

## 3. Description of Proposed Actions

### 3.1 Introduction

This BA evaluates the effects of the following water management actions and conservation measures for both Reclamation and non-Federal entities:

1. Reclamation's proposes the following water management actions:
  - a. Operate Heron Dam and Reservoir as part of the SJC Project to store and deliver water to downstream users.
  - b. Operate El Vado Dam and Reservoir to store and release water, including response to requests by the MRGCD.
2. Non-Federal entities propose the following water management actions:
  - a. MRGCD proposes the following actions:
    - i. Operate the MRG Project Diversion Dams to deliver water to MRGCD lands to meet agricultural demand of lands with appurtenant water rights, including the lands of the Six MRG Pueblos.
    - ii. Operate irrigation drains and wasteways to return water to the river.
3. Proposed conservation measures to offset any adverse impacts caused by the above actions are as follows:
  - a. Reclamation's conservation measures:
    - i. The Supplemental Water Program.
    - ii. Adaptive management.
    - iii. Environmental water operations.
  - b. MRGCD's conservation measures:
    - i. Enhanced coordination;
    - ii. Changes in operation to support instream habitat and flow management.
    - iii. Changes in operation to support spring peak flows.
  - c. ABCWUA's conservation measures:
    - i. Additional storage of native water;
    - ii. Conservation Storage Agreements;

- iii. Lease Supplemental Water;
  - iv. Continued efforts towards water conservation; and
  - v. Continued coordination with water releases and diversions.
- d. Collaborative Program conservation measures:
- i. Habitat restoration and management;
  - ii. Water management;
  - iii. Population augmentation/propagation;
  - iv. Water quality management; and
  - v. Species research, monitoring and adaptive management.

These actions are described more fully in the sections below.

## **3.2 Description of Reclamation’s Proposed Water Actions**

Reclamation operates Heron and El Vado Dams and Reservoirs in consideration of a complex Web of variables, including precipitation, drought, allocation of water supplies, MRGCD requests, and the Pueblos’ prior and paramount water rights, and also in accordance with Federal statute, NMOSE permit, and contracts with water users. Reclamation operates the two facilities for the following purposes:

- Storage and delivery of water for agricultural uses (Heron and El Vado), and municipal, and industrial uses (Heron).
- Assistance to New Mexico in meeting its downstream water delivery obligations mandated by the Rio Grande Compact of 1938 (El Vado).

Additionally, incidental purposes of Reclamation’s operations include fish and wildlife benefits, recreation for both Heron and El Vado, and flood control for El Vado. Reclamation operates both reservoirs in compliance with the Endangered Species Act and to manage water in Reclamation’s Supplemental Water Program. Reclamation will use adaptive management as part of its future water operations.

### **3.2.1 SJC Project Operations at Heron Dam and Reservoir**

Water at Heron Reservoir that is allocated to contractors and subsequent deliveries out of Heron Reservoir are tracked with a daily accounting model. All inflows to Heron Reservoir that are native to the basin are bypassed and are not

included with SJC Project accounting. Water allocated to MRGCD is released from Heron Dam each year at the request of the MRGCD, typically for delivery to El Vado Reservoir where it is then released as needed to meet MRGCD's daily demand. Water allocated to the ABCWUA is released from Heron Dam to Abiquiu Reservoir, at the request of the ABCWUA, and eventually is delivered to ABCWUA's surface water diversion structure in Albuquerque or is used to offset depletions to surface water supplies caused by ground water pumping, as assessed by the Office of the State Engineer (i.e., letter water deliveries). Water allocated to other contractors also may be released from Heron Dam to offset depletions (which generally either is directed to Elephant Butte or El Vado, depending on if the calculated depletion impacted the Rio Grande Compact or the MRGCD), as determined by the Office of the State Engineer, or may be released for storage in allocated space at El Vado, Abiquiu Reservoir, and/or Elephant Butte Reservoir. Beginning in 2011, water allocated to Santa Fe is being released from Heron Dam to provide water to Santa Fe's Buckman Direct Diversion.

SJC Project water used to offset evaporation losses from the recreation pool maintained at Cochiti Lake may be partially released from Heron Dam during the first part of July but is generally released from Heron Dam in the late fall and winter. This action, as it relates to the Corps' operation of Cochiti Reservoir, is described in more detail as an interrelated and interdependent activity in section 6.

#### **3.2.1.1 SJC Project Contractor Allocation**

Once Reclamation releases SJC Project water from Heron Reservoir, it belongs to SJC contractors and can be used immediately or stored in other facilities for future use. The total annual SJC Project contractor allocation is based on a firm yield analysis for Heron Reservoir that sets the annual allocation at 96,200 AF. Reclamation does not have discretion to release more than this firm yield amount. All of the existing contracts are repayment contracts with no expiration date; thus, potential renegotiation of SJC Project contracts and associated terms is not considered under this BA. Table 1 summarizes SJC Project contracts, including a listing of the individual contractors, contract initiation dates, and the annual amount of SJC Project water allocated to each contractor.

#### **3.2.1.2 Third Party Subcontracting of SJC Project Water**

Reclamation authorizes SJC Project contractors to subcontract water stored in Heron Reservoir to third parties. Reclamation's Supplemental Water Program consists primarily of SJC Project water that Reclamation subcontracts. Since 2003, all of the SJC Project contractors with the exception of Pojoaque Valley Irrigation District have subcontracted their water, at one time or another, to Reclamation.

Contracts with the following SJC Project contractors grant Reclamation a first-right-of-refusal to subcontract SJC Project water stored in Heron Reservoir:

- Village of Los Lunas
- Village of Taos Ski Valley
- Town of Taos
- City of Santa Fe
- Santa Fe County
- City of Espanola
- County of Los Alamos

**Table 1. San Juan Chama Project contracts**

<b>Contractor</b>	<b>Allocated Water Amount (AF)</b>	<b>Date Initiated</b>	<b>Purpose</b>
Albuquerque-Bernalillo County Water Utility Authority	48,200	1963	M&I
Middle Rio Grande Conservancy District	20,900	1963	Irrigation
Jicarilla Apache	6,500	1992	M&I
City of Santa Fe	5,230	1976	M&I
Cochiti Recreation Pool <sup>1</sup>	5,000	1964	Recreation
Taos Pueblo	2,215	2011	M&I
Ohkay Owingeh Pueblo	2,000	2001	M&I
Incorporated County of Los Alamos	1,200	1977	M&I
Pojoaque Valley Irrigation District	1,030	1972	Irrigation
City of Espanola	1,000	1978	M&I
For Aamodt Indian Water Rights Settlement	775	Allocated, but Uncontracted	
Town of Belen	500	1990	M&I
Village of Los Lunas	400	1997	M&I
Town of Taos	400	1981	M&I
Town of Bernalillo	400	1988	M&I
County of Santa Fe	375	1976	M&I
Town of Red River	60	1990	M&I
Village of Taos Ski Valley	15	1978	M&I
<b>TOTAL ALLOCATION:</b>	<b>96,200</b>		

<sup>1</sup> SJC Project water is released to maintain a 1,200-surface-acre permanent pool for recreation and fish and wildlife purposes at Cochiti Reservoir; and 5,000 AFY is delivered to Cochiti to offset evaporative losses associated with maintenance of this pool. (Public Law 88-293)

**3.2.1.3 SJC Project Offset of Pojoaque Tributary Unit Depletions (Nambe Falls)**

The Pojoaque Tributary Unit, a component of the SJC Project, stores water at the Nambe Falls Dam and Reservoir located on the Rio Nambe, which is a tributary to the Rio Grande, and provides approximately 1,030 AF of Supplemental Water for about 2,768 acres of irrigated lands. About 34% of the irrigated lands are Indian lands located on the Nambe, Pojoaque, and San Ildefonso Pueblos. Construction of Nambe Falls Dam began in June 1974 and was completed in June 1976. Cyclical operations of Nambe Falls consist of non-irrigation season operations and irrigation season operations and cause depletions to native Rio Grande water.

To offset these depletions and to keep the river whole, Reclamation releases SJC Project water from Heron Reservoir, as is described in the 1972 Contract (#14-06-500-1986) between Reclamation and the Pojoaque Valley Irrigation District. An annual depletion amount is calculated for Nambe Falls operations for the entire year, and the offsetting SJC Project water is released from water allocated for this purpose at Heron Reservoir. The actual annual SJC Project water allocation used to offset the effects of Nambe Falls Reservoir storage has varied.

**3.2.1.4 Summary of Reclamation's Proposed Actions for SJC Project Operations of Heron Dam and Reservoir**

Reclamation proposes to continue operating and maintaining Heron Dam and Reservoir consistent with current agreements to store water and in accordance with constraints and conditions applicable to the SJC Project. Reclamation can only store SJC Project water pursuant to statute and is prohibited from releasing water for ESA purposes unless Reclamation purchases the water from a willing contractor.

Reclamation delivers SJC Project water to users in the MRG based on water contracts with various entities, commonly referred to as SJC Project contractors, and based on subcontracts between SJC Project contractors and third parties. Delivery of SJC Project water is authorized for municipal, industrial, irrigation, and recreational purposes. Incidental benefits provided by operation of Heron Reservoir include domestic and fish and wildlife uses. SJC Project water must be consumptively and beneficially used in New Mexico, at a downstream destination, and without harm to native Rio Grande water. Reclamation generally makes releases as follows:

- Releases for delivery of contractors' annual allocations to downstream storage occur at a rate between 165–500 cfs and typically occur in the months of November and December; however, releases may be made at the call of contractors throughout the year.

- Releases to offset depletions caused by contractors' ground water pumping and/or actions upstream of the Otowi gage occur approximately every 3–4 months at a rate of between 50–200 cfs.
- Releases occur to compensate evaporation losses at the Cochiti Recreation Pool to restore a minimum pool area of 1,200 surface acres at Cochiti Lake (Public Law 88-293).
- Releases occur to offset the operations of the Pojoaque Tributary Unit of the SJC Project, including storage in Nambe Falls Reservoir.
- Releases are deferred when ice cover on Heron Reservoir poses public safety issues.
- Releases cannot be made to meet ESA obligations unless Reclamation acquires the SJC Project water from one of its contractors.
- Waivers to extend the required date of delivery of the contractors' annual allocation until April 30 or September 30 of the following year are granted on a case-by-case basis if there is a benefit to the United States.

### **3.2.2 Operation of El Vado Dam and Reservoir**

As discussed in section 2, MRGCD constructed El Vado Dam and Reservoir in 1935, and Reclamation and the Corps developed the MRG Project. With the establishment of the MRG Project, MRGCD pays Reclamation for operation of El Vado Dam and Reservoir. Pursuant to the Flood Control Acts, the 1951 Contract with the MRGCD, and Permit No. 1690, Reclamation stores water in and release water from El Vado Reservoir at the request of MRGCD and to provide incidental flood control.

Both native Rio Grande water and SJC Project water are stored in El Vado Reservoir. Storage of native water may occur if native flows are available on the Rio Chama in excess of downstream Rio Chama direct flows rights and the MRGCD river diversion demand and restrictions on storage are not in place per Articles VII and VIII of the Rio Grande Compact.<sup>15</sup> (See section 2 for a discussion of the Rio Grande Compact and Article VII). Storage and release of SJC Project water are conducted according to contract. El Vado Reservoir also provides recreational opportunities and allots space for sediment control.

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<sup>15</sup> When the amount of usable Rio Grande Project storage in Elephant Butte Reservoir is below 400,000 AF, the Rio Grande Compact limits upstream storage of river flows in reservoirs constructed after 1929. For further discussion, see section 5.

### **3.2.2.1 Irrigation Operations for the MRGCD**

The plan for filling El Vado is to store all native flows into the reservoir that are in excess of downstream requirements, such as those for Rio Chama water rights holders. In general, native water is stored during the spring runoff for release later in the year when flows are lower than MRGCD's river diversion demand for delivery of water to its constituents. Reclamation releases water as requested from the MRGCD from El Vado Reservoir when natural flow of the Rio Grande is not sufficient to meet the demands of the MRGCD and the Six MRG Pueblos. SJC Project water released from Heron Reservoir for immediate use downstream from El Vado Reservoir is simply passed through El Vado Dam.

Reclamation's irrigation operations primarily consist of changing the rate and timing of storage released from El Vado Reservoir, which increases flows in the MRG that the MRGCD diverts to meet its irrigation needs. Irrigation needs generally are determined by MRGCD, and Reclamation adjusts El Vado's gates to meet those needs.

### **3.2.2.2 Operations for Prior and Paramount Lands**

As described in section 1, Reclamation shares the United States Government's trust responsibility to Indian tribes, including the Six MRG Pueblos, and Congress declared through the Act of March 13, 1928 (45 Stat. 312) that 8,847 acres of pueblo lands in the Middle Rio Grande had water rights that were "prior and paramount" to water rights for other lands.<sup>16</sup> Reclamation performs operations to reserve water at El Vado for use on these lands with prior and paramount rights. The Designated Engineer, currently from BIA, and Reclamation perform the following computation procedure. The flow of water necessary at Otowi gage to meet prior and paramount needs is determined by:

1. Identifying crop demand.
2. Applying field application and conveyance efficiencies from the point of diversion on the Rio Grande.
3. Applying river efficiencies from the Otowi gaging station to diversion points on the river.

Next, the Designated Engineer forecasts the monthly supply of water at the Otowi gaging station using historically dry years as a baseline: March to July is based on the monthly distribution of flows as a percentage of the total in 1934; August to October is based on 1956; the May runoff forecast is used to project natural flow for May through July and is adjusted downward by 20% for uncertainties associated with the forecast; and an adjustment using coefficients specified in the 1981 Agreement is made to the forecasted supply because the entire flow of the river cannot be captured at the river diversions.

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<sup>16</sup> The 1928 Act adjudicated prior and paramount water rights for 8,346 acres of Pueblo lands, but on May 16, 1938, the Secretary of the Interior determined that the actual acreage was 8,847.

Pursuant to the 1981 Agreement, the Designated Engineer and Reclamation calculate the need to store water in El Vado based on months in which the forecasted supply of the river is inadequate to meet the forecasted demand of 8,847 acres. Monthly forecasted shortages between supply and demand are increased by 20% to cover transportation and carriage loss in the river. Monthly adjusted shortages are totaled resulting in the quantity of water to be managed for the pueblos in El Vado. The 1981 Agreement is nonspecific regarding release procedures. Currently, the Designated Engineer uses a spreadsheet tool for monitoring the daily natural supply at Otowi and uses the 1956 crop demand curve for monitoring daily demand until a better tool is developed. The Coalition of the Six MRG Pueblos (Coalition) currently directs the Designated Engineer to order Reclamation to make release of stored water over specified periods of time. MRGCD delivers this water to the pueblos as appropriate through downstream diversions. Unused prior and paramount water in El Vado that was stored when Compact Article VII restrictions were in place is released to satisfy Rio Grande Compact obligations after the irrigation season ends, usually in November or December. Unused water stored for the prior and paramount lands without Compact restrictions in place is reassigned as native Rio Grande water for use by the MRGCD, which is then available for use on non-pueblo and pueblo land within the MRGCD.

### ***3.2.2.3 Summary of Reclamation's Proposed Actions for Operation of El Vado Dam and Reservoir***

Reclamation proposes to continue operating and maintaining El Vado Dam and Reservoir consistent with current agreements, the Compact, and the operational and hydrologic constraints and conditions of the MRG Project. Reclamation proposes to continue storing the flow of the Rio Chama in El Vado Reservoir as requested by MRGCD and to ensure delivery of water as requested by the MRGCD and as requested by the Designated Engineer as part of prior and paramount operations. Retention and regulation of native Rio Grande flows will be performed consistent with the Doctrine of Prior Appropriation<sup>17</sup> and in coordination with the State of New Mexico, and to meet downstream senior flow rights.

Reclamation proposes to operate and maintain El Vado Dam and Reservoir as follows:

- Store water in and release water from El Vado Dam and Reservoir pursuant to the Flood Control Acts of 1948 and 1950, the 1951 Contract with MRGCD, in accordance with NMOSE Permit No. 1690, and to meet the downstream channel capacity of 4,500 cfs.

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<sup>17</sup> New Mexico water law follows the Doctrine of Prior Appropriation, which provides that water users that apply water to beneficial use earlier in time (senior users) will have a better right against later water users (junior users) in times of shortage. (NM Constitution, Article II, Section 2).

- Carry out NMOSE water user delivery requirements, Compact requirements, and MRGCD requests for water storage and release.
- Maintain safe storage elevation of El Vado Reservoir per standard operating procedures except under specific exceptions that consider flood routing criteria, water surface elevation, and river flow in the Middle Rio Grande Valley.
- Store native flows when Article VII of the Compact is not in effect.
- Store native flows as needed for the prior and paramount lands of the Six MRG Pueblos and release this water for the Six MRG Pueblos as requested by the Designated Engineer pursuant to the 1981 Agreement when Article VII of the Compact is in effect.
- Store and release SJC Project water, if requested by the MRGCD.
- Bypass native Rio Grande water flows into El Vado Reservoir up to 100 cfs between April 1 and September 1 to meet demands of Rio Chama water rights holders downstream from Abiquiu Dam.
- Operate to stay within the safe downstream channel capacity on the Rio Chama per standard operating procedures.

Additional considerations for Reclamation’s operation of El Vado Dam and Reservoir are as follows:

- When water is available for release to downstream users or storage reservoirs, Reclamation manages releases to benefit fisheries below El Vado Dam from November to March.
- When water is available for release to downstream users or storage reservoirs, and in cooperation with effected parties, Reclamation manages releases for rafting during weekends in July, August, and September.

### **3.3 Non-Federal Proposed Actions**

#### **3.3.1 The Middle Rio Grande Conservancy District**

MRGCD requests releases of water from El Vado Reservoir and diverts Rio Grande surface water to provide water for irrigated agriculture using the works at Cochiti Dam and operates diversion structures at Angostura, Isleta, and San Acacia (collective the Diversion Dams). Additionally, MRGCD diverts from three diversion structures on the Low Flow Conveyance Channel: the 1200 check structure, Neil Cupp, and Lemitar.

### **3.3.1.1 MRGCD Water Operations**

MRGCD uses water stored in El Vado during times when native Rio Grande flows are insufficient to meet irrigation demand (typically, these times are between June and September). It requests that Reclamation store native water in El Vado during times when Article VII restrictions are not in place. During times when Article VII restrictions are in place, MRGCD may request storage up to the extent that New Mexico has relinquished credit water to Texas and authorized use by the MRGCD. During normal operations, when the natural system is producing less water than required by the MRGCD to meet irrigation demand, MRGCD uses water from storage to augment the Rio Grande up to its needs. MRGCD utilizes water from available and authorized water sources. In general, MRGCD prioritizes the water released to supplement the natural flow as follows:

1. Rio Grande water stored under normal conditions (no Compact restrictions)
2. Water stored due to Rio Grande Compact credit relinquishment
3. SJC Project water

MRGCD may reduce diversions, or cease calling for releases from El Vado Reservoir before the scheduled end of the irrigation season to conserve water for subsequent irrigation seasons. This becomes carryover storage in El Vado.

MRGCD follows shortage-sharing operations at times when the natural flow is insufficient to meet the full irrigation demand, and there is not sufficient water in storage at El Vado to make up the difference, or MRGCD chooses to not call for release of available water in storage to make up the shortfall. At these times, the water needs for the prior and paramount lands of the Pueblos are met first, using flows from the main stem of the Rio Grande and upstream tributary flows, and then if natural flows are not sufficient with water held at El Vado Reservoir to benefit the prior and paramount lands of the Six MRG Pueblos. The delivery of water to Pueblo lands with prior and paramount water rights is carefully scheduled and monitored and involves a high level of coordination between Reclamation, BIA, the Six MRG Pueblos, and MRGCD. Water to meet the needs of these lands primarily is diverted at the Cochiti Dam outlet works and at Angostura. Although much of Isleta Pueblo is served from the Angostura Diversion, small diversions sometimes are required at Isleta Dam to serve parts of the Isleta Pueblo. Water delivery to Isleta Dam is most efficient and effective if the needed water is diverted at Angostura and routed through the MRGCD system. Any water remaining downstream from Isleta Pueblo after prior and paramount needs are met is shared equally among all users. Newly reclaimed lands of the Pueblos receive water similar to non-Pueblo lands.

Reclamation coordinates with the MRGCD for releases of irrigation water from El Vado Reservoir at the request of MRGCD. During periods of high runoff on the Rio Chama and absent any restrictions on storage due to the Compact,

MRGCD may request Reclamation to store up to 100% of the natural Rio Grande flow entering El Vado Reservoir.

MRGCD requests releases of supplemental irrigation water from El Vado Reservoir for the benefit of all irrigators in the most efficient manner practical, minimizing times when MRGCD is in prior and paramount operation. Minimizing prior and paramount operation periods benefits the species by reducing the need for Supplemental Water for the species. It also benefits the Pueblos by providing fully for their needs without the more restrictive scheduling and monitoring necessitated by prior and paramount operation.

To determine the rate of release, MRGCD evaluates the amount of native flow moving downstream in the Rio Grande at the Embudo gage and the amount of native flow contributed by the Rio Chama and other tributaries. That combined amount then is compared with the MRGCD's estimated diversion demand. Irrigation storage is released only when the natural flow is insufficient to meet MRGCD's irrigation demands. Natural flow is generally only sufficient to meet that need during the snowmelt runoff early in the irrigation season and during periods of heavy monsoon activity late in the irrigation season.

MRGCD has a small (2,000 AF) re-regulation pool at Abiquiu Reservoir for its share of SJC Project water. While, in general, this has little effect on flows in the MRG, it occasionally is used to produce recreational benefits on the Rio Chama. Small blocks of water may be moved to Abiquiu Reservoir specifically to increase flow on the Wild and Scenic portion of the Rio Chama to an appropriate level for recreational whitewater rafting. This water is released later from Abiquiu Reservoir when needed to meet irrigation needs. This is done on a larger scale with movement of ABCWUA water supply from upstream reservoirs to Abiquiu; but when ABCWUA is not moving water, the MRGCD re-regulation pool at Abiquiu will continue to be used for this purpose.

### **3.3.1.2 MRGCD's Water Diversions and Returns**

The water that MRGCD diverts consists of natural flows of the main stem of the Rio Grande and its tributaries (including the Rio Chama, if the water is passed through without being stored in El Vado), SJC Project water, native Rio Grande flows stored at El Vado (including water stored as the result of New Mexico credit relinquishment pursuant to the Compact [relinquishment water]). Under certain operations for Pueblo lands with prior and paramount water rights, MRGCD diverts native Rio Grande water stored in El Vado by Reclamation. MRGCD operates the Diversion Dams to match actual agricultural demand as closely as practical. This allows the MRGCD to release less water from storage and, therefore, may allow it to extend its irrigation season.

Typically, MRGCD diverts and delivers water from March 1–October 31 each year. The MRGCD Board of Directors determines the duration of the irrigation

season. In recent years, the Six MRG Pueblos have requested delivery of irrigation water through November 15. MRGCD has complied with this request for Pueblo lands, but has continued to end non-Indian deliveries on October 31. Irrigation demand correlates closely with climatic conditions and the physiologic properties of agricultural crops. Demand is highest during the months of May, June, and July, tapering off in August and through September. During the early and late part of the irrigation season, much of the water diverted by MRGCD is returned directly to the Rio Grande. During the peak growing season, most water diverted is consumed by crops; and return flows are minimal. From March through mid-June, natural flows in the Rio Grande are generally greater than MRGCD consumptive needs. However, after the end of the spring snowmelt runoff, naturally occurring flows often drop precipitously and are generally less than the consumptive needs of MRGCD. At this time, MRGCD augments the natural flow of the Rio Grande, up to its consumptive needs, through requests that Reclamation release stored water from El Vado Reservoir.

MRGCD diversion flows are higher than consumptive use of water. This additional flow, often referred to as “carriage water,” is a common and necessary component of gravity-fed irrigation systems worldwide. It can lead to misrepresentations of agricultural water consumption. Much of MRGCD’s carriage water returns to the Rio Grande through a variety of paths. Some simply passes down the length of a canal and returns directly to the Rio Grande through a wasteway. Some canals, farm ditches, and fields discharge surface water directly to MRGCD drains. Some water seeps from canals or from field applications into the ground water system and then is intercepted by MRGCD drains to once again become surface flow. Flow recovered in MRGCD drains may be discharged back to the Rio Grande or be recycled to another canal. However, some carriage water is truly lost from the system through evaporation, consumption by riparian vegetation along irrigation canals, and seepage to ground water (which then is pumped and consumed by other users).

MRGCD’s wasteways and drain outfalls provide water that may be re-diverted downstream; and, therefore, the accounting of the total MRGCD diversion may account the same water a number of times. See figure 3 below.

Return flow from the Cochiti division comprises about 18% of the supply for the Albuquerque Division. Return flows from the west side of the Albuquerque Division supply a portion of water directly to the west side of the Belen Division and Isleta Pueblo. Return flow from the east side re-enter the Rio Grande a short distance upstream of Isleta dam and are then diverted for re-use. Direct Albuquerque division return flow comprises about 13% of supply for the Belen Division. When combined with indirect returns (returned to the Rio Grande before being re-diverted), Albuquerque division provides about 35% of Belen Division supply.

The Belen division diverts water to both sides of the Rio Grande. The east side system is comprised of the Peralta Main Canal, San Juan Main Canal, and many laterals and Acequias. Return flows from the east side may be delivered back to the Rio Grande from 4 outfalls, or routed all the way to the Lower San Juan Drain outfall, about 9 miles upstream of San Acacia Dam. At its terminus, the east side system delivers water to the La Joya Acequia Association (LJAA), an independent system not part of the MRGCD.

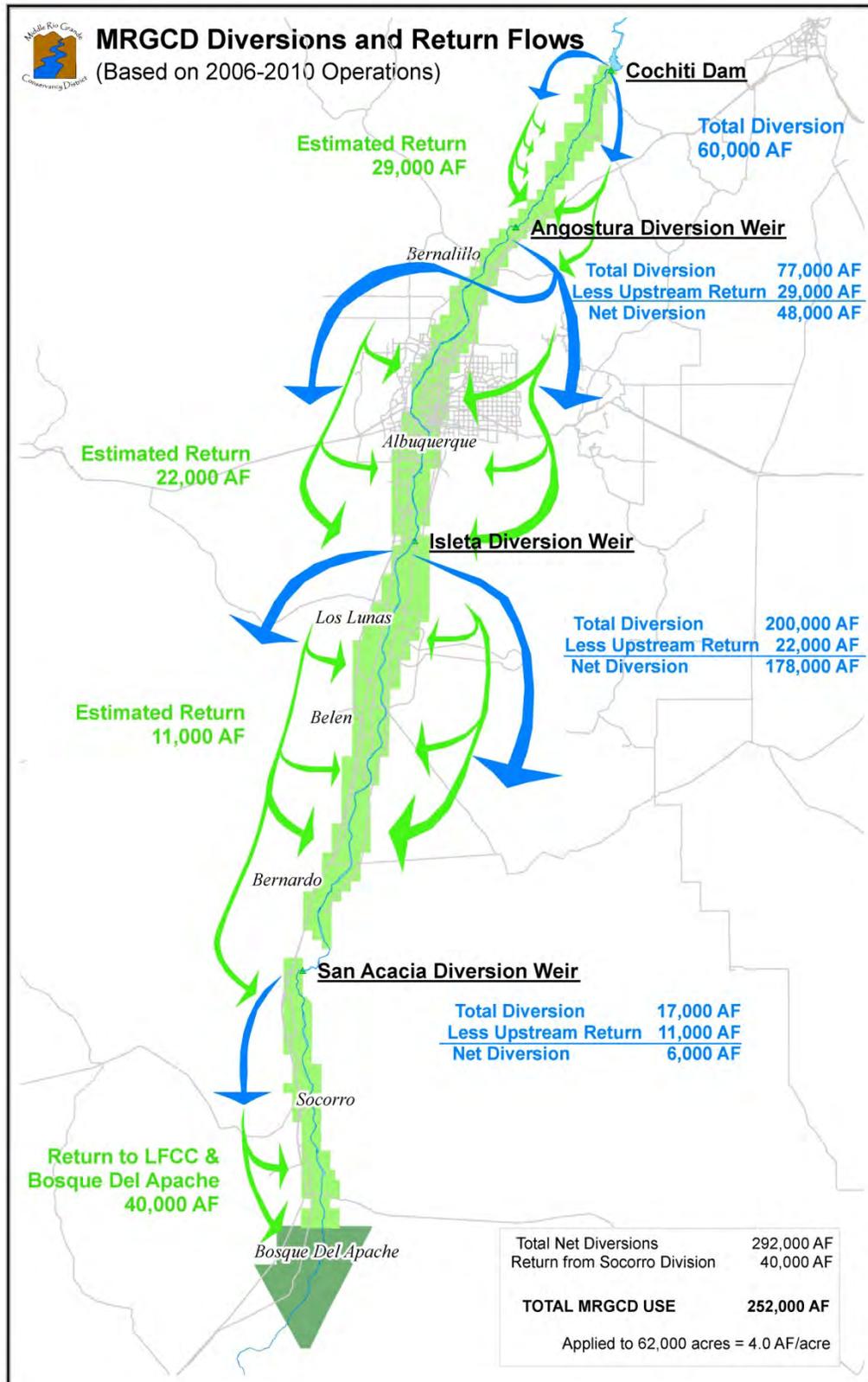


Figure 3. MRGCD diversions and return flows.

The west side system diverts water to the Belen High Line Canal, which supplies laterals and Acequias. Return flows from the west side may be directed back to the Rio Grande at seven locations or may be delivered directly into the Socorro Division, via the Unit 7 Drain. Direct Belen division return flow, comprises about 79% of supply for the Socorro Division.

San Acacia Diversion Dam is used primarily to supplement flows when necessary, or during periods when the Belen Division is unable to supply water. When flows in the Rio Grande are high, San Acacia Dam may be used preferentially over Belen return flows due to a lower salt content in the water at certain times of the year. During much of the year, water is intentionally diverted at Isleta Dam and routed to Socorro Division to minimize the very high evaporative conveyance losses incurred by the river during the summer months. The Socorro Main Canal receives water from both the Unit 7 Drain and from San Acacia Dam. The Socorro Main Canal has a North, Center, and South portion. To a large degree, return flows are collected from the North section to supply the Center section, and from the Center section to supply the South section. The LFCC recycles Socorro Division water supplies at three locations.

MRGCD returns surface water from its canals directly to the LFCC at four wasteway points. The MRGCD then may divert this recovered water into its canal system at three locations. There is a single, small MRGCD wasteway that can return water directly to the Rio Grande by discharging to the Brown arroyo, which crosses over the LFCC to enter the Rio Grande.

### **3.3.1.3 Summary of MRGCD'S Proposed Actions**

MRGCD proposes to continue coordinating with Reclamation for the release of irrigation water from El Vado Reservoir, operating the Diversion Dams and delivering return flows to the Rio Grande, as has been done since 1935, to provide water for beneficial use by the Six MRG Pueblos and as provided for by New Mexico law to non-Pueblo water users within the MRGCD service area, as described above, and in compliance with State and Federal law.

MRGCD proposes to request releases from El Vado Reservoir and to operate and maintain the Diversion Dams pursuant to the 1923 New Mexico Conservancy Act, Federal Congressional Acts of 1928 and 1935, NMOSE Permit No. 0620, and the 1951 Contract to meet the following requirements:

- Divert and deliver water stored in and released from El Vado Dam and native Rio Grande water to satisfy the needs of private property holders and users of water within its service area, prior and paramount lands, and newly reclaimed lands of the Six MRG Pueblos.

- During times of shortage, divert and deliver native Rio Grande water for lands of the Six MRG Pueblos with prior and paramount water rights, as requested by the BIA Designated Engineer.
- Re-divert MRGCD's contracted SJC Project water, which, by statute, cannot be used by the United States for ESA purposes, except upon a willing seller basis.

## **3.4 Proposed Conservation Measures**

### **3.4.1 Reclamation's Conservation Measures**

#### **3.4.1.1 Reclamation's Supplemental Water Program**

Reclamation's Supplemental Water Program is a proposed conservation measure to aid Reclamation's ESA compliance for its MRG Project operations and river maintenance program. The Program is fully within Reclamation's discretionary and budgetary control, and was identified as a specific Federal responsibility in 2008 congressional legislation. In 2011, Reclamation completed an updated NEPA analysis of the Program and issued a finding of no significant impacts. The current Program consists of three components:

1. Water acquisition and storage.
2. SJC Project waivers of mandatory release dates from Heron Reservoir.
3. Pumping and conveying water from the LFCC to the Rio Grande, including the operation of an outfall near Escondida.

##### **3.4.1.1.1 Water Acquisition**

Supplemental Water Program water acquisition and storage includes several sources. Reclamation has acquired most of its Program water by entering into temporary lease agreements with many SJC Project contractors on a willing lessor basis. However, as SJC Project contractors develop facilities to put their contracted water to beneficial use, less water will be available in the future for lease to supplement species needs.

Reclamation had leased previously unallocated SJC Project water for use in its Supplemental Water Program; however, that water was allocated for the Aamodt and Abeyta Pueblo water rights settlements in 2010. Reclamation proposes to seek lease agreements for newly allocated SJC Project water from the Pueblos until the water projects associated with the settlements are completed.

With the support of the MRGCD, the SJC Project water used in the Program is exchanged with native Rio Grande water. Reclamation also releases water captured, stored, and made available under an agreement between Reclamation

and the NMISC, the Emergency Drought Water Agreement, as amended, to meet the needs of the MRG Project and to benefit the federally listed endangered species. Additionally, Reclamation has entered into agreements with the MRGCD and the ABCWUA to store the leased SJC Project water that Reclamation acquires for the Program in El Vado and Abiquiu Reservoirs, respectively.

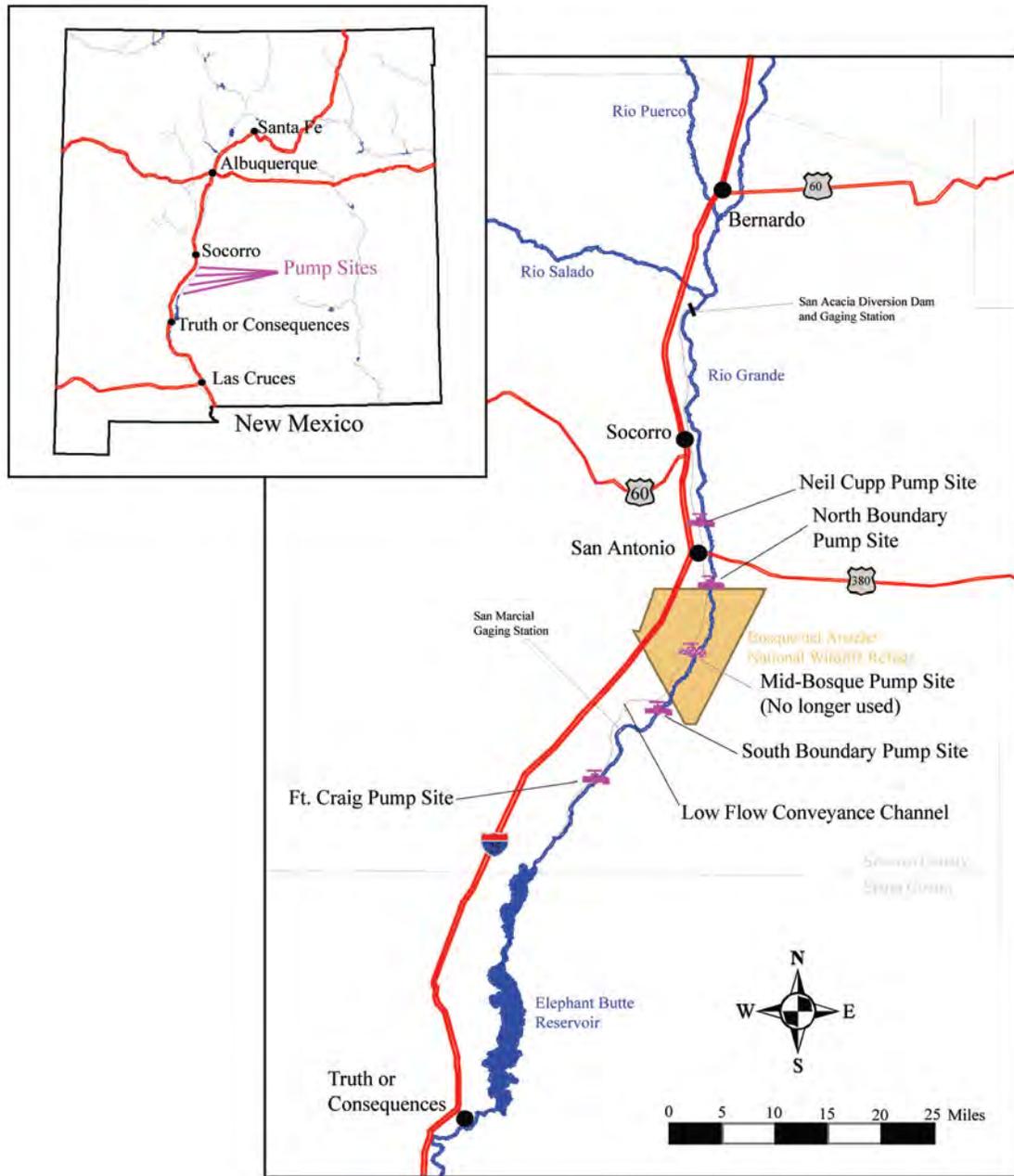
Reclamation also is seeking to acquire pre-1907 surface water rights as part of the U.S. Department of the Interior's Americas Great Outdoor initiative – Price's Dairy. The Service, working in partnership with the Reclamation, Bernalillo County, the city of Albuquerque, and local residents, is proposing to create a new national wildlife refuge along the Rio Grande in the South Valley of Albuquerque. It will encompass the 570-acre Price's Dairy property, one of the largest remaining agricultural properties in the metro region. The mission of the refuge will be to protect and restore wildlife habitat, enhance public recreation, preserve open space, and offer environmental education programs for visitors from across New Mexico and beyond. The 546 AF of senior water rights associated with the dairy would be used for onsite habitat restoration, agro-ecosystem demonstration, and environmental flows for ESA compliance in the MRG. Specifically, the portion of water rights acquired by Reclamation would be used as part of the Supplemental Water Program; and a portion of the water rights acquired by the Service will be used, as available, to support environmental flows.

#### **3.4.1.1.2 SJC Project Waivers**

Reclamation regularly authorizes extension of the date that SJC Project contractors take delivery of their annual allocation of SJC Project water if it benefits the United States and does not impact the delivery of imported water into Heron Reservoir. Through this process, contractor water that will be leased to Reclamation can be retained in storage at Heron Reservoir by the contractor, or Reclamation, into the year after the year the water was allocated to the contractor. This helps to ensure that the Supplemental Water still will be available when it is needed to meet flow requirements or storage space for the Supplemental Water will be available at downstream reservoirs. Waivers generally allow SJC Project water to remain in Heron Reservoir through April 30 of a given year. Waivers beyond April 30 have occurred infrequently under extreme conditions. Reclamation has authorized waivers at times when maintaining water in Heron allowed the use of such water as part of the Program at a later date or when the changing of delivery timing helped maintain fishery and recreational flows on the Rio Chama.

#### **3.4.1.1.3 Pumping from the LFCC**

Program pumping of water from the LFCC is used to support flows in the San Acacia Reach of the Rio Grande. Each year and as necessary, Reclamation reinstalls pumps at four locations along the LFCC, shown on figure 4, which are used to convey Supplemental Water from the LFCC to the Rio Grande for the benefit of the silvery minnow and the flycatcher.



**Figure 4. Current and historical LFCC pumping site locations.**

Maintenance, including sediment and aquatic vegetation removal, and necessary rehabilitation of discharge channels, including riprap lining, to a point sufficient to convey target water flows from pumps and unintended floodwater without erosion or degradation of pumping infrastructure. The annual maximum acreage of impact from the sum of areas described by the inlet to the pumps stretching to the outfall at the river is 2.6 acres. Much of this work is done with traditional heavy machinery including excavators, backhoes, dump trucks, and small hand-held power equipment.

Vegetation control, related to Supplemental Water pumping operations, occurs in two different areas. The first area is within 100 feet of either side of a given discharge channel or pipe network centerline at each of the four historic pumping sites. The maximum impact area of this first area is a total of 12 acres. The second area is along the corridors (10 lateral feet of either side) of evacuation routes that would be used by Reclamation and authorized contractor personnel who are working specifically in pumping operation and maintenance (O&M). The evacuation routes from the Neil Cupp and North Boundary pump sites are along the LFCC eastern road up to Highway 380. The evacuation routes for the Ft. Craig and South Boundary Sites are along the LFCC eastern road, including the bridge across the LFCC and east/west road to the San Marcial Yard. The maximum impact area of this second area is 126 acres. Vegetation control, or mowing, typically will be done with a radial blade mounted to a backhoe or other heavy equipment and can impact an annual total maximum of 138 acres for total pumping operations-related mowing. Historically, pumping-related mowing rarely amounts to more than one-fourth of the total maximum acreage, or about 34.5 acres. Acreage impacted from native willow harvesting, done for habitat restoration or remediation at locations outside of the pumping mowing-related boundaries, is not intended to be counted in the proposed acreage limits of mowing. Willow harvesting acreage is not expected to exceed a total of 5 acres and is typically done in the winter seasons when the species is dormant. Mowing is not expected to take place April 15 to August 15 to respect the guidelines set forth in the Migratory Bird Treaty Act of 1918. On occasion, circumstances may warrant violation of these dates; in which case, Reclamation will consult with the Service to ensure endangered or threatened avian species will not be disturbed as a result of mowing or other vegetative clearing.

Established protocols related to these functions will be followed that minimize or eliminate impacts to endangered species. If possible, planned work in-channel will be done when water is not present. When water is present within a discharge channel, various approved methods will be employed with the intent of safely removing potential endangered species prior to beginning work. When vegetative removal is necessary associated with pumping operations tasks, Reclamation biologists will survey the intended area of action for possible endangered species prior to clearing.

#### **3.4.1.1.4 Adaptive Management**

Reclamation is developing an implementation plan for a pilot adaptive management program in 2012. Reclamation proposes to examine water operations, including Supplemental Water and LFCC pumping, with the goal of optimizing the use of available water to support silvery minnow habitat and viability. Reclamation's AM efforts are intended to supplement and aid the RIP's adaptive management plan, discussed above.

**3.4.1.1.5 Summary of Reclamation’s Proposed Conservation Measure – the Supplemental Water Program**

Reclamation proposes the following specific conservation measures related to its Supplemental Water Program:

- To purchase or lease from willing parties, water, water rights or the right to store water for use in the Rio Grande to provide supplemental flows to the Rio Grande.
- To lease water from SJC Project contractors, depending on environmental conditions, water availability, funding, and the willingness of contractors to enter into leasing agreements.
- To acquire pre-1907 surface water rights from Price’s Dairy, in partnership with the Service.
- Reclamation proposes to release Program water as needed, to meet downstream flow targets, while supplies last.
- To seek to enter into water acquisition agreements and/or water management agreements with SJC contractors and other interested parties.
- To release water stored pursuant to the Emergency Drought Water Agreement or other similar agreements, as is made available by the State of New Mexico, consistent with the Compact and with State and Federal law.
- To utilize its Program water only when native flow management is insufficient to meet ESA requirements by exchanging leased SJC Project water with native Rio Grande water.
- To authorize temporary waivers, which allow SJC Project contractors to take their water deliveries in the following calendar year, if such waivers will benefit the United States and not impact delivery into Heron Reservoir.
- To pump and convey water from the LFCC to the Rio Grande, including the operation of an outfall near Escondida, New Mexico.

**3.4.1.2 Reclamation’s Environmental Water Operations**

A significant amount of coordination between Reclamation, the Corps, the MRGCD, and State and local water management agencies is necessary to successfully accomplish environmental water operations, also known as “River Eyes,” which includes coordination of water and river operations to improve system operations and to benefit habitat for listed species. The actions include daily observations of river conditions with written summer reports distributed via

email to recipients of water operations conference call notes and verbal reports given during water operations conference calls. River reconnaissance generally is performed early enough in the day so that observations can be relayed to water operations staff by 8:00 a.m. and may be followed up with late afternoon reconnaissance. Handheld global positioning system units are used to record spatial characteristics of receding and advancing edges of running water habitat. Irrigation wasteways also are surveyed to determine if they are actively contributing to river flows. Daily coordination of water operations between Federal and non-Federal partners are especially critical during periods of limited water availability and river drying.

Reclamation proposes, as a conservation measure, to continue its interagency efforts and environmental water operations.

### **3.4.2 MRGCD's Proposed Conservation Measures**

In conjunction with its proposed actions, the MRGCD proposes the following general and specific conservation measures. In addition to the measures described below, the MRGCD proposes to continue participating in the Collaborative Program and funding PVA research and model development.

Through inclusion in this BA, the MRGCD recognizes the need to continue to cooperate with Reclamation in achieving ESA compliance. As a part of this effort, the MRGCD Board of Directors approved a suite of specific conservation measures it is committed to in support of the Collaborative Program's goals (or a RIP, should one develop). These specific MRGCD commitments are included in Section 3.4.2.2 below, and in Appendix 8.

#### **3.4.2.1 MRGCD's Enhanced Water Operations**

##### **3.4.2.1.1 Enhanced Coordination**

MRGCD proposes to continue water operations, in coordination with Reclamation, the Corps, and State and local water management agencies, as was described above in Reclamation's environmental water operations. MRGCD's environmental water operations included the following:

- Participation in the regular management of water operations throughout the MRG, in conjunction with Reclamation, the Corps, NMISC, ABCWUA, and the Service with the goal of meeting irrigation water needs through providing efficient water management. Such conjunctive management should assist with meeting the needs of all State of New Mexico permitted water uses, remaining in compliance with the Rio Grande Compact, and benefitting the species to the greatest extent practical.
- Provision of access to MRGCD managed lands for operational and scientific purposes involving species (including guides, keys, etc.),

including activities related to habitat restoration projects, fish monitoring, and fish salvage.

- Operation and maintenance of measurement stations, telemetry equipment, computer processing, and data exchange networks to collect and distribute information on MRGCD water operations to other water management entities and the general public.
- Expansion and refinement of the network of MRGCD measurement stations to contribute to a more thorough scientific understanding of water movement, distribution, and use throughout the MRG.
- Support for efforts by Reclamation and the NMISC to fully understand Rio Grande depletions from all sources through participation in river measurements made by various entities.
- Support for management of Supplemental Water by Reclamation and species salvage by the Service, through participation in river measurements during critical periods.

#### **3.4.2.1.2 Changes in Operation to Support Instream Habitat and Flow Management**

The primary purpose of the operational measures described below is to benefit listed species.

- The MRGCD will continue to improve its system's operational efficiency and, therefore, minimize the amount of water from El Vado that is needed to augment MRG flows for irrigation demand. These actions can decrease significantly the requirement for Supplemental Water if they are able to keep the irrigation system from going into shortage operations. Shortage operations are "run-of-the-river" operations in which there is no available water in storage for non- prior and paramount irrigators and insufficient natural flow. During these operations, Reclamation's Supplemental Water is expended quickly, especially if there are any flow requirements beyond Isleta Dam. Efficient MRGCD operations allow flow targets to be met without Supplemental Water when MRGCD is operating normally and decrease the amount of Supplemental Water to cover times that the MRGCD is in shortage operations, since the efficiency helps to minimize the amount of time that the MRGCD is in shortage operations.
- In coordination with Reclamation's Supplemental Water Program, MRGCD will manage conveyance of Supplemental Water for delivery to drain outfalls and wasteways to better meet the needs of RGSM. These releases provide discrete wetted sections that serve as refugia for RGSM, with possible SWFL benefit and are most beneficial to the species when the release rates are managed for consistency.

- On occasion, when water is physically available, and in coordination with Reclamation and the Service, the MRGCD will manage its returns flows to assist the Service with its RGSM rescue efforts.
- Minimize or temporarily suspend diversions during periods of peak egg production to minimize incidental entrainment of eggs and larvae into irrigation canals; subject to rates of flow, agricultural needs, and coordination with the Service.
- During normal MRGCD operations, MRGCD will convey Reclamation's Supplemental Water as far as the Isleta Diversion Dam without incurring any consumptive losses for ESA.
- MRGCD will divert Reclamation's Supplemental Water as necessary at the Diversion Dams, leaving an equivalent amount of native Rio Grande water undiverted. This water accounting exercise provides that the Supplemental Water Program's SJC Project water is fully consumed within the MRG, which is consistent with the intent of the SJC Project to provide for beneficial use of Colorado River water in New Mexico.
- During normal MRGCD operations, the MRGCD will allow a flow of native Rio Grande water equivalent to 50% of Reclamation's Supplemental Water arriving at Isleta Diversion Dam to pass through the San Acacia diversion after an appropriate time delay. MRGCD will bear a variable portion of losses to Reclamation's Supplemental Water, dependent on rates of flow and time of year.
- During MRGCD shortage/conservation operations and when the ABCWUA has agreed to suspend diversions of native Rio Grande water, MRGCD will, if deemed necessary, reduce diversions at Angostura Diversion Dam to the minimum practical rate of flow required to meet irrigation demand within the Albuquerque division, as occurred during the fall of 2011.
- Under certain conditions, by mutual agreement and to prevent delay, when Reclamation has begun releasing Supplemental Water but that water has not yet reached its intended destination, MRGCD will assist Reclamation to achieve intended rates of flow below the Diversion Dams.
- Under certain conditions, by mutual agreement and contingent on water being physically present, MRGCD will take actions to maintain a small discharge, not to exceed 8 cfs (normal gate leakage) below the Isleta Diversion Dam.
- Under certain conditions, by mutual agreement and contingent on water being physically present, MRGCD will take actions to maintain a small

discharge, not to exceed 8 cfs (normal gate leakage) below the San Acacia Diversion Dam.

- During normal operation, and when water in excess of irrigation demand is available, MRGCD will manage its diversions and outfalls to return flows to the Rio Grande to specific habitat areas near drain and wasteway discharge locations. MRGCD will identify key target areas where water can be returned, especially during critically dry periods, to maintain wetted habitat for silvery minnow when drying is occurring elsewhere in the river. Figure 3 in section 3.3.1.2 illustrates the locations where MRGCD can best enhance river flows.
- When not in normal operations, or when MRGCD water supplies are severely constrained, MRGCD may convey Reclamation Supplemental Water for delivery to drain outfalls and wasteways. These deliveries will be in coordination with Reclamation's Supplemental Water Program to maintain discrete wetted sections that serve as refugia for silvery minnow, with possible Southwestern willow flycatcher benefit.

#### **3.4.2.1.3 Changes in Operation to Support Spring Peak Flows**

- MRGCD will request that Reclamation store water at El Vado Reservoir in a manner that minimizes the impact of storage operation on the magnitude and duration of spring runoff hydrographs. To the extent practical and consistent with MRGCD storage requirements, storage should occur early during the runoff period so that more water may pass through El Vado during times most advantageous to spawning of the silvery minnow. MRGCD may request that Reclamation use an increased rate of storage at El Vado during times when releases from Abiquiu Reservoir are at channel capacity to minimize reduction to peak discharge through the MRG.
- To the extent practical, MRGCD will coordinate its storage requests with Reclamation, NMISC, and the Corps with the intent of reaching its storage objectives maximizing peak discharge and/or duration of the spring runoff through the MRG for the benefit of the species.

#### **3.4.2.2 Proposed Conservation Measures: July 24, 2012**

At its July 24, 2012 Board of Directors meeting, the MRGCD approved additional conservation measures to be included in Reclamation's July 31, 2012 BA. However, at that time, Reclamation and the MRGCD anticipated that the Middle Rio Grande Recovery Implementation Program (RIP) would be included as the conservation measure serving as the means for ESA compliance. In this amended BA, Reclamation provides that the Collaborative Program will serve as the means for including non-Federal actions in its Section 7 consultation, and that conservation measures proposed by Reclamation, MRGCD, the State and the

Authority, together with the conservation actions currently taken by and through the Collaborative Program will serve to offset the adverse impacts of the proposed actions described in this BA. What follows are the proposed conservation measures approved by the MRGCD on July 24, 2012, without revision.

### Proposed MRGCD Conservation Measures

#### Preamble

1. Pursuant to its statutory general grant of powers (NMSA 1978, § 73-14-48), MRGCD has authority to enter into an endangered species Recovery Implementation Program (RIP) and to undertake certain species survival and recovery actions to be incorporated within the MRGRIP Action Plan. However, MRGCD has no authority to violate its statutory obligations and MRGCD is specifically prohibited from relinquishing control of the waters or lands of the District or from administering or managing District waters in such a way as to impair the private water rights of individual irrigators or its own statutory water rights (NMSA 1978, § 73-14-47).<sup>18</sup>
2. MRGCD has the authority to develop an Operating Plan to carry out some of the programs within the RIP that will benefit listed species (NMSA 1978, §§ 73-14-48 *et seq.*), but MRGCD has no authority to relinquish its authority to implement the terms of such an Operating Plan to any third party, particularly when such implementation may involve control of the use of the District waters or lands (NMSA 1978, § 73-14-47).
3. MRGCD has the authority to lease or otherwise provide reservoir storage space for a “supplemental water pool” and to assist in developing programs for use of that storage to provide protection for the RGSM consistent with the RIP, and as a contribution to cost-share, but it cannot do so in a way that reduces storage for persons entitled to receive water from the MRGCD (NMSA 1978, § 73-14-47).

Consistent with the above limitations, the MRGCD proposes the following actions for conservation of the species:

- A. The MRGCD recognizes the need for ESA compliance and the need to continue to cooperate with Reclamation in future compliance efforts, which include the conjunctive management of water for species needs, municipal withdrawals, RGC obligations, and irrigation needs. The MRGCD will develop annually an

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<sup>18</sup> See *Gutierrez v. MRGCD*, 34 N.M. 346, 282 P. 1 (1929) (citing the full protection of private water rights afforded by Section 316 of the Conservancy Act).

Operating Plan. This Plan will coordinate the delivery of irrigation water to water rights holders and water users within the MRGCD. The Plan will also assist in meeting the needs of the listed species for population survival and recovery, including spawning, recruitment and survival habitat needs as determined by using the best available scientific information. The development and implementation of this MRGCD Operating Plan will be incorporated into the Middle Rio Grande Recovery Implementation Program (MRGRIP) Action Plan as part of the conservation actions and/or tasks which are expected to permit the MRGRIP to attain and maintain compliance with the ESA.

- B. The MRGCD will cooperate with state and federal agencies in creation and operation of a “supplemental water pool” consisting of up to 30,000 AF to be stored in available space in Abiquiu reservoir. Water stored for ESA purposes may, subject to ISC approval, be stored under the authority of the Strategic Water Reserve. Water stored separately by MRGCD for irrigation purposes will be managed by the MRGCD under its authority contained in the Conservancy Act. The conjunctive management of MRGCD water will provide some environmental and biological benefits to RGSM. The creation of the SWR was authorized by the NM Legislature in 2005, for the purposes of providing a water reserve to help New Mexicans manage through drought periods. In addition to meeting the needs of water users and NM’s delivery obligations under the RGC, a goal of the pool will be to assist in providing flows needed for ESA purposes, and in so doing, to protect the rights of existing water users. Storage space at Abiquiu Reservoir for the pool was set aside by the ABCWUA as a result of a settlement between ABCWUA and Environmental groups when the ABCWUA was seeking to permit and construct its SJC Diversion works.

Water supply for the pool may come from a variety of sources including uncontracted SJC water and purchases of SJC water by the Federal Government from willing sellers. The use of surplus SJC water would be a primary choice for development of water supply, along with RG water stored as a result of NM having relinquished credit water in Elephant Butte reservoir to Texas under the Rio Grande Compact. Use of this water would be subject to the limitations of New Mexico water law. MRGCD is the largest and most likely recipient of credit water stored as a result of relinquishment and in the absence of ESA requirements would logically be the recipient of most of this water. Relinquishment credit water (more correctly stated as the right to store water against relinquished NM RGC credits) is made available by the New Mexico Rio Grande Compact Commissioner. MRGCD will urge that a percentage of water resulting from credit relinquishments to the pool be allocated for ESA purposes. MRGCD will cooperate with appropriate entities to maximize NM credit status under the RGC,

and increase the opportunities for future credit relinquishment to benefit both the ESA needs and MRGCD water supply. Concurrently, MRGCD will expand its opportunity for storage to manage through drought by completion of agreements with ABCWUA to store up to 50,000 AF of water at Abiquiu Reservoir. Space at Abiquiu reservoir for this purpose was pledged by ABCWUA as a result of MRGCD withdrawing its objections to permitting and construction of the ABCWUA SJC diversion works. While MRGCD has authority over water it holds in storage, MRGCD will cooperate and coordinate with NMISC, ABCWUA, BOR and other appropriate entities to conjunctively manage releases from storage and releases from the pool to maximize flexibility in Rio Chama water operations for the benefit of environmental/recreational concerns, and to minimize evaporative or conveyance losses.

- C. Depending on the available water supply and consistent with its primary statutory mission of conveying and delivering water for its use in agriculture, when MRGCD has water surplus to the needs of its irrigators within its canal system, the MRGCD will manage its diversions and outfalls to return excess flows to the Rio Grande for habitat areas and other designated sites, as determined by, and consistent with tasks identified within the MRGRIP Action Plan. The MRGCD will participate with other MRGRIP entities, in particular with the U.S. Fish and Wildlife Service, the MRGRIP Science Coordinator and scientific workgroups, and the MRGRIP management and Executive Committee, to identify and study key habitat areas to which water can be returned, especially during critically dry periods, to serve species population needs for survival and recovery, as determined by the best available scientific information, by maintaining wetted habitat for silvery minnow when drying is occurring elsewhere in the river. This commitment will not compel the District to deliver water to habitat or other sites when it is needed to serve irrigators' requirements.

When the MRGCD determines that water surplus to irrigation needs is not available within the MRGCD system, and flow to designated habitat or other areas for species needs is desired, MRGCD will convey water to these areas from available species water resources. MRGCD's contribution will be to bear the conveyance loss from point of release at a reservoir to point of delivery at habitat area, if MRGCD is delivering water along these same pathways for irrigation purposes. An exception may occur if delivery of water to a designated habitat area requires the use of a canal or other water pathway which is not normally or currently in use, in which case species water would be required to incur actual conveyance losses.

- D. The MRGCD will cooperate and assist with the creation and enhancement of specific habitat areas, the so-called “String of Pearls” to provide a series of refuge areas where RGSM populations may be maintained during normal periods of low and intermittent flow in the MRG. These areas tend to be located near MRGCD outfalls which typically discharge excess water, or which can be readily used to convey species water with minimal losses. These areas are located in the Albuquerque, Isleta, and San Acacia reaches of the Rio Grande. The MRGCD will maintain its outfalls and, consistent with existing agreements, the federal agencies will provide maintenance and enhancement of river areas through channel shaping, bank modification, vegetation management, food management, and biological management (non-native or predator removal) to provide conditions suitable to preserving maximum numbers of RGSM in good health for extended periods of time. The “String of Pearls” will provide RGSM refugial habitat between Cochiti reservoir and Bosque del Apache. The locations of the pearls are illustrated in the following map:
- E. To allow more precise control and management of water supply to San Acacia dam, MRGCD will pursue construction of a siphon near Bernardo, NM to deliver excess irrigation returns from the San Juan Riverside Drain system directly to the Unit 7/Socorro Main Canal system. This is envisioned to allow for more reliable water supply to the MRGCD Socorro division while simultaneously reducing the total annual volume of water required for diversion at San Acacia dam. This would be anticipated in turn to benefit peak flows through San Acacia dam, and sediment movement and river morphology upstream and downstream of San Acacia dam with associated benefits for RGSM. During times of low or no flow, the Bernardo siphon could be envisioned to assist with management of the “String of Pearls” by creating a refugial area downstream of the siphon itself, and creating a more dependable water supply at San Acacia dam for the maintenance of a refugial area downstream of the dam. It is anticipated that costs of this project operations will be borne in part by the MRGCD, and in part by the federal government. Once the anticipated water supply benefits of the Bernardo Siphon Project have been realized, distribution of water supplies resulting from the Project could be directed by the District to meet the needs of water users in the MRGCD Socorro division in conjunction with those of the listed species.
- F. To provide a water supply for the last pearl on the string, MRGCD will construct a return flow collection system at its southern boundary. Excess water from the San Antonio Acequia, the Socorro Main South Canal, the Socorro Riverside Drain, and the Elemendorf Drain will be routed to a central collection/distribution point. At the distribution point, water will be directed into the Low Flow Conveyance Channel and will be lifted back to the Rio Grande through a

permanent electrically powered pumping station to be constructed by the MRGCD and operated and maintained by the BOR. It is anticipated that costs of these operations will be supported as cost-share by the MRGCD, and also by the federal agencies and the MRGRIP. Distribution of water at this point will be to meet the needs of the listed species, the water rights of the Bosque del Apache National Wildlife Refuge, and RGC delivery obligations.

G. Recession Management

During inevitable low and intermittent flow periods on the RG, RGSM mortality may be greatly reduced by controlled rates of recession, allowing individuals to move to suitable habitat locations (the String of Pearls). Controlling this rate of recession can be challenging, and has in the past resulted in usage of large amounts of species water. This may be at the conclusion of the spring snowmelt period, or after periods of heavy precipitation. To the extent permitted by the Rio Grande Compact, a controlled rate of recession may be produced by USACE reducing releases from Cochiti reservoir in a series of small steps. As a part of the conservation measures to the MRGRIP, the MRGCD will establish a policy where during times of floodwater storage and managed recession for RGSM, MRGCD available natural flow will be determined by the theoretical release from Cochiti reservoir in the absence of any such managed recession. In this way, USACE may have greater flexibility in controlling the rate of recession for RGSM without affecting NM's RGC deliveries to Elephant Butte. This mechanism would require an update to the Water Control Manual for Cochiti reservoir.

- H. The MRGCD will actively participate in the creation of habitat to benefit the lifecycle of the RGSM. Habitat creation will be the responsibility of an interagency team consisting of MRGCD, the NMISC, BOR, USFWS, and USACE. The MRGCD will provide assistance in obtaining funding (cost share, etc.) and/or land for habitat restoration. Habitat restoration may be focused on enhancing the interconnection between active river channel and floodplain, as well as other types of restoration. Habitat restoration will be engineered to provide progressively greater levels of inundation at increasing flows, resulting in a range of habitat types. An initial goal over a XX year period will be 75 acres of RGSM habitat across the range of discharges.
- I. To the degree permitted by New Mexico water law, the MRGCD will cooperate with efforts to establish a program whereby groundwater users within the MRGCD may offer water for lease to BOR or other groups for the express purpose of providing flows from wells for endangered species. Water provided to this program will be from willing lessees with pre-1907 or pre-basin groundwater

pumping rights for agricultural use. Transfers of use of irrigation wells to instream uses will need to go through the OSE application and permitting process. Administration of this program must necessarily involve close coordination with the NMOSE and MRGCD to establish appropriate volumes of water and rates of flow, and to insure and verify that land from which pre-1907 water rights have been transferred for species use do not continue to be irrigated (absent an MRGCD water bank withdrawal).

- J. While the development of new modeling and analysis continues to assist in addressing species management uncertainties, the MRGCD will continue to fund the current PVA and statistical data analysis efforts through a research agreement with Montana State University as a contribution to the scientific understanding of the RGSM.

### **3.4.3 ABCWUA's Conservation Measures**

#### ***3.4.3.1 Additional Storage of Native Water***

The Albuquerque Bernalillo County Water Utility Authority (Water Authority) proposes to continue developing potential additional storage of native water at Abiquiu Reservoir. While perhaps ten years or more may be required, the Water Authority is proceeding with property lease and condemnation activity as necessary to increase the elevation of water storage at Abiquiu (6220 to 6230 elevation). The Water Authority has been working with the USACE, starting a project development team at the USACE, determining status of contract modification with the USACE, and evaluating real estate considerations and NEPA analysis. In general, increased storage of water is difficult within the Middle Rio Grande, but could provide additional opportunities for the management of water to benefit endangered species and water users.

#### ***3.4.3.2 Conservation Storage Agreements***

The Water Authority has agreements with environmental groups to potentially store 30,000 acre feet of water for conservation storage in the facilities where the Water Authority currently stores SJC water. While this activity is currently not allowed under existing permits held by the Water Authority, details are being negotiated with the ISC and the BOR.

#### ***3.4.3.3 Lease Supplemental Water***

The Water Authority will consider potentially leasing water to the BOR within the Supplemental Water Program. This would depend upon availability of water, timing and amount of lease, environmental compliance considerations, the participation of others in the program and other stipulations. SJC project waivers continue to be a mechanism for BOR to provide fishery and recreational flows on the Rio Chama. Third party sub-contracting of Water Authority SJC water is not currently being done, but remains an option for the Water Authority, and other water users.

#### **3.4.3.4 Continued Efforts Towards Water Conservation**

The Water Authority operates a rate payer water conservation program and posts frequent updates. The program continues to meet required and previously determined goals ahead of planned schedules and will be expanded to increase effectiveness.

#### **3.4.3.5 Continued Coordination With Water Releases/Diversions**

The Water Authority will continue to coordinate with other entities. Specific releases and amounts of water may occur when it is feasible and can be accomplished with the diversion schedules and amounts necessary to comply with Water Authority operations and requirements. Closer coordination with all Rio Grande water users is called for within the development of the RIP of the Middle Rio Grande Endangered Species Collaborative Program. The Water Authority participates through development of the BOR Annual Operating Plan, and developing the Adaptive Management framework being considered within the Collaborative Program.

### **3.4.4 Middle Rio Grande Endangered Species Collaborative Program**

A conservation measure proposed in this BA for both Reclamation and the non-Federal entities is the continued implementation of the Collaborative Program. The purpose of the Collaborative Program as described in the 2008 MOA is two-fold:

- First, to prevent extinction, preserve reproductive integrity, improve habitat, support scientific analysis, and promote recovery of the listed species within the Program area in a manner that benefits the ecological integrity, where feasible, of the Middle Rio Grande riverine and riparian ecosystem; and,
- Second, to exercise creative and flexible options so that existing water uses continue and future water development proceeds in compliance with applicable federal and state laws.

To achieve these ends, the Program may not impair state water rights or federal reserved water rights of individuals and entities; federal or other water rights of Indian nations and Indian individuals, or Indian trust assets; SJ-C Project contractual rights; and the State of New Mexico's ability to comply with Rio Grande Compact delivery obligations.

#### **3.4.4.1 Reliance on Collaborative Program for ESA Compliance**

Section 7(a)(2) of the ESA requires Federal agencies to ensure their actions are not likely to jeopardize the continued existence of listed species or destroy or

adversely modify designated critical habitat (see 50 CFR 402.01). This ESA requirement also includes any non-Federal actions that have a Federal nexus, where a Federal agency funds, authorizes, or carries out the action in whole or in part. Section 9 of the ESA prohibits Federal and non-Federal parties subject to the jurisdiction of the United States from “taking” endangered species. In the MRG basin, a variety of Federal and non-Federal activities related to water operations, water management and use, river maintenance, and flood control are subject to the ESA.

The Collaborative Program receives funding through congressional appropriations to implement projects designed to benefit the federally listed endangered silvery minnow and the flycatcher. The Collaborative Program implements activities required by the 2003 BiOp to support compliance with the BiOp providing ESA coverage for the two federal action agencies and broad coverage for participating non-federal entities. The 2003 BiOp also serves as a tool to conserve listed species, assist with species recovery, and help protect critical habitat.

Implementation of the Collaborative Program is presented in this section as a conservation measure to offset the effects of the water management-related activities described in chapters 3 of Parts I, II and III of this BA. Collaborative Program conservation measures for the aggregate set of adverse effects presented in the effects analyses have been designed to offset or minimize both direct and indirect adverse effects of the proposed action as well as of interrelated and interdependent actions.

#### **3.4.4.2 Collaborative Program Elements and Work Groups**

Collaborative Program activities are generally organized by seven LTP element categories: habitat restoration and management, water management, population augmentation/propagation, water quality management, research, monitoring, and adaptive management, public outreach, and program management.

The Executive Committee establishes work groups as needed to provide assistance and expertise to address specific Collaborative Program tasks. The Coordination Committee carries out the directives of the Executive Committee and reviews and provides recommendations on all aspects of the Program to the Executive Committee. The Habitat Restoration Work Group helps to restore habitat in the Middle Rio Grande to contribute to accomplishing biological opinion requirements for the benefit of the listed species. The Science Work Group provides scientific recommendations, technical assistance, and expertise. Other established work groups include the Species Water Management Work Group and the Public Information Outreach Work Group. Temporary ad hoc work groups may also be formed and consist of individuals with expertise and/or interest in a specialized subject necessary to implement a Collaborative Program task.

#### **3.4.4.3 Annual Work Plan**

Work groups, e.g., the Executive Committee, the Coordination Committee, and the Program Management Team, engage in an iterative, annual work plan process to identify and prioritize activities needed in the upcoming year for BiOp compliance and to assist with recovery.

#### **3.4.4.4 Adaptive Management**

The Collaborative Program Executive Committee acknowledges that there are still a number of critical uncertainties and hypotheses about the listed species and their habitat that are integral to water management and species recovery activities. AM is a structured and systematic approach for designing, implementing, monitoring, and evaluating management actions to maximize learning about critical scientific questions and to reduce uncertainties that affect management decisions regarding the use of Collaborative Program resources to achieve Collaborative Program goals. Learning resulting from adaptive management activities and monitoring will be used as a tool to improve management decisions to more quickly and cost-effectively attain Program objectives.

The adaptive management framework drafted by contractors to the Collaborative Program (Middle Rio Grande Endangered Species Collaborative Program Adaptive Management Plan Version 1, October 25, 2011) provides guidance for the development of a scientifically defensible AM design specific to the Program. It also includes a set of principles for designing AM actions and examples of management actions and appropriate monitoring plans. As an important priority, the Collaborative Program will use the AM framework and experience of this and other programs to develop a formal AM Plan. The Collaborative Program will identify specific management activities, monitoring, and research that will be used to evaluate and improve management decisions and will identify the decision making framework for flexible water management and other activities that provide for meeting the Program goals.

Adaptive management is not intended as a broad-based research program. In keeping with the purpose of AM, only learning relevant to management decision making will be sought through the AM process. AM will be implemented within the existing financial and hydrological resources available to the Collaborative Program.