



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

JUL 31 2018

DAEN

SUBJECT: Lower San Joaquin River Flood Risk Management Feasibility Study 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 San Joaquin River within the metropolitan area of Stockton, California. It is accompanied by the report of the Sacramento District Engineer and the South Pacific Division Engineer. These interim reports are in partial response to the resolution adopted by the Committee on Public Works of the House of Representatives, adopted May 8, 1964. The resolution requested a review of "the reports on the Sacramento-San Joaquin Basin Streams, California, published in House Document No. 367, 81st Congress, 1st session and other reports, with a view to determine whether any modifications to the recommendations contained therein are advisable at this time, with particular reference to further coordinated development of the water resources in the San Joaquin River Basin, California." Reports related to flood control investigations in the San Joaquin River Basin were initially authorized by Sections 2 and 6 of the Flood Control Act of 1936, Public Law 74-738. House Report 105-190, which accompanied the Energy and Water Development Appropriations Act, 1998, Public Law 105-62, identified initial funding and directed the U.S. Army Corps of Engineers (Corps) to conduct a comprehensive study under the 1964 study authority. As the present report addresses flood risk management concerns in only a portion of the study area, I recommend continuing work under the existing study in order to determine the feasibility of flood risk management plan alternatives for other locations covered by the study authority, including but not limited to the area designated as Reclamation District 17, as well as the cities of Lathrop and Manteca.

2. The reporting officers recommend authorizing a plan to reduce flood risk by reducing the problems associated with seepage, stability and erosion for the levees along the San Joaquin River, Calaveras River, Fourteenmile Slough, Tenmile Slough, and Mosher Slough. The recommendation is supported by the non-federal sponsors, the San Joaquin Area Flood Control Agency (SJAFC) and the State of California. The principal features of the recommended plan by reach are:

Delta Front

- 3.05 miles of fix in place improvements with soil-bentonite cutoff walls of various depths with 2.5 miles of geometry improvement.
- 1.1 miles of seismic fixes through deep soil mixing in North Stockton along two segments of Tenmile Slough.

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- 1.33 miles of new setback levee along the Delta Front to eliminate the eastern portions of the Fourteenmile Slough levee in North Stockton.
- 0.59 miles of height improvements between 1.8 and 2.7 feet on the Delta Front.
- 5 miles of erosion protection.
- Control Structure on Fourteenmile Slough.

North Stockton

- 9.4 miles of fix in place improvements with soil-bentonite cutoff walls of various depths in North Stockton.
- 2.03 miles of height improvements between 1.4 and 1.6 feet in North Stockton.

Central Stockton

- 9.2 miles of fix in place improvements with soil-bentonite cutoff walls of various depths in Central Stockton.
- 2 miles of levee geometry improvements in Central Stockton along one segment of the Calaveras River and one segment of the San Joaquin River.
- 0.53 miles of height improvements of 1.8 feet in Central Stockton.
- 0.75 miles of new levee with soil-bentonite cutoff wall on Duck Creek to address flanking of flood waters from south of Central Stockton.
- 0.28 miles of height improvements of 4 feet on the RD 404 levee.
- Control Structure at Smith Canal with 0.2 miles of floodwall.

The recommended plan requires the non-federal sponsors prepare a Floodplain Management Plan, as required for all Corps flood risk management projects per Section 402 of the Water Resources Development Act (WRDA) of 1986, as amended.

There are 14.2 miles of existing federal levee segments within the recommended plan. A total of 9.5 miles of existing non-federal levee and 0.75 miles of newly constructed levee will be added to the federal levee system as part of the recommended plan.

3. The recommended plan is the NED Plan and would reduce flood risk to the City of Stockton. The proposed project would reduce Expected Annual Damages (EAD) within North and Central Stockton by 83 percent, with a residual EAD of approximately \$63,000,000. The proposed project would have significant long-term effects on environmental resources, however in all

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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, and best management practices. No jurisdictional wetlands were identified in the project footprint. 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 the National Marine Fisheries have provided a Biological Opinion in which the agency provided recommendations for design refinement or mitigation. The recommended plan would implement the environmental compensatory mitigation plan and associated monitoring and adaptive management plan.

4. Based on October 2017 price-levels, the estimated total first cost of the NED plan is \$1,070,309,000. The federal share of the estimated first cost of initial construction is currently estimated at \$695,701,000. The non-federal cost share for the NED plan is \$374,608,000. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas is estimated at \$189,101,000. The State of California, along with the San Joaquin Area Flood Control Agency 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 about \$1,062,000 per year.

5. Based on a 2.75-percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$49,294,000, including OMRR&R. The selected plan is estimated to be 89 percent reliable in reducing flood risk for the city of Stockton, California, from a flood which has a one percent chance of occurrence in any year. The selected plan would reduce average annual flood damages by about 83 percent and would leave average annual residual damages estimated at \$63,000,000. Average annual economic benefits are estimated to be \$345,024,000; net average annual benefits are \$295,730,000. The benefit-to-cost ratio is 7.0 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 Lower San Joaquin River feasibility 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 Feasibility 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 San Joaquin and Calaveras Rivers and describes the residual risk. The residual risks have been communicated to SJAFCA and the State of California, and they understand and agree with the analysis. Residual flood risk would be addressed through wise floodplain management measures such as a flood warning and emergency evacuation being incorporated into current plans.

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) and Policy Certification,

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Division Quality Assurance (DQA), Agency Technical Review (ATR), an Independent External Peer Review (IEPR) (Type I), and a Corps Headquarters policy and legal review. All concerns of the DQA and ATR have been addressed and incorporated into the final report. The Final IEPR Report was issued in May 8, 2015. Overall, a total of eight (8) comments were identified and documented and identified as having low significance. The IEPR comments focused on areas of the report consistency and clarity, plan formulation, economic evaluation, engineering assumptions, and environmental analyses. The IEPR panel comments and recommendations for resolution were concurred in and adopted. The IEPR process was completed in July 2015.

Overall the reviews from the aforementioned process resulted in report improvements. Incorporation of review recommendations resulted in expanded narratives and plan evaluations in plan formulation. Recommended improvements better support the decision-making process in the plan selection process. 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. I recommend that the Recommended Plan (Alternative 7a) be authorized for implementation, as a federal project, with such modifications thereof as in the discretion of the Chief of Engineers may be advisable. The plan includes fix-in-place improvements to the existing levees along Mosher Slough, Fourteenmile Slough, Tenmile Slough, the lower Calaveras River, San Joaquin River and French Camp Slough; the primary method of levee improvement is the construction of slurry walls of various depths. Also included are two closure structures and the construction of 0.75 miles of new levee. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies. The cost of the plan recommended in this Report will be cost shared in accordance with Section 103 of the WRDA 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. Applying these requirements, the federal portion of the estimated total first cost is \$695,701,000 and the non-federal portion is \$374,608,000, or a federal share of 65 percent and a non-federal share of 35 percent. Federal implementation of the selected plan 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 NED Plan 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;

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

3. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of any relocations determined by the federal government to be required for the initial construction or the operation and maintenance of the project, all in compliance with applicable provisions of the Uniform Relocation and Assistance and real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601-4655) and the regulations contained in 49 C.F.R. Part 24;

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

b. 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;

c. Inform affected interests, at least annually, of the extent of protection afforded by the project; participate in and comply with applicable federal floodplain management and flood insurance programs; comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12); and publicize floodplain 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 project;

d. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;

e. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsors own or control for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;

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

g. 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

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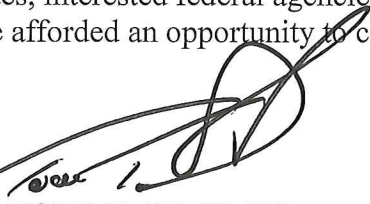
under lands, easements, or rights-of-way that the federal government determines to be required for construction, operation, and maintenance of the project. However, for lands that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigations unless the federal government provides the non-federal sponsors with prior specific written direction, in which case the non-federal sponsors shall perform such investigations in accordance with such written direction;

h. Assume, as between the federal government and the non-federal sponsors, 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; and

i. Agree, as between the federal government and the non-federal sponsors, that the non-federal sponsors 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.

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.

*STRONGLY
ENDORSE THIS
PROJECT...
BCR is 7 to 1 current interest
BCR is 2.6 @ 7% interest rate,
VERY COMPETITIVE +
VERY IMPORTANT !!*


TODD T. SEMONITE
Lieutenant General, U.S. Army
Chief of Engineers