

**RIO GRANDE FLOODWAY, SAN ACACIA TO BOSQUE DEL APACHE UNIT  
FLOOD RISK MANAGEMENT PROJECT  
SOCORRO COUNTY, NEW MEXICO**

The Final General Reevaluation Report and Supplemental Environmental Impact Statement II (GRR-SEIS II), dated October 2013, for the Rio Grande Floodway, San Acacia to Bosque del Apache project focuses on flood risk management to communities along the Rio Grande from the San Acacia Diversion Dam downstream to Elephant Butte Lake, New Mexico. A General Reevaluation Study was undertaken to modify the authorized project to conform with new levee design requirements, revised hydrology, and changed environmental conditions. Based upon this report, the reviews of other federal, state and local agencies and Native American tribes, input from the public, and the review by my staff, I find the plan recommended in the GRR-SEIS II to be technically feasible, economically justified, environmentally preferable, cost effective, and in the public interest. All substantive comments received on the draft and final GRR-SEIS II were assessed and considered in the decision-making process. All comments and the Corps' responses have been attached (as Appendix G) to the final document. Thus, I approve the Rio Grande Floodway, San Acacia to Bosque Del Apache Unit Flood Risk Management Project for construction.

The Final GRR-SEIS II, herein incorporated by reference, documents the evaluation of alternatives to address flood risks. Specific flood risk management features of the Recommended Plan include:

- 610-foot long concrete floodwall immediately upstream from the San Acacia Diversion.
- 1.1 miles of soil cement embankment on the west bank, downstream from the diversion.
- Removal of 42.3 miles of existing spoil bank and replacement with an engineered, earthen levee extending from the soil cement embankment downstream to Tiffany Junction, including seepage control and tie back levees at confluent channels, with a levee height four feet above the mean water surface elevation of the 1%-chance exceedance flood event.
- 5.7 miles of riprap protection on the levee slope and toe.
- Excavation of 12.4 acres on the east bank terrace, immediately downstream from San Acacia Diversion Dam to reduce the velocity of large flood flows.
- Slide-gate closure structure at Brown Arroyo.
- Revegetation and invasive plant species management on all disturbed areas.
- Up to 300-acre spoil deposition area at Tiffany Basin.

Several structural and non-structural alternatives were screened during the plan formulation process and eliminated from further evaluation because they individually or collectively did not fulfill the purpose and need for the project, or resulted in unacceptable adverse impacts to important resources. The alternatives eliminated from detailed evaluation are described in the GRR-SEIS II, and included: floodplain management regulations; retrofitting, dry flood proofing or elevating buildings; buyout or acquisition of damageable property; replacing the San Marcial railroad bridge; local levees (at San Acacia, Socorro, and/or Bosque del Apache National Wildlife Refuge); intermittent levee replacement; extending the levee south from Tiffany Junction adjacent to the railroad alignment.

In addition to the no action alternative, five reasonable and feasible alternatives underwent detailed evaluation, and are fully described in the GRR-SEIS II. Those five alternatives are:

1. An earthen levee from San Acacia to Tiffany Junction (42.3 miles) at the “base levee height” (1%-chance event water surface elevation);
2. An earthen levee extending four miles downstream from Tiffany Junction at the base levee height;
3. An earthen levee extending four miles downstream from Tiffany Junction, with the second alternative to this configuration designed four feet taller;
4. A minor, landward shift of the levee alignment at River Mile 108, which was considered as feature, it was able to be combined with each of the other four levee alternatives; and
5. The Recommended Plan is an earthen levee feature from San Acacia to Tiffany Junction, four feet taller than the base levee height.

For all alternatives, the potential effects to the following resource-related elements were evaluated: soils, hydrology, flood plains, water quality, air quality, noise levels, invasive species, aquatic and riparian habitats, wetlands, waters of the United States, fish and wildlife habitat resources, endangered and threatened species, socio-economics, prime and unique farmland, cultural resources, Indian trust assets, flood hazards, induced damages, land use and classification, environmental justice, and aesthetics.

The primary factor differentiating impacts among the alternatives was the size (both height and length) of the new levee, and its ensuing differential effects on the value of damages reduced, construction costs, the amount of waste spoil, and the potential for adverse impacts on fish and wildlife resources, including endangered species. While the levee alternatives built to the base height would create a smaller levee footprint, they would require significantly larger disposal areas and greater disposal costs for the deposition of waste spoil material removed from spoil bank. The longer levee alternatives would have greater construction costs and potential resource effects while only marginally increasing the value of flood damage prevented. The combinable alternative that would shift the levee alignment landward at River Miles 108 would entail slightly greater construction costs with only a marginal improvement of fish and wildlife habitat resources, and no additional value to flood risk management. The Recommended Plan is the National Economic Development (NED) Plan, which maximizes net economic benefits consistent with protecting the Nation’s environment, and is an environmentally preferable plan.

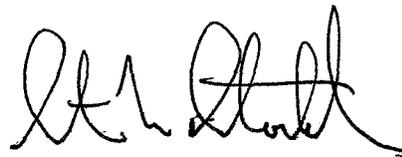
The Recommended Plan includes a feasible and cost-effective mitigation and monitoring plan consistent with Council on Environmental Quality guidance and the requirements of Section 2036 of the Water Resources Development Act of 2007. Mitigation measures include:

- 27.8 acres of native grass and forbs in areas exposed by the removed spoil bank.
- 1.8 acres of willow and riparian shrub plantings along the base of the soil cement embankment.
- 1.1 acres of willow plantings along the Rio Grande channel bankline.
- 50.4 acres of riparian trees and dense shrubs.
- Additional mitigation and monitoring activities relative to listed species.

All practicable means to avoid or minimize adverse environmental effects have been incorporated into the Recommended Plan. As explained in detail in the GRR-SEIS II, the potential effects on many resource elements were minor or substantively similar among the

various alternatives. Pursuant to the National Historic Preservation Act, and in consultation with the New Mexico State Historic Preservation Officer the Corps determined that the Recommended Plan would have no adverse effect on historic properties. The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix B of the GRR-SEIS II and a Section 401 State Water Quality Certification has been received. Best management practices as detailed in the GRR-SEIS II, and in accordance with the Water Quality Certification, will be implemented. The Corps has also completed Section 7 Consultation pursuant to the Endangered Species Act with the U.S. Fish and Wildlife Service (Service) and will comply with the Reasonable and Prudent Measures and Terms and Conditions in the Biological Opinion for the Rio Grande silvery minnow and Southwestern willow flycatcher. The Service has determined that the Recommended Plan is not likely to jeopardize the continued existence of the minnow or the flycatcher. The Corps fully commits to implementing the mitigation measures identified in the GRR/SEIS II, which are herein incorporated by reference.

Principle national policies that were considered when making a balanced decision to select the Recommended Plan from among the feasible alternatives evaluated included NED benefit evaluation procedures required for all Corps flood risk reduction projects by the Water Resources Development Act of 1986, the National Environmental Policy Act (along with Council on Environmental Quality guidance) and the Endangered Species Act. Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resource Council's *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. All applicable laws, executive orders, regulations, and local plans were considered in evaluating the alternatives. Based on review of these evaluations, I find that any adverse affects of the Recommended Plan have been avoided and/or minimized to the extent practicable, and that the Recommended Plan best meets the overall federal objectives. I find that the public interest would best be served by implementing the Recommended Plan. This Record of Decision completes the National Environmental Policy Act process.



Steven L. Stockton, P.E.  
Director of Civil Works



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

MAY 20 2014

CECW

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Director's Report for the Rio Grande Floodway, San Acacia to Bosque del Apache Unit, Socorro County, New Mexico

1. Purpose: To provide for your review and concurrence with the recommendations provided in the Final Integrated General Reevaluation Report and Supplemental Environmental Impact Statement II (GRR-SEIS II) for the Rio Grande Floodway, San Acacia to Bosque del Apache Unit, Socorro County, New Mexico, flood risk management project, (included as enclosure). The Flood Control Act of 1948 (Public Law 80-858, Section 203), authorized construction of the comprehensive plan for the Rio Grande and Tributaries, New Mexico, of which the San Acacia to Bosque del Apache Unit is a component. This report constitutes the final report for a determination by the Director of Civil Works, that the flood risk management project is feasible.

2. Recommendation: That you approve the San Acacia to Bosque del Apache Unit, Socorro County, New Mexico, plan to reduce flood damages and life safety risk by construction of an earthen levee extending approximately 43 miles along the west bank of the Rio Grande, from the San Acacia Diversion Dam to Tiffany Junction. The plan consists of replacing the existing non-engineered spoil bank with a structurally sound levee with a top height corresponding roughly to 4 feet above the mean 1% chance exceedance water surface elevation to provide flood risk benefits from high and low frequency flood events. The recommended plan maximizes net National Economic Development benefits and captures over 90% of the benefits identified in the study area for the period of analysis.

3. Background:

a. The purpose of the project is to reduce the risk of flood damages within the San Acacia to Bosque del Apache Unit of the Rio Grande Floodway in Socorro County, NM. The study area extends from the San Acacia Diversion Dam, located approximately 12 miles just north of the City of Socorro, New Mexico, downstream to Tiffany Junction, approximately 15 miles north of the upper extent of Elephant Butte reservoir. The project is located within New Mexico Congressional District 2 (Pearce (R)).

b. A 1-percent chance flood event occurring today could result in an estimated \$98.4 million in damages (2012 price level) in the study area. Start of damages is estimated to be between the 20- and 14-percent chance flood events. The San Acacia project is a component of the Rio Grande Floodway comprehensive plan that was authorized by the Flood Control Act of 1948, which included the U.S. Army Corps of Engineer (USACE) and Bureau of Reclamation (Reclamation) features for flood risk management and water supply for the Rio Grande Floodway from Velarde, NM to Elephant Butte Reservoir. The USACE features were defined in the report of the Chief of Engineers, dated 5 April 1948, which recommended a comprehensive flood risk management plan for the Rio Grande and Tributaries, NM which including construction of dams and floodways, levee rehabilitation and construction of new levees on the

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Rio Grande, Rio Chama, Jemez River and Bluewater Creek. The 1948 Chief's report did not identify the San Acacia unit as a stand-alone project, however it was a component of the recommended plan for the Rio Grande floodway through Espanola and the Middle Rio Grande Valley to Hot Springs (now known as Truth or Consequences).

c. To date, many of the other components of the 1948 comprehensive plan have been completed. The San Acacia to Bosque del Apache Unit is one of the few remaining components of the 1948 comprehensive plan yet to be constructed. Several studies and reports have been completed to document plan formulation, engineering analyses, economic evaluations, and design changes for this unit.

d. The 1960 Flood Control Act authorized modification of the Rio Grande Basin project to replace the proposed dam on the Rio Chama with Cochiti Reservoir Dam and to add construction of the Galisteo Reservoir Dam, at a total cost of \$58,300,000 based on the report of the Chief of Engineers, dated 29 April 1960. Subsequently, in 1961, a Senate Resolution directed further review of the 1948 report to consider flood and sediment-related problems caused in the area. As a result of this Resolution, USACE developed the Chief of Engineers report dated 27 September 1976 which recommended construction of flood and sediment control dams in lieu of levee rehabilitation in the San Acacia to Bosque del Apache Unit of the Rio Grande Floodway. The 1976 Water Resources Development Act (WRDA) authorized USACE to undertake Phase 1 advanced engineering and design for the project recommended by the 1976 Chief of Engineers report. The final environmental impact statement (EIS) was filed with the Council on Environmental Quality in 1977, and the draft Phase 1 General Design Memorandum (GDM) was completed in April 1985. However, this work was halted in 1985 when the State of New Mexico withdrew support for the project due to environmental concerns regarding construction of the sediment control dams.

e. Following the state's withdrawal of support, the project was reformulated and the recommended plan consisted of construction of an engineered levee along the alignment of the existing spoil bank paralleling the river. The reformulation showed that this was the only economically feasible alternative for this component of the 1948-authorized comprehensive plan. In 1987, Advanced Engineering and Design funds were provided and were used to prepare a Decision Document that was completed in 1988. The 1988 Decision Document concluded that the authorized plan was implementable. The information contained within the Decision Document was revised and submitted as a Reevaluation Report in 1989 (approved in 1990), which reaffirmed that the San Acacia to Bosque del Apache Unit was a technically viable, economically feasible, and implementable alternative. A Phase I GDM was completed in 1990, and a Feature Design Memorandum was completed in June 1991. A final supplemental EIS was filed in 1992. Phase 1 plans and specifications were initiated in 1992 and were nearing completion in 1994, but were put on hold due to newly identified issues, including: changes in hydrologic data analysis, endangered species, and changes in levee design methodology criteria. As a result of the new levee design criteria, the design had to be modified to incorporate new design features.

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SUBJECT: Rio Grande Floodway, San Acacia to Bosque del Apache Unit, Socorro County, New Mexico

f. A Limited Reevaluation Report and Supplemental Environmental Impact Statement (LRR/SEIS) were initiated in 1995 to reassess the authorized plan under current policies, criteria and guidelines. In December 1999, the LRR/SEIS was put on hold pending a decision from the Reclamation concerning the future of the Reclamation's low flow conveyance channel (LFCC). In February 2002, following Reclamation's decision regarding the LFCC, the work was restarted on the LRR/SEIS, which subsequently was changed to a GRR/SEIS.

g. In 2003, a Biological Opinion (BiOp) was issued on Middle Rio Grande water operations which included relocation of the privately-owned San Marcial railroad bridge as one of the Reasonable and Prudent Alternative (RPA) elements. Analysis at the time indicated that implementation of the levee project would impact the bridge, thereby causing a fifth amendment compensable taking of the structure, which would provide the federal interest and authority for relocating the bridge at Federal expense. Because of this, it was deemed appropriate to include as an RPA element under the water operations BiOp. Subsequent analysis has determined that the levee project will not impact the bridge. Therefore, there is no Federal interest or authority to relocate the bridge, making it ineligible for inclusion under the current, or any subsequent BiOp RPA and it was dropped from the project in 2008.

h. Title 1 of WRDA 1992 (Public Law 102-580) revised the project cost sharing as follows: "Notwithstanding any other provision of law, the project for flood control, Rio Grande Floodway, San Acacia to Bosque del Apache Unit, New Mexico, authorized by section 203 of the Flood Control Act of 1948 (Public Law 80-858) and amended by section 204 of the Flood Control Act of 1950 (Public Law 81-516), is modified to more equitably reflect the non-federal benefits from the project by reducing the non-federal contribution for the project by that percentage of benefits which is attributable to the federal properties; except that, for purposes of this subsection, federal property benefits may not exceed 50 percent of the total project benefits."

i. Based on the analyses in this GRR-SEIS II, 40.7 percent of the benefits are attributed to the LFCC. Based on the provisions of WRDA 1992, the local cost sharing requirement is 15.0 percent of the total project cost.

#### 4. Discussion:

a. The non-federal cost-sharing sponsors for the project are the Middle Rio Grande Conservancy District and New Mexico Interstate Stream Commission. Based on an October 2013 price level, the estimated total first cost of the recommended plan is \$244,177,000 with a \$207,584,000 federal cost and \$36,593,000 non-federal cost.

b. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas for construction is estimated at \$993,000. The local sponsors are responsible for the operation and maintenance of the project after construction, a cost currently estimated at \$618,020 per year.

c. The benefit-to-cost ratio for the proposed plan is 1.65 at a 3.5% rate.

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d. Potential adverse environmental effects would be minimized through avoidance, preconstruction surveys and analysis, regulatory requirements, and best management practices. Compensatory mitigation in the form of replacement or enhancement of 63.9 acres of habitat is required as a result of consultation with the U.S. Fish and Wildlife Service. The mitigation and monitoring for endangered species are estimated at \$1,469,000. Potential impacts to vegetation communities and special status species have been greatly reduced through avoidance, construction design and construction practices. Direct impacts to nesting birds and other sensitive species would be avoided by implementing preconstruction surveys and scheduling of construction activities.

e. In accordance with the Corps EC 1165-2-214 on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included an independent Agency Technical Review and an Independent External Peer Review. Overall the reviews have resulted in the improvement of the technical quality of the report including the enhanced communication of risk and uncertainty.

5. Conclusion: I have reviewed the Final GRR-SEIS II. Based on this review, I find the proposed plan is technically and environmentally sound, justified based on the monetary benefits it provides, and is socially acceptable. The proposed project complies with applicable USACE planning procedures and regulations. Also, the views of interested parties, including federal, state, and local agencies, have been considered.



STEVEN L. STOCKTON, P.E.  
Director of Civil Works

Encl



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

REPLY TO  
ATTENTION OF

MAY 20 2014

CECW

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS),  
108 ARMY PENTAGON, WASHINGTON, DC 20310-0108

SUBJECT: Rio Grande Floodway, San Acacia to Bosque del Apache Unit, Socorro  
County, New Mexico – Final USACE Response to Independent External Peer Review

1. Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-214, and the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).
2. The IEPR was conducted by Battelle Memorial Institute. The IEPR panel consisted of four members with technical expertise in Civil Works planning/economics, biology/ecology, cost engineering, and hydrologic and hydraulic engineering.
3. The final written responses to the IEPR are hereby approved. The enclosed document contains the final written responses of the Director of Civil Works to the issues raised and the recommendations contained in the IEPR report. The IEPR Report and the USACE responses have been coordinated with the vertical team and will be posted on the Internet, as required in EC 1165-2-214.
4. If you have any questions on this matter, please contact me or have a member of your staff contact Mr. Bradd Schwichtenberg, Deputy Chief, South Pacific Division Regional Integration Team, at (202) 761-1367.

STEVEN L. STOCKTON, P.E.  
Director of Civil Works

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