



**DEPARTMENT OF THE ARMY**  
**CHIEF OF ENGINEERS**  
**2600 ARMY PENTAGON**  
**WASHINGTON, D.C. 20310-2600**

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SUBJECT: American River Common Features General Reevaluation Report, California

THE SECRETARY OF THE ARMY

1. I submit, for transmission to Congress, my report on the study of flood risk management along the American and Sacramento Rivers within the metropolitan area of Sacramento, California. It is accompanied by the report of the Sacramento District Engineer and the South Pacific Division Engineer. These reports supplement the 29 June 1992 and 27 June 1996 reports of the Chief of Engineers. These reports were prepared as an interim general reevaluation study of the American River Common Features Project, which was authorized by Section 101(a) (1) of the Water Resources Development Act (WRDA) of 1996 (Pub. L. No. 104-303, § 101(a)(1), 110 Stat. 3658, 3662-3663 (1996)), as amended. Amendments to this authority are as follows: 1) Section 366 of WRDA of 1999 (Pub. L. 106-53, § 366, 113 Stat. 269, 319-20 (1999)); 2) Section 129 of the Energy and Water Development Appropriations Act (EWDAA) of 2004 (Pub. L. No. 108-137, §129, 117 Stat. 269, 1839 (2003)); 3) Section 130 of the Consolidated Appropriations Act (CAA) of 2008 (Pub. L. No. 110-161, § 130, 121 Stat. 1844, 1947 (2007)); and 4) Section 7002 of the Water Resources Reform and Development Act (WRRDA) of 2014 (Pub. L. No. 113-121, §7002,128 Stat. 1193, 1366 (2014)). The purpose of the report is to present the findings of an interim general reevaluation study of the authorized American River Common Features project. The study was conducted specifically to determine if there is a Federal interest in modifying the authorized project features for flood risk management in the project area.

2. The reporting officers recommend authorizing a plan to reduce flood risk along the American and Sacramento Rivers and Eastside Tributaries in the Sacramento area. The recommendation is supported by the non-Federal sponsors, the State of California and the Sacramento Area Flood Control Agency (SAFCA). The principal features of the recommended plan by reach are:

- Sacramento River East Levee
  - 9 miles of slurry cutoff walls to address levee seepage and stability problems
  - 10 miles rock bank protection to address erosion problems
  - 2.5 miles of geotextile stabilized slope and 2 miles of slope flattening to address levee stability
  - 1 mile of levee raise
- American River
  - 4 miles of rock bank protection and launchable rock trenches on the right bank to address erosion
  - 7 miles of rock bank protection and launchable rock trenches on the left bank to address erosion

DAEN

SUBJECT: American River Common Features GRR, California

- Eastside Tributaries
  - 4 miles of slurry cutoff wall to address levee seepage and stability problems along the Natomas East Main Drain (NEMDC) and Arcade Creeks
  - 4 miles of levee raises to address potential floodwater overtopping along Arcade Creek.
  - About 1 mile of levee raise and extension along Magpie Creek along with 80 acres of floodplain preservation
- Sacramento Bypass
  - Widen the Sacramento Weir and Bypass by 1,500 feet to reduce the water surface elevation in the Sacramento River and allow more water to flow into the Bypass system. This would include the construction of a new 2 miles long setback levee.

3. The recommended Locally Preferred Plan (LPP) would reduce flood risk to the City of Sacramento and surrounding areas. The proposed project would reduce Expected Annual Damages (EAD) within Sacramento by 73%, with a residual EAD of approximately \$130 million. Annual Exceedance Probabilities for flooding within Sacramento would be reduced from approximately 3% (1 in 32 chance of flooding in any given year) to approximately 0.7% (1 in 147 chance of flooding in any given year). The proposed project would have significant long-term effects on environmental resources, however in all cases, the potential adverse environmental effects would be reduced to a less than significant level or mitigated through project design, construction practices, preconstruction surveys and analysis, regulatory requirements, habitat restoration, and best management practices. Approximately 0.4-acre of jurisdictional wetlands were identified in the project footprint which could be impacted by the project, however this impact would be mitigated through the purchase of credits at a mitigation bank. Potential impacts to vegetation communities and special status species have been greatly reduced through feasibility level design. Direct impacts to nesting birds and other sensitive species would be avoided by implementing preconstruction surveys and scheduling of construction activities. The U.S. Fish & Wildlife Service and National Marine Fisheries Service have provided Biological Opinions in which the agencies provided recommendations for design refinement or mitigation.

4. Based on October 2015 price-levels, the estimate total first cost of the plan is \$1,565,750,000. In accordance with the cost sharing provision of Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2213), the State of California as the non-federal cost-sharing sponsor is responsible for the additional cost of the LPP. The federal share of the estimated first cost of initial construction would remain the same for the NED Plan and the LPP, currently estimated at \$876,478,000. The non-federal estimated cost share increases from \$467,514,000 with the NED Plan to \$689,272,000 with the LPP. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas is estimated at \$245,324,000. The State of California, along with the City of Sacramento and the American River Flood Control District would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction. Operation and maintenance is currently estimated at \$494,000 per year.

5. Based on a 3.125-percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$74,777,000, including OMRR&R. The selected plan is estimated to be 89% percent reliable in safely passing a flood which has a one

DAEN

SUBJECT: American River Common Features GRR, California

percent chance of occurrence in any year (100-year flood) significantly reducing flood risk for the City of Sacramento, California. The selected plan would also reduce average annual flood damages by about 73 percent and would leave average annual residual damages estimated at \$130 million. Average annual economic benefits are estimated to be \$344,695,000; net average annual benefits are \$269,918,000. The benefit-to-cost ratio is 4.6 to 1.

6. The goals and objectives included in the Campaign Plan of the U.S. Army Corps of Engineers have been fully integrated into the American River Common Features GRR study process. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing future safety and economic benefits to the community. The recommended plan allows for continued floodplain flooding in the widened Sacramento Bypass while focusing the flood risk reduction on the established urban area. The GRR Study team organized and participated in stakeholder meetings and public workshops throughout the process and worked with local groups to achieve a balance of project goals and public concerns. The study report fully describes flood risks associated with the American and Sacramento Rivers and describes the residual risk. The residual risks have been communicated to the State of California and the SAFCA and they understand and agree with the analysis.

7. In accordance with the Corps guidance on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and rigorous review process to ensure technical quality. This included District Quality Control (DQC), Agency Technical Review (ATR), an Independent External Peer Review (IEPR) (Type I), and a Corps Headquarters policy and legal review. All concerns of the DQC and ATR have been addressed and incorporated into the final report. An IEPR was completed by Battelle Memorial Institute in July 2015. A total of seventeen (17) comments were documented. The IEPR comments identified one significant concern in the area of hydraulic analysis which was addressed with clarifying language. Additional comments of medium to low significance focused on areas of the plan formulation, engineering assumptions, and environmental analyses that needed improvements to support the decision-making process and plan selection. This resulted in expanded narratives throughout the report to support the decision-making process and justify the recommended plan. All comments from the above referenced reviews have been addressed and incorporated into the final documents. Overall the reviews resulted in improvements to the technical quality of the report. A safety assurance review (Type II IEPR) will be conducted during the design phase of the project.

8. Washington level review indicated that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The plan complies with all essential elements of the 1983 U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation Studies. The recommended plan complies with other administrative and legislative policies and guidelines. The views of interested parties, including federal, state and local agencies have been considered.

9. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend modifying the authorized American River Common Features project to include the following: the construction of levee improvement measures to address seepage,

DAEN

SUBJECT: American River Common Features GRR, California

stability, erosion and overtopping concerns identified for the Sacramento River, Natomas East Main Drainage Canal (NEMDC), Arcade Creek, and Magpie Creek as well as erosion measures for specific locations along the American River. The Sacramento Weir and Bypass would be widened to divert more flood flows into the Yolo Bypass. Further, I advise that these be authorized in accordance with the reporting officers' recommended plan at an estimated cost of \$1,565,750,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies. The NED cost component of the LPP recommended in this Report will be cost shared in accordance with Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2213), with a minimum non-Federal share of 35 percent, not to exceed 50 percent, of total NED costs. The non-Federal share will also include 100 percent of the LPP increment above the NED costs. Applying these requirements, the Federal portion of the estimated total first cost is \$876,478,000 and the non-Federal portion is \$689,272,000, or a Federal share of 56 percent and a non-Federal share of 44 percent. Federal implementation of the LPP would be subject to the non-Federal Sponsor agreeing to comply with applicable Federal laws and policies, including but not limited to:

a. Provide a minimum of 35 percent, but not to exceed 50 percent, of total NED costs as further specified below:

1. Provide 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

2. Provide, during construction, a contribution of funds equal to 5 percent of total project costs which must be in the form of cash;

3. Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the project;

4. Provide, during construction, any additional funds necessary to make its total contribution equal to at least 35 percent of total project costs;

b. Provide 100 percent of the LPP increment above total NED costs.

c. Shall not use funds from other federal programs, including any non-federal contribution required as a matching share therefore, to meet any of the non-federal obligations for the project unless the federal agency providing the federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

d. Not less than once each year, inform affected interests of the extent of protection afforded by the flood risk management features;

e. Agree to participate in and comply with applicable federal flood plain management and flood insurance programs;

f. Comply with Section 402 of WRDA 1986, as amended (33 U.S.C. 701b-12), which requires a non-federal interest to prepare a flood plain management plan within one year after the

DAEN

SUBJECT: American River Common Features GRR, California

date of signing a project partnership agreement, and to implement such plan not later than one year after completion of construction of the project;

g. Publicize flood plain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by the flood risk management features;

h. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;

i. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

j. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

k. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;

l. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

m. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

n. Comply with all applicable federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); the Rehabilitation Act of 1973, as amended (29 U.S.C. 794) and Army Regulation 6007 issued pursuant thereto; and 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (labor

DAEN

SUBJECT: American River Common Features GRR, California

standards originally enacted as the Davis-Bacon Act, the Contract Work Hours and Safety Standards Act, and the Copeland Anti-Kickback Act);";

o. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

p. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

q. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA; and

r. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

10. The recommendation contained herein reflects the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsor, the States, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

THOMAS P. BOSTICK  
Lieutenant General, U.S. Army  
Chief of Engineers