



## DEPARTMENT OF THE ARMY

CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, DC 20310-2600

REPLY TO  
ATTENTION OF

21 JAN 2015

DAEN

SUBJECT: Armourdale and Central Industrial District Levee Units, Missouri River and Tributaries at Kansas Citys, Missouri and Kansas

### THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on proposed modifications to the Armourdale and Central Industrial District levee units of the Missouri River and Tributaries at Kansas Citys, Missouri and Kansas, project. It is accompanied by the report of the Kansas City District Engineer and the Northwestern Division Engineer, which address modifying the project authority to improve project capabilities and reliability. These reports were prepared under the authority of Section 216 of the 1970 Flood Control Act, which authorizes the Secretary of the Army to review the operation of projects constructed by the Corps of Engineers when found advisable due to significantly changed physical, economic or environmental conditions. The Missouri River and Tributaries at Kansas Citys project is authorized by the Flood Control Act of 1936, and modified by the Flood Control Acts 1944, 1946, 1954, and 1962, and the Water Resources Development Act of 2007. Preconstruction engineering and design activities, if funded, would be continued under the Section 216 authority.
2. The reporting officers recommend authorization of a plan for flood risk management to modify the existing project to reduce flood risks in the vicinity of Kansas City, Missouri, and Kansas City, Kansas. The plan includes measures to increase the performance of the existing Armourdale and Central Industrial District Levee Units, which are part of the existing Kansas Citys system. The increase in performance is achieved by addressing structural and geotechnical reliability of existing features, and increasing the height of the existing levees and floodwalls by as much as five additional feet. The recommended plan provides approximately 65% assurance to contain flows within the project parameters at or below 0.2% (1/500) Annual Exceedance Probability (AEP) water surface elevation, consistent with the existing flood risk management system. This is the equivalent of the recommended plan providing approximately 98% assurance to contain flows within the project parameters at or below the 1.0% (1/100) AEP water surface elevation.
3. The recommended plan would reduce flood risk to areas of the Citys of Kansas City, Missouri, and Kansas City, Kansas. The proposed plan would reduce Expected Annual Damages (EAD) by 88%, with a residual EAD of approximately \$7.7M. Annual Exceedance Probabilities for flooding from the Kansas River would be reduced from 3.5% in the Armourdale Unit and 0.33% in the Central Industrial District Unit to 0.12% in both units. The proposed project was evaluated in the 2006 Programmatic Environmental Impact Statement. No significant changes were identified and the determination that no long-term effect on environmental resources was confirmed. No compensatory mitigation is required.

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4. Based on October 2014 price levels, the total first cost of these measures is estimated at \$318,517,000 for all flood risk management. Under cost sharing specified by Section 103 of the Water Resources Development Act (WRDA) of 1986, Public Law 99-662, as amended by Section 202 of WRDA 1996, each measure would be cost shared 65 percent federal and 35 percent non-federal, resulting in an estimated federal share of \$207,036,000 and an estimated non-federal share of \$111,481,000. The total expected annual costs, based on a discount rate of 3.375 percent and a 50-year period of analysis, are \$16,876,900, including \$347,900 for operation, maintenance, repair, rehabilitation, and replacement (OMRR&R). The expected annual benefits are estimated to be \$57,565,300 with net annual benefits of \$40,688,400. The benefit-cost ratio is approximately 3.4 to 1 for the new work. The measures recommended for implementation will be carried out with two non-federal cost sharing sponsors.

a. The recommended measures for increasing the degree of protection for the Armourdale Levee Unit on the Kansas River include increasing the height of approximately 33,000 linear feet of levee and floodwall between 1.2 and 5.2 feet (average increase 4 feet), adding underseepage control measures including 74 relief wells and 2,000 linear feet of underground slurry cutoff wall, adding three closure structures and modifying or replacing four closures, modifying seven pump stations and removing two stations, modifying drainage structures, and relocating utility crossings. The Kaw Valley Drainage District is the non-federal cost-sharing sponsor for all features. The estimated total first cost of the plan is \$236,447,000. The estimated federal share is \$153,690,500 and the estimated non-federal share is \$82,756,500. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD) is estimated at \$4,532,000. There is no cost associated with mitigation due to the low potential to impact the existing environment in and around the project site. The total expected annual costs are \$12,183,900, including \$198,200 for OMRR&R. The expected annual benefits are estimated to be \$52,254,600 with net annual benefits of \$40,070,700.

b. The recommended measures for increasing the degree of protection for the Central Industrial District Levee Unit on the Kansas River include increasing the height of approximately 11,750 linear feet of levee and floodwall between 0.2 and 3.8 feet (average increase 3.6 feet), adding 600 linear feet of new floodwall, adding underseepage control features including 57 relief wells and approximately 3,450 linear feet of area fill, adding four new closure structures and modifying or replacing two closures, modifying five pump stations and removing two stations, modifying drainage structures, and relocating utility crossings. The Kaw Valley Drainage District is the non-federal cost-sharing sponsor for all features. The estimated total first cost of the plan is \$81,485,000. The estimated federal share is \$52,965,300 and the estimated non-federal share is \$28,519,700. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD) is estimated at \$2,631,000. There is no cost associated with mitigation due to the low potential to impact the existing environment in and around the project site. The total expected annual costs are \$4,292,600, including \$149,700 for OMRR&R. The expected annual benefits are estimated to be \$5,246,900 with net annual benefits of \$954,300.

c. The recommended measures for increasing the degree of protection for the Central Industrial District Levee Unit on the Missouri River includes modifying approximately 290 linear feet of floodwall to improve structural reliability. The City of Kansas City, Missouri, is the non-federal

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cost-sharing sponsor for all features. The estimated total first cost of the plan is \$585,000. The estimated federal share is \$380,300 and the estimated non-federal share is \$204,700. The cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD) is estimated at \$0. There is no cost associated with mitigation due to the low potential to impact the existing environment in and around the project site. The total expected annual costs are \$29,500, including \$0 for OMRR&R. The expected annual benefits are estimated to be \$63,600 with net annual benefits of \$34,000.

5. The above plan for increasing the degree of protection and benefit for the Armourdale and Central Industrial District Units complete the total system evaluation and recommendation for improving the benefits provided by the existing Kansas Citys Flood Risk Management Project. The previously approved plan for modifications to this system is currently being implemented.

a. The plan to increase the degree of protection for the Argentine Levee Unit and to improve the reliability of the East Bottoms and Fairfax-Jersey Creek Levee Units were previously recommended by the Chief's Report of Dec. 19, 2006, and authorized in the Water Resources Development Act (WRDA) of 2007. Based on October 2014 price levels the authorized total first cost of these three measures is estimated at \$81,514,000, all for flood risk management. Under cost sharing specified by Section 103 of the WRDA of 1986, Public Law 99-662, as amended by Section 202 of WRDA 1996, the estimated federal share is \$52,984,100 and the estimated non-federal share is \$28,529,900.

b. The plan to correct design and construction deficiencies in the Fairfax-Jersey Creek and North Kansas City levee units in order to restore the original degree of protection were approved by the Chief's Report of Dec 19, 2006. Based on October 2014 price levels, the authorized total first cost of the deficiency correction plan is estimated at \$20,700,000. In accordance with Section 103 of WRDA 1986, as amended, the estimated federal share is \$13,455,000 and the estimated non-federal cost share is \$7,245,000.

6. The goals and objectives included in the Campaign Plan of the U.S. Army Corps of Engineers 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. The Feasibility Study team organized and participated in stakeholder and public meeting throughout the process and worked to achieve a balance of project goals and public concerns. The study report fully describes local flood risks associated with the Kansas River, including residual risks that remain even after implementation of the recommended plan. These residual risks have been communicated to the non-federal sponsors 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 in the region. While a trend towards wetter conditions in the future has been identified, the impacts are expected to be within the range of uncertainty addressed by the current hydrologic model.

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

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technical quality. This included an Agency Technical Review (ATR), and an Independent External Peer Review (Type I IEPR), and a Corps Headquarters policy and legal review. All concerns of the ATR have been addressed and incorporated into the final report. An IEPR was completed by Battelle Memorial Institute in January 2014. Overall, the IEPR report contained twenty-one comments from two commenting periods. The first comment period was conducted at the Alternative Formulation Briefing (AFB) and the second round of comments was on the draft final feasibility report. Five comments of high significance were identified at the AFB and one comment of high significance was identified within the draft final feasibility report. The IEPR comments identified concerns in areas of the engineering assumptions and environmental analysis 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 to 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 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 plan recommended by the reporting officers is technically sound, economically justified, and environmentally and socially acceptable. The plan complies with the 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 and complies with other administrative and legislative policies and guidelines. The views of interested parties, including federal, State, and local agencies have been considered during the State and Agency review period. During this review USEPA requested additional information regarding the potential impacts of future regional climate changes on the projects performance and the integration of non-structural measures. In response to these concerns USEPA was provided analysis that shows that there is little effect to project performance due to regional climate change. Non-structural measures were considered in this study, however; those measures were determined not to be cost effective.

9. I concur with the findings, conclusions and recommendation of the reporting officers. Accordingly, I recommend the plan to further reduce flood risks for the Missouri River and Tributaries at Kansas Citys project be authorized at an estimated total first cost of \$318,517,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation and approval are subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 103 of WRDA 1986, as amended. The non-federal sponsors would provide the non-federal cost share and all LERRD. Further, the non-federal sponsors would be responsible for all OMRR&R. This recommendation and approval are subject to the non-federal sponsors 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;

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(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 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.

c. Agree to participate in and comply with applicable federal floodplain management and flood insurance programs.

d. Comply with Section 402 of the Water Resources Development Act of 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.

e. 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.

f. 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.

g. 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.

h. 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.

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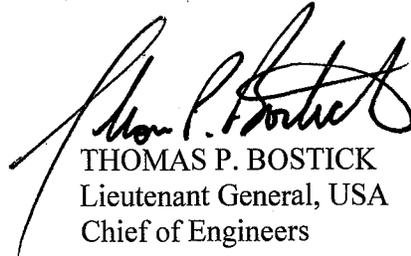
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i. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, 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.

j. 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.

k. 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.

10. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does 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 recommendation may be modified before it is transmitted to Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsors, the States of Kansas and Missouri, interested federal agencies, and other parties will be advised of any modifications and will be afforded the opportunity to comment further.



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