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105th Congress, 2d Session – – – – – – – – – – – – – House Document 105–185

# FLOOD DAMAGE REDUCTION PROJECT, KANSAS CITY, MISSOURI

## COMMUNICATION

FROM

## THE ACTING ASSISTANT SECRETARY (CIVIL WORKS) THE DEPARTMENT OF THE ARMY

TRANSMITTING

THE REPORT ON AUTHORIZATION OF A FLOOD DAMAGE REDUCTION PROJECT FOR THE BLUE RIVER BASIN AT THE DODSON INDUSTRIAL DISTRICT, KANSAS CITY, MISSOURI, PURSUANT TO PUB. L. 104–303, SEC. 101(a)(18)

FEBRUARY 3, 1998.—Referred to the Committee on Transportation and Infrastructure and ordered to be printed

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# FLOOD DAMAGE REDUCTION PROJECT, KANSAS CITY, MISSOURI

# CONTENTS


| | Page |
|---|---|
| Letter of Transmittal | XII |
| Comments of the Office of Management and Budget | IX |
| Comments of the State of Missouri | X |
| Comments of the Department of the Interior | XI |
| Report of the Chief of Engineers, Department of the Army | 1 |
| Report of the Division Engineer | 5 |
| Report of the District Engineer. | |
| Syllabus | 7 |
| INTRODUCTION | 8 |
| Authority | 8 |
| Study History | 8 |
| Study Purpose and Scope | 8 |
| Prior Studies and Reports | 9 |
| Existing Water Projects | 12 |
| PLAN FORMULATION | 14 |
| EXISTING CONDITIONS | 14 |
| Basin Description | 14 |
| Environmental and Cultural Setting | 15 |
| Site Description and Economic Setting | 17 |
| Historic Flooding | 20 |
| Historical Stream-Gage Data | 20 |
| HYDROLOGY AND HYDRAULICS | 20 |
| ECONOMIC EVALUATION OF FLOOD DAMAGE | 27 |
| Existing Flood Damage Conditions | 28 |
| Future Flood Damage Conditions Without Federal (Corps) Action | 31 |
| PLANNING NEEDS AND OPPORTUNITIES | 32 |
| PLANNING CRITERIA AND CONSTRAINTS | 32 |
| Planning Objectives | 33 |
| MEASURES AVAILABLE TO ADDRESS PROBLEMS | 33 |
| Upstream Dams | 33 |
| Nonstructural Measures | 33 |
| Structural Measures | 36 |
| Structural Plan Descriptions | 39 |
| EVALUATION AND SCREENING OF STRUCTURAL PLANS | 45 |
| Comparison of Plans | 47 |
| PLAN SELECTION | 52 |
| IDENTIFICATION OF NED PLAN | 78 |
| SIGNIFICANT EFFECTS | 79 |
| SELECTED PLAN | 82 |
| DESCRIPTION OF SELECTED PLAN | 84 |
| Levees | 84 |
| Drainage Systems | 85 |
| Utility Relocations | 85 |
| Lands Required | 85 |
| OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION | 86 |
| STUDY COORDINATION AND PARTICIPANTS (PRIOR TO OCTOBER 1995) | 86 |
| Non-Federal Sponsor | 86 |
| Federal Agencies | 86 |
| State and Local Agencies | 89 |
| Other Interests | 90 |
| LOCAL SPONSORSHIP REQUIREMENTS | 90 |
| Sponsor's Intent | 92 |

Page

LOCAL SPONSORSHIP REQUIREMENTS—Continued
Financing Plan Outline ..... 92
Use of Funds ..... 93
CONCLUSIONS ..... 94
RECOMMENDATION ..... 94
DISCLAIMER ..... 95
ENVIRONMENTAL ASSESSMENT ..... 98
NEED FOR THE ACTION ..... 101
ALTERNATIVES ..... 101
Plans Eliminated from Further Study ..... 101
Plans Considered in Detail ..... 102
No Action Alternative ..... 102
Structural Measures ..... 102
Reach 1 (Upstream of Prospect) ..... 102
Reach 2 (Prospect to Hickman Mills Drive) ..... 103
Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive) ..... 103
ENVIRONMENTAL SETTING ..... 104
ENVIRONMENTAL EFFECTS ..... 108
Reach 1 (Upstream of Prospect) ..... 109
Reach 2 (Prospect to Hickman Mills Drive) ..... 110
Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive) ..... 110
ENVIRONMENTAL EFFECTS MATRIX ..... 111
CONCLUSIONS ..... 112
AGENCIES AND INDIVIDUALS CONSULTED ..... 112
RECIPIENTS OF DRAFT FEASIBILITY REPORT/EA ..... 112

TABLES

1. BLUE RIVER PEAK DISCHARGE AT BANNISTER ROAD ..... 21
2. 1995 EXPECTED ANNUAL DAMAGES, EXISTING CONDITIONS ..... 28
3. FLOOD AND ECONOMIC DATA, EXISTING CONDITIONS ..... 29
4. 1995 EXPECTED ANNUAL DAMAGES, FUTURE CONDITIONS ..... 31
5. HYDROLOGIC AND ECONOMIC DATA, FUTURE CONDITIONS ..... 32
6. NONSTRUCTURAL MEASURES ..... 34
7. SCREENING OF NONSTRUCTURAL MEASURES ..... 35
8. STRUCTURAL MEASURES ..... 36
9. SCREENING OF STRUCTURAL MEASURES ..... 38
10. ARRAY OF STRUCTURAL PLANS ..... 39
11. COMPARISON OF PLAN FEATURES ..... 47
12. BENEFIT-COST RATIOS FOR REACH-ALIGNMENT COMBINATIONS . 49
13. COMPARISON OF STRUCTURAL PLAN COSTS AND BENEFITS ..... 50
14. PLAN EVALUATION MATRIX ..... 54–75
15. PLAN 114 COSTS AND BENEFITS COMPARISON ..... 79
16. COST ESTIMATE SUMMARY ..... 82
17. ANNUAL COST CALCULATION ..... 83
18. BENEFITS SUMMARY ..... 83
19. BENEFIT COST ANALYSIS ..... 84
20. COST SHARING ..... 92

FIGURES

1. STUDY AREA LOCATION AND VICINITY ..... 10
2. DODSON INDUSTRIAL DISTRICT ..... 11
3. FLOODPLAIN ZONES-DODSON INDUSTRIAL DISTRICT ..... 13
4. DISCHARGE-FREQUENCY CURVES ..... 22
5. EXISTING CONDITION WATER SURFACE PROFILES ..... 23
6. INTERIOR DRAINAGE ..... 26
7. FLOOD RELATIONSHIP CURVES ..... 30
8. SELECTED PLAN ..... 76
9. PROPOSED LEVEE WATER SURFACE PROFILES ..... 77
10. BENEFIT-COST/LEVEE HEIGHT CURVES ..... 80

Page

11. AREA PROTECTED BY THE PROPOSED PROJECT ..... 81

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## APPENDICES

Appendices Accompanying the Report of the District Engineer

(Appendices B–J Printed)

A. ENGINEERING.
B. SOCIOECONOMICS ..... 115
C. PUBLIC INVOLVEMENT ..... 158
D. SECTION 404(b)(1) COMPLIANCE ..... 172
E. FISH AND WILDLIFE COORDINATION ACT REPORT ..... 181
F. CORRESPONDENCE ..... 204
G. COMMENTS AND RESPONSES ..... 243
H. REAL ESTATE PLAN ..... 257
I. CULTURAL RESOURCES ..... 267
J. WETLAND MITIGATION PLAN ..... 295

# LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

REPLY TO
ATTENTION OF

29 DEC 1997

Honorable Newt Gingrich
Speaker of the House
of Representatives
Washington, D.C. 20515

Dear Mr. Speaker:

Section 101(a)(18)of the Water Resources Development Act of 1996, authorized a flood damage reduction project for the Blue River Basin at the Dodson Industrial District, Kansas City, Missouri. The Secretary of the Army supports the authorization and plans to implement the project through the normal budget process.

The authorized project is described in the report of the Chief of Engineers dated September 5, 1996, which includes other pertinent reports and comments. These reports are in partial response to a resolution adopted by the House Committee on Public Works and Transportation on September 19, 1984.

The views of the State of Missouri and the Department of the Interior are set forth in the enclosed report.

The authorized project maximizes net national economic development benefits consistent with environmental quality. The project consists of a combination of levees, floodwalls, and road closure structures to reduce flood damages to the Dodson Industrial District. Project features include about 5,450 feet of earthen levee and about 150 feet of concrete floodwall. These structures would have an average height of about ten to 15 feet. The project would contain a flood with a 0.2 percent chance exceedance level, about a 500-year event, and reduce average annual flood damages by about 93 percent. Fish and wildlife mitigation features include grading and selected plantings to establish a 4-acre wetland habitat.

Based on October 1995 price levels, the total first cost of the authorized project is about $17,082,000, of which about $12,043,000 would be Federal, and about $5,039,000 would be non-Federal. In addition, in

accordance with Section 202(c) of the Water Resources Development Act of 1996, non-Federal interests will be required to implement a flood plain management plan for the project area.

The Office of Management and Budget advises that there is no objection to the submission of this report to the Congress. A copy of its letter is enclosed in the report.

Sincerely,

John H. Zirschky
Acting Assistant Secretary of the Army
(Civil Works)

Enclosure

# COMMENTS OF THE OFFICE OF MANAGEMENT AND BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

JUN 2 [illegible]

The Honorable H. Martin Lancaster
Assistant Secretary of the
Army for Civil Works
Pentagon - Room 2E570
Washington, D.C. 20310-0108

Dear Mr. Lancaster:

We have completed our review of the following projects, as required by Executive Order 12322:

- Boston Harbor, Massachusetts, by letter of September 20, 1996;
- Blue River Basin, Dodson Industrial Area, Kansas City, Missouri, by letter of October 14, 1996;
- Charleston Harbor, South Carolina, by letter of July 19, 1996;
- Clifton, Arkansas, by letter of June 12, 1996;
- Columbia River Treaty Fishing Access Sites -- Phase II, by letter of July 23, 1996;
- Long Beach Island, New York, by letter of April 30, 1996;
- Lower Savannah River, South Carolina, by letter of September 17, 1996.

Our review concluded that your recommendations for these projects are consistent with the policies and program of the President. The Office of Management and Budget does not object to your submitting these reports to Congress.

We note that these projects have been at OMB for review beyond our normal review time. We regret any difficulties that this extended review time might have created. We are taking steps to improve the timeliness of these reviews to help the Corps and the local sponsors.

Sincerely,

T.J. Glauthier
Associate Director
Natural Resources,
Energy and Science

## COMMENTS OF THE STATE OF MISSOURI

Mel Carnahan
Governor

Richard A. Hanson
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Post Office Box 809
Jefferson City
65102

Stan Perovich
Director
Division of General Services

May 6, 1996

Policy Review Branch
Policy Review and Analysis Division
ATTN: CECW-AR (SA)
7701 Telegraph Road
Alexandria, Virginia 22315-3861

Gentlemen:

Subject: 96040067 - General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District, Kansas City, Missouri

The Missouri Federal Assistance Clearinghouse, in cooperation with state and local agencies interested or possibly affected, has completed the review on the above project application.

None of the agencies involved in the review had comments or recommendations to offer at this time. This concludes the Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the State Clearinghouse requirements.

Sincerely,

Lois Pohl

Lois Pohl, Coordinator
Missouri Clearinghouse

LP:cm

# COMMENTS OF THE DEPARTMENT OF THE INTERIOR

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER 96/261

JUN 6 1996

Mr. David B. Sanford, Jr.
Chief, Policy Review and Analysis Division
Policy Review Branch
ATTN: CECW-AR (SA)
7701 Telegraph Road
Alexandria, Virginia 22315-3861

Dear Mr. Sanford:

The Department of the Interior has reviewed the proposed Chief of Engineers report and related documents concerning Flood Damage Reduction for the Blue River at Dodson Industrial District, Kansas City, Jackson County, Missouri.

The documents provide an adequate description of fish and wildlife resources and potential related impacts. Our final Fish and Wildlife Coordination Act Report is included as Appendix E of the Feasibility Report and includes specific comments and recommendations of the Department relevant to this project that have been incorporated throughout the reports and support documents. Appendix J contains the Wetland Mitigation Plan that assures adequate wetland mitigation will occur.

Thank you for the opportunity to provide these comments.

Sincerely,

Willie R. Taylor

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance

# FLOOD DAMAGE REDUCTION PROJECT, KANSAS CITY, MISSOURI

## REPORT OF THE CHIEF OF ENGINEERS

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CECW-PC 5 September 1996

SUBJECT: Blue River Basin, Kansas City, Missouri

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on the Blue River basin, Kansas City, Missouri. It is accompanied by the report of the district and division engineers. These reports are in partial response to a resolution passed by the Committee on Public Works and Transportation of the U.S. House of Representatives on 19 September 1984 requesting review of the reports on the Blue River, Kansas and Missouri, to determine whether any modifications should be made in the recommendations therein, with particular reference to flood control and related water problems upstream from 63rd Street in Kansas City, Missouri. Preconstruction engineering and design activities for the proposed project will be continued under the authority provided by the resolution.

2. The reporting officers recommend construction of a combination of levees, floodwalls, and road closure structures for flood damage reduction and public safety. Project features include about 5,450 feet of earthen levee and 150 feet of floodwall, with an average height of 10 to15 feet and a maximum height above the river bed of about 57 feet. Fish and wildlife impact mitigation features include grading and selected plantings to establish a 4-acre wetland habitat. There are no separable elements. The plan would reduce flood damage costs, reduce the threat to loss of life, reduce health and safety services disruptions, and preserve the environmental resources of the area. The proposed project would contain a flood with a 0.2 percent chance exceedance level.

3. The estimated first cost of the recommended plan, based on October 1995 price levels, is $17,100,000. Total average annual charges, based on a discount rate of 7.625 percent and a 50-year period for economic analysis, are estimated at $1,548,000 including $17,500 for operation, maintenance, rehabilitation, replacement, and repair. The average annual economic benefits are estimated at $1,923,000 with net annual benefits of $375,000. The benefit-cost ratio is 1.2. The proposed plan is the national economic development plan.

4. Washington level review indicates that the proposed plan is technically sound, economically justified, and environmentally acceptable. The proposed project complies with applicable U.S. Army Corps of Engineers planning procedures and regulations. Also, the views of interested parties, including Federal, State, and local agencies have been considered. There are no objections to the proposed plan.

5. The Administration has initiated the development of a new cost sharing policy for flood damage reduction projects. I recommend that improvements for flood damage reduction in the Blue River basin be authorized subject to cost sharing that is consistent with Administration policy. This recommendation is also subject to the non-Federal sponsor agreeing to comply with applicable Federal laws and policies, including the following requirements:

a. Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

b. Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project;

c. For so long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed project, or functional portion of the project, at no cost to the Government, in accordance with applicable Federal and State laws and any specific directions prescribed by the Government;

d. Grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project;

e. Hold and save the Government free from all damages arising for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors;

f. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs;

g. Perform, or cause to be performed, 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), 42 USC 9601-9675, that may exist in, on, or under lands, easements or rights-of-

way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government;

h. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Government determines necessary for the construction, operation, or maintenance of the project;

i. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA;

j. Participate in and comply with applicable Federal floodplain management and flood insurance programs in accordance with Section 402 of Public Law 99-662;

k. Prevent future encroachments on project lands, easements, and rights-of-way which might interfere with the proper functioning of the project:

l. Not less than once each year, inform affected interests of the limitations of the protection afforded by the project;

m. Publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the floodplain, and in adopting such regulations as may be necessary to prevent unwise future development and to ensure compatibility with protection levels provided by the project;

n. 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; and

o. Comply with all applicable Federal and State laws and regulations, including Section 601 of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive

5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

6. 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 the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsor, the State of Missouri; interested Federal agencies; and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

PAT M. STEVENS IV
Major General, USA
Acting Chief of Engineers

# REPORT OF THE DIVISION ENGINEER

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSOURI RIVER DIVISION
12565 WEST CENTER ROAD
OMAHA, NEBRASKA 68144-3869

REPLY TO
ATTENTION OF

18 MAR 1996

CEMRD-ET-P

MEMORANDUM FOR CDR USACE (CECW-ZA), WASH DC 20314-1000

SUBJECT: Blue River Basin, Kansas City, Missouri
CWIS No. 012563, Feasibility Report (Flood Damage Reduction for the Dodson Industrial District)

I concur in the recommendations and conclusions of the District Engineer.

RICHARD W. CRAIG
COL, EN
Commanding

6

# GENERAL INVESTIGATION of FLOOD DAMAGE REDUCTION

for

BLUE RIVER at DODSON INDUSTRIAL DISTRICT

KANSAS CITY, MISSOURI

Final

FEASIBILITY REPORT and ENVIRONMENTAL ASSESSMENT

FEBRUARY 1996

## *SYLLABUS*

Flooding has damaged development in the Blue River Basin of Kansas City, Missouri, and surrounding communities periodically for many years. We received a resolution by the City of Kansas City, Missouri and other requests to restudy the Blue River Basin for potential measures to reduce recurring flood damages. A Resolution adopted by the Committee on Public Works and Transportation, United States House of Representatives on September 19, 1984, authorized a reconnaissance study. Our reconnaissance indicated that a feasible project to reduce flood damages could be developed on the Blue River in the vicinity of the Dodson Industrial District of Kansas City, Missouri. This feasibility study is a continuation of that study effort as recommended in the May 1987 Reconnaissance Report.

We considered plans including combinations of levee alignments with and without floodwall sections, channel bank excavation, and nonstructural measures. We examined the most favorable plan, Plan 114, at the 4-percent, 1-percent, and 0.2-percent levels of protection. Although either the 1- or 0.2-percent level would have a positive benefit-cost ratio, the maximum net benefits are associated with the 0.2-percent level of protection.

The recommended plan is a levee and gate system 5,600 feet long connecting the Bannister Road Federal Complex levee upstream to the embankment of Bruce R. Watkins Drive downstream. The recommended plan would protect the Dodson Industrial District with a 0.2-percent level of protection from Blue River flooding.

The recommended plan would not significantly affect the environment and is the NED (National Economic Development) plan. The benefit-cost ratio is 1.2 to 1, with net annual benefits of $375,000. The project would have average annual benefits of $1,923,000, and annual costs of $1,548,000 based on a Federal interest rate of 7 5/8 percent. The non-Federal sponsor, the City of Kansas City, Missouri, prefers the recommended plan. The estimated project cost is $17,100,000 (October 1995 prices). The Federal share of the project cost is $12,060,000 and the non-Federal share is $5,040,000. The proposed cost apportionment is preliminary, subject to validation of the Federal interest during Washington level review.

GENERAL INVESTIGATION of FLOOD DAMAGE REDUCTION
FEASIBILITY REPORT and ENVIRONMENTAL ASSESSMENT
for
BLUE RIVER at DODSON INDUSTRIAL DISTRICT
KANSAS CITY, MISSOURI

February 1996

# INTRODUCTION

## Authority

This feasibility study was authorized by a resolution adopted by the Committee on Public Works and Transportation, United States House of Representatives, on 19 September 1984. The text of the resolution is as follows:

> That the Board of Engineers for Rivers and Harbors, is hereby, requested to review the report of the Chief of Engineers on the Blue River, vicinity of Kansas City, Missouri and Kansas, published as House Document Numbered 332, 91st Congress, 2nd Session, and other pertinent reports, with a view to determining whether any modifications of the recommendations contained therein are advisable at the present time, with particular reference to the Blue River from 75th Street upstream including the Indian Creek, Tomahawk Creek, Wolf Creek, and Coffee Creek drainage areas in Missouri and Kansas.

## Study History

The Dodson Industrial District of Kansas City, Missouri has experienced many floods on the Blue River. The most serious floods occurred in November 1928, April 1944, July 1951, July 1958, September 1961, September 1977, June 1984, September 1986 and May 1990. The September 1961 event was the flood of record. The City of Kansas City, Missouri, passed a resolution on 27 April 1984 requesting a restudy of the Blue River Basin. The Mid-America Regional Council passed a similar resolution on 26 June 1984. The resultant May 1987 Reconnaissance Report recommended a feasibility study. On 26 May 1987, the City provided a letter of intent to sponsor this flood damage reduction study. A feasibility study cost sharing agreement (FCSA) was signed 13 July 1988 and subsequently amended 26 January 1990, 10 January 1992, 13 May 1993, 14 February 1994, and 7 September 1995. We began the study in August 1988.

## Study Purpose and Scope

PURPOSE.

The study is to develop alternative flood damage reduction plans for the Blue River in the vicinity of the Dodson Industrial District, determine their economic effectiveness and identify the National Economic Development Plan or other recommended plan.

TECHNICAL SCOPE.

We expanded information from the Reconnaissance Report to include evaluation of the economic, social, and environmental feasibility of an array of flood damage reduction plans within the study area described in the geographic scope.

GEOGRAPHIC SCOPE.

The study area is the Blue River floodplain in the vicinity of the Dodson Industrial District in Kansas City, Missouri. Figure 1 is a map of the Blue River Basin and the metropolitan Kansas City area indicating the study area. The study area is bounded approximately by the Bannister Road Federal Complex on the southwest (near Grandview Road), Bruce R. Watkins Drive (near 85th Street) on the northeast, the Union Pacific railroad tracks on the northwest, and Blue River Road on the southeast, all in Section 22, Range 33 W, Township 48 N, in Jackson County, Missouri. Figure 2 is a general map of the study area.

## Prior Studies and Reports

FLOOD INSURANCE STUDY (FIS), City of Kansas City, MISSOURI. Published by the Federal Emergency Management Agency (FEMA), in September 1990, it showed most of the area within the 1 percent (100 year) floodplain of Blue River and the remainder in the 0.2 percent (500 year) flood zone, see Figure 3. The hydrologic and hydraulic analyses for the FIS were performed for FEMA by the U.S. Army Corps of Engineers, Kansas City District. The report includes flood discharges, water surface profiles, and flooded area and floodway maps for use in developing actuarial flood insurance rates. Since the City of Kansas City is a participating community in the National Flood Insurance Program (NFIP), all properties within the city are eligible for flood insurance. If the project for the Dodson Industrial District is constructed, the City would request adjustment of the Flood Insurance Rate Map (FIRM) to reflect the achievement of protection from greater-than-1 percent flood levels.

BLUE RIVER BASIN, KANSAS AND MISSOURI, RECONNAISSANCE REPORT. Completed by the Corps of Engineers in May 1987. The study explored flood damage reduction measures in the Blue River Basin including the Dodson Industrial District, and concluded that feasible measures were implementable for flood damage reduction and was the basis for this feasibility study. The reconnaissance report recommended that feasibility phase studies be conducted. The reconnaissance report was certified 3 September 1987.

FLOOD PLAIN INFORMATION, BLUE RIVER, BRUSH CREEK & INDIAN CREEK, WITHIN KANSAS CITY, MISSOURI. Completed by the Kansas City District, Corps of Engineers, in April 1970. The report evaluated flood hazards within the City of Kansas City, Missouri along the Blue River and its tributaries. It was intended as an aid in identifying local flood problems for planning development in the basin.

Figure 1. STUDY AREA LOCATION AND VICINITY

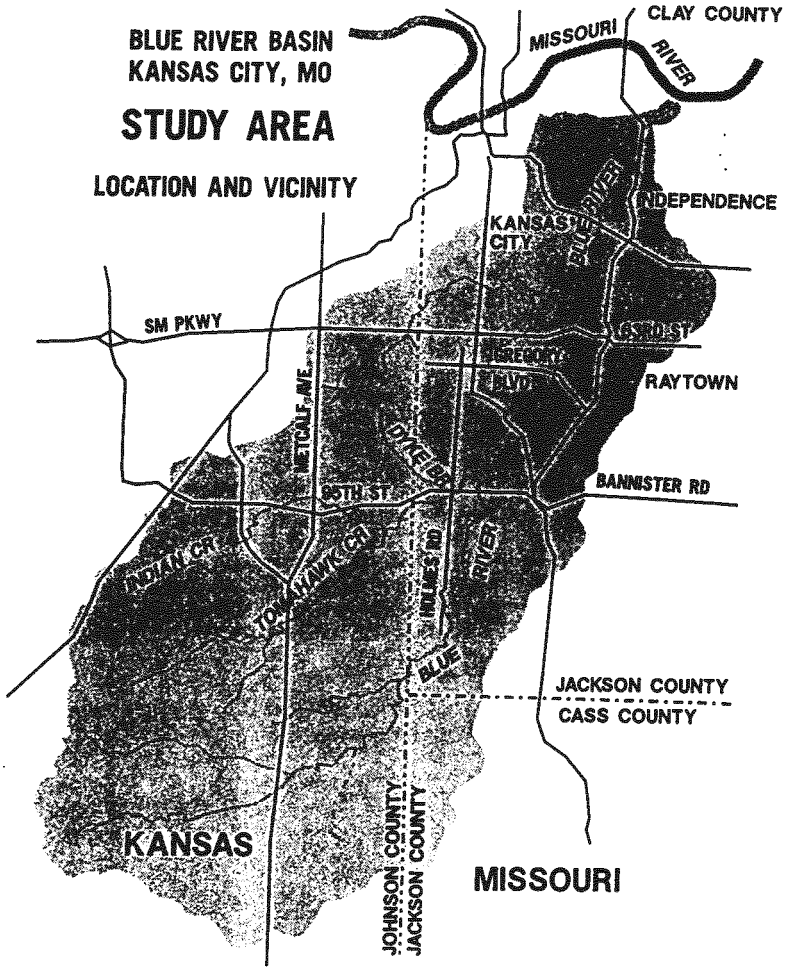
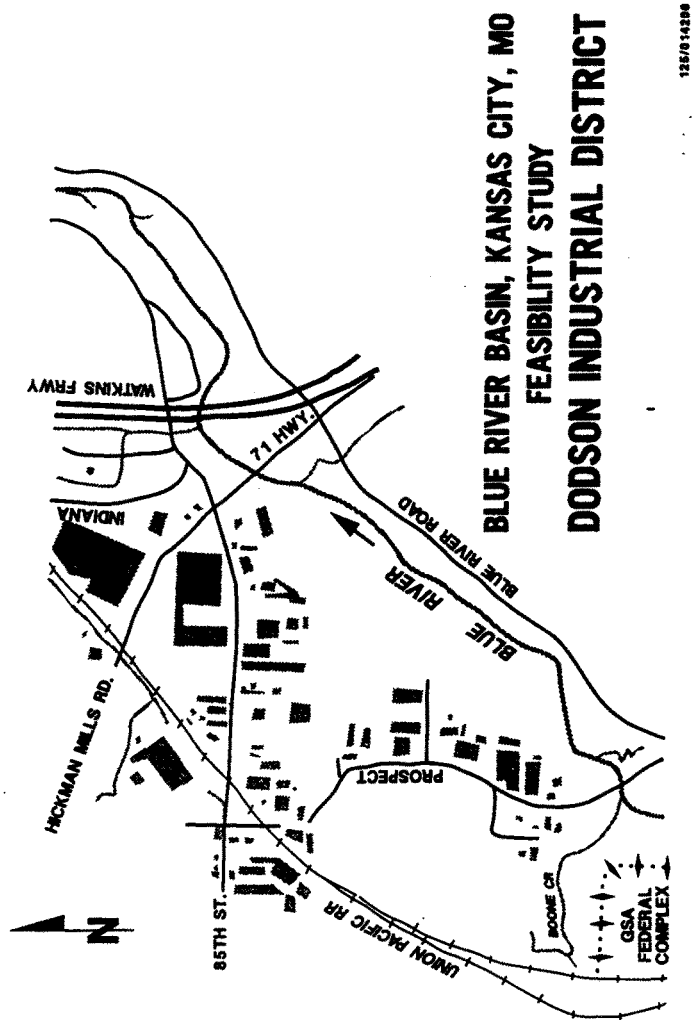


Figure 2. DODSON INDUSTRIAL DISTRICT



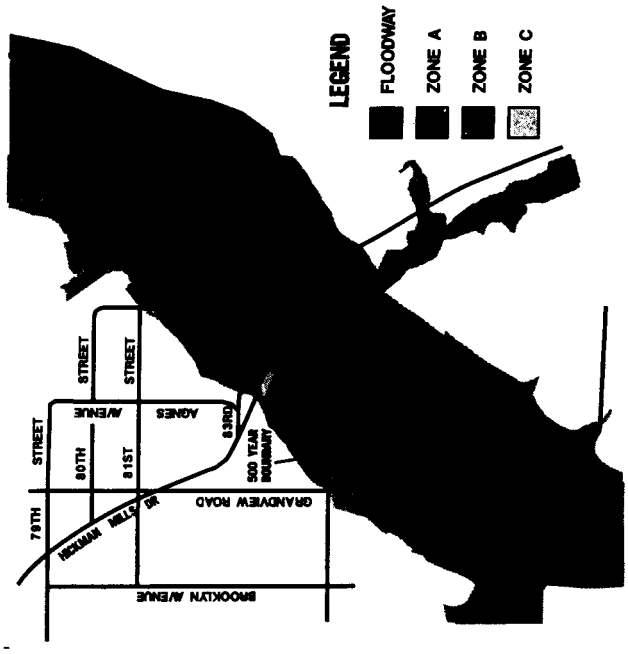
## Existing Water Projects

FLOOD INSURANCE PROGRAM. The City of Kansas City participates in the National Flood Insurance Program (NFIP) administered by FEMA. Property owners pay premiums for flood insurance for structural development such as residences and businesses. Future development in the 1 percent (100 year) flood zone will require special measures, such as construction on fill material or raising first floor levels to an elevation several feet higher than first floor elevations of existing structures. FEMA regulations require the lowest floor of new structures in the 1 percent floodplain to be above the base (1 percent) flood elevation (BFE), unless the community has a basement exception granted by FEMA. This requirement is reflected in the City of Kansas City floodplain management ordinance which applies to development constructed after the date of the Flood Insurance Rate Map (FIRM). Structures with basements below the BFE which existed prior to FEMA designation of flood hazard areas may also be eligible for flood insurance.

BANNISTER ROAD FEDERAL COMPLEX FLOOD PROTECTION, KANSAS CITY, MISSOURI. This facility is immediately upstream of the Dodson Industrial District. Flood protection is provided for the Regional Headquarters of the General Services Administration, the Department of Energy and its contractor Allied Signal, the Internal Revenue Service, and several smaller federal organizations. We accomplished the initial phase of construction in 1970-71 to protect the complex from the 1.54 percent (65 year) flood event. We have constructed a second project which is designed to protect the complex to the 0.2-percent (500 year) level. The Department of Energy and the General Services Administration funded the second project through an Interagency Agreement. The first construction contract on the second project was awarded in July 1992, a second in March 1993, and construction was completed in December 1994.

BLUE RIVER BASIN PROJECT KANSAS AND MISSOURI. This project was authorized by the Flood Control Act of 1970 (Public Law 91-611). A two-part plan included the construction of four lakes near the headwaters of the Blue River (Mill Lake in Missouri, and Indian, Tomahawk, and Wolf-Coffee Lakes in Kansas) and channel modifications in the lower 12 miles in Kansas City, Missouri. Opposition to the lakes in the 1970's resulted in reclassification of the lakes to the an inactive or deferred status. The lakes were later deauthorized by the Water Resources Development Act of 1986, Public Law 99-662. Construction on the Blue River Channel Modification began in November 1983 and continues, in stages, using multiple construction contracts. All construction is presently scheduled for completion by September 2003. When completed, the channel modifications will provide a

Figure 3. FLOODPLAIN ZONES-DODSON INDUSTRIAL DISTRICT




BLUE RIVER,
KANSAS CITY, MO

FEASIBILITY STUDY

FLOOD PLAIN
ZONES

3.33 percent (30 year) level of protection to this highly developedreach. The channel modification terminates approximately 5.5 miles downstream of the Dodson Industrial District and has no effect on flood stages or damages at Dodson.

## PLAN FORMULATION

This section of the report presents an assessment of water and related land resources problems and opportunities specific to the study area, beginning with a description of existing conditions. The study area is described in terms of its location in the Blue River basin, the environmental and cultural setting, economic setting, historic flooding, hydrology, and flood damages. Future conditions without the project are discussed, followed by a statement of the planning needs and opportunities for solving identified problems. Planning criteria and constraints are noted, followed by a statement of planning objectives.

Measures available to address problems and opportunities are then identified and combined into an array of alternative plans which are screened and refined to make up a final array of plans. These plans are presented, evaluated, and a trade-off analysis is displayed to illustrate the rationale for selection of the final plan which is then recommended for construction.

## EXISTING CONDITIONS

### Basin Description

The Blue River is formed by the confluence of Wolf and Coffee Creeks in Johnson County, Kansas near the Kansas-Missouri State line. It crosses the state line into Kansas City, Missouri and flows northeasterly through Kansas City for 37 miles to join the Missouri River on the right bank near Sugar Creek, Missouri, at about river mile 357. The basin watershed lies in the Central Lowland physiographic province of western Missouri and eastern Kansas, a maturely dissected and gently rolling region with relatively wide stream valleys. The topography is developed on Pennsylvanian age shales with interbedded limestone, sandstone, and coal. The Blue River drains 272 square miles of which 188 are upstream of the Dodson Industrial District. Fifty-six percent of the Blue River basin is in Kansas. The basin is 30 miles long and a maximum of about 12 miles wide. Within Kansas City, the basin width averages about 1/2 to 3/4 mile. Elevations range from 1,135 feet National Geodetic Vertical Datum (NGVD) in the headwaters to 700 feet, NGVD, at the mouth.

## Environmental and Cultural Setting

Wetlands. Much of the study area was originally forested floodplain and would have been considered "wetland" under the current definition applied under Section 404 of the Clean Water Act. However, construction debris and other materials have been used through the years to raise the level of the floodplain and alter the drainage pattern to such an extent that most of the area does not qualify as "wetlands" using the current definition. There are approximately 6 to 7 acres of timbered wetlands remaining in the study area. Human disturbance of the drainage patterns resulted in the alteration/formation of one small pond (0.2 acres) in the study area. This pond receives drainage from the nearby business properties and has been altered by fill activities associated with the industrial district.

Vegetation. Most riparian trees were gradually eliminated from the study area. A few scattered large trees remain along the edge of the Blue River and on parts of the floodplain. Box elder, silver maple, and elm are most common. A few sycamore and black walnut are also present. Some disturbed portions of the floodplain have reforested and are primarily covered with sapling and pole sized ash, elm, and box elder. A scattering of other trees from burr oak to black cherry are found throughout the area. Areas with semi-open understory have stinging nettle, jewelweed, rough-leaved dogwood, blackberry, multi-flora rose, and American elderberry.

The Boone Creek drainage, a small stream on the left bank of the Blue River north of the Federal Complex, has been altered by construction that removed most of the larger trees. Poison hemlock and giant ragweed have been able to retain dominance along the creek, aided by the periodic removal of encroaching trees by beaver.

Upland sites vary from the early stages of reforestation to a nearly complete absence of vegetation in highly developed areas, which are mostly in cool season grasses and are periodically maintained to prevent reforestation. A mixture of annual and perennial plants cover the closed Kansas City 87th Street and Prospect Landfill north of Boone Creek.

Wildlife. White-tailed deer and red fox use the floodplain along Boone Creek and the Blue River. Beaver are found in both streams; muskrats may be present in the river but have not been observed. Cottontails are common at the closed landfill but less numerous at the upland sites with less desirable habitat. Squirrel and raccoon tracks are found throughout floodplain areas.

Small wading birds use the Boone Creek floodplain. Their use of nearby ponds is more limited. Hawks are frequently visible throughout the study area, with red-tailed hawks and kestrels being most commonly observed. In the Dodson study area, the former Arrow Truck Sales storage yard, the vacant Labconco property, and the closed landfill provide the best habitat for resident and migrant smaller birds. Grackles nest and roost in the wooded wetlands. Some waterfowl use the small ponds and the Blue River.

Black rat snakes, garter snakes, and yellow-bellied racers have been observed within the study area. Up to a dozen species of fish may be present in the Blue River. Green sunfish and unidentified minnows have been seen in Boone Creek along with snapping turtles and bullfrogs. Turtles and frogs are found in the small pond. The pond has not been examined for the presence of fish.

Endangered species. No threatened or endangered species are known to use the area nor is any critical habitat likely be adversely affected by the plans under study.

Cultural Resources. The Corps conducted a cultural resources survey of the proposed levee corridor in 1990, in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. No cultural materials were located. There are no known prehistoric or historic sites within the levee corridor. One known historic site, Russell's Ford, is across the Blue River from the construction corridor and will not be affected by the project.

In March 1993, the Corps conducted an additional archeological survey of proposed borrow areas for the project. One prehistoric site (23JA442) of unknown cultural affiliation was identified during the survey. Subsequent intensive surface survey and systematic subsurface auger-testing indicate that this site is both shallow and disturbed, and therefore does not possess the integrity to qualify for listing in the National Register of Historic Places. A report of the 1993 survey of borrow areas was submitted to the SHPO for review and comment. The SHPO concurred that 23JA442 was not significant and that there were no significant cultural resources that would be affected by the project. Archeological reports of the 1993 survey of borrow areas and the 1990 survey of the levee corridor, as well as copies of letters of coordination with the Missouri State Historic Preservation Office, are included in Appendix I.

Solid and Hazardous and Toxic Waste. Based on soil borings and visual inspection, we suspect that several properties consisting of fill contain regulated wastes that would require disposal in a permitted landfill. Although these sites will require construction methods consistent with waste disposal regulations, they are not necessarily hazardous or toxic waste sites. These properties include Bargain Spot Lumber and Materials, and Everett Holding Company in Reach 2. In Reach 1 the Richard W. Schweiger property may contain fill requiring landfilling if excavated. In Reach 3, the property currently owned by Laidlaw Waste, Inc. which leases a large portion of the site to a nursery and lawn care business, may contain regulated wastes.

Hazardous waste is confirmed to exist on the Arrow Truck property in Reach 2. In 1988 the Missouri Department of Natural Resources (MDNR) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Inspection on the Arrow Truck facility. During this inspection MDNR found several unsatisfactory features. In 1990 MDNR and the U.S. Environmental Protection Agency (EPA) agreed on a preliminary site assessment under the Comprehensive Environmental Resource Compensation and Liability

Act (CERCLA) to determine whether the site contained hazardous wastes. A Preliminary Assessment Report published in 1991 indicated that the site might be contaminated with lead battery residue. In April 1992 a Site Sampling Report included the results of surface sampling which indicated lead levels above the concentration EPA considers hazardous. On September 28, 1994, MDNR published the results of surface and subsurface sampling performed as part of a Site Inspection (SI) Report. The report confirmed the presence of charactieristic hazardous waste on the Arrow Truck property based upon the toxicity of lead. Based upon the results of the testing, MDNR has recommended that contaminated soils be removed from the site. EPA is currently conducting a Removal Assessment (RA) based upon the information presented in the SI report. EPA will use the RA as a basis for further action at the site. EPA has not yet expressed a schedule for the RA.

Department of the Army regulation (ER 1165-2-132, June 92) requires that the non-Federal Sponsor provide project lands free from hazardous and toxic waste contamination prior to the initiation of a Federal Project. The costs of remediation are not considered as a project cost nor in determining economic feasibility of the project. This report contemplates that, whatever EPA determines, Kansas City, working in conjunction with MDNR and EPA, will assure that any properties associated with the Federal Project are free of hazardous and toxic waste prior to initiation of the project. The City of Kansas City, Missouri has provided a letter expressing their support for project construction and willingness to sign a Project Cost Sharing Agreement (PCA).

The project cost estimates include landfill disposal costs for an estimated amount of non-hazardous regulated wastes. During the initial phase of Preconstruction Engineering and Design (PED) a detailed and thorough soil sampling and testing effort will be conducted to better determine the extent of regulated waste contamination.

A more detailed description of the site contamination is located in Appendix A, the Engineering Appendix.

## Site Description and Economic Setting

Location. The Dodson Industrial District lies on the left descending side of the Blue River between the Bannister Road Federal Complex at the upper end and Bruce R. Watkins Drive (new U.S. Highway 71) at the lower end. Boone Creek is a tributary of the Blue River that separates the Federal Complex from the Dodson area. The creek follows a remnant of a meander in the Blue River channel in existence before a cutoff was made and the Federal Complex flood protection works were developed. A large portion of the meander and surrounding low areas were further changed by the filling of the 87th and Prospect Landfill on the west side of the study area.

The study area has been divided into three segments called "reaches" for the purposes of analysis and description in this study. Reach 1 is the upstream end of the area and extends from the Bannister Federal Complex northeast to Prospect Road. Reach 2 extends from Prospect Road northeast to Hickman Mills Drive, and contains the majority of land. Reach 3 extends from Hickman Mills Drive to Bruce R. Watkins Drive.

Infrastructure. The City of Kansas City, Missouri, operated the 87th and Prospect Landfill on the west side of the study area from 1958 to its closing in 1971. This 80-acre site accepted organic, inorganic, and mixed municipal wastes from construction, textile, fertilizer, paper/printing, general chemical, plating, lab/hospital, photo finishing, electrical conductor, and public utility sources. The unlined landfill was excavated to groundwater, then had 40 feet of compacted wastes placed in the excavation followed by a 3-foot clay layer. No leachate or gas collection systems were installed. Access remained unrestricted following closure, creating the potential for undocumented disposal of unknown wastes. Tests of landfill leachate from this site found contamination below serious contaminant levels.

A private firm operates a second landfill, known as the Southeast Sanitary Landfill, on the left bank of the Blue River immediately below the Bruce R. Watkins Drive bridge. This landfill is State permitted and has been in operation since 1972. The landfill is scheduled for closure by early 1999. The original 80 acres was expanded to 139 acres in 1980 by an exchange of land with the Jackson County Department of Parks and Recreation and construction of a new channel for a portion of the Blue River. An earthen berm at the riverside base of the landfill retains the landfilled refuse as filling progresses downstream in a northerly direction.

Several physical improvements have recently been made or are planned which will provide better quality transportation systems and improved access. The Missouri Highway and Transportation Department (MHTD), the City of Kansas City, and Jackson County are constructing new bridges and roads in the area. Bruce R. Watkins Drive (new U.S. Highway 71), constructed by MHTD was opened to traffic from Bannister Road to 75th Street in 1991 and will eventually provide quick access to downtown Kansas City and other points in the metropolitan area. The entire drive is expected to be completed by 2000.

Both the old southbound and northbound U.S. Highway 71 bridges were in poor structural condition and the northbound bridge has been removed. The southbound bridge has been replaced with a higher and longer structure. Access to the new bridge on the west side of the river has been provided by improvements to Hickman Mills Drive (old U.S. Highway 71).

Eighty-fifth Street has been improved through the protected area and provides direct access to the Bruce R. Watkins Drive and the future 87th Street bridge, which will be located just downstream of the Bruce R. Watkins Drive bridge. Kansas City has

improved the portion of 85th Street west of Hickman Mills Drive, and MHTD has provided the extension to the Bruce R. Watkins Drive interchange.

Jackson County plans to start construction in spring of 1996 for replacement of the Prospect-Grandview Road bridge at the south end of the area. The existing bridge is in poor structural condition and will be replaced with a higher and wider structure that will provide better access to and from the south. All of these bridges clear the 1-percent flood stage per FEMA requirements.

The Burlington-Northern Railroad which previously owned a route through the area has removed its track and bridge across the Blue River just downstream of the old northbound U.S. Highway 71 bridge. The Union Pacific Railroad provides rail service to the area. All of the local highway projects are scheduled for completion by 1996 or sooner, prior to the expected construction phase of any flood protection measures, and new sewer lines have recently been installed by Kansas City to serve much of the area.

Thus, most of the physical improvements needed to make the area more efficient and for the retention of existing businesses are completed or in progress. All of the infrastructure improvements are independent of the flood reduction project and are not included in project costs.

Economic Development. The Dodson Industrial District is located in the south-central portion of Kansas City, Missouri, approximately 9 miles from the downtown business district. The major part of the area was originally established as an industrial park, with other development following to the west and north within the floodplain. The area is now made up of 30 commercial and light industrial firms and one public works facility (a sewage pump station) employing an estimated 1,250 people. Total investment is estimated to be in excess of $219 million. It provides stability to low-income areas by employing many southern and central Kansas City residents.

A much larger number of people commute through the area daily or conduct business with companies located there. The businesses in the district represent a mixture of small to large companies, a few in the "Fortune 500" category. The area is surrounded by several major commercial and industrial centers such as the Bannister Road complex immediately to the south, the Bannister Mall area to the southeast, and the Prospect Avenue merchant area to the north. The land on the east side of the Blue River across from the study area is undeveloped wooded parkland and is part of the Jackson County Blue River Parkway. A very small amount of parkway is located in the study area, along the west side of the Blue River.

## Historic Flooding

The Dodson Industrial District is subject to frequent inundation by the Blue River. Serious floods occurred in November 1928, April 1944, July 1951, September 1961, and May 1990. Less severe floods occurred in July 1958, September 1977, and June 1984. Reliable estimates of flood damage in the Dodson area during these events are unavailable. The 1961 event was the flood of record, with a peak discharge of 41,000 cubic feet per second (cfs). The flood event of May 1990 caused nearly $1.6 million in damages (1995 prices) within the Dodson Industrial District.

## Historical Stream-Gage Data

A river-gage station was installed at Bannister Road approximately one-half mile upstream of the project site by the U. S. Geological Survey (USGS) in 1939. The drainage area of the basin upstream of this gage is 188 square miles. The flood crest of record since 1939 was a stage of 44.46 feet (798.19 ft., NGVD) on September 13, 1961, that had an estimated maximum discharge of 41,000 cfs. The maximum stage known prior to the gage record was equivalent to about 39 feet on November 17, 1928. The zero gage elevation is at 753.73 feet NGVD.

# HYDROLOGY AND HYDRAULICS

Note on terminology: Because the terminology "100 year", "500 year" etc when referring to flood or storm frequency can be misleading (i.e. a "100 year" storm or a "100 year" flood could occur two years in a row in a very wet period), the Corps of Engineers is transitioning to the notation "percent chance of exceedence", or "percent", when referring to flood or storm frequency. As an example, the 1 percent flood is a flood that has one chance in 100 divided by 1, or one chance in 100, of being exceeded in any given year. The 0.2 percent flood has one chance in 100 divided by 0.2, or one chance in 500 of being exceeded in any given year. The 1 percent flood corresponds to the previously used "100 year" designation. The 0.2, 5, 10, 20, and 50 percent events would correspond to the previously used 500, 20, 10, 5, and 2 year designations, respectively.

To determine the discharge-frequency relationship for the Blue River, we made a statistical analysis of annual peak discharges for the period of record (1939-1988) using data collected at the Bannister Road gage. We eventually modified this analysis to include only the period of record from 1956 through 1988 to more accurately reflect the effects of basin urbanization. The discharge-frequency relationship derived from this analysis provided a basis for calibrating basin run-off models used to project future conditions.

We used a modified version of the Environmental Protection Agency's Storm Water Management Model (SWMM) to determine discharge of selected storms. Rainfall data of 6-hour durations for the 10, 1, and 0.2 percent chance exceedence events were applied to the model.

The resulting discharge-frequency relationships for future conditions (year 2015) were used to establish water surface profiles for levee design at the project site. Future conditions, or "urbanized" hydrologic conditions, represent an estimate of the Blue River Basin flood discharges which would result from land development and zoning projected to be in existence in the year 2015. The year 2015 is the year estimated for full urbanization effects to be realized in Johnson County, Kansas in the upper Blue River Basin. Discharge-frequency curves, water surface profiles and other miscellaneous illustrations are included in the Hydrology and Hydraulics Section of the Engineering Appendix (Appendix A), along with a detailed discussion of the analysis.

Discharge-Frequency Relationships. Figure 4 shows a discharge-frequency curve plotted from the computer-generated data. The peak discharge shown in Table 1 indicates the conditions on Blue River at Bannister Road for the period of record for 1995 and for 2015 conditions.

Table 1. BLUE RIVER PEAK DISCHARGE AT BANNISTER ROAD

| (cubic feet per second) | | | |
|---|---|---|---|
| Event (percent chance) | Period of Record (1956-1988) | SWMM 1995 | SWMM 2015 |
| 50.00 | 9,550 | | |
| 20.00 | 15,600 | | |
| 10.00 | 20,800 | 27,380 | 29,360 |
| 5.00 | 26,800 | | |
| 2.00 | 36,500 | | |
| 1.00 | 56,600 | 53,230 | 55,170 |
| 0.50 | 75,000 | | |
| 0.20 | | 73,770 | 75,100 |

Hydraulic Modeling. We computed water surface elevations and profiles through the study area using the HEC-2 backwater hydraulic model. The reach of the Blue River modeled extended from river mile 17.990 to 21.715. Because the study area only extends from about mile 19.883 to 20.860, we can readily determine the upstream or downstream effects of structural alternatives.

Stream cross-sectional data used in tne model was plotted from photogrammetric mapping taken in 1986. Cross-sections were located to adequately characterize the hydraulic properties of the stream. The model reflects planned future conditions in the study area, such as replacement of the U.S. Highway 71 bridges with a single, higher and longer-spanned structure, replacement of the Prospect-Grandview Road bridge with a higher, longer-spanned structure, and the addition of the new 87th street bridge. The new Bruce R. Watkins Drive Bridge, opened to traffic in 1991, was also included.

Figure 4. DISCHARGE-FREQUENCY CURVES

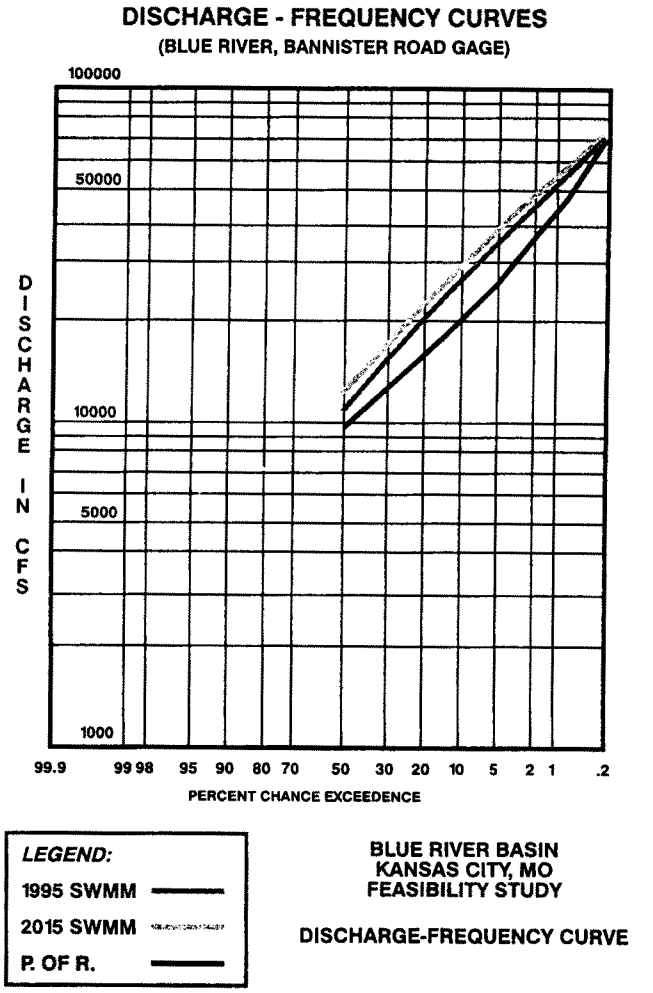
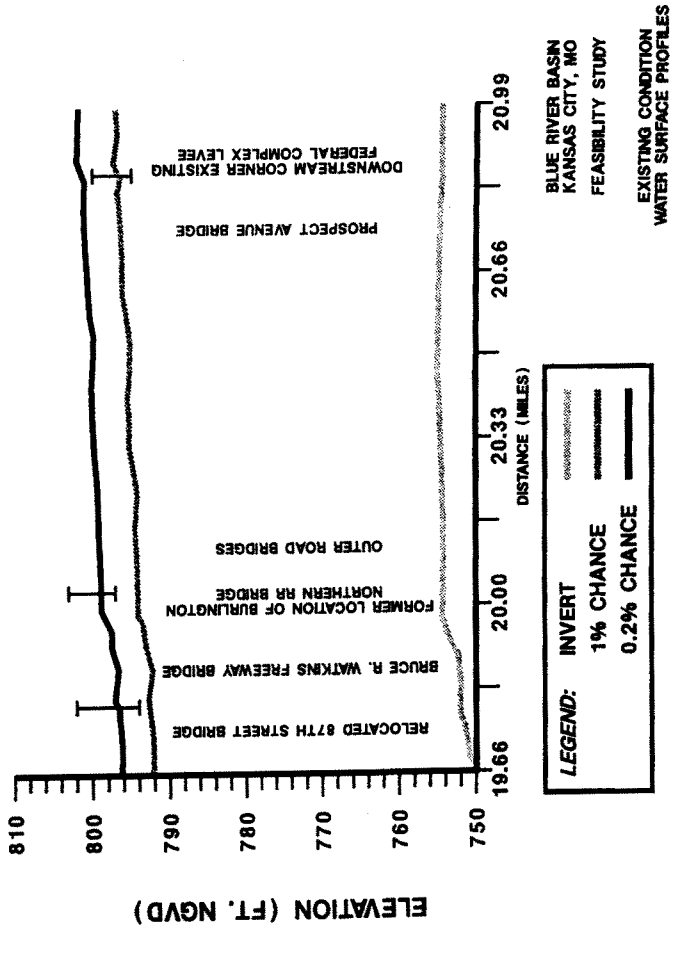


Figure 5. EXISTING CONDITION WATER SURFACE PROFILES



All bridge and related highway improvements in the immediate future are included as the "existing" condition.

We used a major flood event of May 15, 1990, on the Blue River to calibrate the model. By adjusting roughness coefficients of the stream cross-section and determining and adjusting the effective conveyance of the channel in the model we achieved computed flood water surface profiles to match observed high water marks. Further verification was made by comparison with discharge measurements taken at the Bannister gage.

A series of water surface profiles were computed for the Blue River at the Dodson Industrial District for the 1995 and 2015 existing (without any levee) conditions using the calibrated hydraulic model. Then, a series of profiles were developed for various possible levee heights protecting the Dodson area using the 4, 1, and 0.2 percent chance discharges. With levee profiles were also developed for the theoretical 2015 discharges. Figure 5 depicts the 1 and 0.2 percent profiles for 1995 discharges without levee. Several different levee and floodwall combinations, and also alignment variations, were run in the model to determine hydraulic effects. These "with project" profiles were checked for impacts upstream and downstream of the Dodson area.

The Hydrology and Hydraulics Section of the Engineering Appendix provides the discharges that produced these profiles and their approximate frequencies for the various levee alignment scenarios. The selected plan for protection of the Dodson area was determined after further detailed analysis, including economic and environmental considerations discussed later in this report. The profile for the selected plan is located in the SELECTED PLAN section of this report at Figure 9.

Interior Drainage. Levee projects require the consideration of drainage streams or basins which the levee alignment would intersect. The levee proposed along the left bank of the Blue River connects with the Bannister Federal Complex levee at the upstream end and terminates at the embankment for the Bruce R. Watkins Drive-Manchester Avenue interchange at the downstream end. Four primary drainage subbasins exist along this reach on the left side of the river that require gravity drainage structures and associated ponding areas. See Figure 6. The subbasin near Bruce R. Watkins Drive, subbasin C1, would have a storage pond formed by the removal of borrow for the levee. Each drainage structure has flow controls in the form of flapgates on the downstream, or river side of the culvert, backed up by manually operated sluicegates for positive shutoff. Drawing Plate 7 ("fold out" drawing plates are located in the back of Appendix A, Engineering Appendix) shows the subbasins, and Plates 20 and 21 show typical drainage feature details. A detailed report of the interior drainage is in the Hydrology and Hydraulics Section of Appendix A.

The HEC Interior Flood Hydrology (IFH) Package model, utilizing the Clark Unit Hydrograph Method, was used for the subbasin hydrology model. We developed hypothetical rainfall events or storms for each subbasin using the HEC-IFH program and

data from the NOAA Technical Memorandum NWS HYDRO-35 and U.S. Weather Bureau Technical Paper No. 40 (TP-40). We selected short duration rainfall events (1 to 3 hours) as the most appropriate due to the short time of concentration of the subbasins. Blue River floods experienced at the Bannister Road gage have lasted 3 days or less.

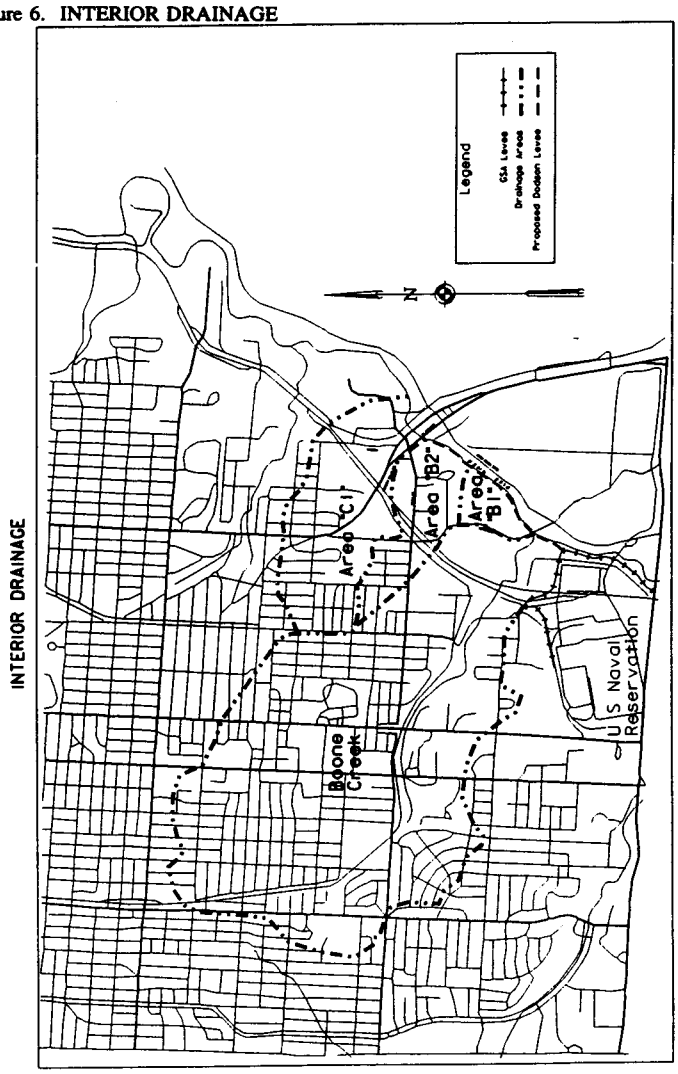
The four subbasins drain a total of 2,151 acres. The largest, Boone Creek Subbasin, has 1,664 acres mostly beyond the protected area. The proposed levee crosses Boone Creek near its confluence with the Blue River. Boone Creek drainage would be controlled by one 96-inch reinforced concrete pipe (RCP) culvert with a flap gate on the downstream end. For the 0.2 percent chance (500 year) storm over the Boone Creek Subbasin, we estimate that ponding would reach a maximum of 785.8 feet NGVD. The elevation at which flood damage would occur is 790 feet NVGD.

Subbasins B1 and B2 lie entirely within the industrial district area to be protected by the levee. Drainage would be controlled by one 48-inch culvert draining each area. For the 0.2 percent chance storm over subbasins B1 and B2, ponding would reach maximum elevations of 780.15 and 782.67 feet respectively. The elevations at which flood damages would occur are estimated to be 787.00 feet NVGD for both subbasins.

Subbasin C1 drains 310 acres, mostly beyond the protected area. Drainage is controlled through an existing 6-foot by 5-foot culvert under the new Manchester-85th Street roadway. This structure would be modified to include the same flow controls as previously described and as detailed on Plate 21. The vacant area immediately above the culvert is proposed as a source of borrow for the earth levee but would also serve as a ponding area. For the 0.2 percent chance storm over Subbasin C1, we estimate that ponding would occur to a maximum elevation of 786.18 feet. Damages would occur at an elevation of 788 feet NVGD.

If gravity flow from each of the drainage subbasins was blocked by high a stage on the Blue River, and simultaneously large rainfall occured over the drainage subbasins, the ponding areas would each have sufficient capacity to store runoff from up to the 1 percent (100 year) storm without causing damage to structures.

Figure 6. INTERIOR DRAINAGE



## ECONOMIC EVALUATION OF FLOOD DAMAGE

Potential damages and expected project benefits developed for this study follow the procedures outlined in Economic and Environmental Principles and Guidelines for Water and Related Resources Implementation Studies (P&G) in Engineering Regulation (ER) 1105-2-100, dated 28 December 1990.

We conducted field surveys of developed properties within the study area limits between 1990 and 1995. Property values were estimated based on interviews with corporate leaders, local realtors, and knowledgeable citizens. The surveys separated properties into commercial and public categories with road damages included in the public category. Commercial properties, the largest category of investments (30 firms and 2 vacant lots), were valued at about $214.8 million (October 1995 prices), including contents. Public structures have an estimated value of $4.5 million and consist of one property (excluding transportation facilities). We found no residential units within the study area limits.

As a first step in computing potential flood damages, we adjusted zero damage elevations of individual structures to an index point elevation in each of the three reaches. Potential flood damages to structures were computed using specific depth-damage information provided by companies in the area and standard flood damage computer programs previously developed by the Kansas City District.

We estimated potential damage to transportation facilities, which include city streets, highways, and rail lines, by obtaining mileage within each flood zone from maps, computing damages per mile and annualizing the resulting primary damages. Damages per mile were based on a standard depth damage curve for various types of roads and our current estimates of road investment per mile.

Emergency costs were based on estimates provided by the sponsor and private companies for flood fighting and recovery costs (excluding repairs) for various flood events. We developed and annualized a cost curve for emergency costs for a range of flood frequency events. However, average annual damages for this sub-category are a minor part of total damages.

We computed expected annual damages using our depth-damage computer programs which employ standard Corps of Engineers' methodology of integrating the stage-frequency data developed in hydrology and hydraulics with economic stage-damage data. We developed frequency and rating curves and used cross-sectional data to adjust property elevations to the index points.

## Existing Flood Damage Conditions

Table 2 presents expected annual damages under existing without project conditions by flood probability events for the commercial and public categories.

Table 2. 1995 EXPECTED ANNUAL DAMAGES, EXISTING CONDITIONS

| Percent-Chance Event | Commercial | Public | Total |
|---|---|---|---|
| 10 | $ 8,600 | $ 7,800 | $ 16,400 |
| 4 | $ 141,800 | $18,800 | $ 160,600 |
| 2 | $ 468,600 | $27,200 | $ 495,800 |
| 1 | $ 773,200 | $34,200 | $ 807,400 |
| 0.5 | $1,146,600 | $39,700 | $1,186,300 |
| 0.2 | $1,510,400 | $45,100 | $1,555,500 |
| 0.05 | $1,728,900 | $48,700 | $1,777,600 |

Table 3 displays the numerical data from which the Blue River flood relationship curves for existing conditions in Figure 7 were plotted. The curves in FIgure 7 show the following relationships of current hydrologic/hydraulic and economic data at Dodson:

> STAGE-DAMAGE
> STAGE-DISCHARGE
> DISCHARGE-PROBABILITY
> DAMAGE-PROBABILITY

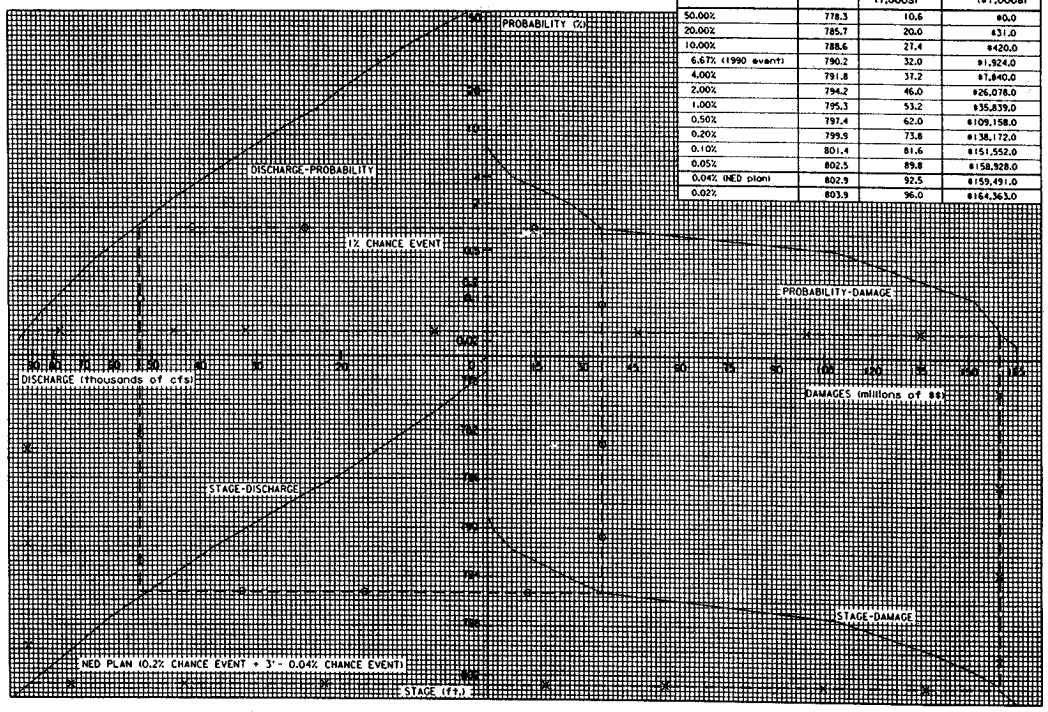
Table 3. FLOOD AND ECONOMIC DATA, EXISTING CONDITIONS

| Probability (Percent-Chance) | Discharge (c.f.s.) | Stage (ft. NGVD**) | Primary Damages |
|---|---|---|---|
| 50 | 10,600 | 778.3 | $0 |
| 20 | 20,000 | 785.7 | $30,500 |
| 10 | 27,400 | 788.6 | $419,700 |
| 4 | 37,200 | 791.8 | $7,840,400 |
| 2 | 46,000 | 794.2 | $26,078,200 |
| 1 | 53,200 | 795.3 | $35,838,700 |
| 0.5 | 62,000 | 797.4 | $109,158,100 |
| 0.2 | 73,800 | 799.9 | $138,171,600 |
| 0.05 | 89,800 | 802.5 | $158,928,300 |

* Rounded to nearest hundred cfs. ** Elevations at Blue River mile 20.4.

Figure 7. FLOOD RELATIONSHIP CURVES

FIGURE 7: STAGE-PROBABILITY-DISCHARGE-DAMAGE RELATIONSHIPS




| PROBABILITY | ELEVATION | DISCHARGE (1,000s) | DAMAGES ($1,000s) |
|---|---|---|---|
| 50.00% | 778.3 | 10.6 | $0.0 |
| 20.00% | 785.7 | 20.0 | $31.0 |
| 10.00% | 788.6 | 27.4 | $420.0 |
| 6.67% (1990 event) | 790.2 | 32.0 | $1,924.0 |
| 4.00% | 791.8 | 37.2 | $7,840.0 |
| 2.00% | 794.2 | 46.0 | $26,078.0 |
| 1.00% | 795.3 | 53.2 | $35,839.0 |
| 0.50% | 797.4 | 62.0 | $109,158.0 |
| 0.20% | 799.9 | 73.8 | $138,172.0 |
| 0.10% | 801.4 | 81.6 | $151,552.0 |
| 0.05% | 802.5 | 89.8 | $158,928.0 |
| 0.04% (NED plan) | 802.9 | 92.5 | $159,491.0 |
| 0.02% | 803.9 | 96.0 | $164,363.0 |

## Future Flood Damage Conditions Without Federal (Corps) Action

Without flood protection, the Dodson Industrial District will continue to be damaged by periodic flooding, and will be faced with economic decline despite the infrastructure improvements. The problem will worsen with time if no corrective action is taken because frequently flooded buildings deteriorate and have shortened economic lives. These factors will depress the market for resale of businesses. Although Kansas City participates in the Flood Insurance Program, the flood risk will continue in the absence of a project, and property owners will continue to pay premiums for flood insurance. Future development will require special measures, such as construction on fill material or raising first floor levels to an elevation several feet higher than the first-floor elevations of existing structures. FEMA requirements would also prohibit new basements below the base flood elevation. Little new development has occurred in the area for several years because potential businesses find it more advantageous to settle in locations where flood risks are slight, flood insurance is not required, and the above mentioned special considerations are not required for new construction.

Table 4. 1995 EXPECTED ANNUAL DAMAGES, FUTURE CONDITIONS
(Year 2015)

| Percent-Chance | | Commercial (dollars) | Public (dollars) | Total (dollars) |
|---|---|---|---|---|
| Existing | 2015 | | | |
| 10 | 12.5 | 9,300 | 8,900 | 18,200 |
| 4 | 5.0 | 168,800 | 22,100 | 190,900 |
| 2 | 2.6 | 553,800 | 32,500 | 586,300 |
| 1 | 1.4 | 913,800 | 39,700 | 953,500 |
| 0.5 | 0.6 | 1,466,700 | 49,500 | 1,516,200 |
| 0.2 | 0.24 | 1,910,700 | 56,100 | 1,966,800 |
| 0.05 | 0.07 | 2,028,600 | 57,900 | 2,086,500 |

Table 4 displays the annual damages resulting from the integration of stage-probability-discharge data associated with the projected 2015 water surface profiles. Table 5 displays the primary damages versus stage, discharge and frequency for the 2015 profiles. The increases in expected annual damages in Tables 4 and 5 are due solely to the expected increase in frequency in year 2015 for a given flood elevation. Property and contents are valued in current dollars with no inflation nor deflation in accordance with ER 1105-2-100.

Table 5. HYDROLOGIC AND ECONOMIC DATA, FUTURE CONDITIONS (Year 2015)

| Probability (Percent-Chance) | Discharge (c.f.s.*) | Stage (ft. NGVD) | Primary Damages |
|---|---|---|---|
| 50 | 12,000 | 780.1 | $0 |
| 20 | 22,000 | 786.5 | $5,000 |
| 10 | 29,400 | 789.3 | $38,900 |
| 4 | 40,000 | 792.6 | $304,000 |
| 2 | 48,000 | 794.7 | $755,300 |
| 1 | 55,200 | 795.7 | $1,167,000 |
| 0.5 | 64,000 | 797.8 | $1,628,800 |
| 0.2 | 75,100 | 800.2 | $2,014,400 |

* Rounded to nearest hundred cfs.

## PLANNING NEEDS AND OPPORTUNITIES

Most of the Dodson Industrial District is subject to damaging floods from the Blue River. In addition to immediate economic losses, flooding is hazardous to human lives, disrupts community activities, and will cause a long-term decline of property values. The area exhibits a definite need to reduce its flood damage potential and the flood hazard to human life and livelihood in the area. To meet that need, we can identify the planning opportunity for development of an effective flood damage reduction plan for the area. Implementation of an effective flood protection plan would 1) protect existing development, thereby reducing future losses to existing development; 2) make some limited amounts of land available for future development coincident to protecting existing development; and 3) enhance the area's future economic stability.

## PLANNING CRITERIA AND CONSTRAINTS

Flood damage reduction plans must meet criteria for technical effectiveness, economic feasibility, and environmental acceptability in accordance with ER 1105-2-100. No unique or unusual constraints were applied to the planning activity.

Note that the damage and cost totals in the following sections (which detail the NED plan selection process) are in October 1992 prices, as distinguished from the October 1995 prices used elsewhere in the report. We originally used the 1992 price level in comparing

plans for NED selection. Although the dollar amounts shown in the following sections have increased somewhat in the past 3 years, updating the price level would not affect plan selection in any way. None of the fundamental assumptions underlying the original estimates have changed. The factors causing the intervening cost increases affect all of the viable structural alternatives to an equivalent degree. Therefore, the original preliminary costs and benefits for these alternatives have not been revisited in order to stay within the study budget.

### Planning Objectives

The Federal objective of this study is to reduce flood damages in the Blue River basin at the Dodson Industrial District in a way that will contribute to the national economic development (NED) and protect the Nation's environment. Additional objectives are to reduce the flood risks to public health and safety and to develop opportunities for natural, recreational and cultural resource utilization in conjunction with flood damage prevention measures.

## MEASURES AVAILABLE TO ADDRESS PROBLEMS

### Upstream Dams

We discarded upstream dams as a measure because the Blue River basin upstream of Dodson is heavily developed with commercial and residential areas and does not possess any open locations suitable for a flood control impoundment. The only reasonable possibilities for flood control reservoirs were the locations cited for the Blue River Basin Projects previously described in the Introduction under Existing Water Projects. The lakes were deferred and eventually deauthorized by the Water Resources Development Act of 1986. The estimated cost of the lakes varied from $22 - $64 million and totaled $171 million for all four. The upper reaches of the basin where the lakes were to have been located have experienced extensive development since that time.

### Nonstructural Measures

Nonstructural measures are actions that can reduce flood damages by modifying or relocating the damageable property, rather than by modifying flood flows. Some construction is usually required for each property to be protected. Management of the flood plain can prevent damage by preventing the development of damageable features in known flood hazard areas. Nonstructural measures for preventing flood damage are shown in Table 6. Screening in terms of their applicability for reducing flood damages at Dodson is shown in Table 7.

Table 6. NONSTRUCTURAL MEASURES

1. Flood Insurance compensates property owners for some flood losses and draws attention to the existence of the flood hazard.

2. Flood Warning Systems with Temporary Evacuation Plans allow removal of persons and damageable property from the path of an oncoming flood until the flood threat has passed.

3. Flood Proofing is an adjustment to damageable property to reduce or eliminate the potential for future damage. This can be done by:

a. Waterproofing buildings up to the maximum flood height;

b. Permanently placing contents within buildings at elevations above the level of potential flooding;

c. Providing closures for openings that are below flood level;

d. Constructing small flood walls or ring levees around individual structures;

e. Raising buildings above flood heights and placing new foundations under them.

4. Permanent Evacuation is the relocation of damageable development to areas that are not within a flood hazard zone and conversion of the flood zone land use to a purpose, such as park development or agriculture, which is compatible with natural flood plain conditions.

5. Development Policies, Educational Programs and Tax Incentives can be adopted to encourage wise use of flood plain land.

6. Flood Plain Regulation through local zoning and building codes prevents development of structures that would encroach on flood flows or be damaged by future flooding. Building code restrictions may include:

a. Requirement for new structures to be placed above flood level by building on fill or columns and prohibiting basements;

b. Requirements for features such as furnaces, air conditioners, water heaters, and utility connections to be installed above flood levels;

c. Requiring use of waterproof materials and flood resistant structural design for elements constructed in flood prone areas.

7. Place Fill for New Development to comply with 6.a. Basements would continue to be prohibited.

Table 7. SCREENING OF NONSTRUCTURAL MEASURES

| MEASURE | ACTION | RATIONALE |
|---|---|---|
| Flood Insurance. | Implemented. | Flood insurance does not cover all losses, or prevent damage from occurring. |
| Flood Warning Systems with Temporary Evacuation Plans. | Implemented as part of a city-wide flood warning system for Blue River. | Some emergency evacuation is accomplished when flooding threatens, but this action is primarily a safety measure and does not prevent damage to property that cannot be temporarily evacuated. |
| Flood Proofing. | Eliminated. | Flood proofing existing structures by raising them to place the first floor elevation above the level of threatened flooding or by building flood walls or ring levees around individual structures or groups of structures are measures which would reduce flood damages and benefit those individual properties treated. Flood proofing was not evaluated in detail because of the vast number of existing structures in this densely developed area that would require substantial structural renovation to add additional floors and/or construct walls/levees. A few isolated structures could possibly be renovated but overall this measure would not constitute a comprehensive plan to satisfy the identified needs and planning objectives. |
| Permanent Evacuation. | Eliminated. | Essentially all of the Dodson area is within the 100-year floodplain and evacuation of the businesses is not feasible. |
| Development Policies, Educational Programs and Tax Incentives. | Eliminated. | Existing restrictions prevent new development in the flood hazard zones. There is no undeveloped space in the Dodson area that is not in a flood hazard zone. |
| Flood Plain Regulation. | Implemented. | Existing restrictions associated with participation in the federal flood insurance program effectively constrain future development in the absence of a structural project which would result in permanent changes to the flood hazard zones. These controls do not prevent damage to existing developments. |
| Place Fill for New Development. | Eliminated. | Very little contiguous undeveloped space exists in the area, thus integrating scattered raised parcels with existing development is not practical. Also, no benefit provided to existing development. |

## Structural Measures

Several structural measures listed in Table 8 are available that could help reduce the amount of flood damage in the Dodson Industrial District and also help relieve the economic stagnation caused by the threat of severe flooding. These measures were analyzed and used as elements of the various alternative plans formulated during the study. Table 9 displays factors considered in screening the measures and combining them into alternative plans. Table 10 lists the resultant array of structural plans.

Table 8. STRUCTURAL MEASURES

| |
|---|
| 1. Modifications of the channel to increase the efficiency of Blue River in passing high flows and reduce flood elevations. |
| 2. Construction of a channel cutoff to divert flood flows away from the Dodson Industrial District. |
| 3. Construction of a levee to protect the Dodson Industrial District from flood flows. |
| 4. Utilization of floodwalls in congested areas to protect developed property from flood flows and reduce real estate requirements and avoid relocations. |

Channel modification includes lowering and/or widening the Blue River channel. The effectiveness of channel modification is limited by downstream conditions. The area on the left bank for about 1 mile immediately below the study area is an active sanitary landfill scheduled for closure by early 1999. The landfill occupies the original floodplain to great depths adjacent to the river bank resulting in a narrow valley. The right bank side is steep, densely wooded parkland. The 1-percent and 0.2-percent flood event stages at the upstream end of the landfill (near the Watkins Drive bridge) exceed elevation 792 ft. and 796 ft. NGVD (1995), respectively. Ignoring any additional hydraulic losses, these elevations are the minimum flood stage elevations that can be achieved through the study reach by channel modifications within the study reach. From Table 3, severe damages occur in the Dodson Industrial District at these flood stages (approximately $35.8 million and $138.2 million respectively), therefore only partial damage reduction is achieved by channel modification through the study reach.

The cost estimate for the Blue River Channel Modification project (under construction) immediately below 63rd Street is approximately $1,100 per linear foot, or about $5.8 million per mile for a 3.33 percent (30 year) level of protection. This cost is solely for excavation and disposal and does not include any bridge replacements, major structures, utility relocations, real estate, engineering, construction management or any other costs.

Applying this unit cost to the length of the study reach of about 5,700 feet, amounts to about $6,270,000. Replacement of the new U.S. Highway 71 bridges and the Prospect-Grandview bridge would add another $4.5 to $5 million for a subtotal of about $11 million. At $11 million the measure is infeasible while utility relocations, grade control structures, real estate, engineering, and construction management would add greatly to the cost.

Flood stages in the study reach can only be reduced by extending channel modification far enough downstream to sufficiently lower downstream flood stages. Taken to the extreme, if channel modification were extended approximately 5.5 miles downstream to 63rd Street (which is at the upstream boundary of the existing Blue River Channel Modification project), the starting water surface elevations there for the 1- and 0.2-percent floods are approximately elevations 778 ft. and 785 ft., NGVD, respectively. Damages begin in Dodson at the 778 ft. stage. Additional hydraulic losses would increase the flood stage by several feet at Dodson resulting in significant damages.

At minimum, channel modification downstream of Dodson would require the removal of vast quantities of the sanitary landfill material or excavation of the wooded hillside or a combination thereof; removal and replacement of several downstream bridges including Gregory Boulevard (approximately 2 miles downstream), Hickman Mills Drive and Prospect; a major grade control structure between Dodson and the Federal Complex, several utility relocations, engineering and construction management, and real estate requirements.

Lowering the channel for this section of Blue River is not feasible since the gradient of the river is very flat (about 4 feet per mile in the vicinity of the study area). Several feet of channel lowering would be necessary to achieve any flood reduction. Therefore, lowering would need to be extended several miles downstream to be effective. The extent of the lowering would also require channel widening to stabilize the side slopes. A grade control structure would be required at the upstream end of the study reach to prevent upstream headcutting. Several bridges and utilities crossing the river in the study reach and downstream would require modifications or relocations. One or both sides of the channel would require extensive clearing of riparian timber and other habitat through the parklands far downstream.

Applying the unit cost for channel excavation cited above, the excavation and disposal cost of extending the channel modification 5.5 miles to 63rd Street would easily exceed $32 million. The cost would far exceed flood reduction benefits rendering the plan infeasible.

Considering the magnitude and nature of the quantities and costs, the required bridge and utility relocations/modifications, and the required real estate, the cost for channel modification greatly exceeds that of any of the levee alternatives and produces far less flood damage reduction.

Ring levees/floodwalls can be placed around individual or groups of structures depending on the clear space provided. The Dodson area is generally densely developed having clusters of structures with large truck dock staging areas, parking lots, and storage yards close to public highways and utilities. Because the remaining clear space is not sufficient for levees, floodwalls are the only available option. Floodwalls placed around the three businesses having the greatest flood damages, an aggregate 77 percent of the total damages, would require more than 7,000 feet of floodwall. Ringing another 13 locations would require more than 700 feet of rolling closure gates or stop-log structures. Either measure would cost multiples of the cost for earth levees and require a much longer line of protection than a levee for the entire study reach. The floodwalls alone would cost over $20 million and would not be feasible.

Table 9. SCREENING OF STRUCTURAL MEASURES

| MEASURE | ACTION | APPLICATION | RATIONALE |
|---|---|---|---|
| 1. Channel Modification. | Eliminated. | Not used. | Enlarging the existing Blue River channel in the study area will not reduce flood stages and avoid flood damages in the study area due to downstream conditions. |
| 2. Channel Cutoff. | Retained as a partial measure. | Retained on Boone Creek in Reach 1, Alternative 2. | This measure is necessary on Boone Creek to make room for levee construction along the Creek. |
| 3. Levee. | Retained. | Used in all alternatives except Reach 3; Alternatives 1 & 3. | This measure will protect the Dodson Industrial District from flood flows and can be implemented independently of other measures. |
| 4. Floodwall. | Retained. | Used in Reach 2; Alternatives 2 & 3; Reach 3; Alternatives 1, 2, 3 & 4. | Floodwalls are used to protect developed properties with minimal real estate requirements. |

Table 10. ARRAY OF STRUCTURAL PLANS

| PLAN | MEASURES INCLUDED | DESCRIPTION |
|---|---|---|
| 1. Reach 1 Alt. 1. | 3 | Levee |
| 2. Reach 1 Alt. 2. | 2 & 3 | Levee & Channel Cutoff |
| 3. Reach 2 Alt. 1. | 3 | Levee |
| 4. Reach 2 Alt. 2. | 3 & 4 | Levee & Floodwall |
| 5. Reach 2 Alt. 3. | 3 & 4 | Levee & Floodwall |
| 6. Reach 3 Alt. 1. | 4 | Floodwall |
| 7. Reach 3 Alt. 2. | 3 & 4 | Levee & Floodwall |
| 8. Reach 3 Alt. 3. | 4 | Floodwall |
| 9. Reach 3 Alt. 4. | 3 & 4 | Levee & Floodwall |

## Structural Plan Descriptions

All of the alternative structural plans and associated details described in this section are illustrated on the indicated figures and plates in Appendix A, the Engineering Appendix.

Terminal points for levees along this reach of the Blue River are provided at the upper end by the Federal Complex levee, which is at a 0.2-percent level of protection, or by the high terrain at the west side of the floodplain. The Bruce R. Watkins Drive embankment is the only terminus available at the downstream end. This reach of the Blue River is approximately 1 mile long.

A narrow corridor passes between development and the FEMA floodway boundary. That corridor is the most apparent alignment for a levee or floodwall. Some structures actually encroach on the floodway or are extremely close to the boundary, particularly near the Prospect Avenue/Grandview Road and Hickman Mills Drive bridges. At some of these locations, the choices of structural measure and/or alignment are severely limited.

In the following discussion the study area is subdivided into three sections or reaches to investigate alternatives for that particular reach. ***These reach alternatives are not independent. Each reach must have a measure to complete the plan of protection for the study area; the void in the line of protection that would result if any reach lacked adequate protection would cause flooding of the entire area.***

**REACH 1:** See Appendix A, Plate 8.

Reach 1: Alternative 1. This reach is at the upstream end of the study area above Grandview/Prospect Road. This plan includes a levee across Boone Creek from a connection with the Bannister Road Federal Complex levee immediately upstream to Prospect Avenue/Grandview Road. A new bridge is to be constructed at this location across Blue River as previously described in Existing Conditions, Economic Setting. The proposed levee would join with the bridge approach embankment which will be constructed above the 1-percent flood stage. This alignment offers the shortest route to high ground and avoids traversing the closed landfill to the west.

The levee across Boone Creek would be 700 feet long and from about 4 to 51 feet high for the 1-percent level of protection up to about 56 feet high for the 0.2-percent level of protection. At the base the levee would be from about 34 to 450 feet wide. A drainage structure consisting of a 96-inch diameter culvert pipe and a gatewell structure would control the flow of Boone Creek into the Blue River and prevent backflow of floods from the Blue River into Boone Creek and the protected area. A flapgate on the downstream end of the culvert would automatically prevent backflow, and a sluice gate included in the gatewell would provide positive closure. The sluice gate is operated with a mechanism at the top of the gatewell structure which is readily accessible from the top of the levee (Appendix a, Plate 20). Flow will pass through the culvert into the Blue River whenever the water level in Boone Creek is higher than the water level in the Blue River.

This alternative would result in the relocation of one business.

Reach 1: Alternative 2. This plan was formulated in the Reconnaissance Report and involves an earth levee that starts at the Prospect Avenue/Grandview Road bridge approach embankment and roughly borders the north bank of Boone Creek in a westerly direction to a junction with high ground west of the Union Pacific Railroad tracks. The levee would be 2,000 feet long, and from about 12 to 32 feet high for the 1-percent level of protection up to about 37 feet high for the 0.2-percent level. Then base width would vary from about 80 to 170 feet.

A major part of the levee alignment crosses a closed sanitary landfill. The only other alignment possible, without crossing Boone Creek, is to border the east and north sides of the closed landfill and eventually join high ground west of the railroad tracks. This alignment is thousands of feet longer, and probably would not avoid encroachment onto

the landfill since development now exists very close to the landfill boundary. See Appendix A, Plate 2.

Samples of leachate draining from the landfill have been tested which did not contain serious contaminant levels. However, wastes from a variety of sources, including industrial and medical, are in this landfill. Any excavation, dewatering, or other operations for construction would face high risks that special construction methods, handling, and/or material disposal would be required.

A clay blanket from the creek to the levee would be necessary to prevent seepage of flood water beneath the levee and through the porous landfill media. To establish a baseline cost for the embankment, we assumed the foundation conditions for the levee to be acceptable. No additional construction measures or associated cost have been investigated although some would possibly be needed to stabilize the foundation.

This plan requires a minor amount of channel relocation for Boone Creek. Closure structures are required at the Union Pacific Railroad tracks to prevent floodwater from entering the protected area through the gaps at the tracks. This plan would provide protection to the Dodson Industrial District but allow Blue River floods to enter Boone Creek inundating a greater area than would occur with Alternative 1.

This alternative would result in the relocation of one business.

**REACH 2:** See Appendix A, Plate 9.

Reach 2: Alternative 1. This alternative includes an earthen levee for the entire length of the reach between Prospect Avenue/Grandview Road and Hickman Mills Drive (formerly southbound U.S. Highway 71). The levee would join with the bridge approach embankments at each end. Total levee length is 3,900 feet. The levee varies from about 5 to 25 feet high for the 1-percent level of protection up to about 30 feet high for the 0.2-percent level; and in base width from about 40 to 250 feet. The riverside levee toe would be set at or behind the current FEMA floodway boundary avoiding encroachment of the floodway. The levee alignment would be held back from the floodway boundary in a portion of the upper half of the reach to shorten the levee and to allow a riverward borrow area.

As for all alternatives for this reach, two drainage structures are included, each having a 48-inch diameter culvert and a gatewell to control interior drainage into the Blue River and prevent backflow (Appendix A, Plate 20). The plan requires more real estate than the other alternatives for this reach leaving a smaller protected area. Two businesses would need to be relocated to implement this plan.

Reach 2: Alternative 2. This plan includes a combination earthen levee with concrete floodwalls at both ends. Both floodwalls would join bridge approach embankments.

Typical floodwall details are shown on Appendix A, Plate 19. The floodwalls would minimize space required in congested areas and avoid relocating businesses. The alignment of the levee would minimize real estate requirements in the reach, leaving the maximum space in the protected area. A slight encroachment of the floodway at the lower end of the reach would avoid a business relocation. Foreshore excavation in the encroached area would mitigate some of the encroachment. We would provide a clay blanket in the mitigated area to prevent seepage of floodwater below the levee and up into the protected area. We expect the excavated materials to be mostly rubble and construction debris unsuitable for use in the levee. Unusable material would be disposed offsite.

Drainage structures of the same design as Alternative 1, and at the same locations, are included to control drainage out of the protected area.

The 3,000-foot earthen levee would vary from about 5 to 25 feet high for the 1-percent level of protection up to 30 feet high for the 0.2-percent level. The base width would vary from about 40 to 250 feet. The plan also includes 1,200 feet of floodwall, ranging from about 7 to 15 feet high for the 1-percent level of protection up to about 20 feet for the 0.2-percent level of protection.

Reach 2: Alternative 3. This alternative includes a combination of earthen levee with floodwalls at either end similar to Alternative 2. This alternative would provide more space between the levee and the Blue River in the upper part of the reach to allow a borrow/disposal area and a slightly shorter levee.

Foreshore excavation would mitigate floodway encroachment at the lower end as described for Alternative 2. We would dispose of a volume of excavated materials in the borrow area similar to the volume of the borrow removed. Any remaining excavated material would be disposed off-site. We would provide a clay blanket to prevent seepage beneath the levee into the protected area.

Drainage structures of the same design and locations as described in the other alternatives are included to control drainage from the protected area.

This plan includes 2,900 feet of earthen levee and 1,200 feet of floodwalls having heights and base widths as described for Alternative 2.

Reach 2: Road Closure Structures. Two road crossings are in Reach 2, Prospect Avenue/Grandview Road at the upstream end and Hickman Mills Drive (formerly southbound U.S. 71 Highway) at the downstream end. Both bridges and approaches will be built above the 1-percent level of protection. The junction of the levee/floodwall with the future road embankments would likewise be above the 1-percent level eliminating the need for a closure structure for either road. All alternatives for this reach would require identical rolling gate closure structures for protection levels above the 1-percent level.

Alternative costs for the 0.2-percent level reflect the costs of these structures. Plates 15 and 16 in Appendix A, the Engineering Appendix, show typical details of the closure structures.

Reach 2: Borrow Area. Approximately 4 acres of land riverward of the levee in Reach 2 would be available for a levee material borrow area. The exact size of the borrow area would be determined by the use of the resulting excavated area as designed in the final selected plan.

**REACH 3:** See Appendix A, Plate 10.

Reach 3: Alternative 1. This alternative includes a floodwall for the entire reach from the downstream side of Hickman Mills Drive (formerly southbound U.S. 71 Highway) bridge to the upstream side of the future 87th Street bridge. The floodwall would parallel the alignment of the future 85th Street extension to Manchester Street and Bruce R. Watkins Drive interchange. We would place additional embankment adjacent to the future 85th Street road embankment to provide an adequate platform to place the floodwall and provide safe shoulder clearance. According to the Missouri Highway and Transportation Department, much of the embankment for the Watkins Drive and Manchester Street at this location is rock and other materials from a nearby quarry. Because this embankment may be too porous at high flood levels, the exposed face of the widened embankment would include a clay blanket to prevent seepage.

We would also place a clay blanket on the exposed face of the road embankment from the downstream side of the future 87th Street bridge around the terminus of Manchester Street and along the access ramp onto the Watkins Drive to an elevation matching the design flood level. At the 0.2-percent level of protection, this segment would require an earthen berm varying from 1 to 2 feet high at the outside edge of the road embankment. Also, the 0.2-percent event water surface at the 87th Street bridge abutment is approximately 1 foot above the planned roadway grade and might require a sandbag closure as an emergency measure. The 1-percent flood level is below the roadway grade, and no closure structure would be required.

An existing culvert drains a large area west of the river as previously described for Sub-basin C1 in the Interior Drainage section of this report. This alternative includes provisions to modify this structure by extending the riverside end, inclusion of an endwall with flap gate, and addition of a gatewell structure with a sluicegate for positive closure. Appendix A, Plate 21 shows typical details.

This alternative includes 1,100 feet of floodwall up to about 10 feet high for the 1-percent level of protection, or up to about 15 feet high for the 0.2 percent level.

Reach 3: Alternative 2. This alternative includes a floodwall from the downstream side of the Hickman Mills Drive adjacent to the future 85th Street extension to Manchester Street

exactly as described for Alternative 1. Approximately 600 feet north of Hickman Mills Drive, the floodwall in this alternative would end. We would place a rolling gate closure structure where the floodwall would cross 85th Street and connect with an earthen levee on the west side. See Appendix A, Plate 17 for gate details. This levee would tie into the exit ramp embankment of Bruce R. Watkins Drive. A 72-inch culvert and gatewell structure at the intersection of the levee and the existing ditch near the exit ramp would control interior drainage from the west (Sub-basin C1). We would place clay blankets on the exposed surfaces of Bruce R. Watkins Drive embankments at the end of the floodwall where the levee and ramp join.

The plan would provide adequate protection to the industrial area but would not protect the Bruce R. Watkins Drive interchange. This area becomes flooded during approximately a .28- to .25-percent chance event.

The plan requires 700 feet of floodwall up to about 10 feet high for the 1-percent level of protection or about 15 feet high for the 0.2-percent level. The plan also includes 500 feet of earthen levee, varying from about 6 to 15 feet high for the 1-percent level of protection or up to about 20 feet high for the 0.2-percent level. The base width would vary from about 50 to 150 feet. One closure structure is required.

Reach 3: Alternative 3. This alternative is similar to Alternative 2 except that the floodwall would extend farther north along the proposed 85th Street extension to Manchester Street to a point beyond the exit ramp of Bruce R. Watkins Drive. We would place a rolling gate closure structure where the floodwall crosses Manchester Street before it terminates in the existing Drive embankment. See Appendix A, Plate 18 for gate details. We would place clay blankets on exposed surfaces of the Drive embankment at the juncture of the gate closure structure, floodwall, and exit ramp.

A drainage structure of the same design and at the same location described for Alternative 2 would control drainage from Sub-basin C1.

This plan would provide more flood protection than Alternative 2 because the Drive exit ramp would remain open up to the design level of protection.

This alternative includes 900 feet of floodwall up to about 10 feet high for the 1-percent level of protection or about 15 feet high for the 0.2-percent level. One closure structure is required.

Reach 3: Alternative 4. This alternative consists of an earthen levee with floodwall on top starting at the downstream side of the Hickman Mills Drive bridge. Approximately 100 feet north of Hickman Mills Drive, on the east side of 85th Street the levee would join a rolling gate closure structure which would cross 85th Street. A short floodwall west of 85th Street would connect the closure structure to a second rolling gate closure structure at the Indiana Avenue service road (old north bound Highway 71). See

Appendix A, Plate 17 for details. The earthen levee would resume at the north end of the closure structure and continues on a northerly alignment roughly parallel to 85th Street to end at the Watkins Drive exit ramp embankment.

We would place some clay blanketing on exposed embankment surfaces at the future Hickman Mills Drive bridge and the parkway exit ramp. The plan includes a drainage structure exactly as described in Alternative 2 at the drainage ditch near the exit ramp.

This alternative would provide adequate protection to the industrial area but offer the least protection of all alternatives for this reach for the interchange.

The plan includes 850 feet of earthen levee, from about 6 to 15 feet high for the 1-percent level of protection or about 20 feet high for the 0.2-percent level. The base width would vary from about 90 to 160 feet. The plan also includes 150 feet of floodwall up to about 10 feet high for the 1-percent level of protection or about 15 feet high for the 0.2-percent level. Two closure structures are required.

Reach 3: Borrow Area/Ponding Area. Approximately 10 acres of vacant land north of 85th Street would provide part of the earth borrow needed for the various plans. This area receives and stores drainage from Sub-basin C1 as previously described in Interior Drainage.

## EVALUATION AND SCREENING OF STRUCTURAL PLANS

The NED plan was selected from a matrix which included 48 combinations, or 24 for each of two levels of protection: the 1 percent flood and the 0.2 percent flood. Each of the 24 combinations was comprised of one of two alternatives in Reach 1 (the area immediately upstream of the Prospect Avenue bridge); one of three alternatives in Reach 2 (the area between Prospect Avenue and Hickman Mills Drive); and one of four alternatives in Reach 3 (the area immediately downstream of Hickman Mills Drive). Preliminary construction costs were formulated for all 48 combinations in October 1992 prices and annualized at the then-current Federal interest rate of 8 1/4%.

In the economic screening process, we included the benefits accrued by eliminating physical inundation. Minor categories of benefits such as emergency costs, traffic interruption costs, location benefits, and flood insurance benefits were not included in the screening for the NED plan selection because they were considered essentially constant in all alternatives. The only significant variable in evaluating benefits of the various alternatives was the number of relocations involved. Benefits were evaluated up to the 1 and 0.2 percent flood elevations.

The matrix of costs and benefits for the 48 combinations indicated that net benefits generally were highest for plans built to the 0.2 percent flood elevation. Of the 24

combinations with this level of protection, 16 were economically feasible and 12 of these 16 had net benefits in excess of $100,000. Only 8 of the 24 combinations with protection to the 1 percent flood elevation were feasible, and all had net benefits below $100,000. Net benefits were highest for those 0.2 percent protection combinations using Alternative 1 in Reach 1 and Alternative 1 in Reach 2. The combination with the highest net benefits was Plan 114 (Alternative 1 in Reach 1, Alternative 1 in Reach 2, and Alternative 4 in Reach 3). This combination had estimated net benefits of $483,000.

A cost curve also was developed enabling comparison of annual costs and benefits at different levels of protection. The curve was based on preliminary construction costs for the 4 , 1, and 0.2 percent levels of protection. The cost curve confirmed that net benefits were maximized at about the 0.2 percent elevation.

Based on the results of these analyses, Plan 114, with protection up to the 0.2 percent flood, was judged to be the NED plan and was carried forward for more extensive evaluation of costs and benefits. The benefits and costs associated with this plan changed subsequently due to updated field survey data, changes in price levels and interest rates, and more detailed construction cost estimates, but none of the changes would have affected the original ranking of combinations.

## Comparison of Plans

Table 11 compares features of the structural plans, Table 12 compares benefit-cost ratios, and Table 13 compares costs and benefits.

Table 11. COMPARISON OF PLAN FEATURES

REACH 1

| Feature | Alternate 1 | | | Alternate 2 | | |
|---|---|---|---|---|---|---|
| Level of Protection (Percent Chance) | 4 | 1 | .2 | 4 | 1 | .2 |
| Relocations | yes | yes | yes | yes | yes | yes |
| Levee (ft.) | 700 | 700 | 700 | 2000 | 2000 | 2000 |
| Drainage Structure | 1 | 1 | 1 | no | no | no |
| Railaroad Closure Structure | no | no | no | 2 | 2 | 2 |
| Creek Realignment (ft.) | no | no | no | yes | yes | yes |
| Undeveloped Land Protected (acres) | 0 | 0 | 0 | 0 | 0 | 0 |

REACH 2

| Feature | Alternate 1 | | | Alternate 2 | | | Alternate 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Level of Protection (Percent Chance) | 4 | 1 | .2 | 4 | 1 | .2 | 4 | 1 | .2 |
| Relocations | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Levee (ft.) | 3900 | 3900 | 3900 | 3000 | 3000 | 3000 | 2900 | 2900 | 2900 |
| Floodwall (ft.,) | 0 | 0 | 0 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| Drainage Structure | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Channel Modification | no | no | no | no | no | no | no | no | no |
| Undeveloped Land Protected (acres) | 35 | 35 | 35 | 40 | 40 | 40 | 38 | 38 | 38 |

**REACH 3**

| Feature | Alternate 1 | | | Alternate 2 | | | Alternate 3 | | | Alternate 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Level of Protection (Percent Chance)** | **4** | **1** | **.2** | **4** | **1** | **.2** | **4** | **1** | **.2** | **4** | **1** | **.2** |
| Relocations | no | no | no | no | no | no | no | no | no | no | no | no |
| Levee (ft.) | 0 | 0 | 0 | 00 | 500 | 500 | 0 | 0 | 0 | 0 | 850 | 850 |
| Floodwall (ft.,) | 0 | 1100 | 1100 | 0 | 700 | 700 | 0 | 900 | 900 | 0 | 150 | 150 |
| Drainage Structure | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Road Clusure Structure | no | no | no | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| Undeveloped Land Protected (acres) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 12. BENEFIT-COST RATIOS FOR REACH-ALIGNMENT COMBINATIONS

| Reach 1 | Reach 2 | Reach 3 | B/C Ratio | | |
|---|---|---|---|---|---|
| Alternate | Alternate | Alternate | 4 % | 1 % | 0.2 % |
| 1 | 1 | 4 | <1.0 | 1.09 | 1.42 |
| 1 | 1 | 2 | <1.0 | 1.09 | 1.40 |
| 1 | 1 | 3 | <1.0 | 1.07 | 1.34 |
| 1 | 1 | 1 | <1.0 | 1.06 | 1.29 |
| 2 | 1 | 4 | <1.0 | 0.99 | 1.23 |
| 2 | 1 | 2 | <1.0 | 0.99 | 1.22 |
| 2 | 1 | 3 | <1.0 | 0.97 | 1.17 |
| 1 | 3 | 4 | <1.0 | 1.05 | 1.16 |
| 1 | 3 | 2 | <1.0 | 1.05 | 1.15 |
| 2 | 1 | 1 | <1.0 | 0.97 | 1.14 |
| 1 | 3 | 3 | <1.0 | 1.04 | 1.11 |
| 1 | 3 | 1 | <1.0 | 1.03 | 1.08 |
| 1 | 2 | 4 | <1.0 | 0.91 | 1.04 |
| 2 | 3 | 4 | <1.0 | 0.97 | 1.04 |
| 1 | 2 | 2 | <1.0 | 0.91 | 1.03 |
| 2 | 3 | 2 | <1.0 | 0.96 | 1.03 |
| 1 | 2 | 3 | <1.0 | 0.90 | 1.00 |
| 2 | 3 | 3 | <1.0 | 0.95 | 1.00 |
| 1 | 2 | 1 | <1.0 | 0.89 | 0.97 |
| 2 | 3 | 1 | <1.0 | 0.95 | 0.97 |
| 2 | 2 | 4 | <1.0 | 0.85 | 0.94 |
| 2 | 2 | 2 | <1.0 | 0.85 | 0.93 |
| 2 | 2 | 3 | <1.0 | 0.84 | 0.90 |
| 2 | 2 | 1 | <1.0 | 0.83 | 0.88 |

Table 13. COMPARISON OF STRUCTURAL PLAN COSTS AND BENEFITS

1 Percent Chance (October 1992 Prices)

| Plan | Total Cost | Annual Cost | Annual Benefits | Net Benefits |
|---|---|---|---|---|
| 114 | $10,256,200 | 932,000 | $1,016,000 | $ 84,000 |
| 112 | 10,292,700 | 934,000 | 1,016,000 | 82,000 |
| 113 | 10,463,800 | 949,000 | 1,016,000 | 67,000 |
| 111 | 10,558,000 | 957,000 | 1,016,000 | 59,000 |
| 214 | 11,290,600 | 1,026,000 | 1,016,000 | (10,000) |
| 134 | 11,539,900 | 1,047,000 | 1,102,000 | 55,000 |
| 132 | 11,576,400 | 1,049,000 | 1,102,000 | 53,000 |
| 212 | 11,327,100 | 1,028,000 | 1,016,000 | (12,000) |
| 133 | 11,747,500 | 1,064,000 | 1,102,000 | 38,000 |
| 213 | 11,498,200 | 1,044,000 | 1,016,000 | (28,000) |
| 131 | 11,841,700 | 1,072,000 | 1,102,000 | 30,000 |
| 211 | 11,592,400 | 1,051,000 | 1,016,000 | (35,000) |
| 232 | 12,610,800 | 1,143,000 | 1,102,000 | (41,000) |
| 234 | 12,574,300 | 1,141,000 | 1,102,000 | (39,000) |
| 233 | 12,781,900 | 1,156,000 | 1,102,000 | (54,000) |
| 231 | 12,876,100 | 1,160,000 | 1,102,000 | (58,000) |
| 124 | 13,375,500 | 1,210,000 | 1,102,000 | (108,000) |
| 122 | 13,412,000 | 1,213,000 | 1,102,000 | (111,000) |
| 123 | 13,583,100 | 1,228,000 | 1,102,000 | (126,000) |
| 121 | 13,677,300 | 1,234,000 | 1,102,000 | (132,000) |
| 224 | 14,409,900 | 1,296,000 | 1,102,000 | (194,000) |
| 222 | 14,446,400 | 1,302,000 | 1,102,000 | (200,000) |
| 223 | 14,617,500 | 1,316,000 | 1,102,000 | (214,000) |
| 221 | 14,711,700 | 1,326,000 | 1,102,000 | (224,000) |

0.2 Percent Chance
(1992 Prices)

| Plan | Total Cost | Annual Cost | Annual Benefits | Net Benefits |
|---|---|---|---|---|
| 114 | $12,690,900 | $1,149,000 | $1,632,000 | $483,000 |
| 112 | 12,884,900 | 1,166,000 | 1,632,000 | 466,000 |
| 113 | 13,478,900 | 1,219,000 | 1,632,000 | 413,000 |
| 111 | 13,974,900 | 1,262,000 | 1,632,000 | 370,000 |
| 214 | 14,624,000 | 1,324,000 | 1,632,000 | 308,000 |
| 212 | 14,818,100 | 1,340,000 | 1,632,000 | 292,000 |
| 213 | 15,412,000 | 1,393,000 | 1,632,000 | 239,000 |
| 134 | 16,031,300 | 1,448,000 | 1,685,000 | 237,000 |
| 132 | 16,225,300 | 1,464,000 | 1,685,000 | 221,000 |
| 211 | 15,908,000 | 1,437,000 | 1,632,000 | 195,000 |
| 133 | 16,819,300 | 1,517,000 | 1,685,000 | 168,000 |
| 131 | 17,315,300 | 1,561,000 | 1,685,000 | 124,000 |
| 124 | 17,922,600 | 1,617,000 | 1,685,000 | 68,000 |
| 234 | 17,964,500 | 1,622,000 | 1,685,000 | 63,000 |
| 122 | 18,116,600 | 1,633,000 | 1,685,000 | 52,000 |
| 232 | 18,158,500 | 1,639,000 | 1,685,000 | 46,000 |
| 123 | 18,710,600 | 1,686,000 | 1,685,000 | (1,000) |
| 233 | 18,752,500 | 1,692,000 | 1,685,000 | (7,000) |
| 121 | 19,206,600 | 1,731,000 | 1,685,000 | (46,000) |
| 231 | 19,248,500 | 1,737,000 | 1,685,000 | (52,000) |
| 224 | 19,853,700 | 1,791,000 | 1,685,000 | (106,000) |
| 222 | 20,049,700 | 1,809,000 | 1,685,000 | (124,000) |
| 223 | 20,643,700 | 1,862,000 | 1,685,000 | (177,000) |
| 221 | 21,139,700 | 1,906,000 | 1,685,000 | (221,000) |

The differences in benefits of the various plans depend solely on the alternative used in Reach 2. Alternative 1 provides less benefits than either Alternative 2 or 3 because of the total displacement of two businesses.

All plans with a benefit-cost ratio (BCR) less than 1.0 are not economically justified. We eliminated these from further consideration.

## PLAN SELECTION

As evidenced by Tables 12 and 13, plans incorporating Alternative 1 for Reaches 1 and 2 have significantly higher net benefits and benefit-cost ratios. These plans are more likely to yield the NED plan unless significant detrimental environmental or other social effects are associated with them. Table 14 compares each alternative within each reach with the No Action condition. The comparisons cover impact assessment and planning objectives, net beneficial and adverse affects, and the rank each plan achieves in meeting planning criteria and plan contributions.

From Table 14, a comparison of the alternatives in Reach 1 indicates that Alternative 1 ranks higher on all accounts than Alternative 2. Other than the NED account, the major difference between the alternatives is that 2 is inferior to 1 in the Environmental Quality (EQ) account. Alternative 2 would require a large amount of clearing and realignment of Boone Creek which would result in greater impact on terrestrial and aquatic flora and fauna. Also of major importance are the potential problems that could be experienced with constructing the levee on top of the landfill. Although testing of leachate from the landfill did not indicate substances above allowed contaminate levels, those tests were limited in scope whereas construction would impact major areas of the landfill increasing the chances of an environmental threat or greatly increased project cost.

Alternative 1 in Reach 2 is superior to Alternatives 2 and 3 on all accounts, especially the NED. Alternative 1 does not require streambank excavation for floodway mitigation as do Alternatives 2 and 3, and it provides the most space for a future riverside parkway which offsets the requirement for slightly more clearing than Alternative 2. The area requiring streambank excavation is an old dumping site for construction rubble and debris. Some buried materials could require special handling and/or disposal if excavated, or could otherwise require special construction methods that could significantly increase costs. Alternative 1 does require the total displacement (as compared to a partial displacement for Alternatives 2 and 3) of two businesses, one at each end of the reach, where space severely limits construction between the FEMA floodway and existing development. All Reach 2 Alternatives involve the construction of cutoff trench under the levee to natural ground. This feature could result in the landfill disposal of a certain amount of regulated waste.

All alternatives in Reach 3 compare equally on all accounts except the NED account where Alternative 4 is the best. The main disadvantage to this alternative, and all others except Alternative 1, is that it does not protect the interchange of Bruce R. Watkins Drive. The interchange grade is approximately the 3-percent chance flood level, and therefore will require closing during floods above that level. The major reason for the higher cost of Alternative 1 is the cost difference between floodwalls and earthen levees. Because the FEMA floodway is located right at the 85th Street-Manchester roadway, space is not sufficient to construct a levee between the roadway and the river. All three alternatives in Reach 3 incorporate a 10-acre borrow site north of 85th Street for levee material. A portion of this excavation will likely encounter regulated waste which must be disposed of in a permitted landfill.

The selected plan is Plan 114 (Alternative 1 in Reach 1, Alternative 1 in Reach 2, and Alternative 4 in Reach 3). See Figure 8 and Appendix A, Plates 2 through 5.

Figure 9 illustrates the profiles of the water surface and levee top for the selected plan. The top of levee profile is designed to account for various risks and uncertainties associated with this project as presented in studies discussed in the Hydrology and Hydraulics Section of the Engineering Appendix. Uncertainties in the design flood profile include debris clogging the channel and/or greater channel roughness than anticipated. The levee top will be slightly lower near Bruce R. Watkins Drive to ensure initial overtopping at the lower end and to reduce damage from floods greater than the design event.

It should be noted that in September 1994, hazardous waste contamination (a limited area of lead battery residue) was confirmed to exist in the property on the levee alignment at the downstream end of Reach 2 on the Arrow Truck property. This determination was made subsequent to plan screening and selection. It has been determined that there is no practicable alternative alignment to avoid the contaminated property and still provide continuous flood protection. The Sponsor, the City of Kansas City, Missouri, understands that they must provide lands free from hazardous waste contamination prior to project construction.

Table 14. PLAN EVALUATION MATRIX

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| A. PLAN DESCRIPTION | Same as existing condition. | Levee crossing Boone Creek terminating at GSA Federal Complex Levee. | Levee bordering north side of Boone Creek across landfill and railroad tracks to terminus point. |
| B. IMPACT ASSESSMENT | | | |
| National Economic Development | | | |
| Annual Flood Damage Reduction | | | |
| 1 percent flood level | $0 | $35,800 (71%) | $35,800 (71%) |
| 0.2 percent flood level | $0 | $50,400 (100%) | $50,400 (100%) |
| Total Project Cost: | | | |
| 1 percent flood level | $0 | $2,659,300 | $3,693,600 |
| 0.2 percent flood level | $0 | $3,012,600 | $4,945,700 |
| Total Annual Project Cost: | | | |
| 1 percent flood level | $0 | $241,500 | $335,800 |
| 0.2 percent flood level | $0 | $273,000 | $447,700 |
| Environmental Quality | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| Terrestrial Flora and Fauna | None | Loss of terrestrial and aquatic flora and habitat. | Loss of most of the existing terrestrial habitat. |
| Aquatic Flora and Fauna, Wetland | No Impact | Loss of aquatic flora and habitat in Boone Creek. | Potential to replace some aquatic and semi-aquatic habitat with relocated creek channel. Potential problems with construction on closed landfill. |
| Esthetics: | | | |
| Stream Modifications | None | Embankment in Boone Creek | 400-foot realignment of Boone Creek |
| Greenspace Impact | None | Approximately 3 to 4 acres of clearing. | Approximately 11 to 13 acres of clearing. |
| Other Social Effects | | | |
| Leisure Opportunities (Hiking) | No change | Provides opportunity for continuous left bank parkway | No significant change |
| Reduction in Flood Depths | No change | Yes | Yes |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| Structures Protected (100-year Event) | | | |
| Commercial | 0 | 6 | 6 |
| Public | 0 | 1 | 1 |
| Relocations | | | |
| Structures | 0 | Total displacement of one business. | Total displacement of one business. |
| Utilities | 0 | Throughout Plan Limits | Throughout Plan Limits |
| Construction Impacts | | | |
| Roads Closed (Permanent) | 0 | None | None |
| Roads Closed (Temporarily) | 0 | None | Two railroad tracks for closure structures. |
| Regional Economic Development | None | Same as NED | Same as NED |
| C. PLAN EVALUATION | | | |
| 1. Contributions to Planning Objectives | | | |
| a. Reduce flood damages in the Blue River basin at Dodson Industrial District | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| Beneficial | None | Reduces flood depths throughout reach to 500-year level of protection | Reduces flood depths throughout reach to 500-year level of protection except Boone Creek. |
| Adverse | None | None | None |
| b. Reduce flood risks to public | | | |
| health and safety | | | |
| Beneficial | None | Flood depth reduced | Flood depth reduced |
| Adverse | None | None | None |
| c. Develop opportunities for natural, recreational and cultural resource utilization in conjunction with flood damage prevention measures | | | |
| Beneficial | None | Opportunity for continuous left bank parkway | None |
| Adverse | None | About 3-4 acres of clearing required | About 11-13 acres of clearing required |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| 2. Net (with vs. without) beneficial and adverse affects | | | |
| NED (Objective/Account) | N/A | | |
| Beneficial (1%-chance) | | $205,700 | $300,000 |
| (0.2%-chance) | | $222,600 | $397,300 |
| Adverse | | ------ | ------ |
| EQ (Objective/Account) | N/A | | |
| Beneficial | | None | None |
| Adverse | | See "B" above | See "B" above |
| OSE (Account) | | | |
| Beneficial | N/A | | |
| Leisure Opportunities | | Same as C.1.c. above | None |
| Construction Impact | | None | None |
| Health and Safety | | Reduced flood risk | Reduced flood risk |
| Relocations | | None | None |
| Adverse | N/A | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| Leisure Opportunities | | None | None |
| Construction Impact | | None | Temp. RR closure |
| Health and Safety | | None | None |
| Relocations | | See "B" above | See "B" above |
| RED (Account) | N/A | Same as NED | Same as NED |
| 3. Plan Response to Associated Evaluation Criteria.* | | | |
| ACCEPTABILITY (Acceptance by concerned publics) | N/A | high | low |
| COMPLETENESS (All necessary investments or other actions to insure full plan attainment are incorporated) | N/A | high | moderate |
| EFFECTIVENESS (Technical performance of the plan and contributions of the plan and contributions of plan to planning objectives and system of accounts) | N/A | high | moderate |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 1 | |
|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVE 1 | ALTERNATIVE 2 |
| EFFICIENCY (Ability to plan to achieve planning objectives and contributions to NED and EQ outputs in a least cost way) | N/A | high | Low |
| 4. Rankings of Plan Contributions with regard to: ** | N/A | | |
| NED (Objectives/Accounts) | | 1 | 2 |
| EQ (Objectives/Accounts) | | 1 | 2 |
| OSE (Accounts) | | 1 | 2 |
| RED (Accounts) | | 1 | 2 |
| TOTAL | | 4 | 8 |
| | | | |

* High, Moderate, Low
** No. 1 indicates greatest contribution

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| A. PLAN DESCRIPTION | Same as existing condition. | Earthen levee set entirely behind the FEMA floodway boundary, approaches minimum length alignment. Allows for borrow area in upper end. | Combination earthen levee with floodwall in developed areas. Foreshore excavation at lower end to mitigate slight encroachment of floodway. | Same as REACH 2-2 except that alignment allows for borrow area in upper end and is slighter shorter. |
| B. IMPACT ASSESSMENT | | | | |
| National Economic Development | | | | |
| Annual Flood Damage Reduction | | | | |
| 1-percent-chance protection | $0 | $795,900 (70%) | $881,900 (78%) | $881,900 (78%) |
| 0.2-percent-chance protection | $0 | $1,084,900 (95%) | $1,137,900 (100%) | $1,137,900 (100%) |
| Total Project Cost: | | | | |
| 1-percent-chance protection | $0 | $5,656,200 | $8,775,500 | $6,939,900 |
| 0.2-percent-chance protection | $0 | $6,989,000 | 12,220,700 | 10,329,400 |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Total Annual Project Cost: | | | | |
| 1-percent-chance protection | $0 | $509,200 | $787,900 | $623,900 |
| 0.2-percent-chance protection | $0 | $630,200 | $1,097,600 | $928,600 |
| Environmental Quality | | | | |
| Terrestrial Flora and Fauna | None | Loss of wooded wetland and other wooded sites. | Tree loss as in Alt. 1, plus all river bank trees in the clay blanket area. | Losses similar to Alt. 2. |
| Aquatic Flora and Fauna, Wetland | No Impact | Partial to complete loss of existing pond. Potential to replace some of the wetland and tree losses at drain pipes and borrow site. | Some loss of the existing pond, and wetland replacement potential as in Alt. 1. Potential problems with fill excavation. | Potential problems with fill excavation and reburial in borrow area. Wetland replacement potential same as Alts. 1 & 2. |
| Esthetics: | | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Stream Modifications | None | No change | 1500 feet of foreshore widening at lower end. | 1500 feet of foreshore widening at lower end. |
| Greenspace Impact | None | Approximately 17 to 20 acres of clearing | Approximately 15 to 18 acres of clearing | Approximately 23 to 25 acres of clearing |
| Other Social Effects | | | | |
| Leisure Opportunities (Hiking) | No change | About 22 acres added to parkway between levee and river. | About 13 acres added to parkway between levee and river. | About 15 acres add to parkway between levee and river. |
| Reduction in Flood Depths | No change | Yes | Yes | Yes |
| Structures Protected (1-percent-chance event) | | | | |
| Commercial | 0 | 30 | 33 | 33 |
| Public | 0 | 0 | 0 | 0 |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Relocations | | | | |
| Structures | 0 | Total displacement of two businesses and one satellite dish. | Partial displacement of two businesses and one satellite dish. | Partial displacement of two businesses and one satellite dish. |
| Utilities | 0 | Throughout Plan Limits | Throughout Plan Limits | Throughout Plan Limits |
| Construction Impacts | | | | |
| Roads Closed (Permanent) | 0 | None | None | None |
| Roads Closed (Temporarily) | 0 | Two above 100-year level for closure structures. | Two above 100-year level for closure structures. | Two above 100-year level for closure structures. |
| Regional Economic Development | None | Same as NED | Same as NED | Same as NED |
| C. PLAN EVALUATION | | | | |
| 1. Contributions to Planning Objectives | | | | |
| a. Reduce flood damages in the Blue River basin at Dodson Industrial | | | | |
| District | | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Beneficial | None | Reduces flood depths throughout reach to 500-year level of protection | Reduces flood depths throughout reach to 500-year level of protection | Reduces flood depths throughout reach to 500-year level of protection |
| | | | | |
| | | | | |
| Adverse | None | None | None | None |
| | | | | |
| b. Reduce flood risks to public health and safety | | | | |
| Beneficial | None | Flood depth reduced | Flood depth reduced | Flood depth reduced |
| Adverse | None | None | None | None |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| c. Develop opportunities for natural, recreational and cultural resource utilization in conjunction with flood damage prevention measures | | | | |
| Beneficial | None | About 22 acres added to parkway between levee and river | About 13 acres added to parkway between levee and river | About 15 acres added to parkway between levee and river |
| Adverse | None | About 17-20 acres of clearing required | About 15-18 acres of clearing required | About 23-25 acres of clearing required |
| 2. Net (with vs. without) beneficial and adverse affects | | | | |
| NED (Objective/Account) | N/A | | | |
| Beneficial (1-percent-chance) | | $286,700 | $94,000 | $258,000 |
| (0.2-percent-chance) | | $454,700 | $40,300 | $209,300 |
| Adverse | | ---- | ---- | ---- |
| EQ (Objective/Account) | N/A | | | |
| Beneficial | | None | None | None |
| Adverse | | See "B" above | See "B" above | See "B" above |
| OSE (Account) | | | | |
| Beneficial | N/A | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Leisure Opportunities | | Same as C.1.c. above | Same as C.1.c. above | Same as C.1.c. above |
| Construction Impact | | None | None | None |
| Health and Safety | | Reduced flood risk | Reduced flood risk | Reduced flood risk |
| Relocations | | None | None | None |
| Adverse | N/A | | | |
| Leisure Opportunities | | None | None | None |
| Construction Impact | | Temp. road closures above 1-percent-chance | Temp. road closures above 1-percent-chance | Temp. road closures above 1-percent-chance |
| Health and Safety | | None | None | None |
| Relocations | | See "B" above | See "B" above | See "B" above |
| RED (Account) | N/A | Same as NED | Same as NED | Same as NED |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 2 ALTERNATIVES | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| 3. Plan Response to Associated Evaluation Criteria.* | | | | |
| ACCEPTABILITY (Acceptance by concerned publics) | N/A | Moderate | Moderate | Moderate |
| COMPLETENESS (All necessary investments or other actions to insure full plan attainment are incorporated) | N/A | High | High | High |
| EFFECTIVENESS (Technical performance of the plan and contributions of plan to planning objectives and system of accounts) | N/A | High | Moderate | Moderate |
| EFFICIENCY (Ability to plan to achieve planning objectives and contributions to NED and EQ outputs in a least cost way) | N/A | High | Moderate | Moderate |
| 4. Rankings of Plan Contributions with regard to:** | N/A | | | |
| NED (Objectives/Accounts) | | 1 | 3 | 2 |
| EQ (Objectives/Accounts) | | 1 | 2 | 3 |
| OSE (Accounts) | | 1 | 2 | 3 |
| RED (Accounts) | | 1 | 3 | 2 |
| TOTAL | | 4 | 10 | 10 |

* High, Moderate, Low
** No. 1 indicates greatest contribution

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| A. PLAN DESCRIPTION | Same as existing condition. | Floodwall along alignment of future 85th St. (on riverside) through the Watkins Drive interchange. | Floodwall/ earth levee combination along alignment of future 85th St. (both sides) terminating at freeway off ramp. Closure structure across 85th St. | Floodwall along alignment of future 85th St. (on riverside) terminating downstream of off ramp. Closure structure across 85th St. | Earth levee & floodwall Hickman Mills to 85th St. Wall from 85th St to Indiana Ave service road. Levee from the sevice road to Wattkins ramp embankment. Closure structures across 85th St. and the service road. |
| B. IMPACT ASSESSMENT | | | | | |
| National Economic Development Annual Flood Damage Reduction | | | | | |
| 1-percent-chance protection | $0 | $184,300(37%) | $184,300(37%) | $184,300(37%) | $184,300(37%) |
| 0.2-percent-chance protection | $0 | $496,400(100%) | $496,400(100% | $496,400(100% | $496,400(100% |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| Total Project Cost: | | | | | |
| 1-percent-chance protection | $0 | $2,242,600 | $1,977,300 | $2,148,300 | $1,940,800 |
| 0.2-percent-chance protection | $0 | $3,973,300 | $2,883,300 | $3,477,300 | $2,689,300 |
| Total Annual Project Cost: | | | | | |
| 1-percent-chance protection | $0 | $204,200 | $181,500 | $196,800 | $179,200 |
| 0.2-percent-chance protection | $0 | $358,900 | $262,500 | $315,500 | $246,100 |
| | | | | | |
| Environmental Quality | | | | | |
| Terrestrial Flora and Fauna | None | Loss of riparian habitat. | Loss of riparian habitat. | Loss of riparian habitat. | Loss of riparian habitat. |
| | | | | | |
| Aquatic Flora and Fauna, Wetland | No Impact | | | | |
| Esthetics: | | | | | |
| Stream Modifications | None | None | None | None | None |
| | | | | | |
| Greenspace Impact | None | 2 to 3 acres of clearing. | 2 to 3 acres of clearing. | 2 acres of clearing. | 2 to 3 acres of clearing. |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| Other Social Effects | | | | | |
| Leisure Opportunities (Hiking) | No change | No change | No change | No change | No change |
| Reduction in Flood Depths | No change | Yes | Yes | Yes | Yes |
| Structures Protected (1-percent-chance event) | | | | | |
| Commercial | 0 | 4 | 4 | 4 | 4 |
| Public | 0 | 0 | 0 | 0 | 0 |
| Relocations | | | | | |
| Structures | 0 | None | None | None | None |
| Utilities | 0 | None | None | None | None |
| Construction Impacts | | | | | |
| Roads Closed (Permanent) | 0 | None | None | None | None |
| Roads Closed (Temporarily) | 0 | 0 | 1 | 1 | 2 |
| Regional Economic Development | None | Same as NED | Same as NED | Same as NED | Same as NED |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| C. PLAN EVALUATION | | | | | |
| 1. Contributions to Planning Objectives | | | | | |
| a. Reduce flood damages in the Blue River basin at Dodson Industrial District | | | | | |
| Beneficial | None | Reduces flood depths throughout reach to 500-year level of protection | Reduces flood depths throughout reach to 500-year level of protection except for freeway interchange | Reduces flood depths throughout reach to 500-year level of protection except for part of freeway interchange | Reduces flood depths throughout reach to 500-year level of protection except for freeway inter-change |
| Adverse | None | None | None | None | None |
| b. Reduce flood risks to public health and safety | | | | | |
| Beneficial | None | Flood depth reduced | Flood depth reduced | Flood depth reduced | Flood depth reduced |
| Adverse | None | None | None | None | None |
| | | | | | |
| | | | | | |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | WITHOUT CONDITION | REACH 3 ALTERNATIVES 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| c. Develop opportunities for natural, recreational and cultural resource utilization in conjunction with flood damage prevention measures | | | | | |
| Beneficial | None | None | None | None | None |
| Adverse | None | About 2-3 acres of clearing required | About 2-3 acres of clearing required | 2 acres of clearing required | About 2-3 acres of clearing required |
| 2. Net (with vs. without) beneficial and adverse affects | | | | | |
| NED (Objective/Account) | N/A | | | | |
| Beneficial (1-percent-chance) | | ($19,900)) | $2,800 | ($12,500) | $5,100 |
| (0.2-percent-chance) | | $137,500 | $233,900 | $180,900 | $250,300 |
| Adverse | | ---- | ---- | ---- | ---- |
| EQ (Objective/Account) | N/A | | | | |
| Beneficial | | None | None | None | None |
| Adverse | | See "B" above | See "B" above | See "B" above | See "B" above |
| OSE (Account) | | | | | |
| Beneficial | N/A | | | | |
| Leisure Opportunities | | None | None | None | None |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| Construction Impact | | None | None | None | None |
| Health and Safety | | Reduced flood risk | Reduced flood risk | Reduced flood risk | Reduced flood risk |
| Relocations | | None | None | None | None |
| Adverse | N/A | | | | |
| Leisure Opportunities | | None | None | None | None |
| Construction Impact | | None | Temp. road closure | Temp. road closure | Temp. road closures |
| Health and Safety | | None | None | None | None |
| Relocations | | | | | |
| RED (Account) | N/A | Same as NED | Same as NED | Same as NED | Same as NED |
| 3. Plan Response to Associated Evaluation Criteria.* | | | | | |
| ACCEPTABILITY (Acceptance by concerned publics) | N/A | High | Low | Moderate to Low | Moderate to Low |
| COMPLETENESS (All necessary investments or other actions to insure full plan attainment are incorporated) | N/A | High | Low | Low | Low |

Table 14. PLAN EVALUATION MATRIX CONT'D.

| | | REACH 3 | | | |
|---|---|---|---|---|---|
| | WITHOUT CONDITION | ALTERNATIVES | | | |
| | | 1 | 2 | 3 | 4 |
| EFFECTIVENESS (Technical performance of the plan and contributions of the plan to planning objectives and system of accounts) | N/A | High | Moderate | Moderate | Moderate |
| EFFICIENCY (Ability to plan to achieve planning objectives and contributions to NED and EQ outputs in a least cost way) | N/A | Moderate | Moderate | Moderate | Moderate |
| 4. Rankings of Plan Contributions with regard to: | | | | | |
| NED (Objectives/Accounts) | N/A | 4 | 2 | 3 | 1 |
| EQ (Objectives/Accounts) | | 1 | 3 | 2 | 4 |
| OSE (Accounts) | | 1 | 4 | 2 | 3 |
| RED (Accounts) | | 4 | 2 | 3 | 1 |
| TOTAL | | 10 | 11 | 10 | 9 |

* High, Moderate, Low
**No. 1 indicates greatest contribution

Figure 8. SELECTED PLAN

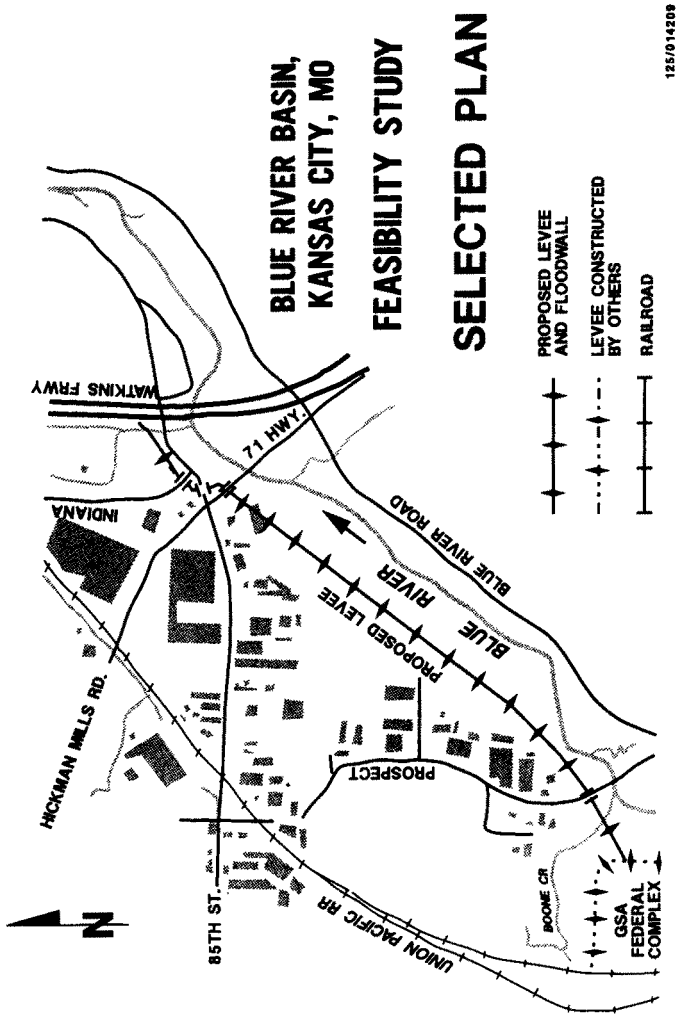
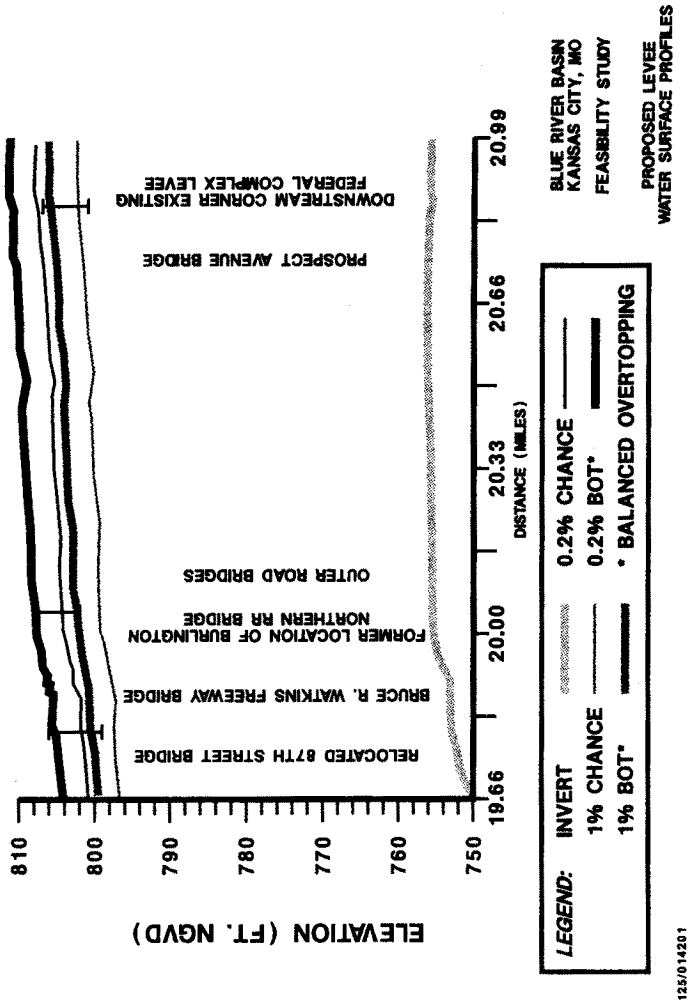


Figure 9. PROPOSED LEVEE WATER SURFACE PROFILES



## IDENTIFICATION OF NED PLAN

The plan that has the highest net benefit is defined as the National Economic Development (NED) plan and should be recommended for construction. Plan 114 at a 4-percent chance exceedence level has negative net benefits and is economically unjustified. Both the 1 and 0.2 percent levels have positive net benefits and BCR's greater than 1.0. Annualized benefit data for all three levels, plus additional data for the 0.67, 0.5, 0.33, and 0.13 levels are plotted relative to incremental levee heights, see Figure 10. The annualized costs for Plan 114 are also plotted on Figure 10. The vertical divergence between the fitted curves represents the estimate of net benefits for a given incremental levee height which corresponds to a specific flood protection level. The zero point on the horizontal axis represents the 4 percent level. Other protection levels are indexed to their respective levee incremental heights on the horizontal axis. The incremental heights are based on the vertical differential between the balanced overtopping flow profiles (design top of levee elevations) of the protection levels. Figure 10 indicates that the benefits would be maximized at the 0.2 percent level and not at an incremental level between the 1 and 0.2 percent levels or beyond the 0.2 percent level and therefore is the NED level of protection.

The benefit curve is extended to a data point for the 0.13 percent level. Cost data above the 0.2 percent level does not exist since no plans were developed for this range nor contemplated. However, since no protection is provided by the Federal Complex levee on the upstream side of the study area above the 0.2 percent level, a plan similar to (but higher in elevation and at greater cost than) that of Alternative 2 in Reach 1 would be required to tie into high ground west of the study area. Although the cost of the overall plan would be much greater, the incremental cost of Alternative 2 over Alternative 1 in Reach 1 ($175,000) for the 0.2 percent level demonstrates that net benefits are reduced for protection levels above the 0.2 percent level. The cost of Plan 214 is plotted for comparison.

Table 15 provides a comparison of costs and benefits for the selected levels of protection displayed by Figure 10.

Table 15. PLAN 114 COSTS AND BENEFITS COMPARISON.
(October 1992 prices)

| Exceedence Level (percent chance) | Total Cost | Annual Cost* | Annual Benefits | Benefit Cost Ratio | Net Benefits | Residual Damages |
|---|---|---|---|---|---|---|
| 4 | $9,457,000 | $860,000 | $381,000 | 0.44 | ($476,000) | $1,331,000 |
| 1 | $10,256,000 | $932,000 | 1,016,000 | 1.09 | $84,000 | $696,000 |
| 0.67 | $10,908,000 | $990,000 | $1,295,000 | 1.31 | $305,000 | $417,000 |
| 0.5 | $11,244,000 | 1,020,000 | $1,399,000 | 1.37 | $379,000 | $313,000 |
| 0.33 | $11,915,000 | $1,080,000 | $1,537,000 | 1.42 | $457,000 | $175,000 |
| 0.2 | $12,691,000 | $1,149,000 | $1,632,000 | 1.42 | $483,000 | $80,000 |

*Annual cost includes interest during construction (IDC)

## SIGNIFICANT EFFECTS

ENVIRONMENTAL QUALITY.

During construction, dust raised by earth moving activities and temporarily increased turbidity in the Blue River, and higher noise levels would adversely impact the environment. The project would include provisions for protection of the riparian corridor to the maximum extent possible, plantings of vegetation beneficial to wildlife, and construction of a wetland to mitigate the loss of an estimated 1.1 acres of timbered wetland in Reach 2. The Wetland Mitigation Plan is at Appendix J.

A Finding of No Significant Impact (FONSI) is included in this report.

OTHER SOCIAL EFFECTS.

The project would significantly reduce disruptions to the area and protect the lives and health of the public.

Figure 10. BENEFIT-COST/LEVEE HEIGHT CURVES

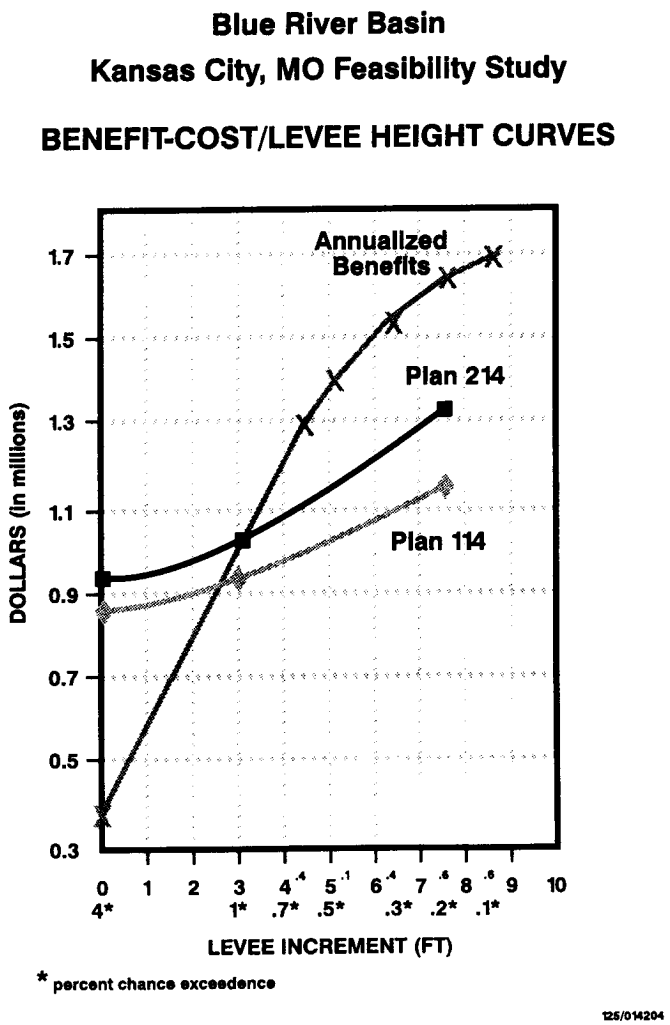
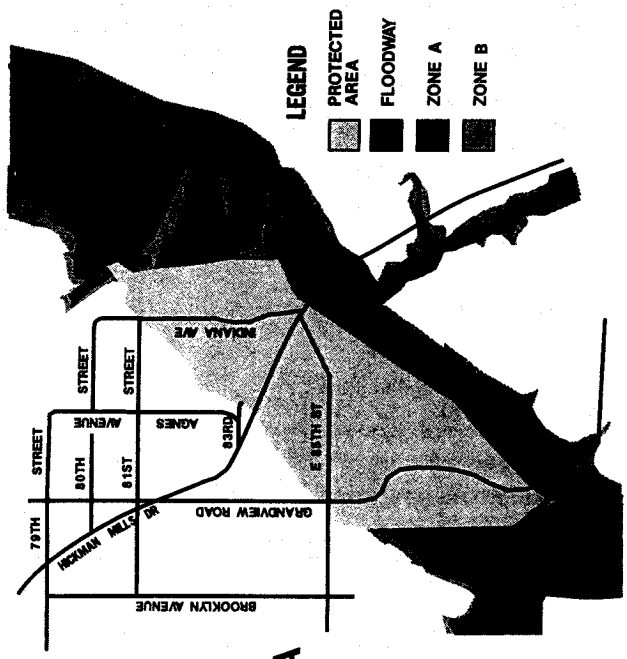


Figure 11. AREA PROTECTED BY THE PROPOSED PROJECT




BLUE RIVER BASIN, KANSAS CITY, MO

FEASIBILITY STUDY

PROTECTED AREA

## SELECTED PLAN

Based on findings of the feasibility study, Plan 114, we selected a levee at the 0.2-percent chance exceedence level of protection, because it is the NED plan; ranks higher in comparison to other alternatives in plan contributions to environmental quality and other accounts; and is favored by the non-Federal sponsor. See Figure 8 and Plates 2 through 5 in Appendix A. Figure 11 shows the floodplain and the area protected by the plan. Table 16 displays a cost estimate summary for Plan 114 based on a **detailed computer aided final cost estimate of the selected plan.** The Engineering Appendix includes a final estimate summary. Estimated project costs total $17,082,000 at October 1995 price levels.

Table 16. COST ESTIMATE SUMMARY

| | Cost Account | October 1995 Prices (dollars) |
|---|---|---|
| 01 | Lands and Damages | 3,751,000 |
| 02 | Relocations | 433,900 |
| 11 | Levees and Floodwalls | 8,780,900 |
| 15 | Floodway Control Structures | 1,888,800 |
| 30 | Planning, Engineering and Design | 1,600,000 |
| 31 | Construction Management | 627,200 |
| | TOTAL PROJECT COST (Rounded to nearest $100,000) | 17,100,000 |

At the 7 5/8-percent Federal interest rate with amortization over 50 years, the annualized cost is $1,548,000 as shown in Table 17. The benefits are summarized by category in Table 18. Annual benefits total $1,923,000 at October 1995 prices.

Table 17. ANNUAL COST CALCULATION

(October 1995 Prices at 7.63 percent interest)
(dollars)

| | |
|---|---|
| Project implementation cost | 17,081,800 |
| Interest during construction | 2,479,000 |
| Total Investment | 19,560,800 |
| **Annual costs** | |
| Principal & Interest | 1,530,300 |
| Operations & Maintenance | 17,500 |
| TOTAL ANNUAL COSTS | 1,547,800 |

Table 18. BENEFITS SUMMARY

| October 1995 prices | |
|---|---|
| Commercial | |
| Existing | $1,600,500 |
| Future | 216,500 |
| Public | |
| Existing | 46,700 |
| Future | 6,000 |
| Emergency costs | 48,200 |
| FIS administrative costs | 1,500 |
| Location benefits | 3,400 |
| TOTAL | $1,922,800 |

Table 19. BENEFIT COST ANALYSIS

| | |
|---|---|
| PRICE LEVEL | October 1995 |
| INTEREST RATE | 7.63 percent |
| TOTAL PROJECT COST | $17,100,000 |
| ANNUAL COSTS | $ 1,548,000 |
| ANNUAL BENEFITS | $ 1,923,000 |
| BENEFIT COST RATIO | 1.2 to 1 |
| NET BENEFITS | $ 375,000 |
| RESIDUAL DAMAGES | $ 144,000 |

If the project is approved for construction, the City of Kansas City, with Corps assistance, could apply for an adjustment to the Flood Insurance Rate Map (FIRM). After completion of the project, the FIRM could be reissued with overprinting indicating the areas protected by the project from floods up to the 0.2-percent level and proposed adjustments to the designated floodway. Flood insurance rates could then be adjusted to reflect the elimination of flood hazard in the protected area.

## DESCRIPTION OF SELECTED PLAN

The recommended plan for the flood reduction project for the Dodson Industrial District in Kansas City, Missouri, is a levee roughly parallel to the Blue River, connecting to the Federal Complex levee at the upstream end and to Bruce R. Watkins Drive at the downstream end. The plan would provide protection from flooding for up to the 0.2-percent chance exceedence flood event. The Engineering Appendix includes drawing plates of the selected plan. Project features include:

### Levees

Approximately 5,600 feet of levee, floodwalls and gates varying between 10 and 56 feet high, but generally averaging about 15-20 feet high, would prevent damages from floods up to the 0.2-percent level to the Dodson Industrial District. The top of levee elevation at the upstream connection to the Federal Complex levee is approximately 806 feet NGVD. The top of levee elevation decreases to approximately 800 feet NGVD at the downstream end.

## Drainage Systems

Figure 7 shows the interior drainage sub-basins.

a) Boone Creek Sub-basin. This basin is the largest of the interior drainage areas, having an area of 1,664 acres most of which is west of the protected area and is drained by Boone Creek into the Blue River at the upper end of the project adjacent to the Federal Complex levee. The drainage is controlled by a gated structure and a 96-inch culvert passing through the proposed levee.

b) Sub-basin B1. An area of 76 acres within the protected area which drains through the proposed levee in a 48-inch culvert controlled by a gated structure.

c) Sub-basin B2. An area of 102 acres within the protected area which drains through the proposed levee in a 48-inch culvert controlled by a gated structure.

d) Sub-basin C1. An area of 310 acres mostly lying west of the protected area. Drainage passes through the proposed levee in a 72-inch culvert connected to an existing 6-foot by 5-foot culvert which is gated. Immediately upstream of the culvert is an area proposed as a borrow area for levee construction that would also serve as ponding area for interior drainage.

## Utility Relocations

Utility relocations and modifications are non-Federal requirements. These are sewer lines and a short section of water line that either require new locations or modifications to accommodate the proposed flood reduction features.

## Lands Required

Provision of all lands, easements, and rights of way is the responsibility of the non-Federal sponsor. Construction of the project would require the acquisition of about 122.65 acres of land in fee or permanent easement. In addition, a temporary construction easement would be required for 4.83 acres. See Appendix H, Real Estate Appendix.

Permanent Acquisition: About 17.24 acres of land would be for the levee. The 30.91 acres lying between the levee and the river in Reach 2 would be left in its natural state and used as a public park. Permanent easements of about 74.50 acres would also be required for the ponding areas.

Temporary Easements: A total of 4.83 acres of temporary easement would be provided by the local sponsor which would be required for access during construction.

## OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION

We estimate Plan 114 requirements for operation, maintenance, repair, replacement, and rehabilitation (OMRR & R) at $17,500 on an average annual basis. Periodic rehabilitation, replacements and repairs will likely be required over the life of the project. Tasks include mowing and general cleanup on the levee; riprap replacement and debris removal in the channel; monitoring and maintenance of the wetland mitigation plantings and drainage,; and maintenance of the closure gates and gated drainage structures.

## STUDY COORDINATION AND PARTICIPANTS (PRIOR TO OCTOBER 1995)

This section relates only the coordination accomplished **prior to** the November 17, 1995 publishing of the October 1995 Draft of the Feasibility Report for public review. The review comments and coordination pertaining to the October 1995 public review draft are documented in several of the appendices, as explained below. We held a public meeting on December 13, 1995 in which the selected plan was presented to the public. The comment period closed on December 27, 1995. Appendix C contains the documentation of the public involvement process after October 1995. Appendix G contains agency comments and responses resulting from the publishing of the October 1995 Draft Report. Appendix F contains copies of all pertinent correspondence in chronological order throughout the life of the study.

### Non-Federal Sponsor

City of Kansas City, Missouri

Coordination was maintained between the staffs of the district and the City on a frequent basis throughout the feasibility investigations. Members of the study team and District management met with City officials on a quarterly basis for status briefings. Members of the study team also accompanied the sponsor in meetings with business representatives of the Dodson area and with other public agencies. The sponsor participated in the plan selection process and concurs with the selection of Plan 114 at the 0.2-percent level of protection.

### Federal Agencies

FEDERAL EMERGENCY MANAGEMENT AGENCY.

The Kansas City, Missouri, office provided guidance regarding floodplain management criteria.

US DEPARTMENT OF THE INTERIOR - US GEOLOGICAL SURVEY, WATER RESOURCE DIVISION.

The USGS office at Kansas City, Missouri, provided hydraulic information, revised to reflect the May, 1990 flood event, for the Blue River at the Bannister Road Bridge.

US DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE (FWS).

With a letter, dated November 4, 1994, FWS submitted a draft Fish and Wildlife Coordination Act Report for consideration. The report addressed likely effects on forested wetlands, uplands, and aquatic habitat in the proposed project area and included recommendations to preserve and improve fish and wildlife habitat.

The following discussion identifies each FWS recommendation as well as a specific response from the Corps concerning its relationship to the selected project plan.

1. RECOMMENDATION: "Avoid removing or injuring woodland trees within the project area."

RESPONSE: As detailed in the Draft Environmental Assessment, the proposed levee alignment would result in the destruction of about 20 acres of terrestrial habitat. The study area includes about 6 to 7 acres of timbered wetlands of which about 1.1 acres would be destroyed by levee construction. However, removal of trees would be restricted to the absolute minimum required to accomplish the work. Trees located adjacent to construction areas would be marked and/or protected to prevent damage during construction operations. In addition to the borrow area wetland mitigation site, following completion of levee construction, about 22 acres landward of the levee would be allowed to re-vegetate naturally as part of a new addition to the Blue River Parkway. If left undisturbed, this riverward area would eventually develop into a timbered riparian corridor. The Corps agrees with this FWS recommendation and will implement it whenever possible during project construction.

2. RECOMMENDATION: "Use the riverward borrow area as a mitigation site for forested wetland loses."

RESPONSE: As presently proposed, the project would result in the unavoidable loss of about 1.1 acres of timbered wetland. To mitigate for this wetland loss, the Corps proposes to enhance a 4 acre borrow site which would be located riverward of the proposed levee. The borrow area would be contoured and planted following completion of levee construction. About 500 trees would be planted with 300 trees in the bottom of the borrow site and an additional 200 trees would be planted along the side slopes. In this way, a currently mowed field would be converted into timbered riparian habitat suitable for a wide variety of wildlife species.

3. RECOMMENDATION: "Establish suitable trees in the new wetland area."

RESPONSE: The Corps concurs with this recommendation. Refer to the proposed mitigation plan in Appendix J for specific tree species which would be planted in the mitigation site. Tree species composition was coordinated with both the FWS and the Missouri Department of Conservation.

4. RECOMMENDATION: "Establish native grasses and forbs on the upper slopes of the borrow area as a buffer."

RESPONSE: Following shaping and contouring of the borrow area, and the placement of a layer of topsoil, yellow sweet clover would be sown to initiate soil stabilization. A mixture of grasses and forbs would also be sown to provide a persistent vegetative cover which would eventually be enhanced by recolonization of natural vegetation. Refer to the proposed mitigation plan in Appendix J for species specific information. Herbaceous species composition was coordinated with the FWS and the Missouri Department of Conservation.

5. RECOMMENDATION: "Maintain a hydrologic connection between the mitigation wetland and the Blue River."

RESPONSE: A pipe would be located on the riverward side of the mitigation site to allow periodic inundation of the wetland from high flows of the Blue River. The pipe would not be gated so drainage from runoff and high flows would not be impeded, fish would not be trapped in the site, and periods of prolonged ponding, which would be detrimental to many timbered species, would be avoided.

6. RECOMMENDATION: "Minimize upland tree removal with the construction easement."

RESPONSE: The Corps concurs with this concept and tree removal would be restricted to the absolute minimum required to accomplish the work. The location of the proposed levee was developed so adverse impacts to timbered areas would be avoided to the greatest extent practicable while still meeting basic project objectives.

7. RECOMMENDATION: "Allow upland tree regeneration on at least two acres of land between the river and the levee."

RESPONSE: About 22 acres of land riverward of the proposed levee alignment would be added to the Blue River Parkway. This acreage would be allowed to re-vegetate naturally which would eventually result in an extensive strip of riparian timber.

8. RECOMMENDATION: "Establish trees along the Blue River where the riparian woodlands are sparse or nonexistent."

RESPONSE: Other than the mitigation site, presently there are no plans to plant trees in other areas along the Blue River. However, this concept will be given consideration during the final design of the proposed project.

9. RECOMMENDATION: "Encourage wetland development at the borrow areas landward of the levee."

RESPONSE: Presently there is no plan to develop a wetland in the borrow site which would be located landward of the levee. Since precipitation and runoff would be about the only source of water to this area (except for a rare overtopping of the proposed levee), some seasonal wetland species may briefly establish themselves during typically wet spring periods of high precipitation. However, this growth would be rapidly replaced by upland species following a change to typically prolonged dry summer conditions. There is no plan to provide an external source of water to regulate the hydrologic regime of this borrow site located within the industrial area. However, following levee construction, this borrow site would be shaped, contoured, and seeded to stabilize the area and would be viable for natural re-vegetation of indigenous species.

## State and Local Agencies

MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT

We consulted the Missouri Highway and Transportation Department regarding current and future highway construction in the Dodson area.

STATE HISTORIC PRESERVATION OFFICER (SHPO)

We provided reports of the 1990 archeological survey of the levee corridor and the 1993 archeological survey of borrow areas to the SHPO for review and comment.

MISSOURI DEPARTMENT OF CONSERVATION

We coordinated Development of the wetland mitigation plan with the Missouri Department of Conservation.

JACKSON COUNTY PARKS AND RECREATION DEPARTMENT

We coordinated with the Jackson County Parks and Recreation Department regarding the future incorporation of real estate acquired for the project into the County's Blue River Parkway system.

JACKSON COUNTY PUBLIC WORKS DEPARTMENT

We provided the Jackson County Public Works Department information regarding flood discharges and stages for their use in designing the new Grandview Road/Prospect Avenue bridge.

## Other Interests

We have participated and will continue to participate in coordination and information meetings with businesses and interested citizens' groups in the Dodson Industrial District and vicinity.

# LOCAL SPONSORSHIP REQUIREMENTS

The requirements for non-Federal sponsorship of this project will be fully delineated in a Project Cooperation Agreement (PCA). The PCA will be finalized and executed prior to start of construction. Some of the major non-Federal requirements from the PCA follow:

1. Provide, during construction, a cash contribution equal to 5 percent of total project costs assigned to flood control;

2. Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or ensure performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

3. Provide, all improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the project. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and dewatering pumps and pipes.

4. For so long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed project, or functional portion of the project, 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.

5. Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor, now or hereafter, owns or controls for access to the project for the purpose of inspection, and, if necessary, after failure to perform by the non-Federal sponsor, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Federal Government shall operate to relieve the non-Federal sponsor of responsibility to meet the non-Federal sponsor's obligations or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance.

6. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project 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.

7. Perform, or cause to be performed, any investigations for hazardous substances as 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 (PL) 96-510, as amended, 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the 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..

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

9. To the maximum extent practicable, operate, maintain, repair, replace and rehabilitate the project in a manner that will not cause liability to arise under CERCLA.

10. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, as amended, by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (PL 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for the construction, operation, and maintenance of the project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and inform all affected in connection with said Act.

11. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352 (42 USC 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulations 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

12. Provide that portion of total historic preservation mitigation and data recovery costs attributable to flood control that are in excess of one percent of the total amount authorized to be appropriated for flood control.

13. Participate in and comply with applicable Federal flood plain management and flood insurance programs.

14. Not less than once each year inform affected interests of the extent of protection afforded by the project.

15. Publicize flood plain information in the area concerned. Provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the flood plain and in adopting such regulations as may be necessary to prevent unwise future development and to ensure compatibility with the protection provided by the project.

From Table 16, the total project cost is $17,100,000 at October 1995 price levels. Based on WRDA 86 cost sharing policies, the local share would have been $5,040,000 ($4,185,000 in LERRD value and 5 percent of the total project cost minimum cash contribution).

Table 20. COST SHARING

(October 1995 Price Level)

| | |
|---|---|
| Planning, Engineering and Design | $ 1,600,000 |
| Construction and Construction Management | 11,297,000 |
| LERRD | 4,185,000 |
| TOTAL PROJECT COST (Rounded to nearest $100,000) | $17,100,000 |
| Non-Federal Share (minimum 25 percent) | |
| Cash Contribution (5 percent, minimum) | 855,000 |
| LERRD | 4,185,000 |
| TOTAL NON-FEDERAL SHARE | 5,040,000 |
| Federal Percentage | 70.5 |
| Non-Federal Percentage | 29.5 |

## Sponsor's Intent

The City of Kansas City, Missouri, by letter dated 17 November 1995, has expressed a commitment to sponsor the project and indicated that it had reviewed this draft report, and understands the requirements herein. The City understands that resolution of the hazardous waste contamination on the levee alignment is a requirement prior to project construction. Based upon this and upon City participation in other current and past Corps of Engineers flood damage reduction projects, we are confident that the City fully understands the legal and cost sharing requirements of a PCA. The City also has provided confirmation of its intent and a statement of financial capabilities in a letter dated 20 February 1996, and in the attached City Council Resolution No. 951615 dated 7 December 1995. Copies of these documents from the City of Kansas City are in Appendix F.

## Financing Plan Outline

The local share may be provided by the City of Kansas City's capability to finance pay-as-you-go capital improvements with a half cent sales tax or to issue lease revenue bonds that may be retired with sales tax or other operating revenues. Project funds allocation would require City Council approval but would not require further public approval. Currently, both Moody's and Standard & Poor's list a top-quality bond rating of "Aa" (or "AA") for the City's

general obligation bonds. For leasehold revenue bonds, the city's rating by both Moody's and Standard & Poor's is also a top-quality rating of "A".

## Use Of Funds

The State, County and City own some highway right-of-way and lands. Other lands required are in private ownership and will be acquired by the sponsor prior to initiation of construction. Land acquisition will begin after the project has been approved and the PCA has been executed. Appendix H, Real Estate Plan, and the cost estimate summary in the Engineering Appendix include a cost estimate of the real estate interests that have not yet been acquired. The cost estimate will be revised as necessary during preparation of plans and specifications. We estimate the total cash contribution required from the non-Federal sponsor for the project during construction to be $855,000. We estimate the annual cash required from the non-Federal sponsor for operation, maintenance and rehabilitation to be $17,500.

## CONCLUSIONS

In the Feasibility Study for Dodson Industrial District, Kansas City, Missouri, I have considered the public interest in all significant aspects of the potential project. Those aspects include environmental effects, compensation needs, social and economic effects, and engineering feasibility and effectiveness. Based on that study, I conclude that a local flood damage reduction project on Blue River at the Dodson Industrial District, under the Authority and resolution adopted by the Committee on Public Works and Transportation, United States House of Representatives on September 19, 1984, is desirable and feasible.

## RECOMMENDATION

I recommend that Plan 114, a system of levees, floodwalls, and closure structures with a level of protection up to and including the 0.2-percent chance exceedence flood event, selected herein for the purpose of flood protection at Dodson Industrial District, Kansas City, Missouri, be approved for implementation as a Federal project under authority of the Resolution of the Committee on Public Works and Transportation, United States House of Representatives adopted September 19, 1984, with such modifications thereof as in the discretion of the Commander, HQUSACE, may be advisable. I also recommend that funds be made available for preparation of Plans and Specifications with construction of the project conditional upon successful negotiation of the Project Cooperation Agreement and performance of required items of cooperation by the non-Federal sponsor.

This study was conducted using cost sharing policies established by the Water Resources Development Act of 1986. It is my understanding that the Administration has initiated the development of a new cost sharing policy for flood damage reduction projects. Therefore, I further recommend that the improvements for flood damage reduction at Dodson Industrial District, Kansas City, Missouri, be authorized subject to cost sharing consistent with Administration policy.

Robert E. Morris
Colonel, Corps of Engineers
District Engineer

Date 22 Feb 96

## DISCLAIMER

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 the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsor, the State, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

REPLY TO
ATTENTION OF:
CEMRK-EP-PR

# Finding of No Significant Impact

## General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District Kansas City, Missouri

I have reviewed and evaluated the Environmental Assessment (EA), the Feasibility Report, and other relevant data and information pertaining to the recommended and alternative flood damage reduction measures studied for the Dodson Industrial District, Blue River Basin, Kansas City, Missouri.

This feasibility study was authorized by a resolution of the Committee on Public Works and Transportation, United States House of Representatives, adopted September 19, 1984. The City of Kansas City, Missouri, requested the Kansas City District's assistance in determining the engineering and economic feasibility of protecting the Dodson Industrial District from flooding caused by the Blue River. The measures in the recommended plan would provide the Dodson Industrial District with protection from a 0.2 percent chance (500 year) flood event. The EA was prepared to serve as a record of coordination for the study and summarize the proposed project's expected effects on the existing environment.

I have examined several structural alternatives for each project reach and the "no Federal action" alternative in regard to reducing this flood damage problem, and have considered each alternative's engineering and economic feasibility and environmental effects. I find that the recommended "Plan 114" offers the best solution, providing environmentally-acceptable, sound engineering flood protection at minimal cost. (Plan 114 is known as such because it includes Alternatives 1, 1, and 4 in Reaches 1, 2, and 3, respectively.)

"No Federal action" is an unacceptable alternative as it would not address the reason for the requested assistance and would allow continued flood damage in Dodson. Without corrective action, the Industrial District's problems would worsen as frequently flooded buildings deteriorate.

The EA considered all relevant environmental, social, and economic factors which the recommended plan could potentially affect, including wetlands, threatened and endangered species, fish and wildlife, vegetation, air and water quality, cultural resources, and social and economic conditions in the affected area. Currently, rights-of-way needed for portions of the proposed levee contain potential and known non-hazardous regulated wastes and one known hazardous waste site. Further investigation of these sites will occur during early stages of preconstruction engineering and design. Kansas City, Missouri, as local sponsor, must provide all required project lands and assure the lands are free from any solid, special, hazardous, and toxic wastes prior to project construction.

The recommended plan's potential adverse effects includes loss of 17 to 22 acres of terrestrial habitat. Approximately 1.1 acre of the affected area has been determined to be wooded wetlands. A wetland mitigation plan was developed, coordinated with, and approved by Federal and State resource agencies. The mitigation plan involves developing a wetland in the 4-acre riverward borrow area in Reach 2. Provision of flood protection for the approximately 30 businesses in the Dodson Industrial District would be the recommended plan's primary benefit.

Temporary, short-term increases in the Blue River's turbidity would occur during construction and until disturbed slopes and overbank areas are revegetated and stabilized. Increased levels of air-borne dust, exhaust emissions, noise, and traffic on haul roads and access routes from heavy equipment operation during construction would be localized and would not persist after project completion. The recommended "Plan 114" complies with requirements of Section 404 of the Clean Water Act and Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands".

Based on the Environmental Assessment for the proposed action, no significant adverse impacts on the quality of the human environment are anticipated. The proposed action has been coordinated with appropriate resource agencies and there are no significant unresolved issues. Accordingly, I have determined that preparation of an Environmental Impact Statement is not required for the recommended flood damage reduction measures known as "Plan 114" for the Dodson Industrial District, Blue River Basin, Kansas City, Missouri.

**Date** 15 Mar 96

Robert E. Morris
Colonel, Corps of Engineers
District Engineer

Blue River Basin
Dodson Industrial District
Kansas City, Missouri

**Kansas City District**
**U.S. Army Corps of Engineers**

# Environmental Assessment

## General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District Kansas City, Missouri

Prepared by the Engineering and Planning Division
Kansas City District, U.S. Army Corps of Engineers

**February 1996**

# ENVIRONMENTAL ASSESSMENT

## General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District Kansas City, Missouri

### TABLE OF CONTENTS


**NEED FOR THE ACTION** . . . . . 101

**ALTERNATIVES** . . . . . 101
Plans Eliminated from Further Study . . . . . 101
Plans Considered in Detail . . . . . 102
No Action Alternative . . . . . 102
Structural Measures . . . . . 102
Reach 1 (Upstream of Prospect) . . . . . 102
Alternative 1 **(Selected Alternative)** . . . . . 102
Alternative 2 . . . . . 102
Reach 2 (Prospect to Hickman Mills Drive) . . . . . 103
Alternative 1 **(Selected Alternative)** . . . . . 103
Alternative 2 . . . . . 103
Alternative 3 . . . . . 103
Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive) . . . . . 103
Alternative 1 . . . . . 103
Alternative 2 . . . . . 103
Alternative 3 . . . . . 104
Alternative 4 **(Selected Alternative)** . . . . . 104

**ENVIRONMENTAL SETTING** . . . . . 104

**ENVIRONMENTAL EFFECTS** . . . . . 108
Reach 1 (Upstream of Prospect) . . . . . 109
Alternative 1 **(Selected Alternative)** . . . . . 109
Alternative 2 . . . . . 110
Reach 2 (Prospect to Hickman Mills Drive) . . . . . 110
Alternative 1 **(Selected Alternative)** . . . . . 110
Alternative 2 . . . . . 110
Alternative 3 . . . . . 110
Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive) . . . . . 110
Alternative 1 . . . . . 110

EA CONTENTS CONT'D.

Alternative 2 . . . . . 112
Alternative 3 . . . . . 112
Alternative 4 (Selected Alternative) . . . . . 112

**CONCLUSIONS** . . . . . 112

**FIGURE 1** . . . . . 106

**ENVIRONMENTAL EFFECTS MATRIX** . . . . . 111

**AGENCIES AND INDIVIDUALS CONSULTED** . . . . . 112

**RECIPIENTS OF DRAFT FEASIBILITY REPORT/EA** . . . . . 112

# ENVIRONMENTAL ASSESSMENT

## General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District Kansas City, Missouri

## NEED FOR THE ACTION

The Dodson Industrial District is located in the south-central portion of Kansas City, Missouri, approximately nine miles from the downtown business district (See Feasibility Report, Figure 1). This area has been developed as an industrial park and is located entirely within the floodplain of the Blue River. The businesses in the district are a mixture of small and large companies and employ approximately 1,300 people. Total investment is estimated in excess of $219 million. The area is surrounded by several major commercial and industrial centers such as the General Services Administration Federal Complex immediately to the south, the Bannister Mall area to the southeast, and the Prospect Avenue merchant area to the north. A detailed project description, drawings, discussion of the economic justification, coordination, and potential environmental effects for the proposed plan considered in this Environmental Assessment (EA) are also discussed in the Feasibility Report and Appendixes, incorporated herein by reference.

Much of the Blue River Basin has been developed for residential and commercial purposes and frequent flooding is common for the Dodson Industrial District. Serious floods have occurred in 1928, 1944, 1951, 1961, 1984, and 1990 with less severe floods in 1958 and 1977. The 1990 flood caused over $1.3 million in damages within the Dodson Industrial District.

Many physical improvements are currently under construction, or are planned, which will upgrade the area's transportation system and other support services. These improvements will make the area more attractive to business development and aid in retaining existing businesses.

## ALTERNATIVES

**Plans Eliminated from Further Study.** Preliminary analyses were made of a wide variety of structural and non-structural measures that could potentially solve the water resources problems in the study area. Upstream dams and several non-structural measures were initially investigated and eliminated because they could not meet the Study's planning objectives. See Feasibility Report, "Measures Available to Address Problems".

**Plans Considered in Detail.** The final array of plans included the following non-structural plan (No Action) and various combinations of structural plans for the three reaches involved.

**No Action Alternative.** This alternative would not address the reason for the requested assistance, i.e., reducing flooding problems along the Blue River in Kansas City, Missouri. Without flood protection, the Dodson Industrial District would continue in a static condition and eventually decline. If no corrective action is taken, the District's problems would worsen in the future as frequently flooded buildings deteriorate. Any future development would require special measures, including construction on fill material or raising first floor levels several feet higher than existing structures. New development has nearly ceased in the area as businesses find it more advantageous to locate where flood risks are slight, flood insurance is not required, and special construction considerations are not necessary.

**Structural Measures.** For planning and construction purposes, the project study area was divided into three reaches: Reach 1 - upstream of Prospect/Grandview Road; Reach 2 - from Prospect/Grandview Road to the future Hickman Mills Drive (formerly southbound U.S. 71 Highway); and Reach 3 - downstream from the future Hickman Mills Drive. Total length of the three reaches is approximately one mile. In addition to the "no action" alternative, two possible structural alternatives were studied for Reach 1, three structural alternatives for Reach 2, and four structural alternatives for Reach 3. **One alternative from each reach is necessary to provide complete protection for existing development in the study area.** A brief description of each alternative follows. The selected alternative is designated for each reach. A more detailed description of these alternatives may be found in the Feasibility Report.

**Reach 1 (Upstream of Prospect)**

**Alternative 1 (Selected Alternative)** (Engineering Appendix, Plate 8). This alternative includes a 700-foot levee across Boone Creek, from Prospect/Grandview Road connecting with the General Services Administration Complex levee immediately upstream. A drainage structure consisting of a 96-inch diameter culvert pipe and a gatewell structure would be used to control the flow of Boone Creek into the Blue River and prevent the backflow of Blue River floodwaters into Boone Creek and the protected area.

**Alternative 2** (Engineering Appendix, Plate 8). With this alternative, a 2,000-foot levee would be constructed along the north bank of Boone Creek from Prospect/Grandview Road to the Union Pacific Railroad embankment. A large part of this levee would be constructed over a closed sanitary landfill and a small amount of channel relocation would be needed for Boone Creek. Closure structures would also be required at the Union Pacific Railroad tracks. This alternative would provide protection to the Dodson Industrial area but would allow Blue River flood to still enter Boone Creek, flooding a larger area than would occur with Alternative 1, above.

**Reach 2 (Prospect to Hickman Mills Drive)**

Alternative 1 (Selected Alternative) (Engineering Appendix, Plate 9). This alternative includes a 3,900-foot levee for the entire reach between Prospect Avenue/Grandview Road and the future Hickman Mills Drive (formerly southbound U.S. 71 Highway). The levee would be set at or behind the current Federal Emergency Management Agency (FEMA) floodway boundary to avoid encroachment of the floodway. A 4 acre riverward borrow area would be located at the upstream part of this reach. Two drainage structures are included in the selected alternative, each a 48-inch diameter culvert pipe with a gatewell structure to control interior drainage and prevent backflow of floodwater. Two rolling-gate closure structures are also included, one for the roadway crossing at Prospect/Grandview Road and one for the future Hickman Mills Drive (formerly southbound U.S. 71 Highway).

Alternative 2 (Engineering Appendix, Plate 9). This alternative consists of a levee with concrete floodwalls at each end of the reach. The floodwalls would be used to minimize space and avoid relocating existing businesses. There would be 3,000 feet of levee and 1,200 feet of floodwall. This alternative's alignment would encroach upon the floodway to a slight extent at the downstream end. However, excavating an area riverward of the levee would compensate for lost floodway capacity. Two drainage structures and two rolling-gate closure structures (as in Alternative 1 for Reach 2) are also included in this alternative.

Alternative 3 (Engineering Appendix, Plate 9). Alternative 3 consists of 2,900 feet of levee with 1,200 feet of concrete floodwalls, similar to Alternative 2. This alignment however, would provide more space between the levee and the Blue River in the upstream part of the reach, allowing for a borrow/disposal area and a slight reduction of the levee length. As in Alternative 2, riverward excavation would compensate for the downstream floodway encroachment. Two drainage structures and two rolling-gate closure structures are included in this alternative, as with the other alternatives for Reach 2.

**Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive)**

Alternative 1 (Engineering Appendix, Plate 10). This alternative includes 1,100 feet of floodwall for the entire reach from downstream of the future Hickman Mills Drive (formerly southbound U.S. 71 Highway) bridge to the upstream side of the future 87th Street bridge. A clay blanket would also be required from the downstream side of the future 87th Street bridge around the end of Manchester Street and along the access ramp to Bruce R. Watkins Drive. Approximately 6 to 7 acres of vacant land, located north of 85th Street, would be used for borrow material and ponding.

Alternative 2 (Engineering Appendix, Plate 10). Alternative 2 would include 700 feet of floodwall constructed from the downstream side of the future Hickman Mills Drive adjacent to the future 85th Street extension to Manchester Street, as in Alternative 1. The floodwall would end at a point approximately 600 feet north of Hickman Mills Drive. A rolling gate closure structure would cross 85th Street and connect to a levee along the west side of

85th Street. This levee would extend 500 feet and connect with the Bruce R. Watkins Drive exit ramp embankment. A 6-foot by 5-foot culvert with flapgate, gatewell, and sluicegate controls would control drainage from the west and be located at the intersection of the levee and the existing ditch near the Bruce R. Watkins Drive exit ramp. As with Alternative 1, approximately 6 to 7 acres of vacant land north of 85th Street would be used for borrow material and ponding. This plan would not provide flood protection to the Bruce R. Watkins Drive and 85th Street interchange.

Alternative 3 (Engineering Appendix, Plate 10). This alternative is similar to Alternative 2, except the floodwall would extend farther north along the proposed 85th Street extension and Manchester Street to a point beyond the Bruce R. Watkins Drive exit ramp. A rolling gate closure structure would be required to cross Manchester Street. Approximately 900 feet of floodwall is included with this alternative. As with Alternative 1, approximately 6 to 7 acres of vacant land north of 85th Street would be used for borrow material and ponding.

Alternative 4 (Selected Alternative) (Engineering Appendix, Plate 10). The selected alternative includes a levee with floodwall on top from immediately downstream of the Hickman Mills Drive bridge to the east side of 85th Street, approximately 100 feet north of the bridge. The levee would connect with a rolling-gate closure structure across 85th Street. West of 85th Street a short length of floodwall would connect the first closure structure to a second rolling-gate closure structure at the outer road of Hickman Mills Drive (formerly northbound U.S. 71 Highway). The levee would resume north of this closure structure and parallel 85th Street to the freeway exit ramp embankment. As in Alternative 2, a drainage structure would be located at the ditch near the exit ramp. The selected alternative includes 850 feet of levee, 150 feet of floodwall, and two closure structures. As with all Reach 3 alternatives, approximately 6 to 7 acres of vacant land north of 85th Street would be used for borrow material and ponding.

See the "Plan Selection" Section of the Feasibility Report for additional information concerning selection of the recommended plan.

## ENVIRONMENTAL SETTING

The Blue River is a right bank tributary of the Missouri River and is the major drainage for the Kansas City metropolitan area. The basin watershed lies in the Osage Plains physiographic section of western Missouri and eastern Kansas, a maturely dissected and gently rolling region with relatively wide stream valleys. Native vegetation was a mixture of bluestem tallgrass prairie on the upper and drier reaches of the hills and oak-hickory forests in the valleys draining the area. The topography is developed on Pennsylvanian age shales with interbedded limestone, sandstone, and coal. Total drainage area of the Blue River is 272 square miles, 188 of which are upstream of the Dodson Industrial District.

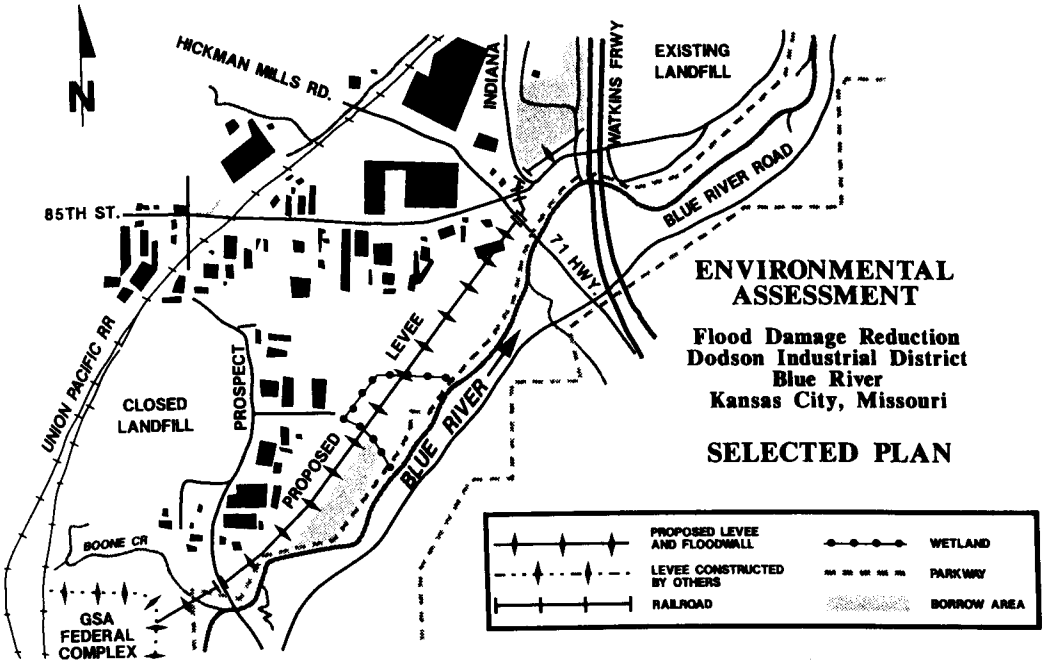
The study area is approximately one mile long and is located in a highly developed, urban environmental setting in Kansas City, Missouri (Figure 1). Intensive urban disturbance has

occurred throughout the study area and the surrounding land. Being located approximately nine miles from the downtown business district, little of the natural environment remains. In areas that have been intensively disturbed but are vegetated, plant species are those that are tolerant of disturbed conditions. These species include sweet clover, annual sunflower, musk thistle, poison hemlock, giant ragweed, aster, goldenrod, and various grasses. Most of the riparian trees have been removed from the study area with only a few scattered large trees and a couple isolated stands of young trees still remaining. Tree species found in the study area include boxelder, ash, elm, silver maple, willow and cottonwood with an occasional walnut, basswood, sycamore, and bur oak. Understory plant species include stinging nettle, jewelweed, rough-leaved dogwood, blackberry, elderberry, and multiflora rose.

Much of the study area was originally forested floodplain and would have been delineated as "wetlands" under Section 404 of the Clean Water Act. Through the years however, construction debris, soil, and other materials have been used to raise the level of the floodplain and alter drainage patterns to the extent that most of the area no longer qualifies as "wetlands". There are however, approximately 6 to 7 acres of seasonally-flooded timbered wetlands remaining in the study area (Figure 1). Human disturbance of drainage patterns has resulted in the alteration/formation of one small (0.2 acre) pond in the study area. This pond receives drainage from nearby business properties and has been altered by fill activities associated with the industrial district.

Wildlife species found in the study area are those that are tolerant of urban conditions. Species include raccoon, opossum, fox and gray squirrels, cottontail rabbit, red fox, beaver, and an occasional white-tailed deer. Common bird species include blue jay, cardinal, dove, robin, red-winged blackbird, grackle, starling, red-tailed hawk, kestrel, black-capped chickadee, junco, and various species of sparrow. Common reptile and amphibian species found in the area include black rat snakes, garter snakes, yellow-bellied racers, snapping turtles, and bullfrogs. Fish species found in the study area include green sunfish, bluegill, channel catfish, largemouth bass, and various species of minnows.

The U.S. Fish and Wildlife Service (FWS) has prepared a Fish and Wildlife Coordination Act Report for this project (Appendix E to the Feasibility Report/EA). In their report, the FWS identified four threatened or endangered species whose historical ranges included the Blue River Basin. Species of interest are the bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus), Mead's milkweed (Asclepias meadii), and the western prairie fringed orchid (Platanthera praeclara). However, no designated critical habitat occurs in the project area, and due to existing, intensive urban development of the study area none of these species would likely be adversely affected by the project. No other Federally-listed threatened and endangered species (or designated critical habitat) were identified by the FWS. Coordination pursuant to the Endangered Species Act is documented in Appendix E to the Feasibility Report.




**ENVIRONMENTAL ASSESSMENT**

**Flood Damage Reduction**
**Dodson Industrial District**
**Blue River**
**Kansas City, Missouri**

**SELECTED PLAN**

FIGURE 1

125/015101

The Blue River Parkway extends along the Blue River in Missouri upstream from Swope Park to the Kansas State line, providing a large area of open space for the Kansas City metropolitan area. In the study area most of the parkway is located across the river from the Dodson Industrial District (Figure 1). This linear park is managed by the Jackson County Parks and Recreation Department and has been developed for intensive-use recreation in some areas, with other reaches managed as natural areas.

From 1958 through 1971, the City of Kansas City, Missouri, operated a landfill at 87th and Prospect Streets in an old meander of the Blue River (Figure 1). The city's 80-acre landfill was unlined and accepted organic, inorganic, and mixed wastes from construction, textile, fertilizer, paper/printing, general chemical, plating, lab/hospital, photo finishing, electrical conductor, and utility company sources. The landfill site was excavated to groundwater, had 40 feet of compacted waste placed in the excavated area, and was covered by a 3-foot-thick cap of clay. No leachate or gas collection systems were installed. Boone Creek, a filled-in remnant of an old Blue River channel, drains the area of the landfill.

A second landfill, Southeast Sanitary Landfill, is operated by a private firm and is located on the left bank of the Blue River immediately downstream of the Bruce R. Watkins Drive bridge (Figure 1). Southeast Landfill is permitted by the state of Missouri and has been in operation since 1972. The private landfill expanded from its original 80 acres to 139 acres in 1980 through a land exchange with the Jackson County Parks and Recreation Department and construction of a new channel for a portion of the Blue River. A flood protection levee has been constructed at the riverside base of the landfill as filling has progressed downstream along the Blue River. Southeast Landfill will close by early 1999 according to the operator.

A cultural resources evaluation of the flood protection alternatives under study was completed in April 1990 (Appendix I to the Feasibility Report). The cultural resources study consisted of an examination of historical records and photographs, consultation with the Archaeological Survey of Missouri, and a field survey of a corridor containing the various levee alignments. The only known historical site in the Dodson vicinity identified at that time was Russell's Ford, at the Blue River. This nineteenth century ford served as a river crossing for the Harrisonville Road which ran from Westport, Missouri, southeast to nearby Harrisonville, Missouri. This ford did play a minor role in the Civil War Battle of Westport. During recent times however, Russell's Ford has been significantly affected by previous construction and fill activities. In addition, this ford is outside of the proposed levee construction corridor and would not be affected by the proposed project.

The Corps conducted an archeological survey of proposed borrow areas for the project in March 1993. One prehistoric site of unknown cultural affiliation was identified during the survey. Subsequent intensive surface survey and systematic subsurface auger-testing indicated that this site is both shallow and disturbed, and therefore does not possess the integrity to qualify for listing in the National Register of Historic Places. Archeological reports of the 1993 survey and the 1990 survey, as well as copies of letters of coordination with the Missouri State Historic Preservation Office and the Archeological Survey of Missouri are also

included in Appendix I. If any other prehistoric or historic sites are discovered during construction activities, the contractor will be required to immediately stop work at that location and contact the Kansas City District, Corps of Engineers, and the Missouri State Historic Preservation Office.

## ENVIRONMENTAL EFFECTS

The recommended alternative consists of a 5,600-foot long levee, extending from the General Services Administration Federal Complex levee at the upstream end to the embankment of Bruce R. Watkins Drive at the downstream end (Figure 1). The recommended alternative was developed to protect the existing riparian corridor to the maximum extent practicable and to compensate for environmental impacts through selective revegetation and wetland development. A Section 404 Public Notice was issued and a Section 404 public interest review conducted concurrently with public review of the Feasibility Report and EA. Copies of the Section 404 Public Notice and the Section 404(b)(1) Evaluation Report of the selected alternative are included in Appendix D to the Feasibility Report. Approximately 1.1 acre of wooded wetlands would be lost to the proposed action. As mitigation, wetlands would be developed in an approximately 4 acre riverward borrow area. A Wetland Mitigation Plan has been prepared and coordinated with resource agencies and is included as Appendix J to the Feasibility Report.

Excavation for levee construction in areas of existing fill material may encounter non-hazardous regulated waste material (solid or "special" wastes) requiring disposal in permitted landfills. Much of the fill which makes up the Schweiger property in Reach 1 will require landfilling. Visual inspection and soil borings indicate that several properties in Reach 2, including Bargain Spot Lumber and Materials and Everett Holding Company, contain regulated wastes requiring disposal in a permitted landfill. Although these sites require construction methods consistent with waste disposal regulations, they are not necessarily hazardous or toxic waste sites. The property at the borrow site in Reach 3 is currently owned by Laidlaw Waste, Inc. and leased to a nursery and lawn care business. This site may also contain regulated wastes.

Hazardous waste is confirmed on the Arrow Truck property in Reach 2. The Missouri Department of Natural Resources (MDNR) conducted a Resource Conservation and Recovery Act (RCRA) compliance inspection at the Arrow Truck facility in 1988. MDNR found several unsatisfactory features during the RCRA inspection. The U.S. Environmental Protection Agency (EPA) and MDNR agreed on a preliminary site assessment in 1990 under the Comprehensive Environmental Resource Compensation and Liability Act (CERCLA) to determine whether the site contained hazardous wastes. A 1991 Preliminary Assessment Report indicated the site might be contaminated with lead battery wastes. An April 1992 Site Sampling Report included the results of **surface** sampling which indicated lead levels were above the concentration EPA considers hazardous. MDNR published results of **surface and subsurface** sampling performed on Arrow Truck as part of a Site Inspection (SI) Report on September 28, 1994, confirming the presence of characteristic hazardous waste based on lead

toxicity. Based on the testing MDNR has recommended that contaminated soils be removed from the site. EPA is currently conducting a Removal Assessment (RA) based on information presented in the SI report, although EPA has not yet expressed a schedule for the RA. EPA will use the RA as a basis for further action at the site.

Department of the Army regulations require that lands provided for construction of a project be free of hazardous and toxic waste contamination prior to initiation of a Federal project. Whatever EPA determines, it is accepted (required) that Kansas City, Missouri, working with MDNR and EPA, will assure that all properties used in the flood protection project are free of hazardous and toxic waste prior to initiation of construction.

Non-hazardous regulated wastes are scheduled for disposal at permitted landfills. As detailed soil testing was not conducted, the quantity of such wastes is estimated. Early phases of preconstruction engineering and design would contain detailed and thorough soil sampling and testing efforts to better define the extent of contamination. Additional regulated wastes on other properties could be discovered at that time. Any project lands contaminated by regulated wastes, whether solid, special, hazardous or toxic in nature, will require remediation by the project sponsor prior to the start of project construction.

As construction activities would disturb an area greater than 5 acres, the Kansas City District will apply to MDNR for a general storm water discharge permit in accordance with provisions of the National Pollutant Discharge Elimination System (NPDES). As required by the NPDES permit, appropriate measures would be taken to minimize erosion and storm water discharges during and after project construction.

The recommended plan is located in the base floodplain and subject to Executive Order 11988, "Floodplain Management." The recommended plan protects an estimated 16.5 acres of undeveloped land in an otherwise fully developed industrial park of about 250 acres. There is no practicable alternative to the incidental protection which the project would provide to this undeveloped land. Therefore, the Corps has determined that the recommended plan complies with the intent of Executive Order 11988.

The recommended plan will provide the Dodson Industrial District with protection from the 0.2 percent chance (500 year) flood on the Blue River. **The recommended total plan consists of Alternative 1 in Reach 1, Alternative 1 in Reach 2, and Alternative 4 in Reach 3, i.e. "Plan 114".** In addition to the normal, temporary, construction related impacts, environmental effects would occur for each alternative as listed below.

**Reach 1 (Upstream of Prospect)**

**Alternative 1 (Selected Alternative).** This alternative would result in the loss of approximately 3 to 4 acres of existing terrestrial habitat, a small amount of aquatic habitat where the levee crosses Boone Creek, and 0.15 acres of land from the Blue River Parkway. One existing business would be displaced. Upon construction of this alternative, selective

vegetation (trees, shrubs, and native grasses) would be planted upstream of the Boone Creek crossing to provide benefits to wildlife species.

Alternative 2. Approximately 11 to 13 acres of existing terrestrial habitat would be lost with this plan and a 400-foot section of Boone Creek would be realigned. One existing business would be displaced. Construction of a levee on the old landfill, as proposed under this alternative, would require significant sampling and monitoring of the old landfill, with potentially severe and expensive remediation and cleanup. The area of the creek realignment would be selectively planted to provided benefits to wildlife species.

**Reach 2 (Prospect to Hickman Mills Drive)**

Alternative 1 (Selected Alternative). Approximately 12 to 15 acres of existing terrestrial habitat, including approximately 1.1 acre of wooded wetlands, would be lost with this alternative. Some alteration would occur to the existing pond, although it would still be a ponding area for interior drainage. Approximately 22 acres of land riverward of the levee would be added to the Blue River Parkway and managed as a natural area by the city or county. A wetland would be developed in the 4-acre riverward borrow area and the area would be selectively shaped and planted (see Appendix J, Wetland Mitigation Plan). This plan would displace two businesses and may displace another. This alternative requires the most real estate plus relocation of existing businesses compared to other Reach 2 alternatives.

Alternative 2. Environmental impacts associated with this alternative would be the loss of 1 to 2 acres of wetlands and 15 to 18 acres of existing terrestrial habitat. Most of the terrestrial habitat lost with this plan would be as a result of the excavation to mitigate the floodway encroachment. The area would be selectively planted with vegetation to benefit wildlife species. Approximately 13 acres of land would be added to the Blue River Parkway. In addition, two businesses would be partially displaced by Alternative 2.

Alternative 3. Environmental impacts for this alternative would be similar to Alternatives 1 and 2 combined, including the loss of 3 to 4 acres of wetlands. However, 23 to 25 acres of existing terrestrial habitat would be lost due to the borrow area and the excavation required to compensate for the floodway encroachment of the levee. Use of the borrow area to develop wetlands would not be possible as this area would be used to dispose of excavated material removed to increase the floodway. Approximately 15 acres of land would be added to the Blue River Parkway.

**Reach 3 (Hickman Mills Drive to Bruce R. Watkins Drive)**

Alternative 1. Approximately 2 to 3 acres of existing terrestrial habitat would be lost with this alternative. In addition, approximately 6 to 7 acres of vacant developed land north of 85th Street would be used for borrow material and ponding. This borrow area could develop into a wetland and be selectively shaped and planted to provide benefits to wildlife species.

## ENVIRONMENTAL EFFECTS MATRIX

The following matrix compares the environmental effects of each alternative by reach.

| | Terrestrial Habitat | Wetlands | Park Land | Businesses |
|---|---|---|---|---|
| "No Action" | Continued loss of terrestrial habitat because of business development. | Continued loss of wetlands as they are filled by businesses and development. | No change. | Continued flooding of existing businesses and loss of businesses as they relocate. |
| | | **REACH 1** | | |
| Alternative 1 (SELECTED) | Three to four acres of terrestrial habitat would be lost. Trees, shrubs, and native grasses planted for wildlife habitat upstream of Boone Creek levee crossing. | Small amount of aquatic habitat would be lost. | Loss of approximately 0.15 acre of Blue River Parkway required. Provides opportunity for continuous left bank parkway. | One business would be displaced. |
| Alternative 2 | Eleven to thirteen acres of terrestrial habitat would be lost. | Approx. 400 feet of Boone Creek would be straightened. Potential to replace aquatic and semi-aquatic habitat with relocated channel. | No effect. | One business would be displaced. |
| | | **REACH 2** | | |
| Alternative 1 (SELECTED) | Twelve to fifteen acres of terrestrial habitat would be lost. | One acre of wooded wetlands would be lost. A wetland would be developed in the 4-acre riverward borrow area. | Twenty-two acres added to parkway between levee and river. | Two businesses would be displaced. Another may potentially be displaced. Thirty-two structures would be protected. |
| Alternative 2 | Fifteen to eighteen acres of terrestrial habitat would be lost. | One to two acres of wetlands would be lost. Small wetland develop at drainage pipes. | Thirteen acres added to parkway between levee and river. | Two businesses would be partially displaced. Thirty-four structures would be protected. |
| Alternative 3 | Loss of 23 to 25 acres of terrestrial habitat. | Three to four acres of wetlands would be lost. Wetland may develop at drainage pipes. | Fifteen acres added to parkway between levee and river. | Two businesses would be partially displaced. Thirty-four structures would be protected. |
| | | **REACH 3** | | |
| Alternative 1 | Loss of two to three acres of terrestrial habitat. | Wetlands could develop in 6-7 acre borrow area. | No effect. | No effect. |
| Alternative 2 | Loss of two to three acres of terrestrial habitat. | Wetlands could develop in 6-7 acre borrow area. | No effect. | No effect. |
| Alternative 3 | Two acres of terrestrial habitat would be lost. | Wetlands could develop in 6-7 acre borrow area. | No effect. | No effect. |
| Alternative 4 (SELECTED) | Loss of two to three acres of terrestrial habitat. | Wetlands could develop in 6-7 acre borrow area. | No effect. | No effect. |

**Alternative 2.** Environmental impacts associated with this alternative would be similar to Alternative 1.

**Alternative 3.** Environmental impacts associated with Alternative 3 would be similar to Alternative 1. However, approximately two acres of terrestrial habitat would be lost.

**Alternative 4 (Selected Alternative).** The environmental impacts associated with Alternative 4 would be similar to Alternative 1.

## CONCLUSIONS

Based on information collected in current and prior studies, preparation of an Environmental Impact Statement is not anticipated at this time. No significant impacts which would adversely affect the quality of the human environment have been identified for the proposed plan (Plan 114) for flood reduction measures at the Dodson Industrial District, Kansas City, Missouri. The Kansas City District has prepared a Finding of No Significant Impact (FONSI) and included it with this EA.

## AGENCIES AND INDIVIDUALS CONSULTED

U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency

Archeological Survey of Missouri
Missouri Department of Conservation
Missouri Department of Natural Resources
Missouri State Historic Preservation Office

Jackson County Parks and Recreation Department

Kansas City, Missouri, Parks and Recreation Department

## RECIPIENTS OF DRAFT FEASIBILITY REPORT/EA

**Elected Officials**

Honorable John Ashcroft, United States Senator
Honorable Christopher Bond, United States Senator
Honorable Karen McCarthy, Representative in Congress

**Federal Agencies**

Federal Emergency Management Agency, Region VII
General Services Administration, Bannister Federal Complex
U.S. Department of Energy
U.S. Environmental Protection Agency
  Regional Administrator, Region VII
  Superfund Division
  Water Resources Protection Branch
U.S. Fish and Wildlife Service, Columbia, Missouri, Field Office
U.S. Fish and Wildlife Service, Manhattan, Kansas, State Office
U.S. Geological Survey
Natural Resources Conservation Service, Missouri State Conservationist
Mid-America Regional Council

**State Agencies**

Missouri Department of Conservation
Missouri Department of Natural Resources
  Deputy State Historic Preservation Officer
  Director and State Historic Preservation Officer
  Director, Division of Environmental Quality
  Director, Hazardous Waste Program
  Director, Solid Waste Management Program
  Director, Water Pollution Control Program
Missouri Highway & Transportation Department

**County Agencies**

Jackson County Parks & Recreation Department
Jackson County Public Works

**City Agencies**

City Development Department
City Manager's Office
Kansas City Landmarks Commission**
Kansas City Parks & Recreation Department
Kansas City Zoological Gardens**
Public Works Department
Special Assistant for Community Affairs

**Interested Citizen & Environmental Organizations**

Blue River Stream Team Committee
Citizens Environmental Council of Kansas City**
Historic Kansas City Foundation
Sierra Club, Metro Kansas City Group

**Businesses and Individuals**

Fifty-one (51) businesses and ten (10) individuals

- Fifteen (15) businesses and two (2) individuals received copies of the Draft Feasibility Report/Environmental Assessment
- Thirty-six (36) businesses and eight (8) individuals received Notices**

**Agencies, groups, businesses, or individuals receiving a Public Notice announcing the availability of the Draft Feasibility Report/Environmental Assessment, as well as the time and location of the Public Meeting, who did not request a copy of the Report/EA.

# APPENDIX B

## SOCIOECONOMICS

## FEASIBILITY REPORT
## BLUE RIVER BASIN
## DODSON INDUSTRIAL DISTRICT
## KANSAS CITY, MISSOURI

TABLE OF CONTENTS


| SECTION | PAGE |
|---|---|
| I. AREA BACKGROUND | 118 |
| A. General | 118 |
| B. Overview of Land Usage | 118 |
| C. Access | 119 |
| D. Industrial Park Qualities | 119 |
| II. WITHOUT-PROJECT CONDITION ANALYSIS | 122 |
| A. Methodology and Procedures of the Analysis | 122 |
| i. Surveys and Interviews | 122 |
| ii. Property Values | 122 |
| iii. Property Elevations | 123 |
| iv. Damageability | 124 |
| v. Calculation of Primary Damages | 126 |
| vi. Annualization of Primary Damages | 128 |
| vii. Future Condition | 129 |
| viii. Study Reaches | 130 |
| B. Results of Physical Inundation Damage Analysis | 131 |
| i. Total Expected Damages | 131 |
| ii. Future Condition | 135 |
| iii. Damage Profiles by Event | 136 |
| (a) 10% Chance Flood | 136 |
| (b) 1% Chance Flood | 137 |
| (c) 0.2% Chance Flood | 138 |
| iv. The 1990 Dodson Flood | 138 |
| v. Feasibility vs. Reconnaissance Analysis Results | 139 |

TABLE OF CONTENTS (CONTINUED)


| SECTION | PAGE |
|---|---|
| C. Other Costs of Flooding | 139 |
| i. Emergency Floodfighting Costs | 140 |
| ii. Flood Insurance Administrative Costs | 141 |
| III. WITH PROJECT CONDITION ANALYSIS | 142 |
| A. Plan Selection | 142 |
| i. NED Analysis in Concept | 142 |
| ii. NED Plan Selection | 143 |
| B. Benefits Analysis | 144 |
| i. NED Analysis of Dodson Benefits | 144 |
| ii. Risk Considerations | 144 |
| iii. Relocations | 145 |
| iv. Location Benefits | 145 |
| v. Negative Benefits | 149 |
| vi. Incremental Considerations | 151 |
| vii. Total Benefits | 151 |
| viii. Residual Damages | 151 |
| ix. Regional Economic Development (RED) Impacts | 153 |
| C. Costs Analysis | 154 |
| i. Total Costs | 154 |
| ii. Interest During Construction | 154 |
| D. Benefits vs. Costs | 156 |

| TABLES | PAGE |
|---|---|
| 1. Sample Use of Line Items | 124 |
| 2. Sample Depth-Damage Relationships | 126 |
| 3. Sample Calculation of Primary Damages | 127 |
| 4. Sample Calculation of Annual Damages | 128 |
| 5. Total Investment by Reach | 130 |
| 6. Total Primary Damages | 131 |
| 7. Total Annual Damages | 131 |
| 8. Annual Damages, Reach 1 | 132 |
| 9. Annual Damages, Reach 2 | 133 |
| 10. Annual Damages, Reach 3 | 134 |
| 11. Growth in Primary Damages, 1997-2015 | 135 |
| 12. Growth in Annual Damages, 1997-2015 | 136 |
| 13. Damage Profile - 10% Chance Flood | 137 |
| 14. Damage Profile - 1% Chance Flood | 137 |

TABLE OF CONTENTS (CONTINUED)

TABLES

| | PAGE |
|---|---|
| 15. Damage Profile - 0.2% Chance Flood | 138 |
| 16. Emergency Floodfighting Costs | 141 |
| 17. Flood Insurance Costs | 142 |
| 18. Impact of Relocations | 146 |
| 19. Location Benefits | 147 |
| 20. Interior Drainage-Related Damages | 150 |
| 21. Annual Benefits Summary by Category | 152 |
| 22. Cost Summary of Selected Plan | 154 |
| 23. Expenditures by Phase | 155 |
| 24. Interest During Construction by Year | 156 |
| 25. Annual Benefits and Costs | 157 |

FIGURES

| | |
|---|---|
| 1. Regional Map of Greater Kansas City | 120 |
| 2. Economics Study Area | 121 |
| 3. Location Benefits | 148 |

# APPENDIX B

## SOCIOECONOMICS

## FEASIBILITY REPORT
## BLUE RIVER BASIN
## DODSON INDUSTRIAL DISTRICT
## KANSAS CITY, MISSOURI

January 1996

### I. AREA BACKGROUND

#### A. General

The Dodson Industrial District is located in the southeastern portion of Kansas City, Missouri, nine miles from the downtown business district. Most of the area was originally established as an industrial park. The district is surrounded by major commercial/industrial centers, including the General Services Administration/Allied Signal complex immediately to the south (as well as an area projected for expansion by one major company); the booming Bannister Mall area to the southeast; and a merchant area along Prospect Avenue to the north.

Dodson's location relative to the surrounding region is portrayed in Figure 1. Figure 2 shows a close-up of the study area.

#### B. Overview of Land Usage

The Blue River flood plain in the Dodson area covers approximately 250 acres on the left bank and is occupied by commercial and industrial enterprises. (The right bank of the Blue River in this area is undeveloped.) Currently, there are 30 businesses and a sewage treatment plant in the flood plain, employing an estimated 1,250 people. Total investment in these enterprises is estimated to be $219.3 million. Key businesses in the area include Hoechst Marion Roussel (pharmaceuticals), John Deere (agricultural implements), Labconco (laboratory equipment), Kansas City Power and Light, and Bratton Corportation (steel). Businesses in Dodson range from these larger enterprises to medium-sized and small businesses in such areas as moving, construction, automotive parts and repair, and wood products. No residential or agricultural land usage exists in the study area. Two commercial sites currently are vacant. (One vacant site is in the path of the proposed levee and would have to be relocated if occupied.)

C. Access

East-west access in the area is provided by 85th Street, which recently was widened and updated through the Dodson area, and by Interstate Highways 435 and 470, which are intersected about two miles south of the Dodson district. The Watkins Freeway, currently under construction and complete through the eastern edge of Dodson and to the south, will become the new U.S. Highway 71, greatly improving access to the north and south, and the north-south loop of I-435 is only about a mile east of Dodson. Improvements, including a new bridge, are also planned along Prospect Avenue (old Highway 71), which traverses the western edge of Dodson. The area is served by one rail line. The city's main airport, Mid-Continent Airport, is approximately 27 miles to the northwest of the Dodson area and will become much more easily accessible via the new Highway 71. A significant secondary industrial airport, the Johnson County Executive Airport, is about 13 miles to the southwest.

D. Industrial Park Qualities

Dodson has several advantages in comparison to other industrial parks in the region. Several major, nationally-known companies (already listed) anchor the area. Hoechst Marion Roussel plans a major new office complex south of Dodson. The new development, when completed, is expected to represent a significant revival for an area which currently is somewhat blighted. The district is near the largest residential centers in the Kansas City area, in southern Jackson County, Missouri, and Johnson County, Kansas. Access, which has been a longstanding concern, currently is being upgraded significantly, as discussed above. Another long-standing problem has been corrected recently with the installation of a new sewer system.

The flood threat is the primary factor that continues to keep Dodson from being as competitive with other regional industrial parks as it might be. Dodson is important to the Kansas City area because it is one of only two urban industrial parks with significant land remaining to be developed. Most of the regional alternatives are suburban parks with relatively expensive land. In addition, Dodson is a source of stability and employment for the adjoining low-income area of the city.

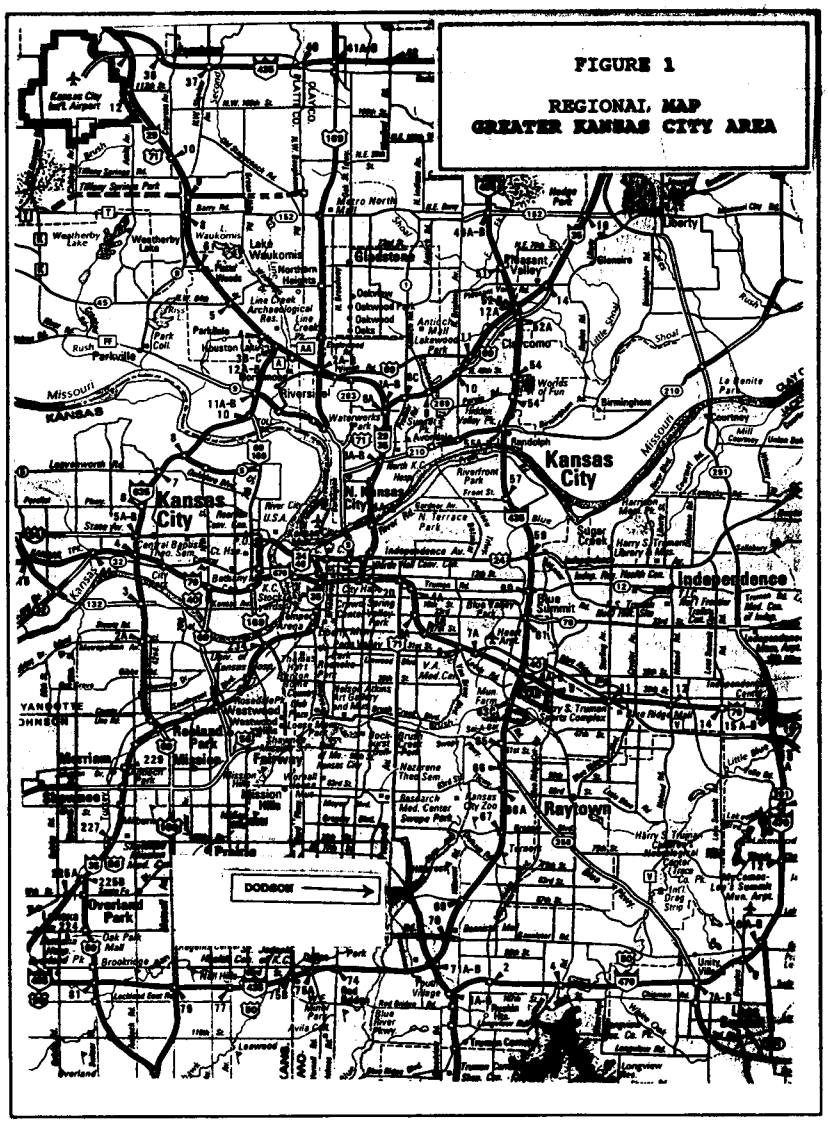



FIGURE 1

REGIONAL MAP
GREATER KANSAS CITY AREA

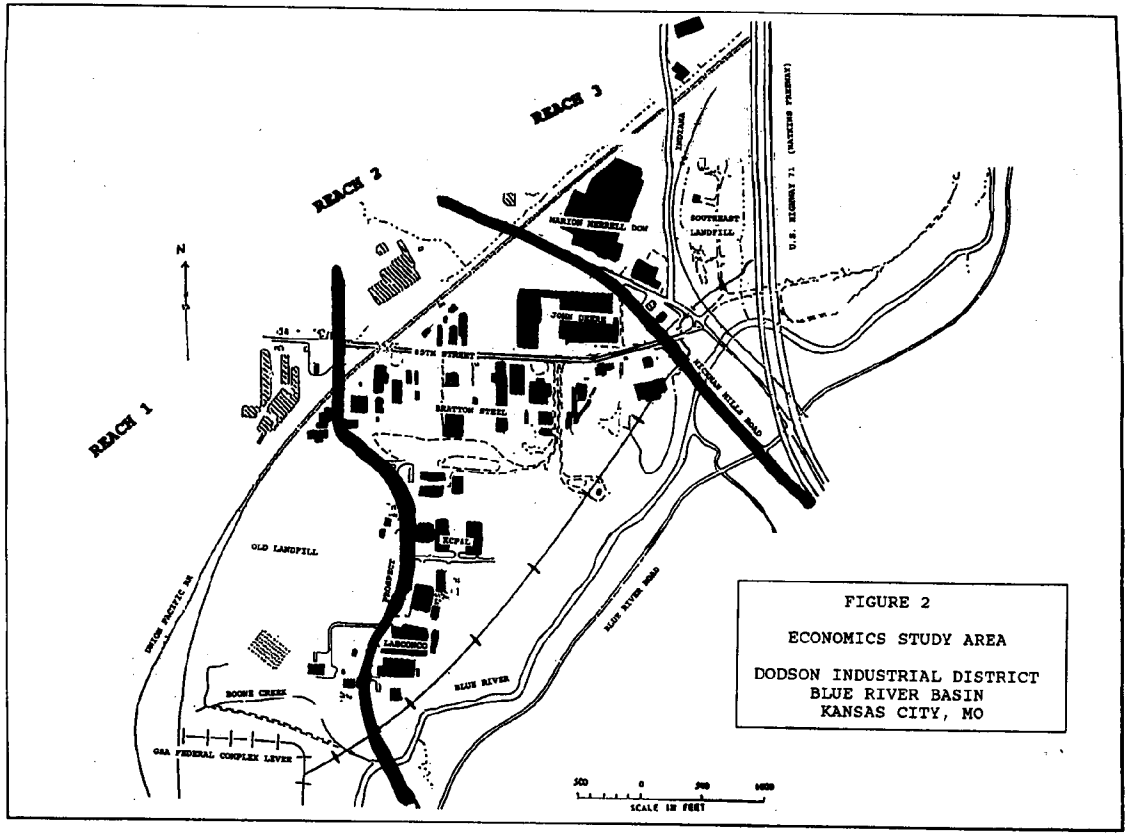



FIGURE 2

ECONOMICS STUDY AREA

DODSON INDUSTRIAL DISTRICT
BLUE RIVER BASIN
KANSAS CITY, MO

## II. WITHOUT-PROJECT CONDITION ANALYSIS

### A. Methodology and Procedures of the Analysis

Economic feasibility analysis in this study follows the procedures outlined in Economic and Environmental Principles and Guidelines for Water and Related Resources Implementation Studies (P&G) in Engineering Regulation (ER) 1105-2-100, dated 28 December 1990.

#### i. Surveys and Interviews

An initial field survey of the Dodson area was accomplished by District personnel in March 1990. Subsequently, more extensive on-site interviews were conducted with most of the firms in the flood plain. The Blue River flood of May 1990 occurred immediately after this initial phase of data-gathering, and a post-flood field survey, including interviews, was done to estimate damages from the flood and to allow comparison of the expected damages developed in the study to damages resulting from an actual flood. Subsequent to the flood, the field survey data have been updated by annual field visits and interviews, most recently in September 1995. This economic analysis reflects January 1996 conditions in Dodson.

Interviews were accomplished with 23 of the 31 enterprises in the floodplain. Attempts to contact and/or schedule interviews with the other 8 enterprises were unsuccessful. However, none of these 8 businesses are key contributors to flood damages in the area.

#### ii. Property Values

Business representatives were asked to provide estimates of the values of their property (excluding land), using prepared estimates or, when necessary, their best judgment. They were asked to provide investment data relative to buildings, equipment, and inventory. The investment values for buildings and equipment are depreciated values, while the values for inventory are replacement costs. The major divisions of property -- buildings, equipment, and inventory -- were subject to further subdivision when warranted by significant investment values. For example, larger companies were asked to provide values for various kinds of equipment, such as computers, office equipment, and rolling stock. Inventory was divided into multiple categories when more than one major type was involved. Companies with more than one building were asked to split their overall estimates of investment into values per building and to identify types of equipment and inventory in each building. Often, Corps personnel made these determinations during on-site inspections of each building.

Representatives of the larger firms generally were better able to provide specific investment data from their records, while estimates provided by smaller businesses often were more informal. In a few instances, values provided by a company were significantly at odds with known values for comparable buildings or items at other companies, or sources for the information seemed doubtful. In such cases, estimates provided by the company were either set aside completely or adjusted to more closely approximate known values for similar items elsewhere.

iii. Property Elevations

Mean sea level (M.S.L.) elevations of structures and contents used in the analysis were obtained in one of two ways. Several of the larger firms made available their engineering floor plans or other surveyed elevations during on-site interviews. Otherwise, ground elevations from contour maps of the area, drawn with two-foot intervals, were used. Elevations of lowest openings and first floors relative to the ground were also noted. Because elevations are meaningful only in relation to a particular point along a stream, the "station" (i.e., the river mile at which the company is located) was also recorded from the maps for use in the analysis.

Line items were used to fine-tune the data collection. As an example, when a warehouse contains a large amount of valuable inventory, it is often racked in several rows, and the upper rows obviously are not as subject to damage as the lower rows. When this occurs, an estimate is made during the on-site interview as to the percentage of inventory on each row. The total inventory is then divided into separate line items to represent each row, with each line item given a different elevation and an appropriate percentage of the overall inventory value, based on visual inspection of the warehouse layout. The same process is applied when splitting contents between buildings.

An example of the use of line items in the analysis of a sample company is displayed in Table 1. The company and the estimates in the table are hypothetical; actual investment data obtained from individual companies is not released as a matter of privacy.

TABLE 1 -- SAMPLE USE OF LINE ITEMS

The hypothetical company used in this example is a small manufacturer. There are three buildings: an office, a plant, and a warehouse. The office is built essentially at grade (i.e., not raised above the lot). The plant and warehouse floors are both built at dock level. The plant contains raw materials racked in rows. The warehouse contains wood finished goods similarly racked.

| ITEM | INVESTMENT VALUE | ELEVATION |
|---|---|---|
| Building A (office) | | |
| Concrete structure | $175,000 | 788.0 |
| Office equipment | $35,000 | 788.5 |
| Computers | $60,000 | 788.5 |
| Building B (plant) | | |
| Concrete structure | $600,000 | 788.0 |
| Production equipment | $1,500,000 | 791.0 |
| Raw materials, row 1 | $400,000 | 791.0 |
| Raw materials, row 2 | $250,000 | 795.0 |
| Raw materials, row 3 | $150,000 | 799.0 |
| Building C (warehouse) | | |
| Concrete structure | $400,000 | 788.0 |
| Forklifts | $75,000 | 791.0 |
| Finished goods, row 1 | $850,000 | 791.0 |
| Finished goods, row 2 | $650,000 | 794.0 |
| Finished goods, row 3 | $400,000 | 797.0 |

iv. Damageability

Damages in this study primarily consist of physical inundation damages to commercial or industrial structures and their contents, or to streets and highways. Businesses were asked to estimate, based on their flood histories, potential physical damages per foot of flooding for each major category of investment. In some cases, businesses were able to base their estimates on past floods by comparing high water marks to actual damage claims. Data from the Blue River flood of May 1990 were particularly useful.

The goal of this portion of the analysis is the production of depth-damage relationships for each type of item susceptible to inundation. These relationships give estimated percentages of damage for each foot of flooding and ideally are tailored to individual companies based on the data they have provided. By developing such relationships, empirical data from a few flood events can be generalized to apply to a broad range of major flood events. Depth-damage relationships are developed for each type of equipment, inventory, or structure.

Because the 1990 flood at Dodson was the first significant flood there since 1961, many Dodson companies had little or no direct flood experience. When flood history was not available as a guide, company officials were asked to make qualitative judgments concerning the relative damageability of their holdings. An item which has experienced prolonged submersion may be relatively salvageable or may be a total loss -- or it may be significantly damaged but partially salvageable. This judgment often can be made confidently even without the benefit of actual flood experience. In addition, standard depth-damage relationships developed by the Kansas City District in previous studies are available for many commonly found items, including office equipment, computers, rolling stock, lumber, food, and electrical parts. Because the damageability of these items rarely varies significantly from one business to another, this data can be used in the absence of more specific first-hand information.

A selection of the depth-damage relationships used in this analysis are summarized in Table 2.

| TABLE 2 -- SAMPLE DEPTH-DAMAGE RELATIONSHIPS | | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM | PERCENTAGE OF DAMAGE PER FOOT OF FLOODING | | | | | | |
| | 1 | 2 | 4 | 6 | 8 | 10 | 12 |
| Concrete bldg. | 5 | 6 | 8 | 12 | 16 | 19 | 25 |
| Metal bldg. | 4 | 6 | 9 | 12 | 16 | 20 | 25 |
| Office equipment | 15 | 30 | 65 | 90 | 100 | 100 | 100 |
| Computers | 30 | 40 | 80 | 95 | 100 | 100 | 100 |
| Forklifts | 10 | 20 | 60 | 100 | 100 | 100 | 100 |
| Tools | 5 | 10 | 35 | 55 | 65 | 75 | 85 |
| Lumber | 10 | 20 | 60 | 85 | 95 | 100 | 100 |
| Auto parts | 10 | 30 | 60 | 70 | 80 | 90 | 100 |
| Drug inventory | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Restaurant inventory | 1 | 10 | 70 | 100 | 100 | 100 | 100 |
| Furniture, wood products | 40 | 75 | 100 | 100 | 100 | 100 | 100 |
| Pipe, steel inventory | 5 | 7 | 11 | 15 | 15 | 15 | 15 |
| General equip. | 10 | 20 | 40 | 60 | 80 | 100 | 100 |
| Paved roads | 1 | 3 | 7 | 13 | 20 | 30 | 40 |

v. Calculation of Primary Damages

Inundation damages in the study area consist of damages to commercial/industrial and public structures and contents and to streets and highways. Many of the businesses in Dodson have heavy investments in high-technology equipment and inventory. Several others have inventories (such as in-transit household goods or pharmaceuticals) which are very susceptible to heavy damage with even a small amount of flooding. About 73% of the total structural investment in Dodson is in building contents (office furnishings, equipment, and inventory). The case for flood protection in Dodson rests on the prevention of potentially heavy losses to the commercial and industrial concerns in the area.

The previously developed depth-damage relationships are applied to a broad range of possible flood events to derive "primary" damages. The "events" refer to floods of various sizes, described in terms of their probabilities over a 100-year period. For example, a 1% chance flood is a relatively severe flood which is estimated to have a 1% chance of occurring during any given year, while a more common 10% chance flood has a 10% chance of occurring in any year and is generally far less severe than a 1% chance flood. A computer program, containing elevations and values for each major line item in each structure in the flood plain, is used to merge hydraulic/hydrologic and depth-damage relationships for various major flood events and to calculate the primary damages for each flood event. The primary damages are calculated for each major flood event by applying the appropriate percentage of damage to the investment value for that line item. Table 3 shows sample calculations of primary damages based on line items from Table 1 and depth-damage relationships from Table 2.

Some relocations are expected to be required as part of the selected plan. This issue is discussed below in the section on benefits. All damage totals in this section of the report reflect existing conditions before relocation.

TABLE 3 -- SAMPLE CALCULATION OF PRIMARY DAMAGES

Values and damages in $1,000s.

Flood elevations at this site are: 10% chance flood - 789.5; 1% chance flood - 793.0; 0.2% chance flood - 796.0.

| LINE ITEM | | | PRIMARY DAMAGES | | | |
|---|---|---|---|---|---|---|
| ITEM | ELEV. | VALUE | EVENT | FLOOD DEPTH | DAMAGE % | DAMAGE $$ |
| Concrete bldg. | 788.0 | $175.0 | 10.0% | 1.5 | 5.5 | $9.6 |
| | | | 1.0% | 5.0 | 10 | $17.5 |
| | | | 0.2% | 8.0 | 16 | $28.0 |
| Wood finished goods row 1 | 791.0 | $850.0 | 10.0% | -1.5 | 0 | $0.0 |
| | | | 1.0% | 2.0 | 75 | $637.5 |
| | | | 0.2% | 5.0 | 100 | $850.0 |
| Wood finished goods row 2 | 794.0 | $650.0 | 10.0% | -4.5 | 0 | $0.0 |
| | | | 1.0% | -1.0 | 0 | $0.0 |
| | | | 0.2% | 2.0 | 75 | $487.5 |

vi. Annualization of Damages

The primary damages for each flood event are annualized by multiplying the mean primary damages and the corresponding probability increment between that flood event and the next most frequent event. The resulting annual damages for each event are summed to obtain cumulative average annual damages. The average annual damages up to each event represent the total benefits possible if the project stopped all floods up to that event.

As an example, in calculating the annual damages for the 1% chance event, assume that the next most frequent event for which primary damages are available is the 2% chance event. The primary damages for the 2% chance event in this example equal $354,000 and equal $655,000 for the 1% chance event. Cumulative average annual damages up to the 2% chance event equal $4,765. Using these data, the difference between the two probabilities would be (0.02 - 0.01) = 0.01. The mean average of the two primary damage totals would be $504,500 (($354,000 + $655,000)/2). Therefore, to obtain the annual damage associated with the 1% chance event, the incremental probability of 0.01 would be multiplied by the mean primary damages of $504,500, yielding annual damages of $5,045. Recalling the cumulative annual damages of $4,765 up to the 2% chance event, the cumulative annual damages up to the 1% chance flood would be $5,045 + $4,765 = $9,810.

Table 4 displays a sample calculation of average annual damages. The simplified example uses the same line items as in Table 3 and the depth-damage relationships from Table 2.

TABLE 4 -- SAMPLE CALCULATION OF AVERAGE ANNUAL DAMAGES

In $1,000s.

| Elev. | Prob. | Incrmnt. | Primary damages | Mean damages | Ann. dmgs. | Cumul. damages |
|---|---|---|---|---|---|---|
| 786.0 | 50.0% | 0.000 | $0 | $0 | $0.0 | $0.0 |
| 787.5 | 20.0% | 0.300 | $0 | $0 | $0.0 | $0.0 |
| 789.5 | 10.0% | 0.100 | $9.6 | $4.8 | $0.5 | $0.5 |
| 790.5 | 4.0% | 0.060 | $11.4 | $10.5 | $0.6 | $1.1 |
| 792.0 | 2.0% | 0.020 | $354.0 | $182.7 | $3.7 | $4.8 |
| 793.0 | 1.0% | 0.010 | $655.0 | $504.5 | $5.0 | $9.8 |
| 795.0 | 0.5% | 0.005 | $1,134.5 | $894.8 | $4.5 | $14.3 |
| 796.0 | 0.2% | 0.003 | $1,365.5 | $1,250.0 | $3.8 | $18.0 |
| 797.5 | 0.1% | 0.001 | $1,531.5 | $1,448.5 | $1.4 | $19.5 |

vii. Future Condition

The base year for the damage analysis is 1997. However, the 1997 condition does not fully reflect the continued urbanization expected in the upstream portion of the Blue River basin. Johnson County, Kansas, which contains much of the upstream river basin, is largely a suburban area which has grown rapidly since World War II and is one of the wealthiest counties in the United States. Overland Park, the largest city in the county, is a classic "edge city" -- a self-sufficient suburb where people live, work, shop, and have little or no contact with the urban core -- which, according to regional projections, is expected to continue to experience intense growth and hyper-development. The county's population, estimated to be 355,100 in 1990, most recently was estimated to total 419,000 as of July 1995. It is expected to grow to 465,100 in 2000 (an increase of 16.6% over 1994), 554,700 in 2010, and 592,300 in 2015 (a 21-year increase of 48.4% over 1994), according to estimates made by the Kansas Division of Budget. The remainder of the upstream Blue River basin is in southwestern Jackson County, Missouri. Most of this portion of the Kansas City metropolitan area is made up of older but quite prosperous suburban areas, and additional urbanization is also forecast in this part of the basin (although not as much as in the newer communities of Johnson County, where there is more undeveloped land).

Therefore, in order to avoid understating potential damages, a future condition was analyzed, reflecting the greater imperviousness expected to result from urbanization in the upstream basin. The year chosen for the future condition analysis was 2015, since urbanization of the basin is expected to be more or less complete by that date. Regional land use projections for Johnson and Jackson Counties were used in the calculations. Expected annual damages for the future condition were calculated and then discounted based on the 18-year growth period and the current Federal interest rate of 7 5/8%. The present worth of the increase in damages from 1997 to 2015 was then added to the 1997 base year damages. Thus, the damage figures presented in this report are those that would be expected assuming 1997 conditions, together with the additional damages that would be expected under 2015 conditions, with all damages expressed in 1995 prices.

It should be noted that no future development was projected in the Dodson study area in calculating damage totals for the 2015 condition. The 2015 totals reflect only development existing in the base year of 1997, as affected by 2015 hydrologic and hydraulic conditions. In addition, 1997 base year totals do not embody any urbanization effects or appreciation in value that might occur between the report completion date and the base year.

viii. Study Reaches

The study area was divided into three reaches for purposes of the economic analysis. The basis for the reach delineations is primarily convenience in this case, although hydrologic and hydraulic distinctions also exist. Reach 1 is the upstream end of the area west of the Prospect Avenue bridge, which contains the Boone Creek basin. This area is affected by Blue River flooding more frequently than the rest of the area. Reach 2 contains the majority of the land and investment in the study area and the great majority of the damage except in the largest floods. It extends from the Prospect bridge to Hickman Mills Drive (old Highway 71). Reach 3 is the portion of the district just downstream of Hickman Mills Drive. This area does not flood frequently, but accounts for substantial damages in a large event.

Total investment relative to these reaches is shown in Table 5. Figure 2 shows the area as divided into reaches.

TABLE 5 -- TOTAL INVESTMENT BY REACH

October 1995 prices; 1997 base year
In $1,000s

| | # firms* | investment | % of total | zero-damage freq.** |
|---|---|---|---|---|
| Reach 1 | 7 | $6,969.0 | 3.1% | 28.6% |
| Reach 2 | 21 | $97,185.0 | 43.5% | 16.7% |
| Reach 3 | 6 | $119,134.0 | 53.4% | 4.3% |
| Total | 34 | $223,288.0 | 100.0% | |

* Number of enterprises shown differs from the total of 30 given elsewhere because of inclusion of vacancies and of companies with more than one location.

** Zero-damage frequency is the frequency associated with the lowest damageable property in that reach.

## B. Results of Physical Inundation Damage Analysis

### i. Total Expected Damages

Total primary damages are displayed by reach in Table 6. Primary damages total about $35.8 million in a 1% chance flood event and $138.2 million in a 0.2% chance event. Total annual damages, summarized by reach in Table 7, amount to $807,000 in a 1% chance event and $1,556,000 in a 0.2% chance event. More detailed breakdowns of both primary and average annual damages for reaches 1, 2, and 3 are presented in Tables 8, 9, and 10.

TABLE 6 -- TOTAL PRIMARY DAMAGES

October 1995 prices; 1997 base year
In $1,000s

| Event | Reach 1 | Reach 2 | Reach 3 | Total |
|---|---|---|---|---|
| 10.0 % | 63.7 | 332.2 | 23.8 | 419.7 |
| 4.0 % | 286.1 | 7,415.4 | 138.9 | 7,840.4 |
| 2.0 % | 943.6 | 23,116.1 | 2,018.5 | 26,078.2 |
| 1.0 % | 1,344.9 | 31,138.0 | 3,355.9 | 35,838.7 |
| 0.5 % | 2,057.2 | 46,729.6 | 60,371.3 | 109,158.1 |
| 0.2 % | 2,690.4 | 58,818.9 | 76,662.4 | 138,171.6 |
| Reach % | 1.9% | 42.6% | 55.5% | 100.0% |

TABLE 7 -- TOTAL ANNUAL DAMAGES

October 1995 prices; 1997 base year
In $1,000s

| Event | Reach 1 | Reach 2 | Reach 3 | Total |
|---|---|---|---|---|
| 10.0 % | $2.8 | $11.9 | $1.7 | $16.4 |
| 4.0 % | $12.5 | $143.6 | $4.5 | $160.6 |
| 2.0 % | $24.8 | $448.2 | $22.8 | $495.8 |
| 1.0 % | $36.5 | $720.8 | $50.1 | $807.4 |
| 0.5 % | $45.1 | $916.9 | $224.3 | $1,186.3 |
| 0.2 % | $52.3 | $1,074.1 | $429.1 | $1,555.5 |
| Reach % | 3.3% | 67.1% | 29.7% | 100.0% |

TABLE 8 -- AVERAGE ANNUAL DAMAGES; REACH 1

Index point: mile 20.9 October 1995 prices
1997 base year In $1,000s

| | | Commercial | | Public | |
|---|---|---|---|---|---|
| Elev. | Prob. | Primary damage | Annual damage | Primary damage | Annual damage |
| 780.3 | 50.000% | $0.0 | $0.0 | $0.0 | $0.0 |
| 787.4 | 20.000% | $2.4 | $0.1 | $0.0 | $0.0 |
| 790.6 | 10.000% | $52.0 | $2.6 | $11.8 | $0.3 |
| 792.1 | 6.667% | $95.2 | $5.0 | $62.0 | $1.5 |
| 793.4 | 5.000% | $160.5 | $7.2 | $83.0 | $2.7 |
| 794.1 | 4.000% | $194.1 | $8.9 | $92.0 | $3.6 |
| 796.1 | 2.500% | $619.9 | $15.1 | $156.7 | $5.4 |
| 796.7 | 2.000% | $756.5 | $18.5 | $187.1 | $6.3 |
| 797.3 | 1.333% | $927.2 | $24.3 | $312.0 | $7.9 |
| 797.5 | 1.000% | $991.1 | $27.5 | $353.7 | $9.1 |
| 798.9 | 0.667% | $1,239.3 | $31.2 | $613.2 | $10.7 |
| 799.7 | 0.500% | $1,306.5 | $33.3 | $750.8 | $11.8 |
| 800.4 | 0.400% | $1,359.8 | $34.6 | $905.4 | $12.6 |
| 801.0 | 0.333% | $1,416.9 | $35.6 | $1,065.0 | $13.3 |
| 801.1 | 0.250% | $1,465.3 | $36.8 | $1,165.3 | $14.2 |
| 802.4 | 0.200% | $1,506.8 | $37.5 | $1,183.6 | $14.8 |
| 803.0 | 0.154% | $1,535.3 | $38.2 | $1,218.2 | $15.4 |
| 803.4 | 0.133% | $1,558.9 | $38.5 | $1,230.2 | $15.6 |
| 803.9 | 0.100% | $1,586.3 | $39.1 | $1,253.5 | $16.0 |
| 805.1 | 0.050% | $1,638.9 | $39.9 | $1,288.1 | $16.7 |
| 805.7 | 0.033% | $1,668.0 | $40.1 | $1,328.5 | $16.9 |
| 806.2 | 0.025% | $1,681.0 | $40.3 | $1,335.1 | $17.0 |
| 806.4 | 0.020% | $1,688.7 | $40.4 | $1,336.4 | $17.1 |

TABLE 9 -- AVERAGE ANNUAL DAMAGES; REACH 2

Index point: mile 20.4 October 1995 prices
1997 base year In $1,000s

| | | Commercial | | Public | |
|---|---|---|---|---|---|
| Elev. | Prob. | Primary damage | Annual damage | Primary damage | Annual damage |
| 778.3 | 50.000% | $0.0 | $0.0 | $0.0 | $0.0 |
| 785.7 | 20.000% | $0.0 | $0.0 | $21.7 | $2.4 |
| 788.6 | 10.000% | $279.3 | $6.0 | $52.9 | $5.9 |
| 790.1 | 6.667% | $1,646.0 | $38.1 | $81.9 | $8.1 |
| 791.2 | 5.000% | $3,325.2 | $79.5 | $118.0 | $9.8 |
| 791.8 | 4.000% | $7,271.8 | $132.5 | $143.6 | $11.1 |
| 793.7 | 2.500% | $18,903.5 | $328.8 | $222.8 | $13.8 |
| 794.2 | 2.000% | $22,866.1 | $433.2 | $250.0 | $15.0 |
| 795.0 | 1.333% | $28,904.7 | $603.4 | $294.8 | $16.8 |
| 795.3 | 1.000% | $30,823.4 | $702.9 | $314.6 | $17.8 |
| 796.7 | 0.667% | $41,674.5 | $823.8 | $401.9 | $19.0 |
| 797.4 | 0.500% | $46,273.8 | $897.1 | $455.8 | $19.8 |
| 798.1 | 0.400% | $49,434.4 | $945.0 | $509.2 | $20.2 |
| 798.7 | 0.333% | $53,377.0 | $979.4 | $559.0 | $20.6 |
| 798.8 | 0.250% | $54,640.1 | $1,024.4 | $583.9 | $21.1 |
| 799.9 | 0.200% | $58,143.5 | $1,052.8 | $675.4 | $21.4 |
| 800.5 | 0.154% | $59,321.0 | $1,079.9 | $724.0 | $21.7 |
| 800.9 | 0.133% | $60,290.1 | $1,092.1 | $765.4 | $21.9 |
| 801.4 | 0.100% | $61,318.3 | $1,112.4 | $813.2 | $22.1 |
| 802.5 | 0.050% | $63,625.9 | $1,143.6 | $908.5 | $22.6 |
| 803.1 | 0.033% | $64,297.2 | $1,154.3 | $961.8 | $22.7 |
| 803.6 | 0.025% | $64,842.2 | $1,159.7 | $1,014.0 | $22.8 |
| 803.9 | 0.020% | $65,218.9 | $1,162.9 | $1,045.4 | $22.8 |

TABLE 10 -- AVERAGE ANNUAL DAMAGES; REACH 3

Index point: mile 19.9
1997 base year

October 1995 prices
In $1,000s

| | | Commercial | | Public | |
|---|---|---|---|---|---|
| Elev. | Prob. | Primary damage | Annual damage | Primary damage | Annual damage |
| 775.8 | 50.000% | $0.0 | $0.0 | $0.0 | $0.0 |
| 782.9 | 20.000% | $0.0 | $0.0 | $6.5 | $0.3 |
| 785.9 | 10.000% | $0.0 | $0.0 | $23.8 | $1.7 |
| 787.4 | 6.667% | $0.0 | $0.0 | $38.4 | $2.7 |
| 788.5 | 5.000% | $0.0 | $0.0 | $56.1 | $3.5 |
| 789.2 | 4.000% | $75.3 | $0.4 | $63.6 | $4.1 |
| 791.1 | 2.500% | $1,117.2 | $9.3 | $106.2 | $5.4 |
| 791.6 | 2.000% | $1,900.3 | $16.9 | $118.2 | $5.9 |
| 792.4 | 1.333% | $2,755.1 | $32.9 | $137.2 | $6.8 |
| 792.7 | 1.000% | $3,206.1 | $42.9 | $149.8 | $7.3 |
| 794.1 | 0.667% | $45,548.5 | $124.1 | $195.9 | $7.8 |
| 794.8 | 0.500% | $60,151.8 | $216.1 | $219.5 | $8.2 |
| 795.5 | 0.400% | $65,882.9 | $279.2 | $239.5 | $8.4 |
| 796.1 | 0.333% | $70,074.9 | $324.6 | $262.1 | $8.6 |
| 796.2 | 0.250% | $70,074.9 | $383.0 | $262.1 | $8.8 |
| 797.3 | 0.200% | $76,357.8 | $420.1 | $304.7 | $8.9 |
| 797.9 | 0.154% | $79,690.8 | $456.2 | $320.1 | $9.1 |
| 798.3 | 0.133% | $82,949.0 | $472.9 | $336.7 | $9.2 |
| 798.9 | 0.100% | $86,231.1 | $501.1 | $350.1 | $9.3 |
| 800.3 | 0.050% | $91,048.3 | $545.4 | $395.4 | $9.5 |
| 801.1 | 0.033% | $92,715.7 | $560.7 | $413.9 | $9.5 |
| 801.6 | 0.025% | $93,863.7 | $568.5 | $428.5 | $9.6 |
| 802.0 | 0.020% | $94,632.1 | $573.2 | $441.4 | $9.6 |

ii. Future Condition

Average annual damages for a 0.2% chance flood event, according to this model, would be expected to increase by about 26% over the 18-year period from 1997 to 2015 (from $1,556,000 to $1,967,000). The total expected annual damages for the 0.2% chance event, including the discounted future increment, are estimated to be $1,904,000. (Discounting is computed at the current Federal interest rate of 7 5/8%.) The discounted future damages account for about 11.9% of this total. For the 1% chance event, damages would be expected to increase by about 18 percent over the 18-year period ($807,000 to $954,000). Future condition damages and their relationship to the 1997 condition are summarized in Table 11 (primary damages) and Table 12 (annual damages).

TABLE 11 -- GROWTH IN PRIMARY DAMAGES, 1997 TO 2015

October 1995 prices
In $1,000s

| Event | 1997 | 2015 | Increase (%) |
|---|---|---|---|
| 10.0 % | $419.7 | $1,274.1 | 203.6% |
| 4.0 % | $7,840.4 | $14,778.5 | 88.5% |
| 2.0 % | $26,078.2 | $31,928.1 | 22.4% |
| 1.0 % | $35,838.7 | $69,002.6 | 92.5% |
| 0.5 % | $109,158.1 | $116,795.3 | 7.0% |
| 0.2 % | $138,171.6 | $141,560.5 | 2.5% |

| TABLE 12 -- GROWTH IN ANNUAL DAMAGES, 1997 TO 2015 | | | | | |
|---|---|---|---|---|---|
| October 1995 prices<br>In $1,000s | | | | | |
| Event | 1997 | 2015 | Increase | Disc.* | Total |
| 10.0 % | $16.4 | $18.2 | 10.8% | $1.0 | $17.4 |
| 4.0 % | $160.6 | $190.9 | 18.9% | $16.8 | $177.4 |
| 2.0 % | $495.8 | $586.3 | 18.2% | $50.1 | $545.9 |
| 1.0 % | $807.4 | $953.5 | 18.1% | $80.8 | $888.2 |
| 0.5 % | $1,186.3 | $1,516.2 | 27.8% | $181.0 | $1,367.3 |
| 0.2 % | $1,555.5 | $1,966.8 | 26.4% | $225.9 | $1,781.4 |
| * This column represents the portion of the increase in damages which is counted in the benefits; i.e., the discounted present worth of the increase. | | | | | |

iii. Damage Profiles by Event

(a) 10% Chance Flood

In the existing, without-project, 1997 base year condition, a 10% chance flood would cause an estimated $420,000 in damage in the Dodson district, with damage to 8 enterprises. Reach 1, while containing less investment than the other reaches, is hit harder proportionally by more frequent events. Damages in this reach begin near the 30% chance flood elevation. Despite accounting for only a little over 3% of total Dodson investment, reach 1 would suffer about $64,000 in damage, or about 15.2% of the total, in a 10% chance event. Three enterprises would be affected, with water depths of up to 4.5 feet. Annual damages up to this event would be about $2,800 in reach 1. (Note that totals of firms affected in this section of the report exceed the total of 30 enterprises previously cited. This is due to the inclusion of vacant businesses and the double-counting of firms with more than one location.)

Damages in reach 2 would total an estimated $332,000 (about $11,900 in average annual damages), about 79.2% of the district total. Five of 22 enterprises in the reach would be damaged by average flood depths of about one foot. Damages in this reach begin near the 15% chance flood elevation. In reach 3, the reach with the largest total investment, only $24,000 in damage, or 5.7% of total damages for the 10% chance event, would be expected to occur. No enterprises would be damaged directly by a flood of this magnitude in this reach; all damage would be to streets,

portions of which are low-lying. Commercial damages would not occur below a 4% chance event elevation. Average annual damages up to this event for reach 3 would be $1,700. Table 13 summarizes the 10% chance event damage profile.

TABLE 13 -- DAMAGE PROFILE: 10% CHANCE FLOOD

In $1,000s

| | # companies affected | primary damage | percent of total | annual damage |
|---|---|---|---|---|
| Reach 1 | 3 | $63.7 | 15.2% | $2.8 |
| Reach 2 | 5 | $332.2 | 79.2% | $11.9 |
| Reach 3 | 0 | $23.8 | 5.7% | $1.7 |
| Total | 8 | $419.7 | 100.0% | $16.4 |

(b) 1% Chance Flood

A 1% chance flood would damage 32 enterprises in the study area, with damage estimated at $35.8 million. In reach 1, six of the seven enterprises would be damaged. Expected damages would total $1.3 million ($36,500 annual), with water depths ranging from 2.5 to 11.5 feet. About 4% of total primary damages for this event are accounted for by reach 1. Reach 2 continues to be the hardest hit reach in a 1% chance event. All 22 enterprises in this reach are in the 1% floodplain. Expected damages would total $31.1 million in reach 2 ($720,800 annual), about 87% of the total. Flood depths would reach 8 feet, with an average depth of around 4 feet. The reach 3 profile shows 4 of 6 companies in the reach affected by this event. Damage would exceed $3 million ($50,100 annual), about 9% of the total. Depths range from 2 to 4 feet. Table 14 summarizes the damages expected in a 1% chance event.

TABLE 14 -- DAMAGE PROFILE: 1% CHANCE FLOOD

In $1,000s

| | # companies affected | primary damage | percent of total | annual damage |
|---|---|---|---|---|
| Reach 1 | 6 | $1,344.9 | 3.8% | $36.5 |
| Reach 2 | 21 | $31,138.0 | 86.9% | $720.8 |
| Reach 3 | 4 | 3,355.9 | 9.4% | $50.1 |
| Total | 31 | $35,838.7 | 100.0% | $807.4 |

(c) 0.2% Chance Flood

Total damages in a 0.2% chance event would be $155.5 million, affecting 34 enterprises. Reach 3 becomes a much greater factor in an event of this size. This reach accounts for only about 10% of the damage in a 1% chance event, but 56% in a 0.2% chance event. Estimated damages in reach 3 would total $76.7 million ($429,100 in annual damages), affecting all six companies in the reach. Flood depths would reach 8.5 feet. In reach 2, the expected damage would be $58.8 million ($1,074,100 annual), about 43% of the total. All 22 companies would be affected by depths of up to 12.5 feet, averaging 7 to 8 feet. In reach 1, the damage would be about $2.7 million ($52,300 annual), about 2% of the total. As much as 16 feet of water would inundate parts of this reach. Table 15 summarizes the 0.2% chance flood event.

TABLE 15 -- DAMAGE PROFILE: 0.2% CHANCE FLOOD

In $1,000s

| | # companies affected | primary damage | percent of total | annual damage |
|---|---|---|---|---|
| Reach 1 | 7 | $2,690.4 | 1.9% | $52.3 |
| Reach 2 | 21 | $58,818.9 | 42.6% | $1,074.1 |
| Reach 3 | 6 | $76,662.4 | 55.5% | $429.1 |
| Total | 34 | $138,171.6 | 100.0% | $1,555.5 |

iv. The 1990 Dodson Flood

The Dodson Industrial District's most recent experience with significant Blue River flooding occurred on 15-16 May 1990, during the preparation of this feasibility report. (The Blue River was a rare exception to the region-wide flooding of 1993. The Dodson area was not affected.) A post-flood damage assessment was done, based on an on-site visit and subsequent telephone interviews. The most serious damages occurred to businesses located along Prospect Avenue, near the river. A moving and storage company was hardest hit, with losses estimated at 50% of their inventory (household goods in transit) and office furniture. Significant damage also occurred at three other businesses. In all, eight firms were damaged, and a dozen others had water on their property and narrowly escaped flooding indoors. The post-flood damage assessment estimated $1.35 million in total losses to the Dodson district ($1.6 million in 1995 prices) as a result of the May 1990 flood. The storm producing this flood was estimated to have been a 6.67% chance event (i.e., approximately a 15 year flood).

Data from the 1990 flood experience were used in calculating and checking the expected damages estimated for this feasibility study. A 6.67% chance event, in this study, would be expected to cause about $1.9 million in damages. This expected result, in a district with over $200 million in investment, is in the same range as the actual damages for the 1990 flood, considering that no two floods of the same probability are identical and that damage from floods in this range of probability could be very sensitive to variations in depth of even a few inches due to the highly-damageable inventory of at least one company that would be affected.

v. Feasibility vs. Reconnaissance Analysis Results

The damage estimates prepared for this feasibility study are comparable to those estimated for the Blue River basin reconnaissance report of 1987. Damages from a 0.2% chance flood were estimated at $108 million in the reconnaissance study (1986 price levels), which is equivalent to $150.7 million in 1995 prices. Damages for an event of this size are now estimated at $138.2 million. For a 1% chance flood, the reconnaissance study estimated damages of $35.2 million ($49.1 million in 1995 prices), while the current estimate is $35.8 million. In the feasibility study, damage estimates are somewhat higher for more frequent flood events in comparison to the reconnaissance report, reflecting experience with actual Blue River floods (particularly 1990) in the Dodson area. The expected damages for a 10% chance flood would be $420,000, compared to $180,000 ($250,000 in 1995 prices) in the 1987 report.

C. Other Costs of Flooding

Public losses from floods, in addition to physical damages to buildings and roads, also include indirect inundation costs associated with emergency flood-fighting services, traffic interruptions, and flood insurance administrative costs. The potential benefits of a flood control plan include the prevention of losses associated with these costs. The process of determining these benefits is similar to the treatment of physical damages. Empirical data is gathered and used to estimate expected losses for each of several events. These estimated losses are conceptually similar to primary damages. Annual damages and benefits are then produced by integrating the primary damages with stage-probability data.

Costs due to flood-related traffic interruptions in the Dodson area were considered but were found to add only a negligible amount to the average annual damages. Traffic interruption costs are not reflected in the totals for this analysis.

i. Emergency Floodfighting Costs

Emergency costs usually are expenses for either police and fire flood-fighting personnel and equipment or flood evacuation measures by businesses. In either case, only those expenses which exceed normal levels of staffing are counted. The city government and several companies were contacted to obtain estimated costs incurred during actual floods. Estimated flood-fighting costs for the May 1990 flood, according to the city, amounted to about $85,900 in 1995 prices. The city had no comparable data on other floods. Expenditures by companies during the 1990 flood totalled another $166,400, for a total emergency cost of $252,300. This was the only event for which empirical data were available.

In the absence of empirical data for more than one event, emergency costs for a range of events were determined by calculating an average cost per hour based on the 1990 flood and then applying the cost per hour to other major events based on their expected duration. The 1990 flood "stayed up" (meaning, for this purpose, that the water exceeded the 50% chance flood elevation) for an estimated 27 hours, according to the hydrographs established for the flood from the Bannister Road river gauge. From this data, an average emergency cost per hour of about $9,300 was deduced ($252,300 / 27). Expected costs for other events were calculated by multiplying the $9,300 by the expected duration (as specified above) of the event in hours. A 2% chance flood, for example, would be expected to stay up for about 38 hours, resulting in an estimated emergency cost of about $353,400 for that event.

The resulting emergency costs per event, which are comparable conceptually to primary damages, are then annualized by the method of integrating stages, probabilities, and damages. The annualized emergency costs are distributed to the three study reaches according to frequency of flooding and density of roads and businesses. The annual benefit is distributed as follows: 10% to reach 1; 80% to reach 2; 10% to reach 3.

The total annual benefit, gained by obviating floodfighting costs up to the 0.2% chance event, is $48,200. Table 16 summarizes emergency cost calculations, displaying expected durations, costs, and annual damages for various flood events.

| TABLE 16 -- EMERGENCY FLOODFIGHTING COSTS | | | |
|---|---|---|---|
| 1995 prices<br>Based on average cost/hour of $9,300 | | | |
| Event | Duration (hours) | Costs (primary dmgs) | Annual costs (benefits) |
| 50% | 3 | $27,900 | $0 |
| 20% | 6 | $55,800 | $12,600 |
| 10% | 12 | $111,600 | $20,900 |
| 6.67% (1990) | 27 | $252,300 | $27,000 |
| 4% | 36 | $334,800 | $34,500 |
| 2% | 38 | $353,400 | $41,400 |
| 1% | 40 | $372,000 | $45,000 |
| 0.5% | 44 | $409,200 | $46,900 |
| 0.2% | 48 | $446,400 | $48,200 |
| 0.1% | 56 | $520,800 | $48,700 |
| 0.02% | 72 | $669,600 | $49,100 |

ii. Flood Insurance Administrative Costs

Floodplain tenants who are susceptible to flooding by 1% chance or more frequent floods often purchase flood insurance to cover at least some of their damages after the occurrence of flooding. The administrative cost of flood insurance policies is considered an NED cost of flooding. Structural plans which prevent damage from at least a 1% chance flood remove the requirement for flood insurance policies, and the administrative costs consequently saved constitute an NED benefit. The annual benefit for any plan is estimated by multiplying the number of structures removed from the high hazard area by the annual administrative cost per policy. Costs may be counted only for those tenants known to hold policies.

A standard estimate of the average administrative cost per flood insurance policy, revised annually, is used in Corps of Engineers economic analyses nationwide. The 1995 estimate is $115 per policy. The field survey found that 13 of 31 enterprises in Dodson had current policies (5 in reach 1, 6 in reach 2, 2 in reach 3). The annual administrative cost of flood insurance to Dodson floodplain tenants, and the attendant benefit associated with the selected plan, therefore is estimated to be $1,495 (13 X $115 = $1,495). Table 17 summarizes the costs by reach.

| TABLE 17 -- FLOOD INSURANCE COSTS | | | |
|---|---|---|---|
| | # companies with policies | admin. cost/ policy | total benefit |
| Reach 1 | 5 | $115 | $600 |
| Reach 2 | 6 | $115 | $700 |
| Reach 3 | 2 | $115 | $200 |
| Total | 12 | | $1,500 |

## III. WITH PROJECT CONDITION ANALYSIS

### A. Plan Selection

#### i. NED Analysis in Concept

Economic costs and benefits resulting from a project are evaluated in terms of their impacts on national wealth, without regard to where in the United States the impacts may occur. National Economic Development (NED) benefits must result directly from a project and must represent net increases in the economic value of goods and services to the national economy (not simply to a locality). For example, if a flood interrupts auto production at a given plant in one community, that community suffers a loss -- but if the affected company replaces the interrupted production at another plant in another city, the community's loss does not represent a net loss to the national economy, and the prevention of such a loss is not claimable as an NED benefit.

NED costs represent the costs of diverting resources from other uses in implementing the project, as well as the costs of uncompensated economic losses resulting from detrimental effects of the project. The benefit-cost ratio and the net NED benefits are calculated during the evaluation process. Net benefits represent the amount by which the NED benefits exceed the NED costs. The plan with the highest net benefits (not necessarily the highest benefit-cost ratio) is considered the recommended plan, assuming technical feasibility, environmental soundness, and public acceptability.

ii. NED Plan Selection

The NED plan was selected from a matrix which included 48 combinations, or 24 for each of two levels of protection: the 1% chance flood and the 0.2% chance flood. Each of the 24 combinations was comprised of one of two alternatives in reach 1, one of three alternatives in reach 2, and one of four alternatives in reach 3. Preliminary construction costs were formulated for all 48 of the combinations and then annualized in October 1992 prices at the then-current interest rate of 8 1/4%. Annual benefits were also calculated for each combination. The matrix compared the annual costs, benefits, and net benefits for each combination.

The only difference in the combinations affecting benefits was the number of relocations required and the level of protection. In particular, the use of alternative 1 in reach 2 required three relocations, while alternatives 2 and 3 in this reach required only one relocation. In 1992 prices, the annual benefits at the 0.2% chance level of protection were estimated to be $1,632,000 for the plans using alternative 1 (three relocations) in reach 2, while the plans using alternatives 2 or 3 in reach 2 had benefits of $1,685,000. For the 1% chance level of protection, the plans with alternative 1 in reach 2 had annual benefits estimated at $1,016,000, compared with $1,102,000 for the plans with alternatives 2 or 3.

The matrix indicated that the highest net benefits generally were associated with plans built to the 0.2% chance flood elevation. Sixteen of the 24 combinations at this level of protection were economically feasible. Only 8 of the 24 combinations with 1% chance protection were feasible, and their net benefits were below $100,000, while half of the 0.2% chance protection combinations had net benefits of over $100,000. Net benefits were highest for those 0.2% chance protection combinations employing alternative 1 in reach 1 and alternative 1 in reach 2. These plans had net benefits ranging from $370,000 to $483,000 in 1992 prices. The combination with the highest net benefits was combination 114 (alternative 1 in reach 1, 1 in reach 2, and 4 in reach 3), which had estimated net benefits of $483,000 at the 0.2% chance level of protection.

A cost curve also was developed enabling comparison of annual costs and benefits at a variety of different levels of protection. The curve was based on preliminary construction costs for the 4%, 1% and 0.2% chance levels of protection. The cost curve confirmed that net benefits were maximized at about the 0.2% chance flood elevation.

Therefore, based on the results of the matrix and the cost curve, combination 114, with protection up to the 0.2% chance flood, was judged the NED plan and was carried forward for more extensive evaluation of costs and benefits. The annual benefits,

costs, and net benefits for this combination, as reflected in the final analysis, differ from the original 1992 totals because of updated field survey information, changes in prices levels and interest rates, and more detailed cost estimates. However, none of the revisions in costs and benefits since the original NED screening analysis would have affected the ranking of the combinations.

## B. Benefits Analysis

This section summarizes the theory of benefit computations used in Corps of Engineers economic analyses. Subsequently, various topics related to benefit calculations are discussed, including risk, relocations, location benefits, negative benefits, incremental considerations, and residual damages. Finally, economic impacts falling outside Corps benefit analysis methods are summarized.

### i. NED Analysis of Dodson Benefits

Annual benefits for the selected plan at Dodson include prevention of physical inundation damages up to the 0.2% chance flood elevation. The structural benefits are divided into commercial and public benefits, and each of these is split into four subcategories: (a) damages prevented under the 1997 base condition, up to the 0.2% event elevation; (b) freeboard benefits, as discussed immediately below under risk considerations; (c) the present-worth of the damages prevented for 2015 conditions; and (d) a small negative benefit due to interior ponding which will exist in the with-project condition (also discussed below), which must be deducted from the benefits. Other categories of benefits include prevention of emergency floodfighting costs and flood insurance administrative costs, as well as location benefits.

### ii. Risk Considerations

As this report was in the final stages of preparation, the Corps was beginning implementation of a new regulatory procedure for calculating economic benefits under conditions of risk and uncertainty. The traditional method for dealing with risk in projects similar to Dodson was to build the levee three feet higher than the targeted level of protection in order to permit wave action and allow a margin of safety for a storm of the design level. Under these procedures, the economic analysis of benefits included (1) all damages prevented up to the targeted level of protection, and (2) 50% of the damages prevented in the range above the level of protection (normally three feet). These procedures were used in calculating benefits for the present study. Study deadlines and budgets did not permit significant revision incorporating the new risk analysis procedures into the substantially completed report, and in accordance with guidance

from Corps headquarters providing for a phase-in period for the new procedures, the benefits presented in this study reflect traditional Corps methodology based on the assumption of three feet of overtopping margin above the 0.2% chance flood elevation. Table 21, which summarizes total benefits, includes overtopping margin benefit totals for each reach.

iii. Relocations

The selected plan is expected to disrupt four enterprises (one of which currently is vacant) to such an extent as to require their relocation. Affected enterprises include one small company in reach 1 and two companies and a vacant business in reach 2. The investment and damage totals displayed in the earlier sections of the appendix are oriented to the existing, without-project condition and, as such, include the four enterprises. A second set of damage computations also was prepared with the four firms deducted, and this set of damage totals was used in calculating annual benefits related to structural inundation.

Table 18 indicates the impact on the economic analysis of deducting the four businesses. Investment, primary damages, and annual damages for each of five events are displayed for both the existing condition and the with-project, with-relocations condition. The removal of the four companies reduces total investment in Dodson by about $6.3 million. Primary damages associated with 0.2% chance event are reduced by $4.33 million, and annual damages for that event are reduced by $26,900.

iv. Location Benefits

Parcels of flood-plain land which are undeveloped or underutilized due to their tendency to flood may be developed for commercial or residential purposes in the event of effective flood protection. The additional income accruing to an area from a change in land use is called a location benefit.

Computation of location benefits began by examining future development in the Dodson floodplain in the context of Executive Order 11988. This regulation states that floodplain land should not be used unless there are significant economic advantages to doing so relative to other available sites. The survey involved examining the market values and characteristics of land available for development in competing industrial parks around metropolitan Kansas City. As discussed at the beginning of this appendix, Dodson offers potential buyers certain advantages, such as good (and improving) highway access, nearby residential areas, large companies with national reputations anchoring the district, and good infrastructure. As for market values, our investigation found that those industrial parks continuing to have significant land available for development generally are located in suburban areas with higher property values. Such areas are not affordable for all

| TABLE 18 -- IMPACT OF RELOCATIONS | | | |
|---|---|---|---|
| In $1,000s<br>1997 base year totals only | | | |
| Event | Existing | With Relocations | Reduction |
| INVESTMENT | | | |
| -- | $223,288.0 | $216,986.0 | $6,302.0 |
| PRIMARY DAMAGES | | | |
| 10% | $419.7 | $374.2 | $45.5 |
| 4% | $7,840.4 | $7,707.9 | $133.0 |
| 2% | $26,078.2 | $25,853.6 | $224.6 |
| 1% | $35,838.7 | $35,579.8 | $258.9 |
| 0.2% | $138,171.6 | $133,839.0 | $4,332.6 |
| ANNUAL DAMAGES | | | |
| 10% | $16.4 | $13.9 | $2.5 |
| 4% | $160.6 | $152.9 | $7.7 |
| 2% | $495.8 | $484.5 | $11.3 |
| 1% | $807.4 | $793.7 | $13.7 |
| 0.2% | $1,555.5 | $1,528.6 | $26.9 |

firms in need of land to develop. Part of the price differential, of course, is due to the flood threat, but Dodson likely would offer lower prices than other parks in any case because it is located inside the city but not in the most active portion of the urban core. The government of Kansas City, Missouri maintains an interest in this project partly because city representatives are aware that the city offers few, if any, other areas with the same economic advantages as Dodson for industrial firms.

From the market survey, an average market price per acre was determined for improved, flood-free commercial land. Estimates were obtained confidentially from realtors with experience selling similar parcels in other areas of the metropolitan Kansas City. The cost of buying the land in its unimproved, without-project condition was subtracted from the expected value of the finished land. The cost to improve the land with sewers, utilities, and streets also was subtracted. The difference between these costs to the developer and the expected market price of the finished land is the net benefit per acre (which is really the more important consideration to the developer than the land's market value).

Finally, the net benefit per acre was multiplied by the number of acres likely to be developed over a given time period. The resulting total was discounted to its present worth based on the phase-in period and then annualized at the current Federal interest rate.

This study projects an estimated location benefit of $3,400, accruing entirely to reach 2, as summarized in Table 21. With protection, 16.5 acres are expected to be improved, with a net benefit of about $5,000 per acre. Total unannualized benefits are $82,500. The present worth of the unannualized benefit is $42,800, and the annual benefit is $3,400. This calculation assumes a 50-year project life and a Federal interest rate of 7 5/8%.

Location benefits make up a relatively small part of the total annual benefits in this study (less than 0.2%). They do not affect economic feasibility, accounting for only about 3% of net benefits. It is also important to note that the protection of these parcels would be incidental to the protection of the entire industrial district, inasmuch as the parcels are interspersed throughout the damage area and no changes in design or additional costs would be necessary to protect them.

The parcels of land on which the location benefits are taken are shown in Figure 4. The owners of the tracts and their addresses are as follows: Tract A, 7.5 acres, owned by John Deere (3210 E. 85th St., Kansas City, MO 64132); Tract B, 7 acres, owned by Kansas City Power and Light (Tax Dept., P.O. Box 679, Kansas City, MO 64141); Tract C, 2 acres, owned by Labconco Corp. (8811 Prospect, Kansas City, MO 64132).

| TABLE 19 -- LOCATION BENEFITS | |
|---|---|
| Price level: October 1995<br>Interest rate: 7 5/8% | |
| Net benefit per acre | $5,000 |
| Developable acres | x 16.5 |
| Total benefits | $82,500 |
| Present worth | $42,800 |
| | |
| Present worth | $42,800 |
| Interest & amortization factor<br>(7 5/8% interest rate, 50 years) | x 0.079401 |
| Annual benefits | $3,400 |

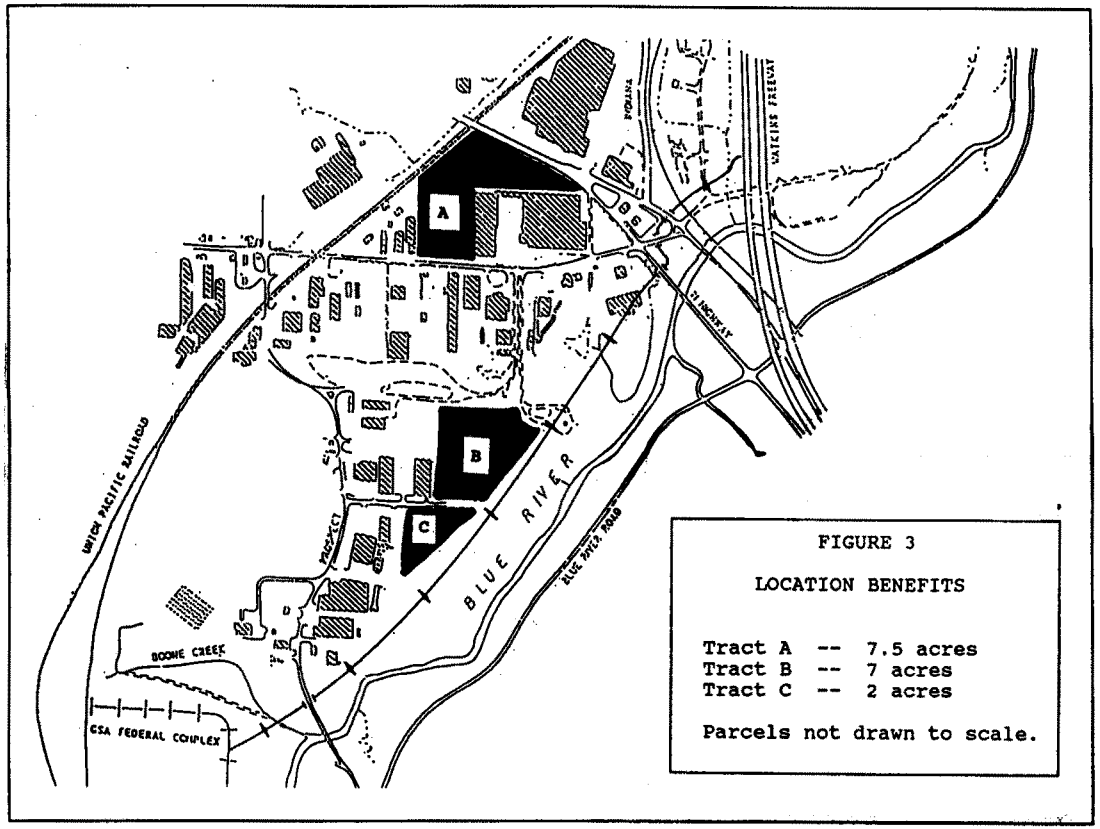



FIGURE 3

LOCATION BENEFITS

Tract A -- 7.5 acres
Tract B -- 7 acres
Tract C -- 2 acres

Parcels not drawn to scale.

The location benefits claimed in this study were compared to two potential limitations, as required in ER 1105-2-100, section 6-44(c). The first limitation is the cost of floodproofing and filling the land; location benefits cannot exceed this cost. Analysis of this limitation required calculation of the approximate number of cubic yards of fill dirt which would be needed to fill the land to the 1% chance flood elevation. This option would not require filling the entire 16.5 acres on which location benefits are taken, but only that amount of the land actually projected to be occupied by buildings. This study assumes that commercial or industrial development would use 50 percent of the area in these parcels. An estimated 42,000 cubic yards of fill dirt would be required to raise these parcels, with a cost of approximately $316,000. The annual cost would be $25,000, given the Federal interest rate of 7 5/8% percent and a 50 year period. It is further assumed that no further floodproofing beyond the fill would be required, no additional land would be needed for fill, and hauling distances would not exceed one mile. The costs of filling the land would be even greater than shown here (thereby raising the allowable limit) if any of these assumptions were invalid.

The second potential limitation is the estimated increase in potential damages if the projected development occurred without flood protection. Existing businesses in the Dodson flood plain average about 9 acres of property and slightly over $4 million of investment per business. Using these averages to project development and phasing the development in over a 10-year period, the discounted increase in annual damages totals $103,400. These analyses demonstrate that the $3,400 claimed in location benefits is well within allowable regulatory limits.

v. Negative Benefits

Implementation of the NED plan is not expected to induce new damages to areas upstream, downstream, or across the river from the levee. However, the potential for a small negative benefit is created by the selected plan's interior drainage configuration. The study area contains four sites where ponding could occur during high river stages, threatening nearby properties with damage which would have to be deducted from the benefits for the plan. Reach 2 contains two of these sites; the other two reaches have one site each. In analyzing the potential for damage, ponding elevations for various events at each site were obtained from hydrology and hydraulics staff. The events, in this case, are events within the leveed area, not events on the Blue River.

The analysis indicated that essentially no damage occurs in the smaller events up to the 1% chance event at any of the four sites. Average annual damages reach $100 or more only at the 0.25% chance event, and then only at one site in reach 2. The total negative benefit due to ponding damage is $300, and this amount has been deducted from project benefits. Table 23 summarizes the

effects of ponding at each of the four sites, showing the ponding elevations at each location along with the associated probability and damages.

TABLE 20 -- INTERIOR DRAINAGE-RELATED DAMAGES

| Area | Frequency | Elevation | Damage | Ann. damage |
|---|---|---|---|---|
| Reach 1 mile 20.8 | 50.0% | 778.6 | $0 | $0 |
| | 10.0% | 782.8 | $0 | $0 |
| | 2.0% | 786.6 | $0 | $0 |
| | 1.0% | 788.0 | $0 | $0 |
| | 0.2% | 790.3 | $7,800 | $0 |
| Reach 2 mile 20.4 | 50.0% | 779.9 | $0 | $0 |
| | 10.0% | 780.5 | $0 | $0 |
| | 2.0% | 781.7 | $0 | $0 |
| | 1.0% | 782.3 | $0 | $0 |
| | 0.2% | 783.4 | $0 | $0 |
| Reach 2 mile 20.2 | 50.0% | 778.3 | $0 | $0 |
| | 10.0% | 781.5 | $0 | $0 |
| | 2.0% | 784.5 | $0 | $0 |
| | 1.0% | 785.7 | $0 | $0 |
| | 0.2% | 787.9 | $88,400 | $300 |
| Reach 3 mile 19.9 | 50.0% | 780.8 | $0 | $0 |
| | 10.0% | 784.1 | $0 | $0 |
| | 2.0% | 786.6 | $0 | $0 |
| | 1.0% | 787.6 | $600 | $0 |
| | 0.2% | 788.7 | $2,300 | $0 |

vi. Incremental Considerations

Flood control projects often consist of separable parts, and economic analyses in such cases must evaluate the feasibility of each part incrementally in addition to examining the project's overall feasibility. The proposed Dodson project does not consist of separable units. All three reaches must be protected in order to provide protection to any individual reach. No natural breaks separate the reaches; the levee alignment ties in to road embankments at the reach breaks, but the embankments are not high enough in themselves to contain a 0.2% chance flood event. Flood water entering any of the reaches during a large flood event would inundate the entire study area. Therefore, no attempt is made here to divide benefits and costs by reaches and justify each reach separately.

vi. Total Benefits

Annual benefits calculated for the selected plan at Dodson total $1,923,000 (1995 prices) and are summarized in Table 21.

The total benefits can be broken down in several ways. In terms of existing and future conditions, 88.3% of total benefits are associated with the existing condition, or about $1,697,000. Evaluated by reach, reach 1 is responsible for 2.9% of total benefits, reach 2 is responsible for 67.5%, and reach 3 is responsible for 29.6%. Commercial enterprises account for 96% of total benefits (including emergency costs, location benefits, and flood insurance administrative costs), as opposed to 4% from the public classification. Prevention of physical inundation damages accounts for 99.7% of the benefits, compared to 0.3% from location and flood insurance benefits.

vii. Residual Damages

Residual damages, or damages that would not be prevented by the project, total $144,000. The selected plan prevents all expected damages up to the 0.2% chance event and is credited with preventing 50% of damages in the overtopping margin range above the 0.2% chance elevation. Residual damages therefore consist of the remaining 50% of overtopping margin range damages, plus all damages caused by extremely large events with peaks exceeding the overtopping margin range (i.e., above, approximately, a 0.04% chance event).

| TABLE 21 -- ANNUAL BENEFITS BY CATEGORY | | | | |
|---|---|---|---|---|
| October 1995 prices<br>Interest rate: 7 5/8% | | In $1,000s<br>0.2% chance flood protection | | |
| | Reach 1 | Reach 2 | Reach 3 | Total |
| PREVENTION OF PHYSICAL DAMAGES | | | | |
| COMMERCIAL | | | | |
| 1997 base | $27.2 | $1,036.2 | $420.2 | $1,483.6 |
| Overtopping margin | $1.2 | $45.5 | $70.2 | $116.9 |
| 2015 condition | $4.2 | $148.4 | $63.9 | $216.5 |
| - ponding resid. | $0.0 | $0.0 | $0.0 | $0.0 |
| Total comm. | $32.6 | $1,230.1 | $554.3 | $1,817.0 |
| | | | | |
| PUBLIC | | | | |
| 1997 base | $14.8 | $21.4 | $8.9 | $45.1 |
| Overtopping margin | $1.0 | $0.6 | $0.3 | $1.9 |
| 2015 condition | $2.4 | $2.6 | $1.0 | $6.0 |
| - ponding resid. | $0.0 | $0.3 | $0.0 | $0.3 |
| Total public | $18.2 | $24.3 | $10.2 | $52.7 |
| | | | | |
| TOTAL PHYSICAL | $50.8 | $1,254.4 | $564.5 | $1,869.7 |
| OTHER BENEFITS | | | | |
| Emergency costs | $4.8 | $38.6 | $4.8 | $48.2 |
| Location benefits | $0.0 | $3.4 | $0.0 | $3.4 |
| FIS administration | $0.6 | $0.7 | $0.2 | $1.5 |
| TOTAL OTHER BENEFITS | $5.4 | $42.7 | $5.0 | $53.1 |
| TOTAL ANNUAL BENEFITS | $56.2 | $1,297.1 | $569.5 | $1,922.8 |

viii. Regional Economic Development (RED) Impacts

The benefit evaluation process involves analysis of the economic losses to a particular region (in this case, the Kansas City metropolitan area) from flooding and the potential gains to the community from the successful prevention of flooding. Some of these impacts may be of major significance to a community, but may not have any net impact on the national economy. These regional (RED) impacts are not included in determining the NED benefits and costs, but receive consideration in terms of environmental impact decision-making.

Blue River flooding at Dodson is responsible for a variety of losses in the area. Businesses and public enterprises suffer physical damages to their buildings, equipment, inventories, and roads. In addition to physical damage noticeable after a flood, flood-prone buildings also deteriorate more quickly over the long term, affecting their usability and resale values. The flood threat may cause developed lots to be vacated and difficult to lease and undeveloped land to remain undeveloped. If a parcel of land is developed, the expense is greater than normal because of floodproofing requirements. Drivers in the area are inconvenienced by road closings which result in extra vehicle operating costs due to detours and opportunity costs due to delays. Many flood plain occupants must purchase flood insurance. The city government must spend money on emergency flood-fighting in excess of normal city public safety requirements. The metropolitan area is denied the full advantages of a healthy industrial park.

As a result of implementation of the NED plan, a few enterprises would be required to relocate, perhaps unwillingly. But most other socioeconomic impacts are positive. Flood protection would enable the community to function with minimal damage to buildings, equipment, inventories, and roads. The continued deterioration of flood-prone buildings would be prevented, as would any subsequent effects on the resale market. Businesses in the area would no longer sustain the costs of annual flood insurance premiums. The need to use landfill or to floodproof buildings would be obviated. About 16.5 acres of currently flood-prone land could be developed commercially subsequent to protection. Drivers would not be inconvenienced as often by road closings. The city government would save money formerly lost to emergency floodfighting. The Dodson area would become a more viable industrial park for metropolitan Kansas City, offering relatively inexpensive urban land as an alternative to higher-priced suburban business parks. Residents of the low-income neighborhoods near Dodson would have improved employment opportunities near their neighborhoods. Some temporary construction jobs would be created.

## C. Costs Analysis

### i. Total Costs

The project cost of the selected NED plan is $17,081,800. The estimated annual cost, summarized in Table 22, is $1,548,000. These cost calculations assume a 50-year project life, a Federal interest rate of 7 5/8%, October 1995 price levels, and annual operations and maintenance costs of $17,500.

| TABLE 22 -- COST SUMMARY OF SELECTED PLAN | |
|---|---|
| October 1995 prices | Interest rate: 7 5/8% |
| | |
| Project Cost | $17,081,800 |
| Interest During Construction | + $2,479,000 |
| Economic Cost | $19,560,800 |
| | |
| Economic Cost | $19,560,800 |
| Interest & Amortization Factor | x 0.078235 |
| Annual Economic Cost | $1,530,300 |
| | |
| Annual Economic Cost | $1,530,300 |
| Annual O & M Cost | + $17,500 |
| TOTAL ANNUAL COST | $1,547,800 |

### ii. Interest During Construction

Interest during construction is a significant component of any annual cost calculation. As directed in ER 1105-2-100 para. 6-153(c)(1), these calculations account for the entire time between the beginning of the planning (PED) phase, through the land preparation (LERRD) phase, and ending with the completion of construction. Interest is calculated for each year of each phase of the study. The general formula used in calculating interest during construction is:

$$I.D.C. = C((1 + i)^n) - C$$

where C is the total expenditure for one phase in a given year, i

is the interest rate, and n is the number of time periods. This formula is applied to year-by-year expenditures for each phase.

Interest during construction for the selected plan is estimated to be $2,479,000 for the total expected project time of about 7 years. This estimate embodies the best current assumptions concerning starting and ending dates for each phase, total expenditures for each phase, and distribution of funding through each phase. These assumptions are subject to change. Table 23 displays the scheduled spending for each phase of the study, including starting and ending dates for the phases, number of months in the phase, total expenditure for the phase, and average monthly expenditure (which assumes a constant flow of expenditures). Table 24 subsequently summarizes interest during construction by year and phase.

TABLE 23 -- EXPENDITURES BY PHASE

In $1,000s

PED = Planning, Engineering, & Design
LERRD = Lands, Easements, Rights of Way, Relocations, & Disposal
Const. = Construction

| Phase | Start | End | Months | Expenditure | Avg. expend. by month |
|---|---|---|---|---|---|
| PED | Sep 96 | Sep 99 | 36 | $1,600.0 | $44.4 |
| LERRD | Jan 00 | Jul 01 | 18 | $4,184.9 | $232.5 |
| Const. | Sep 01 | Sep 03 | 24 | $11,296.9 | $470.7 |
| TOTAL | | | | $17,081.8 | |

TABLE 24 -- INTEREST DURING CONSTRUCTION BY YEAR

Note on distribution of spending: The PED and construction phases are calculated with the assumption of a constant flow of expenditures, based on the average expenditure per month shown in the table above. The LERRD phase is treated differently, as about 90% of the total expenditure for the phase is not scheduled to be spent until the second year.

| Year | Phase | Expenditure | Interest |
|---|---|---|---|
| 1996 | PED | $ 177.8 | $116.0 |
| 1997 | PED | $ 533.3 | $305.7 |
| 1998 | PED | $ 533.3 | $246.3 |
| 1999 | PED | $ 355.6 | $127.4 |
| 2000 | LERRD | $ 418.5 | $109.6 |
| 2001 | LERRD | $3,766.4 | $650.0 |
| 2001 | Const. | $1,882.8 | $325.0 |
| 2002 | Const. | $5,648.4 | $505.6 |
| 2003 | Const. | $3,765.6 | $ 93.4 |
| TOTAL | | | $2,479.0 |

D. Benefits vs. Costs

The conclusion of this economics analysis for the Dodson feasibility study is that the selected plan, a levee providing protection up to the 0.2% chance event, demonstrates economic feasibility. The benefit-cost ratio for the NED plan is 1.2 to 1, with estimated annual benefits of $1,923,000 and annual costs of $1,548,000. Net annual benefits for the plan are $375,000. Table 25 summarizes these results.

If base year conditions alone were used in determining the benefits, with no augmentations to reflect urbanization or other anticipated future changes, the benefit-cost ratio would be 1.1 to 1 ($1,697,000 in annual benefits vs. $1,548,000 in annual costs).

| TABLE 25 -- ANNUAL BENEFITS & COSTS | |
|---|---|
| Price level: October 1995<br>Interest rate: 7 5/8% | |
| Annual benefits | $1,923,000 |
| Annual costs | $1,548,000 |
| BENEFITS TO COSTS RATIO | 1.2 to 1 |
| Net benefits | $375,000 |
| Residual damages | $144,000 |

# APPENDIX C

## PUBLIC INVOLVEMENT

**BLUE RIVER BASIN**
**DODSON INDUSTRIAL DISTRICT**
**KANSAS CITY, MISSOURI**

TABLE OF CONTENTS

INTRODUCTION . . . . . 159

Letter transmitting the draft Feasibility Report for review . . . . . 160

Mailing list for draft Feasibility Report . . . . . 161

Public Meeting Announcement . . . . . 167

Public Meeting Agenda . . . . . 168

Public Meeting Attendance List . . . . . 169

Non-Federal Sponsor's Letter of November 17, 1995 . . . . . 170

Kansas City, Missouri City Council Resolution 951615 . . . . . 171

## INTRODUCTION

Integration of public views and preferences into the formulation and selection of the preferred plan has been accomplished through an ongoing process since study initiation. There have been quarterly coordination meetings with representatives of the non-Federal sponsor, Kansas City, Missouri. In addition, there have been various meetings with local business owners and State and Federal Agencies to address design and property related issues. In July of 1992 the District conducted a Plan Screening Workshop. The workshop included the District study team and representatives of the City. The workshop resulted in the ranking of alternative plans and gave the sponsor the opportunity to participate in the plan selection process. The sponsor also attended the Feasibility Review Conference conducted in June 1993, when the preferred plan was presented. The sponsor has expressed its concurrence with the study process through the original and revised Feasibility Cost Sharing Agreements signed by the sponsor and the Government. The sponsor has expressed concurrence with the preferred solution produced by the Feasibility Study in a letter dated November 17, 1995, indicating its intent to enter into a Project Cost-Sharing Agreement for construction, and in City Council Resolution No. 951615 enacted on December 7, 1995.

On November 17, 1995 we circulated copies of the draft Feasibility Report to a list of businesses in the project area and to local, State, and Federal agencies we anticipated would have an interest in the report. We advised those who received the draft report that we would accept comments until December 27, 1995, and that we would hold a public meeting to discuss the report on December 13, 1995. Simultaneously, the Clean Water Act Section 404 (b) (1) and Section 401 Public Interest Review Notice was published with a concurrent comment period, also to be discussed at the December 13 public meeting. (A copy of the Section 404 Notice appears in Appendix D) Written comments we received during the comment period are reproduced in Appendix F, Correspondence. Appendix G displays our responses to these written comments. The record of the public meeting is a separate document not included in this Feasibility Report. We will provide a copy of the public meeting record to anyone upon request for the cost of reproducing the copy.

Because we formulated the preferred plan in consultation with the non-Federal sponsor, the plan reflected the sponsor's views at the outset, and no change to the preferred plan may be associated with the early public involvement activity. In statements at the public meeting, and in correspondence, the Department of Energy expressed concern about possible hydraulic impacts to the Bannister Federal Complex interior drainage system and outfall. The Federal Complex interior storm drainage outfall is located on Boone Creek upstream of the Reach 1 levee drainage pipe. In view of this concern, we have deleted a proposal to elevate the Reach 1 levee drainage pipe to create a small aquatic habitat landward of the levee on Boone Creek.

**DEPARTMENT OF THE ARMY**
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

REPLY TO
ATTENTION OF:

Planning and Hydrologic Engineering Branch
Engineering and Planning Division

To Whom It May Concern:

This is to request your review and comment on the enclosed draft Feasibility Report for the Blue River, Kansas City, Missouri (Dodson Industrial District).

The report discusses the formulation and selection of structural measures to reduce damaging floods in the partially developed floodplain west of the Blue River upstream and downstream of 85th Street in Kansas City, Missouri. The report includes an Environmental Assessment which evaluates the environmental effects of the selected plan and alternatives.

We are also conducting a public interest review of the project in compliance with Section 404 of the Clean Water Act. Concurrent with this public interest review, we have requested water quality certification from the State of Missouri under Section 401 of the Clean Water Act. A copy of the recently published Section 404 public notice is enclosed for ready reference.

We will receive comments on the enclosed report at a public meeting to be announced shortly or in writing until December 27, 1995. Please mark comments mailed to the address above "ATTN: EP-PF". Our facsimile number is 816-426-2142.

Sincerely,

Roy D. Reed
Deputy District Engineer
For Project Management

Enclosures

7 Ready Mix Concrete
2701 E. 85th St.
Kansas City, MO 64132

Able Hands Construction Co.
2800 E. 85th St.
Kansas City, MO 64132

Access Industries
8045 Indiana
Kansas City, MO 64132

Alber Electric Co.
8601 Prospect
Kansas City, MO 64132

American Catastrophe & Environmental Services
8401 Hickman Mills Dr.
Kansas City, MO 64132

American Homepatient
8131 Indiana
Kansas City, MO 64132

Jackson County Parks
and Recreation Dept.
22807 Woods Chapel Road
Blue Springs, MO 64105

Arrow Truck Sales Inc.
3200 Manchester Trfwy.
Kansas City, MO 64129

General Services Administration
Kansas City South Property Management Center
ATTN: GPMC-MS (George Kibler)
1500 E. Bannister Road.
Kansas City, MO 64138

Department of Energy
Facility Operations Management Center
ATTN: Greg Betzen
2000 E. 95th Street
Kansas City, MO 64131

Bratton Corp.
2801 E. 85th St.
Kansas City, MO 64132

BSC Steel Inc.
2809 E. 85th St.
Kansas City, MO 64132

Hickson
Building Partnership
4600 E. 75th Terrace
Kansas City, MO 64132

Comp Forms, Inc.
7540 Manchester
Kansas City, MO 64134

Bates & Sons
Construction Co.
3829 Troost
Kansas City, MO 64109

Citizens Environmental
Council of Kansas City
520 E. 61st Street
Kansas City, MO 64110

Country Club Tree Service
8820 Prospect
Kansas City, MO 64132

D.J. Roofing Supply Inc.
3201 E. 85th St.
Kansas City, MO 64132

Davis Fence Co.
8700 Prospect
Kansas City, MO 64132

Dean's Transmission
8520 Prospect
Kansas City, MO 64132

Dexter Automotive Materials
8485 Prospect
Kansas City, MO 64132

Electrical Materials Co.
3007 E. 85th St.
Kansas City, MO 64132

Everett Holding Co.
11030 Hickman Mills Dr.
Kansas City, MO 64134

Regional Director
Federal Emergency Management Agency
911 Walnut
Kansas City, MO 64106

U.S. Dept. of the Interior
Geological Survey, Water Resources
Post Office Box 340
Rolla, MO 65401

Hayes Drilling Co.
8845 Prospect
Kansas City, MO 64132

Historic Kansas City Foundation
1003 Broadway
Kansas City, MO 64105

Hoechst Marion Roussel
8333 Hickman Mills Dr.
Kansas City, MO 64132

Holbrook, Heaven, Fay
ATTN: Chris Brumbaugh
Post Office Box 3867
Meriam, KS 66303-0867

Howard Automotive
2740 E. 85th St.
Kansas City, MO 64132

J&I Enterprise Partnership
4500 E. 75th Terrace
Kansas City, MO 64132

John Deere
3210 E. 85th St.
Kansas City, MO 64132

Dodson Division
Kansas City Power & Light Co.
8619 Prospect
Kansas City, MO 64132

Kraft Tank Co.
2921 E. 88th Terr.
Kansas City, MO 64132

Labconco Corp.
8811 Prospect
Kansas City, MO 64132

Landmarks Commission
414 E. 12th Street
Kansas City, MO 64106

Lix Corp.
2808 E. 85th St.
Kansas City, MO 64132

Mabin Construction Co.
3101 E. 85th St.
Kansas City, MO 64132

Peterson
Manufacturing Co.
4200 E. 135th St.
Grandview, MO 64030

McCormack-Payton Storage & Moving Co.
8701 Prospect
Kansas City, MO 64132

Director, Solid Waste Management
Missouri Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65102-0176

Director, Water Pollution Control
Missouri Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65102-0176

Director, Hazardous Waste Program
Missouri Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65102-0176

National Pipeline Corp.
2901 E. 85th St.
Kansas City, MO 64132

Spruce Building
Partnership
7700 Acuff Lane
Lenexa, KS 66216-4203

Power Sweep/Floorco
8600 Prospect
Kansas City, MO 64132

Quik-Trip
8431 Hickman Mills Dr.
Kansas City, MO 64132

Mid-America
Regional Council
600 Broadway
Kansas City, MO 64105

Rochman Universal Doors
2820 E. 87th Terr.
Kansas City, MO 64132

Schweiger Construction
8900 Prospect
Kansas City, MO 64132

Metro Kansas City Group
Sierra Club
Post Office Box 32727
Kansas City, MO 64111

What's Happen'N Lounge
8512 Prospect
Kansas City, MO 64132

Honorable John Ashcroft
United States Senator
600 Broadway, Suite 420
Kansas City, MO 64105

Mr. Richard Barnes
Dexter Automotive
4621 E. 75th Terrace
Kansas City, MO 64132

Ms. Claire F. Blackwell
Deputy State Historict Preservation Officer
Post Office Box 176
Jefferson City, MO
65102 -0176

Honorable Christopher Bond
United States Senator
600 Broadway, Suite 420
Kansas City, MO 64105-1536

Mr. Ladd Boxley
3601 E. 78th St.
Kansas City, MO 64132

Mr. Gary Christoff
Environmental Coordinator
Missouri Dept. of Cons.
Post Office Box 180
Jefferson City, MO 65102-0180

Mr. Michael L. Connelly
9318 E. 105th Street
Kansas City, MO 64134

Mr. Lloyd Davies
Friends of Lakeside Nature Center
Blue River Stream Team Committee
5600 E. Gregory
Kansas City, MO 64132

Mr. Paul Dohert
Superfund Division
EPA
726 Minnesota Avenue
Kansas City, Kansas 66101

Ms. Alice Ellison
Spec. Asst. for Community Affairs
29th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106

Mr. Gary Frazer
Field Supervisor
U.S. Fish and Wildlife Service
608 E. Cherry Street, Room 200
Columbia, MO 65201

Mr. Charles Gause
Dodson Development Corp.
3210 E. 85th Street
Kansas City, MO 64132

Dr. Richard J. Gentile
Professor - Geosciences
Geosciences Bldg. 303A
710 E. 52nd Street
Kansas City, MO 64110

Mr. Jim Goetz
Transilwrap
4231 E. 75th Terrace
Kansas City, MO 64132

Mr. Dennis Grams
Regional Administrator
U.S. EPA, Region VII
726 Minnesota Ave.
Kansas City, KS 66101

Mr. Dave Griffin
Director of Structures
Union Pacific Railroad
1416 Dodge Street
Omaha, NE 68179

Ms. Diane Herschberger
Director, Water Resources Staff
EPA
726 Minnesota
Kansas City, KS 66101

Mr. Craig Hickson
ENTECO
4310 E. 75th Terrace
Kansas City, MO 64132

Mr. Earl Hornbeck
Hornbeck Specialties
4311 E. 75th Terrace
Kansas City, MO 64132

Ms. Lynnis Jameson
City Development Dept.
15th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106

Mr. Frank Kosko
Zip Bowling
7553 Spruce
Kansas City, MO 64132

Honorable Karen McCarthy
Representative in Congress
811 Grand Ave., Room 935
Kansas City, MO 64106

Mr. Mark McHenry
Parks & Recreation
5605 E. 64th St.
Kansas City, MO 64130

Mr. Dave McLerran
Gasket Engineering
4500 E. 75th Terrace
Kansas City, MO 64132

Mr. Joe Mickes
Chief Engineer
Mo. Highway Dept.
Post Office Box 270
Jefferson City, MO 65102

Mr. Ron Miller
Burns & McDonnell
4800 E. 63rd St.
Kansas City, MO 64130

Mr. Russell Mills
State Conservationist
Natural Resources Conservation Service
601 Business Loop 70 West
Columbia, MO 65203

Mr. Don Misenhelter
Salvajor Co.
4530 E. 75th Terrace
Kansas City, MO 64132

Mr. Earl Newill
Chief Engineer
Jackson County Public Works
103 N. Main Street
Independence, MO 64050

Mr. Rich Noll
Assistant City Manager
City Hall, 29th Floor
414 E. 12th Street
Kansas City, MO 64106

Mr. Charles Owsley
Assistant City Engineer
19th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106

Mr. Greg Rothers
Rafael Architects
106 West 11th, #1002
Kansas City, MO 64105

Mr. Al Schulze
Mitigation Division
FEMA, Region VII
911 Walnut
Kansas City, MO 64106

Mr. Larry Shilling
Laidlaw Waste Systems
Post Office Box 5192
Kansas City, MO 64132

Mr. David Shorr
Director and S.H.P.O.
Mo. Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65101-0176

Mr. Mike Thompson
Eagle Litho
4515 E. 75th Terrace
Kansas City, MO 64132

Mr. Warren Welch
City Engineer's Office
19th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106

Mr. George E. Wolf, Jr.
Public Works Director
City Hall, 20th Floor
414 E. 12th Street
Kansas City, MO 64106

Blue River, Kansas City, Mo November 17, 1995

Mr. John Young
Director, Division of Env. Quality
Missouri Dept. of Natural Resources
Post Office Box 176
Jefferson City, MO 65102-0176

Mr. Thomas Zimmer
8333 Douglas, Suite 1414
Dallas, TX 75225

Director Kansas City Zoological
Gardens
ATTN: Mark Wourms
6601 Swope Parkway
Kansas City, MO 64132

**We invite your participation in a Public Meeting to Discuss a Project for**

# Flood Control

**in the**

# Dodson Industrial District

**on the**

Blue River, Missouri and Kansas

The meeting will begin at 7 p.m., December 13, 1995, in the auditorium, Center High School, 87th and Holmes, Kansas City, Missouri.

The meeting will begin with a brief presentation summarizing the preferred plan described in the Feasibility Report published by the Kansas City District Corps of Engineers on November 17, 1995. The preferred plan is a levee to prevent inundation of the protected area by a flood event on the Blue River with a 0.2-percent chance of occurrence in any year (a 500-year flood). If you wish to receive a copy of the report, you may request it from:

The Kansas City District, Corps of Engineers,
700 Federal Building, 601 East 12th Street,
Kansas City, MO 64106-2896
ATTN: EP-PF

or phone Mr. John Grothaus, 426-7345.

Following the presentation, representatives of the Kansas City District Corps of Engineers and the non-Federal project sponsor, the City of Kansas City, Missouri, will be available to listen to comments and provide further information.

Should you have detailed comments on the report, please submit a written copy of your comments either at the meeting or by mail before December 27, 1995.

Robert E. Morris
Colonel, Corps of Engineers
District Engineer

**Your Participation is Important - Please Plan to Attend.**

**Public Meeting**
**on**
Flood Control
**in the**
Dodson Industrial District
**on the**
Blue River, Missouri and Kansas

December 13, 1995

Center High School Auditorium

7 p.m.

---

## ***Agenda***

- Greeting
- Introductions
- Order of Events
- Project Information
- Statements of Public Officials
- Public Statements
- Questions and Answers
- Closing

The following persons attended the Public Meeting on the Blue River, Kansas City, Missouri, Feasibility Report (Flood Damage Reduction for the Dodson Industrial District) at Center High School, December 13, 1995

Mr. Gregory Betzen
Department of Energy
Post Office Box 410202
Kansas City, MO 64141

Mr. Bill Brant
2120 Red Bridge Terrace
Kansas City, MO 64131

Mr. Pete Coleman
483 Northshore Drive
Kansas City, MO 64151

Mr. Jim Davis
9506 Crestview Drive
Kansas City, MO 64137

Mr. Ron Fuhrken
Jackson County Parks Department

Mr. Jene Hayes
8845 Prospect
Kansas City, MO 64132

Mr. Mike Hayes
8845 Prospect
Kansas City, Mo 64132

Mrs. Cosette Kelley

Mr. Duane Kelly
10311 E. 42nd St.
Kansas City, MO 64133

Mrs. Donna F. Kraft
Kraft Tank Company
2921 E. 88th Terrace
Kansas City, MO 64132

Mr. Robert D. Long
2801 E. 85th Street
Kansas City, MO 64132

Mr. Ronald C Miller
Burns & McDonnell
4800 E. 63rd St.
Kansas City, MO 64130

Mr. Don Misehhelter
4530 E. 75th Terrace
Kansas City, MO 64132

Mr. Jerome Nerman
Arrow Truck Sales
3200 Manchester
Kansas City, MO 64129

Mr. Larry Shilling
Box 5192
Kansas City, MO 64132

Mr. George Wolf
City Engineer's Office
19th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106

Mr. Mike Wyckoff
Labconco Corporation
8811 Prospect
Kansas City, MO 64132

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

**Public Works Department**

Office of the Director

20th Floor, City Hall
414 East 12th Street
Kansas City, Missouri 64106

(816) 274-2364
Fax: (816) 274-2369

November 17, 1995

Colonel Robert E. Morris
700 Federal Building Rm. 25
601 East 12th Street
Kansas City, Mo. 64106-2896

Dear Colonel Morris:

Re: Commitment, Blue River Basin, Kansas City, Missouri
(Dodson Industrial District)

The purpose of this letter is to express our commitment to sign a Project Cooperation Agreement as non-Federal sponsor for construction of the Blue River Basin, Kansas City Missouri Project.

We understand that planning for this project has progressed to the stage that requires a firm commitment of financial participation by a non-Federal sponsor for you to complete the Feasibility Report and proceed with preconstruction engineering and design. We have reviewed the project design to date, and we are prepared to participate in construction of the project substantially as designed. We are providing this letter to indicate our support for maintaining the vitality if the project within the project approval and funding process.

Sincerely,

George E. Wolf, Sr., P.E.
Director of Public Works

GEW:WLW:cfw

**RESOLUTION NO. 951615**

**Expressing the City's strong continued support to the Dodson Industrial District Flood Damage Reduction Project on the Upper Blue River in Kansas City, Missouri.**

WHEREAS, the City of Kansas City, Missouri, has sought adequate protection for the Dodson Industrial District whose economic importance has suffered by repeated flooding from the Blue River since 1928; and

WHEREAS, the City on April 27, 1984, passed a resolution requesting a restudy of the Blue River Basin followed by a similar resolution by the Mid-America Regional Council on June 26, 1984, which resulted in a Reconnaissance Report in May 1984 recommending a feasibility study; and

WHEREAS, the City on May 26, 1987, provided a letter of intent to sponsor this flood damage reduction study and on July 13, 1988, signed a feasibility study cost sharing agreement; and

WHEREAS, the Kansas City District of the U.S. Army Corps of Engineers has presented a draft of the feasibility report and environmental assessment with considerable input and review from the City's technical staff who find the NED plan favorable to the City cause; specifically levee protection to this important industrial area; and

WHEREAS, all the above-mentioned efforts including considerable federal and local monetary contributions will be wasted to the continued frustration of the Dodson Industrial District if the project does not proceed; and

WHEREAS, the completion of the project will require substantial annual funding from both federal and city sources; NOW, THEREFORE,

BE IT RESOLVED BY THE COUNCIL OF KANSAS CITY:

Section A. That the Mayor and Council hereby express their intent to provide adequate funding to complete the City's obligations in relation to the study and eventual construction of the Dodson Industrial District Levee Project.

Section B. That the City will strongly encourage congressional representatives to continue their support of this project in future federal budgets.

Section C. That the City actively supports the U.S. Army Corps of Engineers in its efforts to obtain timely federal funding and to complete the project as rapidly as possible.

EMANUEL CLEAVER II, Mayor

Catherine I. Rocke
City Clerk

By Randall Long
DEC 07 1995 Deputy City Clerk

# APPENDIX D

## SECTION 404 COMPLIANCE

Kansas City District has conducted a joint review of the Draft Dodson Feasibility Report/Environmental Assessment under Section 404 of the Clean Water Act and the National Environmental Policy Act. Comments were received on both the Feasibility Report/EA and the Section 404 Public Notice (No. 96-00164) during the joint review period. All comments have been addressed, with all comments and responses included in Appendix G, Comments and Responses, of this Final Feasibility Report/Environmental Assessment.

Upon conclusion of the state and Federal agency review period of the Feasibility Report/Environmental Assessment, KCD's Regulatory Branch (CO-R) will obtain Section 401 state water quality certification and prepare a Statement of Findings, as stated in their enclosed Memorandum, dated 9 February 1996.

Appendix D also includes a copy of the Section 404 Public Notice for the Dodson project (No. 96-00164, issued 17 November 1995), plus the Section 404(b)(1) Evaluation Report.

CEMRK-CO-RW (1145b) 9 February 1996

MEMORANDUM FOR CHIEF, EP-P

SUBJECT: Dodson Industrial District - KCD Permit Application No. 96-00164

1. Reference CEMRK-EP-PR memorandum, dated 27 October 1995, requesting Section 404 authorization for proposed flood damage reduction measures for the Dodson Industrial District, along the Blue River, in Kansas City, Missouri.

2. The public comment period for KCD's Dodson Industrial District permit application has closed. CO-R has provided EP-P with copies of all comments received in response to the public notice issued for the project. Robert Smith of this office recently met with EP-P staff, John Grothaus and Marty Schuettpelz, to discuss the comments received and EP-P's draft responses to those comments. Several comments were revised to satisfy CO-R concerns.

3. CO-R staff have discussed the Draft Feasibility Report's proposed wetland mitigation area design with EP-P staff on several occasions. We believe that refinement of the design may be necessary to assure the mitigation area will have a high probability of success. Refinement of the design would reduce the potential for future remedial work (Appendix J of the Draft Feasibility Report) if the area does not develop into a jurisdictional wetland. We recommend that CO-R be invited to participate in the final design of the mitigation area, during the preconstruction, engineering and design phase (PED) of the project, in order to maximize success of mitigation efforts.

4. CO-R will provide authorization under authority of Section 404 of the Clean Water Act, for the subject project, concurrent with finalization of the Feasibility Report. We will obtain water quality certification, prepare a Statement of Findings and complete our public interest review when final review comments become available and any new issues, identified during that review period, have been resolved. We will continue to coordinate, as needed, with EP-P to expedite authorization for the proposed work.

Joseph S. Hughes
Lawrence M. Cavin
Chief, Regulatory Branch
Construction-Operations Division

CF:
CO
CO-RW-NA

# Public Notice

US Army Corps
of Engineers
Kansas City District
Leaders in Customer Care

Reply To:
U.S. Army Corps of Engineers
Attn: CEMRK-CO-RW (96-00164)
700 Federal Building
Kansas City, MO 64106-2896

Public Notice No. 96-00164
Public Notice Date November 17, 1995
Expiration Date

**Postmaster Please Post Conspicuously Until:** December 17, 1995

**JOINT PUBLIC NOTICE:** This public notice is issued jointly with the Missouri Department of Natural Resources. The Department of Natural Resources will use the comments to this notice in deciding whether to grant Section 401 water quality certification. Commenters are requested to furnish a copy of their comments to the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102.

**APPLICANT:** U.S. Army, Corps of Engineers
Kansas City District (KCD)
700 Federal Building
Kansas City, Missouri 64106-2896

**PROJECT LOCATION** (As shown on the attached drawings): The proposed levee construction project is located within the Blue River floodplain in Section 22, Township 48 north, Range 33 west, Jackson County, Missouri.

**AUTHORITY:** Section 404 of the Clean Water Act (33 USC 1344). The feasibility study for the Dodson Industrial District of Kansas City, Missouri, was authorized by a resolution adopted by the Committee on Public Works and Transportation, United States House of Representatives, on September 19, 1984.

**ACTIVITY** (As shown on the attached drawing): Proposed: The purpose of the proposed levee construction project is to provide flood protection for the Dodson Industrial District. The proposed flood protection project would be built by the Corps of Engineers, Kansas City District (KCD), with the City of Kansas City, Missouri as the local sponsor. The proposed project is divided into three reaches. Reach 1 would include a 700-foot levee across Boone Creek, from Prospect/Grandview Road connecting with the General Services Administration Complex levee upstream. This would require the placement of approximately 14,300 cubic yards of earthen material into Boone Creek. A drainage structure consisting of a 96-inch diameter culvert pipe and a gatewell structure would be used to control the flow of Boone Creek into the Blue River and prevent the backflow of Blue River floodwaters into Boone Creek and the protected area. Reach 2 would include a 3,900-foot levee for the entire reach between Prospect/Grandview Road and the future Hickman Mills Drive (formerly southbound U.S. 71 Highway). The levee would be set at or behind the current FEMA floodway boundary to avoid encroachment of the floodway. Approximately 25,500 cubic yards of earthen material would be placed in an existing wetland, resulting in 1.1 acres of wetlands being filled. A 4-acre riverward borrow area would be located at the upstream part of this reach. Two drainage structures are included in this reach, each a 48-inch diameter culvert pipe with a gatewell structure to control interior drainage and prevent backflow of floodwater. Two rolling-gate closure structures are also included, one for the roadway crossing at Prospect/Grandview Road and one for the future Hickman Mills Drive (formerly southbound U.S. 71 Highway). Reach 3 would include an 850-foot levee, 150 feet of floodwall, and two closure structures. The levee would extend between the future Hickman Mills Drive and the Bruce R. Watkins Freeway. The levee would cross an unnamed tributary to the Blue River, resulting in the placement of approximately 1,600 cubic yards of earthen material into the tributary. A drainage structure consisting of a 72-inch diameter culvert pipe would be used to control interior drainage. Approximately 6 to 7 acres of vacant land north of 85th Street would be used for borrow material and ponding.

**WETLANDS:** The proposed levee construction project would adversely impact, by filling, 1.1 acres of an existing 6 to 7 acre timbered wetland, as described under Reach 2 of the project. KCD proposes to mitigate for the loss by developing a borrow site into a 4-acre riparian wetland in an existing non-wetland, upland area located riverward of the proposed levee. Detailed information concerning the wetland mitigation plan can be found in Appendix J of the Feasibility Report referenced below. The wetland location and borrow/mitigation site are shown on the attached drawings.

**ADDITIONAL INFORMATION:** A Draft Feasibility Report and Environmental Assessment have been prepared by KCD concerning the proposed flood damage reduction measures of the Blue River Basin for the Dodson Industrial District. This report may be obtained by writing to the applicant address above, **Attn: CEMRK-EP-PF, Chief, Formulation Section, or by calling 816-426-3062.**

Additional information about this Section 404 application may be obtained by writing the Chief, Regulatory Branch, address above, or by calling **Mr. Bob Smith** at **816-426-2118** (FAX 816-426-2321).

A **Public Meeting** will be held on Wednesday, December 13, 1995, at 7:00 p.m. at the Center High School Media Center, 87th Street and Holmes, Kansas City, Missouri.

The review of this Public Notice and the Draft Feasibility Report are being conducted concurrently to incorporate appropriate comments in both documents.

**DRAWINGS:** The attached drawings provide location details of the proposed levee construction for flood damage reduction measures of the Dodson Industrial District, Blue River Basin, Jackson County, Missouri.

**CULTURAL RESOURCES:** Kansas City District will comply with the National Historic Preservation Act of 1966 and 36 CFR 800. We have checked the National Register of Historic Places and the Federal Register and no property listed in the Register or proposed for listing is located in the permit area. KCD archaeologists conducted cultural resource surveys of the proposed construction corridor during November 1989 and March 1993. One prehistoric site of unknown cultural affiliation was identified during the second survey. Following intensive field investigations, KCD determined that the resource site was previously disturbed and did not possess the integrity to qualify for listing on the National Register of Historic Places (NRHP). The matter has been coordinated with the State Historic Preservation Officer (SHPO), resulting in a determination that the project, as proposed, would have no impact on any properties listed, or eligible for listing, in the NRHP. The SHPO's concurrence was expressed in a letter from the Missouri Department of Natural Resources (MDNR) dated July 21, 1993.

**ENDANGERED SPECIES:** In compliance with the Endangered Species Act, a preliminary determination has been made that the described work will not affect species designated as threatened or endangered or adversely affect critical habitat. The U.S. Fish and Wildlife Service (FWS), in a November 1994 Draft Fish and Wildlife Coordination Act Report, stated the proposed project area was included in the geographic range of four Federally-listed threatened or endangered species. These species are the peregrine falcon (*Falco peregrinus*), the bald eagle (*Haliaeetus leucocephalus*), Mead's milkweed (*Asclepias meadii*), and the western prairie fringed orchid (*Plantanthera praeclara*). Due to the urban nature and previous disturbance of the site, KCD has determined that none of the listed species are likely to use or be found in the project area. In order to complete our evaluation of this activity, comments are solicited from the U.S. Fish and Wildlife Service and other interested agencies and individuals.

**FLOODPLAINS:** This activity is being reviewed in accordance with Executive Order 11988, Floodplain Management, which discourages direct or indirect support of floodplain development whenever there is a practicable alternative. By this public notice, comments are requested from individuals and agencies that believe the described work will adversely impact the floodplain. The Blue River and its tributaries have a drainage basin of approximately 272 square miles. The Dodson Industrial District is located within the Blue River floodplain and is subject to frequent flooding. The proposed project would provide flood protection for a 0.2 percent chance exceedence (500-year) event.

**CEMRK-CO-RW (96-00164)**

**OTHER CONCERNS:** Currently, rights-of-way needed for portions of the levee contain potential and known regulated wastes. Kansas City, Missouri, as local sponsor, must provide all lands required for the project and must assure they are free of all hazardous and toxic waste before the project can proceed to construction. Department of the Army regulations require that lands provided for construction of a project be free of hazardous and toxic waste contamination prior to initiation of a Federal project.

**WATER QUALITY CERTIFICATION:** Section 401 of the Clean Water Act (33 USC 1341) requires that all discharges of dredged or fill material must be certified by the appropriate state agency as complying with applicable effluent limitations and water quality standards. This public notice serves as an application to the state in which the discharge site is located for certification of the discharge. The discharge must be certified before a Department of the Army permit can be issued. Certification, if issued, expresses the state's opinion that the discharge will not violate applicable water quality standards.

**PUBLIC INTEREST REVIEW:** The decision to issue a permit will be based on an evaluation of the probable impact including the cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, esthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people. The evaluation of the impact of the activity on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency under authority of Section 404(b) of the Clean Water Act (33 USC 1344). The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties, for this Public Notice and the Draft Feasibility Report concurrently, in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used to determine the need for an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

**COMMENTS:** This notice is provided to outline details of the above-described activity so this District may consider all pertinent comments prior to determining if issuance of a permit would be in the public interest. Any interested party is invited to submit to this office written facts or objections relative to the activity on or before the public notice expiration date. Comments both favorable and unfavorable will be accepted and made a part of the record and will receive full consideration in determining whether it would be in the public interest to issue the Department of the Army permit. Copies of all comments, including names and addresses of commenters, may be provided to the applicant. Comments should be mailed to the address shown on page 1 of this public notice.

**PUBLIC HEARING:** Any person may request, in writing, prior to the expiration date of this public notice, that a public hearing be held to consider this application. Such requests shall state, with particularity, the reasons for holding a public hearing.

Lawrence M. Cavin
Chief, Regulatory Branch
Construction-Operations Division

**NOTICE TO EDITORS:** This notice is provided as background information for your use in formatting news stories. This notice is not a contract for classified display advertising.

US Army Corps of Engineers
Kansas City District

# Section 404 (b) (1) Evaluation (40 CFR 230)

Applicant: Kansas City District, COE  Application Number: _____
Activity: Flood Damage Reduction, Dodson Ind Dist  Waterway: Blue River
Section: 22  Township: 48N  Range: 33W  County: Jackson  State: Missouri

| 1. REVIEW OF COMPLIANCE (§230.10(a)-(d)) A review of the permit application indicates that: | PRELIMINARY[1] Yes | PRELIMINARY[1] No | FINAL[2] Yes | FINAL[2] No |
|---|---|---|---|---|
| a. The discharge represents the least environmentally damaging practicable alternative and, if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in, the aquatic ecosystem to fulfill its basic purpose (if no, see Section 2 and information gathered for EA alternative); | ☐ | ☒[3] | ☐ | ☐ |
| b. The activity does not appear to (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of CWA; (2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and (3) violate requirements of any Federally designated marine sanctuary (if no, see Section 2b and check responses from resource and water quality certifying agencies); | ☒ | ☐[3] | ☐ | ☐ |
| c. The activity will not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values (if no, see Section 2); | ☒ | ☐[3] | ☐ | ☐ |
| d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see Section 5). | ☒ | ☐[3] | ☐ | ☐ |

| 2. TECHNICAL EVALUATION FACTORS (SUBPARTS C-F) | N/A | No Adverse Effects | Minimal Adverse | Substantive Adverse | Cumulative Adverse |
|---|---|---|---|---|---|
| a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C) | | | | | |
| 1. Substrate impacts | ☐ | ☐ | ☒ | ☐ | ☐ |
| 2. Suspended particulates/turbidity impacts | ☐ | ☐ | ☒ | ☐ | ☐ |
| 3. Water column impacts | ☐ | ☐ | ☒ | ☐ | ☐ |
| 4. Alteration of current patterns and water circulation | ☐ | ☐ | ☒ | ☐ | ☐ |
| 5. Alteration of normal water fluctuations/hydroperiod | ☐ | ☐ | ☒ | ☐ | ☐ |
| 6. Alteration of salinity gradients | ☒ | ☐ | ☐ | ☐ | ☐ |
| b. Biological Characteristics of the Aquatic Ecosystem (Subpart D) | | | | | |
| 1. Effect on threatened/endangered species and their habitat | ☐ | ☒ | ☐ | ☐ | ☐ |
| 2. Effect on the aquatic food web | ☐ | ☐ | ☒ | ☐ | ☐ |
| 3. Effect on other wildlife (mammals, birds, reptiles, and amphibians) | ☐ | ☐ | ☒ | ☐ | ☐ |
| c. Special Aquatic Sites (Subpart E) | | | | | |
| 1. Sanctuaries and refuges | ☒ | ☐ | ☐ | ☐ | ☐ |
| 2. Wetlands | ☐ | ☐ | ☒ | ☐ | ☐ |
| 3. Mud flats | ☒ | ☐ | ☐ | ☐ | ☐ |
| 4. Vegetated shallows | ☒ | ☐ | ☐ | ☐ | ☐ |
| 5. Coral reefs | ☒ | ☐ | ☐ | ☐ | ☐ |
| 6. Riffle and pool complexes | ☒ | ☐ | ☐ | ☐ | ☐ |
| d. Human Use Characteristics (Subpart F) | | | | | |
| 1. Effects on municipal and private water supplies | ☐ | ☒ | ☐ | ☐ | ☐ |
| 2. Recreational and commercial fisheries impacts | ☐ | ☒ | ☐ | ☐ | ☐ |
| 3. Effects on water-related recreation | ☐ | ☒ | ☐ | ☐ | ☐ |
| 4. Esthetic impacts | ☐ | ☐ | ☒ | ☐ | ☐ |
| 5. Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves | ☐ | ☒ | ☐ | ☐ | ☐ |

REMARKS: Explain on attached sheet any substantive or cumulative adverse effects.

3. EVALUATION OF DREDGED OR FILL MATERIAL (SUBPART G)[4]

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate).

| | |
|---|---|
| 1. Physical characteristics | ☒ |
| 2. Hydrography in relation to known or anticipated sources of contaminants | ☒ |
| 3. Results from previous testing of the material or similar material in the vicinity of the project | ☒ |
| 4. Known, significant sources of persistent pesticides from land runoff or percolation | ☐ |
| 5. Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances | ☒ |
| 6. Other public records of significant introduction of contaminants from industries, municipalities, or other sources | ☒ |
| 7. Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities | ☒ |
| 8. Other sources (specify) | ☐ |

List appropriate references (see attached sheet).

b. Testing Exclusion: An evaluation of the appropriate information in 3a above indicates that the proposed discharge material meets testing exclusion criteria, for the following reason: Yes ☒ No ☐

1. Based on the information above, there is reason to believe the proposed dredge or fill material is not a carrier of contaminants: ☐
2. The levels of contaminants are substantially similiar at the extraction and disposal sites and not likely to result in degradation of the disposal site, and pollutants will not be transported to less contaminated areas; and/or ☐
3. Acceptable constraints are available and will be implemented to reduce contamination to acceptable levels within the disposal site and to prevent contaminants from being transported beyond the boundaries of the disposal site. ☒

4. DISPOSAL SITE DELINEATION (§230.11(f))

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

1. Depth of water at disposal site ☒
2. Current velocity, direction, and variability at disposal site ☒
3. Degree of turbulence ☒
4. Water column stratification ☐
5. Discharge vessel speed and direction ☐
6. Rate of discharge ☐
7. Dredged material characteristics (constituents, amount and type of material, settling velocities) ☐
8. Number of discharges per unit of time ☐
9. Other factors affecting rates and patterns of mixing (specify) ☐

List appropriate references (see attached sheet)

b. Mixing Zone Determination: An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable — Yes ☒ No ☐

5. ACTIONS TO MINIMIZE ADVERSE EFFECTS (SUBPART H)

All appropriate and practicable steps, as warranted, have been taken through application of recommendations of §230.70-230.77 to insure minimal adverse effects of the proposed discharge. List Actions Taken (see attached sheet) — Yes ☒ No ☐

RETURN TO SECTION 1 FOR FINAL COMPLIANCE REVIEW.

6. FACTUAL DETERMINATIONS (§230.11)

A review of the appropriate information as identified in items 2-5 above indicates that there is minimal potential for short-term or long-term environmental effects of the proposed discharge as related to:

| | Yes | No |
|---|---|---|
| a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5) | ☒ | ☐ |
| b. Water circulation, fluctuation, and salinity (review sections 2a, 3, 4, and 5) | ☒ | ☐ |
| c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5) | ☒ | ☐ |
| d. Contaminant availability (review sections 2a, 3, and 4) | ☒ | ☐ |
| e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5) | ☒ | ☐ |
| f. Disposal site (review sections 2, 4, and 5) | ☒ | ☐ |
| g. Cumulative impact on the aquatic ecosystem | ☒ | ☐ |
| h. Secondary impacts on the aquatic ecosystem | ☒ | ☐ |

7. EVALUATION RESPONSIBILITY

a. This evaluation was prepared by: MARTIN R. SCHUETTPELZ Date: 24 October 1995

Position: Environmental Resources Section, Planning & Hydrologic Engineering Branch, KCD

b. This evaluation was reviewed by: [illegible] Date: 12 February 1996

Position: Chief, Environmental Resources Section

8. FINDINGS

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines ☐
b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions (see attached sheet) ☐
c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):
1. There is a less damaging practicable alternative ☐
2. The proposed discharge will result in significant degradation of the aquatic ecosystem ☐
3. The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem ☐

Signature _____ Date _____

Colonel, Corps of Engineers
Commanding

By _____

[1] A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) Guidelines.

[2] Negative responses to three or more of the compliance criteria at this stage indicate that the proposed projects may not be evaluated using this "short-form procedures." Care should used in assessing pertinent portions of the technical information of items 2 a-d below, before completing the final review of compliance.

[3] Negative response to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage c Section 404(b)(2) are to be evaluated in the decision-making process, the "short-form" evaluation process if inappropriate.

[4] If the dredged or fill material cannot be excluded from individual testing, the "short-form" evaluation process if inappropriate.

# Section 404 (b) (1) Evaluation (40 CFR 230)
## Attached Sheet

REFERENCES:

- ☐ Application File No. _____
- ☐ Alleged Violation Case (AVC-_____)
- ☐ U. S. Geological Survey Water Resources Data
- ☐ U. S. Environmental Protection Agency Fish Kill Data
- ☐ Missouri Department of Conservation Fish Kill Data
- ☐ U. S. Environmental Protection Agency Spill Data
- ☐ U. S. Environmental Protection Agency STORET Water Quality Data
- ☐ Lake of the Ozarks Study, WAPORA, Inc., 1982
- ☐ Other:

PRELIMINARY EVALUATION:

Sections 1a and 2.c.2: The proposed project will include placement of fill material in 1.1 acres of wooded wetlands. The Kansas City District has developed, coordinated and received approval of a wetland mitigation plan using a four-acre riverward borrow site. Details of the plan are contained in Appendix J, Wetlands Mitigation Plan, to the Dodson Industrial District Feasibility Report.

Sections 3a and 3b: Early phases of project design and engineering would contain detailed and thorough soil sampling and testing efforts to define the limits of any contamination. Regulated wastes on properties in the area could be discovered at that time. Any project lands containing hazardous or toxic waste contamination will require remediation by the project sponsor prior to initiation of any project construction.

# APPENDIX E

## U.S. FISH AND WILDLIFE SERVICE COORDINATION ACT REPORT

FEASIBILITY REPORT
BLUE RIVER BASIN
DODSON INDUSTRIAL DISTRICT
KANSAS CITY, MISSOURI

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

IN REPLY REFER TO:

March 19, 1996

Colonel Robert E. Morris
District Engineer
Kansas City District
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Attn: Bob Ruff; Planning Division

Dear Colonel Morris;

Enclosed is a copy of our Final Fish and Wildlife Coordination Act Report for the Blue River at Dodson Industrial District, Missouri Flood Protection Project, Kansas City Missouri/Kansas.

This report is intended to accompany the U.S. Army, Corps of Engineers feasibility report on the proposed project and is to be attached to and incorporated into the body of the report to Congress.

If you have any questions concerning this report, please contact Dewey Caster, or me at 913 539-3474.

Sincerely,

William H. Gill

William H. Gill
Field Supervisor

Enclosure

# FINAL
# FISH AND WILDLIFE
# COORDINATION ACT REPORT
# FOR THE
# BLUE RIVER AT DODSON INDUSTRIAL DISTRICT, MISSOURI
# LOCAL FLOOD PROTECTION PROJECT

PREPARED FOR THE
UNITED STATES ARMY, CORPS OF ENGINEERS,
KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
KANSAS STATE OFFICE
MANHATTAN, KANSAS

MARCH 1996

## EXECUTIVE SUMMARY

The Kansas City District, Corps of Engineers, has conducted a feasibility study for the Blue River Basin/Dodson Industrial District in Kansas City, Kansas, to determine whether proposed flood protection measures, designed to alleviate serious flooding problems, are feasible at this time. This final Fish and Wildlife Coordination Act report describes the study area, identifies important aquatic and terrestrial resources, evaluates project impacts, and describes mitigation and enhancement measures.

The project area includes diverse riparian woodlands, a forested wetland and mowed grassy fields along the Blue River in Kansas City, Missouri. The primary impacts from the proposed project would be from the loss of about one acre of forested wetlands, two acres of upland woodlands and a small amount of aquatic habitat on Boone Creek. Therefore, the Fish and Wildlife Service recommends the following mitigation plan.

## RECOMMENDATIONS

1. Avoid removing or injuring riparian woodland trees within the project area.

2. Use the riverward borrow area as a mitigation site for the forested wetlands losses.

3. Establish suitable trees in the new wetland area.

4. Establish native grasses and forbs on the upper slopes of the borrow area as a buffer.

5. Maintain a hydrologic connection between the mitigation wetland and the Blue River.

6. Minimize upland tree removal with the construction easement.

7. Allow upland tree regeneration on as least two acres of land between the river and levee.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

8. Establish trees along the Blue River where the riparian woodlands are sparse or nonexistent.

9. Encourage wetland development at the borrow areas landward of the levee.

TABLE OF CONTENTS


| Heading | Page |
|---|---|
| INTRODUCTION | 186 |
| DESCRIPTION OF THE STUDY AREA | 188 |
| TERRESTRIAL AND AQUATIC RESOURCES WITHOUT THE PROJECT | 188 |
| Terrestrial Resources | 188 |
| Aquatic Resources | 192 |
| Threatened and Endangered Species | 192 |
| Contaminant-Related Problems Affecting Aquatic and Terrestrial Resources | 193 |
| DESCRIPTION OF THE PROJECT | 194 |
| TERRESTRIAL AND AQUATIC RESOURCES WITH THE PROJECT | 196 |
| Terrestrial Resources | 196 |
| Aquatic Resources | 197 |
| MITIGATION AND ENHANCEMENT | 197 |
| RECOMMENDATIONS | 199 |
| LITERATURE CITED | 200 |

## LIST OF FIGURES


| Figure | | Page |
|---|---|---|
| 1 | Location of study area within the Blue River Basin | 187 |
| 2 | Dodson Industrial Complex study area | 189 |
| 3 | Selected alternatives for Dodson Industrial Complex project as shown in the Corps of Engineers' final Project Report | 195 |


## LIST OF APPENDICES


| Appendix | | Page |
|---|---|---|
| A | Tree species located in the Blue River riparian corridor at the Dodson Industrial Complex study area | 201 |
| B | Animal species, or their sign, observed at the Blue River riparian corridor at the Dodson Industrial Complex study area | 202 |
| C | Letter of Concurrence by the Missouri Department of Conservation | 203 |

## INTRODUCTION

This final Fish and Wildlife Coordination Act report (Report) is submitted for the Corps of Engineers' (Corps) Blue River Basin, Dodson Industrial Complex, Missouri feasibility study. It will accompany the (Corps) feasibility report on the proposed project. The feasibility study will help determine if there is a practicable alternative for reducing flood damages along the Blue River in the Dodson Industrial Complex in Kansas City, Missouri.

The study was authorized by a resolution adopted by the committee on Public Works and Transportation, U.S. House of Representatives on September 19, 1984 and by PL 99-141, adopted on November 1, 1985 (U.S. Army, Corps of Engineers 1987).

This Report was prepared pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), Endangered Species Act (16 U.S.C. 1531 et seq.), and the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.). It is a follow-up to the Service's January, 1987 Planning Aid Report provided to the Corps for the Blue River Basin Reconnaissance Study, which included the Dodson Industrial Complex. Information for this Report was obtained from field investigations, aerial photos, maps, project files, meetings and conversations with Corps and Missouri Department of Conservation (Department) personnel. A letter of concurrence dated December 14, 1994 from the Department is included as Appendix C.

The study area is located in the southcentral portion of Kansas City, Missouri in Jackson County (Figure 1). Specifically, it is about two 2 miles east of the Kansas/Missouri border and about 11 miles downstream of where the Blue River crosses into Missouri. The vast majority of the watershed has been developed, mostly during the last 30 years. This development has led to increased water runoff and more regular and intense flooding of residential and commercial areas. The river now rises quickly following local precipitation events. Continuing development in the watershed will exacerbate flooding along the Blue River.

The purpose of this study is to determine the feasibility of a selected flood damage reduction alternative in the Dodson Industrial Complex. The area is comprised of 35 industrial firms and one public works facility, with total investments of $240 million. The southern end of the project would tie in with the recently completed GSA complex levee. This project, if implemented, would involve a 75:25 percent cost share between the Corps and the project sponsor, Kansas City, Missouri. Some flood protection measures proposed in the 1987 Reconnaissance Plan for the Blue River Basin (U.S. Army, Corps of Engineers, 1987) have been constructed (Nall Hills and GSA complex) or are still being studied. Sections of the Blue River, several miles downstream of the proposed project, are also being studied for flood control.

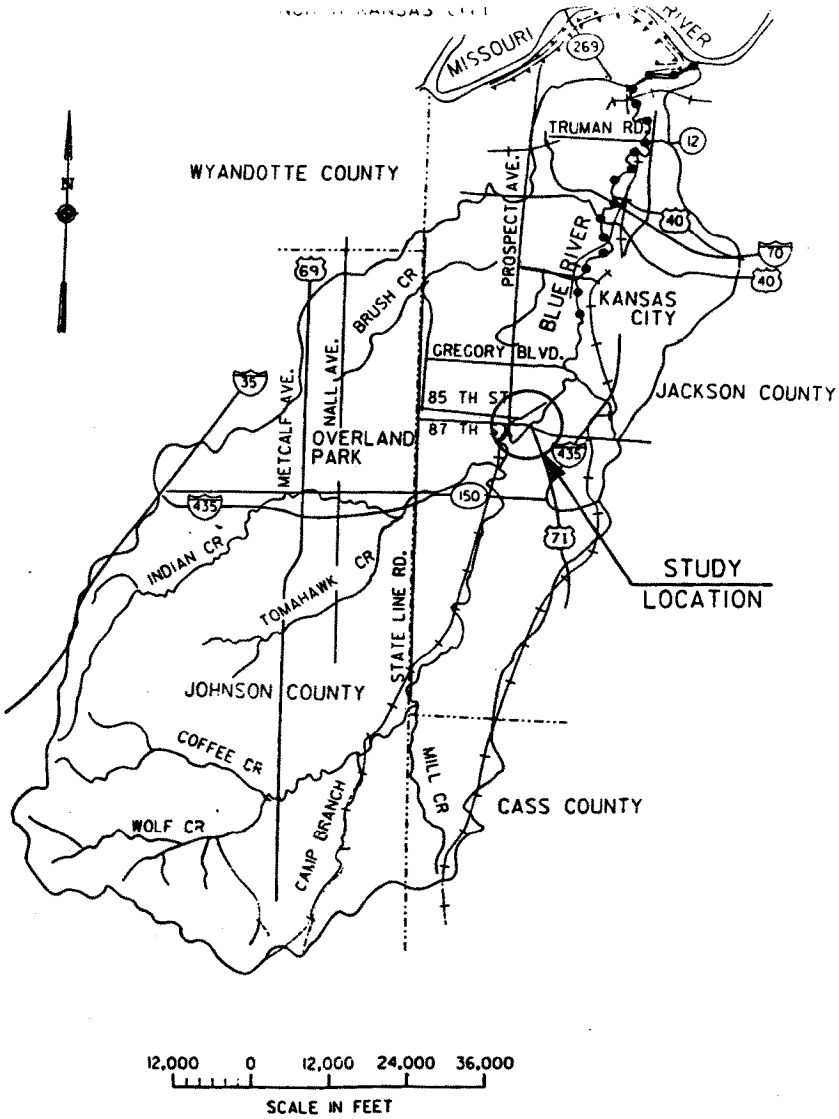



**Figure 1. Location of study area within the Blue River Basin**

## DESCRIPTION OF THE STUDY AREA

The Blue River and its tributaries form a 272 square-mile drainage basin (Figure 1) located in the Osage Cuesta physiographic subprovince. The watershed is characterized by rolling hills formerly vegetated with a mixture of tallgrass prairie on the upper and drier reaches of the hills and oak-hickory forests on the drainageways, stream bottoms and valleys.

Nearly all of the watershed has been cleared and developed. Most of the lower watershed is urbanized, while the upper reaches are suburban. Undeveloped lands in the upper reaches of the watershed are being developed at a rapid pace.

Scattered parks are located in the watershed and several miles of Indian and Tomahawk Creeks are surrounded by narrow linear parks. However, the Blue River Parkway, maintained by Jackson County, provides the largest amount of parkland in the watershed. It follows nearly 15 miles of the Blue River, downstream of the Kansas/Missouri border to Swope Park. Some of the Parkway has been left in a relatively natural condition and passes through diverse riparian woodlands and open areas. This provides some important high quality wildlife habitat and aesthetic relief in an urban environment. A good indication of the quality of this area is the presence of the nearby Blue River Glade Natural Area. Several developed recreational facilities, such as ball fields, also occur within the Parkway.

The portion of the Parkway adjacent to the Dodson Industrial Complex study area (Figure 2) contains mainly high quality riparian and upland woodlands. The Blue River Road, which runs through the Parkway at the study area, is very narrow and has no designated parking areas. Also, there are no trails through this portion of the Parkway. Lack of parking and trails has limited the public use of this area.

## TERRESTRIAL AND AQUATIC RESOURCES WITHOUT THE PROJECT

### Terrestrial Resources

The Blue River riparian corridor through the study area contains a good diversity of tree species with 23 species identified (Appendix A). The dominant species include silver maple, box elder, green ash, black willow and cottonwood. There are scattered large specimens of sycamore, basswood, black walnut, black cherry, bitternut hickory, northern red oak and bur oak. The understory is well developed with herbaceous vegetation, such as stinging nettle, white avens, may-apple, smartweeds, violets and Virginia wild-rye; vines, such as poison ivy, Virginia creeper, green briar and grape; and shrubs, such as rough-leaved dogwood, winged sumac, elderberry and buckbrush.

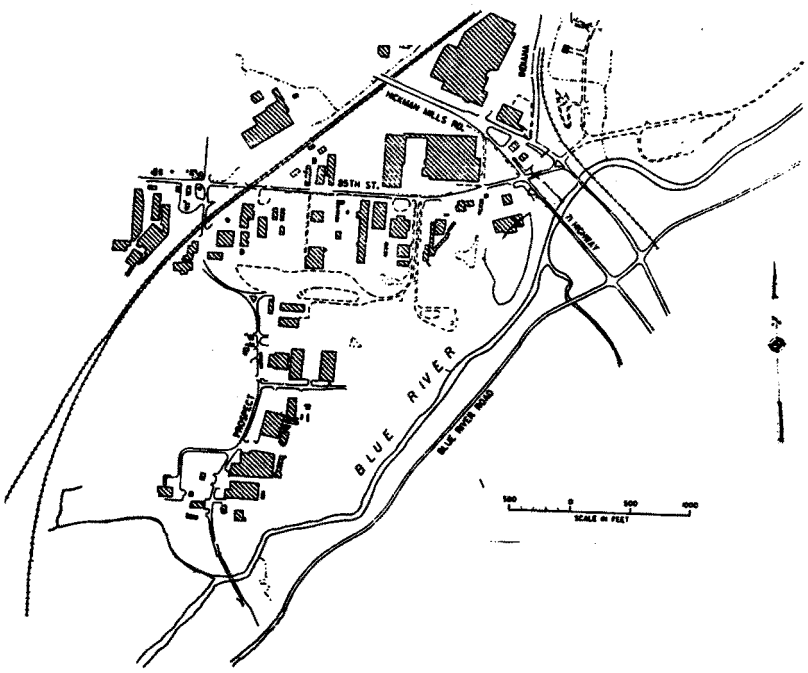



Figure 2. Dodson Industrial Complex study area

Immediately east of the riparian corridor the vegetation changes to a typical oak-hickory upland woodland on steep slopes. Immediately west of the existing riparian corridor the floodplain habitat has been disturbed, and most of the floodplain has received several feet of fill material. Aside from the highly developed areas on this fill, there is mainly cool season grasses interspersed with scattered herbaceous species such as common ragweed, curly dock, ground cherry, wood sorrel, asters and goldenrods. These grassy fields are maintained by regular mowing. About four acres of upland trees have developed on the fill in the last twenty years, in the middle portion of the study area. This dense stand of young trees contains many valuable hardwood trees such as, black walnut, black cherry, bur oak, and shingle oak. Some other tree species present here include red and Siberian elm, basswood, green ash and bitternut hickory.

The riparian corridor becomes narrow on the west side of the river and downstream from an existing wetland. The area adjacent to the existing riparian corridor has been filled with about ten feet of material. The remaining vegetation is dense regrowth of silver maple, box elder, sycamore, smooth sumac and rough-leaved dogwood. Herbaceous plants are also relatively dense and include giant ragweed, poison ivy, Virginia wild-rye, grape and Virginia creeper. Downstream of the Hickman Mills Drive bridge, the riparian corridor is mostly confined to the west bank. The trees are about 30 to 40 years old and include black walnut, green ash, Siberian and slippery elm, box elder and silver maple.

Located within the riparian corridor is about six acres of forested wetland. The boundaries of this wetland were delineated by the Corps of Engineers' using the 1987 wetland delineation manual. Most of this area has been disturbed in the last twenty to thirty years with tree regrowth consisting mainly of silver maple, green ash, red mulberry, eastern cottonwood, black walnut and American sycamore. This woodland has a dense understory which contains such dominant plants as coralberry, white avens, St. John's-wort, clearweed, smartweeds, wild ginger, poison ivy and Virginia wild-rye. The wetland contains one semipermanent shallow pool which is about 30 foot in diameter, and some smaller pools which contain water periodically during the year.

This riparian woodland is important wildlife habitat because it provides food, water and cover to many species of wildlife. A list of the species, or their sign, observed at the study site are recorded in Appendix B. Several biological and physical attributes of riparian areas, as listed by Brinson et al. (1981), make these areas valuable to wildlife: 1. a predominance of woody plants; 2. presence of surface water and abundant soil moisture; 3. a diverse mixture of live and dead vegetation. water bodies, and general ecosystem morphology; and 4. distribution in long corridors providing protected travelways between adjacent habitats and animal populations. All of these attributes apply to the Blue River riparian area within the study area. Because of the urban nature of the area, which has resulted in extensive development within the floodplain of the Blue River, the value of the remaining riparian corridors is greatly enhanced.

The value of this riparian woodland is especially evident by the diversity of birds observed in only four half-day field trips (46 species). If additional trips had taken place during peak migration months, we estimate that the bird list would nearly be doubled. Many of the migratory birds are neotropical migrants; birds which winter in Latin America and breed in the United States and Canada. These birds are represented by such groups as orioles, warblers, flycatchers, vireos, sparrows and thrushes. Some examples of neotropical migrants observed in the study area include great-crested flycatcher, northern oriole, black-and-white warbler, red-eyed vireo, Lincoln's sparrow and indigo bunting.

Neotropical migrants have relatively recently become of concern to many natural resource agencies. They are concurrently being subjected to habitat destruction on the wintering grounds and breeding grounds. Aside from the direct loss of habitats, fragmentation of habitat into smaller parcels has led to severe declines in numbers of many neotropical migrants. While some neotropical migrants nest in the study area, many more use the woodland while passing through between breeding and wintering areas.

The uniqueness of the riparian woodland habitat provided in the study area is indicated by the presence of pileated woodpeckers. This is a species which requires large amounts of woodlands and often has a home range over 300 acres. The U.S. Fish and Wildlife Service (1983) indicated that dense mature forest stands with an abundance of logs and stumps, and large decayed snags provide food and cover for the pileated woodpecker. The pileated woodpecker is a key indicator species for a complete community of hole-nesting birds. The woodlands within the study area cannot provide habitat for this woodpecker without the many acres of surrounding riparian and upland woodlands. However, since the birds were present in the study area, it appears to satisfy a component of the bird's habitat needs. This is a nonmigratory species which has declined in numbers across much of its range because of the forest fragmentation mentioned earlier.

As mentioned previously, about six acres of the riparian woodlands within the project area are jurisdictional wetlands. This area adds habitat diversity to the riparian corridor. It also may be important for several species of invertebrates, amphibians, and other animals such as muskrats, beaver, raccoon, American woodcock and Louisiana waterthrush. Formerly, this type of wetland would have been common in the Blue River floodplain; however, development has eliminated many of them. Because of its location, this wooded wetland provides many of the same functions as the riparian corridor.

Aside from providing terrestrial wildlife habitat, the riparian woodland has several other functions: 1. it filters nutrients and sediments from surface runoff and floodwaters; 2. it filters many pollutants from water sources and is able to break many of them down to less harmful components; 3. it provides shade to the Blue River, thus optimizing light and temperature conditions for aquatic plants and animals; 4. it provides leaves, sticks, and other organic matter into the river which serves as habitat and food for aquatic organisms; and 5. it maintains stable streambanks. All of these functions benefit the quality of the river at the study site and in downstream reaches, and the aquatic organisms which use the river.

Aquatic Resources

The Blue River averages about thirty feet wide through the study area. The banks have a moderately stable slope through most of this reach, which contrasts with the steep slopes found along much of the Blue River. The slopes have remained moderate and the banks with little erosion because of the well developed riparian corridor which is present.

Kansas Department of Wildlife and Parks (KDWP) has classified the portion of the Blue River in Kansas as a high-priority fishery. This rating is based on a combination of fishery characteristics, angling use, water quality, stream uniqueness, riparian association, and restoration potential. Missouri Department of Conservation does not have a similar rating system for streams in Missouri.

At a survey site on the Blue River at the Kansas/Missouri state line, KDWP found 13 fish species (Hartmann 1980). Game fish included largemouth bass, channel catfish, black bullhead and green sunfish, although none were of harvestable size. Because of pollution, benthic insect and fish diversity is relatively low in the Blue River.

Boone Creek enters the Blue River at the upstream end of the project area. The stream has been channelized and its floodplain significantly altered due to urban development and construction of a levee to protect the nearby GSA Complex. The riparian zone is very narrow and consists of scattered small trees and weedy herbaceous plants such as giant ragweed. The bottom substrate is silt and mud and the stream has little instream habitat due to previous channelization.

Threatened and Endangered Species

There are four federally-listed threatened or endangered species, whose range includes the study area. These species include peregrine falcon (Falco peregrinus), bald eagle (Haliaeetus luecocephalus), Mead's milkweed (Asclepias meadii) and western prairie fringed orchid (Platanthera praeclara). The orchid is federally-listed as threatened and the remainder are endangered.

Peregrine falcons are uncommon migrants through the region, most often seen in the spring and fall. They use wetlands and open areas, such as water bodies, cropfields and grasslands, primarily preying upon other birds.

Bald eagles may occur in the region along any large river or at any reservoir during winter. They use areas where large trees provide perch sites in proximity to open water where they feed on fish and waterfowl.

The Mead's milkweed, a perennial broad-leaved plant, is associated with unbroken tallgrass prairie, generally occurring as small populations or scattered individuals. The western

prairie fringed orchid is found in similar habitat as Mead's milkweed.

Contaminant-Related Problems Affecting Aquatic and Terrestrial Resources

Contaminants presently or periodically adversely impact aquatic and terrestrial resources along the Blue River. The most common sources of pollution in the basin include silt and agricultural chemicals (including those used on lawns, ball fields, golf courses, etc.) that enter streams in stormwater runoff.

Fertilizers, herbicides and insecticides are the most common types of agrichemical pollution. The nitrates and phosphates present in fertilizers can cause blooms of undesirable aquatic vegetation (primarily algae) that later die and consume the available dissolved oxygen in the decay process. The blooms may consist of algae species that impart a foul smell and taste to the water. This bad taste can sometimes be conveyed to fish living in the polluted water.

Some herbicides may be directly toxic to fish and wildlife. The residues of some herbicides may be stored in fish tissue, thereby posing a health risk to piscivorous wildlife and humans. Herbicides can also cause algae die-offs that drastically reduce the availability of dissolved oxygen to fish and aquatic insects.

Chlordane is a long-lived, organochlorine insecticide used as a termiticide. It has been shown to cause chronic liver and kidney dysfunction in humans and cancer in laboratory animals. Chlordane residues have been found in carp taken from the Blue River in Kansas City, Missouri, but the residues measured are generally below the action level. But, in September 1985, a health advisory was issued for all fish species in the entire river.

Other sources of contamination present in the Blue River drainage include treated wastewater effluent, petroleum products and industrial pollutants. Treated wastewater effluent typically lowers the dissolved oxygen in the receiving stream (sometimes to zero), thereby stressing or killing fish and aquatic invertebrates. It also enriches the stream with ammonia and nitrates that may cause heavy blooms of undesirable algae. Aesthetic qualities of the receiving waters are sometimes reduced (depending upon the volume of effluent discharged) due to bad odor, water discoloration and filamentous algae.

Petroleum pollution is generally related to spills of fuels or solvents, and to a lesser extent from rainwater runoff from streets and parking lots. In April 1979, a ruptured pipeline released approximately 1,500 gallons of diesel fuel into Indian Creek, a tributary to the Blue River, and killed fish and aquatic invertebrates in an eight mile stretch of the stream. Spills of petroleum products are not uncommon in urban streams and are impossible to predict and difficult to prevent.

## DESCRIPTION OF THE PROJECT

The Corps has evaluated several alternatives to reduce flood damages at Dodson Industrial Complex (U.S. Army, Corps of Engineers 1993). Some of these have already been eliminated from further consideration. For example, construction of four flood control reservoirs in the Blue River watershed was considered many years ago. However, development has occurred rapidly throughout the watershed and has eliminated the practicability of this alternative.

Seven nonstructural alternatives were evaluated for the Dodson Industrial Complex. Three of these alternatives have already been implemented and include: flood insurance, flood warning systems with temporary evacuation plans and floodplain regulation. The remaining nonstructural alternatives were removed from further consideration for a variety of reasons. These alternatives included flood proofing; permanent evacuation; placing fill for new development; and development policies, educational programs and tax incentives.

There were four major structural measures evaluated for the proposed project. These included construction of a channel cutoff, levee, floodwalls and modification of the channel. The channel cutoff measure was eliminated due to the narrow floodplain and only portions of the channel modification alternative were retained for detailed evaluation.

The proposed project was divided into three reaches. Reach 1 includes the Blue River upstream of the Prospect Road bridge, Reach 3 includes the area downstream of the Hickman Mills Drive bridge, and Reach 2 includes the area between these two bridges.

Reach 1 had two levee alternatives which were evaluated. Reach 2 included three alternatives, one with only a levee, and the others with a combination of a levee, channel modification and a floodwall. Reach 3 included four alternatives, two with only floodwalls and two with a levee and a floodwall. Detailed diagrams, descriptions and comparisons of these alternatives can be found in the Corps' final Project Report (U.S. Army, Corps of Engineers 1996). A diagram of the selected alternatives is included in Figure 3.

For Reach 1, Alternative 1 was the selected alternative because it had significantly higher benefits and benefit-cost ratio. A 700 foot-long levee would cross Boone Creek and connect the GSA levee with the Prospect Road approach to the new proposed bridge. A flap gate would be attached to the 96-inch diameter culvert which passes through the levee, in order to prevent Blue River flood flows from backing up Boone Creek.

For Reach 2, Alternative 1 was the selected alternative, because it had a significantly higher benefit-cost ratio and appeared to have fewer adverse environmental affects. The other alternatives would have involved significant streambank excavation to achieve necessary floodway capacity. This alternative includes about 3,900 feet of levee and a riverward borrow area of about five acres.

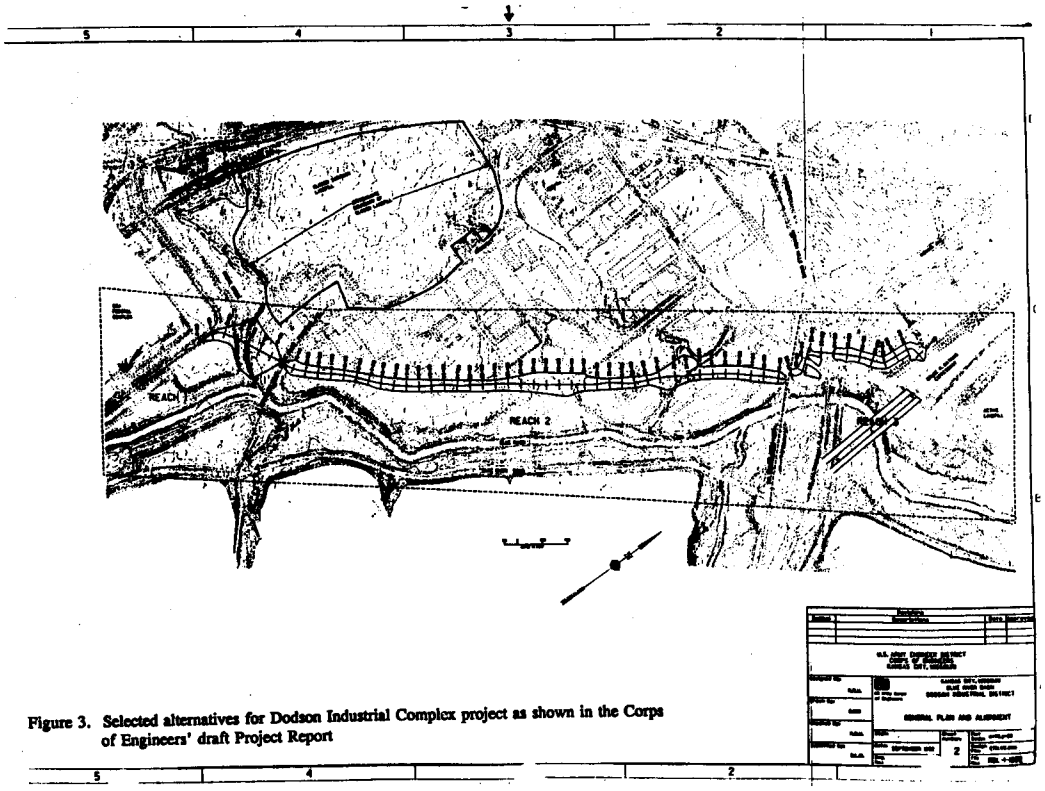



Figure 3. Selected alternatives for Dodson Industrial Complex project as shown in the Corps of Engineers' draft Project Report

The four alternatives for Reach 3 appeared to be relatively equal in most aspects; however, Alternative 4 was selected because it contributed the most to national economic development objectives. This alternative includes about 850 feet of levee, two rolling gate closure structures and 150 feet of floodwall.

## TERRESTRIAL AND AQUATIC RESOURCES WITH THE PROJECT

We determined that the Corps' selected alternatives for the three reaches would either have essentially the same impacts or would have fewer impacts than the other alternatives. Therefore, we are not providing an evaluation of the potential impacts of each alternative for each reach, but only an evaluation of the Corps' selected alternative for each reach.

The major impacts to aquatic and terrestrial resources expected to occur as a result of implementing the proposed project would result from the permanent loss of terrestrial habitat from levee and floodwall construction, permanent loss of aquatic habitat in Boone Creek from the levee crossing, permanent loss of wetlands from levee construction, and temporary loss of terrestrial habitat due to construction activities and borrow construction.

### Terrestrial Resources

The majority of the levee would be constructed over either a mowed grassy field or developed areas such as parking lots, roads, etc. This area provides minimal wildlife habitat, is common in this urban area and the habitat loss would not cause significant adverse impacts to terrestrial resources.

The levee construction would cause the direct loss of about one acre of the forested wetland. The Corps analyzed moving the levee to avoid the wetland but found that option cost prohibitive. Additional indirect impacts to the forested wetland would have accrued before the Corps agreed to move the adjacent borrow area boundary about 100 feet west of its originally proposed boundary. Hydrology of the remaining forested wetland would not be significantly altered due to a drainage structure through the levee.

It was agreed by the Corps, Service, and Missouri Department of Conservation (Department) to use the Wildlife Habitat Appraisal Guide (WHAG), developed by the Department and SCS, for an analysis of the wetland habitat to be lost. This procedure is similar to the Service's Habitat Evaluation Procedures. Corps personnel conducted the WHAG and developed the initial mitigation plan. This was reviewed, commented on and found acceptable by the Department and Service. The WHAG description and specific mitigation details will be included as an Appendix to the Corps' feasibility report.

Using the WHAG, a total of one habitat unit of forested wetland would be lost due to project

construction. The small size of the wetland reduced the potential habitat units. Furthermore, the portion of the wetland affected is on the fringe of the forested wetland, contains some of the youngest trees and has been most disturbed by past activities. The portion of the wetland to remain undisturbed is adjacent to the stream and mature riparian forested areas and would be more valuable to aquatic and terrestrial resources.

Construction of the riverward borrow area would destroy about five acres of wildlife habitat. The majority of this habitat is mowed grassy fields with about two acres of young upland trees which have developed on fill material. The original borrow area would have extended past the upland area into some high quality mature riparian woodland. Aside from direct negative impacts from habitat loss, the construction would have significantly impacted many of the other values of the riparian area. However, the Corps agreed to avoid impacting the riparian woodland by altering the configuration of the borrow site. The loss of the young upland trees would result in limited adverse impacts to wildlife, such as the nesting grackles and blue jays observed at the site. However, this loss is believed to be relatively minor since this is a common habitat in the area and is expected to quickly be reestablished following construction.

Aquatic Resources

The primary impact to aquatic resources would result from the crossing of Boone Creek with the levee and replacement of that short reach with a 96-inch culvert. The culvert would be about 300 feet long and would be able to pass the 100-year flood event. Although the construction would result in 300 feet of virtually no aquatic habitat, the aquatic habitat being lost is already low quality. We anticipate this portion of the project would have a negligible effect, if any, on the aquatic resources of the Blue River.

The construction of the riverward borrow area would have a positive impact on the aquatic resources of the Blue River. This borrow area would be connected with the river during high flows with a drainage structure. The borrow area would be developed into a wetland which would provide flood storage, filtering of sediments and pollutants from flood flows, and food and habitat for aquatic and semiaquatic species. Aquatic habitat in the borrow area would be limited since the borrow area and drainage structure would be designed to evacuate water relatively quickly to avoid destroying the mitigation forested wetland.

## MITIGATION AND ENHANCEMENT

Forested wetland and riparian woodland losses attributable to the proposed project would require in-kind mitigation (replacement of habitat value lost with equal habitat values of the same kinds of habitats as those eliminated). The aquatic habitat at Boone Creek and the upland tree habitat can be replaced out-of-kind. The cost of mitigating habitat losses should be included as a project cost.

Avoiding habitat destruction is the most desirable mitigation measure. While the Corps has agreed to move the borrow area to avoid loss of mature riparian woodland, measures must be employed to ensure that construction crews are fully aware that this area must remain undisturbed. It would be advantageous to mark the area to remain undisturbed for additional insurance of its protection.

Whenever possible, we recommend upland trees within the construction right-of-way remain undisturbed. While these trees are young now, they are closer to a mature and more valuable stage than newly established trees. Mitigating the loss of remaining upland tree acreage would occur by allowing natural regeneration of trees between the levee and the river on at least two acres.

Mitigation of the one habitat unit of forested wetland would include replacing two habitat units of forested wetland within the riverward borrow area by creating approximately four acres of wetlands. One foot of topsoil from the wetland to be destroyed would be spread across the bottom of the borrow area as a seed source. Native grasses and forbs would be planted on the upper slopes of the borrow area and about 500 trees would be planted on the bottom and lower slopes of the borrow area. The tree species to be used include those found at the forested wetland and swamp white oak.

Quarterly reports would be prepared by the project sponsor which includes photographs, percent cover of vegetation, tree survivorship and potential problems with mitigation site. These reports will be evaluated for three years following construction. Success criteria would include 95% vegetative cover, 65% tree survivorship, and use of the area by a variety of wildlife. More detailed information on the proposed mitigation can be found in an Appendix of the Corps' feasibility report.

Section 2 of the Fish and Wildlife Coordination Act requires the Service to identify project-related opportunities to enhance fish and wildlife. The enhancement recommendations discussed below refer to the project-related creation of wildlife habitat, over and above that required to mitigate losses attributable to project construction.

Segments of the Blue River riparian zone which includes only scattered or no trees could be enhanced with the establishment of additional trees. Trees would either be planted with bare-root stock, but we suggest the use of a tree spade to move some of the desirable tree species which would be removed by the borrow area construction. Aside from improving wildlife habitat and other previously listed functions of riparian woodlands, this would improve the aesthetics of the Blue River Parkway. Current plans include placing the 24 acres between the levee and the river into the Blue River Parkway.

Additional borrow areas would be constructed landward of the levee. We recommend they be constructed to encourage the development of wetlands. For example, use of relatively flat slopes on the sides of the borrow area and irregular shorelines would improve wetland development potential.

## RECOMMENDATIONS

In the interest of protecting terrestrial and aquatic resources on lands encompassing the Blue River at Dodson Industrial District project area, the Service requests that the Corps consider the following recommendations:

1. Avoid removing or injuring riparian woodland trees within the project area.

2. Use the riverward borrow area as a mitigation site for the forested wetland losses.

3. Establish suitable trees in the new wetland area.

4. Establish native grasses and forbs on the upper slopes of the borrow area as a buffer.

5. Maintain a hydrologic connection between the mitigation wetland and the Blue River.

6. Minimize upland tree removal within the construction easement.

7. Allow upland tree regeneration on at least two acres of land between the river and levee.

The following recommendations describes opportunities to provide fish and wildlife enhancement through the project.

8. Establish trees along the Blue River where the riparian woodlands are sparse or nonexistent.

9. Encourage wetland development at the borrow areas landward of the levee.

## LITERATURE CITED

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U.S. Army, Corps of Engineers. 1993. Draft project report and environmental assessment for the Blue River Basin - Dodson Industrial District, Kansas City, Missouri. Kansas City Missouri 89 pp. and appendices.

U.S. Fish and Wildlife Service. 1983. Habitat suitability index models: Pileated woodpecker. U.S. Fish & Wildl. Serv. FWS/OBS-82/10.39 15 pp.

## APPENDIX A

Tree species located in the Blue River riparian corridor at the Dodson Industrial Complex study area.

| | |
|---|---|
| silver maple | green ash |
| box elder | Siberian elm |
| slippery elm | American elm |
| eastern cottonwood | red mulberry |
| American sycamore | basswood |
| black walnut | black cherry |
| bur oak | shingle oak |
| northern red oak | bitternut hickory |
| hackberry | Kentucky coffee tree |
| black willow | redbud |
| Ohio buckeye | pawpaw |
| American red cedar | |

## APPENDIX B

Animal species, or their sign, observed at the Blue River riparian corridor at the Dodson Industrial Complex study area.

Mammals-

| | |
|---|---|
| beaver | white-tailed deer |
| gray squirrel | fox squirrel |
| raccoon | house mouse |
| eastern cottontail | opossum |

Amphibians-

| | |
|---|---|
| bullfrog | northern leopard frog |
| black rat snake | garter snake |
| yellow-bellied racer | common snapping turtle |

Birds-

| | |
|---|---|
| great blue heron | wood duck |
| red-tailed hawk | American kestrel |
| wild turkey | killdeer |
| spotted sandpiper | rock dove |
| mourning dove | yellow-billed cuckoo |
| barred owl | chimney swift |
| belted kingfisher | red-bellied woodpecker |
| downy woodpecker | pileated woodpecker |
| eastern phoebe | great-crested flycatcher |
| purple martin | barn swallow |
| blue jay | black-capped chickadee |
| tufted titmouse | Carolina wren |
| blue-gray gnatcatcher | American robin |
| Northern mockingbird | gray catbird |
| brown thrasher | warbling vireo |
| red-eyed vireo | orange-crowned warbler |
| Northern parula | yellow-rumped warbler |
| black-and-white warbler | summer tanager |
| Northern cardinal | indigo bunting |
| Lincoln's sparrow | red-winged blackbird |
| common grackle | brown-headed cowbird |
| Northern oriole | American goldfinch |
| house sparrow | European starling |

APPENDIX C

Letter of Concurrence

by the

Missouri Department of Conservation

MISSOURI DEPARTMENT OF CONSERVATION

2901 West Truman Boulevard
P.O Box 180
Jefferson City Missouri 65102-0180

Telephone: 314/751-4115
Missouri Relay Center: 1-800-735-2966 (TDD)

JERRY J. PRESLEY, Director

Season's Greetings

December 14, 1994

Mr. William H. Gill
US Fish and Wildlife Service
Kansas Field Office
315 Houston Street - Suite E
Manhattan KS 66502-6172

Dear Mr. Gill:

Staff have reviewed the draft FWCA report for the Blue River Dodson Industrial District project in Kansas City, Missouri. We find it to be well-written and accurate, and to provide appropriate mitigative measures to offset unavoidable natural resource impacts resulting from the project. We might make the one suggestion to emphasize protection of a 100-foot wooded riparian corridor along the Blue River wherever it exists in the project area.

We concur with your recommendations and appreciate the opportunity to comment. Kathy McGrath of my staff is available to address and provide any additional information you may require.

Sincerely,

Dan F. Dickneite

DAN F. DICKNEITE
PLANNING DIVISION CHIEF

cc: COE (Ruf)

# APPENDIX F

## CORRESPONDENCE

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

Public Works Department

Office of the Director

20th Floor, City Hall
414 East 12th Street
Kansas City, Missouri 64106

(816) 274-2364
Fax: (816) 274-2369

February 20, 1996

Mr. Harry F. Beyer, Jr.
Chief Engineering and Planning Division
U.S. Army Engineer District-Kansas City
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Mr. Beyer:

Re: Blue River Basin Feasibility Report-Dodson Industrial District

Enclosed is a revised copy of the Statement of Financial Capability as prepared by Janice M. Reed, Director of Finance. If you have any questions, please do not hesitate to contact me.

Sincerely,

George E. Wolf, Jr., P.E.
Director of Public Works

GEW:CEO:ceb

Enclosure

# Interdepartmental Communication

**Date:** February 20, 1996

**To:** George E. Wolf, Director of Public Works

**From:** Janice M. Reed, Director of Finance

**Subject:** STATEMENT OF FINANCIAL CAPABILITY

Attached please find the statement of financial capability as requested by the Corps of Engineers in connection with the Blue River/Dodson Area flood control project. Also included is the City's most recent comprehensive annual financial report (CAFR) and a one page summary listing key financial indicators, bond ratings, and economic statistics for the City.

If you have any questions or comments, please call me at extension 1732.

Janice M. Reed

cc: Charles E. Owsley, City Engineer
Randall J. Landes, Interim City Treasurer

**STATEMENT OF FINANCIAL CAPABILITY**
***CITY OF KANSAS CITY, MISSOURI***

The financial capability of the City of the City of Kansas City, Missouri ("City") to provide the sponsor's share of the Upper Blue River/Dodson Area Flood Control project is based upon the City Council's intent to provide adequate funding to complete the City's obligations through a combination of funding sources (See Attached Resolution No. 951615) which include an annual appropriation from the one-half cent sales tax for capital improvements until it sunsets December 31, 2000.

Based upon the current Corps of Engineers project schedule, it is anticipated that Preconstruction Engineering and Design (PED) will be initiated in September 1996 and be completed in September 1999. During this period, the Project Cooperation Agreement will be negotiated for execution immediately following the completion of PED. Real estate acquisition for project construction is currently scheduled to commence in January 2000 and funds required for the construction contract are scheduled for August 2001.

The City is prepared to accelerate this project schedule to achieve a construction contract award earlier than August 2001. This could be achieved by expediting PED, earlier real estate acquisition by the City, or a combination thereof. The City has the financial capacity to execute the completion of the proposed project and stands ready to assist the Corps of Engineers in the timely completion of this much needed flood damage reduction project.

Payment of the City's financial obligation is estimated to be the following:

| | | |
|---|---|---|
| Fiscal Year 2000 | Start ROW Acquisition | $1,000,000 |
| Fiscal Year 2001 | Complete ROW and Utility Relocation's | 3,185,000 |
| Fiscal Year 2002 | City share of construction | 855,000 |
| | | $5,040,000 |

Payment of the City's share of authorized project costs will be assured on an annual basis. After receiving notification from the Government of the City's portion of authorized project costs for that year, an ordinance will be prepared enabling the City to enter into a contract with the Government in the specified amount, and granting authority to expend the necessary funds to fulfill the City's obligation.

A table of financial highlights and the City's most recent audited financial reports are included. The following paragraphs detail the City's obligations and performance as local sponsor for two Corps flood control projects now in progress: Brush Creek and Blue River.

From 1991 to 1995, the City contributed $50 million to the Brush Creek flood project to widen existing bridges and roadways, redevelop commercial land, construct several lakes, and develop a recreational lake and amenities. The City's contribution was financed with three series of lease revenue bonds; these were issued in 1990, 1991, and 1993. To date, the City has contributed $12.8 million of the $19 million required payment to the Corps. The Corps of Engineers and federal aid urban grants will provide more than $35 million for the total project. Contributions to the Corps and City construction schedules have been in accordance with the terms of the local cooperation agreement for Brush Creek.

As local sponsor for the Blue River flood control project, the City expects to fund $32 million from a combination of pay-as-you-go sales tax revenues and the issuance of lease revenue bonds. The issuance of 1992 and 1994 lease revenue bonds funded $22 million for the project and the remaining $9.9 million is being financed through pay-as-you-go.

## CITY OF KANSAS CITY, MISSOURI

| *Key Financial Indicators* | Current Status | Municipal Credit Benchmark |
|---|---|---|
| General Fund Fund Balance/Expenditures | 6% | n/a |
| Outstanding Debt Per Capita | $ 997 | $ 1,391 |
| Debt Service/Expenditures | 12% | n/a |

| *City Bond Ratings* | Moody's | Standard & Poor's |
|---|---|---|
| General Obligation | Aa | AA |
| Water Revenue | Aa | AA |
| Sewer Revenue | Aa | AA- |
| Airport Revenue | A | A |
| Leasehold Revenue | A | A |

| *Key Economic Indicators* | Kansas City | U.S. Average |
|---|---|---|
| Unemployment Rate | 5.30% | 5.80% |
| Cost of Living Index | 97.1 | 100.0 |
| Per Capital Retail Sales | $ 9,246 | $ 8,010 |
| Cost of 4-Bedroom Home | $ 131,062 | $ 197,617 |

**RESOLUTION NO. 951615**

**Expressing the City's strong continued support to the Dodson Industrial District Flood Damage Reduction Project on the Upper Blue River in Kansas City, Missouri.**

WHEREAS, the City of Kansas City, Missouri, has sought adequate protection for the Dodson Industrial District whose economic importance has suffered by repeated flooding from the Blue River since 1928; and

WHEREAS, the City on April 27, 1984, passed a resolution requesting a restudy of the Blue River Basin followed by a similar resolution by the Mid-America Regional Council on June 26, 1984, which resulted in a Reconnaissance Report in May 1984 recommending a feasibility study; and

WHEREAS, the City on May 26, 1987, provided a letter of intent to sponsor this flood damage reduction study and on July 13, 1988, signed a feasibility study cost sharing agreement; and

WHEREAS, the Kansas City District of the U.S. Army Corps of Engineers has presented a draft of the feasibility report and environmental assessment with considerable input and review from the City's technical staff who find the NED plan favorable to the City cause: specifically levee protection to this important industrial area; and

WHEREAS, all the above-mentioned efforts including considerable federal and local monetary contributions will be wasted to the continued frustration of the Dodson Industrial District if the project does not proceed; and

WHEREAS, the completion of the project will require substantial annual funding from both federal and city sources; NOW, THEREFORE,

BE IT RESOLVED BY THE COUNCIL OF KANSAS CITY:

Section A. That the Mayor and Council hereby express their intent to provide adequate funding to complete the City's obligations in relation to the study and eventual construction of the Dodson Industrial District Levee Project.

Section B. That the City will strongly encourage congressional representatives to continue their support of this project in future federal budgets.

Section C. That the City actively supports the U.S. Army Corps of Engineers in its efforts to obtain timely federal funding and to complete the project as rapidly as possible.

EMANUEL CLEAVER II, Mayor

Catherine T. Becker

City Clerk

By [signature]

DEC 07 1995

CEMRK-CO-RW (1145b) 9 February 1996

MEMORANDUM FOR CHIEF, EP-P

SUBJECT: Dodson Industrial District - KCD Permit Application No. 96-00164

1. Reference CEMRK-EP-PR memorandum, dated 27 October 1995, requesting Section 404 authorization for proposed flood damage reduction measures for the Dodson Industrial District, along the Blue River, in Kansas City, Missouri.

2. The public comment period for KCD's Dodson Industrial District permit application has closed. CO-R has provided EP-P with copies of all comments received in response to the public notice issued for the project. Robert Smith of this office recently met with EP-P staff, John Grothaus and Marty Schuettpelz, to discuss the comments received and EP-P's draft responses to those comments. Several comments were revised to satisfy CO-R concerns.

3. CO-R staff have discussed the Draft Feasibility Report's proposed wetland mitigation area design with EP-P staff on several occasions. We believe that refinement of the design may be necessary to assure the mitigation area will have a high probability of success. Refinement of the design would reduce the potential for future remedial work (Appendix J of the Draft Feasibility Report) if the area does not develop into a jurisdictional wetland. We recommend that CO-R be invited to participate in the final design of the mitigation area, during the preconstruction, engineering and design phase (PED) of the project, in order to maximize success of mitigation efforts.

4. CO-R will provide authorization under authority of Section 404 of the Clean Water Act, for the subject project, concurrent with finalization of the Feasibility Report. We will obtain water quality certification, prepare a Statement of Findings and complete our public interest review when final review comments become available and any new issues, identified during that review period, have been resolved. We will continue to coordinate, as needed, with EP-P to expedite authorization for the proposed work.

Joseph S. Hughes
Lawrence M. Cavin
Chief, Regulatory Branch
Construction-Operations Division

CF:
CO
CO-RW-NA

UNION PACIFIC RAILROAD COMPANY
CONTRACTS & REAL ESTATE DEPARTMENT

R.D. UHRICH
ASSISTANT VICE PRESIDENT

ROOM 1100, 1416 DODGE STREET
OMAHA, NEBRASKA 68179
(402) 271-3753
FAX (402) 271-5493

J. A. ANTHONY
DIRECTOR-CONTRACTS & JOINT FACILITIES
D. D. BROWN
DIRECTOR-REAL ESTATE
J. L. HAWKINS
DIRECTOR-OPERATIONS SUPPORT
D. H. LIGHTWINE
DIRECTOR-REAL ESTATE
W. R. ULRICH
DIRECTOR-BUILDING SERVICES

January 23, 1996

Folder: 1419-92

**MR JOHN GROTHAUS**
**KANSAS CITY DISTRICT**
**CORPS OF ENGINEERS EP-EF**
**700 FEDERAL BUILDING**
**601 EAST 12TH STREET**
**KANSAS CITY MO 64106-2896**

Subject: Your proposed flood control drainage improvement project for the Dodson Industrial District at Kansas City, Missouri.

Dear Mr. Grothaus:

The Railroad Company's Chief Engineering Office has reviewed the plans and the feasibility reports as submitted for the above project and the Railroad Company has no engineering objections to the proposed levee improvements. From the Corps provided plans, it appears that the project will tie into the just completed rolling flood gate across the Railroad Company's Coffeyville Subdivision for the Blue River Project.

The Railroad Company's engineering personnel are not aware of any local drainage problems in the area of the railroad and the Boone Creek Water Shed. From reviewing the plans the Railroad Company does not know what impact if any, the proposed controlled structure may have on the track facilities and bridges in the Boone Creek water shed area.

The Railroad Company is willing to cooperate and work with the Corps on the project and on any Agreements that may be required for the Project between the Corps, the Corps' Contractor, and the Railroad Company on the Railroad Company's right of way.

If you have any further Engineering request you may contact Todd Martindale at (402) 271- 5766, Don Steele at (402) 271- 3303 or you may contact me at (402)271-4309 on any real estate issues and agreements that may be needed for this project.

Yours truly,

Don Abel
Contract Representative

CC: Todd Martindale -- Engineering Room 1000
Don Steele -- Engineering Room 1000

Missouri Highway and Transportation Department

Capitol Ave. at Jefferson St., P.O. Box 270, Jefferson City, MO 65102 (314) 751-2551 Fax (314) 751-6555

December 26, 1995

Colonel Robert E. Morris
Commanding Officer
U.S. Army Corps of Engineers
Kansas City District
700 Federal Office Building
601 East 12th Street
Kansas City, Missouri 64106-2896

Attention: EP-PF

Dear Colonel Morris:

We have reviewed the document entitled, "Draft Feasibility Report and Environmental Assessment for Flood Damage Reduction for the Blue River at the Dodson Industrial District, Kansas City, Missouri" recently provided to our office. This review leads us to make the following comments.

It would appear that the preferred alternative intends to flood 85th Street, thereby denying access to Bruce R. Watkins Drive and to the Industrial Park, the levee is protecting. We suggest the sluce gate assembly you have proposed be located on the south side of the culvert on 85th Street. Additionally, the Corps of Engineers (COE) could place a clay face on our embankment on the south side of 85th Street and the east and west embankments of relocated 87th Street, thereby allowing the detention basin to be south of 85th Street.

On Page 41 of the document, it appears that the COE preferred alternative provides "the least protection of all alternatives for this reach of the interchange".

The Feasibility Report indicates on Page 86 that the COE consulted with our department regarding current and future highway construction in the Dodson area. However, there is no indication by the Corps as to what the response from our department was in order for them to determine if there is any potential impacts. We are not aware of this coordination.

Before the preferred alternative, selected by the COE, can tie into the embankment of the exit ramp of Bruce R. Watkins Drive, a permit will be required from this department prior to the start of construction. This permit will also require a maintenance agreement.

A statement on Page 106 of the Draft Environmental Assessment appears to conflict with statements made on Pages 27, 28 and 98. The fourth paragraph on Page 106 indicates:

> However, the recommended plan would not directly or indirectly support more development in the flood plain or encourage additional occupancy and/or modification of the base flood plain. Therefore, the Corps has determined that the recommended plan complies with the intent of Executive Order 11988.

The first paragraph on Page 27 indicates that:

> Without flood protection, the Dodson Industrial District will continue to be damaged by periodic flooding, and will be faced with economic decline despite the infrastructure improvements. The problem will worsen with time if no corrective action is taken because frequently flooded buildings deteriorate and have shortened economic lives.

It continues in the same paragraph to read:

> Future development will require special measures, such as construction on fill material or raising first floor levels to an elevation several feet higher than the first-floor elevations of existing structures. FEMA requirements would also prohibit new basements below the base flood elevation. Little new development has occurred in the area for several years because potential businesses find it more advantageous to settle in locations where flood risks are slight, flood insurance is not required, and the above mentioned special considerations are not required for new construction.

The first paragraph on Page 28 indicates:

> Implementation of a effective flood protection plan would 1) protect existing development, thereby reducing future losses to existing development; 2) make some limited amounts of land available for future development coincident to protecting existing development; and 3) enhance the area's future economic stability.

Page 98 of the DEA indicates in Paragraph 3:

> Many physical improvements are currently under construction, or are planned, which will upgrade the area's transportation system and other support services. These improvements will likely make the area more attractive to new development and businesses and aid in retaining the existing businesses.

These statements do not support the statement on Page 106 that the recommended plan would not support more development in the floodplain or encourage additional occupancy.

The Draft Environmental Assessment simply discusses the impacts of the proposed improvement. Since the proposal appears like it would support additional flood plain development, we question what the COE should be saying about cumulative and secondary impacts of the proposed action. Often times we are asked this same question by the COE concerning our projects.

We would like to thank the Corps of Engineers for the opportunity to review this document and would encourage your office to further coordinate the activities of this

project with our Kansas City Office. They may be reached at:

Mr. Dan Miller, District Engineer
Missouri Highway and Transportation Department
5117 East 31st Street
Kansas City, MO 64128
Telephone: (816) 889-6339

Sincerely,

Joe Mickes

Joe Mickes
Chief Engineer

jm/sm/maj-de

Copies: Mr. Mark Kross-de
Mr. Dan Miller-4

Department of Energy
Field Office, Albuquerque
Kansas City Area Office
P.O. Box 410202
Kansas City, Missouri 64141-0202

December 19, 1995

U.S. Army Corps of Engineers
Attn: CEMRK-CO-RW (96-00164)
700 Federal Building
Kansas City, MO 64106-2896

Subject: General Investigation of Flood Damage Reduction for Blue River at Dodson Industrial District, Draft Feasibility Report and Environmental Assessment, dated October 1995

Dear Mr. Lilley:

The subject report was reviewed by the Department of Energy (DOE) for potential impacts to the Bannister Federal Complex. The Corps of Engineers (COE) was previous notified of the following concerns through a previous December 6, 1995 draft copy of these comments from AlliedSignal and by the undersigned's comments at the December 13, 1995 public meeting at Center High School. We believe these comments should be provided to the City of Kansas City, Missouri as they may be affected.

1. Paragraph A-3.09c, Boone Creek Subbasin, pages A-23 & A-24; and Figure A-3.12, Boone Creek Profiles, page A-69:

The Bannister Federal Complex's flood protection system was designed to retain interior storm waters in a 500-year event. Changes are noted in Boone Creek's water elevation along the Bannister Federal Complex's north levee, affecting the amount of interior storm water which must be stored within the federal complex's north retention basin. The lower reach of Boone Creek will be used as an interior storm water retention basin after construction of a levee spanning the creek. Boone Creek's discharge will be controlled by a 96-inch reinforced concrete pipe (RCP). Paragraph A-3.09c(6) and Figure A-3.12 indicate a 10 year event with the proposed levee and one 96" RCP raises the water level in Boone Creek by 5 feet above the existing 100 year flood event level. The proposed 100 year event increases the levels in Boone Creek by 10 feet over the existing conditions.

Higher levels in Boone Creek decrease the ability of the federal complex to discharge the initial surge of interior storm waters to the Blue River as our north flapgates would close earlier. The

federal complex would therefore retain a larger volume of storm waters, resulting in additional storage required for a given storm event. We request additional hydraulic studies of the Bannister Federal Complex's interior storage be conducted to determine the extent of this impact and to assure the federal complex retains its capability to store storm waters in a 500 year event.

2. Boone Creek Subbasin and the Bannister Federal Complex's NPDES permit with the State of Missouri for the Outfall 001 compliance sampling point at Boone Creek; Figure 6, page 22, and Figure A-3.11, page A-68

We have concerns regarding the impact to the federal complex's compliance sampling point for Outfall 001 (north storm water discharge into Boone Creek) by installation of the levee and the control structures at Boone Creek's confluence with the Blue River. The concern is by adding a control point on Boone Creek at the new levee, the State of Missouri's Department of Natural Resources (MDNR) will want the federal complex's compliance point for Outfall 001 moved to the new control structure. If that happens, then either a new outlet structure routed directly to the Blue River for the federal complex is needed; or the City of Kansas City, Missouri would need to be the owner of the permit as most of the watershed through the new Boone Creek control structure is not federal property.

Under "General Conditions" of the DOE's NPDES permit with MDNR, representative sampling is addressed. This section requires all samples to be taken at the outfall before the effluent joins or is diluted by any other body of water or substance. Boone Creek fits the definition of "waters of the state" defined under 10 CSR 20-2.010 (82) as, "All rivers, streams, lakes, and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common. These waters also include waters of the United States lying within or adjacent to the state." Assuming "entirely confined" means the water body receives only flow from a discrete source; then Boone creek is not presently considered confined, as it has a significant watershed both above and below the Outfall 001 discharge point from sources other than the federal complex.

Several factors merit leaving the compliance point at its present location. First, the closed 87th and Prospect landfill borders the north bank of Boone Creek immediately downstream of Outfall 001. Second, the watershed of Boone Creek outside the federal complex drains a significant area, 1664 acres. The area is highly urbanized and several light industries are within the drainage area. Discharges from the federal complex to Boone Creek comprise an insignificant volume of flow to Boone Creek when the overall

watershed is considered. Third, runoff from several point sources, (the closed landfill, and businesses in the Dodson district) discharge to Boone Creek downstream of the federal complex. These sources will affect the contaminant loading in Boone Creek. The above factors provide significant reason to not move the federal complex's NPDES compliance for Outfall 001 to the control structure at the proposed levee spanning Boone Creek.

To ensure MDNR concurrence, we request the potential changes to the configuration of Boone Creek be outlined in written correspondence with the state to ensure MDNR agrees with leaving the compliance sample point at the present location. We can participate with the COE in negotiating with the MDNR.

3. Site Description and Economic Setting - Infrastructure, page 11; and Paragraph A-6.02, 87th and Prospect Landfill Site, pages A-99 & A-100

The closed 87th and Prospect Landfill Site, operated by Kansas City, Missouri, from 1958 through 1971 raises several concerns. The federal complex has been studied under a RCRA 3008(h) Consent Order. Groundwater contamination originating from the federal complex has not migrated as far north as Boone Creek, however, ponding of water over the closed landfill could drive contaminants to the south from the landfill. These could be perceived to be originating from federal property.

The report notes the landfill was excavated to groundwater, filled with a variety of municipal, sanitary, and industrial wastes, and capped with a 3-foot cover of clay. The site is noted to have less than the original 3 feet of cover material with patches of no cover. Environmental Protection Agency (EPA) testing of seeps along the southwest edge of the landfill detected low concentrations of various metals and organic compounds. The report states this leachate is not considered hazardous. It is unclear as to the meaning of "not considered hazardous". Is it not considered hazardous to the environment or not considered a RCRA hazardous waste? Depending upon the source, the leachate could be considered a hazardous waste if managed in some fashion.

The primary concern is the ponding within Boone Creek's stormwater retention basin behind the levee over the closed landfill. Although the COE report states an "impermeable clay cap" will be installed over the closed landfill, it is highly doubtful that the cap will indeed be impermeable. Responsibility for the maintenance of this cap to ensure erosion or penetration of the cap by plant root systems could be a problem.

Landfill closure by installation of a clay cap is designed to promote rain event run-off limiting infiltration potential. By

ponding water over the closed landfill, infiltration potential is greatly increased by the static head of the ponded water. This increase in infiltration could mobilize contaminants present within the landfill. The likely migration route of groundwater in this area would be to the south towards Boone Creek with potential impacts to federal complex. Contaminants migrating to the south from the landfill could be perceived to be originating from federal complex.

4. Boone Creek Subbasin and the Bannister Federal Complex's NPDES permit with the State of Missouri for the Outfall 001 compliance sampling point at Boone Creek

It is not clear in the report whether the levee across Boone Creek will affect the water level in Boone Creek at normal stage for the Blue River and Boone Creek. A relatively small rise in the normal elevation of Boone Creek could affect the KCP compliance monitoring point.

If you have any questions on any of the above, please contact myself at (816) 997-3352 or Raymond Meis at (816) 997-5430.

Sincerely,

Gregory A. Betzen
Program Manager
Office of Technical Management

cc:
Joseph Lilley, Corps of Engineers
Missouri Dept. of Natural Resources
P.O. Box 176
Jefferson City, MO 65102
John Casey, GSA, Region 6PCT
Mike Stites, D/SE1, BC30

STATE OF MISSOURI Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

December 15, 1995

U.S. Army Corps of Engineers
Kansas City District
ATTN: CEMRK-CO-RW (96-00164)
Mr. Bob Smith
700 Federal Building
Kansas City, MO 64106-2896

RE: ACOE levee project, Blue River floodplain

Dear Mr. Smith:

The Department of Natural Resources, Water Pollution Control Program, has reviewed Public Notice 96-00164 for a proposed levee construction project. Please refer to the public notice dated November 17, 1995, for project details.

The proposed levee construction project is located within the Blue River floodplain in Section 22, Township 48 north, Range 33 west, Jackson County, Missouri.

We offer the following comments:

1. It is not indicated if any wetlands will be impacted. Wetlands were once a significant component of Missouri's natural heritage, accounting for almost 11 percent of its surface area. As of 1980, 87 percent of Missouri's original 4.8 million acres of wetlands have been eliminated by activities such as land clearing, draining and filling, channelization and damming. Missouri far exceeds the national rate of 53 percent wetland loss. Any changes designed should, at a minimum, maintain the present amount of wetlands, and preferably restore wetlands as part of floodwater storage areas or other open space created on the river side of the levees.

2. Increases in levee height could be limited to protection of Reach 2. Levees in this area would protect 34 structures, whereas, the other two reaches propose to protect 11 structures combined. Any levee construction proposed should be done only after a thorough consideration of alternatives for the management of the floodplain, as recommended by numerous reports including those by the Corps of Engineers following the 1993 floods.

3. It does not seem feasible to consider flood levels and development twenty years in the future. This is not an isolated area. Changes in the areas upstream and downstream of this will affect what happens in this area. Development in the floodplain should be discouraged, not encouraged.

4. Only clean nonpolluted material should be used.

5. Best management practices should be utilized during construction to minimize erosion.

6. How much of the levee will be over thirty feet tall? Levees approaching sixty feet in height seem a bit excessive.

7. Hydrologic connections should be maintained between the proposed mitigation site and the Blue River.

8. Impacts, increased wetlands, etc., related to the floods of 1993 and 1995 should be taken into account in the final document. For example, were buildings destroyed by these floods and not rebuilt, if so a levee may not meet benefit/cost ratio with these removed from calculations.

9. A riparian corridor of at least 100 feet should be maintained along the Blue River.

10. It may be beneficial to reseed the borrow areas (those not used for wetland mitigation) by spreading seed bank materials that could be removed from the borrow areas. If the top six inches of material were stockpiled and redistributed after excavation, there would likely be an abundance of seeds, roots and other plant material that would rapidly revegetate the disturbed area.

11. Any land disturbance activities may require a water pollution control permit. In this regard, please contact the Department of Natural Resources, Kansas City Regional Office at (816) 795-8655.

Thank you for the opportunity to comment on this project. If you have any questions, please call Terri Ely of the Planning Section or me at (314) 751-7428.

Sincerely,

WATER POLLUTION CONTROL PROGRAM

John Madras

John Madras, Chief
Planning Section

JM:tep

# MISSOURI DEPARTMENT OF CONSERVATION

*Headquarters*
2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 314/751-4115 ◆ Missouri Relay Center: 1-800-735-2966 (TDD)

JERRY J. PRESLEY, Director

December 13, 1995

Mr. Lawrence M. Cavin
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, MO 64106-2896

Re: CEMRK-OD-PE (96-00164, U.S. Army Corps of Engineers)

Dear Mr. Cavin:

We appreciate the opportunity to provide comments on the above-referenced Section 404 activity adjacent to the Blue River in Jackson County, Missouri.

We were involved at various stages, in the development of this project and mitigation necessary to offset natural resource losses. In general, we feel our concerns were heard and addressed, and appreciate Corps' staffs' willingness to consider our perspective.

We have one minor comment with regard to the mitigation plans as currently proposed: sideslopes of the borrow area are quite steep. While we understand that your agency is attempting to acquire necessary borrow fill while avoiding encroachment into the riparian corridor and minimizing impacts on wetland (which we support), we do encourage examination of other ways to lessen the slopes of the borrow area. Gradual slopes and a heterogeneous bottom configuration produce better aquatic habitat. In addition, we are concerned as to the stability of the 2:1 slope adjacent to the river. We have concerns that it may be difficult to vegetate the sideslopes, and maintain vegetation after project completion. We also ask that you consider switching the two sideslopes, so that the gentler, and therefore more stable, slope is closest to the river. However, this should not be done if it requires encroachment into the riparian corridor.

Again, thank you for the opportunity to provide comments on this activity, and for your consideration of our concerns throughout the project development process. Kathy McGrath of my staff is available to address any questions you may have.

Sincerely,

DAN F. DICKNEITE
PLANNING DIVISION CHIEF

c: FWS (Frazer)
EPA (Mulder)
DNR (Fawks)

COMMISSION

ANITA B. GORMAN
Kansas City

RANDY HERZOG
St. Joseph

JOHN POWELL
Rolla

RONALD J. STITES
Plattsburg

# CULTURAL RESOURCE ASSESSMENT
## Section 106 Review

**CONTACT PERSON/ADDRESS:**

Lawrence M. Cavin, Chief, Regulatory Branch
Kansas City District, Corps of Engineers
Attn: CEMRK-CO-RE (96-00164)
700 Federal Building
Kansas City, Missouri 64106-2896

**C.**

John Madras
Bob Smith

**PROJECT:**

Dodson Industrial District Levee Construction, COE Permit 96-00164

**FEDERAL AGENCY:**

COE-404

**County:**

Jackson County

**The Historic Preservation Program has reviewed the information submitted on the above referenced project. Based on this review, we have made the following determination:**

[ ] The project area has been previously disturbed or has a low potential for the occurrence of cultural resources. A cultural resource survey, therefore, is not warranted.

[ ] None of the structures involved are eligible for inclusion in the National Register of Historic Places.

[ ] The proposed undertaking will have "no effect" on properties listed on or determined eligible for listing in the National Register of Historic Places.

[X] An adequate cultural resource survey of the project area has been made. We agree that the proposed undertaking will have "no effect" on significant cultural resources.

[ ] An adequate cultural resource survey of the project area has been made. We agree with the report's recommendation that the following potentially eligible sites should be avoided. If these sites are avoided, the proposed undertaking will have "no effect" on significant cultural resources.

Sites:

**For the above checked reason, the Historic Preservation Program has no objection to the initiation of project activities. PLEASE BE ADVISED THAT IF THE CURRENT PROJECT AREA OR SCOPE OF WORK ARE CHANGED, A BORROW AREA IS INCLUDED IN THE PROJECT, OR CULTURAL MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, APPROPRIATE INFORMATION MUST BE PROVIDED TO THIS OFFICE FOR FURTHER REVIEW AND COMMENT. Please retain this documentation as evidence of compliance with Section 106 of the National Historic Preservation Act, as amended.**

By: December 11, 1995

Claire F. Blackwell, Deputy State Historic Preservation Officer — Date

**MISSOURI DEPARTMENT OF NATURAL RESOURCES**
**HISTORIC PRESERVATION PROGRAM**
**P.O. Box 176, Jefferson City, Missouri 65102**
**For additional information, please contact Judith Deel, (314) 751-7862**

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

December 7, 1995

Roy D. Reed
Deputy District Engineer
Planning and Hydrologic Engineering Branch
Engineering and Planning Division
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Mr. Reed:

In response to your letter requesting review and comment on the draft Feasibility Report and Environmental Assessment for the Blue River, Kansas City, Missouri (Dodson Industrial District), please find below a list of comments and issues.

On page 13, second paragraph, the report assumes the City of Kansas City will work with the Missouri Department of Natural Resources (MDNR), so that all properties associated with the project are free of hazardous and toxic waste prior to initiation. The City needs to work closely with appropriate MDNR representatives to address all hazardous waste issues. At a minimum, sampling should be conducted along the foot print of the proposed levee in areas suspected to contain hazardous materials, sediment within the floodway, and in the borrow areas.

The final document should present plans for dealing with hazardous materials. The plans should include sampling methods, contingency plans if hazardous materials are found, and proposed remediation activities or disposal sites. The City and Corps of Engineers need to have technical lead personnel on environmental site impacts and proposed disposal/remediation options.

The final report should address possible impact of floodwalls, levies, and drainage structures on National Pollution Discharge Elimination System (NPDES) permits for sites discharging into the Blue River, Boone Creek or other outfalls.

The content of the Draft Feasibility Report and Environmental Assessment appears to be focused more on the Feasibility issues. If the project goes forward, much more study and detail will be required on the Environmental Assessment aspect. At least two properties along the proposed levee are identified as having environmental concerns. Near the southern end of the project and on the north side of the floodway, the land owned by the City of Kansas City was once used as a landfill. Also, the Arrow Truck Sales property is identified as a CERCLIS site.

I look forward to receiving your response to our comments on the report. Should you have any questions or need clarification, please contact Mr. Vin Journey, of my staff, at (816) 997-5790. Environmental assessment and management planning for construction on impacted or hazardous waste sites are essential for protecting the people and environment of the State of Missouri.

Very truly yours,

DEPARTMENT OF NATURAL RESOURCES

Larry V. Erickson

Larry Erickson
Federal Facilities Section

VJ:al

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

**Public Works Department**

Office of the Director

20th Floor, City Hall
414 East 12th Street
Kansas City, Missouri 64106

(816) 274-2364
Fax: (816) 274-2369

November 17, 1995

Colonel Robert E. Morris
700 Federal Building Rm. 25
601 East 12th Street
Kansas City, Mo. 64106-2896

Dear Colonel Morris:

Re: Commitment, Blue River Basin, Kansas City, Missouri
(Dodson Industrial District)

The purpose of this letter is to express our commitment to sign a Project Cooperation Agreement as non-Federal sponsor for construction of the Blue River Basin, Kansas City Missouri Project.

We understand that planning for this project has progressed to the stage that requires a firm commitment of financial participation by a non-Federal sponsor for you to complete the Feasibility Report and proceed with preconstruction engineering and design. We have reviewed the project design to date, and we are prepared to participate in construction of the project substantially as designed. We are providing this letter to indicate our support for maintaining the vitality if the project within the project approval and funding process.

Sincerely,

George E. Wolf, Sr., P.E.
Director of Public Works

GEW:WLW:cfw

KANSAS CITY
MISSOURI
All-American City
1994

CEMRK-CO-RE (1145-b) DEC 27 1994

MEMORANDUM FOR Chief, EP

SUBJECT: Dodson Industrial District Regulatory Review

1. This memorandum is in response to your memorandum dated 14 December 1994, requesting CO-R review of the Draft Feasibility Report and Environmental Assessment and to your second memorandum of 14 December 1994, requesting a Jurisdictional Determination pursuant to Section 404 of the Clean Water Act (CWA) (33 CFR 1344).

2. CO-R concurs that the ordinary high water mark (OHWM) of the Blue River is at elevation 765 feet, National Geodetic Vertical datum (NGVD) for the point observed. This elevation may be projected upstream and downstream, based on the slope of the riverbed for the length of the project.

3. CO-R also concurs that direct wetland impacts, i.e. the levee footprint, will fill 1.1 acres of jurisdictional wetlands as indicated on the drawings provided. The wetland determination conducted for this project was approved on 31 March 1993, and remains valid for a period of five years from the approval date.

4. The discharge of dredged or fill material, including the incidental discharge associated with excavation, riverward of the OHWM of the Blue River or in the documented wetlands requires prior CWA authorization.

5. The sequencing required by the Section 404 (b)(1) guidelines precludes concurrence with the proposed mitigation plan at this time. CO-R is prepared to merge the CWA regulatory responsibilities with the overall National Environmental Policy Act (NEPA) review. Also, because the proposed project would be Federally funded, the project must be evaluated in consideration of Executive Order No. 11990, titled Protection of Wetlands (Enclosure 1). This order addresses not only wetland losses due to filling but also those due to drainage or inundation.

6. The Regulatory Program Project Manager for this project is Mark Frazier. Please contact Mr. Frazier at extension 2118 for questions concerning this response.

M. D. Jewett

1 Encl

M. D. JEWETT
Chief, Regulatory Branch
Construction-Operations Division

CF:
CO-RW
EP-PR (Dulac)

December 14, 1994

Mr. William H. Gill
US Fish and Wildlife Service
Kansas Field Office
315 Houston Street - Suite E
Manhattan KS 66502-6172

Dear Mr. Gill:

Staff have reviewed the draft FWCA report for the Blue River Dodson Industrial District project in Kansas City, Missouri. We find it to be well-written and accurate, and to provide appropriate mitigative measures to offset unavoidable natural resource impacts resulting from the project. We might make the one suggestion to emphasize protection of a 100-foot wooded riparian corridor along the Blue River wherever it exists in the project area.

We concur with your recommendations and appreciate the opportunity to comment. Kathy McGrath of my staff is available to address and provide any additional information you may require.

Sincerely,

DAN F. DICKNEITE
PLANNING DIVISION CHIEF

DFD:KM:fef
cc: COE (Ruf)
bcc w/attach: Jeffries, Lackamp, Norwat

RECEIVED
DEC 19 1994
REGULATORY

# MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone: 314/751-4115
Missouri Relay Center 1-800-735-2966 (TDD)
JERRY J. PRESLEY, Director

May 13, 1994

Mr. Phil Rotert
Kansas City District, Corps of Engineers
700 Federal Bldg.
Kansas City, MO 64106

Re: Blue River/Dodson Industrial Park

Dear Mr. Rotert:

We appreciate the opportunity to provide comments on mitigation proposed by your agency to offset natural resource losses expected as a result of this project.

Generally we support the direction of your mitigation efforts; creating wetland at a 2:1 acreage ratio and planting the mitigation area to wetland tree species are appropriate considering timbered wetland will be lost. Although riparian corridor resources are not specifically discussed in your evaluation, current plans as we understand them are to move the proposed borrow area at least 100' feet from the Blue River, providing adequate protection to this resource. We do have additional minor, more specific comments which we will forward as soon as possible.

In summary, we support the general content of mitigation plans for the Dodson Blue River project. Questions may be directed to Kathy McGrath of my staff.

Sincerely,

Kathy McGrath

for DAN F. DICKNEITE
PLANNING DIVISION CHIEF

c: U. S. Fish and Wildlife Service (Haley)

COMMISSION

JERRY P. COMBS
Kennett

ANDY DALTON
Springfield

ANITA B. GORMAN
Kansas City

JOHN POWELL
Rolla

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas State Office
315 Houston, Suite E
Manhattan, Kansas 66502

May 9, 1994

Bob Ruf
Planning Branch
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, MO 64106-2896

Dear Mr. Ruf:

This is in reference to the draft wetland mitigation plan we received on April 13, 1994 for the Dodson Industrial District project. This plan includes many elements the Service had discussed earlier with your staff and we support the concept of the plan. However, there are some changes and clarifications which we believe are warranted to ensure adequate wetland mitigation occurs. The Missouri Department of Conservation (MDC) will also be providing specific comments to enhance the success of this wetland mitigation plan.

The plan notes that hydrology for the existing wetland comes from both flooding from the Blue River and runoff from surrounding areas. Due to the levee construction, the mitigation wetland would essentially only receive hydrology from the Blue River. To ensure adequate hydrology at the mitigation wetland, the inlet pipe from the river and the mitigation wetland bottom elevation should be lower than the existing wetland elevation. A close examination of the Blue River hydrograph and other available hydrology information should help determine a suitable elevation for wetland development.

Because of the variable annual hydrology at the site, plant species used should include those with a range of wetness tolerance. The species list proposed is good; however, we suggest adding pin oak. Furthermore, we suggest increasing the number of trees planted to a 10 x 10 foot spacing and possibly decreasing the tree survivorship to 50 %, to take into account natural revegetation.

The monitoring criteria should include the development of a jurisdictional wetland after three years. The Service would like to receive a copy of the annual monitoring report. A field inspection with the Corps, Service, and MDC should take place after three years to determine whether mitigation is successful or corrective actions needs to take place.

It is important that the contractors fully understand the requirements of the mitigation plan. We believe it is also necessary that they are aware of the importance of the adjacent areas and that they are to remain undisturbed. We recommend this adjacent riparian area be flagged to preclude any unforeseen damage during construction.

In conclusion, we believe this proposed mitigation plan is a good initial effort needing only a few changes. We would like an opportunity to comment on later drafts of the mitigation plan. We expect later drafts will include relevant maps and drawings.

If you have any questions or need clarifications contact me or Don Haley of my staff at (913) 539-3474.

Sincerely,

William H. Gill

William H. Gill

cc: MDC, Jefferson City, MO
(Attn: Kathy McGrath)

WHG/dh

# MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone: 314/751-4115
Missouri Relay Center 1-800-735-2966 (TDD)
JERRY J. PRESLEY, Director

August 11, 1993

Mr. Donald Haley
Wildlife Biologist
U. S. Fish and Wildlife Service
315 Houston Street, Suite E
Manhattan, KS 66502

Re: Blue River, Dodson Industrial Park

Dear Mr. Haley:

Enclosed as promised is some information on the values of riparian and wetland timber to wildlife and to maintaining a stable stream bed. Please let me know if you need additional information, and I'll dig a little deeper.

Also, let me know if we need to set up a site visit to perform a WHAG, or if another meeting is needed first.

Sincerely,

Kathy McGrath

KATHY MCGRATH
ENVIRONMENTAL COORDINATOR

KM:jct

Enclosures

cc: Glenn Covington (COE)
Phil Jeffries
Bob Fluchel
Lawrence Lackamp

COMMISSION

JERRY P. COMBS
Kennett

ANDY DALTON
Springfield

ANITA B. GORMAN
Kansas City

JOHN POWELL
Rolla

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE PARKS
P.O. Box 176 Jefferson City, MO 65102-0176 (314)751-2479
FAX (314)751-8656

July 21, 1993

Mr. Michael J. Bart
Chief, Planning Division
Kansas City Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Re: Proposed Dobson Industrial District Levee Project (COE) Kansas City, Missouri

Dear Mr. Bart:

The Historic Preservation Program has reviewed the May 1993 report entitled "Addendum to Cultural Resources Evaluation of the Proposed Levee Corridor in the Dodson Industrial District, Jackson County, Missouri" by Robert Ziegler. Based on this report, it is evident that an adequate cultural resource survey has been made of the project area.

We agree with the investigator's recommendations as outlined on page 3 of the report that no significant cultural resources are located within the proposed project area. Therefore, we have no objection to the initiation of project activities.

However, if the currently defined project area or scope of project-related activities is changed or revised, or if additional borrow areas are included in the project, the Missouri Historic Preservation Program must be notified and appropriate information relevant to such changes or revisions be provided for further review and comment, in order to ascertain the need for additional investigations.

If I can be of further assistance, please write; or call 314/751-7958.

Sincerely,

HISTORIC PRESERVATION PROGRAM

Michael S. Weichman
Senior Archaeologist

mc

c Robert Ziegler

**Public Works Department**

**Division of Engineering**

City of Kansas City, Missouri
Heart of America

19th Floor, City Hall
414 E. 12th Street
Kansas City, Missouri 64106-2785

(816) 274-2565
FAX (816) 274-2059

February 23, 1993

Mr. Joe Lilley, Project Manager
U.S. Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Joe:

Re: Dodson Project - Model Project Cooperation Agreement

I have reviewed the subject agreement and have the following comments:

1. Article II, paragraph g. - If federal funds are not allowed as part of the sponsor's share, then they should <u>not</u> be included in total project costs.

2. Article XVIII - It seems that some determination should be made of the existence and extent of hazardous substances <u>before</u> the agreement is signed. Discovery afterwards could terminate the project.

Please contact me if you have further concerns about the comments.

Sincerely,

Ken Kaul

Ken Kaul, P.E.
Project Manager

KEK:nlj

**[First Endorsement]**

CEMRK-OD-PC (CEMRK-PD-R/9 Feb 93) (1145-b)
Bill DeMar/wd/5643
SUBJECT: Review and Verification of a Previous Wetland Determination for a Proposed Levee Along the Blue River Between 91st Street and 75th Terrace, Kansas City, Jackson County, Missouri

Chief, OD-P 6 April 1993

FOR Chief, PD, ATTN: PD-R (Covington)

1. This office has reviewed the enclosed memorandum, subject as above, for Department of the Army permit requirements.

2. As requested in paragraph 5 of the enclosed memorandum, the following information is provided in like-numbered responses:

a. A new wetland determination has been performed and a copy is enclosed as requested.

b. Based on our review of the new wetland determination, we have determined that approximately 1200 feet of the proposed levee alignment is located within a wetland and will require Department of the Army authorization. The location of the wetland area is indicated on the map in the enclosed copy of the report. The ordinary high water mark for the Blue River averages approximately 7 feet above the flow line of the river.

3. Question concerning the information provided should be directed to Bill DeMar at IC #3443 or extension 5643.

M. D. Jewett
Chief, Regulatory Branch
Operations Division

3 Encls
1 and 2, nc
Added 1 encl
3. Copy of Report

CF:
FO-NA (wo/encls)

**Public Works Department**

**Division of Engineering**

City of Kansas City, Missouri
Heart of America

19th Floor, City Hall
414 E. 12th Street
Kansas City, Missouri 64106-2785

(816) 274-2565
FAX (816) 274-2059

February 27, 1992

Mr. Joe Lilley, Project Manager
US Army Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Dear Mr. Lilley:

Re: Upper Blue River (Dodson Area)
Flood Control Feasibility Study

Item 6 of our agreement responsibilities for this study requires the sponsor to furnish a report describing the potential for city or county park development along the Blue River in the Dodson area. The following information should fulfill this requirement.

There is no indication from representatives of the land owners in the area that any particular recreational fields or playgrounds should be provided. Parking on a large scale would be difficult and undesirable in the industrial area.

In meetings with Jim Shoemaker of the Kansas City Parks and Recreation department and Ronald C. Fuhrken of Jackson County Parks and Recreation it became evident that the area between the toe of the levee and the river should be developed as a natural area. The construction of the levee system would preserve the existing hardwood and other significant timber in the area. Restoration of the disturbed areas between the levee and the river would include native grasses and limited tree plantings.

This area would then fit well into the existing and future trail systems along the Blue River. The trails could eventually extend downstream to Swope Park and beyond and upstream along the Blue and Indian Creek to tie into the system in Johnson County, Kansas.

The natural areas could be owned and maintained by either the city or the county. A small portion of the area along the river bank is already owned by Jackson County.
If you require additional information in this matter, please contact me.

Sincerely,

Ken Kaul, P.E.
Project Manager

KK:nlj
enclosures

JACKSON COUNTY
PARKS AND RECREATION

February 13, 1992

Mr. Ken Kaul, P.E.
Project Manager, Engineering Division
Public Works Department
City of Kansas City, MO
19th Floor City Hall
Kansas City, MO 64106

Re: Dodson Levy System - Proposed

Dear Ken:

Thank you for involving us at this early stage of the project. We have been working with the Kansas City Parks and Recreation Department to coordinate efforts to someday be able to provide a trails system not only along the Big Blue River into Swope Park but to also link up along Indian Creek to hopefully tie into the system in Johnson County in creating a metropolitan trail system.

The land identified with this levy and more specifically between the levy and the river fits into future trail plans and is a necessary part of it. Whether the City or the County develops and maintains the trail at this time is not critical as we have a common goal and can resolve this at the appropriate time.

We hope the feasibility study supports the project and look forward to working with you in the future.

Sincerely,

Ron Fuhrken

Ronald C. Fuhrken
Supt. of Planning, Devel., & Impr.

tm

cc: Bettie Kramer, Parks & Recreation
Willis Staller, Parks & Recreation

22807 Woods Chapel Road
Blue Springs, Missouri 64015

(816) 795-
FAX: (816) 795-

# Inter-Departmental Communication

DATE: February 7, 1992

TO: Ken Kaul, Public Works Engineering

FROM: James Shoemaker, Park Planner

SUBJECT: FLOOD CONTROL PROJECT, DODSON AREA, PROSPECT AVENUE TO U.S. 71

It is our recommendation that the land to be acquired for flood control purposes, between the toe of the proposed levee and the Jackson County park land, be deeded to Jackson County for park purposes, as an addition to Blue River Parkway.

In addition, Jackson County Parks and Recreation should receive permission to construct and maintain a trail on top of the levee.

James Shoemaker

JS/lg

RECEIVED
AUG 28 1991
W & PC ENGINEERING

BLACK & VEATCH
8400 Ward Parkway, P.O. Box No. 8405, Kansas City, Missouri 64114, (913) 339-2000

Kansas City, Missouri
Red Bridge Interceptor

August 26, 1991

Mr. Kenneth E. Burkhead, Sr.
Chief, Engineering Services
Water & Pollution Control Department
5th Floor - City Hall
Kansas City, Missouri 64106

Dear Mr. Burkhead:

In response to your request, we have investigated the ability of the existing Red Bridge Interceptor to carry the additional load imposed by the construction of the proposed 30-foot high Blue River Levee over the interceptor. The proposed levee would cross the Red Bridge Interceptor at an angle of approximately 55 degrees near Station 3+00.

The Red Bridge Interceptor was constructed in 1979. In the area of the proposed levee, a 96-inch reinforced concrete pipe was installed. The pipe was manufactured in accordance with ASTM C655 for 36,000 pounds per foot to produce an "0.01" crack and an ultimate load of 45,000 pounds per foot.

The trench width was limited to 216 inches at a point 12 inches above the pipe. Based upon borings taken near the crossing, the bottom 5 feet of the trench excavation was probably in shale; the top portion of the trench was excavated in silt and trash. The pipe was installed with a Class B Bedding with an estimated bedding factor of 1.9. Item No. 16 to Addendum No. 4 permitted the use of backfill with trash from the top of the pipe to 3 feet below the surface.

Although the construction of the levee above the existing ground surface would result in a theoretical negative projecting embankment condition, it is my opinion that because of the width of the excavation and the probability that trash was used for backfill, the pipe should be designed to carry the entire 54-foot trench load. The existing Red Bridge Interceptor must be reinforced to carry the additional loads imposed by the proposed levee.

The levee designer would probably consider excavating around the pipe to ensure that the voids in the pipe embedment material are filled and that any trash used as a backfill was removed.
The proposed levee may also have impact on the existing 15-inch sanitary sewer located east of Prospect Avenue, the new Highway 71 Interceptor crossing beneath Prospect Avenue, and the existing Blue River Interceptor and West Blue Force Main both located near where the proposed levee ties into the embankment for the Bruce Watkins Freeway.

Very truly yours,

BLACK & VEATCH

A.C. Peterson JCY

A. C. Peterson

ec

JOHN ASHCROFT
Governor

G. TRACY MEHAN III
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Division of Energy
Division of Environmental Quality
Division of Geology and Land Surve
Division of Management Services
Division of Parks, Recreation,
and Historic Preservation

DIVISION OF PARKS, RECREATION, AND HISTORIC PRESERVATION
P.O. Box 176
Jefferson City, MO 65102
314-751-2479

May 22, 1990

Mr. Philip L. Rotert
Chief, Planning Division
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: Proposed Dodson Industrial District Levee Project (COE), Kansas City, Jackson County, Missouri

Dear Mr. Rotert:

In response to your letter dated 02 May 1990 concerning the above referenced project, the Historic Preservation Program has reviewed the information provided and we concur with your determination that no property listed on or determined eligible for inclusion in the National Register of Historic Places will be affected by the proposed undertaking. Therefore, we have no objections to the initiation of project activities.

However, if the currently defined project area or scope of project related activities is changed or revised, or cultural materials are encountered during construction, the Missouri Historic Preservation Program must be notified and appropriate information relevant to such changes, revisions, or discoveries be provided for further review and comment, in order to ascertain the need for additional investigations.

If I can be of further assistance, please write or call 314/751-7860.

Sincerely,

HISTORIC PRESERVATION PROGRAM

Michael S. Weichman
Senior Archaeologist

MSW:nc

cc: Robert Ziegler

United States Department of the Interior
FISH AND WILDLIFE SERVICE
1511 WEST SECOND STREET
GRAND ISLAND, NEBRASKA 68801

March 28, 1986

Mr. Philip L. Rotert
Chief, Planning Division
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, MO 64106-2896

Dear Mr. Rotert:

This responds to your request of March 24, 1986, for a list of federally threatened and endangered species occurring in the Blue River Basin, Kansas and Missouri, reconnaissance study area. We have coordinated our response with the Columbia, Missouri, Fish and Wildlife Service Office. In accordance with Section 7(c) of the Endangered Species Act, we have determined that the following listed species may occur in the Kansas and Missouri project area.

| Listed Species | Expected Occurrence |
|---|---|
| Bald eagle (*Haliaeetus leucocephalus*) | Migration |
| Peregrine falcon (*Falco peregrinus*) | Migration |

If you determine that a project may affect listed species, formal Section 7 consultation should be requested from this office. If you determine that there will be no effect, further consultation is not necessary. For your convenience, a summary of the Section 7 consultation process is attached.

We are including a list of the Category 1 and Category 2 candidate species found in Kansas. Category 1 species are species for which the Service has substantial information to support listing the species as endangered or threatened. The development and publication of proposed rules for these species is anticipated. Category 2 candidate species are species the Service is seeking additional information on their biological status; few Category 2 candidate species are proposed for listing. Candidate species have no legal protection under the Endangered Species Act and are included in this document for planning purposes only.

Category I & II Candidate Species

A. Invertebrate Wildlife Listing
(Federal Register, Volume 49, No. 100, May 22, 1984, Pages 21671 - 21675).

| Category | Common Name | Scientific Name | Family |
|---|---|---|---|
| 2 | Clanton's cave amphipod | Stygobromus clantoni | Crangonyctidae |
| 2 | Prairie mole cricket | Gryllotalpa major | Gryllidae |
| 2 | Six-banded longhorn beetle | Dryobius sexnotatus | Cerambycidae |
| 2 | Scott optioservus riffle beetle | Optioservus phaeus | Elmidae |
| 2 | American burying beetle | Nicrophorus americanus | Silphidae |
| 2 | Black lordithon rove beetle | Lordithon niger | Staphylinidae |
| 2 | Regal fritillary butterfly | Speyeria idalia | Nymphalidae |
| 2 | Western fan-shell pearly mussel | Cyprogenia aberti | Unionidae |
| 2 | Neosho pearly mussel | Lampsilis rafinesqueana | Unionidae |

B. Vertebrate Wildlife Listing
(Federal Register, Volume 50, No. 181, September 18, 1985, Pages 37960-37967).

| Category | Common Name | Scientific Name | Family |
|---|---|---|---|
| 2 | Lake sturgeon | Acipenser fulvescens | Acipenseridae |
| 2 | Pallid sturgeon | Scaphirhyncus albus | Acipenseridae |
| 2 | Blue sucker | Cycleptus elongatus | Catostomidae |
| 2 | Sturgeon chub | Hybopsis gelida | Cyprinidae |
| 2 | Sicklefin chub | Hybopsis meeki | Cyprinidae |
| 2 | Arkansas River shiner | Notropis girardi | Cyprinidae |
| 1 | Neosho madtom | Noturus placidus | Ictaluridae |
| 2 | Hellbender | Cryptobranchus alleganiensis | Cryptbranchidae |
| 2 | Alligator snapping turtle | Macroclenys tennincki | Chelydridae |
| 2 | American swallow-tailed kite | Elanoides forficatus forficatus | Accipitridae |
| 2 | Swainson's hawk | Buteo swainsoni | Accipitridae |
| 2 | Ferruginous hawk | Buteo regalis | Accipitridae |
| 2 | Mountain plover | Chardrius montanus | Charadriidae |
| 2 | Western snowy plover | Charadrius alexandrinus nivosus | Charadriidae |
| 2 | Long-billed curlew | Numenius americanus | Scolopacidae |
| 2 | Migrant loggerhead shrike | Lanius ludovicianus migrans | Laniidae |
| 2 | Kansas bog lemming | Synaptomys cooperi paludis | Muridae |
| 2 | Swift fox | Vulpes velox | Canidae |
| 2 | Wisconsin puma | Felis concolor schorgeri | Felidae |

C. Plant Listing

(Federal Register, Volume 50, No. 188, September 27, 1985, Pages 39526-39584).

| Category | Common Name | Scientific Name | Family |
|---|---|---|---|
| 2 | Foxglove, false, auriculate | Agalinis auriculata | Scrophulariaceae |
| 2 | Milkweed, mead's | Asclepias meadii | Asclepiadaceae |
| 2 | Poppy - mallow | Callirhoe bushii | Malvaceae |
| 2 | Orchid, white-fringed, prairie | Platanthera leucophaea | Orchidaceae |
| 2 | No common name | Silene regia | Caryophyllaceae |
| 2 | No common name | Sporobolus ozarkanus | Poaceae |
| 1 | Buffalo-clover, running | Trifolium stoloniferum | Fabaceae |

If we can be of further assistance, please contact my Assistant Field Supervisor, David Bowman, at FTS 541-6571 or (308) 381-5571. Our new mailing address is: 2604 St. Patrick, Suite 7, Grand Island, Nebraska, 68803.

Sincerely,

David Bowman

David Bowman
Acting Field Supervisor

Attachment-1

cc: FWS/ES, Columbia, MO (Attn: Paul Burke)
FWS/ES, Manhattan, KS
AFA/FA(SE), Region 6 MAIL STOP 60150

GENERAL INVESTIGATION of FLOOD DAMAGE REDUCTION
FEASIBILITY REPORT and ENVIRONMENTAL ASSESSMENT
for
BLUE RIVER at DODSON INDUSTRIAL DISTRICT
KANSAS CITY, MISSOURI

# APPENDIX G

## Responses to Written Comments
**on the**
**Draft Feasibility Report and Environmental Assessment**
**Blue river at Dodson Industrial District, Kansas City, Missouri**
**Dated October 1995**

**CONTENTS**

INTRODUCTION . . . . . 244

Missouri Department of Natural Resources Federal Facilities Section, December 7, 1995 . . . . . 245

The Missouri Department of Conservation, December 13, 1995 . . . . . 246

The Missouri Department of Natural Resources Water Pollution Control Program, December 15, 1995 . . . . . 247

The Department of Energy Kansas City Area Office, December 19, 1995 . . . . . 250

The Missouri Highway and Transportation Department, December 26, 1995 . . . . . 253

GENERAL INVESTIGATION of FLOOD DAMAGE REDUCTION
FEASIBILITY REPORT and ENVIRONMENTAL ASSESSMENT
for
BLUE RIVER at DODSON INDUSTRIAL DISTRICT
KANSAS CITY, MISSOURI

# Appendix G

## Responses to Written Comments
**on the**
**Draft Feasibility Report and Environmental Assessment**
**Blue river at Dodson Industrial District, Kansas City, Missouri**
**Dated October 1995**



### INTRODUCTION

On November 17, 1995, we circulated copies of the Draft Feasibility Report and Environmental Assessment to a list of approximately 50 public agencies, businesses, and individuals who might have had an interest in flood damage reduction measures for the Dodson Industrial District. Other interested citizens and businesses received notices of our intent to publish a report, along with invitations to a public meeting. On December 13, 1995, we held a public meeting to discuss the preferred flood damage reduction plan described in the report, answer questions, and receive oral comments on the draft report and/or the preferred plan. The oral comments and the responses supplied at the public meeting are in the transcript of the meeting which is available on request to the Kansas City District for the cost of reproducing the copy. The comment period on the Draft Feasibility Report and Environmental Assessment closed December 27, 1995. Concurrent with the public involvement process we conducted the Section 404b1 Clean Water Act Public Interest Review. This review included the publishing of a Joint Public Notice with Missouri Department of Natural Resources to seek comments on Section 401 water quality certification as well as Section 404 authorization. The comment period for the Section 404b1 Public Interest Review also closed on December 27, 1995. The comments we received by mail before the close of the comment period are displayed in the left column below, and our responses are to the right of the corresponding comment. We have reproduced the complete correspondence in Appendix F.

**COMMENTS FROM**
**Missouri Department of Natural Resources**
**Federal Facilities Section**
**December 7, 1995**

| Comment | Kansas City District Responses |
|---|---|
| The final report should address possible impact of floodwalls, levies *(sic)*, and drainage structures on National Pollution *(sic)* Discharge Elimination System (NPDES) permits for sites discharging into the Blue River, Boone Creek or other outfalls. | We are aware of a sampling point for compliance with an NPDES discharge permit issued to the Bannister Federal Complex which is directly upstream of the study area. The Federal Complex Outfall 001, which discharges stormwater drainage to Boone Creek, contains and NPDES sampling point. We have received specific comments from the Department of Energy (DOE) in a letter dated December 19, 1995 which address concerns for possible impacts of the project on the sampling point. After conferring telephonically with the DOE Kansas City Area Office, and also personnel in the MDNR Water Pollution Control Program, we concluded that the flood damage reduction project will not adversely impact the NPDES sampling point. After asking that the NPDES data base be checked, no other NPDES sampling points were noted at this time that would be affected by this project. |
| The content of the Draft Feasibility Report and Environmental Assessment appears to be focused more on the Feasibility issues. If the project goes forward, much more study and detail will be required on the Environmental Assessment aspect. At least two properties along the proposed levee are identified as having environmental concerns. Near the southern end of the project and on the north side of the floodway, the land owned by the City of Kansas City was once used as a landfill. Also, the Arrow Truck Sales property is identified as a CERCLIS site. | Construction of the flood damage reduction project will not proceed until the non-Federal sponsor provides project lands free from hazardous waste contamination. Because project construction is preconditioned on the non-Federal sponsor's ability to provide uncontaminated right-of-way, details beyond acknowledgement of known or suspected contaminated areas are beyond the scope of the Feasibility Study. |

**COMMENTS FROM**
**The Missouri Department of Conservation**
**December 13, 1995**

| Comments | Kansas City District Responses |
| --- | --- |
| We have one minor comment with regard to the mitigation plans as currently proposed: sideslopes of the borrow area are quite steep. While we understand that your agency is attempting to acquire necessary borrow fill while avoiding encroachment into the riparian corridor and minimizing impacts on wetland (which we support), we do encourage examination of other ways to lessen the slopes of the borrow area. Gradual slopes and a heterogeneous bottom configuration produce better aquatic habitat. In addition, we are concerned as to the stability of the 2:1 slope adjacent to the river. We have concerns that it may be difficult to vegetate the sideslopes, and maintain vegetation after project completion. We also ask that you consider switching the two side slopes, so that the gentler, and therefore more stable, slope is closest to the river. However, this should not be done if it requires encroachment into the riparian corridor. | As the comment implies, the ideal design for wetland criteria competes with obtaining the required material volume and minimizing disturbance of the riparian corridor. The same factors also constrain slope grading options. During Preconstruction Engineering and Design (PED) we plan to reevaluate the side slopes and also the configuration of the bottom to determine if the plan can be improved to enhance both wetland quality as well as wildlife habitat. |

**COMMENTS FROM**
**The Missouri Department of Natural Resources**
**Water Pollution Control Program**
**December 15, 1995**

| Comments | Kansas City District Responses |
|---|---|
| 1. It is not indicated if any wetlands will be impacted. Wetlands were once a significant component of Missouri's natural heritage, accounting for almost 11 percent of its surface area. As of 1980, 87 percent of Missouri's original 4.8 million acres of wetlands have been eliminated by activities such as land clearing, draining and filling, channelization and damming. Missouri far exceeds the national rate of 53 percent wetland loss. Any changes designed should, at a minimum, maintain the present amount of wetlands, and preferably restore wetlands as part of floodwater storage areas or other open space created on the river side of the levees. | The levee would displace about 1.1 acres of timbered wetland. The October 1995 draft Feasibility Report and Environmental Assessment identified the wetland impact on page 84 in response to the second question from the U.S. Fish and Wildlife Service, on page 107 in the description of Alternative 1, in the Environmental Effects Matrix on page 108, and on page 1 of Appendix J, Wetland Mitigation Plan. We retain those references in this final report. Appendix J describes our plan to mitigate that wetland loss by developing the riverward borrow area as a wetland hydraulically connected to the Blue River. |
| 2. Increases in levee height could be limited to protection of Reach 2. Levees in this area would protect 34 structures, whereas, the other two reaches propose to protect 11 structures combined. Any levee construction proposed should be done only after a thorough consideration of alternatives for the management of the floodplain, as recommended by numerous reports including those by the Corps of Engineers following the 1993 floods. | Although we evaluated structural alternatives in three segments or "reaches," none of the alternatives for any reach are effective without structures protecting the other two reaches. The draft Feasibility Report discusses our investigation of both structural and non-structural alternatives for flood damage reduction in this industrialized area of the Blue River flood plain. The preferred plan best meets the pertinent requirements for engineering feasibility and cost effectiveness and represents wise floodplain management in view of the present level of investment in the flood plain. |

COMMENTS FROM
**The Missouri Department of Natural Resources**
**Water Pollution Control Program**
**December 15, 1995**

| Comments | Kansas City District Responses |
|---|---|
| 3. It does not seem feasible to consider flood levels and development twenty years in the future. This is not an isolated area. Changes in the areas upstream and downstream of this will affect what happens in this area. Development in the floodplain should be discouraged, not encouraged. | The construction of a levee will reduce recurring flood damages to existing development. Land riverward of the levee will remain undeveloped and some will become public land. Within the protected area, very little undeveloped land remains. The remaining undeveloped sites retain little of their natural floodplain value because of their proximity to development and industrial activity. |
| 4. Only clean nonpolluted material should be used. | Concur. |
| 5. Best management practices should be utilized during construction to minimize erosion. | Concur. |
| 6. How much of the levee will be over thirty feet tall? Levees approaching sixty feet in height seem a bit excessive. | The typical height of the levee is 15 to 20 feet. The total length of levee that is greater than 30 feet tall would be approximately 500 feet for all three reaches. The levee which crosses Boone Creek (Reach I) would reach a maximum height of about 56 feet and will be more than 30 feet high for a span of approximately 250 feet. In Reach II, the levee crosses two drainageways. At one of these crossings, the levee would be more than 30 feet tall for a span of about 50 feet. At the other crossing, the levee height would exceed 30 feet for a distance of about 200 feet. The Corps has designed stable embankments at comparable heights on other projects. |
| 7. Hydrologic connections should be maintained between the proposed mitigation site and the Blue River. | Concur. |

COMMENTS FROM
**The Missouri Department of Natural Resources**
**Water Pollution Control Program**
**December 15, 1995**

| Comments | Kansas City District Responses |
|---|---|
| 8. Impacts, increased wetlands, etc., related to the floods of 1993 and 1995 should be taken into account in the final document. For example, were buildings destroyed by these floods and not rebuilt, if so a levee may not meet benefit/cost ratio with these removed from calculations. | The study area experienced only minor flooding in the subject years, therefore we have no reason to believe that additional wetlands were created. The draft Feasibility Report describes the commercial development currently subject to flooding, including those businesses that are closed or abandoned for whatever reason. Should the economic conditions change perceptibly, the economic analysis will be revised accordingly. |
| 9. A riparian corridor of at least 100 feet should be maintained along the Blue River. | The riparian corridor along the levee would average more than 300 feet wide. Only about 100 feet of the 5,600-foot long levee alignment would be less than 100 feet from the channel bank. The preferred levee alignment preserves the maximum riparian corridor consistent with the requirements to provide a reliable structure to protect the existing development. |
| 10. It may be beneficial to reseed the borrow areas (those not used for wetland mitigation) by spreading seed bank materials that could be removed from the borrow areas. If the top six inches of material were stockpiled and redistributed after excavation, there would likely be an abundance of seeds, roots and other plant material that would rapidly revegetate the disturbed area. | Concur. We will use stripped topsoil to the extent possible. Should further reseeding be necessary, we will specify selected native plant species for the seeding program. |
| 11. Any land disturbance activities may require a water pollution control permit. In this regard, please contact the Department of Natural Resources, Kansas City Regional Office at (816) 795-8655. | Concur. |

COMMENTS FROM
**The Department of Energy**
**Kansas City Area Office**
**December 19, 1995**

| Comments | Kansas City District Responses |
|---|---|
| Higher levels in Boone Creek decrease the ability of the (Bannister) federal complex to discharge the initial surge of interior storm waters to the Blue River as our north flapgates would close earlier. The federal complex would therefore retain a larger volume of storm waters, resulting in additional storage required for a given storm event. We request additional hydraulic studies of the Bannister Federal Complex's interior storage be conducted to determine the extent of this impact and to assure the federal complex retain its capability to store storm waters in a 500 year event. | Concur. Studies to assure that Boone Creek ponding produces no net reduction in ponding capability at the Federal Complex will be included in our Planning, Engineering and Design phase. While the levee would pond the 1 percent (100-year) flow on Boone Creek to a higher elevation, it would also eliminate Blue River backwater stages on Boone Creek for floods up to the 0.2 percent (500-year) event. Hydrologic analysis during this study indicated no impact from the flood damage reduction project to the Federal Complex interior drainage capacity. |
| We have concerns regarding the impact to the federal complex's compliance sampling point for Outfall 001 (north storm water discharge into Boone Creek) by installation of the levee and the control structures at Boone Creek's confluence with the Blue River. The concern is by adding a control point on Boone Creek at the new levee, the State of Missouri's Department of Natural Resources (MDNR) will want the federal complex's compliance point for Outfall 001 moved to the new control structure. If that happens, then either a new outlet structure routed directly to the Blue River for the federal complex is needed; or the City of Kansas City, Missouri would need to be the owner of the permit as most of the watershed through the new Boone Creek control structure is not federal property. | The intent of the sampling point at Outfall 001 is to monitor Federal Complex stormwater discharges for specific contaminants. Given the sampling frequencies in the NPDES permit, and given that the sampling point is protected by a flap gate structure further downstream in the outfall, the intent of the permit would be best served by leaving the sampling point in its current location. |

**COMMENTS FROM**
**The Department of Energy**
**Kansas City Area Office**
**December 19, 1995**

| Comments | Kansas City District Responses |
|---|---|
| To ensure MDNR concurrence, we request the potential changes to the configuration of Boone Creek be outlined in written correspondence with the state to ensure MDNR agrees with leaving the compliance sample point at the present location. We can participate with the COE in negotiating with the MDNR. | Sending the draft report to MDNR for comment accomplished the requirement to advise MDNR of the proposed changes in configuration of Boone Creek. We received comments on the draft Feasibility Report from the MDNR Water Pollution Control Program. We have also followed up by alerting the Department telephonically of your specific concern for the sampling point. In the telephone conversations, MDNR representatives agreed that the intended purpose of the sampling point in Outfall 001 would be best served by leaving the sampling point in its present location. |
| The report notes the landfill was excavated to groundwater, filled with a variety of municipal, sanitary, and industrial wastes, and capped with a 3-foot cover of clay. The site is noted to have less than the original 3 feet of cover material with patches of no cover. Environmental Protection Agency (EPA) testing of seeps along the southwest edge of the landfill detected low concentrations of various metals and organic compounds. The report states this leachate is not considered hazardous. It is unclear as to the meaning of "not considered hazardous". Is it not considered hazardous to the environment or not considered a RCRA hazardous waste? Depending upon the source, the leachate could be considered a hazardous waste if managed in some fashion. | Our characterization of the leachate samples as non-hazardous is based upon chemical testing of samples collected from suspected leachate areas. The chemical tests revealed that the samples did not exhibit hazardous characteristics as defined in the Resource Conservation and Recovery Act (RCRA). The proposed flood protection project construction will not disturb the landfill. Also, the flood protection project will result in less frequent inundation of the landfill from flooding. Therefore, we do not consider that the project will manage contaminated leachate from the landfill or landfill waste. |

COMMENTS FROM
**The Department of Energy**
**Kansas City Area Office**
**December 19, 1995**

| Comments | Kansas City District Responses |
|---|---|
| The primary concern is the ponding within Boone Creek's stormwater retention basin behind the levee over the closed landfill. Although the COE report states an "impermeable clay cap" will be installed over the closed landfill, it is highly doubtful that the cap will indeed be impermeable. Responsibility for the maintenance of this cap to ensure erosion or penetration of the cap by plant root systems could be a problem. | Alternative 2 in Reach 1 had proposed a levee section winding back along the north bank of Boone Creek for about 2000 feet to the west. In this alternative the levee would abut the closed landfill for this distance. Thus, on the Boone Creek side of this levee we proposed a clay blanket (as opposed to a clay cap on the landfill) which would prevent seepage through the levee. This alternative was not selected. In the selected plan, Alternative 1 in Reach 1, the levee would avoid the landfill completely (by crossing Boone Creek) and would not include modification to the existing clay cap on the landfill. |
| Landfill closure by installation of a clay cap is designed to promote rain event run-off limiting infiltration potential. By ponding water over the closed landfill, infiltration potential is greatly increased by the static head of the ponded water. This increase in infiltration could mobilize contaminants present with the landfill. The likely migration route of groundwater in the area would be to the south towards Boone Creek with potential impacts to federal complex. Contaminants migrating to the south from the landfill could be perceived to be originating from federal complex. | At present, the closed landfill is subject to inundation during high stages on either Boone Creek or the Blue River. Constructing the levee would have a net beneficial effect on landfill inundation. As an example, the 20 percent (5-year) Blue River flood crest (without the levee) is 4 feet higher than the peak stage of the Boone Creek ponding area (levee in place) in a 1 percent (100-year) Boone Creek event. For less frequent Blue River events, the difference between the ponded-Boone Creek and the Blue River stages is even larger. High stages on the Blue River occur over longer durations than events on the much smaller Boone Creek drainage. Therefore, the landfill will be exposed to shorter and less frequent inundation if the levee is constructed. |

**COMMENTS FROM**
**The Department of Energy**
**Kansas City Area Office**
**December 19, 1995**

| Comments | Kansas City District Responses |
|---|---|
| It is not clear in the report whether the levee across Boone Creek will affect the water level in Boone Creek at normal stage for the Blue River and Boone Creek. | The levee design in the draft Feasibility Report includes a pipe through the levee adequate to convey typical Boone Creek flows to the Blue River. Hydraulic analysis during the Feasibility Study indicated that the drainage structure would be sufficient to pass normal Boone Creek flows with no impact upstream at the Federal Complex outfall. The impact of the pipe structure on the Boone Creek drainage will be further analyzed and confirmed during the Preconstruction, Engineering, and Design (PED) phase. The result will be a structure which meets local and Corps of Engineers drainage standards, as well as results in no adverse impact to the Federal Complex drainage system. |

**COMMENTS FROM**
**The Missouri Highway and Transportation Department**
**December 26, 1995**

| Comments | Kansas City District Responses |
|---|---|
| It would appear that the preferred alternative intends to flood 85th Street, thereby denying access to Bruce R. Watkins Drive and to the Industrial Park, the levee is protecting. We suggest the sluce *(sic)* gate assembly you have proposed be located on the south side of the culvert on 85th Street. | The flood threat to 85th Street will not change if the levee is constructed. The preferred alignment leaves the 85th Street access to Bruce R. Watkins Drive and to northbound U.S. Highway 71 subject to Blue River flooding. The sluice gate is located on the levee for optimal access to the control works during a flood event. |

COMMENTS FROM
**The Missouri Highway and Transportation Department**
**December 26, 1995**

| Comments | Kansas City District Responses |
|---|---|
| Additionally, the Corps of Engineers (COE) could place a clay face on our embankment on the south side of 85th Street and the east and west embankments of relocated 87th Street, thereby allowing the detention basin to be south of 85th Street. | The area available south of 85th Street is too small to provide the required detention area. |
| On page 41 of the document, it appears that the COE preferred alternative provides "the least protection of all alternatives for this reach of the interchange". | The complexity associated with crossing several intersecting roadways and ramps produced alternatives that would cost significantly more, but would protect essentially the same damageable property as the preferred plan. In the required National Economic Development analysis, these more costly alternatives could not compete successfully for selection as the preferred plan for Federal participation. |
| The Feasibility Report indicates on Page 86 that the COE consulted with our department regarding current and future highway construction in the Dodson area. However, there is no indication by the Corps as to what the response from our department was in order for them to determine if there is any potential impacts. We are not aware of this coordination. | We obtained design drawings of the planned Bruce R. Watkins Drive improvements from the Highway and Transportation Department to enable us to accommodate the levee design to the planned road improvements. The draft feasibility report circulated in November 1995 represents our formal request to the Department for comment on the flood damage reduction project. |
| Before the preferred alternative, selected by the COE, can tie into the embankment of the exit ramp of Bruce R. Watkins Drive, a permit will be required from this department prior to the start of construction. This permit will also require a maintenance agreement. | The non-Federal project sponsor, Kansas City, Missouri, would provide all lands, easements, rights-of-way and relocations, and agree to operate and maintain the completed project. We would assist the City in obtaining any necessary permission to abut the levee on the ramp embankment. Any operation and maintenance agreement associated with that permit would be made with the non-Federal sponsor. |

**COMMENTS FROM**
**The Missouri Highway and Transportation Department**
**December 26, 1995**

| Comments | Kansas City District Responses |
| --- | --- |
| A statement on Page 106 of the Draft Environmental Assessment appears to conflict with statements made on Pages 27, 28 and 98. The fourth paragraph on Page 106 indicates:<br><br>> However, the recommended plan would not directly or indirectly support more development in the flood plain or encourage additional occupancy and/or modification of the base flood plain. Therefore, the Corps has determined that the recommended plan complies with the intent of Executive Order 11988.<br><br>The first paragraph on Page 27 indicates that:<br><br>> Without flood protection, the Dodson Industrial District will continue to be damaged by periodic flooding, and will be faced with economic decline despite the infrastructure improvements. The problem will worsen with time if no corrective action is taken because frequently flooded buildings deteriorate and have shortened economic lives. | We have revised the Environmental Assessment to be consistent with the main report. The preferred plan complies with Executive Order 11988 because we have no practicable alternative to protecting the 16 undeveloped acres that are interspersed with the existing development. Our analyses indicated no practicable alternative measures or alternative sites for the Federal action. Nearby infrastructure improvements already planned or underway could make the undeveloped land more desirable independent of flood damage reduction measures. |

**COMMENTS FROM**
**The Missouri Highway and Transportation Department**
**December 26, 1995**

| Comments | Kansas City District Responses |
|---|---|
| It continues in the same paragraph to read:<br><br>Future development will require special measures, such as construction on fill material or raising first floor levels to an elevation several feet higher than the first-floor elevations of existing structures. FEMA requirements would also prohibit new basements below the base flood elevation. Little new development has occurred in the area for several years because potential businesses find it more advantageous to settle in locations where flood risks are slight, flood insurance is not required, and the above mentioned special considerations are not required for new construction. | |
| The Draft Environmental Assessment simply discusses the impacts of the proposed improvements. Since the proposal appears like it would support additional flood plain development, we question what the COE should be saying about cumulative and secondary impacts of the proposed action. Often times we are asked this same question by the COE concerning our projects. | Only 16 of the 250 acres within the protected area are undeveloped while significant recurring flood damages burden the existing development. Removing the developed area from the base flood plain along with the incidental 16 acres is wise flood plain management that would not encourage flood plain development outside the area protected by the preferred plan. |

# APPENDIX H

## REAL ESTATE

CONTENTS

Project Identification . . . . . 258
Project Name and Location . . . . . 258
Reconnaissance Report . . . . . 258

Description of the Area and Acreage to be Acquired . . . . . 258
Description . . . . . 258
Acreage to be Acquired . . . . . 259
Discussion of Applicability of Navigational Servitude . . 260

Number and Cost of Public Law 91-646 Relocations . . . . . 260

Assessment of Local Sponsor's Land Acquisition Experience . . 261

Baseline Cost Estimate . . . . . 262

Map of the Project Area . . . . . 262

Statement of Present and Anticipated Mineral Activity . . . . 262

Proposed Estates . . . . . 262

Detailed Schedule of Real Estate Activities . . . . . 262

Facilities to be Relocated . . . . . 262

Presence of Potential HTRW or other Environmental
Contaminants . . . . . 263

Attitude of Landowners . . . . . 263

Other Relevant Information . . . . . 263

Baseline Cost Estimate. . . . . Exhibit 264

Map . . . . . Exhibit 266

# REAL ESTATE PLAN

## BLUE RIVER BASIN DODSON INDUSTRIAL DISTRICT

## KANSAS CITY, MISSOURI

This Real Estate Plan is provided as Appendix H to the Feasibility Study for the subject project in accordance with ER 405-1-12 paragraph 12-8, dated 28 May 1991.

1. Project Identification

a. Project Name and Location. Flood Damage Reduction for the Blue River Basin (Dodson Industrial District), Kansas City, Missouri.

b. Reconnaissance Report. The report, "Reconnaissance Report, Blue River Basin, Kansas and Missouri," for the river basin upstream of 75th Street including the Dodson area was completed in May 1987 and certified on 3 September 1987. The reconnaissance study was conducted under the authority of a resolution adopted on September 19, 1984 by the United States House of Representatives Committee on Public Works and Transportation.

The current feasibility study is a continuation of that study effort as recommended in the May 1987 Reconnaissance Report. The Corps of Engineers and the City of Kansas City, Missouri entered into a feasibility cost sharing agreement in 1988.

2. Description of the Area and Acreage to be Acquired

a. Description. The Dodson Industrial District is located in Jackson County, Missouri approximately nine miles southeast of downtown Kansas City, Missouri and three miles northwest of the junction of US Highway 71, I-470, and I-435. The district is bounded by 81st Street on the north, Blue River on the south and east, and Prospect Avenue on the west. Bannister Mall is in the southeast corner of the district, Swope Park and the Kansas City Zoo to the northeast, and the East Meyer residential neighborhood to the north. The area immediately surrounding the district is a forgotten section of Kansas City and has experienced very little investment or development in recent years.

The Dodson Industrial District faced major obstacles to successful attraction of industrial development in the past including an inadequate traffic circulation system, flooding problems, insufficient sewer facilities, and a closed landfill site. The area has been upgraded in many respects including

street access and sewer systems in recent years and it has several advantages including proximity to southern Jackson County, Missouri and Johnson County, Kansas, convenient freeway access, rail service, and major industrial anchors.

The district is zoned M2b, industrial. Considering highway access, rail service, possible existence of contamination and hazardous materials because of nearby landfills, and current industrial use and zoning, the highest and best use is considered to be industrial.

b. Acreage to be Acquired. The various estates to be acquired by the local sponsor are explained below. Acquired estates will conform to the descriptions provided in ER 405-1-12, Figures 5-6 to 5-6h.

(1) Fee. Fee acquisition includes approximately 28 acres in Reach 2 consisting of landlocked, unprotected remainders along the river side of the levee. After construction of the levee, land on the river side of the levee will not have street access and the City intends to turn the property over to Jackson County, Missouri for park use. This area includes a 4.86 acre borrow area in the tract to be acquired from Labconco as shown in Exhibit 2 of this appendix.

(2) Permanent Levee Easements. Permanent easements include the land for the levee, a maintenance easement around the entire structure, and flowage easements for ponding areas for temporary storage of water during occasional flood conditions.

(3) Flowage Easements. Ponding areas are required to store interior drainage when flow through the levee to the Blue River is prevented because of high river stages. Perpetual flowage easements for occasional flooding will be acquired to limit land filling and development and to preserve storage capacity in the ponding areas. The largest ponding area will be approximately 56 acres in Boone Creek Basin upstream from Reach 1. This land is subject to flooding along Boone Creek and has not been developed because it is in the FEMA flood plain and is wet much of the time.

The borrow area in Reach 3 will be excavated to a depth of 12 to 15 feet below grade to provide borrow material for the levee. The resulting depression will be maintained to provide a ponding area for anticipated occasional flooding.

(4) Temporary Work Area Easements. Temporary construction easements surrounding the proposed construction site will be acquired for a staging area and for construction access as shown in Exhibit 2.

c. GSA Federal Complex Levee. The south end of the levee, Reach 1, is designed to join the levee at the northeast corner of the Federal Complex owned by the United States General Services Administration (GSA). This will require a permanent easement of approximately 1.15 acres for the levee footprint and a temporary work area easement of approximately 0.35 acre for construction. We have contacted GSA regarding the proposed levee and the real estate requirements and GSA personnel have indicated that they will provide the necessary temporary and permanent easements. GSA has cooperated with the City of Kansas City, Missouri in other projects along Bannister Boulevard in the past and representatives indicated that providing the necessary real estate interests for the proposed levee project would pose no particular problem.

d. Discussion of Applicability of Navigational Servitude. The issue of navigability for the affected stretch of the Blue River has never been judicially established.

Historically, the Kansas City District has considered the Blue River to be navigable only from river mile 0.0 to mile 4.0. This position was based on a discussion in paragraph 1264 of House Document No. 238, 73rd Congress, 2d Session which was drafted pursuant to a letter from the Chief of Engineers dated September 30, 1933.

A study by Grumman Ecosystems Corporation dated September 1975 resulted in a recommendation that the Blue River be considered non-navigable except for the segment within two miles of the mouth of the river (at the confluence with the Missouri River). By memorandum dated 4 August 1978 to the Division Engineer, Missouri River Division, the Kansas City District Engineer recommended that the Blue River be classified non-navigable. There has been no response to that memorandum and the Kansas City District continues to consider the Blue River to be navigable to river mile 4.0 based on House Document No. 238.

In any case, navigability even to river mile 4.0 would not affect the subject project because the project begins at approximately river mile 12.0 and proceeds upstream from there. Since the river is non-navigable in the affected area and the proposed construction will be above the ordinary high water mark, navigational servitude does not apply to the subject project.

3. Number and Cost of Public Law 91-646 Relocations

The staff of the City's Central Relocation Agency will be responsible for the relocation of owners and tenants. The Central Relocation Agency policies and procedures comply with Department of Transportation regulations in Part 49, Section 24 of the Code of Federal Regulations.

There are three businesses that will be affected in varying degrees by all three proposed levee alternatives. There will be no residential relocations.

In Reach 1, Schweiger Construction will be displaced by the levee. In Reach 2, the project will take approximately 50 percent of the lots of both Hayes Drilling, Inc., 8845 Prospect Avenue and Willey Enterprises (tenant on Arrow Truck Sales property), 3215 E. 85th Street. Acquisition of that much lot space will result in total displacement of these businesses.

Estimates prepared by the City of Kansas City, Missouri which are based on visual inspection of the exterior of the businesses only indicate that commercial relocation costs will be:

| | | Estimated Costs |
|---|---|---|
| Schweiger Construction | - Total relocation | $ 65,000 |
| Hayes Drilling | - Total relocation | 88,000 |
| Willey Enterprises | - Total relocation | 55,000 |
| City administrative costs | ($1,800 per tract) | 5,400 |
| Total | | $213,400 |

4. Assessment of Local Sponsor's Land Acquisition Experience

The Property and Insurance Division of the City of Kansas City, Missouri will have the responsibility for acquiring the needed property including appraisal, negotiations, and recommendation of eminent domain procedure if needed and approved by the city council.

The city has indicated that all acquisitions will be performed in accordance with the "Relocation Land Acquisition and Policies Act of 1970," Public Law 91-646, as amended; rules and regulations of the U. S. Army Corps of Engineers and Department of Transportation; statutes of the State of Missouri; and ordinances and policies of the City of Kansas City, Missouri where applicable.

Three of the four staff members in the City's Property and Insurance Division are licensed Real Estate Brokers in the State of Missouri. The staff has been assembled and involved in a variety of real estate transactions over the past ten years including the Brush Creek Project and the Blue River Channel Project. They are considered to be capable of performing the proposed acquisition to support the subject project.

5. Baseline Cost Estimate for Real Estate

A Baseline Cost Estimate is included as Exhibit 1 to this appendix.

6. Map of the Project Area

A map of the project area is included as Exhibit 2 to this appendix.

7. Statement of Present and Anticipated Mineral Activity

There is no current or anticipated mineral activity on the proposed project site.

8. Proposed Estates

Proposed estates are described in paragraph 2.b. of this appendix. These include permanent easements for the levee itself and for operation and maintenance in the future; flowage easements for occasional flooding behind the levee; temporary easements for construction access and a staging area; and fee simple for uneconomic remainders on the river side of the levee. These estates will conform with the standard estates described in ER 405-1-12, Figure 5-6.

9. Detailed Schedule of Real Estate Activities

A schedule of all real estate acquisition activities or milestones is attached as Exhibit 3 to this Appendix.

10. Facilities to be Relocated

Utilities affected by the project consist of sewer facilities owned by the City of Kansas City, Missouri. Construction of the levee will require encasement of a sewer line and short section of water line in concrete in Reach 1 and realignment and encasement of a sewer line in Reach 2. There will be no additional costs associated with acquiring real estate for this work because the facilities are located on project lands.

Estimated costs for altering and relocating facilities are:

| | |
|---|---|
| Relocation and encasement of sewers | $347,100 |
| Contingency (@ 25%) | 86,775 |
| Total | $433,875 |

An Attorney Opinion of Compensability has been prepared for the sewer facilities.

There are also two highway bridges in the project boundary. The city plans to replace the highway bridge over the Blue River at Prospect Avenue prior to construction of the subject project under a separate contract. The bridge at Hickman Mills Drive was recently replaced with a bridge which was designed to accommodate the proposed levee project.

11. Presence of Potential HTRW or other Environmental Contaminants

The City of Kansas City, Missouri operated a landfill northwest of the proposed project site from January 1958 until approximately 1972. The site was operated as a sanitary landfill and site preparation and leachate containment provisions were minimal compared to present standards. The site received a mixture of residential and commercial refuse which was compacted by a crawler track during the early years of operation and a steel-wheeled landfill compactor assisted by crawler tractors in later years. The practice of containing and covering each day's wastes was followed but, because of a continuing shortage of cover material, the daily, intermediate, and final covers were less than what is considered adequate by present standards. The fill is estimated to average 20 to 25 feet in depth with maximum depth approximately five feet deeper. During operation of the landfill, precautions were taken to prevent disposal of liquid or dry chemicals known to be toxic at the time. Such materials as dilute acids, petroleum based solvents and thinners, waste motor oil, and caustic solutions were common items of concern.

The site cannot be considered a tight and dry closure. While it was in operation, the back waters of the Blue River would periodically flood the lower elevations of the site. Additionally, daily cover material was limited and allowed atmospheric moisture to penetrate the cover. The final cover on the site is also insufficient to provide a proper atmospheric moisture seal as the entire site has less than the recommended two feet of final cover material.

Tests and investigations to discover the presence of HTRW or other contamination in the soil will be performed in the pre-construction engineering and design phase of the project.

12. Attitude of Landowners

This study was initiated by the City at the request of property and business owners in the Dodson industrial area. In fact, the owners supplied some of the initial funding toward the study.

During the course of the study, both City and Corps of Engineers representatives have met with the owners several times to update them on study progress and explain the extent and location of the various proposed facilities. They have also proposed levee location alternatives to reduce the land taking and minimize relocation costs.

In summary, the land owners have been very cooperative and supportive of the project.

13. Other Relevant Information

None

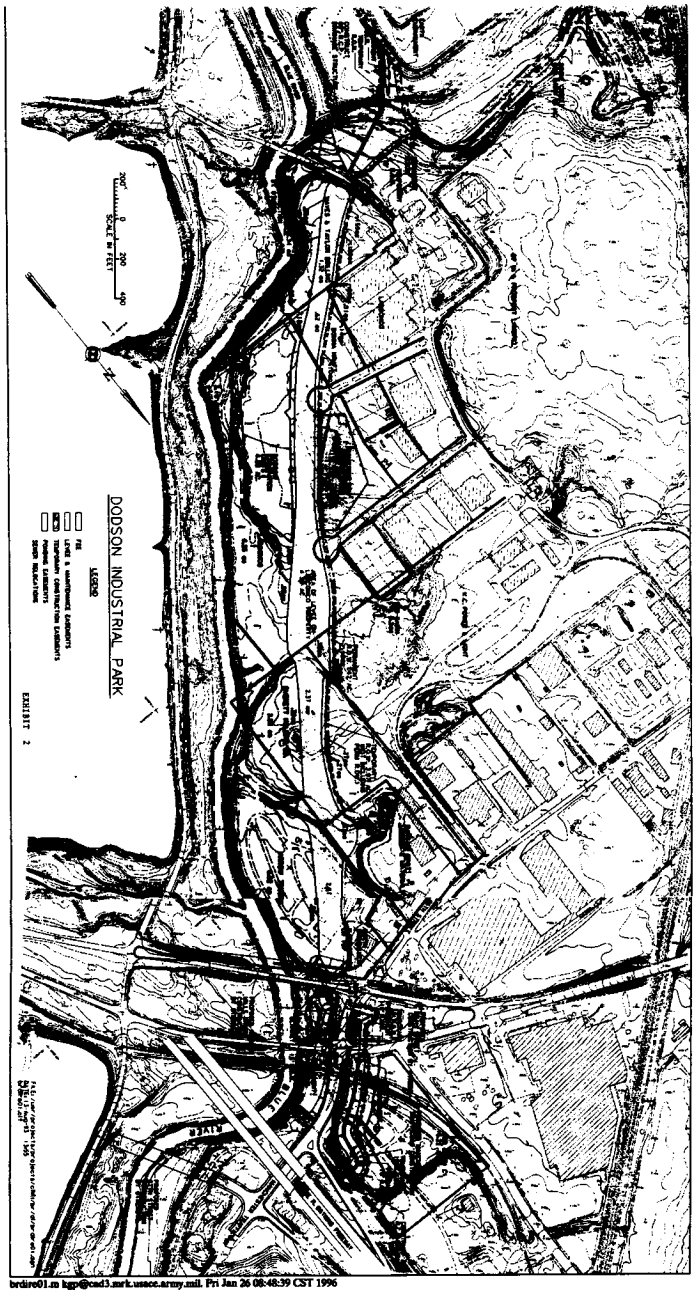
APPENDIX H, EXHIBIT 1

DODSON INDUSTRIAL DISTRICT
REAL ESTATE BASELINE COST ESTIMATE

| | Fee Simple | | | | Levee Easement | | | Flowage/Ponding Easements | | | Construction Easements | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (Acres) | Unit Cost ($/sq ft) | Total Cost | Improvements | Area (Acres) | Unit Cost ($/sq ft) | Total Cost | Area (Acres) | Unit Cost ($/sq ft) | Total Cost | Area (Acres) | Unit Cost ($/sq ft) | Total Cost | Total Costs | Contingency 10% | Total | Admin Fees |
| Reach 1 (Alternative 1) | | | | | | | | | | | | | | | | | |
| GSA | | | | | 1.15 | $0.40 | $20,060 | | | | 0.35 | $0.120 | $1,836 | $21,896 | $2,190 | $24,086 | $2,500 |
| KCMO | | | | | 0.33 | 0.40 | 5,800 | | | | 0.12 | 0.120 | 612 | 6,412 | 641 | 7,053 | 1,500 |
| Ponding area | | | | | | | | 56.00 | 0.15 | $365,904 | | | | 365,904 | 36,590 | 402,494 | 3,000 |
| Schweiger | 2.58 | $1.25 | $140,313 | $125,000 | | | 0 | | | | | | 0 | 265,313 | 26,531 | 291,844 | 4,500 |
| Jackson County | | | 0 | | 0.08 | 0.40 | 1,440 | | | | 0.04 | 0.120 | 234 | 1,674 | 167 | 1,841 | 1,500 |
| Hayes | 0.22 | 1.00 | 9,780 | 1,500 | | | 0 | | | | | | 0 | 11,280 | 1,128 | 12,320 | 1,500 |
| Subtotal | 2.80 | | $150,013 | $126,500 | 1.57 | | $27,300 | 56.00 | | $365,904 | 0.51 | | $2,682 | $672,399 | $67,240 | $739,638 | $14,500 |
| Reach 2 (Alternative 1) | | | | | | | | | | | | | | | | | |
| Arrow Truck | 9.62 | $0.60 | $251,428 | $161,000 | 2.94 | $1.25 | $154,638 | | | | 0.27 | $0.375 | $4,410 | $571,477 | $57,148 | $628,624 | $5,000 |
| Ponding Area B2 | | | 0 | | | | | 1.58 | 1.25 | $103,455 | | | 0 | 103,455 | 10,346 | 113,801 | 3,500 |
| Bungalo Spot | | | 0 | | 0.56 | 0.62 | 15,124 | | | | 0.11 | 0.186 | 856 | 15,980 | 1,598 | 17,578 | 1,500 |
| Ponding Area B2 | | | 0 | | | | | 3.00 | 0.62 | 81,022 | | | 0 | 81,022 | 8,102 | 89,124 | 3,500 |
| Overcut Dribble | 2.86 | 0.65 | 80,978 | 15,000 | 2.64 | 0.75 | 86,249 | | | | 0.27 | 0.225 | 2,646 | 184,873 | 18,487 | 203,360 | 4,000 |
| KCP & L | | | 0 | | 0.41 | 0.60 | 10,716 | | | | 0.10 | 0.180 | 784 | 11,500 | 1,150 | 12,650 | 1,500 |
| Ponding Area B1 | | | | | | | | 3.50 | 0.60 | 91,476 | | | | 91,476 | 9,148 | 100,624 | 3,500 |
| Lehigness | 11.11 | 0.70 | 338,766 | | 4.82 | 1.00 | 209,959 | | | | 2.94 | 0.300 | 38,420 | 587,145 | 58,715 | 645,860 | 5,000 |
| Ponding Area B1 | | | | | | | | 1.70 | 1.00 | 74,052 | | | | 74,052 | 7,405 | 81,457 | 3,500 |
| Donna Kroft | 0.18 | 1.25 | 9,745 | 45,000 | 0.76 | 1.25 | 41,382 | | | | 0.10 | 0.375 | 1,634 | 97,761 | 9,776 | 107,537 | 3,500 |
| Lehigness | | | 0 | 1,000 | 0.04 | 1.25 | 2,178 | | | | 0.03 | 0.375 | 588 | 3,736 | 374 | 4,109 | 1,500 |
| Hayes & Taylor | 4.34 | 0.60 | 113,430 | 15,000 | 1.48 | 1.25 | 80,586 | | | | 0.16 | 0.375 | 2,614 | 211,630 | 21,163 | 232,793 | 4,000 |
| Subtotal | 28.11 | | $794,348 | $237,000 | 13.55 | | $600,832 | 10.10 | | $350,005 | 3.98 | | $51,921 | $2,034,105 | $203,411 | $2,237,516 | $40,000 |
| Reach 3 (Alternative 4) | | | | | | | | | | | | | | | | | |
| Coca Investment | | | | | 0.20 | $3.50 | $31,150 | | | | 0.10 | $1.050 | $4,725 | $35,875 | $3,588 | $39,463 | $3,000 |
| Leidlen | | | | | 0.11 | 1.00 | 4,650 | | | | 0.03 | 0.300 | 360 | 5,010 | 501 | 5,511 | 1,500 |
| St. Louis RR | | | | | 0.21 | 1.00 | 9,050 | | | | 0.04 | 0.300 | 540 | 9,590 | 959 | 10,549 | 1,500 |
| Leidlen | | | | | 1.60 | 0.75 | 52,272 | | | | 0.17 | 0.225 | 1,631 | 53,903 | 5,390 | 59,294 | 2,000 |
| Ponding Area C1 | | | | | | | | 4.40 | 0.50 | $182,952 | | | | 182,952 | 18,295 | 201,247 | 4,000 |
| Subtotal | 0.00 | | $0 | $0 | 2.12 | | $97,122 | 8.40 | | $182,952 | 0.34 | | $7,256 | $287,330 | $28,733 | $316,063 | $12,000 |
| Total | 30.91 | | $944,360 | $363,500 | 17.24 | | $725,254 | 74.50 | | $898,861 | 4.83 | | $61,859 | $2,993,834 | $299,383 | $3,293,217 | $66,500 |

DODSON INDUSTRIAL LEVEE
Feasibility Estimate 29 January 1996
(Price Level Date: 1 October 1995)

| Account Code | Item | Quantity | Unit | Unit Price | Amount | Contingency Percent | Contingency Amount | Total Project Cost | SUBTOTAL |
|---|---|---|---|---|---|---|---|---|---|
| NON-FEDERAL OTHER COSTS | | | | | | | | | |
| 01--- | LANDS AND DAMAGES | | | | | | | | |
| 0102-- | Aquisitions | | | | | | | | |
| | Improvements | | | | | | | | |
| 010202 | Building | | LS | | $165,600.00 | 10% | $16,560.00 | $182,360.00 | |
| 010202 | Other Structures | | LS | | $208,600.00 | 10% | $20,860.00 | $229,460.00 | |
| | Right-Of-Way | | | | | | | | |
| 010202 | Fee Simple (30.9 Acres) | | LS | | $972,300.00 | 10% | $97,230.00 | $1,069,530.00 | |
| 010202 | Permanent Easements (91.74 Acres) | | LS | | $1,672,700.00 | 10% | $167,270.00 | $1,839,970.00 | |
| 010202 | Construction Easement (4.8 Acres) | | LS | | $63,900.00 | 10% | $6,390.00 | $70,290.00 | |
| 010202 | Administrative Fees (23 Parcels) | | LS | | $139,600.00 | 0% | $0.00 | $139,600.00 | |
| 0106-- | PL 91-646 Assistance | | | | | | | | |
| 010602 | Relocation Assistance | | LS | | $214,200.00 | 0% | $0.00 | $214,200.00 | |
| 010602 | Administrative Fees | | LS | | $5,500.00 | 0% | $0.00 | $5,500.00 | |
| | TOTAL LANDS AND DAMAGES | | | | $3,442,700.00 | | | | $3,751,030.00 |
| 02--- | RELOCATIONS | | | | | | | | |
| 0203---- | Relocate Utilities | | | | | | | | |
| 020318-- | Sanitary Sewers | | LS | | $347,100.00 | 25% | $86,775.00 | $433,875.00 | |
| | TOTAL RELOCATIONS | | | | $347,100.00 | | | $433,875.00 | $433,875.00 |
| TOTAL NON-FEDERAL OTHER COSTS | | | | | | | | | $4,184,905.00 |




brdire01.m kgp@cad3.mrk.usace.army.mil. Fri Jan 26 08:48:39 CST 1996

EXHIBIT 2

# APPENDIX I

## CULTURAL RESOURCES

### CULTURAL RESOURCE ASSESSMENT
### Section 106 Review

**CONTACT PERSON/ADDRESS:**

Lawrence M. Cavin, Chief, Regulatory Branch
Kansas City District, Corps of Engineers
Attn: CEMRK-CO-RE (96-00164)
700 Federal Building
Kansas City, Missouri 64106-2896

**C.**

John Madras
[redacted]

**PROJECT:**

Dodson Industrial District Levee Construction, COE Permit 96-00164

**FEDERAL AGENCY:**

COE-404

**County:**

Jackson County

**The Historic Preservation Program has reviewed the information submitted on the above referenced project. Based on this review, we have made the following determination:**

- [ ] The project area has been previously disturbed or has a low potential for the occurrence of cultural resources. A cultural resource survey, therefore, is not warranted.
- [ ] None of the structures involved are eligible for inclusion in the National Register of Historic Places.
- [ ] The proposed undertaking will have "no effect" on properties listed on or determined eligible for listing in the National Register of Historic Places.
- [x] An adequate cultural resource survey of the project area has been made. We agree that the proposed undertaking will have "no effect" on significant cultural resources.
- [ ] An adequate cultural resource survey of the project area has been made. We agree with the report's recommendation that the following potentially eligible sites should be avoided. If these sites are avoided, the proposed undertaking will have "no effect" on significant cultural resources.

Sites:

**For the above checked reason, the Historic Preservation Program has no objection to the initiation of project activities. PLEASE BE ADVISED THAT IF THE CURRENT PROJECT AREA OR SCOPE OF WORK ARE CHANGED, A BORROW AREA IS INCLUDED IN THE PROJECT, OR CULTURAL MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, APPROPRIATE INFORMATION MUST BE PROVIDED TO THIS OFFICE FOR FURTHER REVIEW AND COMMENT. Please retain this documentation as evidence of compliance with Section 106 of the National Historic Preservation Act, as amended.**

By: Mark A. Miller — December 11, 1995

for Claire F. Blackwell, Deputy State Historic Preservation Officer — Date

**MISSOURI DEPARTMENT OF NATURAL RESOURCES**
**HISTORIC PRESERVATION PROGRAM**
**P.O. Box 176, Jefferson City, Missouri 65102**
**For additional information, please contact Judith Deel, (314) 751-7862**

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE PARKS
P.O. Box 176 Jefferson City, MO 65102-0176 (314)751-2479
FAX (314)751-8656

July 21, 1993

Mr. Michael J. Bart
Chief, Planning Division
Kansas City Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Re: Proposed Dobson Industrial District Levee Project (COE) Kansas City, Missouri

Dear Mr. Bart:

The Historic Preservation Program has reviewed the May 1993 report entitled "Addendum to Cultural Resources Evaluation of the Proposed Levee Corridor in the Dodson Industrial District, Jackson County, Missouri" by Robert Ziegler. Based on this report, it is evident that an adequate cultural resource survey has been made of the project area.

We agree with the investigator's recommendations as outlined on page 3 of the report that no significant cultural resources are located within the proposed project area. Therefore, we have no objection to the initiation of project activities.

However, if the currently defined project area or scope of project-related activities is changed or revised, or if additional borrow areas are included in the project, the Missouri Historic Preservation Program must be notified and appropriate information relevant to such changes or revisions be provided for further review and comment, in order to ascertain the need for additional investigations.

If I can be of further assistance, please write; or call 314/751-7958.

Sincerely,

HISTORIC PRESERVATION PROGRAM

Michael S. Weichman
Senior Archaeologist

mc

c Robert Ziegler

JUN 07 1993

Environmental Resources Branch
Planning Division

Mr. David Shorr
Director and State Historic
Preservation Officer
Missouri Department of
Natural Resources
Post Office Box 176
Jefferson City, Missouri 65102

Dear Mr. Shorr:

The Kansas City District (KCD), Corps of Engineers is conducting a feasibility study for flood damage reduction in the Dodson Industrial District within the City limits of Kansas City, Jackson County, Missouri. The KCD is proposing to construct a 1.1 mile long levee along the left bank of the Blue River. In 1990, the KCD conducted a cultural resources survey of the proposed levee alignment. A copy of the report was provided to your office for review and comment, and the opinion was that there were no historic properties listed on or determined eligible for the National Register of Historic Places (NRHP) that would be affected by the construction of the levee.

However, since the 1990 cultural resources survey, the project has been revised to include two borrow areas, both located in the Dodson Industrial District vicinity. In March 1993, the KCD conducted a cultural resources survey of the borrow areas. By copy of this letter, the KCD is forwarding to Mr. Michael Weichman, Senior Archeologist, the report of the 1993 cultural resources investigations.

One prehistoric site (23JA442) was identified in the 1993 survey. Based on an intensive surface survey and systematic, subsurface auger tests, it is the KCD's opinion that the site lacks the integrity which would make it eligible for the National NRHP.

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, I am

requesting that you review the report and comment on the proposed undertaking. Should there be any questions, please contact Dr. Robert Ziegler at (816) 426-3672.

Sincerely,

SIGNED

Michael J. Bart, P.E.
Chief, Planning Division

Copy Furnished (w/enclosure):

Mr. Michael Weichman, Senior Archeologist
Missouri Department of Natural Resources
Post Office Box 176
Jefferson City, Missouri 65102

PD-P (w/encl)
Dist Read File (wo/encl)

CEMRK-PD-R MAY 1993

ADDENDUM TO CULTURAL RESOURCES EVALUATION OF THE PROPOSED LEVEE CORRIDOR IN THE DODSON INDUSTRIAL DISTRICT, JACKSON COUNTY, MISSOURI

Introduction

In 1990, the Kansas City District (KCD) conducted a cultural resources evaluation of the proposed levee corridor within Dodson Industrial District in southern Kansas City, Jackson County, Missouri. A report of the investigation was provided to the State Historic Preservation Office for review and comment (Ziegler 1990). The SHPO concurred with KCD that there were no properties listed on or eligible for the National Register of Historic Places that would be affected by the project (Weichman 1990).

Since the 1990 survey, two borrow areas have been identified for the project. Both borrow areas are adjacent to the proposed levee. In March, 1993 the KCD conducted a two-day survey of the borrow areas. Initial survey work began on March 11 and was completed on March 24. The writer directed the survey and KCD archeologist John Dendy provided assistance.

Location and Description of Borrow Areas

Borrow Area #1 is near the upstream end of the project (Figure 1). The borrow area is approximately 6 1/2 acres in size and fill material may be excavated to depths of 28 feet. Presently this area is not used by the businesses in Dodson Industrial District, although piles of mid-20th century trash indicate that architectural materials and other debris were dumped there in recent times. Aerial photographs indicate that prior to the development of the industrial district the high terrace, some 30 feet above the present river channel, was cultivated.

Borrow Area #2 is near the downstream end of the project (Figure 1). The borrow area is approximately 4 1/2 acres in size and fill material may be excavated to depths of 13 feet. Present use of this area is primarily for parking of vehicles and storage of industrial materials.

Both Borrow Area #1 and Borrow Area #2 lie within Section 22, Township 48N, Range 33W. No archeological sites have been recorded in this section (based on 1990 and 1993 file searches; the latter is attached).

Survey Methods

The survey of Borrow Area #1 consisted of an intensive pedestrian reconnaissance, with parallel transects placed 20 m apart. All soil exposures along these transects were examined for

cultural materials, and at selected points along each transect, subsurface soils were extracted for examination by using a 3/4 inch Oakfield coring tool. About 65% of Borrow Area #1, including the present floodplain (T-0) and lower terrace (T-1) and a portion of the high (T-2) terrace, is in timber. The remaining 35% of the area is in grass. Surface visibility within timbered and grass-covered areas was fair-to-good because of numerous exposures from natural forces (erosion along terrace edges) and man-made forces (sewer and drainage ditch construction).

Systematic subsurface sampling in Borrow Area #1 was later conducted in the general vicinity of a prehistoric site located during the March 11 survey. The sampling procedure is described in the Results section below.

The survey of Borrow Area #2 consisted of a pedestrian reconnaissance and examination of all exposed soil surfaces within the proposed borrow area, including the banks of a rerouted stream drainage. Due to extensive 20th century land-altering activities (roads, railroad right-of-way, stream drainage, commercial and industrial storage lots), an intensive survey including shovel or auger testing was not considered necessary, and in some portions of the proposed borrow area, was not possible because of paved surfaces.

Survey Results

Borrow Area #1 was initially surveyed on March 11, 1993. Within Borrow Area #1, one prehistoric archeological site of unknown cultural affiliation (23JA442) was recorded (Figure 2; see also attached site form). Additionally, one small 20th century building foundation was noted, but not recorded as a site because of its recent age (Figure 2). This foundation dates to the 1960s and all that presently remains is a concrete foundation and the base of a brick chimney.

Site (23JA442) initially appeared as a light-to-moderate scatter of lithic debris on the surface and eroding from the edge of the T-2 terrace (Figure 2). Based on the surface scatter, the site is approximately one acre in size. Mid-20th century trash has been dumped on the site, and a drainage ditch excavated in 1990 has clearly disturbed a portion of the site. A surface-grab sample of artifacts recovered from the surface of the site includes two bifaces of Winterset chert, 17 pieces of lithic debitage (all Winterset chert), one fragment of burned limestone, one mussel shell, one fragment of a canine mandible, and one blue-glazed stoneware rimsherd. Trash from dumping activities (plastic bottles, aluminum cans, asphalt, concrete, and bricks) was not collected. None of the lithic, bone, or shell artifacts is temporally or culturally diagnostic. The stoneware rimsherd could date to the late 19th century but such items are still produced today, thus it is just as likely 20th century in origin.

Ten systematically-placed auger tests (each 20 cm in diameter and 40-50 cm in depth) were excavated at 23JA442 on March 24, 1993. The contents of each auger test was screened through a 1/4 inch mesh screen. Six auger tests were placed at 20 m intervals along a line parallel to the terrace edge and four were placed at 10 m intervals along a line perpendicular to the first transect (Figure 2). The auger tests indicate a plowzone extending to 22 cm b.s. (10YR 3/2 silty clay) and a culturally sterile clay (10YR 3/3) beneath the plowzone. Three of the 10 auger tests produced artifacts, all restricted to the plowzone (Figure 2). Artifacts recovered include two wire nails and three small flakes of Winterset chert. There is no subsurface evidence of cultural features or midden deposits.

Borrow Area #2 was surveyed on March 11, 1993. No sites were identified in Borrow Area #2. As indicated above, 20th century activities have altered this proposed borrow area significantly. An examination of a rerouted stream drainage which now flows through the northern third of the area indicates that as much as 1 m of fill material has been placed there. Observed in the top m of the cutbank were broken concrete, broken asphalt, crushed limestone, and piles of eroded shale.

Conclusions and Recommendations

The survey resulted in the identification of one archeological site (23JA442) within the proposed borrow areas. This is a previously-unrecorded prehistoric site of unknown cultural affiliation; all historic-period materials observed on or just below the surface of the site are likely the result of mid-20th century activities.

Auger tests at 23JA442 were sufficient to determine that subsurface cultural materials are few and confined solely to the plowzone. Moreover, a drainage ditch excavated in 1990 has further disturbed a portion of the site. Because of its limited content and lack of subsurface integrity, 23JA442 has little potential to contribute significant information to the prehistory of the region. Therefore, 23JA442 is not recommended for the National Register of Historic Places.

It is recommended that the undertaking proceed as planned. In the event that artifacts are unearthed from 23JA442 or another location during construction, the Planning Division of the Kansas City District and the Missouri Office of Historic Preservation should be contacted immediately.

Robert J. Ziegler

Robert J. Ziegler, Archeologist

## REFERENCES

Weichman, Michael
1990 Letter to Philip Rotert concerning the proposed Dodson Industrial District Levee, dated May 22.

Ziegler, Robert J.
1990 Cultural Resources Evaluation of the Proposed Levee Corridor in the Dodson Industrial District, Kansas City, Missouri.

# ARCHAEOLOGICAL SURVEY OF MISSOURI

Missouri Archaeological Society--University of Missouri Columbia

1. County Jackson
2. ASM Site Number 23JA442
3. Local Name/Number
4. 1/4 Secs. (1) SE NW SW
5. Sec./LandGrant (1) 22
6. Twp(1) 48N
7. Range(1) 33W
8. 1/4 Secs. (2)
9. Sec./LandGrant (2)
10. Twp(2)
11. Range(2)
12. 1- USGS Grandview Mo.-Kans. 7.5'
16. UTM: Zone 15
17. Northing 4313890
13. 2-County Map
18. Easting 365320
14. 3-Other Map COE Dodson Levee Project
19. NRHP No
15. Cultural Affiliation Unknown Prehistoric
20. Size of Site 60 m NW-SE by 100 m NE-SW
21. 6,000 Sq. m. m sq./ha
22. Owner/Address of Property Labconco Corp. 8811 Prospect, Kansas City, MO 64132
23. Tenant/Address of Property
24. Information current as of March 24, 1993 date.
25. Site Description

The site is a light-to-medium density prehistoric lithic scatter of unknown cultural affiliation. The site lies within a light stand of timber on a T-2 terrace along the left bank of the Blue River, within present-day Dodson Industrial District. Lithic debris was collected from the surface of the site and from the eroded terrace edge. Ten systematic auger tests were excavated to depths between 40-50 cm b.s. Three small flakes and two wire nails were recovered from the plowzone; no cultural materials were present below the plowzone.

26. *This Information Supplied By*

Name Robert Ziegler

Address Kansas City District, Corps of Engineers
700 Federal Building (PD-R)
Kansas City, Missouri 64106

Date May 15, 1993

27. *Affiliation of Reporter*

1_UMC
2_Other Educational Instutions
3_MAS Member
X 4_Non-educational Institution
5_Non-MAS, Private Individual

15 SWITZLER HALL UNIVERSITY OF MISSOURI COLUMBIA COLUMBIA, MO 65211

ASM Site Number 23JA442

28. Condition of Site
The site' s integrity has been affected by plowing and other disturbances. It is estimated that 75-100% of the site is disturbed. A 1940 photograph clearly shows that the site was in cultivation. Excavation of a drainage ditch has clearly affected the southern portion of the site and piles of recent 20th century trash are common on the site's surface. Sewer line excavations may have affected the northern portion of the site. No cultural materials were recovered below the 22 cm. deep plowzone.

29. *Site Nature--General (Check the numbers)*

X 1. Prehistoric
2. Historic
3. Protohistoric
4. Prehistoric/Protohistoric
5. Historic/Protohistoric
6. Prehistoric/Protohistoric/Historic
7. Historic/Architectural
8. Other

9. Prehistoric/Historic

30. *Site Nature- Specific*

X 1. Habitation/Prehistoric (Campsite, Village)
2. Mounds
3. Burial Area
4. Petroglyph/Pictograph
5. Quarry
6. Cave/Shelter
7. Cairn
8. Trail/Trace/Road
9. Other

10. Residence/Farmstead
11. Industrial
12. Military
13. Residence/Farmstead Outbuildings
14. Political/Governmental
15. Church
16. School

31. *Water Source*

1. Spring
2. Intermittent Stream
3. Perennial Stream
X 4. River
5. Confluence of Water Courses
6. Natural Lake
7. Swamp/Bog
8. Other

32. *Topographical Location*

1. Flood Plain (T-0)
2. Stream Terrace (T-1)
X 3. Stream Terrace (T-2)
4. Slope
5. Bluff
6. Hilltop/Ridgetop
7. Other

33. *Material Reported*

X 1. Prehistoric
2. Historical Period
3. Both
4. ?

*Material Location*

34. Is there a collection? X Yes No

35. Repository (1) KCD Office

36. Repository (2)

37. How was the site discovered?

Corps pedestrian survey and auger-testing for Dodson Levee project.

38. Contour Elevation 790-792 ft/MSL

*Nearest (Named **OR** Unnamed) Water*

39. Name Blue River

40. Distance 50 m

41. Right or Left Bank of Stream
(looking Downstream) Left

42. SpringNearby/ Name

43. Distance

ASM Site Number 23JA442

44. Remote Sensing/Sampling Techniques

45. Geomorphology/Land Forms/Soils

T-2 terrace. Kennebec-Colo-Bremer Association, moderately well-drained and poorly-drained soils that formed in alluvium. Soil in the site's vicinity is classified as a Udifluvent, or man-made soil.

46. Land Status When Reported

1. Cultivated
2. Pasturage
X 3. Wooded
4. Flooded
5. Developed
6. Other

47. Land-Use Comments

Site was cultivated in past but now is in light timber. Recent 20th century trash piles (asphalt, concrete, brick, plastic bottles, aluminum cans) attest to dumping activities. Site is within the Dodson Industrial District but has never had any commercial or industrial structures on it.

48. Site Significance/NRHP Eligibility

Site is not eligible. Materials are confined to the plowzone and a combination of plowing and earth-altering activities have severely affected the site's integrity.

49. Literature Sources (INCLUDE any CRM Report(s) pertaining to this site)

Ziegler, Robert (1993). Addendum to Cultural Resources Evaluation of the Proposed Levee Corridor in the Dodson Industrial District, Kansas City, Missouri.
Ziegler, Robert (1990). Cultural Resources Evaluation of the Proposed Levee Corridor in the Dodson Industrial District, Kansas City, Missouri.
Both reports on file in the Planning Division, Kansas City District, Corps of Engineers.

50. Description of Cultural Features

None present

51. Faunal/ Floral Remains

Fragment of canine mandible found on surface (probably recent). One fragment of mussel shell.

52. Drawings, photographs, and/or brief description and quantity of artifacts

Surface Grab Sample: 2 bifaces Winterset chert (see attached); 17 lithic debitage, 1 burned limestone; 1 fragment of mussel shell; 1 fragment of Canine mandible; and 1 blue-glazed stoneware rimsherd (probably 20th century).

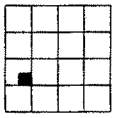
Auger Tests: 3 lithic debitage; and 2 wire nails.

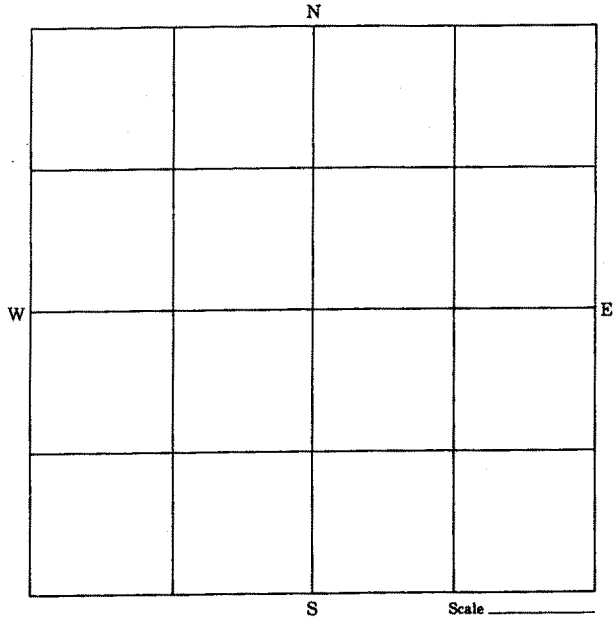
53. Sketch Map APPENDED

Indicate the chief topographical features, such as streams and elevations. Also indicate houses and roads. Indicate the site location by enclosing the site area with dotted line. Note scale of map and portion of section included in sketch map. Include drawings, photographs, etc.

**Is this a full section** NO **, ¼ section** _____ **, other** 1/64 **?**

Indicate part of section included in sketch map.



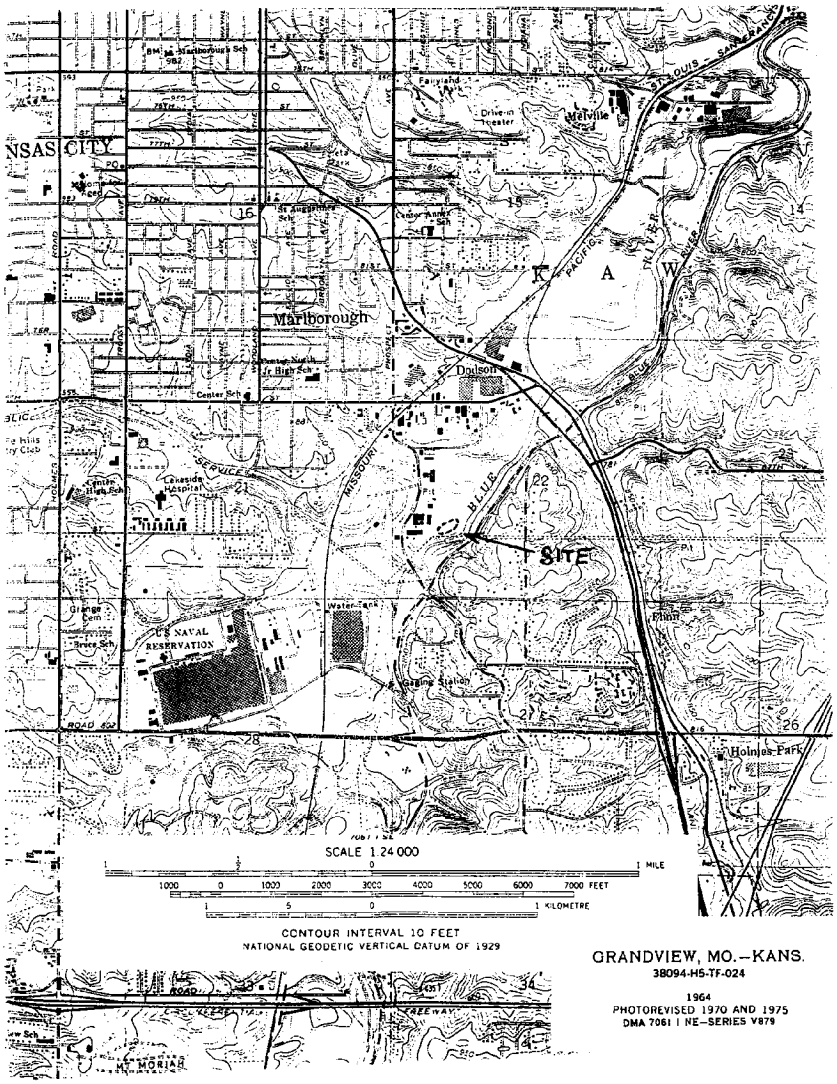


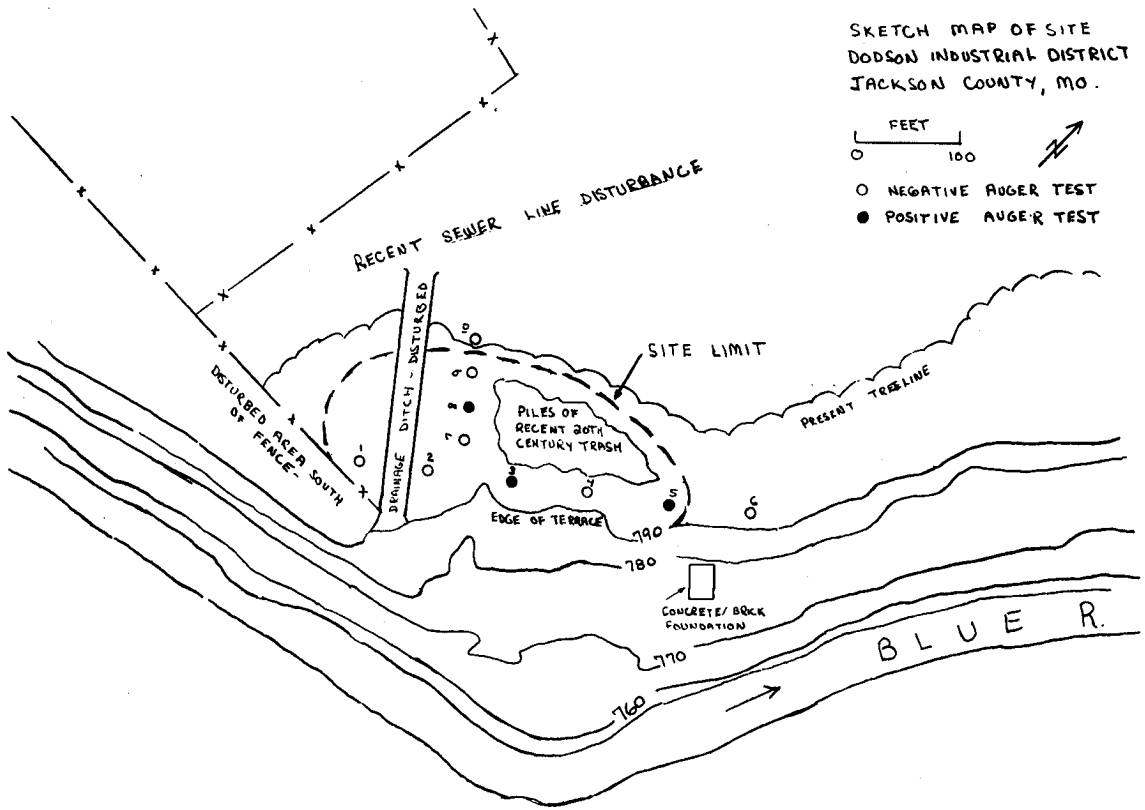

**Scale** _____

Key

**54. Attach a copy of the appropriate topographic map with map name, scale, and site location clearly indicated.**

APPENDED


NSAS CITY
Marlborough
Dodson
Melville
Drive-in Theater
Lakeside Hospital
U.S. NAVAL RESERVATION
Water Tank
Gasoline Station
SITE
Holmes Park
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETRE
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
GRANDVIEW, MO.–KANS.
38094-H5-TF-024
1964
PHOTOREVISED 1970 AND 1975
DMA 7061 I NE–SERIES V879


SKETCH MAP OF SITE
DODSON INDUSTRIAL DISTRICT
JACKSON COUNTY, MO.
FEET
0
100
N
O NEGATIVE AUGER TEST
● POSITIVE AUGER TEST
RECENT SEWER LINE DISTURBANCE
DISTURBED AREA SOUTH OF FENCE
DRAINAGE DITCH - DISTURBED
SITE LIMIT
PILES OF RECENT 20TH CENTURY TRASH
PRESENT TREELINE
EDGE OF TERRACE
790
780
770
760
CONCRETE/BRICK FOUNDATION
BLUE R.

WINTERSET CHERT BIFACES - ACTUAL SIZE

**ARCHAEOLOGICAL SURVEY OF MISSOURI**

**Missouri Archaeological Society—University of Missouri–Columbia**

**REQUEST FOR INFORMATION**

ASM IDENTIFICATION NUMBER ASM 93-211 DATE 4/21/93

This ASM file search was requested by Robert Ziegler

ORGANIZATION Kansas City COE

ADDRESS 700 Federal Building Kansas City, MO 64106-2896

PROJECT TYPE CRM ( X ) MAS Member ( ) DNR Grant ( ) Other ( )

PROJECT NAME Dodson Levee

FEDERAL AGENCY/PROJECT SPONSOR COE

ASM file search specification supplied by user (List by County, Township, Range, and Section).

Jackson County T48N R33W Sections 15, 21, 22, 28

Results of ASM File Search:

| COUNTY | TWNSHP | RANGE | SECTION | SITES LOCATED |
|---|---|---|---|---|
| Jackson | 48N | 33 | 15 | No sites recorded |
| | | | 21 | 23JA314 |
| | | | 22 | No sites recorded |
| | | | 28 | 23JA91, JA304 |
| | | | | |
| | | | | |

A joint activity of the Missouri Archaeological Society
and the
University of Missouri

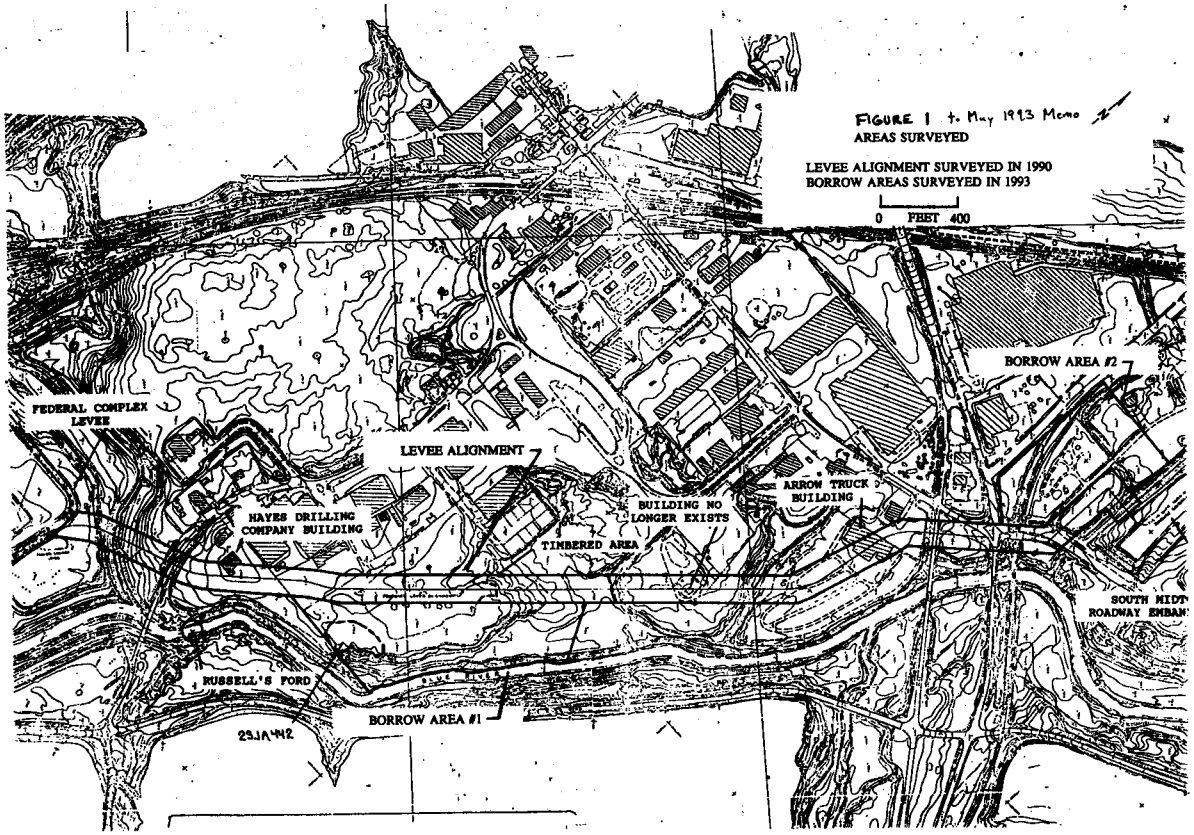


FIGURE 1 t. May 1993 Memo
AREAS SURVEYED
LEVEE ALIGNMENT SURVEYED IN 1990
BORROW AREAS SURVEYED IN 1993
0 FEET 400
FEDERAL COMPLEX LEVEE
LEVEE ALIGNMENT
HAYES DRILLING COMPANY BUILDING
BUILDING NO LONGER EXISTS
TIMBERED AREA
ARROW TRUCK BUILDING
BORROW AREA #2
RUSSELL'S FORD
BORROW AREA #1
25JA442

CEMRK-PD-R APRIL 1990

MEMORANDUM TO FILE

CULTURAL RESOURCES EVALUATION OF THE PROPOSED LEVEE CORRIDOR IN THE DODSON INDUSTRIAL DISTRICT, KANSAS CITY, MISSOURI

Introduction

A cultural resources evaluation was conducted by Corps personnel of the area of a proposed levee to be constructed in the Dodson Industrial District within the city limits of Kansas City, Jackson County, Missouri (Figure 1). The purpose of the evaluation was to identify historic properties that could be impacted by the proposed construction activities.

Proposed Project

The Dodson Industrial District is subject to flooding from the Blue River. The proposed plan consists of constructing a levee extending from the existing embankment of the planned South Midtown Roadway upstream to the southern end of the Dodson Industrial District where it would tie into the Federal Complex levee (Figure 2). Total length of the proposed levee would be approximately 1.1 miles. The construction corridor will be no more than 150 feet wide.

Archeological/Historical Sites Search

The levee would be constructed entirely within Sections 21 and 22, T48N, R33W. The Archaeological Survey of Missouri (ASM) in Columbia indicates that there are no recorded sites within Section 22. There is one site (23JA314) having prehistoric and historic components in Section 21 (Figure 1). This site however is well beyond the proposed project boundaries and would not be affected from construction activities.

The levee project is located within Washington Township, which was formed February 9, 1836. In the mid-Nineteenth Century Washington Township derived much of its wealth from the Santa Fe trade. New Santa Fe, a small town situated near the Kansas State line, was an outgrowth of this trade. Another important town in Washington Township was Hickmans' Mills, described as a "trading point for a large scope of country" (Birdsall 1881). However, both New Santa Fe and Hickmans' Mills are well beyond the limits of the present project. A Nineteenth Century atlas indicates that there were no towns within or in the immediate vicinity of the present project (Jackson County 1877).

The only known historical site in the Dodson vicinity is Russell's Ford, at the Blue River. The ford lies in the SW 1/4 of the SW 1/4 of Section 22 (Figure 1). This Nineteenth Century ford served as a crossing for the Harrisonville Road,

which ran from Westport southeast to nearby Harrisonville, Missouri. The ford played a minor role in the Battle of Westport. On October 22, 1864 Kansas Militia were posted at the ford to prevent the crossing of Confederate General Sterling Price's troops; when Price's men crossed downstream, the Kansas troops withdrew to the north and west. On October 23, 1864 Price's wagon train and most of his army crossed the river at Russell's Ford in their retreat southward after the Battle of Westport. McNeil's Union Brigade was on the bluff to the southeast of the ford but for some unexplained reason did not fire on the enemy (Lee 1982).

Survey Methods

A pedestrian reconnaissance was conducted of the proposed levee corridor (Figure 2). A survey transect along the center line of the 1.1 mile long corridor was walked. Segments of the corridor exhibited obvious disturbances such as recent sewer construction or were rendered unsurveyable because of the presence of modern intrusions such as roads, buildings, paved parking or storage lots, and trash dumped in ravines. Additional survey transects were not conducted in obviously disturbed areas of the corridor. In segments of the corridor that exhibited no obvious disturbances, additional survey transects were placed parallel to the centerline. These transects were approximately 10 meters apart.

Ground cover throughout most of the corridor consisted of grasses and weeds; visibility was fair to good in theses areas. One segment of the corridor approximately 600 feet in length was covered in timber and visibility was poor because of a thick layer of leaf litter.

All exposed surface soils along each survey transect were examined. At selected points along each transect, subsurface soils were extracted for examination by using a 3/4" Oakfield hand-held coring tool. Subsurface shovel tests were conducted at 10 meter intervals along transects within the timbered area.

Survey Results

No prehistoric or historic sites were located within the levee corridor. Two modern structures lie within the corridor. One is an abandoned large storage building within the former Arrow Truck Sales property (Figure 2). The other is a storage shed currently in use by the Hayes Drilling Company (Figure 2). Aerial photographs indicate that these buildings were constructed in the late 1960's- early 1970's and they are not historically significant.

The proposed levee corridor has been extensively disturbed by urban and industrial construction activities. Modern urban intrusions include the Union Pacific Railroad Track, 85th Street, northbound and southbound lanes of 71 Highway, Prospect Avenue and recent sewer construction. Industrial development includes

buildings, parking lots, and storage areas (Figure 2).

Soil cores from disturbed areas generally consist of a brown mottled clay. Black, red, and yellow colors occur within these soils. Small brick, concrete, and asphalt fragments are frequent.

Soil cores taken from the northern half of the timbered segment of the corridor did not appear to be disturbed. These consisted of a dark brown silty clay extending from the surface to approximately 20 centimeters underlain by a brown silty clay. Intensive shovel testing in this area revealed only the presence of modern debris just beneath the leaf litter on the surface. This material consists of bricks and brick fragments, cinder block fragments, window glass, round wire nails, and asphalt roofing shingles.

Because of their concern for Russell's Ford, three members of the Civil War Round Table of Kansas City met the survey crew in the field and identified the location of the ford. Russell's Ford is clearly outside of the proposed levee construction corridor (approximately 175 feet) and would not be affected by the project (Figure 2). It is further evident that Russell's Ford has been significantly impacted by previous construction and fill activities. The right bank (east) approach was disturbed by sewer construction. The left bank (west) approach is buried under many feet of fill material that was dumped there to build up that portion of the Dodson Industrial District.

Summary and Recommendations

A cultural resources investigation of the proposed levee corridor was conducted. This study consisted of an examination of historical records and photographs, consultation with the Archaeological Survey of Missouri, and a field survey of the proposed construction site. Based on these investigations, no known historic properties will be affected by the proposed project.

Since no historic properties will be impacted, clearance is recommended for this project. Should a prehistoric or historic site be discovered during construction activities, the contractor will be required to immediately contact the Kansas City District, Corps of Engineers and the Missouri Office of Historic Preservation.

Robert J. Ziegler

Robert J. Ziegler, Archeologist

## REFERENCES CITED

Birdsall, A
1881 History of Jackson County. Birdsall, Williams and Co., Kansas City, Missouri.

Corps of Engineers
1987 Blue River Basin: Kansas and Missouri Reconnaissance Report. Kansas City District.

Jackson County
1877 Jackson County Atlas of 1877. Atlas on file at Kansas City Public Library, Kansas City, Missouri.

Lee, Fred L.
1982 The Battle of Westport. Westport Historical Society, Kansas City, Missouri.

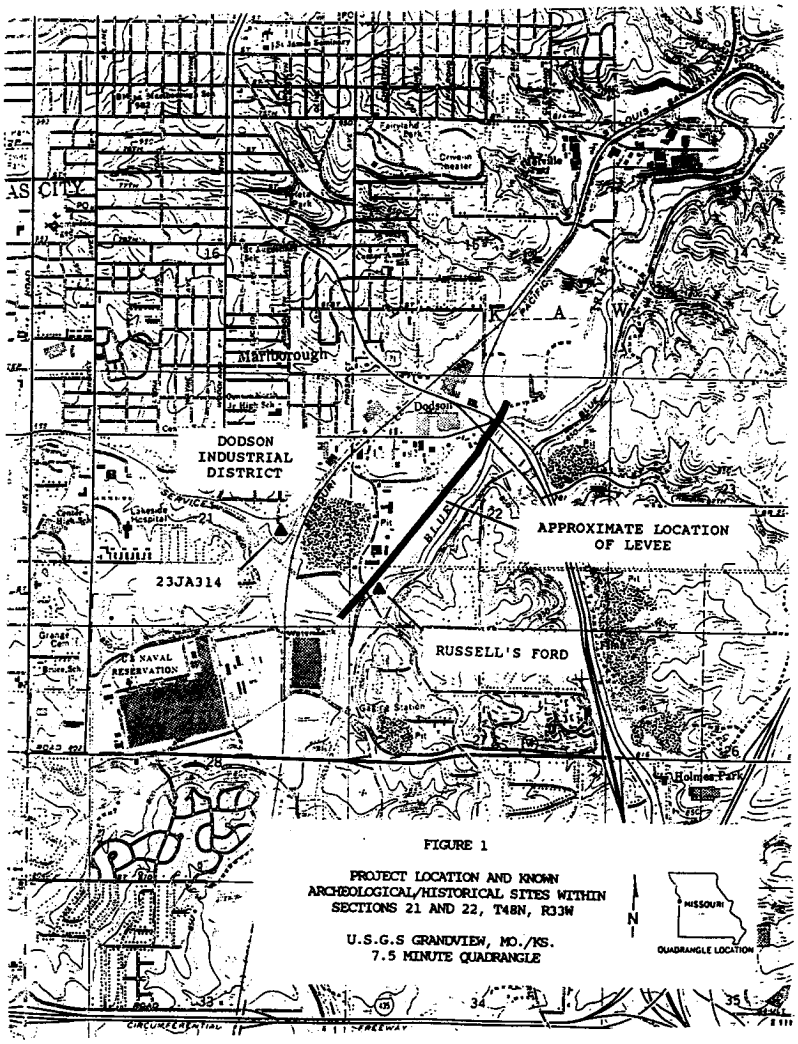



FIGURE 1

PROJECT LOCATION AND KNOWN
ARCHEOLOGICAL/HISTORICAL SITES WITHIN
SECTIONS 21 AND 22, T48N, R33W

U.S.G.S GRANDVIEW, MO./KS.
7.5 MINUTE QUADRANGLE

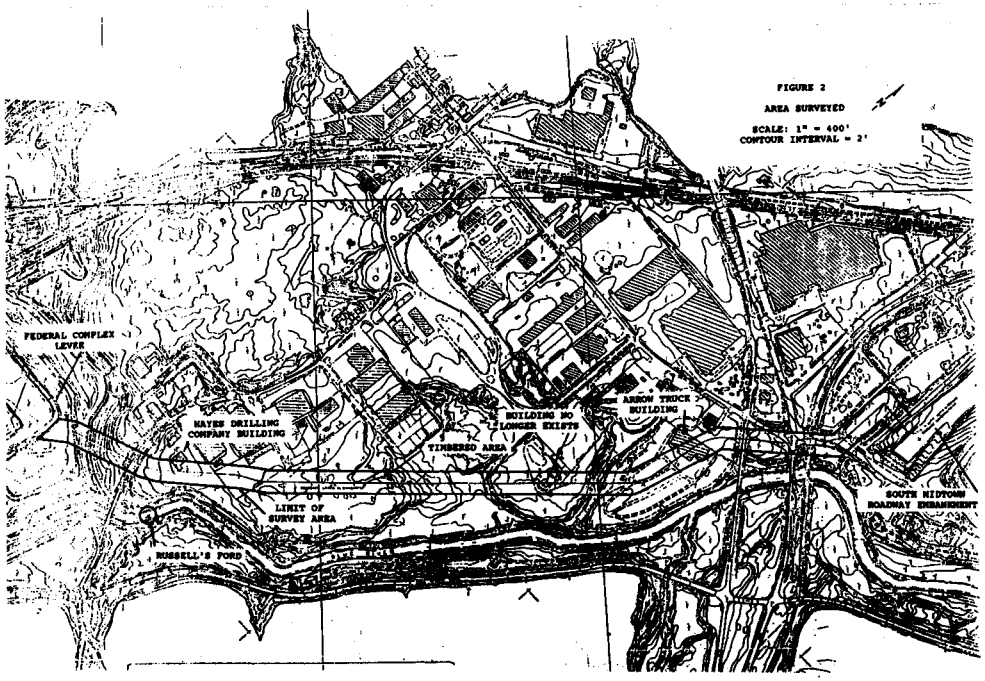



FIGURE 2

AREA SURVEYED

SCALE: 1" = 400'
CONTOUR INTERVAL = 2'

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

REPLY TO
ATTENTION OF:

Environmental Resources Branch
Planning Division

Mr. G. Tracy Mehan III
Director and State Historic
Preservation Officer
Missouri Department of
Natural Resources
Post Office Box 176
Jefferson City, Missouri 65102

Dear Mr. Mehan:

The Kansas City District, Corps of Engineers is designing a levee that would be constructed in the Dodson Industrial District within the city limits of Kansas City, Jackson County, Missouri. The 1.1 mile long levee would protect the Dodson Industrial District from the floodwaters of the Blue River.

Under separate cover, the Kansas City District is forwarding to Mr. Michael Weichman, Senior Archeologist, a copy of the report of the cultural resources investigations of the proposed levee corridor within the Dodson Industrial District. The investigations were directed by Corps Archeologist, Robert Ziegler.

In compliance with Section 106 of the National Historic Preservation Act, as amended, I am requesting that you review the report and indicate whether you agree with the investigator's conclusion that no known historic properties will be impacted by the proposed project.

Should there be any questions, please contact Dr. Robert Ziegler at (816) 426-3672.

Sincerely,

Philip L. Rotert

Philip L. Rotert
Chief, Planning Division

Copy Furnished (w/enclosure):

Mr. Michael Weichman, Senior Archeologist
Missouri Department of Natural Resources
Post Office Box 176
Jefferson City, Missouri 65102

JOHN ASHCROFT
Governor

G. TRACY MEHAN III
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Division of Energy
Division of Environmental Quality
Division of Geology and La ve
Division of Management . s
Division of Parks, Recreation, and Historic Preservation

DIVISION OF PARKS, RECREATION, AND HISTORIC PRESERVATION
P.O. Box 176
Jefferson City, MO 65102
314-751-2479

May 22, 1990

Mr. Philip L. Rotert
Chief, Planning Division
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: Proposed Dodson Industrial District Levee Project (COE), Kansas City, Jackson County, Missouri

Dear Mr. Rotert:

In response to your letter dated 02 May 1990 concerning the above referenced project, the Historic Preservation Program has reviewed the information provided and we concur with your determination that no property listed on or determined eligible for inclusion in the National Register of Historic Places will be affected by the proposed undertaking. Therefore, we have no objections to the initiation of project activities.

However, if the currently defined project area or scope of project related activities is changed or revised, or cultural materials are encountered during construction, the Missouri Historic Preservation Program must be notified and appropriate information relevant to such changes, revisions, or discoveries be provided for further review and comment, in order to ascertain the need for additional investigations.

If I can be of further assistance, please write or call 314/751-7860.

Sincerely,

HISTORIC PRESERVATION PROGRAM

Michael S. Weichman
Senior Archaeologist

MSW:nc

cc: Robert Ziegler

**ARCHAEOLOGICAL SURVEY OF MISSOURI**
**Missouri Archaeological Society—University of Missouri–Columbia**

**REQUEST FOR INFORMATION**

ASM IDENTIFICATION NUMBER ASM89-348 DATE 12-21-1989

This ASM file search was requested by Bob Ziegler

ORGANIZATION KC-COE

ADDRESS Kansas City, MO

PROJECT TYPE CRM (X) MAS Member ( ) DNR Grant ( ) Other ( )

PROJECT NAME Levee Project, Little Blue River Floodplain

FEDERAL AGENCY/PROJECT SPONSOR Kansas City District-COE

ASM file search specification supplied by user (List by County, Township, Range, and Section).

Jackson county, T48N-R33W, secs. 21,22,28

Results of ASM File Search:

| COUNTY | TWNSHP | RANGE | SECTION | SITES LOCATED |
|---|---|---|---|---|
| Jackson | 48N | 33W | 21 | 23JA314 |
| | | | 28 | 23JA91,304 |

A joint activity of the Missouri Archaeological Society
and the
University of Missouri

| | |
|---|---|
| Project: | DODSON |
| Time Now: | 01Oct95 |
| Start: | 01Oct95 |
| Finish: | 01Mar2004 |
| Run: | 01Nov95 |
| Page: | 1 of 1 |

KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI
BLUE RIVER BASIN
DODSON INDUSTRIAL AREA

| Activity ID | Activity Desc. | Duration | Early Start | C1 | Early Finish | Total Float | Calendar | Progress Type | Progress Value |
|---|---|---|---|---|---|---|---|---|---|
| DOD.0316 | INITIATE PREP. OF DRAFT PCA | 0 | 01Jul97 | CIV.K.A | 01Jul97 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0318 | ESTABLISH TEAM MEET W/CITY | 10d | 02Jul97 | CIV.K.A | 16Jul97 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0320 | PREPARE DRAFT PCA | 45d | 17Jul97 | CIV.K.A | 18Sep97 | 286d | 5 DAY- W/ | Planned | 0 |
| DOD.0322 | DRAFT FINANCIAL PLAN (S) | 66d | 17Jul97 | CIV.K.B | 20Oct97 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0324 | REVIEW FINANCIAL PLAN | 22d | 21Oct97 | CIV.K.B | 20Nov97 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0326 | PREPARE FINANCIAL ANALYSIS | 55d | 21Nov97 | CIV.K.B | 11Feb98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0328 | REVIEW FINANCIAL ANALYSIS | 22d | 12Feb98 | CIV.K.B | 16Mar98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0329 | FINALIZE FINANCIAL ANALYSIS | 10d | 17Mar98 | CIV.K.B | 30Mar98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0330 | REVIEW DRAFT PCA (S) | 22d | 19Sep97 | CIV.K.A | 21Oct97 | 286d | 5 DAY- W/ | Planned | 0 |
| DOD.0332 | NEGOTIATE FINAL DRAFT PCA | 33d | 22Oct97 | CIV.K.A | 09Dec97 | 286d | 5 DAY- W/ | Planned | 0 |
| DOD.0334 | FINALIZE DRAFT PCA | 22d | 10Dec97 | CIV.K.A | 12Jan98 | 286d | 5 DAY- W/ | Planned | 0 |
| DOD.0336 | PCA-FIN. ANAL. IN-HOUSE REVIEW | 22d | 31Mar98 | CIV.K.A | 29Apr98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0338 | FINALIZE PCA AND FINANCIAL PLAN | 22d | 30Apr98 | CIV.K.A | 01Jun98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0342 | SUBMIT TO DIVISION | 0 | 02Jun98 | CIV.K.A | 02Jun98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0344 | DIVISION RVIEW PCA PACKAGE | 22d | 02Jun98 | CIV.K.A | 01Jul98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0346 | SUBMIT DRAFT PCA/FIN. PLAN TO HQ | 0 | 02Jul98 | CIV.K.A | 02Jul98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0348 | HQ REVIEW AND APPROVE DRAFT PCA | 90d | 02Jul98 | CIV.K.A | 09Nov98 | 233d | 5 DAY- W/ | Planned | 0 |
| DOD.0352 | PCA SUBMITTED TO ASA | 44d | 04Oct99 | CIV.K.A | 02Dec99 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0354 | PCA SIGNED | 5d | 03Dec99 | CIV.K.D | 09Dec99 | 0 | 5 DAY- W/ | Planned | 0 |

EXHIBIT 3 PAGE 1 of 2

| | |
|---|---|
| Project: | DODSON |
| Time Now: | 01Oct95 |
| Start: | 01Oct95 |
| Finish: | 01Mar2004 |
| Run: | 01Nov95 |
| Page: | 1 of 1 |

KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI
BLUE RIVER BASIN
DODSON INDUSTRIAL AREA

| Activity ID | Activity Desc. | Duration | Early Start | C1 | Early Finish | Total Float | Calendar | Progress Type | Progress Value |
|---|---|---|---|---|---|---|---|---|---|
| DOD.0300 | PREPARE ROW DRAWINGS | 33d | 11Feb99 | CIV.W.C | 29Mar99 | 183d | 5 DAY- W/ | Planned | 0 |
| DOD.0356 | SUBMIT ROW DRAWINGS TO KCMO | 5d | 10Dec99 | CIV.W.C | 16Dec99 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0360 | OBTAIN TITLE EVIDENCE (S) | 22d | 17Dec99 | CIV.W.C | 17Jan2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0370 | REVIEW TITLE EVIDENCE (S) | 10d | 18Jan2000 | CIV.W.C | 31Jan2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0380 | PREPARE MAPS AND LEGAL DESCRIPTION | 66d | 01Feb2000 | CIV.W.C | 02May2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0390 | REVIEW MAPS & LEGAL DESCRIPTIONS (S) | 22d | 03May2000 | CIV.W.C | 01Jun2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0392 | SUBMIT APPRAISERS FOR APPROVAL (S) | 22d | 17Dec99 | CIV.W.C | 17Jan2000 | 76d | 5 DAY- W/ | Planned | 0 |
| DOD.0395 | COE APPROVE APPRAISERS | 22d | 18Jan2000 | CIV.W.C | 16Feb2000 | 76d | 5 DAY- W/ | Planned | 0 |
| DOD.0400 | OBTAIN APPRAISALS (S) | 33d | 02Jun2000 | CIV.W.C | 18Jul2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0410 | REVIEW TRACT APPRAISALS | 22d | 19Jul2000 | CIV.W.C | 17Aug2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0420 | SUBMIT OFFERS TO OWNERS (S) | 22d | 18Aug2000 | CIV.W.C | 18Sep2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0430 | NEGOTIATE SETTLEMENTS (S) | 44d | 19Sep2000 | CIV.W.C | 17Nov2000 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0440 | PERFORM CLOSINGS (S) | 10d | 20Nov2000 | CIV.W.C | 01Dec2000 | 83d | 5 DAY- W/ | Planned | 0 |
| DOD.0450 | PREPARE CONDEMNATIONS (S) | 33d | 20Nov2000 | CIV.W.C | 03Jan2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0460 | REVIEW CONDEMNATIONS (S) | 10d | 04Jan2001 | CIV.W.C | 17Jan2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0470 | CONDEMNATION PROCEEDINGS (S) | 50d | 18Jan2001 | CIV.W.C | 28Mar2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0480 | OBTAIN POSSESSION (S) | 10d | 29Mar2001 | CIV.W.C | 11Apr2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0490 | RELOCATE BUSINESSES (S) | 44d | 12Apr2001 | CIV.W.C | 12Jun2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0500 | REAL ESTATE CERTIFICATE (S) | 10d | 13Jun2001 | CIV.W.C | 26Jun2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0510 | COE REAL ESTATE CERTIFICATION | 10d | 27Jun2001 | CIV.W.C | 10Jul2001 | 0 | 5 DAY- W/ | Planned | 0 |
| DOD.0520 | SUBMIT RE CREDIT REQUEST (S) | 18d | 11Jul2001 | CIV.W.C | 03Aug2001 | 659d | 5 DAY- W/ | Planned | 0 |

EXHIBIT 3 PAGE 2 of 2

# APPENDIX J

## WETLAND MITIGATION

# DODSON INDUSTRIAL DISTRICT
# BLUE RIVER BASIN

### DESCRIPTION OF EXISTING WETLAND

The wetland impacted by the proposed project is adjacent to the Dodson Industrial District which is located in the south-central portion of Kansas City, Missouri (See Engineering Appendix Plate 1). Intensive urban disturbance has occurred throughout the proposed project study area and the surrounding land. Being located approximately nine miles from the downtown business district, little of the natural environment remains. Much of the study area was originally forested floodplain and would have been considered "wetland" under the current definition utilized by Section 404 of the Clean Water Act. However, construction debris and other types of materials have been used through the years to raise the level of the floodplain and alter the drainage pattern to such an extent that most of the area does not qualify as "wetlands" using the current definition. There are approximately 6 to 7 acres of timbered wetlands remaining in the study area (Environmental Assessment Figure 1) of which 1.1 acres will be adversely impacted by the proposed levee project. It is cost prohibitive to realign the levee to avoid this wetland due to the intensive urban development that has occurred immediately adjacent to the wetland.

This mitigation plan has been coordinated with the U.S. Fish and Wildlife Service and the Missouri Department of Conservation and letters of coordination are attached.

#### Composition

There will be an unavoidable loss of 1.1 acres of forested wetlands as a result of the proposed project. Table 1 presents the results of a habitat analysis of the wetland using a Wildlife Habitat Appraisal Guide (WHAG) developed by the Missouri Department of Conservation and U.S. Soil Conservation Service. The WHAG analysis used the standard bottomland hardwood (upland) model and species list. Many of the listed species do not occur in this urbanized setting but are included for informational and comparison purposes.

#### Hydrology

The hydrology for the wetland is provided by both flooding from the Blue River and localized runoff from the adjacent urban development. The wetland is only temporarily inundated during large rainfall events. Inundation is of an extremely short duration as a result of the altered drainage pattern in this highly urbanized setting.

TABLE 1. WHAG Wetland Habitat Analysis

| Species | Total Habitat Units | Habitat Suitability Index (HSI) | Projected Animal Number |
|---|---|---|---|
| White-Tailed Deer | 0.4 | 0.44 | 0.0 |
| Wild Turkey | 0.0 | 0.10 | 0.0 |
| Pileated Woodpecker | 0.0 | 0.10 | 0.0 |
| Fox Squirrel | 0.5 | 0.52 | 0.5 |
| Dickcissel | 0.0 | 0.00 | 0.0 |
| Wood Thrush | 0.0 | 0.10 | 0.0 |
| Kentucky Warbler | 0.0 | 0.10 | 0.0 |
| Eastern Bluebird | 0.0 | 0.00 | 0.0 |
| Bobwhite Quail | 0.0 | 0.10 | 0.0 |
| Eastern Cottontail | 0.0 | 0.10 | 0.0 |
| Indigo Bunting | 0.0 | 0.10 | 0.0 |
| Ring-necked Pheasant | 0.0 | 0.00 | 0.0 |
| Ruffed Grouse | 0.0 | 0.10 | 0.0 |
| Prairie Chicken | 0.0 | 0.00 | 0.0 |

Vegetation

Most of the riparian trees have been removed from the area surrounding the forested wetland with only a few scattered large trees and several isolated stands of young trees still remaining. However, due to frequent inundation by the Blue River along with its surrounding steep slopes, the forested wetland has maintained much of its floodplain vegetation and has remained relatively undisturbed. This wetland contains a mixture of mature and pole size timber. Tree species found in the forested wetland area include boxelder, ash, elm, silver maple, willow and cottonwood with an occasional walnut, basswood, sycamore, and bur oak. Understory plant species include stinging nettle, jewelweed, rough-leaved dogwood, blackberry, elderberry, and multiflora rose.

Function

The wetland area provides terrestrial wildlife value and, due to its small size, limited water quality and flood storage benefits. A total of one habitat unit (white-tailed deer and fox squirrel) is provided by that part of the forested wetland to be lost as a result of the proposed project (see Table 1).

Wildlife species found in the wetland area are representative of both the wetland and upland habitat found in the general project area, and are those that are tolerant of extensive urban conditions. These include raccoon, opossum, fox and gray squirrels, cottontail rabbit, red fox, beaver, and an occasional white-tailed deer. Common bird species include blue jay,

cardinal, dove, robin, red-winged blackbird, grackle, starling, red-tailed hawk, kestrel, black-capped chickadee, junco, and various species of sparrows and warblers. Common reptile and amphibian species found in the area include black rat snakes, garter snakes, yellow-bellied racers, snapping turtles, and bullfrogs. No substantial fishery or aquatic wildlife value is provided by this wetland due to its topography and ephemeral nature.

## MITIGATION PLANNING OBJECTIVE

The planning objective for the proposed mitigation is to construct a seasonally flooded, self-sustaining forested wetland along the riparian corridor of the Blue River to replace lost habitat value resulting from the proposed levee project. The wetland is to be constructed to provide two additional habitat units. A two-to-one mitigation ratio was decided on to compensate for the difference in timber size class between the existing and the constructed forested wetland. The constructed wetland, in the future, will provide adequate wildlife habitat value to support the same wildlife populations that currently exist in the wetland area. The constructed wetland will also replace the limited water quality and flood storage benefits provided by the existing 1.1 acre wetland.

## MITIGATION ALTERNATIVES

Four alternatives were considered for the proposed mitigation: (1) levee realignment; (2) wetland construction in Reach 2 borrow area; (3) wetland construction in Reach 2 borrow area and ponding area; and, (4) wetland construction in Reach 2 and 3 borrow areas and Reach 2 ponding area. An initial investigation of the alternatives resulted in Alternative 2, wetland construction in Reach 2 borrow area, being the selected alternative for detailed consideration. A detailed feasibility cost estimate of wetland mitigation totals approximately $27,000, including tree and native grass plantings and establishment of a hydrologic connection to the Blue River. This cost, plus 20 percent contingency, for a total of $32,400, has been included in the Dodson total project cost. Alternative 1, levee realignment to avoid the wetland, was eliminated due to its excessive cost in comparison to wetland construction costs. A preliminary cost estimate indicated it would cost approximately $280,000 to realign the levee to avoid the 1.1 acres of forested wetlands. These costs include additional real estate and fill material, along with relocating a nearby sewer line. Alternatives 3 and 4 were eliminated because of their location landward of the levee and being isolated from the riparian corridor along the Blue River. Alternative 2, wetland construction in Reach 2 borrow area, was retained for further detailed analysis since it could meet the mitigation planning objectives.

No incremental analysis was performed on this mitigation proposal due to the extremely limited range of mitigation alternatives available in this highly urbanized setting, and the minimal number of habitat units impacted by the proposed levee project. Mitigation Alternatives 2, 3, and 4 are conceptually the same, differing only in their location on project lands. Alternative 3 or 4 could be acceptable for mitigation, if needed, but are far less desirable than Alternative 2 due to part of their location being isolated from the Blue River.

All three of these Alternatives can provide the necessary two habitat units desired for the mitigation and all have essentially the same cost per habitat unit.

## MITIGATION SITE

### Location

The proposed mitigation site is located in a proposed 4 acre borrow site within Reach 2 of the proposed Dodson Industrial District Levee at approximately Station Nos. 15+00 to 25+00, immediately adjacent to the impacted wetland at Station Nos. 27+00 to 30+00 (See Engineering Appendix Plate 4 and Environmental Assessment Figure 1). More specifically, the proposed mitigation site is located in the northwestern 1/4 of the northeast 1/4 of the southwest 1/4 of Section 22, Township 48 North, Range 33 West, Jackson County, Missouri.

### Existing Conditions

The existing use and condition of the proposed mitigation site is an upland old field with some woody invasion along its southern perimeter. This area has been an old field for at least the last thirty years and maintained by mowing. Most of the area has been planted in tall grass fescue. An existing sewer line in this area will be relocated by Kansas City, Missouri, and the area excavated for borrow material as part of the construction for the proposed levee project. No other utility easements, or encroachments, exist at the site which would physically conflict with the development of the site as a mitigation wetland. This borrow area will basically have no watershed, after levee construction, since it will be located on the high ground between the levee and the Blue River.

### Ownership

The land is privately held at this time but would be acquired in fee and permanently set aside as a wetland mitigation area. Restrictions on future use and maintenance of the site will be contained in the project operation and maintenance manual. The manual is prepared during construction of the project.

## MITIGATION PLAN DETAILS

Due to the extensive urban development that has occurred in the project area, mitigation opportunities are very limited. The proposed wetland mitigation site would be constructed by hydrologically connecting the 4-acre riverward borrow area in Reach 2 with the adjacent Blue River and selectively revegetating the site with appropriate wetland and upland plant species. A mitigation area larger than the impacted wetland is needed for the desired two-for-one mitigation ratio. The sides of the borrow area will have 3:1 slopes on the landward side and 2:1 slopes on the riverward side, due to constraints on the size of the borrow area. The bottom of the borrow area would be graded towards the inlet/outlet pipe to prevent/minimize fish entrapment in the mitigation wetland.

Hydrology

This mitigation wetland would be hydrologically connected to the river by installation of a pipe located at the upstream end of the borrow area. The pipe will be placed at an elevation (765 ft. N.G.V.D.) to allow inundation of the borrow area on the average at least once a year. No control structure will be placed on the pipe. If necessary, erosion control measures will be incorporated into the design of the inlet/outlet structure for the pipe.

Soil/Substrate

Based on soil borings, the borrow area will be excavated down to a layer of silty lean clay. A one foot layer of topsoil, obtained from the impacted wetlands, will be spread over the bottom of the borrow area to aid in the establishment of vegetation. This topsoil will contain a seed base along with the necessary organic matter and microorganisms to allow revegetation of the borrow area.

Vegetation

Initially the exposed slopes and bottom of the borrow area will be sown with yellow sweet clover, to provide initial stabilization of the soils, and a grass and forbs mixture for persistent vegetative cover until natural vegetation recolonizes the area. A seeding plan is attached (Attachment 1) with a list of appropriate alternate species. Soil analysis will be done to determine the need for fertilizer, and if needed the site will be fertilized prior to seeding. Approximately 300 trees will be planted in the bottom of the borrow area to aid in establishing desirable tree species in the borrow area. In addition, approximately 200 trees will be planted on the side slopes of the borrow area. Soft and hard mass species (Attachment 1) that are tolerant of inundation will be utilized to maximize value to wildlife species in the area. Bare-root seedlings will be planted on no less than a 10 ft x 10 ft spacing for the bottom of the borrow area and one every 20 ft on the side slopes.

Maintenance and Monitoring

Following construction of the mitigation site, as-built drawings will be provided by the contractor recording the final site contours and any other appropriate permanent features of the site. Annual monitoring reports providing information for three growing seasons after construction will be prepared by the project sponsor. Each report will contain the following information for any given date during June, July, or August for each of the three years:

a. Ten photographs depicting the condition of the site's vegetation.

b. A map recording the location and direction of each photograph.

c. An assessment of the percent of vegetative cover and tree survivorship.

d. An assessment of any potential problems relating to the mitigation site.

Success criteria for the mitigation site will include: 1) development of a jurisdictional wetland after three years; 2) observable evidence of wildlife use by a variety of species; and, 3) 95 percent vegetative cover and 50 percent tree survivorship after three growing seasons. In the event these criteria are not met by the end of the three year monitoring period, or if it is apparent early in the monitoring that this success cannot be achieved, appropriate corrective actions will be initiated to allow for the development of a self-sustaining forested wetland.

Local volunteers and citizen environmental groups will be contacted and their assistance sought for constructing, maintaining, and monitoring the mitigation site.

**Attachment 1**

A. Herbaceous seed mix will be planted at a overall rate of no less than 8 lbs. pure live seed (PLS)/acre and include the following species:

| | |
|---|---|
| Big bluestem | 20% |
| Prairie dropseed | 15% |
| Switchgrass (Kanlow) | 20% |
| Prairie cordgrass | 10% |
| Eastern gamagrass | 20% |
| Sedges | 10% |
| Forbs | 5% |

Except where specified, all species will be varieties adapted to a wet prairie situation. The seed source will be no farther away than 150 miles.

B. Bare-root seedling plantings will consist of the following:

| | |
|---|---|
| Northern Red Oak | 15% |
| Swamp White Oak | 15% |
| Pin Oak | 15% |
| Black Walnut | 15% |
| Hackberry | 10% |
| Green Ash | 10% |
| Red Mulberry | 10% |
| Box Elder | 10% |

# MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone: 314/751-4115
Missouri Relay Center 1-800-735-2966 (TDD)
JERRY J. PRESLEY, Director

May 13, 1994

Mr. Phil Rotert
Kansas City District, Corps of Engineers
700 Federal Bldg.
Kansas City, MO 64106

Re: Blue River/Dodson Industrial Park

Dear Mr. Rotert:

We appreciate the opportunity to provide comments on mitigation proposed by your agency to offset natural resource losses expected as a result of this project.

Generally we support the direction of your mitigation efforts; creating wetland at a 2:1 acreage ratio and planting the mitigation area to wetland tree species are appropriate considering timbered wetland will be lost. Although riparian corridor resources are not specifically discussed in your evaluation, current plans as we understand them are to move the proposed borrow area at least 100' feet from the Blue River, providing adequate protection to this resource. We do have additional minor, more specific comments which we will forward as soon as possible.

In summary, we support the general content of mitigation plans for the Dodson Blue River project. Questions may be directed to Kathy McGrath of my staff.

Sincerely,

Kathy McGrath

for DAN F. DICKNEITE
PLANNING DIVISION CHIEF

c: U. S. Fish and Wildlife Service (Haley)

COMMISSION

JERRY P. COMBS
Kennett

ANDY DALTON
Springfield

ANITA B. GORMAN
Kansas City

JOHN POWELL
Rolla

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas State Office
315 Houston, Suite E
Manhattan, Kansas 66502

May 9, 1994

Bob Ruf
Planning Branch
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, MO 64106-2896

Dear Mr. Ruf:

This is in reference to the draft wetland mitigation plan we received on April 13, 1994 for the Dodson Industrial District project. This plan includes many elements the Service had discussed earlier with your staff and we support the concept of the plan. However, there are some changes and clarifications which we believe are warranted to ensure adequate wetland mitigation occurs. The Missouri Department of Conservation (MDC) will also be providing specific comments to enhance the success of this wetland mitigation plan.

The plan notes that hydrology for the existing wetland comes from both flooding from the Blue River and runoff from surrounding areas. Due to the levee construction, the mitigation wetland would essentially only receive hydrology from the Blue River. To ensure adequate hydrology at the mitigation wetland, the inlet pipe from the river and the mitigation wetland bottom elevation should be lower than the existing wetland elevation. A close examination of the Blue River hydrograph and other available hydrology information should help determine a suitable elevation for wetland development.

Because of the variable annual hydrology at the site, plant species used should include those with a range of wetness tolerance. The species list proposed is good; however, we suggest adding pin oak. Furthermore, we suggest increasing the number of trees planted to a 10 x 10 foot spacing and possibly decreasing the tree survivorship to 50 %, to take into account natural revegetation.

The monitoring criteria should include the development of a jurisdictional wetland after three years. The Service would like to receive a copy of the annual monitoring report. A field inspection with the Corps, Service, and MDC should take place after three years to determine whether mitigation is successful or corrective actions needs to take place.

It is important that the contractors fully understand the requirements of the mitigation plan. We believe it is also necessary that they are aware of the importance of the adjacent areas and that they are to remain undisturbed. We recommend this adjacent riparian area be flagged to preclude any unforeseen damage during construction.

In conclusion, we believe this proposed mitigation plan is a good initial effort needing only a few changes. We would like an opportunity to comment on later drafts of the mitigation plan. We expect later drafts will include relevant maps and drawings.

If you have any questions or need clarifications contact me or Don Haley of my staff at (913) 539-3474.

Sincerely,

William H. Gill

William H. Gill

cc: MDC, Jefferson City, MO
(Attn: Kathy McGrath)

WHG/dh

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