

**REPORT SUMMARY**  
**ARGENTINE, EAST BOTTOMS, FAIRFAX-JERSEY CREEK,**  
**AND NORTH KANSAS CITY LEVEE UNITS**  
**MISSOURI RIVER AND TRIBUTARIES AT KANSAS CITIES, MISSOURI AND KANSAS**  
**INTERIM FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT**

**STUDY INFORMATION**

**Study Authority.** This study is authorized by Section 216 of the Flood Control Act of 1970, which provides general authority to review completed projects as follows:

*The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest.*

**Study Sponsors.** Kansas City, Missouri is the primary sponsor. Three additional sponsors who own and maintain the levee units involved in the study include the North Kansas City Levee District, the Fairfax Drainage District, and the Kaw Valley Drainage District.

**Study Purpose and Scope.** This study seeks to reduce flood damages and reduce the flood risks for four of the seven levee units within the existing Kansas Cities levee system. These include the Argentine Levee Unit, the North Kansas City Levee Unit, the East Bottoms Levee Unit, and the Fairfax-Jersey Creek Levee Unit. A fifth levee unit, the Birmingham Levee Unit, does not need improvements. The pending final feasibility report will address the two remaining levee units at Armourdale and the Central Industrial District.

**Project Location/Congressional District.** The project area is located in the Kansas City metropolitan area at the confluence of the Missouri and Kansas Rivers. The levee units are located in two states, Kansas and Missouri, and encompass several city and county jurisdictions. The primary entities include Kansas City, Missouri, the Unified Government of Wyandotte County and Kansas City, Kansas, and North Kansas City, Missouri. The 32-square-mile protected area is fully developed, consisting primarily of industrial and commercial districts with some residential areas. The existing project consists principally of levees, floodwalls, and appurtenant features. The project extends over the lower 10 miles of the Kansas River and on the Missouri River from 6.5 miles upstream to 12.5 miles downstream of the mouth of the Kansas River. The study area includes Missouri Congressional Districts 5 and 6, and Kansas Congressional District 3.

**Prior Reports and Existing Water Projects.** Prior reports include:

- Flood Plain Information Report, Kansas River, Kansas, Junction City to the Mouth, Kansas City District, U.S. Army Corps of Engineers, April 1956;
- Review Report on the Kansas River, Appendix IV, Hydrology, September 1960;
- Senate Document No. 122, 87th Congress, 2nd Session, Kansas River and Tributaries, Kansas, Nebraska and Colorado, U.S. Army Corps of Engineers, August 1962;
- The Great Flood of 1993 Post-Flood Report, Lower Missouri River Basin, Kansas City District, U.S. Army Corps of Engineers, September 1994; and,
- Annual Report of Reservoir Regulation Activities, Summary for 1997-1998, Kansas City District, U.S. Army Corps of Engineers, Water Control Section.

Existing projects include:

- Missouri River Levee System (MRLS) Unit L-385 located opposite and just upstream of the Fairfax-Jersey Creek Unit
- Kansas & Missouri River Lakes consisting of 18 Federal lakes/reservoirs in the Kansas River basin and six major Federal lakes/reservoirs on the main stem of the Missouri River in the Dakotas and Montana – all reducing flood damages at Kansas City and downstream to the Mississippi River.

**Federal Interest.** Flood damage reduction is a priority water resources mission. The study area includes significant flood damage reduction opportunities with potential solutions of sufficient scale to warrant Federal participation. These potential solutions are technically feasible, economically justified, environmentally sustainable, and acceptable to the public. The solutions have qualified non-Federal sponsors with the legal authority and financial capability. The sponsors understand the non-Federal responsibilities.

## STUDY OBJECTIVES

**Problems and Opportunities.** The entire system of seven levee units withstood the Great Flood of 1993, but some elements of the system were seriously challenged as the flood crested. This flood experience raised a concern that the levees may provide less than the level of protection for which they were designed. Accordingly, this feasibility study was undertaken to further investigate the Federal interest in planning, designing and constructing economically viable measures to address any changed conditions and levee performance issues. After a comprehensive risk based assessment of the existing levee system, the total expected annual physical flood damages for the existing units in the Interim Report are \$50,299,000.

**Planning Objectives.** The two primary objectives of the overall feasibility study are:

- 1) update and verify data on the reliability of the existing project performance under flood conditions,
- 2) develop alternative plans (to include a review of the “no Federal action” alternative) for increasing the overall reliability of the existing system consistent with the original authorizations, and provide a final Recommended Plan for implementation. The Recommended Plan will be technically sound, economically feasible and environmentally acceptable.

**Planning Constraints.** The reconnaissance report was certified and the feasibility study was undertaken with the following stipulations:

- 1) *“...Based on the intense development behind the levees and the complex interaction between individual levee units, the alternatives to be investigated during the feasibility phase shall be limited to those alternatives that provide a uniform level of protection.*
- 2) *The units of the flood protection plan for the Kansas Citys are so closely related and dependent upon each other for effectiveness that the project can only be analyzed by considering the area as a whole. Therefore, all units are interrelated and function as a system in providing flood protection to the area. The formulation of alternatives can proceed on the basis of providing a uniform level of protection, in lieu of doing an incremental analysis for the left and right bank levees.*

## ALTERNATIVES

**Plan Formulation Rationale.** Based on data developed during the reconnaissance phase and early in the feasibility phase, a number of potential strategies and measures to reduce flood damages in the study area had been ruled out before the feasibility phase began. Construction of dams and

reservoirs had been shown to be infeasible and generally did not comply with a Section 216 approach to examination of the existing levee system. Channel modification was deemed infeasible due to lack of complete effectiveness and environmental and reliability factors. All practical non-structural strategies and measures (flood warning and emergency evacuation plans, flood proofing, and buyouts) could not meet the planning objectives and fell short of providing large scale effective risk reduction across intensely developed industrial districts.

Feasibility efforts focused on improvements to reliability of the existing seven levee system using in-depth risk based analysis and observations of levee performance during the 1993 flood. As the study progressed it was determined that the Missouri River Units were able to hydraulically pass the design discharge and thus levee raises on the Missouri River were not necessary, but specific geotechnical and structural risks did need to be addressed.

The analysis of the three Kansas River units (Argentine, Armourdale, and CID-Kansas) showed overtopping performance to be significantly less than currently authorized. After other potential solutions were considered, studies demonstrated the need for a levee raise along the three lower Kansas River units. The Interim Feasibility Report presents detailed levee raise recommendations for the Argentine unit. The detailed Armourdale and CID recommendations will follow in the Final Feasibility Report. A consistent overall systems approach and a comprehensive hydrologic and hydraulic analysis are being used for the Interim Feasibility Report and the pending Final Feasibility Report. The Interim Feasibility Report will facilitate a more prompt start to implementation and allow a more manageable Federal and non-Federal funding stream over the entire study and implementation period.

**Management Measures and Alternative Plans.** A variety of alternatives were examined to address the reliability problems. Depending on the particular unit, they included engineering measures to address structural reliability, foundation underseepage, foundation stability, pump station reliability, and reliability against overtopping. Table 1 displays the early screening alternative plans considered for the problems identified and the results of that screening.

The Argentine Unit was designed to pass a discharge of 390,000 cfs (typically associated with the 0.2% chance flood event or nominal 500-year flood). Updated hydraulic analyses indicated that the Argentine Unit (as well as the other Kansas River Units, Armourdale and CID) is not able to pass the design discharge. This problem was related to changed conditions in the Kansas River as well as a more current and technologically improved hydrologic analysis.

The Fairfax-Jersey Creek Unit floodwall at the BPU Power Plant is structurally inadequate for approximately 1,500 linear feet. Measures were considered to replace or reinforce this section of floodwall. Also in the Fairfax-Jersey Creek Unit, a section of sheetpiles was found to be significantly degraded requiring replacement.

Two sites in the North Kansas City Unit, known as "National Starch" and "Harlem", require additional underseepage control.

The East Bottoms Unit requires additional underseepage control at the confluence of the Missouri River and Blue River.

**Final Array of Alternatives.** Four alternatives were considered for the Argentine Levee Unit, including, raising the levee 2 feet (0.2% chance profile), raising it 5 feet (0.2% chance profile plus 3 feet), raising it 7 feet (0.2% chance profile plus 5 feet), and increasing the structural reliability of pump stations with no levee raise. The two final alternatives for the Fairfax-Jersey Creek BPU Floodwall were modification/reinforcement of the existing floodwall, and a combination of new wall segments with reinforcement of the existing wall. At the Fairfax-Jersey Creek Sheetpile Wall replacement site, a

closed sheetpile wall, an open cell sheetpile wall, an augur cast pile wall, and the option of flood fighting were considered. At the North Kansas City Harlem and National Starch Underseepage Sites, seepage berms, buried collector pipes, pressure relief wells, and the option of flood fighting were considered. For the East Bottoms-Blue River Confluence Underseepage Site, a sheetpile wall, a slurry cut-off wall, and pressure relief wells were considered.

**Comparison of Alternatives.** For the Missouri River structural and underseepage improvements associated with the Fairfax-Jersey, North Kansas City, and the East Bottoms Units, the NED Plans adequately corrected the identified problems. At the Argentine Unit, the 5-foot levee raise alternative had essentially the same net benefits as the 7-foot levee raise at significantly less cost and is significantly more affordable to the sponsors. Therefore, the 5-foot levee raise was designated as the NED Plan.

**Key Assumptions.** The future without-project conditions were forecast using assumptions of relatively stable economic, engineering, and environmental conditions. The period of analysis is 50 years. Levee unit sponsors' maintenance and operations are expected to continue to be good to very good. Where two sites in one levee unit (Fairfax-Jersey Creek and North Kansas) have less than acceptable reliability, both sites need to be corrected to bring the levee unit to an acceptable level of overall reliability and performance. Reducing the risk of overtopping drove the formulation plans for the Argentine Levee Unit.

**RECOMMENDED PLAN.** The recommended measures include three that can be implemented under existing construction authority (deficiency corrections) and three that require modification of the existing construction authority and some that do not. The recommended Argentine Levee modifications would increase the project capabilities beyond existing authorized levels and thus require modification of the existing construction authority. The Fairfax-Jersey Creek Sheetpile Wall would involve the reconstruction due to deterioration over time and a section of new sheetpile wall, and thus requires modification of the existing construction authority. The East Bottoms underseepage modification addresses changed conditions, which also require modification of the existing construction authority. Both of the North Kansas City underseepage modifications and the Fairfax-BPU floodwall strengthening would correct design deficiencies, which can be implemented under existing project authority.

**Argentine Levee Raise:** Approximately 5.5 miles of levee would be raised an average of about 5 feet. The levee unit raise includes modifying earthen levee and berms, about 1340 feet of flood wall, stop log gaps, and other necessary line of protection features. Fourteen utility crossings would be relocated over the levee, including pressure pipelines that currently pass under the levee. Three pump stations would be modified or replaced to retain the reliability of the line of protection.

**Fairfax Jersey Creek Levee Unit – Fairfax-Jersey Creek Sheetpile Wall:** The modifications would include reconstructing about 868 linear feet of sheetpile wall to ensure the wall's stability and construction about 590 linear feet of new sheetpile wall to reduce the risk of levee failure.

**East Bottoms Levee Unit:** Modifications would include installing approximately seventeen pressure relief wells to reduce underseepage and reduce the risk of failure and constructing approximately 2,100 linear feet of 30-inch pipe system to transfer collected seepage from the wells to the proximity of the Hawthorne pump plant.

**North Kansas City Levee Unit – Harlem Area:** Modifications would include constructing a new buried collector system about 2,600-feet long and 18-inches in diameter with seepage collection vaults to enable pumping during flood events. This would control underseepage pressures at the interior toe of the existing levee.

North Kansas City Levee Unit – National Starch Area: Modifications would include installing approximately 20 pressure relief wells, an approximately 2,000-foot long and 30-inch diameter pipeline, and a new pump station to collect, move and remove water in order to control underseepage at the interior toe of the existing levee.

Fairfax Jersey Creek Levee Unit – Fairfax-BPU Floodwall: The modifications would include strengthening about 1,446 linear feet of floodwall using approximately 50-foot deep; 24-inch diameter piles about seven feet apart.

**Systems / Watershed Context.** The Kansas City Metropolitan Levee System was initially authorized by the 1936 Flood Control Act and modified by subsequent acts as a system to provide uniform flood protection to the industrial and commercial areas at the confluence of the Missouri and Kansas Rivers. The system was designed to pass a related set of design discharges on the Kansas and Missouri Rivers and has been analyzed and modified subsequently as a system with uniform level of protection. The recommended modifications were analyzed within this context, as will those to be considered the pending report on the remaining Kansas River units. Existing upstream flood storage capability was and will be properly considered in these analyses.

**Environmental Operating Principles.** Substantial efforts were made to ensure formulation of an environmentally sustainable project. Input was solicited from the appropriate state and Federal resource agencies, local agencies and the public at large. The proposed project has been formulated such that there is minimal impact to the environment. The construction footprint of the project is small, will not change existing land uses, and has very low increased operation and maintenance requirements above the existing project. The only requirement for compensable mitigation is a 0.21 acre wetland to replace wetlands impacted by the increased project footprint. A significant reach of foreshore vegetation has developed on the Kansas River and is considered to be valuable riparian habitat by the resource agencies. This project specifically avoids any significant impact to this riparian area.

**Independent Technical Review.** An Independent Technical Review (ITR) Team was established concurrent with the Product Delivery Team, and routinely provided review and comment at key points in the study. The ITR team represented the entire spectrum of required technical disciplines and involved multiple Corps Districts, the Corps Flood Damage Reduction Center of Expertise, and the Corps Levee Safety Program Manager. The ITR process was consistent with guidance and was duly documented. Major ITR issues involved hydrology and hydraulics, structural design criteria, pump station analysis, and risk and uncertainty parameters. All issues were fully addressed and resolved.

## **EXPECTED PROJECT PERFORMANCE AND IMPLEMENTATION**

**Project Costs.** Total first costs for the recommended project are summarized in Table 1. All of the costs displayed herein are based on an October 2005 price Level, a 5.125 percent discount rate, and a 50-year period of analysis.

**Equivalent Annual Costs and Benefits.** The project costs and benefits are summarized below in Table 2.

Argentine Levee Raise: The estimated total first cost of the plan is \$52,893,000. The total cost includes \$500,000 for mitigation. The total expected annual costs are \$3,570,000, including \$13,000 for OMR&R. The selected plan is estimated to be 99 percent reliable in protecting portions of Kansas City, Kansas from a flood which has a one percent chance of occurrence in any year (100-year flood). The selected plan would reduce average annual flood damages by about 81 percent and would leave average annual residual damages estimated at \$4,160,000. The expected annual

**Table 1. Total Project Costs by Category (\$1,000) – Overall Recommended Plan Interim Report**

Category of Cost	Modify Existing Authority			Within Existing Authority			Total
	Argentine	FJC - Sheetpile Wall	East Bottoms	NKC - Harlem Area	NKC - National Starch Area	FJC - BPU	
Lands & Damages	\$ 1,631	\$ 0	\$ 9	\$ 75	\$ 105	\$ 244	\$ 2,068
Relocations	836	113	0	0	0	0	949
Fish & Wildlife Mitigation	500	0	0	0	0	0	500
Levees & Floodwalls	25,000	5,940	894	841	1,204	4,374	38,253
Pumping Plants	9,783	0	0	0	2,973	0	12,756
PED	2,792	716	377	294	825	1,186	6,191
Construction Management	2,581	424	63	59	296	326	3,749
Contingencies	9,769 (23%)	1,648 (23%)	301 (22%)	280 (22%)	1,218 (23%)	1,748 (29%)	14,965 (23%)
Total Cost	\$52,893	\$8,845	\$1,644	\$1,549	\$6,621	\$7,879	\$79,431

benefits are estimated to be \$18,165,000 with net annual benefits of \$14,595,000. The benefit-cost ratio is approximately 5.1 to 1.

East Bottoms Levee Unit: The estimated total first cost of the plan is \$1,644,000. The total expected annual costs are \$121,000, including \$25,000 for OMRR&R. The selected plan is estimated to be 99.8 percent reliable in protecting the Northeast Industrial District, Kansas City, Missouri 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 59 percent and would leave average annual residual damages estimated at \$2,986,000. The expected annual benefits are estimated to be \$4,358,000 with net annual benefits of \$4,237,000. The benefit-cost ratio is approximately 35.9 to 1.

North Kansas City Levee Unit – Harlem Area: The estimated total first cost of the plan is \$1,549,000. The total expected annual costs are \$93,000, including \$2,000 for OMRR&R. The selected plan is estimated to be 98 percent reliable in protecting the North Kansas City, Missouri 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 33 percent and would leave average annual residual damages estimated at \$7,885,000. The expected annual benefits are estimated to be \$3,896,000 with net annual benefits of \$3,803,000. The benefit-cost ratio is approximately 42 to 1.

North Kansas City Levee Unit – National Starch Area: The estimated total first cost of the plan is \$6,621,000. The total expected annual costs are \$423,000, including \$33,000 for OMRR&R. The selected plan is estimated to be 98 percent reliable in protecting the North Kansas City, Missouri 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 25 percent and would leave average annual residual damages estimated at \$4,915,000. The expected annual benefits are estimated to be \$2,970,000 with net annual benefits of \$2,547,000. The benefit-cost ratio is approximately 7.0 to 1.

Fairfax Jersey Creek Levee Unit – Fairfax-BPU Floodwall: The estimated total first cost of the plan is \$7,879,000. The total expected annual costs are \$477,000, including \$3,000 for OMRR&R. The selected plan is estimated to be 99 percent reliable in protecting the Fairfax Industrial District, Kansas

**Table 2. Economic Characteristics of the Recommended Plan and Components (\$1,000)**

Category of Cost	Modify Existing Authority			Within Existing Authority			Total
	Argentine	FJC - Sheetpile Wall	East Bottoms	NKC - Harlem Area	NKC - National Starch Area	FJC - BPU	
<b>Investment Costs</b>							
Total Project Construction Costs	\$52,893	\$8,845	\$1,644	\$1,549	\$6,621	\$7,879	\$79,431
Interest During Construction	5,210	406	72	70	364	612	6,734
Total Investment Cost	\$58,103	\$9,251	\$1,716	\$1,619	\$6,985	\$8,491	\$86,165
<b>Average Annual Costs, Benefits And Residual Damages</b>							
Interest and Amortization of Initial Investment	\$3,244	\$517	\$96	\$90	\$390	\$474	\$4,811
Other Annual Costs *	313	0	0	0	0	0	313
OMRR&R	13	3	25	2	33	3	79
Total Average Annual Costs	3,570	520	121	93	423	477	5,204
Residual Damages with Project	4,160	\$5,843	2,986	7,885	4,915	4,549	16,610
Residual Damages	18.6%	35.3%	40.7%	66.9%	41.7%	27.5%	28.6%
Average Annual Benefits	\$18,165	\$10,720	\$4,358	\$3,896	\$2,790	\$1,294	\$41,404
Other Beneficial Effects	185 acres habitat	--	--	--	--	--	185 acres habitat
Net Annual Benefits	\$14,595	\$10,201	\$4,237	\$3,803	\$2,547	\$817	\$36,200
BC Ratio at 5.125%	5.1	20.6	35.9	42.0	7.0	2.7	8.0
BC Ratio at 7.0%	3.8	15.6	28.9	32.2	5.4	2.0	6.0

Notes: \* Other Annual Direct or Associated Costs of project implementation include Argentine Unit induced damages (\$207) and non-creditable relocations (\$106).

\*\* Residual Damages as a percent of Future- Without Project Damages

\*\*\* Values in this table are rounded. Any discrepancies are due to rounding

City, Kansas 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 8 percent and would leave average annual residual damages estimated at \$4,549,000. The expected annual benefits are estimated to be \$1,294,000 with net annual benefits of \$8,170,000. The benefit-cost ratio is approximately 2.7 to 1.

Fairfax Jersey Creek Levee Unit – Fairfax-Jersey Creek Sheetpile Wall: The estimated total first cost of the plan is \$8,845,000. The total expected annual costs are \$520,000, including \$3,000 for OMRR&R. The selected plan is estimated to be 99 percent reliable in protecting the Fairfax Industrial District, Kansas City, Kansas 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 65 percent and would leave average annual residual damages estimated at \$5,843,000. The expected annual benefits are estimated to be \$10,720,000 with net annual benefits of \$10,201,000. The benefit-cost ratio is approximately 20.6 to 1.

**Cost Sharing.** Standard cost sharing rules for flood damage reduction projects will apply to this project. The local sponsor is required to pay a minimum of 35 percent of implementation costs, including responsibility for all lands, easements, rights-of-way, relocations, and disposal areas (LERRD), and a minimum cash contribution of 5 percent. The estimated Federal and non-Federal shares of the project construction costs are shown in Tables 3, 4 and 5 below.

**Table 3. Project Construction Cost Share Summary for Elements Requiring Additional Authorization (\$1,000)**

Item	Federal Cost	Non-Federal Cost	Total Cost
<b>Argentine Levee Unit</b>			
PED	\$ 2,222 (65%)	\$ 1,197 (35%)	\$ 3,419
LERR&D	\$ 0	\$ 2,940	\$ 2,940
Flood Damage Reduction	<u>32,157</u>	<u>14,377</u>	<u>46,533</u>
Subtotal	<u>\$ 32,157 (65%)</u>	<u>\$ 17,317 (35%)</u>	<u>\$ 49,474</u>
Total Element	\$ 34,380 (65%)	\$ 18,513 (35%)	\$ 52,893
Associated Costs*		\$ 1,898	
<b>FJCLU – Jersey Creek Sheetpile Wall</b>			
PED	\$ 572 (65%)	\$ 308 (35%)	\$ 880
LERR&D	\$ 0	\$ 149	\$ 149
Flood Damage Reduction	<u>5,178</u>	<u>2,638</u>	<u>7,816</u>
Subtotal	<u>\$ 5,178 (65%)</u>	<u>\$ 2,787 (35%)</u>	<u>\$ 7,965</u>
Total Element	\$ 5,749 (65%)	\$ 3,096 (35%)	\$ 8,845
<b>East Bottoms Levee Unit</b>			
PED	\$ 299 (65%)	\$ 161 (35%)	\$ 460
LERR&D	\$ 0	\$ 10	\$ 10
Flood Damage Reduction	<u>770</u>	<u>404</u>	<u>1,174</u>
Subtotal	<u>\$ 770 (65%)</u>	<u>\$ 414 (35%)</u>	<u>\$ 1,184</u>
Total Element	\$ 1,069 (65%)	\$ 575 (35%)	\$ 1,644
<b>Subtotals for Elements Requiring Additional Authorization</b>			
PED	\$ 3,093 (65%)	\$ 1,666 (35%)	\$ 4,759
LERR&D	\$ 0	\$ 3,099	\$ 3,099
Flood Damage Reduction	<u>38,105</u>	<u>17,419</u>	<u>55,524</u>
Subtotal	<u>\$ 38,105 (65%)</u>	<u>\$ 20,518 (35%)</u>	<u>\$ 58,623</u>
Total Element	\$ 41,198 (65%)	\$ 22,184 (35%)	\$ 63,382

\* Non-creditable relocations

**Table 4. Project Construction Cost Share Summary for Elements Implementable Within Existing Authorization (\$1,000)**

Item	Federal Cost	Non-Federal Cost	Total Cost
<b>North Kansas City Levee Unit – Harlem Area</b>			
PED	\$ 233 (65%)	\$ 126 (35%)	\$ 359
LERR&D	\$ 0	\$ 86	\$ 86
Flood Damage Reduction	<u>774</u>	<u>330</u>	<u>1,104</u>
Subtotal	<u>\$ 744 (65%)</u>	<u>\$ 416 (35%)</u>	<u>\$ 1,190</u>
Total Element	\$ 1,007 (65%)	\$ 542 (35%)	\$ 1,549
<b>North Kansas City Levee Unit – National Starch Area</b>			
PED	\$ 655 (65%)	\$ 353 (35%)	\$ 1,008
LERR&D	\$ 0	\$ 125	\$ 125
Flood Damage Reduction	<u>3,649</u>	<u>1,839</u>	<u>5,488</u>
Subtotal	<u>\$ 3,649 (65%)</u>	<u>\$ 1,964 (35%)</u>	<u>\$ 5,613</u>
Total Element	\$ 4,304 (65%)	\$ 2,317 (35%)	\$ 6,621
<b>Fairfax / Jersey Creek Levee Unit – BPU Floodwall</b>			
PED	\$ 982 (65%)	\$ 528 (35%)	\$ 1,510
LERR&D	\$ 0	\$ 298	\$ 298
Flood Damage Reduction	<u>4,139</u>	<u>1,932</u>	<u>6,071</u>
Subtotal	<u>\$ 4,139 (65%)</u>	<u>\$ 2,230 (35%)</u>	<u>\$ 6,369</u>
Total Element	\$ 5,121 (65%)	\$ 2,758 (35%)	\$ 7,879
<b>Subtotals for Elements Implementable Within Existing Authorization</b>			
PED	\$ 1,870 (65%)	\$ 1,007 (35%)	\$ 2,877
LERR&D	\$ 0	\$ 509	\$ 509
Flood Damage Reduction	<u>8,562</u>	<u>4,101</u>	<u>12,663</u>
Subtotal	<u>\$ 8,562 (65%)</u>	<u>\$ 4,610 (35%)</u>	<u>\$ 13,172</u>
Total Element	\$ 10,432 (65%)	\$ 5,617 (35%)	\$ 16,049

**Table 5. Project Construction Cost Share Summary for the Entire Recommended Plan (\$1,000)**

Item	Federal Cost	Non-Federal Cost	Total Cost
PED	\$ 4,963 (65%)	\$ 2,673 (35%)	\$ 7,636
LERR&D	\$ 0	\$ 3,608	\$ 3,608
Flood Damage Reduction	<u>46,667</u>	<u>21,520</u>	<u>68,187</u>
Subtotal	<u>\$ 46,667 (65%)</u>	<u>\$ 25,128 (35%)</u>	<u>\$ 71,795</u>
Total Element	\$ 51,630 (65%)	\$ 27,801 (35%)	\$ 79,431

**Project Implementation.** In order to maintain the necessary flexibility and control in the acquisition process, and in order to manage the Federal and sponsor funding cycles effectively, it is anticipated that separate contract packages will be developed for each sponsor. This approach will involve separate design agreements and individual Project Cooperation (PCA) agreements for each sponsor. The sponsors concur with this approach to implementation. The total fully funded project cost inflated to midpoint of construction, including all six project components, is estimated at \$88,875,000.

The Kaw Valley Drainage District (KVDD) of Wyandotte County, Kansas, would sponsor work on the Argentine Unit and the Fairfax-Jersey Creek Unit Sheetpile Wall. KVDD would assume responsibility for the total non-Federal share of \$21,609,000, including the cost of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD) estimated at \$3,089,000. In

addition, KVDD would be fully responsible for removing and relocating utilities and discharge pipelines on the project site that are non-compensable. The cost of this relocation work is estimated at approximately \$1,898,000. KVDD plans to issue general obligation bonds to fund project commitments under authority granted by State of Kansas statutes.

Kansas City, Missouri would sponsor the recommended East Bottoms Levee Unit modification. The City anticipates using City Public Improvements Advisory Committee (IPAC) funds.

The North Kansas City Levee District (NKCLD) of Clay County, Missouri, would sponsor the recommended work on the North Kansas City Unit at the Harlem and National Starch areas. The total non-Federal cost share of the two project elements is estimated at \$8,895,000, with \$2,859,000. NKCLD intends to meet its obligations by issuing general obligation bonds under existing state authority, subject to voter approval.

The Fairfax Drainage District (FDD) of Wyandotte County, Kansas, would sponsor the recommended Fairfax-BPU Floodwall modification. FDD intends to finance their share of costs from their general operating budget along with additional contributions by industrial and utility concerns within the district.

**Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R).** Operation, maintenance, repair, replacement and rehabilitation of the project would remain the responsibility of the non-Federal sponsors. Operation and maintenance manuals would be prepared (or updated as appropriate) by the Corps of Engineers and provided to the sponsors. OMRR&R costs for six recommended modifications would increase the total project's OMRR&R cost by about \$79,000 annually.

**Key Social and Environmental Factors.** This project meets the intent to protect minority and low income populations per Executive Order 12898. The levee districts and protected areas contain significant minority and lower income populations in the residential areas and employment base. The project improves the economic conditions of the protected areas by providing more reliable protection from flooding without causing adverse effects to the populations or to community cohesion.

**Stakeholder Perspectives and Differences.** Substantial efforts were made to ensure formulation of an environmentally sustainable and publicly acceptable project. Input was solicited from the appropriate state and Federal resource agencies, local agencies and the public at large. Widely advertised public meetings were conducted during the course of the study. The Environmental Protection Agency is a cooperating agency in the study. Recreation enthusiasts in the area are encouraging the sponsors and the Corps to provide opportunities for trails to be incorporated in the levee systems. Where this is practicable, the Corps is supportive of the sponsors accommodating compatible recreation into their projects if they so desire. There is universal support for the project in the metropolitan area and the sponsors are unified in their cooperation with the Corps. The sponsors are strongly supportive of authorization and moving into the design phase to correct the design deficiencies as soon as practical.

**State and Agency Review.** The State and Agency Review for the final report began 29 September 2006 and ended 29 October 2006. In a letter dated 10 October 2006, the State of Missouri had no comments or recommendations. In a letter dated 27 October 2006, the Department of the Interior did not object to the proposed project and had no comments to offer. In a letter dated 03 November 2006, the Kansas Department of Health and Environment summarized state permit requirements and water quality protection requirements. It noted that the review of HTRW sites is dated and may need to be updated. It encouraged the Corps to participate in an upcoming watershed protection effort. CECW-NWD replied with letter on 22 November 2006 that acknowledged the state's concerns and recommendations. The Department of Agriculture (Natural Resource Conservation Service),

Department of Transportation (Federal Aviation Administration), Environmental Protection Agency (Region VII), and Federal Management Agency, indicated by phone or e-mail that they had no comments. No other letters were received.