



**DEPARTMENT OF THE ARMY**  
**CHIEF OF ENGINEERS**  
**2600 ARMY PENTAGON**  
**WASHINGTON, DC 20310-2600**

REPLY TO  
ATTENTION OF

DAEN

SUBJECT: Upper Turkey Creek Basin Flood Risk Management Study, Merriam, Kansas

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood risk management improvements on Turkey Creek in the City of Merriam, Kansas. It is accompanied by the report of the district and division engineer. These reports were prepared pursuant to the Resolution of the Committee on Transportation and Infrastructure, U.S. House of Representatives, Docket 2616, adopted 16 February 2000, requesting that the Secretary of the Army review the report of the Chief of Engineers on the Turkey Creek Basin, Kansas and Missouri, dated 21 June 1999, and any other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of flood damage reduction for areas of Turkey Creek Basin in Johnson and Wyandotte Counties, Kansas, upstream of the project for flood damage reduction authorized in section 101(a)(24) of Public Law 106-53, the Water Resources Development Act (WRDA) of 1999. Preconstruction engineering and design activities, if funded, would be continued under the authority of the committee resolution cited above.

2. The reporting officers recommend authorizing a plan to reduce flood damages by the construction of new features to significantly reduce risks from flash flooding in the City of Merriam, Kansas. The recommended plan, Alternative 2d, includes recommendations for a levee and floodwall system to protect lives and property located between Antioch Avenue and Shawnee Mission Parkway in Merriam, Kansas. The primary plan features are 3,380 feet of levee up to approximately six feet in height and 6,820 feet of floodwall up to approximately 6.5 feet in height. The floodwall system includes a supporting foundation in the form of an array of auger grout piles. Bridge modification includes headwalls for the purpose of tying in proposed levees and floodwalls at the Merriam Drive Bridge. A 2.1 acre-foot gravity drained stormwater detention pond is included for interior drainage adjacent to the Merriam Marketplace. The project also includes stormwater, water and sanitary utility relocations, and environmental compensatory mitigation of seven acres of mast producing trees. The recommended plan would pass the one percent annual chance flood event through the downtown Merriam project reach with an estimated assurance of 83 percent.

3. The recommended plan is the National Economic Development (NED) Plan. Project costs are allocated to the flood risk management purpose. Based on the October 2014 price levels, the estimated first cost to the plan is \$37,579,000. In accordance with the cost sharing provisions of Section 103 of WRDA 1986, as amended by Section 202 of WRDA 1996, the federal share of the first costs of the flood risk management features is estimated to be 65

DAEN

SUBJECT: Upper Turkey Creek Basin Flood Risk Management Study, Merriam, Kansas

percent or \$24,426,000, and the non-federal share is estimated to be 35 percent or \$13,153,000, including the provision of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRDs). The LERRDs for the recommended plan are estimated to cost \$9,652,000, less than the 35 percent minimum required non-federal contribution to the project. The remaining non-federal share will be a cash contribution of \$3,501,000; because this exceeds the minimum cash contribution, no additional non-federal cash contribution is required. The non-federal sponsor, the City of Merriam, Kansas, is responsible for the operation, maintenance, repair, rehabilitation, and replacement (OMRR&R) of the project after construction, a cost currently estimated to be about \$41,000 annually. Based on a 3.375 percent discount rate and a 50 year period of analysis, the total equivalent average annual costs of the project, including OMRR&R, are estimated to be \$1,732,000. The recommended plan is estimated to reduce expected annual flood damages by 73 percent. Total expected average annual benefits are estimated to be \$3,445,000 with net annual benefits of \$1,713,000. The benefit-cost ratio is 2.0 to 1.

4. The goals and objectives included in the Campaign Plan of the U.S. Army Corps of Engineers (USACE) have been fully integrated into the feasibility study process. The recommended plan has been designed to avoid or minimize environmental impacts, to reduce risk of loss of life, and to reasonably maximize economic benefits to the community in coordination with the existing flood risk management system. There are no significant direct or cumulative environmental impacts associated with the recommended plan. The long-term environmental and cultural consequences of plan implementation are positive as the reduced flash flood risk will improve protection of the social and environmental fabric that has developed within the study area. The feasibility study team organized and participated in stakeholder and public meetings throughout the process and worked to achieve a balance of project goals with public concerns. The study report describes existing flood risks to the community, risks that will be reduced by the recommended plan, and residual risks that will remain. These residual risks have been communicated to the non-federal sponsor and community stakeholders, and they understand and agree with the analysis. The feasibility study team has reviewed current available information on the estimated future impact of climate change to the region. While a trend towards slightly wetter conditions in the future has been identified in eastern Kansas by the National Weather Service (NWS), the analysis identified no discernible trends that would indicate a significant increase in annual maximum precipitation.

5. In accordance with the USACE 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 an Agency Technical Review (ATR), Type I Independent External Peer Review (IEPR), and a USACE Headquarters policy and legal review. All concerns of the ATR have been addressed and incorporated into the final report. The IEPR was completed by Battelle Memorial Institute in October 2013. A total of 16 comments were made. In summary, the IEPR comments related to report completeness in the areas of hydrology and hydraulic analyses, plan formulation, design, communication of residual risk, mitigation requirements, cost and schedule risk, risk and uncertainty, and economic analysis. The most significant comment was that the study hydrology and hydraulics needed to be updated to take into account the 2013 publication of the NWS's National Oceanic and

DAEN

SUBJECT: Upper Turkey Creek Basin Flood Risk Management Study, Merriam, Kansas

Atmospheric Administration Atlas 14 report. This resulted in a revised without- and with-project hydrologic and hydraulic analysis with up to a 13 percent increase in discharges for the 1-percent annual chance flood event, and an increase of up to 2 feet in hydraulic profiles at certain locations. After an evaluation of the impacts of the updated hydrology and hydraulics and effects on plan formulation, a rigorous sensitivity analysis determined that these revised results did not alter the plan formulation or economic analyses used to identify the recommended plan as the NED Plan. The process resulted in updated engineering and economic analyses and expanded narratives throughout the report to support the decision-making process and further justify the recommended plan. All comments from the above referenced reviews have been addressed and incorporated into the final document. Overall the reviews resulted in improvements to the technical quality of the report. A Type II IEPR Safety Assurance Review will be conducted prior to initiation of physical construction and periodically thereafter until construction activities are completed.

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

7. I concur with the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the plan to improve flood risk management for the City of Merriam, Kansas, be authorized in accordance with the reporting officers' recommended plan at a total investment cost of \$37,359,000. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 103 of WRDA 1986 (33 U.S.C. 2213), as amended. The non-federal sponsor will provide the non-federal share of project costs including all LERRDs. Further, the non-federal sponsor would be responsible for all OMRR&R. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies, including but not limited to:

a. Provide the non-federal share of total project costs, including a minimum of 35 percent but not to exceed 50 percent of total project 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;

(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

DAEN

SUBJECT: Upper Turkey Creek Basin Flood Risk Management Study, Merriam, Kansas

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; and

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

b. Not less than once each year, inform affected interests 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 WRDA 1986, as amended (33 U.S.C. 701b-12) which requires a non-federal interest to prepare a floodplain management plan within one year after the date of signing a project partnership agreement, and to implement such plan not later than one year after completion of construction of the project; 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;

c. 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;

d. For so long as the project remains authorized, OMRR&R 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;

e. 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, or OMRR&R of the project;

f. Hold and save the United States free from all damages arising from the construction, OMRR&R of the project and any betterments, 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), 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

DAEN

SUBJECT: Upper Turkey Creek Basin Flood Risk Management Study, Merriam, Kansas

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;

h. 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;

i. 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, OMRR&R the project in a manner that will not cause liability to arise under CERCLA; and

j. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public law 91-646, as amended by title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR part 24, in acquiring lands, easements, and rights-of-way, and performing relocations for construction, operation, and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

8. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It neither reflects 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 recommendation may be modified before they are transmitted to Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsors, the state, interested federal agencies, and other parties will be advised of any modifications and will be afforded the opportunity to comment further.

THOMAS P. BOSTICK  
Lieutenant General, USA  
Chief of Engineers