

Reclamation's decision to move forward is based on how the alternatives meet the project's purpose and need, the magnitude of environmental effects, and the ability to apply mitigation to reduce those effects.

While the alternatives would affect different resources in different ways, once mitigation is incorporated into the project, there would no significant adverse impacts associated with implementation of Alternative 2. Because potentially significant impacts of Alternative 2 can be mitigated to less than significant, and Alternative 2 more fully meets the purpose and need for the project, Reclamation has chosen to implement Alternative 2.

## **Purpose and Need**

The purpose of the Proposed Action is to facilitate and approve voluntary water transfers from willing sellers upstream of the Delta to water users south of the



Delta, and in the San Francisco Bay Area. Water users have the need for immediately implementable and flexible supplemental water supplies to alleviate shortages.

All action alternatives meet the purpose and need, but Alternative 2 has the most flexibility for water users to obtain water supplies from multiple sources. The No Action Alternative would not meet the purpose and need.

## Environmental Issues Evaluated

During January 2011, public scoping sessions on the development of the Long-Term Water Transfers EIS/EIR were held in Chico, Los Banos, and Sacramento. Key issues raised during the public scoping process that are applicable for inclusion in the EIS/EIR are listed below. The public in the Seller Service Area and not in the Buyer Service Area provided these comments.

- Water transfers could result in long-term impacts to groundwater, by decreasing groundwater levels and adversely affecting groundwater users that are not participating in transfers.
- The cumulative effects analysis should include all water transfers and programs that result in additional groundwater pumping in the Sacramento Valley region.
- Water transfers could result in impacts to adjacent water users, local economies, and fish and wildlife.

The alternatives were evaluated to address these issues and potential impacts to the range of environmental and socioeconomic resources relevant to NEPA and CEQA. The action alternatives have the potential to result in significant impacts to several resources (including water supply, groundwater, air quality, vegetation and wildlife, and agricultural land use) before mitigation. The differences between alternatives for these impacts include:

- *Water supply:* groundwater substitution transfers in Alternatives 2 and 3 could decrease flows in surface water bodies following a transfer while groundwater basins recharge. The change in surface water flows could decrease CVP and SWP water supply in upstream storage and Delta diversions. Mitigation Measure WS-1 (Streamflow Depletion Factor) would reduce this effect to less than significant.
- *Groundwater:* groundwater substitution transfers in Alternatives 2 and 3 could cause a reduction in groundwater levels, migration of poor quality groundwater, and subsidence in the seller areas. These effects would be

reduced through implementation of Mitigation Measure GW-1 (Mitigation and Monitoring Plans).

- *Air Quality*: groundwater substitution transfers in Alternatives 2 and 3 could increase emissions of air pollutants from the groundwater well pumps, but these effects would be reduced to a less-than-significant level through implementation of Mitigation Measures AQ-1 (Reducing pumping to reduce emissions) and AQ-2 (Operate electric engines).
- *Vegetation and Wildlife*: groundwater substitution transfers in Alternatives 2 and 3 could reduce stream flows supporting natural communities in small streams, but these impacts would be reduced to a less-than-significant level by implementation of Mitigation Measure GW-1 (Mitigation and Monitoring Plans). Cropland idling transfers in Alternatives 2 and 4 could affect giant garter snake when idling is on rice fields, but these effects are reduced to a less-than-significant level by incorporating environmental commitments.
- *Agricultural Land Use*: cropland idling transfers under Alternatives 2 and 4 could decrease the amount of lands characterized as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland under the Farmland Mapping and Monitoring Program (FMMP). Cropland idling would also be included in Alternative 2, but would be less frequent than in Alternative 4 because Alternative 2 has more potential ways to make water available for transfer. The potentially significant impact under Alternative 4 would be reduced to a less-than-significant level through implementation of Mitigation Measure LU-1 (Avoid changes in FMMP land use classifications).
- *Regional Economics*: cropland idling and crop shifting transfers under Alternatives 2 and 4 could reduce employment, labor income, and economic output for businesses and households linked to agricultural activities in areas transferring water (Butte, Colusa, Glenn, Solano, Sutter, and Yolo counties). However, employment, labor income, and economic output would be reduced in the buyer's areas without the project (No Action Alternative), and by comparison the impacts would be similar to implementing the No Action Alternative.
- *Indian Trust Assets*: the potential range of actions included in the action alternatives would have no effect on Indian Trust Assets.

## Mitigation Monitoring and Reporting

Implementation of Alternative 2 could result in potential significant environmental impacts associated with water supply, air quality, groundwater resources, and vegetation and wildlife. Implementation of mitigation measures

and environmental commitments listed in Appendix A will be required as a condition of approval to alleviate potential impacts. Table A-1 lists the mitigation measures identified in the EIS/EIR, responsible parties, the time frame for implementation, and the monitoring parties. Table A-2 lists the environmental commitments, the responsible parties, time frame for implementation, and the monitoring parties.

## **Section 7 of the Federal Endangered Species Act (ESA)**

On December 15, 2008, USFWS issued a biological opinion on the coordinated long-term operations of the CVP and SWP on Delta smelt (USFWS 2008). Similar to the USFWS biological opinion on delta smelt, National Oceanic Atmospheric Administration Fisheries Service (NOAA Fisheries) issued a biological opinion on June 4, 2009 on the effects of continued long term coordinated operations of the CVP and SWP on listed anadromous fish (NOAA Fisheries 2009).

Transfers of water through the Delta were included in the project descriptions and subsequent effects analysis in these opinions. Reclamation relies on these consultations to satisfy ESA compliance for anadromous fish and delta smelt. The opinions included the following operational criteria applicable to water transfers:

- A maximum amount of water transfers is 600,000 AF per year in dry and critical dry years and dry years (following dry or critical years). For all other year types, the maximum transfer amount is up to 360,000 AF.
- Transfer water will be conveyed through DWR's Harvey O. Banks (Banks) Pumping Plant or Jones Pumping Plant during July through September unless Reclamation and/or DWR consult with the fisheries agencies.

Analysis in the EIS/EIR is consistent with these operational criteria as they affect transferring water through the Delta.

Reclamation consulted under Section 7 of the ESA with the United States Fish and Wildlife Service (Service) for this action. All action alternatives evaluated in the EIS/EIR considered impacts to ESA-listed species and impacts to these species were a consideration in comparison with the No Action Alternative.

Reclamation initiated consultation with the Service on October 7, 2014 and submitted a biological assessment on November 4, 2014. The Service provided its Biological Opinion to Reclamation on April 30, 2015. Conservation measures included in the Biological Opinion were the same conservation measures listed in the EIS/EIR, with one notable exception; rather than providing an incidental take statement for a 10 year period, Reclamation and the

Service agreed through consultation to append the Biological Opinion each year with an incidental take statement that would authorize additional take for each subsequent year based on outcomes of the meetings described below. In this way, Reclamation and the Service will reassess impacts to the giant garter snake on an annual basis and assess the efficacy of the conservation measures to ensure that implementation of the program is not causing unreasonable impacts to giant garter snake. These conservation measures are provided in the Appendix Table 2.

## **Section 106 Compliance**

Reclamation is responsible for complying with Section 106 of the National Historic Preservation Act (NHPA). The range of potential transfer actions associated with Alternative 2 would not result in any construction or land-altering/ground disturbing activities beyond normal agricultural practices, including temporary land fallowing, or in any significant changes in reservoir operations that would expose buried resources, if present. Changes in water levels caused by transfer operations would be within the range of normal operations.

## **Comments Received on the Final EIS**

Reclamation's Notice of Availability of the Final EIS/EIR was published on March 20, 2015, and the Environmental Protection Agency's Notice of Availability was published on March 27, 2015. The EIS/EIR was posted on Reclamation's website, and copies were distributed to those who requested a copy. A press release was made on March 20, 2015, and was sent to participants in public meetings and commenters on the Draft EIS/EIR.

Reclamation received comments from 4 organizations after release of the Final EIS/EIR, and prior to preparation of the ROD. The commenters were: AquAlliance, Sportfishing Protection Alliance, and the Aqua Terra Aeris Law Group (AquAlliance); Friant Water Authority; Eric Hanson; and the Delta Stewardship Council. Many of these comments reiterated comments previously provided during the public comment period, or disagreed that Reclamation had adequately addressed the previous comments in the Final EIS/EIR. The comments consisted of the following:

- Friant Water Authority did not agree that their comments on the Draft EIS/EIR were adequately addressed in Appendix J of the Final EIS/EIR. The Friant Water Authority was concerned that water being transferred would supplant CVP supplies, and that water being transferred may not be real water. The Final EIS/EIR indicates in several places (including Section 2.3.2.5) that water transfers would only use available capacity at the CVP and SWP export facilities, and would not compete with the

delivery of CVP supplies. Common Response 14 in Appendix J documents how Reclamation will review each transfer to ensure that water is new water available to the system.

- AquAlliance suggested that many additional transfers have been proposed that should have been included in the cumulative impact analysis. While some of the specific projects were not envisioned during development of the EIS/EIR, related projects were considered for many of the projects cited in the comment. The comment discusses transfers to the Tehama-Colusa Canal Authority (TCCA) in 2014 and 2015. The Environmental Assessment/Initial Study for these transfers indicates that the water analyzed is generally from the same sellers as included in the Long-Term Water Transfers EIS/EIR, and the transfers are not additive (TCCA and Reclamation 2015). The comment letter also mentions 2015 transfers to State Water Contractors. The individual districts proposed different quantities for transfer than included in the cumulative analysis, but the total quantity of these transfers was similar. Additionally, most of these transfers are no longer moving forward because of limited allocations to State Water Project settlement contractors. The comment also mentions transfers from Yuba County Water Agency, which are included as part of the Yuba Accord in the cumulative analysis in the EIS/EIR.
- AquAlliance also suggested that existing protections for delta smelt and salmon are not adequate, and water transfers will exacerbate this condition. The Final EIS/EIR includes an analysis of water transfers on sensitive fish in Section 3.7. Additionally, the comment indicates that the existing biological opinions do not provide adequate protection, however, the biological opinions currently governing operations of the CVP and SWP are valid opinions prepared and issued by the regulatory agencies in consultation with the operating agencies in compliance with Section 7 of the ESA (50 CFR 402) and upheld by the 9<sup>th</sup> Circuit in litigation.
- AquAlliance explained GCID's delivery schedule which provides that 5.5 acre-feet of water per acre of rice land is diverted for rice production. Cropland idling transfers make 3.3 acre feet per acre available for transfer (which is the amount of water used by the crop, or the evapotranspiration of applied water). AquAlliance suggested there was no analysis of the remaining 2.2 acre-feet per acre. The remaining water diverted represents conveyance losses, deep percolation, and return flows that continue downstream for subsequent uses. This issue is explained in more detail in response to Comment SA01-23, which addresses potential changes in return flows associated with cropland idling.

- AquAlliance suggested Reclamation would need to consider the effects of installing the emergency drought barriers on transferring water across the Delta. The EIS/EIR contains analysis that indicates transfers have very little impact on water quality in the Delta, and installation of the barrier would not change conclusions from this analysis. Additionally, Reclamation, as part of its drought response, continues to evaluate all potential drought response actions in real time and is analyzing the effects of CVP operation with an emergency drought barrier.
- Eric Hanson submitted a letter to the Service and Reclamation regarding the adequacy of conservation measures proposed for protection of the giant garter snake, specifically questioning the efficacy of removing size limitations for conservation of the snake. All of the information cited in Mr. Hanson's letter (with the exception of his own or others unpublished data and monitoring reports) was considered in 2014 when these conservation measures were revised using the best available scientific information. As stated in the EIS/EIR, and reiterated in response to comments received from Defenders of Wildlife, the change in conservation measures reflects a better understanding of the habitat available to the snake, the likelihood that the snake would use certain habitats, and available information on currently viable reproducing populations. These conservation measures are reflected in the previous years (2014) transfer biological opinion issued by the service, and the most recent biological opinion issued by the service for the 2015 to 2024 period.
- The Delta Stewardship Council submitted additional comments reiterating that Reclamation did not fully respond to previous comments and suggesting that transfers contemplated over the 10 year period of analysis (2015-2024) may not be consistent with the Delta Plan. The Delta Stewardship Council provided a copy of pages 46-50 of the Delta Plan that provides information on the projects that must be consistent with the Delta Plan when being carried out by a State or local agency. Reclamation provided responses to the Delta Stewardship Council's comments on the Draft EIS/EIR, and still commits to coordinating with the Delta Stewardship Council as appropriate when contemplating transfers. If Reclamation and a State or local agency proposes to transfer water over on a long term basis, as opposed to the temporary annual transfers analyzed in the EIS/EIR, Reclamation will work with the State or local agency to ensure transfers adhere to applicable law.

# Appendix A

## Mitigation Monitoring and Reporting

**Table A-1. Mitigation Measures**

Measure No.	Mitigation Measure	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
WS-1	<p>The purpose of Mitigation Measure WS-1 is to address potential streamflow depletion effects to Central Valley Project (CVP) and State Water Project (SWP) water supply. Reclamation will apply a streamflow depletion factor to mitigate potential water supply impacts from the additional groundwater pumping due to groundwater substitution transfers. The streamflow depletion factor equates to a percentage of the total groundwater substitution transfer that will not be credited to the transferor and is intended to offset the streamflow effects of the added groundwater pumping due to transfer.</p> <p>As described in the impact analysis, the magnitude of the potential water supply impact depends on hydrologic conditions surrounding the transfer period (both before and after). The exact percentage of the streamflow depletion factor will be assessed and determined on a regular basis by Reclamation and California Department of Water Resources (DWR), in consultation with buyers and sellers, based on the best technical information available at that time. The percentage will be determined based on hydrologic conditions, groundwater and surface water modeling, monitoring information, and past transfer data. Application of the streamflow depletion factor will offset potential water supply effects and reduce them to a less than significant level. The streamflow depletion factor may not change every year, but will be refined as new information becomes available and may become more site specific as better data and groundwater modeling becomes available. The minimum streamflow depletion factor (based on modeling completed for this EIS/EIR) will be 13 percent, but this factor may be adjusted based on additional</p>	Reclamation	Reclamation and DWR	CVP and SWP operations reporting.	Ongoing.

Measure No.	Mitigation Measure	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
	<p>information on local conditions.</p> <p>Reclamation and DWR require the imposition of a streamflow depletion factor because they will not move transfer water if doing so will violate the no injury rule. This process to evaluate and determine the streamflow depletion factor will help verify that the factor reduces potential impacts to avoid legal injury to CVP or SWP water supplies and a substantial impact or injury.</p>				
GW-1	<p>The <i>DRAFT Technical Information for Preparing Water Transfer Proposals</i> (Reclamation and DWR 2014) provide guidance for the development of proposals for groundwater substitution water transfers. The technical information informs the development of the monitoring and mitigation program for the range of potential transfer activities evaluated in this EIS/EIR, which will be updated as appropriate based on the most current version of the technical paper each year of the ten-year term of potential activities.</p> <p>The objective of Mitigation Measure GW-1 is to avoid significant adverse environmental effects and ensure prompt corrective action in the event unanticipated effects nevertheless occur. The measure accomplishes this by monitoring groundwater and/or surface water levels during transfers to avoid potential effects. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects to non-transferring parties; (3) assure that a local mitigation strategy is in place prior to the groundwater transfer; and (4) mitigate significant adverse environmental effects that occur. Reclamation will verify that sellers adopt and implement these mitigation measures to avoid potentially significant adverse effects related to groundwater extraction. In addition, each entity participating in a groundwater substitution transfer must confirm that the proposed groundwater pumping will be compatible with state and local regulations and Groundwater Management Plans (GMPs). As Groundwater Sustainability Plans</p>	Participating Sellers	Reclamation	Seller transfer application package.	Prior to water transfers.



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Measure No.	Mitigation Measure	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
	(GSPs) are developed by Groundwater Sustainability Agencies, potential sellers must confirm that the proposed pumping is compatible with applicable GSPs.				
GW-1	<u>Well Review Process</u> Potential sellers must submit well data for Reclamation and, where appropriate, DWR review, as part of the transfer approval process. Required information will be detailed in the most current version of the <i>DRAFT Technical Information for Preparing Water Transfer Proposals</i> .	Participating sellers	Reclamation	Seller transfer application package.	Prior to water transfers.
GW-1	<u>Monitoring Program</u> Potential sellers must complete and implement a monitoring program subject to Reclamation's approval that shall, at a minimum, include the following components:	Participating sellers	Reclamation	Seller transfer application package and monitoring reports.	Prior to, during, and after water transfers.
GW-1	<u>Monitoring Well Network</u> The monitoring program shall incorporate a sufficient number of monitoring wells, as determined by Reclamation in relation to local conditions, to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. Depending on local conditions, additional groundwater level monitoring may be required near ecological resource areas.	Participating sellers	Reclamation	Seller transfer application package and monitoring data.	Plan submitted prior to water transfers; monitoring information submitted during and after transfer.
GW-1	<u>Groundwater Pumping Measurements</u> All wells pumping to replace surface water designated for transfer shall be configured with a permanent instantaneous and totalizing flow meter capable of accurately measuring well discharge rates and volumes. Flow meter readings will be recorded just prior to initiation of pumping and at designated times, but no less than monthly and as close as practical to the last day of the month, throughout the duration of the transfer.	Participating sellers	Reclamation	Seller transfer application package with field spot-checks and monitoring data.	Prior to, during, and after water transfers.
GW-1	<u>Groundwater Levels</u> Sellers will collect measurements of groundwater levels in both participating transfer wells and monitoring wells. Groundwater level monitoring will include measurements before, during and after transfer-related pumping. The seller will measure groundwater levels as follows: <ul style="list-style-type: none"> <li>• Prior to transfer: Groundwater</li> </ul>	Participating sellers	Reclamation	Regular inspection, monitoring data, and report on effects to deep-rooted vegetation, if necessary.	Prior to, during, and after water transfers.

Measure No.	Mitigation Measure	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
	<p>levels will be measured monthly from March in the year of the proposed transfer until the start of the transfer (where possible).</p> <ul style="list-style-type: none"> <li>• Start of transfer: Groundwater levels will be measured on the same day that the transfer begins, prior to the pump being turned on.</li> <li>• During transfer: Groundwater levels will be measured throughout the transfer period at the frequency specified in the most current <i>DRAFT Technical Information for Preparing Water Transfer Proposals</i>.</li> <li>• Post-transfer: Groundwater levels will be measured weekly for one month after the end of transfer pumping, after which groundwater levels will be measured monthly through March of the year following the transfer.</li> </ul> <p>Sellers thus monitor effects to groundwater levels that may result from the proposed transfer and avoid significant impacts. The primary criteria used to identify significant impacts to groundwater levels are the Basin Management Objectives (BMOs) set by GMPs. In the Sacramento Valley, several counties have established GMPs to provide guidance in managing the resource. The existing GMPs and BMOs are discussed in Section 3.3.1.2, Regulatory Setting.</p> <p>In areas where quantitative BMOs do not exist, Reclamation, SLDMWA, and the potential seller(s) will coordinate closely with potentially impacted third parties to collect and monitor groundwater data. If a third party expects that it may be impacted by a proposed transfer, that party should contact Reclamation and the seller with its concern. The burden of collecting groundwater data will not be the responsibility of the third party. If warranted, groundwater level monitoring to address the third-party's concern may be incorporated in the monitoring and mitigation plans required by Mitigation Measure GW-1.</p> <p>Additionally, to avoid effects to</p>				

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Measure No.	Mitigation Measure	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
	<p>vegetation, sellers will monitor groundwater depth data to verify that significant adverse effects to deep-rooted vegetation are avoided. If monitoring data indicate that water levels have dropped more than 10 feet where groundwater was 10 to 25 feet below ground surface prior to starting the transfer of surface water made available from groundwater substitution actions, the seller must implement actions set forth in the mitigation plan. If historic data show that groundwater elevations in the area of transfer have typically varied by more than this amount annually during the proposed transfer period, then the transfer may be allowed to proceed. If there is no deep-rooted vegetation (i.e., oaks that would have tap roots greater than 10 feet deep) within one-half mile of the transfer area or the vegetation is located along waterways that will continue to have water during the transfer, the transfer may be allowed to proceed. If significant adverse impacts to deep-rooted vegetation occur as a result of the transfer despite the monitoring efforts and implementation of the mitigation plan, the seller will prepare a report documenting the result of the restoration activity to plant, maintain, and monitor restoration of vegetation for 5 years to replace the losses.</p>				
GW-1	<p><i>Groundwater Quality</i> For municipal sellers, the comprehensive water quality testing requirements of Title 22 are considered sufficient for the water transfer monitoring program. Agricultural sellers shall measure specific conductance in samples from each participating production well. Samples shall be collected when the seller first initiates pumping, monthly during the transfer period, and at the termination of transfer pumping.</p>	Municipal sellers	Reclamation	Inspections during transfer period and monitoring data.	Prior to, during, and after water transfers.
GW-1	<p><i>Land Subsidence</i> Subsidence monitoring will be required if groundwater levels could decline below historic low levels during the proposed water transfer. If the measured groundwater level falls below the historic low level, land surface elevation measurements in strategic locations within and/or near the transfer area will be required. Measurements may include (1)</p>	Participating sellers	Reclamation	Regular inspections and monitoring data.	Prior to, during, and after water transfers.

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	<p>extensometer monitoring, (2) continuous Global Positioning System (GPS) monitoring, or (3) extensive land-elevation benchmark surveys conducted by a licensed surveyor. This data could be collected by the seller or from other sources (such as public extensometer data). Measurements must be completed on a monthly basis during the transfer.</p> <p>If the land surface elevation survey indicates an elevation decrease between 0.1 foot and 0.2 foot from the initial measurement, the seller could have significant impacts and would need to start the process identified in the Mitigation Plan. The seller will also work with Reclamation to assess the accuracy of the survey measurements based on current limitations of technology, professional engineering/surveying judgment, and any other data available in or near the transferring area.</p> <p>The threshold of 0.1 foot was chosen as this value is typical of the elastic (i.e., recoverable) portion of subsidence; the threshold of 0.2 foot was selected considering limitations of current land survey technology. This threshold is supported by a review of data from the several extensometers within the Sacramento Valley.</p>				
GW-1	<p><i>Coordination Plan</i> The monitoring program will include a plan to coordinate the collection and organization of monitoring data. This plan will describe how input from third parties will be incorporated into the monitoring program, and will include a plan for communication with Reclamation as well as other decision makers and third parties.</p>	Participating sellers	Reclamation	Seller transfer application package with Coordination Plan.	Prior to water transfers.
GW-1	<p><i>Evaluation and Reporting</i> The monitoring program will describe the method of reporting monitoring data. At a minimum, sellers will provide data summary tables to Reclamation, both during and after transfer-related groundwater pumping. Post-program reporting will continue through March of the year following the transfer. Sellers will provide a final summary report to Reclamation evaluating the effects of the water transfer. The final report will identify</p>	Participating sellers	Reclamation	Seller transfer application package and monitoring data and report.	Plan submitted prior to water transfers; monitoring information submitted during and after transfer.

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	<p>transfer-related impacts on groundwater and surface water (both during and after pumping), and the extent and significance, if any, of effects on local groundwater users. It shall include groundwater elevation contour maps for the area in which transfer operations are located, showing pre-transfer groundwater elevations, groundwater elevations at the end of the transfer, and recovered groundwater elevations in March of the year following the transfer. The summary report shall also identify the extent and significance, if any, of transfer-related effects to ecological resources such as fish, wildlife, and vegetation resources.</p>				
GW-1	<p><u>Mitigation Plan</u> Potential sellers must complete and implement a mitigation plan. If the seller's monitoring efforts indicate that the operation of wells for groundwater substitution pumping are causing substantial adverse impacts, the seller will be responsible for mitigating any significant environmental impacts that occur. Mitigation actions must be implemented to reduce impacts to a less than significant level and could include:</p> <ul style="list-style-type: none"> <li>• Curtailment of pumping until natural recharge corrects the issue.</li> <li>• Lowering of pumping bowls in non-transferring wells affected by transfer pumping.</li> <li>• Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer.</li> <li>• Curtailment of pumping until water levels raise above historic lows if non-reversible subsidence is detected (based on local data to identify elastic versus inelastic subsidence).</li> <li>• Reimbursement for modifications to infrastructure that may be affected by non-reversible subsidence.</li> <li>• Other appropriate actions as determined by Reclamation.</li> </ul> <p>As summarized above, the purpose of Mitigation Measure GW-1 is to monitor groundwater levels during transfers to avoid potentially significant adverse effects. The mitigation plan will</p>	Participating sellers	Reclamation	Mitigation plan, monitoring data for mitigation activities, and regular inspections of mitigation activities.	Prior to, during, and after water transfers.

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	<p>describe how to address any significant effects that occur despite the monitoring efforts. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects; and (3) assure that a local mitigation strategy is in place prior to the groundwater transfer. Accordingly, to ensure that mitigation plans will be feasible, effective, and tailored to local conditions, the plan must include the following elements:</p> <ul style="list-style-type: none"> <li>• A procedure for the seller to receive reports of purported environmental effects or effects to non-transferring parties;</li> <li>• A procedure for investigating any reported effect;</li> <li>• Development of mitigation options, in cooperation with the affected parties, for legitimate significant effects; and</li> <li>• Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.</li> </ul> <p>Mitigation to avoid potentially significant subsidence impacts and ensure prompt corrective action in the event of unanticipated effects nevertheless occur is described by the following stages.</p> <p><i>Stage 1: Groundwater Levels</i> Irreversible subsidence would not occur if groundwater levels stay above historic low levels for the entire transfer season. As groundwater is pumped from an aquifer, the pore water pressure in the aquifer is reduced. This reduction in pore water pressure increases the effective stress on the structure of the aquifer itself. This increase in effective stress can cause the aquifer structure to deform, or compress, resulting in the subsidence of the ground surface elevation. Subsidence can be irreversible if the reduced effective stress is lower than historically low effective stress. Typically this would be the result of groundwater levels reaching levels lower than the historical low level. If groundwater level monitoring indicates that groundwater levels remain above</p>				

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	<p>historic low levels, then no additional actions for subsidence monitoring or mitigation are necessary.</p> <p><i>Stage 2: Ground Surface Elevations</i> Stage 2 includes monthly ground surface monitoring during water transfers if they could cause groundwater levels to fall below historic low levels, as described above in the Monitoring Plan. If ground surface elevations decrease between 0.1 and 0.2 foot, the seller will evaluate the accuracy of the information based on the current limitations of technology, professional engineering/surveying judgment, and other local data. If the elevations decline more than 0.2 feet, this change could indicate inelastic subsidence, which would trigger a shift to Stage 3.</p> <p><i>Stage 3: Local Investigation</i> If the threshold of 0.2 foot of ground surface elevation change is exceeded, the seller shall cease groundwater substitution pumping for the transfer until one of the following occurs: (1) groundwater levels recover above historic low groundwater levels; (2) seller completes a more detailed local investigation identifying hydrogeologic conditions that could potentially allow continued transfer from a subset of wells (if the seller can provide evidence that this pumping is not expected to cause additional subsidence); or (3) seller completes an investigation of local infrastructure that could be affected by subsidence (such as water delivery infrastructure, water supply facilities, flood protection facilities, highways, etc.) indicating the local threshold of subsidence that could be experienced before these facilities would be adversely affected. Any option should also consider the effect of non-transfer pumping that may be causing subsidence.</p> <p><i>Stage 4: Mitigation</i> If subsidence effects to local infrastructure occur despite monitoring efforts, then the sellers must work with the lead agencies to determine whether the measured subsidence may be caused by water transfers.</p>				

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	<p>Any significant adverse subsidence effects caused by transfer activities must be addressed and a contingency plan in the event of a need for further corrective action must be approved by Reclamation before transfers could continue after Stage 3.</p> <p><i>Stage 5: Continued Monitoring</i> The sellers will continue to monitor for subsidence while groundwater levels remain below historic low levels. If the seller has ceased transfer-related pumping but groundwater levels remain below historic lows, subsidence monitoring will need to continue until the spring following the transfer. The results of subsidence monitoring will be factored into monitoring and mitigation plans for future transfers.</p>				



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AQ-1	<p>Selling agency would reduce pumping at diesel or natural gas wells to reduce emissions to below the thresholds. If an agency is transferring water through cropland idling and groundwater substitution in the same year, the reduction in vehicle emissions can partially offset groundwater substitution pumping at a rate of 4.25 acre-feet (AF) of water produced by idling to one acre-foot of groundwater pumped. Agencies may also decide to replace old diesel or natural gas wells to reduce emission below the thresholds.</p> <p>Any selling agencies with potentially significant emissions, as determined by this EIS/EIR, will be required to maintain daily recordkeeping logs that document the specific engine to be used for groundwater substitution transfers, the power rating (hp), and applicable emission factors. Emission calculations will be completed daily for comparison to the significance thresholds determined for each selling agency. The recordkeeping logs will be sent to Reclamation monthly for verification that emissions are within the allowable limits.</p> <p>Reclamation will also work with the water agencies to inform individual growers of incentive funding available through the Natural Resources Conservation Service's Environmental Quality Incentives Program. Funded conservation practices including the replacement of internal combustion engines in irrigation pumps; therefore, the program may be used by growers to further reduce criteria pollutant emissions.</p>	Selling agency	Reclamation	Daily recordkeeping logs specifying the engines operated by each selling agency with potentially significant emissions and calculated criteria pollutant emissions.	Monthly during transfer.

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AQ-2	Any engines operating in the area of analysis that are capable of operating as either electric or natural gas engines would only operate with electricity during any groundwater transfers. Any selling agencies with these engines will be required to maintain daily recordkeeping logs that document the engines used for groundwater substitution transfers and the type of fuel used. The recordkeeping logs will be sent to Reclamation monthly for verification that the engines are operating in compliance with the mitigation measure.	Selling agency	Reclamation	Daily recordkeeping logs documenting the engines used for groundwater substitution transfers and the fuel type used.	Monthly during transfer.
LU-1	Water would not be acquired from a particular parcel of land if idling the land would result in a lower classification of Important Farmland as defined under the Farmland Mapping and Monitoring Program (FMMP). The selling agency will provide cropping history of specific parcels to be idled for the transfer to Reclamation to determine if idling will result in a change in classification from Important Farmland.	Selling agency	Reclamation	Maps of fields to be idled with land classification and past cropping patterns for field to be idled.	Prior to water transfer.

**Table A-2. Environmental Commitments**

Environmental Commitments	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
In groundwater basins where sellers are in the same groundwater subbasin as protected aquatic habitats, such as giant garter snake preserves and conservation banks, groundwater substitution will be allowed as part of the long term water transfers if the seller can demonstrate that any impacts to water resources needed for special-status species protection have been addressed. In these areas, sellers will be required to address these impacts as part of their mitigation plan.	Participating Sellers	Reclamation	Seller transfer application package.	Prior to water transfers.
Carriage water (a portion of the transfer that is not diverted in the Delta and becomes Delta outflow) will be used to maintain water quality in the Delta. Carriage water is represented as a percent of the transfer that does not reach the buyer, and this percent is calculated during the transfer based on real-time monitoring information in the Delta. Typical carriage water amounts range from 20 to 30 percent for transfers from the Sacramento Valley, and about 10 percent for transfers from the San Joaquin Valley.	Reclamation	Reclamation	CVP operations reporting.	During water transfers.

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Environmental Commitments	Responsible Party	Monitoring Party	Method of Verification	Timing of Verification
As part of the approval process for long-term water transfers, Reclamation will have access to the land to verify how the water transfer is being made available and to verify that actions to protect the giant garter snake are being implemented	Participating Sellers	Reclamation	Seller transfer application package with regular inspections of transfer actions.	Access provided prior to and during water transfers; inspections ongoing.
Reclamation will provide a map(s) to the USFWS in June of each year showing the parcels of riceland that are proposed for the purpose of transferring water for that year. These maps will be prepared to comport to Reclamation's geographic information system (GIS) standards.	Participating Sellers	Reclamation	Completed mapping package from sellers showing parcels idled. Reclamation will prepare complete package for USFWS.	June of each transfer season.
Movement corridors for aquatic species (including pond turtle and giant garter snake) include major irrigation and drainage canals. The water seller will keep adequate water in major irrigation and drainage canals. Canal water depths should be similar to years when transfers do not occur or, where information on existing water depths is limited, at least two feet of water will be considered sufficient.	Participating Sellers	Reclamation	Seller transfer application package with field spot-checks.	Ongoing during transfer season.
Districts proposing water transfers made available from idled rice fields will ensure that adequate water is available for priority habitat with a high likelihood of giant garter snake occurrence. The determination of priority habitat will be made through coordination with giant garter snake experts, Geographic Information System (GIS) analysis of proximity to historic tule marsh, and GIS analysis of suitable habitat. The priority habitat areas are indicated on the priority habitat maps for participating water agencies and will be maintained by Reclamation. As new information becomes available, these maps will be updated in coordination with USFWS and CDFW. In addition to mapped priority habitat, fields abutting or immediately adjacent to federal wildlife refuges will be considered priority habitat.	Participating Sellers	Reclamation	Seller transfer application package with field spot-checks. Priority habitat maps reviewed and updated as needed prior to each transfer season.	Field spot checks to occur during the transfer season, priority habitat to be reviewed and update prior to the next transfer season.
Maintaining water in smaller drains and conveyance infrastructure supports key habitat attributes such as emergent vegetation for giant garter snake for escape cover and foraging habitat. If crop idling/shifting occurs in priority habitat areas, Reclamation will work with contractors to document that adequate water remains in drains and canals in those priority areas. Documentation may include flow records, photo documentation, or other means of documentation agreed to by Reclamation and USFWS.	Participating Sellers	Reclamation	Seller transfer application package with field spot-checks.	Ongoing during transfer season.

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<p>Mapped priority habitat known to be occupied by giant garter snake and priority habitats with a high likelihood for giant garter snake occurrence (60 percent or greater probability) will not be permitted to participate in cropland idling/shifting transfers. Water sellers can request a case-by-case evaluation of whether a specific field would be precluded from participating in long-term water transfers. These areas include lands adjacent to naturalized lands and refuges and corridors between these areas, such as:</p> <ul style="list-style-type: none"> <li>• Fields abutting or immediately adjacent to Little Butte Creek between Llano Seco and Upper Butte Basin Wildlife Area, Butte Creek between Upper Butte Basin and Gray Lodge Wildlife areas, Colusa Basin drainage canal between Delevan and Colusa National Wildlife Refuges, Gilsizer Slough, Colusa Drainage Canal, the land side of the Toe Drain along the Sutter Bypass, Willow Slough and Willow Slough Bypass in Yolo County, Hunters and Logan Creeks between Sacramento and Delevan National Wildlife Refuges; and</li> <li>• Lands in the Natomas Basin.</li> </ul>	Participating Sellers	Reclamation	Seller transfer application package, maps of fields to be idled, and field spot-checks of land idled.	Prior to and during water transfers.
<p>Sellers will perform giant garter snake best management practices, including educating maintenance personnel to recognize and avoid contact with giant garter snake, dredging only one side of a conveyance channel per year, and implementing other measures to enhance habitat for giant garter snake. Implementation of best management practices will be documented by the sellers and verified by Reclamation and will be included in the annual monitoring report.</p>	Participating Sellers	Reclamation	Seller transfer application package with field spot-checks and documented in annual monitoring report.	Ongoing.
<p>In order to limit reduction in the amount of over-winter forage for migratory birds, including greater sandhill crane, cropland idling transfers will be minimized near known wintering areas that support high concentrations of waterfowl and shorebirds, such as wildlife refuges and established wildlife areas.</p>	Participating Sellers	Reclamation	Seller transfer application package, maps of fields to be idled, and field spot-checks	Prior to and during transfer season.
<p>No later than December 31, 2015, Reclamation shall submit to the Service a supplement to the conservation measures which will establish performance measures and metrics to evaluate their effectiveness. This supplement shall identify the data needed to produce estimates of change or trends in snake reproduction, numbers, and distribution in the action area.</p>	Reclamation	Reclamation	Service to Accept	December 31, 2015

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<p>Reclamation proposes an adaptive approach to implementation of the water transfer program to ensure that, prior to finalizing the water transfer agreements each year, Reclamation can make adjustments to the program. Adjustments would be made in response to new information about the status of the snake, effectiveness of conservation measures, environmental conditions, and population responses of the snake. By February 28 of each year Reclamation, the Service, the California Department of Fish and Wildlife (CDFW), and USGS will meet to discuss the annual monitoring report, evaluate results of snake monitoring and research, evaluate the implementation of conservation measures, and consider other relevant information. The Service, CDFW, and Reclamation, in consultation with USGS scientists, will identify any changes needed to snake conservation measures for the current year's water transfer program to assure continued conservation of the snake based on the joint evaluation of the most current scientific information. In addition, the agencies will discuss water transfers anticipated for the current year and the extent and location of proposed crop idling (up to the stated maximum acreage).</p>	Reclamation	Reclamation	Distribution of monitoring report to USFWS and occurrence of annual meeting.	February 28 of each Year.
<p>By March 30 of each year, following the joint meeting and review of available information, the Service will provide additional analysis in support of an Incidental Take Statement for the current year's water transfers that will be appended to this programmatic biological opinion. It is expected that the total amount of water transferred which results in impacts to the snake (crop idling/crop shifting) will not exceed what is identified in the BA; however, Reclamation anticipates that the location of these impacts in the landscape will shift annually based on willing sellers, water year type, and other uncertainties. The Service will append this biological opinion each year over the 10-year life of the proposed action with an Incidental Take Statement based on the specific and current information available to Reclamation and the Service. The purpose of this programmatic consultation is to allow Reclamation to take an adaptive approach to implementation of the water transfer program due to the degree of uncertainty in water availability, annual farming decisions, and natural variability associated with snakes, their habitat, and their responses to the proposed action.</p>	USFWS	USFWS	Incidental Take Statement to Reclamation	March 30 of each year