



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

Finding of No Significant Impact

Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Study Kansas and Missouri

Project Summary

Under the authority of Section 216 of the 1970 Flood Control Act, the U.S. Army Corps of Engineers (Corps) at the request and with the cooperation of the project sponsors Elwood-Gladden Drainage District (right bank, Kansas), St. Joseph Airport Levee District (right bank, Missouri), and South St. Joseph Drainage District (left bank, Missouri), proposes to construct Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Project. The proposed project is located on opposite sides of the Missouri River in the St. Joseph, Missouri metropolitan area between River Miles 437 and 457. It involves a raise to the right bank levee unit using earthen material to an elevation sufficient to pass the one-hundred year flood event with 90 percent reliability and a corresponding raise to the left bank levee unit in specified areas to accommodate the slight rise in water surface elevations resulting from the initial right bank construction. The project purpose is to restore the reliability of the units to reduce damages from potential flooding on the Missouri River in the vicinity of St. Joseph, Missouri, and to allow the Federal Emergency Management Agency (FEMA) to re-certify the levees. The units are located within Buchanan County, Missouri and Doniphan County, Kansas and provide flood damage reduction benefits to the cities of St. Joseph, Missouri, and Elwood and Wathena, Kansas.

Alternatives

Five alternatives were considered; four build alternatives and the “No Action” alternative. These alternatives include: a raise to the right-bank levee unit using earthen material to an elevation sufficient to pass the one-hundred year flood event with 90 percent reliability, along with a corresponding raise to the left-bank levee unit in specific areas to accept the slight rise in water surface elevations resulting from the initial raise (Alternative 1 – 100-year event plus 3.0 feet of margin); a raise to the right-bank levee to an increased level of flood damage reduction (Alternative 2 - 500-year event plus 1.5 feet of margin), with a corresponding raise to the left-bank levee unit; a raise to the right-bank levee to a further increased level of flood damage reduction (Alternative 3 - 500-year event plus 3.0 feet of margin), with a corresponding raise to the left-bank levee unit; a raise to the right-bank levee only using earthen fill to the 100-year level of flood damage reduction with 75 percent reliability (Alternative 4 – 100 year-event plus 1.5 feet of margin) and; the “No Action” alternative.

1) Alternative 1 (100-year event plus 3.0 feet of margin). This alternative consists of raising the R471-460 from zero to 3.37 feet at specific points along its entire length, with

corresponding raises to L-455 as required to accept the slight rise in surface water elevations, to pass the one-hundred year flood event with 90 percent reliability.

2) Alternative 2 (500-year event plus 1.5 feet of margin). This alternative consists of raising the R471-460 an average of two feet along its entire length, with corresponding raises to L-455 as required to accept the slight rise in surface water elevations.

3) Alternative 3 (500-year event plus 3.0 feet of margin). This alternative consists of raising the R471-460 approximately three and one half feet along its entire length, with corresponding raises to L-455 as required to accept the slight rise in surface water elevations.

4) Alternative 4 (100-year event plus 1.5 feet of margin). This alternative consists of raising the R471-460 anywhere from zero to 1.2 feet at specific points along its entire length, with no raise to L-455, to pass the one-hundred year flood event with approximately 75 percent reliability.

All of the build alternatives will obtain borrow material from accreted lands riverward of the levee units. The borrow lands consist of 1,139 acres in Kansas between River Miles 454.9 to 451.9 and from River Miles 446.7 to 443.4. A smaller area in Missouri of 30.4 acres will be used between River Miles 442.6 to 442.9. The amount of borrow material needed depends upon the necessary levee height increase, and each alternative incorporates the same minimization measures to reduce and off-set impacts to area vegetation.

As each unit is raised, drainage structures would be affected. While some may require only a top platform raise at a lower raise, they may require a complete replacement with a higher raise due to added hydraulic and soil pressures. Extensions to underseepage berms and modifications to relief wells will be required. The scope of extensions and modifications is increased as the level of flood damage reduction is increased.

5) No Action Alternative. This represents the alternative of no action by the Federal government. It would not reduce existing flood damage potential. Additionally, this alternative does not provide a long-term solution for flood damage reduction, nor assurance that the levee will be re-certified by FEMA. If the levee remains de-certified, the economic impact of a flood event will be of considerable expense to the local communities in terms of flood insurance, flood damage, flood fighting, and flood related injuries.

Recommended Plan

The recommended plan is Alternative 1 and is described in detail in the Environmental Assessment. Of the five (5) alternatives considered, this plan is recommended because it will allow the system to pass the 1% chance (100-year) flood event with 92% reliability (greater than the minimum FEMA criteria); reduce economic hardship; allow modifications and improvements to local businesses; promote new investment; and allow FEMA to re-certify the right bank levee unit. Re-certification of the levee will prevent increases in flood insurance premiums; reduce sponsors' costs for flood fighting; and, allow mission essential upgrades to the Missouri Air National Guard Base from being jeopardized. Although this alternative impacts slightly more environmental resources over that of Alternative 4, it provides for greater economic development through recertification of

the levee. Further, this alternative avoids impacts to cultural resources and results in no significant adverse impacts to the human environment.

Summary of Environmental Impacts

For the construction of the preferred alternative approximately 7.0 acres of secondary trees (willow/cottonwood), 13.0 acres of shrubland, and 4.9 acres of wetlands (farmed) would be permanently impacted. The completed project will create habitat to offset losses as a result of the increased levee footprint (see “Mitigation Measures” below). Other environmental impacts include noise, minor increases in exhaust and fugitive dust, and localized disturbance to area wildlife from construction equipment and construction workers during the construction phase of the project. However, the impacts associated with construction of the project are short term, minor, and less than significant.

Mitigation Measures

The proposed project will avoid, minimize, and offset impacts to habitat with on-site mitigation. When obtaining borrow material, existing wetlands will be scraped and reshaped along their edges equal to or greater than those areas filled under the levee footprint to increase their functions and values, and ensure no net loss of wetland habitat. Borrow areas with secondary tree growth will be dug as deep as possible to minimize the amount of disturbance while leaving enough blanket material to ensure water retention. In addition, between borrow areas, undisturbed buffers of up to 500 feet will be maintained to keep existing habitat and provide diversity. Other borrow areas will be contoured with uneven bottom elevations and islands of habitat to increase habitat diversity. Grassland areas disturbed during levee reshaping will be re-seeded with native grass species to the extent practicable and mulched following construction. However, the Kansas City District requirements for seeding and mulching of levee embankments dictate the use of grass species (such as fescue, brome, and rye) that sprout quickly to limit erosion, that can be readily mowed in order to facilitate levee inspection to ensure levee stability, and that help prevent the burrowing of animals that could disrupt levee integrity. Best Management Practices will be used to prevent the introduction of fuel and chemicals from construction equipment into the surrounding area. Additionally, these measures will include operational limitations to reduce the loss of soils, petroleum products, or other deleterious material into the waterway and adjacent resources.

Public Availability

The proposed project was circulated to the public and resource agencies through Public Notice 200501489 (August 1, 2006), with a thirty-day comment period ending on August 31, 2006. The notice was published in area newspapers and mailed to adjacent landowners, state and federal resources agencies and other interested parties. In addition, the public notice was available for public agency review and comment on the Corps’ Kansas City District Regulatory Branch webpage (http://www.nwk.usace.army.mil/regulatory/public_notices.htm).

Conclusion

After evaluating the anticipated environmental, economic, and social effects of the proposed activity, it is my determination that construction of the proposed Missouri River

Levee System Units L-455 and R471-460 Flood Damage Reduction Study in Kansas and Missouri does not constitute a major Federal action that would significantly affect the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date: _____

Michael A. Rossi
Colonel, Corps of Engineers
District Engineer



Environmental Assessment Final

Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Saint Joseph, Missouri / Elwood, Kansas

September 2006

U.S. Army Corps of Engineers
Kansas City District
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KANSAS CITY DISTRICT, CORPS OF ENGINEERS
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EXECUTIVE SUMMARY

In accordance with the National Environmental Policy Act, the U.S. Army Corps of Engineers (Corps/USACE), Kansas City District has prepared an Environmental Assessment (EA), for the St. Joseph, Missouri and Elwood and Wathena, Kansas Flood Damage Reduction Study, Missouri River. This EA considers the environmental impacts of proposed alternatives identified to address whether one or more plans for increasing the level of flood damage reduction is technically viable, economically feasible, and environmentally acceptable, or if no action is warranted.

The St. Joseph levee units evaluated in this EA are L-455 and R471-460. These units collectively comprise the protective works that provide flood damage reduction for St. Joseph Metropolitan Area, Buchanan and Andrew Counties, Missouri and Elwood and Wathena, Doniphan County, Kansas.

The Corps' "Notice of Intent to prepare an Environmental Impact Statement (EIS)" was published in the Federal Register on November 20, 2003 (Appendix A). The Corps initial scoping workshops were conducted during the fall of 1995 and included meetings with local, state and Federal agencies, organizations and the general public. On 13 September 1995, the Corps held a public information workshop in St. Joseph, Missouri to provide public notification that a Federal study had been initiated, and to solicit information and views about water resource problems and potential solutions in the study area. Comments were solicited from the public at this meeting in which approximately 50 people attended. No substantial opposition or controversial comments were received as a result of the public scoping meeting.

On 19 March 1996, a meeting in St. Joseph was held with the potential sponsors from the levee districts and representatives of the cities of St. Joseph, Elwood, and Wathena to disseminate the results of the study and to solicit views concerning the study findings. As a result of this meeting, the local sponsors expressed an interest in proceeding to feasibility studies. On October 29, 2002, the Corps and the Federal Emergency Management Agency held a public meeting in Elwood, Kansas at the Elwood Community Center to explain to residents the increased risk of flooding in the area. A similar meeting was held on October 30, 2002 in Wathena, Kansas.

A draft EIS was prepared and provided to resource agencies for review as well as to Corps personnel for internal technical review. Based on comments received and after evaluating them the impacts were deemed not significant and readily mitigated. Therefore, the determination was made to revert to preparation of an Environmental Assessment (EA). Thus, the Corps is proceeding with this EA.

The five alternatives considered were: raise the right levee section using earthen material to the 1% chance (100-yr) flood event plus 3.0 feet margin, and a corresponding raise to the left levee section in specific areas to accept the slight rise in water surface elevations resulting from the initial raise (Alternative 1 - **Preferred**); raise the right bank levee unit to the elevation of the 0.2% chance (500-yr) event plus 1.5 feet of margin, with a corresponding raise to the left bank levee unit (Alternative 2); raise the right bank levee unit to a the elevation of the 0.2% chance (500-yr) event plus 3.0 feet of margin, with a corresponding raise to the left bank levee unit (Alternative 3), raise the right bank levee unit only using earthen fill to the 1% (100-yr) event level event plus 1.5 feet of margin (Alternative 4); and, a “No Action” Alternative. The Final EA represents a detailed study of the environmental impacts associated with each of the alternatives.

The draft EA and corresponding Feasibility Study were released to the public in a Public Notice (200501489) dated August 1, 2006 with a 30-day comment period ending on August 31, 2006. The Corps also held an additional public meeting on 28 August 2006 at the Elwood Community Center in Elwood, Kansas to bring the public up-to-date on the proposed project since it has been ten years since the last public meeting. For further information concerning the St. Joseph Levees Feasibility Study, the EA or public meetings, please contact Mr. Eric S. Lynn, Project Manager for the St. Joseph Levees Study at the above address or by telephone at 816-389-3258.

Environmental Assessment

Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
St. Joseph, Missouri / Elwood, Kansas

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2
3 **Missouri River Levee System**
4 **Units L-455 and R471-460**
5 **Flood Damage Reduction Study**
6 **St. Joseph, Missouri / Elwood, Kansas**

7
8 **1.0 Introduction**

9
10 **1.1 Project Location and History**

11
12 The City of St. Joseph, the county seat of Buchanan County, is located adjacent to the
13 Missouri River from river mile 445 to 452, in northwest Missouri. The Missouri River has
14 played an important role in the development and growth of the city serving as a major
15 transportation route before the arrival of railroads and the automobile. In the middle of the 19th
16 century, St. Joseph was on the western frontier and served as a point of departure for westbound
17 wagon trains and the Pony Express.

18
19 The Missouri River, one of the largest rivers in the United States, drains 424,300 square
20 miles above St. Joseph. The topography of the study area is generally represented by hills and
21 uplands, which rise from 100 feet to 200 feet above the Missouri River floodplain. The Missouri
22 River borders the eastern bluffs in the northern part of the city, and then crosses over to border
23 the western bluffs opposite the southern part of the city. Its floodplain is three to five miles wide
24 at Saint Joseph.

25
26 **1.2 Levee Unit Descriptions**

27
28 **1.2.1 Unit L-455**

29
30 The Missouri River Levee System (MRLS) Unit L-455 is a part of a Federal flood
31 damage reduction project. Its sponsor is the South St. Joseph Drainage and Levee District. This
32 unit is located on the left bank of the Missouri River in Buchanan County, Missouri. The levee
33 extends from the mouth of Whitehead Creek (Missouri River mile marker 447.3) ten miles
34 downstream to Contrary Creek (Missouri River mile marker 437.3) and provides flood damage
35 reduction for a flood prone area within the southwest section of the city of St. Joseph.

36
37 The levee was constructed in three phases. Phase I was completed by Grosshans &
38 Petersen, Inc., between March, 1962 and August, 1964. Phase II was begun in September 1963,
39 with work completed by December 1964. The final phase (Brown's Branch Pumping Plant) was
40 completed by the Luhr Construction Company in February, 1967. Some rehabilitation work on
41 the levee was completed in 1985; however, no project modifications have been made since then.
42 The levee sustained minor damage during the 1993 flood and the U.S. Army Corps of Engineers
43 (Corps) under the PL84-99 program repaired the damages.

45 Levee Unit L-455 was designed and constructed to provide flood damage reduction for a
46 flow of 325,000 cubic feet per second (cfs) with two feet of freeboard plus one foot for dynamic
47 effects such as super-elevation on the outside of bends. The levee freeboard was above the
48 constant flow backwater profile of the original design hydraulics and included 0.15 foot per mile
49 for the effect of a rising hydrograph. The protected area includes approximately 7,519 acres of
50 which about 5,100 are cropland. The remainder of the protected area includes a state highway,
51 several railroads; as well as industrial, residential, and recreational areas located in the southwest
52 sections of the city of St. Joseph.

53
54 The current design of Levee L-455, based on the Corps hydrologic and hydraulic
55 modeling, shows that the levee will pass the one percent event (100-year flood), under both
56 existing and future conditions. When taking into account an additional design profile
57 incorporating a three-foot margin (to ensure minimum 90 percent reliability), the model shows
58 that unit L-455 would continue to contain the flood event.

59 1.2.2 R471-460

60
61
62 Levee Unit R471-460 is also part of a Federal flood damage reduction project. Its
63 sponsors are the Elwood Gladden Drainage District (Kansas) and the St. Joseph Airport Levee
64 District (Missouri). This unit is located on the right bank of the Missouri River between river
65 miles 441.7 and 456.6, in eastern Doniphan County Kansas, and northwestern Buchanan County,
66 Missouri.

67
68 The unit was constructed by List and Clark Construction Company between June, 1966
69 and June, 1968. It was designed and constructed to provide flood damage reduction for a
70 maximum flow of 325,000 cubic feet per second (cfs) with two feet of freeboard plus one foot
71 for dynamic effects such as super-elevation on the outside of bends. The levee freeboard was
72 above the constant flow backwater profile of the original design hydraulics and included 0.15
73 foot per mile for the effect of a rising hydrograph. Some rehabilitation work was done in 1984.
74 The levee unit sustained damage from high floodwaters both prior to and after overtopping on
75 July 26, 1993. When it was overtopped, floodwaters eroded and breached the levee embankment
76 at two locations, causing extensive damage to the remaining levee before receding into the
77 channel on August 8, 1993.

78
79 Alternatives considered for repair of damaged areas ranged from no action (no repair) to
80 restoration of the damaged portion to its original pre-flood condition. The alternative that was
81 implemented included the repair of levee breaches and scour holes on the top, sides, and toe of
82 the levee. The protected area comprises 13,524 acres; 10,150 acres in Kansas including the town
83 of Elwood. The remaining 3,374 acres are in Missouri, including Rosecrans Memorial Airport
84 and a Missouri Air National Guard base.

85
86 The current design of Levee Unit R471-460, based on the Corps of Engineers' hydrologic
87 and hydraulic modeling, shows that the levee will pass the one percent event or the 100-year
88 flood, under both existing and future conditions. When taking into account an additional design
89 profile incorporating a three-foot margin construction, necessary to provide minimum 90 percent
90 reliability, the model shows that Levee Unit R471-460 would not contain the flood rise nor

91 provide additional flood damage reduction to specific locations along the levee. Based on the
92 modeling results, parts of Unit R471-460 would need to be raised by zero to as much as 3.37 feet
93 to provide similar damage reduction benefits.

94 **1.3 Purpose and Need**

95 **1.3.1 Background**

96
97
98
99 Flood of 1993 The flooding experienced in the St. Joseph area during 1993 was part of a
100 widespread pattern of flooding experienced throughout the lower Missouri River Basin. Above
101 average precipitation was recorded in the region from the fall of 1992 into the spring of 1993.
102 This caused saturated soil conditions and high stream flows in the lower Missouri River Basin by
103 the spring of 1993. A severe weather pattern with associated thunderstorms and heavy rains
104 followed in June and July 1993. The above average precipitation, saturated soil conditions, high
105 stream flows, and excessive runoff, were the primary cause of the flooding experienced in the St.
106 Joseph region in the summer of 1993.

107
108 At Missouri River Mile 448.2 near Elwood, the Missouri River was at or above flood
109 stage (17 feet) from June 26 to August 6, 1993 (43 days). On July 23, the entire town of Elwood,
110 Kansas was evacuated as a result of potential overtopping of the Missouri River Levee Unit
111 R471-460. On July 24 the levee was overtopped near the old Missouri River Channel, east of
112 Rosecrans Memorial Airport. On the Missouri side, the city of St. Joseph also began having
113 problems keeping floodwaters out of its water supply system and was forced to shut down the
114 system to prevent contamination. The water supply system is upstream of Levee Unit L-455 and
115 is not protected by the levee. On July 26, the Missouri River crested at 15 feet above flood stage
116 (32 feet) with a discharge of 335,000 cubic feet per second (cfs).

117
118 Elwood, Kansas, and the surrounding area were inundated with water up to 12 feet in
119 depth when Unit R471-460 was overtopped and breached. The entire Elwood business district
120 and an estimated 450 residences were flooded with an average of six feet of water. Urban
121 damages, which include residential, commercial, and industrial damages, were estimated at
122 \$92,305,000 for Elwood. Urban damages for the city of Wathena, Kansas, also within Levee
123 Unit R471-460, were estimated at \$5,188,000.

124
125 Other key facilities in the Elwood area that were flooded when Levee Unit R471-460 was
126 overtopped included the Rosecrans Memorial Airport and Missouri Air National Guard Base.
127 Damages to the Air Guard base were estimated at \$16,000,000 and damages to the airport were
128 estimated at over \$1,000,000.

129
130 The 1993 flood was considered a major flood in the Missouri River basin and caused
131 serious damage to public and private property throughout the basin. Short-term effects included
132 temporary loss of housing, loss of public utility service, transportation detours and delays, and
133 loss of business due to temporary closings. Long-term effects include negative economic
134 impacts to the region and nation.

136 This flood raised a concern that the levees may provide less than the level of flood
137 damage reduction for which they were designed. Section 216 of the 1970 Flood Control Act
138 provides continuing authority to examine completed Federal projects to determine whether the
139 projects are providing benefits as intended.

140 1.3.2 Purpose

141
142
143 Purpose: The purpose of the Missouri River Levee System Units L-455 and R471-460
144 Flood Damage Reduction Project in Kansas and Missouri is to reduce damages from potential
145 flooding on the Missouri River in the vicinity of St. Joseph, Missouri. The sponsor-preferred
146 purpose is to provide flood damage reduction equal to, or greater than, the one percent event with
147 90 percent reliability, under both the existing and future conditions, in order to provide for re-
148 certification of the right-bank levee by the Federal Emergency Management Agency (FEMA).

149 1.3.3 Need

150
151
152 Need: The need of the Missouri River Levee System Units L-455 and R471-460 Flood
153 Damage Reduction Project in Kansas and Missouri is to improve the adequacy and reliability of
154 the levee units to reduce damages from potential flooding on the Missouri River in the vicinity of
155 St. Joseph, Missouri. Also in December 1999, FEMA formally de-certified Unit R471-460
156 because it was determined that the levee would not pass the base flood. The de-certification
157 subjects the properties protected by this unit to higher insurance premiums under the National
158 Flood Insurance Program. The sponsor-preferred need is to allow passing of the one percent
159 flood event with 90 percent reliability under both existing and future conditions, and to allow
160 FEMA to re-certify the right-bank levee. If the right-bank levee remains de-certified, the
161 economic impact of a flood event will be of considerable expense to the local communities in
162 terms of flood insurance, flood damage, flood fighting, and flood related injuries.

163 1.4 Authority

164
165
166 This study is being conducted under the authority provided by Section 216 of the 1970
167 Flood Control Act. This act provides authority to reexamine completed civil works projects:

168
169 *Section 216. The Secretary of the Army, acting through the Chief of Engineers, is*
170 *authorized to review the operation of projects, the construction of which has been*
171 *completed and which were constructed by the Corps of Engineers in the interest of*
172 *navigation, flood control, water supply, and related purposes, when found advisable due*
173 *to the significantly changed physical or economic conditions, and to report thereon to*
174 *Congress with recommendations on the advisability of modifying structures or their*
175 *operation, and for improving the quality of the environment in the overall public interest.*

176
177 Section 216 provided continuing authority to examine completed Federal projects to
178 determine whether the projects are providing benefits as intended. The results of this
179 examination indicate that raising the level of flood damage reduction provided by the St. Joseph
180 levee unit system may be technically and economically feasible without unacceptable

181 environmental or social impacts. Accordingly, a Federal interest exists in designing and
182 constructing improvements because of the potential to benefit the National economy.

183 184 **1.5 Prior Studies**

185
186 The below studies and reports have been completed pertaining to the study area and
187 surrounding areas. These were used to gather information regarding the levee units and past
188 flood events:

- 189
- 190 • Missouri River Levees (Sioux City, Iowa to the Mouth) Definite Project Report,
191 March 1947.
- 192 • General Design Memorandum – Levee Unit L-455, September 1959.
- 193 • General Design Memorandum – Levee Unit R471-460, December 1965.
- 194 • Operations and Maintenance Manual, MRLS Unit L-455, 1969.
- 195 • Missouri River Flood Plain Pilot Study, St. Joseph to Kansas City, November
196 1977.
- 197 • Operation and Maintenance Manual, MRLS Unit R471-460, December 1986.
- 198 • Saint Joseph, Missouri December 1987 Reconnaissance Report.
- 199 • Project Information Report, Missouri River Levee System, South St. Joseph Unit,
200 Levee Unit L-455, October 1993.
- 201 • Project Information Report, Missouri River Levee System, Elwood-Gladden Unit,
202 Levee Unit R471-460, January 1994.
- 203 • Emergency Levee Repair, MRLS Unit R471-460, Doniphan County, Kansas and
204 Buchanan County, Missouri, Construction Plans and Specifications, February
205 1994.
- 206 • The Great Flood of 1993 Post-Flood Report, Lower Missouri River Basin,
207 September 1994.
- 208 • Missouri River Levee System Units L-455 and R461-471 Engineering and
209 Technical Appendices A-I, May 1996.
- 210 • Reconnaissance Report, MRLS Units L-455 and R-460-471, May 1996.
- 211

212 **1.6 Public Involvement/Scoping**

213
214 The Corps' initial scoping process was conducted during the fall of 1995 and early 1996
215 and included meetings with local, state and Federal agencies, organizations and the general
216 public. On 13 September 1995, the Corps held a public information workshop in St. Joseph,
217 Missouri to provide notification to the public that a Federal study had been initiated, and to
218 solicit information and views about water resource problems and potential solutions in the study
219 area. Comments were solicited from the public at this meeting in which approximately 50
220 people attended. No substantial opposition or controversial comments were received as a result
221 of the public scoping meeting.

222
223 On 19 March 1996, a meeting in St. Joseph was held with the potential sponsors from the
224 levee districts and representatives of the cities of St. Joseph, Elwood, and Wathena to
225 disseminate the results of the study and to solicit views concerning the study findings. As a
226 result of this meeting, the local sponsors expressed an interest in proceeding to feasibility studies.

227 On October 29, 2002, the Corps and FEMA held a public meeting in Elwood, Kansas at
228 the Elwood Community Center to explain to the residents the increased risk of flooding in the
229 area. A similar meeting was held on October 30, 2002 in Wathena, Kansas at the Wathena
230 Community Center.

231
232 The Corps, in accordance with NEPA, actively solicited input on the project in its Notice
233 of Intent (NOI) to prepare an Environmental Impact Statement (EIS) (Appendix A), which was
234 published in the Federal Register on November 20, 2003. No comments were received as a
235 result of the NOI from either government agencies or the general public. Based on receiving no
236 comments on the NOI and an Internal Technical Review, the decision was made that the impacts
237 of the proposed project were not significant and an EIS was not required. Therefore, the Corps
238 determined that it was only necessary to prepare an Environmental Assessment (EA).

239
240 On August 1, 2006, a description of the proposed project was circulated to the public and
241 resource agencies through Public Notice No. 200501489 issued jointly by the Corps and the
242 Missouri Department of Natural Resources, Water Pollution Control Program. The public notice
243 included a thirty-day comment period that ended on August 31, 2006 and provided instructions
244 for the public to provide comments on the proposed project. The public notice also included
245 information on the Corps preliminary determination to prepare a Finding of No Significant
246 Impact (FONSI) for the project and a draft Section 404(b)(1) Evaluation. The public notice was
247 mailed to adjacent landowners, individual, agencies, and businesses listed on the NWK-
248 Regulatory Branch's general mailing list; state of Missouri and Buchanan County mailing lists,
249 and the state of Kansas and Doniphan County mailing lists. A copy of the public notice and list
250 of recipients is found in Appendix G. An additional public meeting was held (August 28, 2006)
251 during preparation of the draft EA to update the public since the last meetings were held about
252 ten years ago. Comments received as a result of this meeting are included in Appendix C.

253
254 **1.7 Project Sponsors**

255
256 Sponsorship for the Missouri River Levee System Units L-455 and R471-460 Flood
257 Damage Reduction Study, Kansas and Missouri is provided by the Elwood-Gladden Drainage
258 District (right bank in Kansas), the St. Joseph Airport Levee District (right bank in Missouri),
259 and the South St. Joseph Drainage District (left bank).

260 **2.0 Alternatives**

261
262 The alternatives formulated for the two individual levee units were primarily based upon
263 the existing conditions of each levee unit, and the results of hydraulic, geotechnical, structural,
264 economic, and environmental analyses. Prior to, and throughout the scoping process, the Corps
265 has attempted to identify a comprehensive range of project alternatives, based upon the
266 aforementioned analyses.

267
268 **2.1 Alternatives Originally Studied but Removed from Further Consideration in this**
269 **EA**

270
271 2.1.1 Nonstructural

272
273 Nonstructural measures generally do not restrict or alter floodwaters; rather they involve
274 protection of structures within the flood plain through modification to withstand flooding with
275 minimal damage. Nonstructural measures may also include the regulation of existing uses and
276 future development within the flood plain so they are compatible with the flood hazard or
277 advance flood-warning systems. Examples of the nonstructural measures considered included:
278

- 279 • Floodproofing. This could involve various techniques such as: elevation of the
280 structure's windows and doors with water resistant materials or even the construction of
281 small ring levees or walls around flood susceptible structures. This measure is feasible
282 for a small number of existing structures but likely not for the St. Joseph metropolitan
283 area given the number and types of buildings and facilities located within the protected
284 area of R471-460. Additionally, this non-structural alternative would not restore FEMA
285 certification to the levee.
286
- 287 • Permanent evacuation, relocation, floodplain buyout. This would require the acquisition
288 of existing property and either relocation, demolition, or conversion to parks and
289 recreation, or agriculture, of the structures. This is feasible for a small number of existing
290 structures but likely not for the St. Joseph metropolitan area given the number and types
291 of buildings and facilities located within the protected area of R471-460. Additionally,
292 this non-structural alternative would not restore FEMA certification to the levee.
293
- 294 • Flood Warning System with Temporary Evacuation Plan. After the devastating 1984
295 flood, the city of St. Joseph installed a flood warning system on Blacksnake Creek and
296 Whitehead Creek. Increased consideration was given to developing a coordinated system
297 of precipitation stations, gages, and a computer network to interpret data from the other
298 tributaries; however, this has not yet been developed. This alternative would provide
299 study area businesses and residences with warning of a predicted flood. Additionally,
300 those having the capability to relocate would have the opportunity. Typically, a rain
301 and/or stream gage infrastructure is required to monitor hydrologic conditions in the
302 basin, and serve as a basis for providing early prediction and warning of impending high
303 water at pre-designed areas prone to flooding. A realistic and funded/resourced response
304 plan to be implemented by jurisdictional governing agencies is also a key requirement.

305 This measure as a stand-alone project would not be feasible for the St. Joseph area but
306 may be considered as an additional measure in conjunction with the preferred alternative.
307

- 308 • Flood plain regulation. Regulatory controls are imposed at the state and/or local level to
309 restrict the development of structures and the use of flood prone lands. St. Joseph, and
310 Andrew and Buchanan counties Missouri and Wathena and Doniphan counties, Kansas
311 participate in the National Flood Insurance Program, evaluating potential construction
312 and certifying compliance to appropriate regulations. However, existing structures are
313 still in need of protection and this alternative would not address those structures.
314
- 315 • River Level Changes. This measure may provide reduction of flood damages by limiting
316 or delaying excessive runoff, thereby reducing downstream flows and flood stages. A
317 flood damage reduction reservoir is designed to impede the flow of water when runoff is
318 high and release it gradually after the threat of flooding has passed. The closest dam that
319 could be operated for river level changes is 360 miles upstream. The complex Missouri
320 River system is unable to be managed to the necessary level to measure effects at a single
321 levee unit.
322

323 2.1.2 Structural 324

325 Typical structural measures reduce the frequency of damaging overflows by altering the
326 natural flow of the watercourse through one or more of the following considered measures:
327

- 328 • Channel Modifications. Diversion, channelization, or other hydraulic improvements are
329 designed to increase flow capacity. In general, hydraulic improvements decrease the
330 water surface elevation associated with a flood event, resulting in less overbank flow and
331 a reduced potential for flooding in adjacent areas. Typical improvements include
332 dredging, diversion, island clearing and removal, channel straightening, bridge
333 modifications, and concrete channel lining. The costs and impacts associated with
334 channel modifications are far beyond the scope of this study, and the environmental
335 impacts that would result are far greater than the preferred alternative; therefore, this
336 alternative was not considered for future study.
337
- 338 • Levee Setback/Realignment. Two options are available for possible realignment of Unit
339 R471-460. At approximately river mile 448 the levee moves closer to the river,
340 narrowing the floodway and creating a constriction, called by some a “pinch point”,
341 during high flow events. This constriction could be reduced by realignment of the levee
342 in this location, or the unit could be realigned further upstream to provide a wider
343 floodway upstream of the pinch point for increased floodplain storage during high flow
344 events.
345

346 Levee Setback 347

348 The narrow point in the levee alignment at approximately river mile 448 coincides with
349 the river bend immediately upstream of Unit L-455. Setting back Unit R471-460 at this location
350 would provide for a wider floodway during high flow events. This location also coincides with

351 the locations of an active Union Pacific railroad bridge and the double-span bridge carrying US
352 Highway 36. There is significant business development, including a large construction
353 company, located between the two bridges immediately inside the protected area. Both bridges
354 would likely require extensive modification and the existing businesses would have to be
355 relocated to achieve significant levee setback.
356

357 The Corps estimates that a levee setback in this location could lower the general water
358 surface profile in this vicinity up to half a foot; however, this is not enough to offset the
359 overtopping concern for the remainder of the unit. Bridge modification, real estate acquisition,
360 business demolition and relocation, and new levee construction would all contribute to a
361 significantly higher cost for this alternative comparative to other proposed alternatives.
362 Environmental benefits would be marginally enhanced by the creation of a short reach of new
363 riverside floodplain habitat relative to the currently existing resources in the area. The economic
364 benefits of the alternative would be negatively impacted by the loss of businesses in the area and
365 the increased cost. It is clear from preliminary analysis that the marginal hydraulic and
366 environmental benefits of a setback of the levee in the vicinity of river mile 448 would not offset
367 the significant adverse economic, engineering, transportation, and social impacts that would be
368 incurred to the project.
369

370 Levee Realignment in Upstream Portion of Unit R471-460 371

372 Upstream of the pinch point, consideration was given to methods to expand the floodway
373 to provide storage during high flow events. In this area, the levee could be realigned toward the
374 bluffs and existing levee alignment removed, providing increased floodplain volume and
375 connectivity to the river. Alternatively the old levee alignment could remain and allowed to
376 overtop and fail during high flows, providing some increment of additional storage during large
377 floods. In order to achieve certified flood damage reduction for the communities and facilities in
378 the study area, the new section of levee could be constructed north of Rosecrans Airport starting
379 near river mile 452 to connect the existing levee with the bluff to the west. Requirements and
380 anticipated impacts of this new levee are as follows:
381

- 382 • The existing levee cannot be removed without specific authorization from Congress.
383 Removal of the remaining existing levee section would likely be politically, and socially
384 unacceptable. The remaining existing levee section would likely still be maintained in
385 operation by the local entities and if maintained in accordance with the program, would
386 be eligible for flood disaster relief under the provision of Public Law 84-99. Future
387 claims for Federal assistance for flood fighting and damage restoration would likely
388 increase. With the existing levee section still in place, the incremental floodplain benefits
389 associated with a realignment of the Federal project in the north would be marginal.
390
- 391 • Formulating an alternative that allows for the overtopping and failure of an existing levee
392 does not meet the stated planning objectives of this study.
393
- 394 • Nearly three miles of new levee would need to be constructed, requiring significant real
395 estate acquisition, additional material borrow sites, new drainage structures, and possible

396 a road closure structure at the tie-in to the bluff. This feature would involve a significant
397 cost increase.

- 398
- 399 • There is no guarantee that real estate agreements would be easily reached with existing
400 land owners and condemnation may be necessary. Such negotiations, and additional
401 construction time, would likely cause a protracted time delay that would prolong the
402 exposure of residents to impacts and risk from the currently decertified levee.
403
- 404 • Approximately six miles of the existing levee downstream of river mile 452 would still
405 be subject to overtopping that would need to be addressed to restore FEMA certification.
406
- 407 • The introduction of a new levee section into an existing levee system will increase the
408 annual operation and maintenance costs.
409
- 410 • The new alignment would permanently remove some agricultural ground from
411 production due to construction and would allow significant additional acreage of
412 productive agricultural property to remain subject to impact from lesser floods. Some
413 existing benefits of the existing project would be lost by removing this property from the
414 certified area.
415
- 416 • The new alignment would cross the flight path in close proximity to the airport creating a
417 right-of-way encroachment and safety issue that likely would not be acceptable to the Air
418 Guard or the Federal Aviation Administration.
419
- 420 • No additional environmental benefits would be realized if the existing levee would stay
421 in place and the existing agricultural land would remain in production. To realize any
422 environmental benefits from realignment, the existing levee would have to be removed
423 entirely and the land reverting to a natural riparian state, which may require the
424 government to buy-out the existing agricultural property at considerable additional
425 expense to the project.
426
- 427 • Significant political and public protest likely would be encountered by any proposal to
428 remove property from the protected area or physically remove any existing section of
429 levee.
430
- 431 • Implementation of changes to existing levee alignment would require additional
432 Congressional authorization
433

434 A point-by-point consideration of the cost impacts to construct a new levee section,
435 including all aspects discussed herein, indicated that realignment options would likely be greater
436 than the cost of other alternatives proposed in the same area. Due to anticipated higher costs, a
437 potential decrease in existing project benefits, and serious concerns over the social impacts of the
438 proposal to the area communities, the levee realignment alternative was not carried forward for
439 additional analysis.

440
441

442 **2.2 Alternatives for further consideration in the EA**

443
444 2.2.1 Alternative 1 (**Preferred Alternative** - 100-year level plus 3.0 feet)

445
446 Existing levees can be modified to provide a higher level of flood damage reduction than
447 that which currently exists. In this instance, modification is accomplished by raising the existing
448 levee using earth fill. A substantial portion of Levee Unit R471-460 would be raised to a level
449 sufficient to pass the one percent (100-year) flood with a 90 percent level of reliability, allowing
450 for re-certification of the levee by FEMA. The anticipated right bank raise varies along the
451 levee's length from zero to 3.37 feet. Increases in levee height would result in corresponding
452 increases in levee toe width and seepage/stability berm width. Additionally, a raise to the right
453 bank levee would require minor raises (less than one foot) at specific locations along the left
454 bank levee to accommodate the increased rise in water surface elevation resulting from the initial
455 work. The engineering drawings in Appendix B of the feasibility report and plates at the end of
456 the feasibility report illustrate levee alignments, cross-sections, and area foot-prints.

457
458 Borrow areas currently identified for the proposed levee raise include riverward areas in
459 both Kansas and Missouri. For Kansas, the borrow areas consist of approximately 1,139 acres
460 located from river mile 454.9 to 451.9 and from river mile 446.7 to 443.4. For Missouri, the
461 borrow area consists of approximately 30.4 acres from river Mile 442.6 to 442.9. The feasibility
462 report color plates detail these areas.

463
464 The Preferred Mitigation Plan A variety of avoidance, minimization, and offset
465 measures will be implemented to reduce and off-set impacts to area habitat that results from
466 construction of the proposed project. These measures include:

- 467 • best management practices (BMP) with construction equipment to avoid engine fluids from
468 entering the area soils and waterways (ensuring grease and oil are cleaned off equipment
469 before entering the construction area, checking drain pan bolts to ensure tight fits,
470 ensuring other fluid containers are secure, etc.) ;
- 471 • BMP to prevent the transport of invasive species to and from the construction sites
472 equipment shall be sprayed of with high powered sprayers with hot water before entering
473 and when leaving the work sites);
- 474 • BMP to prevent the transport of invasive species to and from the construction sites from
475 footwear, other clothing, and sampling equipment used during monitoring shall be
476 enforced,
- 477 • BMP to minimize adverse water quality effects, such as erosion, through revegetation with
478 native grass species to the extent practicable and mulching as soon as practicable
479 following construction. However, the Kansas City District requirements for seeding and
480 mulching of levee embankments dictate the use of grass species (such as fescue, brome,
481 and rye) that sprout quickly to limit erosion, that can be readily mowed in order to
482 facilitate levee inspection to ensure levee stability, and that help prevent the burrowing of
483 animals that could disrupt levee integrity;
- 484 • planting a total of 7.0 acres of trees and 12.7 acres of shrubland vegetation immediately
485 following construction activities to help offset the impact from the removal of floodplain
486 habitat, increase water filtration, and minimize the long-term transport of sediment from
487 the site (list of species contained within the Mitigation Plan, Appendix J);

- 488 • avoiding “high value” species habitat by first using bare and/or cropland areas for borrow
489 material rather than forested or wetland areas;
- 490 • varying bottom depths of excavated borrow sites; creating islands within the borrow sites to
491 maximize diversity of habitat;
- 492 • spacing borrow areas apart from one another by approximately 500 feet to provide areas of
493 no disturbance and border habitat;
- 494 • avoiding any larger old growth trees (24-inches dbh, 50 feet or taller, 100 feet or closer to
495 the waters edge) to reduce impacts to area wildlife; and,
- 496 • restoring a total of 4.9 acres of wetlands through the scraping and reshaping of wetlands
497 equal to that which was lost (outside of the Elwood Bottoms area but within the other
498 project area borrow area);
- 499 • monitoring and adaptive management as required.

500

501 With the implementation of the above measures, impacts to species habitat will be
502 sufficiently offset and the net adverse effects will be insignificant; thus, no additional mitigation
503 is proposed. The following alternative mitigation plans were considered by the project team,
504 discussed with the various Resource Agencies, and not selected for the stated reasons.

505

506 Off-Site Mitigation Plan The Off-Site Mitigation Plan included a proposal to purchase
507 off-site lands for the creation of new wetlands and the establishment of terrestrial vegetation.
508 This plan would require planting 7.0 acres of trees and 12.7 acres of shrubs, creating 4.9 acres of
509 wetlands following construction activities, monitoring, and adaptive management as required to
510 ensure performance standards are met. This plan was not selected based on the cost needed to
511 purchase additional real estate, the cost associated with the excavation of the wetland areas, the
512 cost to seed and plant the wetland areas with appropriate vegetation, and the cost of increased
513 monitoring and maintenance to ensure success of the wetlands.

514

515 On-site Mitigation Plan with Upland Wetlands A second mitigation plan included the
516 planting of 7.0 acres of trees and 12.7 acres of shrubs with like species at the area of impact, and
517 included the use of larger sized individuals. This alternative also sought to create 7.4 acres of
518 wetlands in areas of bare upland habitat to provide diversity. Using upland areas for wetland
519 mitigation usually requires a higher mitigation ratio (1:1.5) based on the reduced likelihood that
520 the area will develop and provide the intended functions and values. Additionally, this
521 alternative would require the use of an artificial hydrology source to ensure adequate wetland
522 growth (e.g., pumps and culverts). This alternative was not selected because the cost of each
523 individual tree was substantially higher than the cost of the individual trees in the preferred
524 mitigation plan, the trees would not have provided diversity nor mast to the benefit of resident
525 wildlife, and the placement of trees did not seek to diversify overall area habitat by planting in
526 bare areas or in areas containing invasive species, such as reed canary grass. The use of culverts
527 and pumps needed to provide the necessary hydrology to the wetlands was deemed un-natural
528 and would have resulted in substantial costs to construct, operate, and maintain. The newly
529 constructed wetlands would have required planting with appropriate vegetation as no seed bank
530 would have been available, the upland mitigation required a higher mitigation ratio, and the
531 upland sites would require additional monitoring to ensure success. This alternative resulted in
532 substantially higher costs with a decreased chance of success.

533

534 No-Action Mitigation Plan This plan would not require any mitigation to off-set
535 impacts. No trees, shrubs, or wetlands would have been replanted nor enhanced. This plan
536 would have ignored the intent of the Environmental Operating Principles, the December 24,
537 2002, Regulatory Guidance Letter on Compensatory Mitigation, the recommendations of the US
538 Fish and Wildlife Service, the recommendations of Kansas and Missouri state resource agencies,
539 and professional judgment. Additionally, this plan likely would have required formal
540 consultation under the Endangered Species Act, which could have resulted in higher overall
541 mitigation ratios and costs. Thus, this plan was not selected.

542
543 Based on the types of habitats impacted, the belief that the off-set habitat would
544 regenerate on its own with existing seed banks, the reduced costs in combining wetland off-set
545 with borrow construction, the ability to replace impacted trees with higher value species at a
546 lower individual cost, the physical placement of trees to diversify area habitat, and through
547 coordination with the resource agencies, and professional judgment, the preferred mitigation plan
548 is the least costly alternative and was therefore selected. The preferred mitigation plan consists
549 of planting 7.0 acres of trees and 12.7 acres of shrubs, restoring 4.9 acres of wetlands concurrent
550 with borrow excavation, monitoring, and adaptively managing as required to ensure performance
551 standards are met. The Mitigation Plan is described in more detail in Appendix J to this
552 Environmental Assessment.

553
554 Under the Corps' Missouri River Fish & Wildlife Mitigation Program land is purchased
555 from willing sellers throughout the Missouri River corridor to implement habitat restoration
556 efforts. Land has recently been purchased in the St. Joseph Study Area for inclusion in this
557 program and additional land purchases are being negotiated. The planning and design of projects
558 under this program are separate from the efforts and recommendations of this feasibility study.
559 However, any proposed project under this program authority will complement the proposed
560 mitigation recommendations in this report and will be coordinated during project
561 implementation.

562
563 The Corps of Engineers Missouri River Enhancement Program (Section 514) is
564 designing a project at Lake Contrary for restoration of the lake and its surrounding wetland and
565 riparian habitat. This project is separate from the efforts and recommendations of this feasibility
566 study; however, any proposed project under this program authority is expected to complement
567 these recommendations and will be coordinated during project implementation.

568 569 2.2.2 Alternative 2 (500-year level plus 1.5 feet)

570
571 Comparative economic and cost factors will be applied to the one-percent flood level
572 analysis to estimate the benefits and costs of raising the level of flood damage reduction. Points
573 of interest will include the level of the 1993 Missouri River flood event and the 0.2 percent (500-
574 year) flood event. These additional data points will be used to develop the cost-benefit curve and
575 show how the preferred alternative compares to the National Economic Development (NED)
576 plan. In the interest of time and sponsor funding, detailed engineering analysis of these
577 additional points will be kept to a minimum.

578
579
580

581 2.2.3 Alternative 3 (500-year level plus 3.0 feet)

582
583 Comparative economic and cost factors will again be applied to the one-percent flood
584 level analysis to estimate the benefits and costs of raising the level of flood damage reduction to
585 this increased level. Points of interest will include the level of the 1993 Missouri River flood
586 event and the 0.2 percent (500-year) flood event. These additional data points also will be used
587 to develop the cost-benefit curve and show how the preferred alternative compares to the NED
588 plan. In the interest of time and sponsor funding, detailed engineering analysis of these
589 additional points will be kept to a minimum.

590
591 2.2.4 Alternative 4 (100-year level plus 1.5 feet)

592
593 The existing right-bank levee would be modified to provide a higher level of flood
594 damage reduction. Modification is done by raising the existing levee using earth fill. The right
595 levee unit would be raised to a level sufficient to pass the one percent (100-year) flood with a 75
596 percent level of reliability. This raise would not allow for re-certification of the right bank levee
597 by the Federal Emergency Management Agency (FEMA). The anticipated right bank raise
598 would vary along its length from zero to 1.2 feet and would not require a raise to the left-bank
599 levee. Increases in levee height would result in corresponding increases in levee toe width and
600 seepage/stability berm width and were determined to be approximately 16 percent less than that
601 of the preferred alternative.

602
603 Borrow areas identified for the above alternatives are the same areas identified in
604 Alternative 1. Also, the same avoidance, minimization, and offset measures as identified in
605 Alternative 1 would be implemented for each build alternative to reduce impacts to habitat that
606 would result from construction.

607
608 As each unit is raised, drainage structures would be affected. While some may require
609 only a top platform raise at a lower levee raise, they may require a complete replacement with a
610 higher levee raise due to additional hydraulic and soil pressures.

611
612 **Underseepage Berms**

613
614 An underseepage berm consists of a continuous strip of soil placed on the ground
615 adjacent to the landside of the levee. Its purpose is to counteract the hydraulic pressures that will
616 force water to seep underneath the levee during a high flow event and surface on the landside.
617 The height of the raise to Unit R471-460 will cause these hydraulic pressures to increase and
618 thus requires extension of the existing berms within area that will be subjected to a height
619 increase.

620
621 The minimal height raise proposed for L-455 in Alternative 1 (100+3) will not
622 significantly alter the hydraulic pressures encountered during a high flow event and does not
623 require an extension of the existing berm. Under seepage problems were not observed during the
624 1993 flood, so the existing berms are considered to adequate. However, despite their observed
625 successful performance during a significant flood event, the widths of the berms are not in
626 accordance with current berm construction criteria now in use by the Corps. Therefore, it is

627 proposed that in the area subject to raise in Unit L-455 for Alternative 1, the underseepage berms
628 will be extended as needed to comply with current construction criteria. Berms in other areas of
629 the unit, where the levee is not being disturbed, will remain as is based on their past
630 performance. For the 500-year event raise alternatives, significant raises are proposed and
631 underseepage berm extensions would be required relative to the increase in height.

632

633 **R471-460 Relief Wells**

634

635 The intended purpose of the wells is to relieve excessive uplift pressure during high river
636 levels at the toe of the levee where the impervious blanket is thin and variable. The twenty
637 original pressure relief wells located between levee stations 292+00 and 327+00 are 8-inch
638 diameter assembled wood stave screens and risers wrapped with stainless steel wire. Current day
639 pressure relief well construction materials no longer include wood assemblies and have been
640 replaced with the more reliable and durable steel riser and screen assemblies. Wood stave well
641 assemblies cannot withstand aggressive pressure relief well testing, development, and treatments.
642 The pressure relief wells were installed in 1967, and all indications are that individual well
643 efficiencies have decreased requiring development and treatment of the wood stave well
644 assemblies. Throughout the pressure relief well field there will be a 2.5 feet minimum increase
645 in differential hydrostatic head across the levee attributed to the top of levee raise. This will
646 provide additional stress to the pressure relief well field with well assemblies of uncertain
647 structural integrity.

648

649 **L-455 Relief Wells**

650

651 The existing relief well field is located upstream of the area of the proposed Alternative 1
652 (100+3) raise and will not be affected by this alternative. Due to the limited raise necessary for
653 the 100+3 raise alternative, installation of new relief wells in the project area is not necessary.
654 Implementation of Alternative 2 (500+1.5) or Alternative 3 (500+3) will affect a greater length
655 of levee and cause higher underseepage pressures.

656

657 2.2.5 No Action.

658

659 Levee units R471-460 and L-455 would remain in their current condition. This measure
660 would not reduce existing flood damage potential. Additionally, this measure does not provide a
661 long-term solution for flood damage reduction, nor assurance that the levee will be re-certified
662 by FEMA. If the levee remains de-certified, the economic impact of a flood will be of
663 considerably expense to the local communities in terms of increased flood insurance premiums,
664 flood damage, flood fighting, and flood related injuries.

665

666 Additionally, if the project is not authorized to restore certification to the right bank,
667 FEMA will eventually enact a major zoning change that will greatly increase flood insurance
668 costs and requirements and greatly degrade the economic health of the area. Currently, mission
669 essential upgrades to the Missouri Air National Guard Base at the airport are being jeopardized
670 by the status of the levee. Some increases in investment are likely to take place including the
671 expansion of the Air National Guard Base, but at much greater cost to the users. If the project is
672 not implemented by the federal government, then the local sponsors will be faced with the

673 significant financial burden of trying to implement the project themselves; or they will have to
674 rely on flood-fighting to protect the investments in the area from future floods.
675

676 **3. Affected Environment**

677

678 **3.1 Physical-Chemical Environment**

679

680 3.1.1 Geology, Minerals and Soils

681

682 The project area is predominantly an alluvial flood plain underlain by bedrock of the
683 Pennsylvanian System, Kansas City Group. Pennsylvania strata generally consist of inter-
684 bedded sandstone, shale, limestone, clay, and coal. Limestone is the most abundant resource
685 present and it is mined for materials primarily used for road and highway construction.

686

687 In addition to limestone, sand and gravel are locally important mineral resources. The
688 historic production of these resources is from flood plain and in-channel deposits of major
689 streams. Crushed limestone has replaced stream gravels as the predominant coarse aggregate in
690 cement. Upland terrace and glacial deposits are important sources of sand and gravel in the
691 southeastern and northwestern portions of Missouri.

692

693 Soils within the project area have primarily developed as a result of the wind-borne
694 deposition of fine-grained material (loess) and the deposition of material on land by streams
695 (alluvium). Loess deposits are visible on the exposed valley walls adjacent to the Missouri
696 River. Missouri River floodplain soils belong to the Haynie-Urban Land-Leta association. Soils
697 of the upland, loess hills are of the Knox-Judson-McPaul and the Marshall-Ladoga-Gara
698 associations. The soil associations generally consist of deep, nearly level, well drained to
699 somewhat poorly drained soils comprised of river-deposited sand, silt, and clay.

700

701 The flood plain or bottoms area is three to five miles wide in the St. Joseph study area
702 and is characterized by low-lying, nearly level terrain. The uplands are composed of steep to
703 moderately sloping hills composed of loess or loamy soils. Buchanan County and Doniphan
704 County consist of several soils types, which are either hydric, prime farmland, or both.

705

706 3.1.2 Water Quality

707

708 In accordance with the Clean Water Act, individual states are responsible for adopting
709 water quality standards for their jurisdictions. Water quality standards are used to establish
710 water quality criteria to protect and maintain the identified designated uses of water resources.
711 Section 305(b) of the Clean Water Act requires states to produce "Water Quality Inventories"
712 that assess progress in achieving water quality objectives.

713

714 Water quality impacts to the Missouri River originate from point and nonpoint sources of
715 pollution. Point sources enter the river from discrete water conveyance systems (e.g., pipes,
716 culverts, trenches). Point sources include discharges from Publicly Owned Treatment Works
717 such as sewage treatment plants, and industrial facilities. Nonpoint sources enter the river in
718 overland runoff or subsurface percolation, and can originate from land use activities associated
719 with agriculture, mining, urban areas, and other sources.

720

721 Section 303(d) of the CWA requires that each state identify waters that are not meeting
722 water quality standards and for which adequate water pollution controls have not been required.

723 The Missouri River segment within the vicinity of the project area is currently 303(d) listed as
724 “impaired” due to excess levels of chlordane and polychlorinated biphenyls (PCBs).

725
726 Water quality of the Missouri River tributaries in St. Joseph has been severely impacted
727 by urban development. Significant segments of five out of the seven tributaries in the study area
728 have been placed underground in conduits and are used as a combined sanitary/storm water
729 sewer system. The remaining two tributaries, Roy’s Branch and Contrary Creek, drain relatively
730 undeveloped areas. The Missouri River near St. Joseph is classified as “Class P - permanent
731 flow general warm water fishery resource.” A general warm water resource provides protection
732 to both game and non-game fish occurring in the area. The river provides a water source for
733 irrigation, livestock/wildlife watering, aquatic life protection, boating, drinking water supply, and
734 industrial withdrawal.

735 3.1.3 Air Quality

736
737
738 In accordance with the Clean Air Act, the US Environmental Protection Agency (EPA)
739 set National Ambient Air Quality Standards for pollutants considered harmful to the environment
740 and public health. The six principal pollutants, also known as “criteria” pollutants are: ozone,
741 lead, inhalable particles, carbon monoxide, nitrogen dioxide, and sulfur dioxide.

742
743 Both the states of Missouri and Kansas air quality generally meet the EPA’s accepted
744 levels of criteria pollutants. Fluctuations in air quality constituents are not uncommon; however,
745 St. Joseph consistently experiences generally good air quality throughout the metropolitan area
746 and is in attainment with the air quality standards.

747 3.1.4 Noise

748
749
750 Sound is the sensation produced in the hearing organs when waves are created in the
751 surrounding air by the vibration of some material body. Noise is defined as unwanted sound or
752 sound in the wrong place at the wrong time. A sound-level meter is the basic instrument of noise
753 measurement and the outputs are provided in the form of decibels. Table 3-1 provides noise
754 levels common to our everyday activities.

755
756 Existing sound levels throughout the St. Joseph metropolitan area are highly variable
757 depending on location. Sound levels range from relatively loud noises associated with urban and
758 industrial activities to very quiet rural environments. Noise sources include agricultural and
759 industrial activities, traffic on roads, aircraft over-flights, and natural sounds such as wind
760 through trees and water falling over rocks. It is highly unlikely that noise standards in the St.
761 Joseph metropolitan area would be exceeded under existing conditions. In portions of the
762 metropolitan area, especially near industrial areas, sound levels could occasionally exceed noise
763 standards under certain conditions.

764
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770

Table 3-1. Common Noise Levels

Common Noise Levels	Noise Levels in Decibels (dB)
Rock Band at 16 Feet	110
Jet Flyover at 985 Feet	105
Gas Lawn Mower at 3 Feet	95
Diesel Truck at 50 Feet	85
Normal Speech at 3 Feet	65
Average Residence	35
Leaves Rustling	15
Threshold of Hearing	0

771
772
773
774
775
776

Ambient noise levels are generally dependent upon the level of urban development and associated activities conducted within a given area. Land use within the project area is dominated by agricultural land, residential, commercial, and industrial uses. Sensitive noise receptors include residences, schools, hospitals, wildlife, and others.

777
778

3.1.5 Visual Quality

779
780
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784

The project area contains features attributable to both low to moderate and high aesthetic value. The majority of the landscape is dominated by agriculture adjacent to the existing levee system. Areas containing established communities are located near industrial development. The project area contains floodplain forest, wetlands, open vistas, and bluffs, which provides natural diversity to the river corridor landscape. Cropland and grassland is established in portions of the rivers' floodplain.

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Existing levees and flood damage reduction mechanisms that have been installed to prevent bank or levee erosion interrupt the natural character of the river system. However, flood damage reduction features have been in-place for many years and in many instances, blend into the river-view and adjacent development. Armoring with rock rip-rap is an example of introducing materials that do not naturally occur within the river corridor and may be considered aesthetically displeasing to that portion of the population that utilize the rivers for recreation. The contrast of rip-rap and other flood damage reduction features within the river corridor has become less evident over time with the process of weathering and the establishment of vegetation.

795
796
797

3.1.6 Hazardous Waste Management

798
799

The Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984, sets the requirements for reduction, control,

800 management, and disposal of solid and hazardous waste. Solid waste management and disposal,
801 including mixed municipal solid waste landfills, industrial, and special waste landfills, ash
802 landfills, and construction and demolition material landfills, is regulated by the states of Missouri
803 and Kansas. Management of industrial wastewater, with its associated solid waste, may be
804 managed through National Pollutant Discharge Elimination System permits or state approved
805 permits.
806

807 Past contamination from releases of hazardous materials and waste is being addressed
808 through the Comprehensive Environmental Response, Comprehensive Environmental Response,
809 Compensation, and Liability Act, commonly known as “Superfund” and enacted by Congress in
810 1980. This law created a tax on the chemical and petroleum industries and provided broad
811 Federal authority to respond directly to releases or threatened releases of hazardous substances
812 that may endanger public health or the environment. Revenues collected went to a trust fund for
813 cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA established prohibitions
814 and requirements concerning closed and abandoned hazardous waste sites; provided for liability
815 of persons responsible for releases of hazardous wastes at these sites, and established a trust fund
816 to provide for cleanup when no responsible party could be identified.
817

818 Before the feasibility study phase of this project, a complete reconnaissance report that
819 included Hazardous, Toxic, and Radiological Waste (HTRW) evaluation was preformed in May
820 1996 by HDR Engineering, Inc. This was preformed to re-examine the levee areas and further
821 investigate several areas outlined in the Feasibility Study Scope of Work. A site visit was
822 conducted on August 12, 1999 during which a local member of the levee board was questioned
823 about the sites in the feasibility study scope of work. On levee R-460-471, the only potential
824 HTRW concern is at the Herzog Hot Mix Plant north of Highway 36. Stockpiles of what appears
825 to be recycled asphalt are in contact with the landside toe of the levee. On levee L-455, three
826 potential HTRW concerns were identified. One is the proximity of underground gas pipelines
827 near station 55+00 to station 85+00. The second concern is industrial sewage pipes crossing the
828 west side of the levee along Brown’s Branch Creek. The third concern is sediment ponds near
829 station 110+00. Although the ponds are within 500 feet of the levee centerline, they are at least
830 100 feet from the toe of the levee. This distance makes it unlikely that they would be disturbed
831 for a levee raise of five feet or less, but the existence of the ponds will be considered during
832 design.
833

834 All sites mentioned in the feasibility study scope of work were eliminated as items of
835 concern. No additional information concerning HTRW was obtained during the interview with
836 the levee board member, a site visit, and a thorough database search. A complete summary of
837 each potential site and how they were addressed is included in the HTRW Appendix of the
838 feasibility report.
839

840 **3.2 Biological Environment**

841 **3.2.1 Vegetation**

842 Three vegetation types generally dominate the project area: floodplain forest (*Populus-*
843 *Salix*), oak-hickory-maple forest (*Quercus-Carya-Acer*), and openings of bluestem prairie
844
845

846 (*Andropogon-Panicum-Sorghastrum*). Although the project area's floodplains have been largely
847 cleared for development, there are bands of riparian forest habitat located riverward of the levee
848 units. Predominant tree species found in these riparian bands include eastern cottonwood,
849 willows, box elder, green ash, silver maple, and American sycamore. The understory includes
850 reproduction of these species, plus some redbud, dogwood, black cherry, and various shrubs.
851 The ground layer in the riparian bands varies from sparse to dense vegetation and contains
852 primarily poison ivy, Virginia creeper, honeysuckle, greenbrier, and gooseberry, and various
853 other species.

854
855 Remnants of the oak-hickory-maple upland forest vegetation type are present on the steep
856 hillsides adjacent to the Missouri River floodplains. In addition to sugar maple, white and black
857 oak, and hickories for which this upland vegetation type is named; other hardwood species
858 present include American sycamore, beech, black walnut, bur and chinkapin oak, hackberry,
859 American and slippery elm, hawthorn, honeylocust, redbud, and dogwood. The understory
860 consists of regeneration of the above species and the ground layer includes: violets, poison ivy,
861 Virginia creeper, greenbrier, and honeysuckle and other species.

862
863 Most of the vegetation in the study area has been greatly impacted by urban development.
864 In general, the upper reaches of the tributaries draining the area are located in the more
865 established residential neighborhoods and the lower reaches are located in the intensively
866 developed business district and croplands. The banks along Roy's Branch, Contrary Creek, and
867 limited areas along the upper reaches of the other tributaries contain tracts of riparian timber. A
868 mix of sycamore, cottonwood, maple, oak, and hickory dominates these areas. Other areas along
869 the upper reaches of the tributaries are in residential development, parkland, or various stages of
870 successional recovery.

871 872 3.2.2 Wildlife

873
874 Mammals associated with the remaining wooded riparian habitat include the white-tailed
875 deer, eastern cottontails, and red and gray squirrels. Aquatic and terrestrial furbearers are
876 important parts of the ecosystem, and those present in the area include the beaver, mink, and
877 muskrat (dependent on the aquatic habitat) and opossum, coyote, raccoon, and striped skunk
878 (dependent on terrestrial habitat). However, small mammals, such as mice, voles, rats, and bats
879 account for the majority of the species present. The white-tailed deer is the only naturally
880 occurring large mammal still common in developed urban areas. Eastern wild turkeys are
881 present in the open, less developed floodplain areas.

882
883 The avifauna of the study area includes permanent residents, summer residents,
884 transients, and winter residents. The project area provides year-round habitat for approximately
885 31 bird species, with another 67 species using the project area for nesting and another 14 species
886 only as winter residents. Over 110 species use the corridor over the study area for fall migration.
887 Summer resident species associated with aquatic habitats include waterfowl, wading birds, and
888 selected passerines. Summer waterfowl are dominated by wood ducks which nest in wooded
889 bottomlands and rear their young in nearby aquatic habitats. Nesting by other waterfowl,
890 primarily mallards, is minor. Wading birds, such as the great blue heron and green heron, utilize
891 shallow areas as foraging habitat.

892 Waterfowl and shorebirds dominate transient species associated with aquatic habitats.
893 The most numerous and impressive migration is that of the snow goose, particularly in the
894 spring. Other migrating species include the Canada goose, mallard, and pintail.

895
896 Common amphibians found in the study area include the American toad, Rocky
897 Mountain toad, Blanchard's cricket frog, Cope's gray treefrog, Great Plains toad, Woodhouse's
898 toad, northern cricket frog, eastern gray treefrog, boreal chorus frog, western chorus frog,
899 smallmouth salamander, plains spadefoot toad, plains leopard frog, bullfrog, and Great Plains
900 narrowmouth toad. Common reptiles that may be found in the study area include the snapping
901 turtle, painted turtle, false map turtle, ornate box turtle, slider, smooth and spiny soft-shelled
902 turtles, five-lined skink, Great Plains skink, northern prairie skink, six-lined racerunner, western
903 worm snake, ringneck snake, eastern hognose snake, racer, rat snake, prairie kingsnake, red
904 milksnake, gophersnake, northern water snake, brown snake, western ribbon snake, common
905 garter snake, copperhead, and timber rattlesnake. The northern leopard frog and western fox
906 snake also may be present in the study area (Collins 1993).

907
908 3.2.3 Aquatic Ecosystem (including fisheries and wetlands)

909
910 Missouri River fish populations have been greatly affected by channel alterations in the
911 project area. Most indigenous fish species still remain, but have suffered serious population
912 declines. The rivers' fishery is characterized by species typical of large, turbid rivers. These
913 species include the dominant game fish species such as the smallmouth, buffalo, common carp,
914 river carpsucker, shortnose gar, and channel catfish. Gizzard shad is the dominant forage
915 species. Other game species present are the flathead and blue catfish, white crappie, freshwater
916 drum, longnose gar, green sunfish, and bluegill. Other forage and nongame species present
917 include various minnows and shiners.

918
919 Numerous wetlands exist within the project area as small pockets, old meander scars, and
920 within the riparian strips. An old oxbow of the Missouri River (French Bottoms) was cut off
921 when the river changed its course during the flood of 1952. Remnants of the oxbow remain as
922 Browning Lake, an area protected by Levee Unit R471-460. Lake Contrary is in the area
923 protected by levee L-455. It is currently being studied by the Corps for a restoration project.
924 With the assistance of the Corps of Engineers Regulatory Branch, many wetlands have been
925 delineated along the levees in the Buchanan County, Missouri and Doniphan County, Kansas
926 project area.

927
928 National Wetland Inventory (NWI) database maps for the project area indicate that there
929 were many wetlands in the project area. Classification of the wetlands has been divided into
930 those occurring on the Kansas side of the Missouri River and those on the Missouri side of the
931 river. These wetlands are permanently flooded, seasonally flooded, temporarily flooded, or
932 semi-permanently flooded and include forested, broad leaved deciduous, and scrub shrub
933 vegetation. In addition, there are areas classified as palustrine unconsolidated bottom,
934 intermittently exposed (PUBG) which are typically mud or sand flats. Some of the wetlands are
935 natural and some are man-made. Table 3-2 illustrates types and acreages of wetlands occurring
936 in Kansas, and Table 3-3 illustrates types and acreages of wetland in Missouri.

937 Historically, wet mesic bottomland forest was the most extensive bottomland forest
 938 natural community in Missouri (Nelson 1987). This community has a diversity of tree species
 939 such as pin oak, cottonwood, river birch, green ash, hackberry, cherry, sweetgum, hawthorn,
 940 dogwood, hickories, wildplum, persimmon, maples, elm, and sassafras. A well-developed
 941 understory is often present, containing poison ivy, elm, nettle, and honeysuckle. These
 942 communities provide habitat for a wide variety of resident and migratory wildlife. Forested
 943 wetlands have been found to support significantly higher abundance and diversity of bird species
 944 compared to upland forests (Brinson 1981).

945
 946 The majority of the Kansas state wetlands are forested (71%) followed by emergent
 947 (17%), scrub-shrub (11%), and those classified as other wetlands (1%) (Table 3-2).
 948

949 Table 3-2. Kansas Study Area Wetlands

Wetland Type	Classification	Acreage
Forested	PFO	402.56
Emergent	PEM	95.23
Scrub-shrub	PSS	64.16
Other Wetlands	PUS	5.54

951
 952 The majority of the Missouri state wetlands are forested (75%) followed by emergent
 953 (19%), and scrub-shrub (6%) (Table 3-3). The Missouri State side of the river contained no
 954 wetlands identified as “other” within the project area.

955
 956 Table 3-3. Missouri Study Area Wetlands

Wetland Type	Classification	Acreage
Forested	PFO	143.03
Emergent	PEM	36.72
Scrub-shrub	PSS	1.74

957
 958
 959 In addition to the NWI maps, Corps staff conducted a detailed wetland determination of
 960 the proposed project area following the process outlined by the “Kansas Wetland Conventions, A
 961 Technical Document for Wetland Determinations/Delineations in Kansas.” Please see Appendix
 962 I for a detailed description on the methods used to make this determination and resulting data.
 963

964 The regulatory office completed the review of the wetland delineation, and concurred with the
 965 methods employed to complete the determination and field verification of the wetland areas on 6
 966 May 2005. Subsequently, the Regulatory Office provided a Jurisdictional Determination (file
 967 number 200501489) for the overall wetland delineation and mapping (Appendix I). Based on
 968 these findings, the Corps has used this more detailed information as a basis in determining
 969 impacts resulting from the proposed project.

970
 971
 972
 973

974 3.2.4 Threatened and Endangered Species

975
976 The U.S. Fish and Wildlife Service Kansas office was consulted about threatened and
977 endangered species that could occur in the project area. They provided a list of the following
978 species as possibly occurring in the vicinity of the Missouri River in Doniphan County.
979

- 980 • Piping plover (*Charadrius melodus*). This small threatened shorebird may be a
981 seasonal spring and fall migrant through portions of Kansas, particularly along the
982 Missouri River. Plovers are associated with unvegetated shorelines, sandbars, and
983 mudflats and commonly feed upon aquatic invertebrates.
984
- 985 • Bald eagle (*Haliaeetus leucocephalus*). This large threatened raptor may occur along
986 any river or at any reservoir in Kansas during winter. Eagles are commonly found in
987 areas where large trees provide perch sites in proximity to open water where they feed
988 on fish and waterfowl.
989
- 990 • Least tern (*Sterna antillarum*). This endangered shorebird can be found in similar
991 habitat as the piping plover, which is unvegetated wetland habitat, feeding primarily
992 on small fish. It occurs as a spring and fall migrant through Kansas, and also nests in
993 central and southwest Kansas.
994
- 995 • Pallid sturgeon (*Scaphirhynchus albus*). The endangered sturgeon is a moderately
996 large, bottom-dwelling fish historically occurring in portions of the Missouri River. It
997 requires sandbars, chutes, and backwater areas for reproduction.
998
- 999 • Indiana bat (*Myotis sodalists*). From late fall through winter, the endangered Indiana
1000 bat in Missouri hibernates in caves in the Ozarks and Ozark Border Natural Divisions.
1001 During the spring and summer, Indiana bats utilize living, injured (e.g., split trunks
1002 and broken limbs from lightning strikes or wind), dead or dying trees for roosting
1003 throughout the state. Indiana bat roost trees tend to be greater than nine inches
1004 diameter at breast height (dbh) (optimally greater than 20 inches dbh) with loose of
1005 exfoliating bark. Most important are structural characteristics that provide adequate
1006 space for bats to roost. Preferred roost sites are located in forest openings, at the
1007 forest edge, or where the overstory canopy allows some sunlight exposure to the roost
1008 tree, which is usually within one kilometer (0.61 mile) of water. Indiana bat forage
1009 for flying insects (particularly moths) in and around the tree canopy of floodplain,
1010 riparian, and upland forests.
1011

1012 The U.S. Fish and Wildlife Service office in Missouri also was consulted concerning
1013 threatened and endangered species that could occur in the project area on the Missouri side of the
1014 project. They noted that the pallid sturgeon (*Scaphirhynchus albus*), a federally listed
1015 endangered species, may occur throughout the Missouri River reach and recent records are on
1016 file for this species occurring in the project area. Sturgeons have been captured in tributary
1017 mouths, over sandbars, along main channel borders, and in deep holes elsewhere in the Missouri
1018 River. Small sturgeons have been captured in off-channel backwaters.
1019

1020 Wintering populations of the threatened bald eagle (*Haliaeetus leucocephalus*) are
1021 common along the Missouri River and, in recent years, eagles have successfully nested or
1022 attempted nesting at several locations along the river. There are no known active bald eagle
1023 nests in the project area. Wintering eagles usually occupy river habitats between November 15
1024 and March 1, depending on the availability of open water in the river and floodplain lakes and
1025 wetlands. Larger diameter (greater than 12-inch diameter at breast height) cottonwoods,
1026 sycamores, and other large riparian trees are preferred daytime perches and nighttime roosts.

1027
1028 There were no records of the endangered Indiana bat (*Myotis sodalist*) from Buchanan
1029 County; however, summering bats have been found throughout much of northern Missouri and
1030 may occur in suitable habitat along the river during the summer.

1031
1032 Important fish and wildlife habitats within the project area are associated with the river
1033 and are generally riverward of the main levees. Habitats include the river, side channels and
1034 chutes, cut-off islands and sloughs, tributary confluences, floodplain scour lakes and blow holes
1035 created by past floods, floodplain forests, emergent wetlands, and former borrow areas. The
1036 highest value habitats on the Missouri side of the river are located riverward of the levee or
1037 around Lake Contrary between river miles 437 and 444.

1038
1039 The Missouri Department of Conservation was consulted during preparation of the
1040 reconnaissance report and informed the Corps that state listed sensitive species or communities
1041 are known to occur in the vicinity of the project site. The pied-billed grebe (Podilymbus
1042 podiceps) is considered rare in this area and the skeleton plant (Lygodesmia juncea) is on a
1043 watch list in the state of Missouri.

1044
1045 The Kansas Department of Wildlife and Parks provided the following list of state listed
1046 species in addition to the species provided by the Kansas U.S. Fish and Wildlife Service.

- 1047
- 1048 • American burying beetle (Nicophorus americanus). This beetle has been found in the
1049 Midwest in mixed agricultural lands, including pastures and mowed fields, and
1050 riparian forests. Humus and loose topsoil suitable for burying carrion is essential for
1051 this species.
 - 1052
 - 1053 • Chestnut lamprey (Ichthyomyzon castaneus). This species is known to occur in the
1054 Missouri River main stem and spawns over clean gravel in small tributary streams.
1055 This species is considered threatened in the State of Kansas and critical habitat has
1056 been designated.
 - 1057
 - 1058 • Eastern spotted skunk (Spilogale putorius interrupta). This species prefers brushy
1059 grasslands and woodland edges and may also inhabit abandoned or seldom used farm
1060 buildings. The eastern spotted skunk is considered threatened in Kansas.
 - 1061
 - 1062 • Silverband shiner (Notropis shumardi). This species may occur in the Missouri River
1063 main stem and prefers moderately deep areas of water flowing over sand or gravel
1064 substrate. Critical habitat has been designated for the silverband shiner.
- 1065

- 1066 • Snowy plover (Charadrius alexandrinus). The snowy plover may occur as an
1067 occasional seasonal transient or summer visitant at sparsely vegetated wetlands and
1068 impoundment shorelines. It is a state listed threatened species.
1069
- 1070 • Western earth snake (Virginia valeriae elegans). This species prefers rocky hillsides
1071 in or near moist woodlands where rocks, logs, or leaf litter provide cover. It is a state
1072 listed threatened species.
1073
- 1074 • White-faced ibis (Plegadis chihi). This species may occur as an occasional seasonal
1075 transient or summer visitant at wetlands and impoundments. It is a state listed
1076 threatened species.
1077

1078 3.3 Socio-Economic Environment

1079 3.3.1 Demography

1080 **Buchanan County, Missouri**

1081
1082 As of the census of 2000 there are 85,998 people, 33,557 households, and 21,912 families
1083 residing in the county. There are 36,574 housing units at an average density of 34/km² (89/mi²).
1084 The racial makeup of the county is 92.73% White, 4.36% Black or African American, 2.43%
1085 Hispanic or Latino, 0.42% Native American, 0.45% Asian, 0.02% Pacific Islander, 0.65% from
1086 other races, and 1.37% from two or more races.
1087

1088
1089 Of the 33,557 households, 30.60% have children under the age of 18 living with them,
1090 49.30% are married couples living together, 12.00% have a female householder with no husband
1091 present, and 34.70% are non-families. Twenty-eight point nine percent of all households are
1092 made up of individuals and 12.50% have someone living alone who is 65 years of age or older.
1093 The average household size is 2.42 and the average family size is 2.98.
1094

1095
1096 In the county, the population is spread out with 24.30% under the age of 18, 11.00% from
1097 18 to 24, 28.50% from 25 to 44, 21.20% from 45 to 64, and 15.00% who are 65 years of age or
1098 older. The median age is 36 years. For every 100 females there are 96.70 males. For every 100
1099 females age 18 and over, there are 93.90 males.
1100

1101 The median income for a household in the county is \$34,704, and the median income for
1102 a family is \$42,408. Males have a median income of \$31,697 versus \$21,827 for females. The
1103 per capita income for the county is \$17,882. Twelve point two percent of the population and
1104 8.50% of families are below the poverty line. Out of the total population, 15.00% of those under
1105 the age of 18 and 9.60% of those 65 and older are living below the poverty line.
1106

1107 **Andrew County, Missouri**

1108
1109 As of the census of 2000, there are 16,492 people, 6,273 households, and 4,635 families
1110 residing in the county. There are 6,662 housing units at an average density of 6/km² (15/mi²).
1111 The racial makeup of the county is 98.38% White, 0.42% Black or African American, 0.84%

1112 Hispanic or Latino, 0.34% Native American, 0.22% Asian, 0.01% Pacific Islander, 0.18% from
1113 other races, and 0.45% from two or more races.

1114

1115 Of the 6,273 households, 34.50% have children under the age of 18 living with them,
1116 62.70% are married couples living together, 7.40% have a female householder with no husband
1117 present, and 26.10% are non-families. Twenty-two point three percent of all households are
1118 made up of individuals and 10.50% have someone living alone who is 65 years of age or older.
1119 The average household size is 2.59 and the average family size is 3.03.

1120

1121 In the county, the population is spread out with 26.40% under the age of 18, 7.90% from
1122 18 to 24, 27.60% from 25 to 44, 23.70% from 45 to 64, and 14.40% who are 65 years of age or
1123 older. The median age is 38 years. For every 100 females there are 95.00 males. For every 100
1124 females age 18 and over, there are 93.00 males.

1125

1126 The median income for a household in the county is \$40,688, and the median income for
1127 a family is \$46,067. Males have a median income of \$32,955 versus \$22,586 for females. The
1128 per capita income for the county is \$19,375. Eight point two percent of the population and
1129 6.40% of families are below the poverty line. Out of the total population, 10.50% of those under
1130 the age of 18 and 8.00% of those 65 and older are living below the poverty line.

1131

1132 **Doniphan County, Kansas**

1133

1134 As of the census of 2000, there are 8,249 people, 3,173 households, and 2,183 families
1135 residing in the county. There are 3,489 housing units at an average density of 3/km² (9/mi²).
1136 The racial makeup of the county is 94.85% White, 2.00% Black or African American, 1.16%
1137 Hispanic or Latino, 1.21% Native American, 0.25% Asian, 0.00% Pacific Islander, 0.40% from
1138 other races, and 1.29% from two or more races.

1139

1140 Of the 3,173 households, 32.60% have children under the age of 18 living with them,
1141 56.40% are married couples living together, 8.70% have a female householder with no husband
1142 present, and 31.20% are non-families. Twenty-seven point six percent of all households are
1143 made up of individuals and 14.20% have someone living alone who is 65 years of age or older.
1144 The average household size is 2.48 and the average family size is 3.03.

1145

1146 In the county, the population is spread out with 25.30% under the age of 18, 11.80% from
1147 18 to 24, 24.70% from 25 to 44, 22.00% from 45 to 64, and 16.20% who are 65 years of age or
1148 older. The median age is 37 years. For every 100 females there are 98.60 males. For every 100
1149 females age 18 and over, there are 96.20 males.

1150

1151 The median income for a household in the county is \$32,537, and the median income for
1152 a family is \$39,357. Males have a median income of \$28,096 versus \$19,721 for females. The
1153 per capita income for the county is \$14,849. Eleven point nine percent of the population and
1154 9.00% of families are below the poverty line. Out of the total population, 13.30% of those under
1155 the age of 18 and 12.50% of those 65 and older are living below the poverty line.

1156

1157

1158 3.3.2 Development and Economy
1159

1160 St. Joseph originally developed in the early nineteenth century as a fur-trading post on the
1161 Missouri River. It came to prominence in the 1840s and 1850s as a “jumping off” point where
1162 Oregon and California-bound travelers ended their journeys by water and began their trek by
1163 land to Oregon and California. The Pony Express and the railroads began to play dominant roles
1164 in St. Joseph during the Civil War. Subsequently, the livestock industry (specifically meat
1165 packinghouses), was critical to the area’s economy from approximately the mid-nineteenth to the
1166 mid-twentieth century.
1167

1168 The area’s long-standing agricultural concentration continues to be reflected in the
1169 contemporary St. Joseph area economy’s growing emphasis on life sciences. This network of
1170 industries includes health care, animal pharmaceuticals, agricultural chemicals, seed production,
1171 food processing, and animal research and development. The old stockyards area (protected by
1172 Unit L-455) is home to a number of large manufacturing concerns in the animal pharmaceuticals
1173 and agricultural chemicals industries as well as a major new pork processing plant.
1174

1175 The area across the Missouri River in and around Elwood, Kansas, (protected by Unit
1176 R471-460), also hosts a few similar businesses in the same industries. At present, life sciences
1177 account for an estimated 6,837 jobs in the metro area. Many of these jobs are connected with
1178 agriculture-related sectors of the life sciences. City leaders have formed a network of life
1179 science executives in a long-term effort to develop this emerging strength, and this local
1180 emphasis increasingly is tied in regionally to aggressive efforts in the Kansas City area to
1181 encourage life sciences growth.
1182

1183 According to the St. Joseph Area Chamber of Commerce, the largest individual
1184 employers in the St. Joseph metropolitan area include: Heartland Health (2,900 employees); St.
1185 Joseph School District (1,650 employees); Triumph Foods (a new pork processing facility with
1186 an estimated 1,000 employees); American Family Insurance (841 employees); Altec Industries
1187 (840 employees); city of St. Joseph (655 employees); and, Boehringer Ingelheim Vetmedica
1188 (animal pharmaceuticals with 607 employees). Other employers accounting for more than 500
1189 employees in the Metropolitan Statistical Area include Systems and Services Technology (loan
1190 servicing); Western Reception Diagnostic and Correctional Center; Missouri Western State
1191 University; Wal-Mart; Sara Lee Foods; and, Johnson Controls battery division. The Missouri
1192 Air National Guard 139th Airlift Unit base north of Elwood, Kansas has a base population
1193 currently estimated at 360.
1194

1195 U. S. Census Bureau 2002 statistics on county business patterns indicate a total of 2,654
1196 businesses in Buchanan County. Of this total, 463 retail sector businesses accounted for 17.4
1197 percent of the total and 287 construction sector businesses accounted for 10.8 percent of the
1198 total. Other industries accounting for more than 5 percent of the total included other services
1199 except public administration, 12.8 percent; health care and social assistance, 9.8 percent;
1200 construction, 9.5 percent; finance and insurance, 7.7 percent; accommodation and food services,
1201 7.4 percent; professional, scientific and technical services, 6.7 percent; wholesale trade, 5.2
1202 percent. Doniphan County statistics indicated 162 businesses active in the 2002 survey. Of
1203 these, 25, or 15.4 percent, were retail, and 26, or 16 percent, were in the other services except

1204 public administration grouping. Other industries accounting for more than 5 percent of the total
1205 included transportation and warehousing (8.6 percent); health care and social assistance (8.6
1206 percent); construction (8 percent); finance and insurance (8 percent); wholesale trade (7.4
1207 percent); manufacturing (6.8 percent); and, accommodation and food services (5.6 percent).
1208

1209 Both Buchanan and Doniphan Counties are predominantly rural and are characterized by
1210 substantial agricultural land uses. Within the study area some 7,200 crop acres are protected by
1211 the R471-460 levee, and most of this land is in the northern half of the protected area. The L-
1212 455 levee protects about 5,100 crop acres in an area immediately southwest of St Joseph.
1213 According to the 2002 Census of Agriculture, each county had just over 200,000 acres in farm
1214 uses. While Buchanan County had 848 farms averaging 236 acres each; Doniphan County farms
1215 were much larger with 469 farms averaging 439 acres each.
1216

1217 Buchanan County accounted for nearly \$28 million in production in 2002, while
1218 Doniphan County production was valued at approximately \$32 million. In both counties,
1219 slightly over three-fourths of total production value was accounted for by crop sales, while the
1220 remaining amounts were accounted for by livestock sales. Soybeans and corn are the dominant
1221 crops in both counties, and this is particularly true in the Missouri River bottomlands protected
1222 by the L-455 and R471-460 levee units where virtually nothing else is grown. Soybeans in
1223 Buchanan County account for 29.4 percent of total land in farms; while in Doniphan County
1224 beans made up 45.2 percent of the total. Corn accounted for 47.7 percent of total land in farms
1225 in Doniphan County and 21.6 percent in Buchanan County.
1226

1227 Flood insurance has emerged as an increasingly serious economic concern in the Levee
1228 Unit R471-460 area. This levee unit failed in the 1993 Missouri River flood, resulting in
1229 devastating damage in and around the town of Elwood. Subsequently, this levee was judged
1230 unable to contain a 1 percent-chance flood event with at least 90 percent confidence, and its
1231 current height was found to be deficient in providing adequate margin above the 1 percent-
1232 chance event. Consequently, the R471-460 unit was decertified by FEMA in 1999. The area
1233 was designated by FEMA as an "AR" zone, which is a temporary category that assumes
1234 imminent improvement of the levee to certification standards and is designed to minimize
1235 economic impacts to the community during the implementation period of the repair or
1236 improvements.
1237

1238 Failure to take steps needed to recertify the levee would eventually result in forcing
1239 residents and business owners in the area to buy costly flood insurance. Meanwhile, any new
1240 development will face new legal requirements including elevation, imposing additional costs on
1241 developers and potentially discouraging new development as well as growth of existing
1242 businesses. The most serious impact probably would involve the Missouri Air National Guard
1243 base located immediately north of Elwood, Kansas. The base was heavily damaged in the 1993
1244 flood, and the Air Guard currently plans to relocate to higher ground within the protected area.
1245

1246 The new site for the base would be about nine feet higher than the present site, which
1247 would not entirely remove the base from the floodplain but obviously would greatly reduce the
1248 damage potential in the event of another flood. The timeline is unclear because of Federal
1249 funding exigencies but should be gradually implemented within the next 15 years. However, if it

1250 becomes clear that the levee will not be recertified, the Air National Guard almost certainly
1251 would simply close the base and pull out of the area altogether at some point. The loss of a
1252 military base would be a major hardship for Elwood, a small town with few large employers. An
1253 economic impact would be felt in the St. Joseph-area economy as a whole.

1254
1255 The L-455 levee unit currently meets FEMA certification standards, but any future move
1256 to decertify the levee based on subsequent analyses would harm economic development in the
1257 city of St. Joseph and in the rural area southwest of St. Joseph. The entire central industrial
1258 district of the city, containing many large businesses, would be subjected to regulatory
1259 requirements that would discourage new businesses and growth by existing businesses and
1260 possibly result in the loss of one or more major area employers.

1261
1262 3.3.3 Land Use

1263
1264 The land use within the project area boundaries can be separated into approximately 12
1265 categories. These range from fully natural settings to fully developed. The land cover types and
1266 acreages are provided in Table 3-4 below. The land cover type identified is not the region of
1267 influence should the levees fail, but rather the land use within the footprint of the proposed
1268 project.

1269
1270 Table 3-4. Land Cover Types in the St. Joseph Levee Project Area.

1271

Land Cover Type	Total Acres
Side channels	0.13
Tributary rivers/streams	2.17
Developed	7.35
Naturally bare	2.77
Deciduous trees	388.32
Shrubland	153.08
Grassland	234.76
Cultivated	846.3
Cultivated with levee	25.72
Emergent wetland	131
Scrub shrub wetland	65
Forested wetland	545

1272
1273 3.3.4 Transportation

1274
1275 The study area for the evaluation of transportation and traffic is the existing road network
1276 in the St. Joseph Metropolitan Area in both Missouri and Kansas. The primary east-west
1277 transport route through the study area is U.S. Highway 36. U.S. Highway 59, a primary north-
1278 south route, borders the study area of unit L-455. Interstate highways adjacent to the study area
1279 include I-29, and I-229. Local arteries and roads connected to these major routes could be
1280 impacted by large volumes of traffic, and could be traveled upon by construction vehicles during

1281 project construction. The Union Pacific Railroad provides for transportation of freight in the
1282 area and is also considered in this analysis.

1283
1284 3.3.5 Utilities/Water Supply
1285

1286 The utilities in the project area consist of five known utility lines within the right bank
1287 unit. There are no known utility lines within the area of the left bank unit subject to a raise.

1288 A small above ground power line runs on six poles adjacent to the landside levee toe
1289 from approximately levee station 280+00 to levee station 300+00. A high tension power
1290 transmission line crosses the levee at approximately levee station 301+20. A telephone cable,
1291 known as “UL-4”, as identified in the levee Operation & Maintenance manual crosses up and
1292 over the levee at station 418+15. A gas line, known as “UL-3”, as identified in the levee
1293 Operation & Maintenance manual crosses under the levee at station 417+65. A 16-inch diameter
1294 water line, known as “UL-2”, as identified in the levee Operation & Maintenance Manual crosses
1295 up and over the levee at station 300+00.

1296
1297 3.3.6 Flood Damage Reduction
1298

1299 Flood damage reduction along the Lower Missouri River is primarily accomplished by
1300 constructed levees, storage capacity of the Missouri River Mainstem Reservoir System, tributary
1301 flood damage reduction structures and impoundments, and the controlled release of water from
1302 Gavins Point Dam. Major Missouri River floods have occurred in 1844, 1881, 1903, 1908,
1303 1943, 1947, 1951, 1952, 1993, and 1997.

1304
1305 The protective works that provide local flood damage reduction for the metropolitan
1306 areas of St. Joseph, Missouri and Elwood and Wathena, Kansas are described in section 1.1
1307 *Project Location and History*, and section 1.2 *Levee Unit Descriptions*. Please refer to these
1308 sections for a detailed account of the areas’ flood damage reduction levees.

1309
1310 3.3.7 Recreation
1311

1312 Land within the floodplain of the proposed project is mostly privately owned. Recreation
1313 on the Missouri River within the project area is access limited, and primarily involves boating
1314 and fishing, with some hiking, canoeing, and wildlife/bird watching. Drought or low water
1315 levels can shorten the seasonal timeframe for boat-oriented recreation because some boat ramps
1316 are inaccessible during non-navigation periods.

1317
1318 St. Joseph’s park system encompasses more than 1,500 acres of city parks connected by a
1319 26-mile parkway system. Public recreation facilities include golf courses, baseball fields, ice-
1320 skating rinks, swimming pools, and tennis courts. The parkway system, developed in 1918, was
1321 one of the first comprehensive parkway plans implemented in the United States. The completed
1322 greenbelt of hiking and biking trails connects the principal parks and recreational facilities
1323 throughout the city.

1324
1325

1326 3.3.8 Archaeological and Historic Resources
1327

1328 Section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended June
1329 17, 1999) requires federal agencies to take into account the effects of their undertakings on
1330 historic properties. By definition, historic properties are those that are eligible for or listed on the
1331 National Register of Historic Places. Federal undertakings refer to any federal involvement
1332 including funding, permitting, licensing, or approval. Federal agencies are required to define and
1333 document the Area of Potential Effect for undertakings. It is the geographic area or areas within
1334 which an undertaking may directly or indirectly cause changes in the character or use of historic
1335 properties, if such properties exist.

1336
1337 The Advisory Council on Historic Preservation (ACHP) issues regulations that
1338 implement Section 106 of NHPA at 36 CFR Part 800, Protection of the Historic Properties.
1339 Section 106 sets up the review process whereby a federal agency consults with the State Historic
1340 Preservation Officers (SHPO), Native American tribes, and other interested parties including the
1341 public to identify, evaluate, assess effects, and mitigate adverse impacts on any historic
1342 properties affected by their undertaking.

1343
1344 3.3.8.1 Background Review
1345

1346 A literature and background review of the proposed Missouri River Levee System Units
1347 L-455 and R-460-471 study area was completed in 1996 and 2001. The background search
1348 consisted of a review of the National Register of Historic Places; site records from the Kansas
1349 and Missouri SHPO's, archeological reports from projects in the region, and appropriate
1350 historical documents. The review found no archeological sites or historic structures recorded
1351 within the study area. Since the 1996 review, no additional sites have been recorded within the
1352 study area.

1353
1354 A review of the Kansas City District's Abandoned Shipwrecks on Missouri River
1355 Channel Maps of 1879 and 1954 identified nine shipwrecks in the vicinity of the study area.
1356 These ships and the year they sank include the Dan Converse (1858), the Watosia (1858), Jennie
1357 (1890), Bertha (1873), Denver No.1 (1867), Denver City (1867), Dorothy (1920), Mt. Sterling
1358 (1918), and Pathfinder (unknown). The wrecks were briefly described in *The Report of the Chief
1359 of Engineers, U.S. Army, Appendix D, Report on Steamboat Wrecks on Missouri River* by
1360 Captain H.M. Chittenden, Corps of Engineers in 1897 and the Dr. E.B. Trail Collection, 1858-
1361 1965.

1362
1363 The Corps also conducted an accreted land study of the APE to help determine the
1364 potential for archeological sites within the study area. The study was undertaken by using GIS to
1365 overlay historic Corps of Engineer Missouri River channel maps from 1804, 1879, 1892, 1926,
1366 1954, as well as current maps to show the various locations of the river channel. The former
1367 channel locations are considered accreted land. The study found that much of the proposed
1368 project area is comprised of land accreted after 1879. These results along with the results of the
1369 background literature review were coordinated with the appropriate SHPO.

1373 3.3.9 Environmental Justice

1374
 1375 The Executive Order on Environmental Justice (Executive Order 12898) requires
 1376 consideration of social equity issues, particularly any potential disproportionate impacts to
 1377 minority or low-income groups. This is to ensure that issues such as cultural and dietary
 1378 differences are taken into consideration to ensure that adequate risk is evaluated (EPA, 2004).
 1379 To determine potential impacts to minority or low-income groups, the racial and income
 1380 composition of the individual census tracts within, and adjacent to the study area, were examined
 1381 using 2000 census data.

1382
 1383 For Census 2000, the Office of Management and Budget (OMB) considered race and
 1384 Hispanic origin to be separate and distinct concepts, and the terms “Hispanic” and “Latino”
 1385 synonymous for reporting purposes. The OMB defines Hispanic or Latino as “a person of
 1386 Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin
 1387 regardless of race.” Therefore, Hispanics/Latinos may be of any race and are not defined as an
 1388 individual race category by the OMB. Persons who reported Hispanic/Latino origin are included
 1389 within the seven mutually exclusive race categories used by the OMB to sum the total
 1390 population, which include: (1) White; (2) Black or African American; (3) American Indian &
 1391 Alaska Native; (4) Asian; (5) Native Hawaiian and Other Pacific Islander; (6) Some other race;
 1392 (7) Two or more races.

1393
 1394 Table 3-5 represents the racial composition of the proposed project area. Comparison
 1395 data provides insight into the demographics of an area overall while providing an understanding
 1396 of areas that are often overlooked in general population data. The percentage of persons who
 1397 reported “some other race” and “two or more races” were combined, and are represented in the
 1398 “Other Races” column. Racial composition and Hispanic or Latino origin percentages were
 1399 calculated from the census tract population data reported in section 3.3.

1400
 1401 Table 3-5. Project Area Racial Composition.

1402

County	%White	%Black	%Native American/ Alaskan	%Asian	%Pacific Islander	%Other Races*	%Hispanic /Latino
Buchanan	92.73	4.36	0.42	0.45	0.02	2.02	2.43
Andrew	98.38	0.42	0.34	0.22	0.01	0.63	0.84
Doniphan	94.85	2.00	1.21	0.25	0.00	1.69	1.16

Source: Census 2000

*Percentages are calculated from the sum of persons who reported “some other race” or “two or more races”.

1403
 1404 The majority of the persons in the proposed project area reported their race as “White.”
 1405 This is followed by Blacks, Hispanic/Latino, Other races, Native American/Alaskan, Asian, and
 1406 finally Pacific Islander. When the total of the other than white races are summed, one can see
 1407 that only a very small percent of the racial composition consists of “minority” races.

1408
 1409 The core of Executive Order 12898 provides for the protection of both minority and low-
 1410 income groups. Therefore, income data and racial composition data from Section 3.3 were used

1411 to provide an overview of the proposed project area in terms of the minority make-up and the
 1412 residents living below the poverty line. This information is based on the percent of the total
 1413 population for each county. Table 3-6 represents this data. The poverty line is defined as the
 1414 level of income below which one cannot afford to purchase all the resources one requires to live.
 1415 By definition, people below the poverty line have no disposable income.

1416
 1417 Table 3-6. Percentage of Minority Residents and Residents Living Below
 1418 the Poverty Line in the Project Area.
 1419

County	%Minority Residents	% Living Below the Poverty Line
Buchanan	9.7	12.2
Andrew	2.46	8.2
Doniphan	6.31	11.9

1420
 1421 Additional environmental justice indicators such as education level, languages spoken,
 1422 and percent children and elderly reveal trends about the socio-demographic aspects of a
 1423 community that may be used to make generalizations about the population and the capacity of
 1424 residents to cope with potential additional environmental stresses.

1425
 1426 The level of education and/or literacy rates for the adult population provides a critical
 1427 measure of the likelihood and the ability of the community to know about and participate in
 1428 public meetings, to comment on written proposals and to otherwise participate in the decision-
 1429 making process. If tools used to encourage public participation are not tailored to local
 1430 education rates, or perceived rates, the outreach process may be ineffectual (USEPA, 2004).
 1431 From the Census 200 data, over 80% of residents in each county are high school graduates.

1432
 1433 Information on whether languages other than English are spoken among the population,
 1434 and percentage distribution of these languages, is important in determining effective public
 1435 participation processes. According to the U.S. Census Bureau (2000), the most common
 1436 language spoken at home, by individuals age five and over, is English with an average of 96%.
 1437 The percent of language other than English that is spoken in the area averages to about 2.8%.

1438
 1439 Children under age five and elderly populations above age 65 are considered to be
 1440 sensitive populations that may experience disproportionate impacts from environmental
 1441 stressors. Table 3-7 below provides insight into a subpopulation that exists within the various
 1442 counties within the study area. The counties in the proposed project area contain a slightly
 1443 higher percent of elderly individuals over that which occurs state-wide.

1444
 1445 Table 3-7. Percent of Sensitive Populations within the Proposed Project Area.
 1446

County	%Children under 5/ % throughout State	%Elderly over Age 65/ % throughout State
Buchanan	6.3/6.6	15.0/13.5
Andrew	6.3/6.6	14.4/13.5
Doniphan	6.4/7.0	16.2/13.3

1447

1448 After the levee was decertified in 1999, FEMA and the Corps of Engineers collaborated
1449 to use a deliberate communication strategy to ensure broad community awareness of the AR
1450 interim flood re-zoning process for the right bank levee unit (R460-471). FEMA is mandated to
1451 conduct outreach to all possible communities affected by re-zoning actions and they developed a
1452 process that encompasses all of the potentially affected communities. The Corps was not just a
1453 “by-stander” in this process, but was actively engaged in partnership with FEMA in releasing
1454 information and making presentations at the meetings. This is because a critical component of
1455 the AR interim re-zoning process is the remedy to corrective action being developed to address
1456 the re-zoning. In this case, the corrective action central to the process was this feasibility study
1457 and eventual authorization and funding of a Corps project to improve the levee system. Thus,
1458 the Corps participated in the AR zoning outreach process and events by presenting the feasibility
1459 study planning process, the status of the study, and the most likely recommendations of the
1460 study. This process was followed and reported on periodically by the media serving the
1461 communities.

1462
1463 Region VII of the U.S. Environmental Protection Agency reviewed data and associated
1464 information used for the consideration of environmental justice. No concentrated blocks of
1465 ethnic or minority communities occur within the project area. Given the demographic
1466 characteristics of the project area, (96 percent English speaking and over 80 percent high school
1467 graduates), the public involvement process used communication methods appropriate to
1468 communicate the information about the proposed flood damage reduction project. Information
1469 was provided via public notices mailed to homeowners and business owners in the area, legal
1470 notices in area newspapers, and on the Corps web site. Information about the project was mailed
1471 to adjacent landowners, area organizations, area businesses, Native American tribes, USEPA
1472 identified contacts, and federal, state, and local government agencies. Also, at the most recent
1473 public meeting held on August 28, 2006, in the town of Elwood, Kansas, a local community
1474 affected by the proposed project, the meeting was attended by a diverse group of local citizens
1475 and was considered by all measurements a successful meeting. Indications from the meeting are
1476 of broad support for the project which is needed to avert current and future adverse economic
1477 impacts to the affected communities.

1478 **4. Environmental Effects of the Proposed Alternatives**

1479

1480 **4.1 Introduction**

1481

1482 This chapter presents the potential effects on the various resources that could result from
1483 implementation of the preferred alternative, Alternative 2, Alternative 3, Alternative 4, and the
1484 No Action Alternative. It is organized by resource. Each resource section includes a brief
1485 discussion of what was included in the resource being analyzed. The potential short-term effects
1486 of construction and the long-term operational effects are presented for all alternatives. Measures
1487 to minimize adverse effects are also presented where appropriate. Please reference Table 5 –
1488 Summary of Impacts at the end of this document for a quick assessment of impacts resulting
1489 from each alternative. Also, note that the preferred alternative will require the placement of fill
1490 material in area wetlands, that a section 404(b)(1) evaluation has been prepared pursuant to the
1491 Clean Water Act, and that a 401 Water Quality Certification will be obtained prior to project
1492 construction.

1493

1494 The Environmental Effects chapter uses three levels of impacts to describe the anticipated
1495 impacts: no impact, less than significant impact, and significant impact. Under the no impact
1496 category, the analysis of the resource would no perceptible impact would be anticipated. A less
1497 than significant impact would be an anticipated perceptible beneficial or adverse impact that
1498 does not meet the standard for being significant. A significant impact would be an anticipated
1499 perceptible impact that meets or exceeds the general standard for significance as defined by
1500 Council on Environmental Quality (CEQ) implementing regulations as discussed below.

1501

1502 The CEQ guidelines indicate the significance of an impact is determined by the intensity
1503 and the context of the impact evaluated. Intensity refers to the severity or extent of an impact
1504 and context relates to the environmental circumstances at the location of impact. The CEQ
1505 regulations for impacting the procedural provisions of NEPA (40 CFR 1508.27) specify that the
1506 following intensity and context criteria should be considered as general guidelines when
1507 determining the significance of impacts.

1508

1509 Intensity Evaluation should consider:

1510

- 1511 • Both beneficial and adverse impacts;
- 1512 • The degree to which the proposed action would affect public health or safety;
- 1513 • Unique characteristics of the geographic area such as proximity to historic or
1514 cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers,
1515 or ecologically critical areas;
- 1516 • The degree to which the effects on the quality of the human environment are
1517 likely to be highly controversial;
- 1518 • The degree to which the possible effects on the human environment are highly
1519 uncertain or could involve unique or unknown risks;
- 1520 • The degree to which the action may establish a precedent for future actions with
1521 significant effects;
- 1522 • Whether the action is related to other actions with individually insignificant but
1523 cumulatively significant impacts;

- 1524 • The degree to which the action may adversely affect districts, sites, highways,
1525 structures, or objects listed in, or eligible for listing in, the NRHP or may cause
1526 loss or destruction of significant scientific, cultural, or historical resources;
- 1527 • The degree to which the action may adversely affect an endangered or threatened
1528 species, or its habitat, that has been designated to be critical under the Endangered
1529 Species Act; and,
- 1530 • Whether the action threatens a violation of Federal, state, or local law or
1531 requirements imposed for the protection of the environment.

1532
1533 Context Evaluation should consider:

- 1534
- 1535 • The area or quantity of an affected resource relative to the available area or
1536 quantity of that resource;
- 1537 • The potential for change in reproductive success of a species and maintenance of
1538 a population at pre-project levels; and,
- 1539 • The period or recovery.

1540
1541 A determination of significance for a particular impact may be based on one or more of
1542 the intensity criteria and the context in which the impact would occur. The context refers to the
1543 significance of an impact to society as a whole, the affected region, the affected interests, and the
1544 locality.

1545
1546 This chapter also presents the potential for cumulative impacts, which are the impacts on
1547 the environment that result from the incremental impact of the project when added to the impacts
1548 of other past, present, and reasonably foreseeable future actions regardless of what agency or
1549 person undertakes such other actions.

1550
1551 After the level of impacts has been defined, measures to minimize adverse impacts are
1552 considered in this chapter using the following guidelines:

- 1553
- 1554 • Avoiding the impact altogether by modifying or not taking a certain action or
1555 parts of an action;
- 1556 • Minimizing impacts by limiting the degree or magnitude of the action and its
1557 implementation;
- 1558 • Rectifying the impact by repairing, rehabilitating, or restoring the affected
1559 environment;
- 1560 • Reducing or eliminating the impact over time by preservation and maintenance of
1561 operations during the life of the action; and/or,
- 1562 • Compensating for the impact by replacing or providing substitute resources or
1563 environments.

1564
1565 The use of measures to minimize adverse impacts and the effectiveness of these measures
1566 will be used, in general, by decision makers when evaluating the alternatives and balancing the
1567 projects overall merits with its potential impacts.

1568
1569

1570 **4.2 Future Conditions without the Project – No Action**

1571
1572 4.2.1 Baseline

1573
1574 The future conditions without project incorporates projects planned to be completed
1575 within the study reach, and any long term natural river processes that may affect future stages.
1576 For the purposes of this study, future conditions are defined as conditions reasonably expected to
1577 be present in 2030. A critical assumption of this analysis is that hydrologic conditions along the
1578 Missouri River are relatively static. This assumption was also implemented in the *Upper*
1579 *Mississippi River System Flow Frequency Study* (UMRSFFS) (2003), which was based on the
1580 study of 100 years of gage records along the Missouri River. The UMRSFFS superseded the
1581 previous Missouri River hydrology study titled *Missouri River Agricultural Levee Restudy*
1582 *Program* (1962). It is therefore reasonable to assume that the newly published flows in the
1583 UMRSFFS will still be applicable at the future conditions date.

1584
1585 By current estimates, Unit R471-460 has a 51.3 percent chance of passing a one percent
1586 event and an 8.2 percent chance of passing a 0.2 percent chance event. Large areas of existing
1587 residential, business and industrial development are now in a zone no longer afforded 100-year
1588 level of flood damage reduction, and increasing economic hardship is expected to result.
1589 Modifications or improvements to businesses are constrained. New investment of any kind is
1590 now questionable. The area will enter into an economic decline with less viability for
1591 improvement or enhancement, and increasing economic blight. If a project is not authorized to
1592 restore certification to the right bank, FEMA will eventually enact a major zoning change that
1593 will greatly increase flood insurance requirements and greatly degrade the economic health of
1594 the area.

1595
1596 Currently, mission essential upgrades to the Missouri Air National Guard Base at the
1597 airport are being jeopardized by the status of the levee. Some increases in investment are likely
1598 to take place including the expansion of the Air National Guard base, but at much greater cost to
1599 the users. If the project recommended by this study is not implemented by the Federal
1600 government, then the local sponsors will be faced with a substantial financial burden of trying to
1601 implement the project themselves; or, they will have to rely on flood-fighting to protect the
1602 investment in the area from future floods. Without recertification of the levee, economic
1603 development could be stymied and population could decline in the area. This in turn could result
1604 in no future development in the area and current buildings being abandoned and demolished.
1605 This could have a substantial benefit to area habitat and wildlife species in the long term.

1606
1607 Current analysis shows that Unit L-455 currently has a 93.6 percent chance of containing
1608 a one percent flood and a 65.8 percent chance of containing a 0.2 percent chance flood. Potential
1609 expansion of the city of St. Joseph to the south will result in existing agricultural property being
1610 converted to residential, commercial, or industrial uses. As new investment increases, damages
1611 associated with flooding will increase. Increased development in this levee unit, over the long-
1612 term, will likely result in adverse effects to area habitat and wildlife species.

1616 4.2.2 Missouri River

1617
1618 The Missouri River has been subject to many natural processes that have affected river
1619 stages. A general decline in river stage is anticipated to occur during low flows (20,000 cfs to
1620 100,000 cfs), and a general increase in river stage is anticipated to occur during high flows
1621 (<100,000 cfs). These flow and stage fluctuations are primarily attributed to the accretion of
1622 land and subsequent vegetation establishment behind dikes placed for navigation channel
1623 alignment. Vegetation stabilizes the accreted land from erosion and allows the accretion and
1624 vegetation cycle to continue further into the channel. Future conditions without the project will
1625 lead to increased flooding of the project area during the one percent flood flows; no re-
1626 certification by FEMA of the project area levees; decreased economic viability in the project area
1627 overall; and, potential for increased natural habitat conditions as the river re-connects to its
1628 historic flood plain.

1629
1630 **4.3 Physical-Chemical Environment**

1631 4.3.1 Geology, Minerals and Soils

1632
1633
1634 The potential geology, mineral, and soil impacts are discussed in this section in terms of
1635 impacts on the area bedrock which may in turn cause sink holes or other changes to the area
1636 condition.

1637
1638 Geology and minerals would not be impacted by any of the build alternatives because the
1639 excavation of borrow materials and the construction activities associated with levee raises and
1640 widening would be conducted within the soil layers well above bedrock. No post-construction
1641 impacts to geology or minerals would be anticipated from the operation of the two levee units.
1642 Area soils will be used to provide fill for the levee raises and will be disturbed. Coordination
1643 with both Kansas and Missouri NRCS was conducted (Appendix D) using the Farmland
1644 Conversion Impact Rating Form AD-1006 to determine prime farmland values. The Kansas
1645 NRCS stated that prime farmland soils will be converted by the proposed project; however, the
1646 relative value of the farmland conversion is zero. Thus, the impacts to prime farmland in Kansas
1647 are believed to be insignificant. The Missouri NRCS stated that prime farmland soils also will
1648 be converted by the proposed project and that the relative value of the farmland to be converted
1649 was high. However, based on the percentage (.001 percent) of farmland being converted
1650 compared to that within the county, the impacts to prime farmland resulting from the proposed
1651 project are believed to be insignificant. Soils used for the levee raises will be compacted and
1652 seeded in order to remain in place. The No Action Alternative would have no impact on
1653 geology, minerals, or soils.

1654 4.3.2 Water Quality

1655
1656
1657 Potential impacts to the quality of the surface water and groundwater are addressed in this
1658 section. Water quality of surface water bodies and groundwater can be indirectly affected by
1659 changing the quantity or volume of water in the water body or groundwater. Additionally, water
1660 quality may be affected by loss of area vegetation, or by leakage of fluids from construction
1661 related equipment.

1662 **Preferred Alternative**

1663
1664 The preferred alternative consists of raising the right bank levee (R471-460) anywhere
1665 from zero to 3.37 feet at specific points along its entire length, with corresponding raises to the
1666 left bank levee (less than one foot) as needed. These anticipated raises will result in increases to
1667 both the toe width and seepage berms. The overall width increase from the expanded levee and
1668 seepage berms will range from approximately 35 feet to 372.5 feet landward of the right bank
1669 levee unit and approximately 29 feet to 50 feet riverward of this same levee unit. Extension of
1670 the levee toe width and seepage berms will impact a total of approximately 285 lineal acres
1671 landward of the levee and approximately 77 lineal acres riverward of the existing levee.
1672

1673 The increased elevations to the left bank levee (L-455) will also increase toe width and
1674 seepage berms by approximately 136.5 feet to 356.5 feet landward of the levee, and
1675 approximately 41.5 feet riverward of the existing levee. Extension of the levee toe width and
1676 seepage berms will impact a total of approximately 43 lineal acres of land landward of the levee
1677 and approximately 54 lineal acres of land riverward of the existing levee.
1678

1679 Over the entire project area, when considering borrow material excavation and riverward
1680 berm expansion, temporary and permanent impacts to secondary tree growth and shrubland will
1681 occur. However, various minimization measures as described in the Vegetation Section (4.4.1)
1682 below will be implemented. Removal of trees and shrubs has the potential to affect water quality
1683 by reducing the filtering effects that these habitat types provide, and increasing the chances for
1684 erosion of soils. Additionally, because the levee is being raised, the potential for Missouri River
1685 overtopping is decreased. This decreased overtopping will limit Missouri River water from
1686 spreading over its historic floodplain, thereby incrementally decreasing the opportunity for river
1687 water filtration and purification.
1688

1689 Borrow areas currently identified for the proposed levee raise include riverward areas in
1690 both Kansas and Missouri. For Kansas, two borrow areas were identified and consist of a total
1691 of approximately 1,139 acres located from river mile 454.9 to 451.9 and from river mile 446.7 to
1692 443.4. For Missouri, the borrow area consists of approximately 30.4 acres from river mile 442.6
1693 to 442.9. After implementation of the preferred alternative, vegetation in the borrow areas will
1694 be allowed to reestablish naturally over time. Some adaptive management may be necessary if
1695 invasive species, such as reed canary grass, begin to dominate the areas. These impacts are
1696 believed to be short-term, less than significant, and construction related.
1697

1698 During excavation, best management practices will be implemented to minimize adverse
1699 water quality effects. Where appropriate, revegetation with native species to the extent
1700 practicable and mulching will be done as soon as practical after completion of activities to
1701 minimize the length of time soils are exposed to erosion. Planting trees and/or other vegetation
1702 would be done as appropriate to help increase water filtration, minimize the long-term transport
1703 of sediment from the site, and offset the impact to floodplain habitat.
1704

1705 Best management practices to minimize and avoid impacts from construction related
1706 equipment would also be implemented to reduce and avoid construction equipment fluids from
1707 entering the area soils and, subsequently, the waterway. There may be a temporary increase in

1708 turbidity levels in the project area during construction. Turbidity will be short-term and
1709 localized and no significant adverse impacts are expected. State standards for turbidity will not
1710 be exceeded. Therefore, the construction related impacts are expected to be less than significant.

1711

1712 **Alternative 2 (500 plus 1.5 feet of margin)**

1713

1714 Alternative 2 consists of raising the right bank levee (R471-460) approximately 3.5 feet
1715 along its entire length, with corresponding raises to the left bank levee. These anticipated raises
1716 will result in increases to both the toe width and seepage berms. The overall width increase
1717 (levee and seepage berms) will maximize the project boundaries of 500 feet landward and spread
1718 approximately 37 to 60 feet riverward of the right bank levee unit. Extension of the levee toe
1719 width and seepage berms will impact approximately 385 lineal acres of land landward of the
1720 levee and approximately 81 lineal acres of land riverward of the existing levee.

1721

1722 The increased elevations to the left bank levee (L-455) will also increase toe width and
1723 seepage berms by approximately 500 feet landward of the levee, and approximately 41.5 feet
1724 riverward of the existing levee. Extension of the levee toe width and seepage berms will impact
1725 approximately 46 lineal acres of land landward of the levee and approximately 54 lineal acres of
1726 land riverward of the existing levee.

1727

1728 Borrow areas currently identified for this alternative include the same riverward areas as
1729 the preferred alternative in both Kansas and Missouri. An increased amount of borrow material
1730 for this alternative would be required and impacts to vegetation throughout the entire borrow
1731 area would be expected. However, it is anticipated that a greater adverse impact to vegetation
1732 and, subsequently, on water quality over that of the preferred alternative would be expected.

1733

1734 During construction, similar best management practices as the described in the preferred
1735 alternative would be implemented to minimize adverse water quality effects. Therefore, the
1736 construction related impacts are expected to be less than significant.

1737

1738 **Alternative 3 (500 plus 3.0 feet of margin)**

1739

1740 Alternative 3 consists of raising the right bank levee (R471-460) up to five feet along its
1741 entire length, with corresponding raises to the left bank levee (average of 2.5 feet). These
1742 anticipated raises will result in increases to both the toe width and seepage berms. The overall
1743 width increase (levee and seepage berms) will maximize the project boundaries of 500 feet
1744 landward and spread approximately 37 feet to 60 feet riverward of the right bank unit. Extension
1745 of the levee toe width and seepage berms will impact approximately 336 lineal acres of land
1746 landward of the levee and approximately 81 lineal acres of land riverward of the existing levee.

1747

1748 The increased elevations to the left bank levee (L-455) will also increase toe width and
1749 seepage berms by approximately 500 feet landward of the levee, and approximately 54 feet
1750 riverward of the existing levee. Extension of the levee toe width and seepage berms will impact
1751 approximately 46 lineal acres of land landward of the levee and approximately 54 lineal acres of
1752 land riverward of the existing levee. It should be noted that the project boundary was set at no

1753 more than 500 feet from the center line of the existing levee. The impacts from Alternative 3
1754 exceed this boundary, but were only reported to the boundary limit.

1755 Borrow areas currently identified for this Alternative include the same riverward areas as
1756 the preferred alternative in both Kansas and Missouri. An increased amount of borrow material
1757 for this alternative would be required and impacts to vegetation throughout the entire borrow
1758 area would be expected. This would, in turn, have a greater adverse impact on water quality over
1759 that of the Alternative 2.

1760
1761 During construction, similar best management practices as the described in the preferred
1762 alternative will be implemented to minimize adverse water quality effects. Therefore, the
1763 construction related impacts are expected to be less than significant.

1764
1765 Alternative 4 (100 plus 1.5 feet of margin)

1766
1767 Alternative 4 consists of raising the right bank levee (R471-460) anywhere from zero to
1768 1.2 feet at specific points along its entire length, with no raise required to the left bank levee.
1769 These anticipated raises will result in increases to both the toe width and seepage berms. The
1770 overall width increase from the expanded levee and seepage berms will range from
1771 approximately 35 feet to 307.5 feet landward of the right bank levee unit and approximately 29
1772 feet to 50 feet riverward of this same levee unit. Extension of the levee toe width and seepage
1773 berms will impact a total of approximately 271 lineal acres of land landward of the levee and
1774 approximately 65 lineal acres of land riverward of the existing levee.

1775
1776 Borrow areas currently identified for this alternative include the same riverward areas as
1777 the preferred alternative in both Kansas and Missouri. A decreased amount of borrow material
1778 (approximately 16%) would be required for this alternative and impacts to vegetation as
1779 described for the preferred alternative above would be expected. These impacts, although
1780 similar in type, are expected to be reduced given that a decreased amount of fill material would
1781 be required.

1782
1783 During construction, similar best management practices as the described in the preferred
1784 alternative will be implemented to minimize adverse water quality effects. Thus these impacts
1785 are believed to be short-term, less than significant, and construction related.

1786
1787 “No Action” Alternative

1788
1789 The “No Action” alternative would involve no construction activity and no change in
1790 project operations. Because Levee Unit R471-460 is not FEMA certified to contain the 100-year
1791 flood event, flows of this magnitude would overtop the banks and cause flooding to surrounding
1792 industrial and residential areas, thereby, incrementally affecting water quality as it comes into
1793 contact with these facilities and household products. However, because the majority of the area
1794 protected by the levee is agricultural, these impacts are believed to be insignificant. River water
1795 contact with agricultural land could provide some benefits to water quality through filtration
1796 depending on timing and the amount of pesticides and herbicides used.

1797
1798

1799 4.3.3 Air Quality

1800
1801 The potential air quality impacts are discussed in this section in terms of short-term
1802 construction impacts and long-term operations impacts, meaning those after project
1803 implementation.

1804
1805 **Preferred Alternative**

1806
1807 Construction related air quality impacts would tend to be localized and temporary in
1808 nature. Such impacts would be due to relatively minor amounts of combustion related emissions
1809 from vehicle engine exhausts, and fugitive dust from earthmoving operations. Most of the
1810 affected landward area is currently farmed and, therefore, has these same types of emissions, but
1811 on a more on-going basis. During construction, best management practices (such as watering
1812 roads and construction sites) would be implemented to minimize fugitive dust and pollutant
1813 emissions. The construction related impacts are expected to be short-term and less than
1814 significant, in comparison to the current land use activities.

1815
1816 After implementation of the preferred alternative, the combustion related emissions and
1817 fugitive dust would return to the level of existing conditions. Farming and tilling would
1818 continue, and air quality would again reach pre-construction levels. This analysis indicates that
1819 construction related air quality impacts would be less than significant.

1820
1821 **Alternative 2 (500 plus 1.5 feet of margin)**

1822
1823 Under Alternative 2, construction related air quality impacts would tend to be similar to
1824 those of the preferred alternative. It can be assumed that because this alternative requires a
1825 higher level of flood damage reduction, additional construction over a longer period of time
1826 would be required which; in turn would increase combustion related emissions and fugitive dust
1827 slightly over that of the preferred alternative.

1828
1829 After implementation of this alternative, the combustion related emissions and fugitive
1830 dust would return to the level of existing conditions. Farming and tilling would continue, and air
1831 quality would reach pre-construction levels. This analysis indicates that construction related air
1832 quality impacts would be less than significant. During construction, best management practices
1833 (such as watering roads and construction sites) would be implemented to minimize fugitive dust
1834 and pollutant emissions.

1835
1836 **Alternative 3 (500 plus 3.0 feet of margin)**

1837
1838 Under Alternative 3, construction related air quality impacts would tend to be similar to
1839 those of the preferred alternative. It can be assumed that because this alternative requires a still
1840 higher level of flood damage reduction than Alternative 2, additional construction over a longer
1841 period of time would be required which; in turn, would increase combustion related emissions
1842 and fugitive dust slightly over that of the increased level of flood damage reduction alternative.

1844 After implementation of this alternative, the combustion related emissions and fugitive
1845 dust would return to the level of existing conditions. Farming and tilling would continue, and air
1846 quality would reach pre-construction levels. This analysis indicates that construction related air
1847 quality impacts would be less than significant. During construction, best management practices
1848 (such as watering roads and construction sites) would be implemented to minimize fugitive dust
1849 and pollutant emissions.

1850

1851 **Alternative 4 (100 plus 1.5 feet of margin)**

1852

1853 Under Alternative 4, construction related air quality impacts would tend to be similar to
1854 those of the preferred alternative. It can be assumed that because this alternative requires a lower
1855 level of flood damage reduction, less construction over a shorter period of time would be
1856 required which; in turn, would incrementally decrease combustion related emissions and fugitive
1857 dust under that of the preferred alternative.

1858

1859 After implementation of this alternative, the combustion related emissions and fugitive
1860 dust would return to the level of existing conditions. Farming and tilling would continue, and air
1861 quality would reach pre-construction levels. This analysis indicates that construction related air
1862 quality impacts would be less than significant. During construction, best management practices
1863 (such as watering roads and construction sites) would be implemented to minimize fugitive dust
1864 and pollutant emissions.

1865

1866 **“No Action” Alternative**

1867

1868 The “No Action” alternative would involve no construction activity and no change in
1869 project operations. Therefore, effects to air quality resources would remain status quo in the
1870 study area.

1871

1872 4.3.4 Noise

1873

1874 The principal source of noise in the project area is from farming activities, motor vehicle
1875 traffic along major highways and in urban areas, industry, and to a lesser extent from railroad
1876 traffic. Project related impacts to noise would be from operation of construction related
1877 equipment and increased construction related traffic on area roads.

1878

1879 The evaluation and control of construction noise must be considered during the
1880 course of the proposed project. During design and construction, every effort will be made to
1881 ensure the community is aware of the project. Additionally, source control, site noise emissions,
1882 and work hours will be managed on the construction sites to minimize noise emissions.

1883

1884 **Preferred Alternative**

1885

1886 Construction activities related to modifying the existing levee under the preferred
1887 alternative will require the use of heavy earthmoving equipment and mobilization of equipment
1888 on area roads. This equipment would produce some noise during construction periods.
1889 However, it is not anticipated that construction activities would increase noise levels beyond that

1890 typical of farming operations or area traffic in the vicinity. Additionally, construction related
1891 activities would be preformed during “normal business hours” and not during sensitive periods
1892 (i.e., night). Therefore, construction related noise effects are anticipated to be less than
1893 significant.

1894
1895 After project completion, noise levels would return to the level of existing conditions.
1896 Farming and tilling would continue, and noise levels would reach pre-project conditions.
1897 Because adverse noise impacts are not anticipated, additional measures to minimize adverse
1898 effects are not necessary beyond those previously mentioned.

1899
1900 **Alternative 2 (500 year plus 1.5 feet of margin)**

1901
1902 Construction activities to modify the existing levees under Alternative 2 would require
1903 the use of heavy earthmoving equipment. This equipment would produce the same noise during
1904 construction periods as the preferred alternative; and it is anticipated that construction activities
1905 would extend over a longer period of time due to the increased levee construction needed to raise
1906 both levees to the increased level of flood damage reduction. However, it is not anticipated that
1907 construction activities would increase noise levels beyond that typical of farming operations in
1908 the vicinity. Additionally, construction related activities would be preformed during normal
1909 business hours and not during sensitive periods (i.e., night). Therefore, construction related
1910 noise effects are anticipated to be less than significant.

1911
1912 After implementation of this alternative, the noise levels return to the level of existing
1913 conditions. Farming and tilling would continue, and noise would reach pre-construction levels.
1914 This analysis indicates that construction related noise impacts would be less than significant.
1915 Because adverse noise impacts are not anticipated, measures to minimize adverse effects are not
1916 necessary beyond those previously mentioned.

1917
1918 **Alternative 3 (500 year plus 3.0 feet of margin)**

1919
1920 Construction activities to modify the existing levees under Alternative 3 would be similar
1921 to that of Alternative 2, only over a slightly longer period of time.

1922
1923 **Alternative 4 (100 plus 1.5 feet of margin)**

1924
1925 Construction activities to modify the existing levees under Alternative 4 would require
1926 the use of heavy earthmoving equipment. This equipment would produce the same amount of
1927 noise during construction periods as the preferred alternative. Construction related noise is
1928 anticipated over a shorter period of time due to the decreased levee construction needed to raise
1929 the right-bank levee and would be avoided all together at the left-bank levee since no
1930 construction would be required at that location. It is not anticipated that construction activities
1931 would increase noise levels beyond that typical of farming operations in the vicinity.
1932 Additionally, construction related activities would be preformed during “normal business hours”
1933 and not during sensitive periods (i.e., night). Therefore, construction related noise effects are
1934 anticipated to be less than significant.

1935

1936 After implementation of this alternative, the noise levels return to the level of existing
1937 conditions. Farming and tilling would continue, and noise would reach pre-construction levels.
1938 This analysis indicates that construction related noise impacts would be less than significant.
1939 Because adverse noise impacts are not anticipated, measures to minimize adverse effects are not
1940 necessary beyond those previously mentioned.

1941
1942 **“No Action” Alternative**

1943
1944 The “No Action” alternative would involve no construction activity and no change in
1945 project operations. Therefore, no effects to noise in the study area would be expected.

1946
1947 **4.3.5 Visual Quality**

1948
1949 The potential visual quality impacts are discussed in this section in terms of impacts that
1950 the area population may perceive or interpret as pleasing or displeasing characteristics of the
1951 proposed project.

1952
1953 **Preferred Alternative**

1954
1955 Construction of the preferred alternative will require the use of construction related
1956 equipment for the clearing, grubbing, and sloping of the existing levee, the raising and widening
1957 of the existing levee and berms, and the vegetation clearing of trees to obtain borrow material for
1958 the proposed project. Additional construction related impacts include the stockpiling of soil and
1959 other materials needed to construct the levee upgrade. These impacts will be construction
1960 related, short term, and less than significant. The Corps will incorporate minimization measures
1961 into the proposed project to ensure the effects to area visual quality are quickly offset.
1962 Minimization measures will include regrading, reseeding, mulching, and to the extent required,
1963 replanting of trees following construction activities in an effort to return the area to visually
1964 pleasing conditions.

1965
1966 The contrast between natural landforms and the engineering features of the upgraded
1967 levee will be minimal as existing levees are within the proposed project area. Additionally,
1968 much of this area is access limited and; therefore, out of view for most of the area public. The
1969 completed project will not block, eliminate, or screen existing views or vistas, is not adjacent to
1970 critical environmental areas, will not open new access to the site, or change plans to maintain the
1971 existing natural setting of the project area; thus, the changes to the visual quality from the
1972 proposed project is believed to be short-term, mostly construction related and less than
1973 significant.

1974
1975 **Alternative 2 (500 year plus 1.5 feet of margin)**

1976
1977 Construction of Alternative 2 would require similar construction related work as that of
1978 the preferred alternative. The construction related operations would require a longer period of
1979 time to complete due to the increased extent of construction, so equipment would be in the area
1980 longer. However, the visual quality impacts would be no greater than that of the preferred
1981 alternative and thus would be considered less than significant. Similar minimization measure as
1982 the preferred alternative would be implemented.

1983 **Alternative 3 (500 year plus 3.0 feet of margin)**

1984

1985 Construction of Alternative 3 would result in similar effects to the visual quality of the
1986 project area as that described above.

1987

1988 **Alternative 4 (100 plus 1.5 feet of margin)**

1989

1990 Construction of Alternative 4 would require similar construction related work as that of
1991 the preferred alternative. The construction related operations would require a shorter period of
1992 time to complete due to the decreased amount of construction, so equipment would not be in the
1993 area of the right-bank unit as long as in the preferred alternative. Construction equipment would
1994 not occur in the area of Unit L-455 at all since no levee raise is proposed in this area. These
1995 impacts are considered construction related and short term; thus, these impacts are believed to be
1996 less than significant.

1997

1998 **“No Action” Alternative**

1999

2000 The “No Action” alternative would involve no construction activity and no change in
2001 project operations. Therefore, no effects to the visual quality in the study area would be
2002 expected over status quo.

2003

2004 **4.3.5 Hazardous Waste Management**

2005

2006 The potential impacts to hazardous waste sites are discussed in this section in terms of
2007 impacting known sites during times of obtaining borrow soils and constructing and operating the
2008 two levee units.

2009

2010 Hazardous waste areas would not be impacted by any of the build alternatives because
2011 the excavation of borrow materials and the construction activities associated with levee raise and
2012 widening would be conducted outside of areas known to contain hazardous wastes. No post-
2013 construction impacts to hazardous wastes site would be anticipated from the operation of the two
2014 levee units. The No Action Alternative would have no impacts on hazardous waste.

2015

2016 **4.4 Biological Environment**

2017

2018 Comments from the U.S. Fish and Wildlife Service were received on 30 June 2006 and
2019 August 9, 2006 (Appendix D). The Corps’ responses to these draft and final Coordination
2020 Report recommendations have been incorporated in this EA. Comments from the Kansas
2021 Department of Wildlife and Parks (undated letter and letter dated 25 April 2006) and the
2022 Missouri Department of Conservation (letters dated 27 September 1995 and 12 May 2006) also
2023 are included in Appendix D, along with the Corps’ responses.

2024

2025 Engineering Regulation 1105-2-100, Section C-3(d) (5), page C-15 directs that ecological
2026 resources be evaluated using a habitat-based methodology. It also requires that mitigation
2027 features be incrementally justified. However, due to the temporary and minor effects on the
2028 stated resources and given the limited extent and type of effects associated with the proposed

2029 project; along with the avoidance, minimization, and offset features incorporated into the
2030 proposed project description, it was determined that this level of analysis was not needed.

2031

2032 4.4.1 Vegetation

2033

2034 **Preferred Alternative**

2035

2036 Construction of the preferred alternative would result in the raising of the right bank
2037 levee by zero to 3.37 feet; an increase to the levee toe width; an extension to the seepage and
2038 stability berms associated with the levee; and, borrow excavation within an area of
2039 approximately 1,139 acres riverward of R471-460, and approximately 30 acres riverward of L-
2040 455. Lateral expansion of levee R471-460 and seepage berm is estimated at 35 feet to 372.5 feet
2041 landward and approximately 29 feet to 46.5 feet riverward of the existing levee. Lateral
2042 expansion of levee L-455 and seepage berm is estimated at 136.5 to 356.5 feet landward and
2043 approximately 41.5 feet riverward of the existing levee. Expanding the levees would result in
2044 the permanent removal of approximately 1.6 acres of secondary tree growth and 4.7 acres of
2045 shrubland landward of the levees and 5.4 acres of secondary growth trees and 8.0 acres of
2046 shrubland riverward of the levees. The impact to these habitats will be permanent because this
2047 habitat would be kept from growing on the levee areas through normal levee maintenance
2048 practices. Although this secondary growth vegetation is of lesser value when compared to more
2049 mature forests, it still provides a measure of habitat important to resident species. Thus, based
2050 on professional judgment, measures to offset its loss are needed in order to aid resident species
2051 that were temporarily displaced, to be consistent with the Environmental Operating Principles,
2052 and overall to be a fair and reasonable in the Corps efforts to protect the environment. Thus, a
2053 total of 7.0 acres of trees and 12.7 acres of shrubland vegetation will be planted on site
2054 immediately following construction activities. Based on the type of vegetation removed, coupled
2055 with offset, the impacts are believed to be short-term, and less than significant.

2056

2057 Impacts within the 1,139 acres (R471-460) and 30 acres (L-455) to secondary tree growth
2058 and shrubland at the borrow sites would be considered temporary in nature and is therefore,
2059 expected to be less than significant. Considerable amounts of other secondary growth willow
2060 trees and shrublands are found adjacent to these areas; and, over time these areas are expected to
2061 reestablish/revert to existing habitat as the Missouri River flows onto the floodplain.
2062 Additionally, steps will be taken in these borrow areas to minimize effects to this habitat.
2063 Minimization measures include, but are not limited to, avoiding this habitat by first using bare
2064 and/or cropland areas, excavating as deep as possible in treed areas to minimize lateral impacts,
2065 and avoiding any larger older growth trees (greater than 50 feet tall and/or 24-inches diameter of
2066 breast height within 100 feet of the water's edge). Additional minimization techniques to be
2067 used in borrow areas include varying bottom depths of excavated borrow sites, creating islands
2068 within the borrow site through avoidance of specified areas, and spacing borrow areas apart from
2069 one another by approximately 500 feet to provide areas of no disturbance.

2070

2071 Construction work to extend the landward seepage berms also would result in temporary
2072 impacts to approximately 274 acres of primarily agricultural land with minor amounts of
2073 secondary tree growth and shrubland on the right-bank levee, and 44 acres of similar land use on
2074 the left-bank levee. Following construction, these areas would be replanted with a similar

2075 number of trees and shrubs that were removed and allowed to revert back to their existing
2076 conditions as no levee maintenance activities will be conducted on seepage berm areas.
2077 Coordination with Corps representatives of the Missouri River Fish and Wildlife Mitigation
2078 Program has been done to ensure that obtaining borrow material, (particularly from the Elwood
2079 Bend site) is conducted in an appropriate manner so that the area is not diminished in value.
2080 Further coordination among mitigation program specialists will be done to design other possible
2081 methods for borrow excavation as the project gets closer to the construction phase. Thus, these
2082 impacts are expected to be short-term and less than significant.

2083
2084 Modifying the two levees would also permanently impact approximately 4.4 acres of
2085 farmed wetlands landward of the levees and approximately 0.5 acre of farmed wetlands
2086 riverward of the two levees. Impacts to these wetlands, and their associated vegetation, would
2087 result as the areas are filled and sloped, thereby inhibiting the ponding of water. The permanent
2088 loss of wetlands would contradict the Corps' policy of "no net loss of wetland habitat" unless
2089 measures to avoid, minimize, and mitigate their loss is implemented. Therefore, 4.9 acres of
2090 wetlands will be restored onsite and adjacent to existing riverward wetlands concurrently with
2091 construction activities. Wetland impacts would be offset through the scraping and reshaping of
2092 the wetland areas to expand these areas equal to that which was lost. Wetland offset will be
2093 conducted to meet the no net loss of wetland habitat, to be consistent with the Environmental
2094 Operating Principles, and overall to be a fair and reasonable in the Corps efforts to protect the
2095 environment. Although farmed wetlands are of lower value than emergent or forested wetlands,
2096 they none-the-less provide essential functions and values. With the offset proposed, the impacts
2097 to the farmed wetlands are considered less than significant.

2098
2099 Some of the wetlands along both levees consist of acreage enrolled in the U. S. Natural
2100 Resources Conservation Service's (NRCS) Wetland Reserve Program. Wetland impacts have
2101 been coordinated with the NRCS, relevant state agencies, and the USFWS. To the extent
2102 possible, these areas will be avoided and lands outside these protected areas will be used for
2103 borrow. Where necessary, the Corps will use minimization and mitigation measures described in
2104 the NRCS Engineering Field Handbook, May 1997, Chapter 13 "Wetland Restoration,
2105 Enhancement, or Creation" and the "Erodible Land and Wetland Conservation and Reserve
2106 Program" provisions of the Food Security Act of 1985, as amended, to avoid/reduce impacts and
2107 to provide for a more natural setting following construction. These minimization measures
2108 would be similar to those identified above.

2109
2110 During construction, BMP would be used and minimization measures would be
2111 employed. Utilizing these minimization measures will help to reduce impacts; and, in time will
2112 reestablish as Missouri River floods modify this area. Also, construction BMP will be used to
2113 help prevent the transport of invasive species to and from the construction sites.

2114
2115 Grassland strips occurring on and adjacent to the levee and the toe would be impacted
2116 during construction by grading, sloping, and grubbing as the width of the levee and seepage
2117 berm expands. Impacts to grassland vegetation would be temporary but would cease to provide
2118 habitat to existing wildlife (insects, small mammals, etc.) during project construction and for
2119 approximately two to three years after project completion; or until the grassland vegetation
2120 becomes well established. This impact is considered temporary as the completed levee side

2121 slopes would be seeded and mulched with a “levee” seed mix following project completion.
2122 This will reduce erosion; and would in turn provide habitat, loafing, and forage areas for these
2123 species.

2124

2125 Also, grassland strips are found along a considerable portion of the project area and
2126 would provide habitat to any wildlife species temporarily displaced during construction
2127 activities. Therefore, impacts to area grasslands are considered less than significant.

2128

2129 **Alternative 2 (500 plus 1.5 feet of margin)**

2130

2131 Construction of Alternative 2 would result in the raising of the right bank levee by an
2132 average of 3.5 feet along its entire length, an increase to the levee toe width, an extension to the
2133 seepage berms associated with the levee, and the excavation of approximately 1,139 acres
2134 riverward of R471-460, and 30 acres riverward of L-455 of borrow material. Lateral expansion
2135 of levee R471-460 will maximize the project boundaries of 500 feet landward and spread 37 feet
2136 to 60 feet riverward of the existing levee. Lateral expansion of levee L-455 is estimated at 500
2137 feet landward and approximately 41.5 feet riverward of the existing levee.

2138

2139 Expanding the levees would permanently impact approximately 2.2 acres of secondary
2140 tree growth and 6.4 acres of shrubland landward of the levees and approximately 5.4 acres of
2141 secondary growth trees and 8 acres of shrubland riverward of the levees. Impacts to the
2142 secondary tree growth and shrubland within the levee expansion areas, both landward and
2143 riverward, would be considered permanent as trees would be kept from growing in these areas
2144 through normal levee maintenance practices. Although this secondary growth vegetation is of
2145 lesser value when compared to more mature forests, it still provides a measure of habitat
2146 important to resident species. Therefore, measures to offset their loss would be required to aid
2147 resident species that were temporarily displaced, to be consistent with the Environmental
2148 Operating Principles, and overall to be a fair and reasonable in the Corps efforts to protect the
2149 environment. A total of approximately 7.6 acres of secondary tree growth and 14.4 acres of
2150 shrubland is anticipated to be lost as a result of this alternative; therefore, approximately 7.6 and
2151 14.4 acres of “in-kind” habitat would be offset on site. Based on the type of vegetation removed,
2152 coupled with offset, the impacts are believed to be short-term, and less than significant.

2153

2154 Impacts to the secondary tree growth and shrubland at borrow sites would be temporary
2155 and is expected to be less than significant as considerable amounts of other secondary growth
2156 willow trees are found adjacent to these areas. Over time these areas are expected to reestablish
2157 as the Missouri River flows onto the floodplain. The minimization techniques would be the
2158 same as the preferred alternative.

2159

2160 Modifying the two levees would also impact approximately 5.6 acres of farmed wetlands
2161 and their associated vegetation landward of the levees and 0.6 acre of farmed wetlands and their
2162 associated vegetation riverward of the two levees. Impacts to these wetlands, and their
2163 associated vegetation, would result as the areas are filled and sloped, thereby inhibiting the
2164 ponding of water. The permanent loss of wetlands would contradict the Corps’ policy of “no net
2165 loss of wetland habitat” unless measures to avoid, minimize, and mitigate their loss is
2166 implemented. Therefore, 6.2 acres of wetlands will be restored onsite and adjacent to existing

2167 riverward wetlands concurrently with construction activities. Wetland impacts would be offset
2168 through the scraping and reshaping of the wetland areas to expand these areas equal to that which
2169 was lost. Wetland offset will be conducted to meet the no net loss of wetland habitat, to be
2170 consistent with the Environmental Operating Principles, and overall to be a fair and reasonable in
2171 the Corps efforts to protect the environment. Although farmed wetlands are of lower value than
2172 emergent or forested wetlands, they none-the-less provide essential functions and values. With
2173 the offset proposed, the impacts to the farmed wetlands are considered less than significant.

2174
2175 Impacts to the wetlands at borrow sites would be temporary and is expected to be less
2176 than significant. During construction, BMP would be utilized and the minimization measures as
2177 described above would be employed. Using these minimization measures would reduce impacts;
2178 and, with time these areas are expected to reestablish as the Missouri River regularly flows onto
2179 the floodplain. In addition, coordination with Corps representatives of the Missouri River Fish
2180 and Wildlife Mitigation Program will continue to ensure that obtaining borrow material,
2181 particularly from the Elwood Bend site, is conducted in an appropriate manner such that the area
2182 is not diminished in value and is consistent with future plans.

2183
2184 Grassland strips occurring on and adjacent to the toe of the levee would be impacted as
2185 the width of the levee and seepage berm expands. Impacts to grassland vegetation would be
2186 temporary but would cease to provide habitat to existing wildlife (e.g. insects, small mammals)
2187 during project construction and for approximately two to three years after project completion, or
2188 until the vegetation is well established. This impact is considered temporary as the levee side
2189 slopes and seepage berms would be seeded and mulched with a “levee” seed mix following
2190 project completion to help reduce erosion; and, this would provide habitat, loafing, and forage
2191 areas for these species. Also, grassland strips are found along a considerable portion of the
2192 levees and would provide habitat to any wildlife species temporarily displaced during
2193 construction activities. Therefore, impacts to area grasslands are considered less than significant.

2194
2195 **Alternative 3 (500 plus 3.0 feet of margin)**

2196
2197 Construction of Alternative 3 would result in the raising of the right bank levee by
2198 approximately five feet along the entire levee, an increase to the levee toe width, an extension to
2199 the seepage berms associated with the levee, and the excavation of approximately 1,139 acres
2200 riverward of R471-460, and 30 acres riverward of L-455 of borrow material. The project
2201 boundary was set at no more than 500 feet from the center line of the existing levee. The
2202 impacts from the 500 plus 3.0 feet of margin alternative exceed this boundary, but were only
2203 reported to the boundary limit. Thus, lateral expansion of levee R471-460 was set at 500 feet
2204 landward and would spread approximately 60 feet riverward of the existing levee. Lateral
2205 expansion of levee L-455 was set at 500 feet landward and would spread approximately 54 feet
2206 riverward of the existing levee.

2207
2208 Expanding the levees would result in the permanent impact to 2.7 acres of secondary tree
2209 growth and 8 acres of shrubland landward of the levees and 5.4 acres of secondary growth trees
2210 and 8 acres of shrubland riverward of the levees. Although this secondary growth vegetation is
2211 of lesser value when compared to more mature forests, it still provides a measure of habitat
2212 important to resident species. Therefore, measures to offset their loss would be required to aid

2213 resident species that were temporarily displaced, to be consistent with the Environmental
2214 Operating Principles, and overall to be a fair and reasonable in the Corps efforts to protect the
2215 environment. Thus, a total of 8.1 acres of secondary tree growth and 16 acres of shrubland
2216 would be planted to offset the impact. Based on the type of vegetation removed, coupled with
2217 offset, the impacts are believed to be short-term, and less than significant.
2218

2219 Impacts to secondary tree growth at borrow sites would be temporary and is expected to
2220 be less than significant as considerable amounts of other secondary growth willow trees are
2221 found adjacent to these areas. Over time these areas are expected to reestablish as the Missouri
2222 River flows onto the floodplain. The minimization techniques would be the same as the
2223 preferred alternative.
2224

2225 Modifying the two levees would also impact approximately 6.7 acres of wetlands and
2226 their associated vegetation landward of the levees and 0.6 acre of wetlands and their associated
2227 vegetation riverward of the two levees. Impacts to these wetlands, and their associated
2228 vegetation, would result as the areas are filled and sloped, thereby inhibiting the ponding of
2229 water. The permanent loss of wetlands would contradict the Corps' policy of "no net loss of
2230 wetland habitat" unless measures to avoid, minimize, and mitigate their loss is implemented.
2231 Therefore, 7.3 acres of wetlands will be restored onsite and adjacent to existing riverward
2232 wetlands concurrently with construction activities. Wetland impacts would be offset through the
2233 scraping and reshaping of the wetland areas to expand these areas equal to that which was lost.
2234 Wetland offset will be conducted to meet the no net loss of wetland habitat, to be consistent with
2235 the Environmental Operating Principles, and overall to be a fair and reasonable in the Corps
2236 efforts to protect the environment. Although farmed wetlands are of lower value than emergent
2237 or forested wetlands, they none-the-less provide essential functions and values. With the offset
2238 proposed, the impacts to the farmed wetlands are considered less than significant.
2239

2240 Impacts to the wetlands at borrow sites would be temporary and is expected to be less
2241 than significant. During construction, BMP would be used and the minimization measures
2242 described above would be employed. Utilizing these measures would reduce impacts and with
2243 time, these areas are expected to reestablish as the Missouri River flows onto the floodplain. In
2244 addition, coordination with Corps representatives of the Missouri River Fish and Wildlife
2245 Mitigation Program has been done to ensure that obtaining borrow material, particularly from the
2246 Elwood Bend site, is conducted in an appropriate manner such that the area is not diminished in
2247 value and is consistent with future plans.
2248

2249 Grassland strips occurring on and adjacent to the toe of the levee would be
2250 impacted as the width of the levee and seepage berm expands. Impacts to grassland vegetation
2251 would be temporary but would cease to provide habitat to existing wildlife (e.g. insects, small
2252 mammals) during project construction and for approximately two to three years after project
2253 completion, or until the vegetation is well established. This impact is considered temporary as
2254 the levee side slopes and seepage berms would be seeded and mulched with a "levee" seed mix
2255 following project completion to help reduce erosion. This would provide habitat, loafing, and
2256 forage areas to these species. Also, grassland strips are found along a considerable portion of the
2257 levees and would provide habitat to any wildlife species temporarily displaced during
2258 construction activities. Therefore, impacts to area grasslands are considered less than significant.

2259 **Alternative 4 (100 plus 1.5 feet of margin)**
2260

2261 Construction of Alternative 4 would result in the raising of the right bank levees by zero
2262 to 1.2 feet, an increase to the levee toe width, an extension to the seepage and stability berms
2263 associated with the levee, and borrow excavation within an area of approximately 1,139 acres
2264 riverward of R471-460, and approximately 30 acres riverward of L-455. Lateral expansion of
2265 levee R471-460 and seepage berms is estimated at 35 feet to 307.5 feet landward and
2266 approximately 29 feet to 46.5 feet riverward of the existing levee. Expanding the levee would
2267 result in the permanent removal of approximately 1.3 acres of secondary tree growth and
2268 approximately 4.0 acres of shrubland landward of the levees, and approximately 4.5 acres of
2269 secondary growth trees and 6.2 acres of shrublands riverward of the levee. The impact to these
2270 habitats is expected to be permanent because this habitat would be kept from growing on the
2271 levee areas through normal levee maintenance practices. Although this secondary growth
2272 vegetation is of lesser value when compared to more mature forests, it still provides a measure of
2273 habitat important to resident species. Therefore, measures to offset their loss would be required
2274 to aid resident species that were temporarily displaced, to be consistent with the Environmental
2275 Operating Principles, and overall to be a fair and reasonable in the Corps efforts to protect the
2276 environment. Thus, a total of 5.8 acres of “in-kind” trees and 10.2 acres of shrubland vegetation
2277 will be planted on site after construction. Based on the type of vegetation removed, coupled with
2278 offset, the impacts are believed to be short-term, and less than significant.
2279

2280 Impacts within the 1,139 acres (R471-460) and 30 acres (L-455) of secondary tree growth
2281 and shrubland at the borrow sites are temporary in nature and is expected to be less than
2282 significant. Considerable amounts of other secondary growth willow trees and shrublands are
2283 found adjacent to these areas, and over time, these areas are expected to reestablish/revert to
2284 existing habitat as the Missouri River flows onto the floodplain. Additionally, steps will be
2285 taken in these borrow areas to minimize effects to this habitat. Minimization measures are
2286 identical to those listed for the preferred alternative.
2287

2288 Construction work to extend the seepage berms also would result in temporary impacts to
2289 approximately 229.5 acres of primarily agricultural land with minor amounts of secondary tree
2290 growth and shrubland on the right-bank levee. Following construction, these areas would be
2291 allowed to revert back to their existing conditions as no levee maintenance activities will be
2292 conducted over the top of seepage berm areas. Coordination with Corps representatives of the
2293 Missouri River Fish and Wildlife Mitigation Program will continue to ensure that obtaining
2294 borrow material, particularly from the Elwood Bend site, is conducted in an appropriate manner
2295 such that the area is not diminished in value and is consistent with future plans.
2296

2297 Modifying the levee would also permanently impact a total of approximately 3.7 acres of
2298 farmed wetlands landward of the levees and approximately 0.5 acre of farmed wetlands
2299 riverward of the two levees. Impacts to these wetlands, and their associated vegetation, would
2300 result as the areas are filled and sloped, and thereby inhibit the ponding of water. The permanent
2301 loss of wetlands would contradict the Corps’ policy of “no net loss of wetland habitat” unless
2302 measures to avoid, minimize, and mitigate their loss is implemented. Therefore, 4.2 acres of
2303 wetlands will be restored onsite and adjacent to existing riverward wetlands concurrently with
2304 construction activities. Wetland impacts would be offset through the scraping and reshaping of

2305 the wetland areas to expand these areas equal to that which was lost. These wetlands require
2306 offset to meet the no net loss of wetland habitat, to be consistent with the Environmental
2307 Operating Principles, and overall to be a fair and reasonable in the Corps efforts to protect the
2308 environment.

2309
2310 During construction, BMP would be used and minimization measures would be
2311 employed. Using these minimization measures will help to reduce impacts and with time, these
2312 areas will reestablish as the Missouri River floods onto the floodplain reverting this area to pre-
2313 construction conditions. Additionally, construction BMP will be used to help prevent the
2314 transport of invasive species to and from the construction sites.

2315
2316 Grassland strips occurring on and adjacent to the levee and the toe would be impacted
2317 during construction by grading, sloping, and grubbing as the width of the levee and seepage
2318 berm expands. Impacts to grassland vegetation would be temporary but would cease to provide
2319 habitat to existing wildlife (insects, small mammals, etc.) during project construction and for
2320 approximately two to three years after project completion, or until the grassland vegetation
2321 becomes well established. This impact is considered temporary as the completed levee side
2322 slopes would be seeded and mulched with a “levee” seed mix following project completion to
2323 help reduce erosion. In turn this would provide habitat, loafing, and forage areas for these
2324 species. Additionally, grassland strips are found along a considerable portion of the levees and
2325 would provide habitat to any wildlife species temporarily displaced during construction
2326 activities. Thus, impacts to area grasslands are considered less than significant.

2327
2328 **“No Action” Alternative**

2329
2330 The “No Action” alternative would involve no construction activity and no change in
2331 project operations so no wetlands would be impacted. No borrow material would be obtained so
2332 no impacts to forested areas or shrub habitat would occur. Additionally, because the borrow
2333 areas would not be used, no riverward areas would be disturbed and no increased functions of
2334 existing wetland acreage and fishery habitat would be provided.

2335
2336 **4.4.2 Wildlife**

2337
2338 Impacts to wildlife were assessed by determining whether the alternatives under
2339 consideration would cause a loss of wildlife habitat, or cause temporary or permanent avoidance
2340 of the area. In this evaluation, wildlife was considered as all the species of mammals, birds,
2341 reptiles, and amphibians known to occur in the project area.

2342
2343 **Preferred Alternative**

2344
2345 Construction of the preferred alternative would result in temporary impacts to wildlife.
2346 These impacts would be caused by the increased human activity and noise associated with the
2347 construction efforts and impacts to grasslands, wetland vegetation, and terrestrial habitat
2348 resulting from the increased toe width of the levee, the increased width of seepage berms, and
2349 while obtaining borrow material. Construction activities would not be conducted along the entire
2350 length of the levee all at once; so wildlife would only avoid those areas where construction is

2351 occurring to the extent that they feel threatened. Decreased loafing would occur in areas
2352 adjacent to construction activities.

2353
2354 Wildlife which normally traverses the areas under construction would have to travel
2355 greater distances during hunting and foraging; which would in turn increase wildlife use and
2356 competition in neighboring areas. Loss of area habitat types would affect area wildlife by
2357 temporarily and permanently removing summer and winter habitat used by a variety of local and
2358 migratory species, and suitable trees used by squirrel, raccoon, opossum, and various species of
2359 passerines. Wetlands, grasslands, young trees and the associated buds and seeds that provide a
2360 staple food source for area wildlife would be removed. Cottontail rabbits that feed on plants in
2361 open areas along the levees and within the forested areas, and mice that are associated with the
2362 areas grasslands that would be grubbed and reshaped would be left in the open and forced to find
2363 alternative shelter. Rabbits and mice provide a prey base for larger carnivores such as snakes,
2364 coyotes, foxes, and raptors. The temporary absence of the prey species would cause a temporary
2365 absence of the predatory species. Because of the variety of species affected in the immediate
2366 area of construction, this impact could be considered substantial if long-term. However, the
2367 construction related impacts would be temporary in nature, and many of these species would
2368 immediately return to the site following construction. Therefore, the impacts to area wildlife are
2369 considered minor, temporary, and less than significant.

2370
2371 Where appropriate, revegetation through seeding of grasses, planting of trees, and
2372 reshaping of wetland areas would be done as soon as practical after completion of, or concurrent
2373 with, construction activities. This in turn would minimize the length of time soils are exposed
2374 and area habitat is unusable. In time, these areas would revert to pre-construction conditions and
2375 area wildlife could once again feed, breed, and shelter in these areas.

2376
2377 **Alternative 2 (500 plus 1.5 feet of margin)**

2378
2379 Construction of Alternative 2 would result in temporary impacts to wildlife similar to the
2380 preferred alternative but would likely occur for an extended period of time due to the increased
2381 construction time need to complete the project. These impacts would be caused by the increased
2382 human activity and noise associated with the construction efforts, and the permanent and
2383 temporary loss of grassland, wetland vegetation, and/or terrestrial habitat resulting from the
2384 increased toe width of the levee, the increased width of seepage berms, and when obtaining
2385 borrow material. Because of the variety of species affected in the immediate area of
2386 construction, this impact could be considered substantial if long-term. However, the
2387 construction related impacts would be temporary in nature, and many of these species would
2388 immediately return to the site following construction. Therefore, the impacts to area wildlife are
2389 considered minor, temporary, and less than significant.

2390
2391 Where appropriate, revegetation through seeding of grasses, planting of trees, and
2392 reshaping of borrow areas would be done as soon as practical after completion of, or concurrent
2393 with, construction activities. This in turn would minimize the length of time soils are exposed
2394 and area habitat is unusable.

2395
2396

2397 **Alternative 3 (500 plus 3.0 feet of margin)**

2398

2399 Construction of Alternative 3 would result in temporary impacts to wildlife similar to
2400 those for the action above. These impacts would be caused by the increased human activity and
2401 noise associated with the construction efforts, and the permanent and temporary loss of
2402 grassland, wetland vegetation, and terrestrial habitat resulting from the increased toe width of the
2403 levee, the increased width of seepage berms, and when obtaining borrow material. Because of
2404 the variety of species affected in the immediate area of construction, this impact could be
2405 considered substantial if long-term. However, the construction related impacts would be
2406 temporary in nature, and many of these species would immediately return to the site following
2407 construction. Therefore, the impacts to area wildlife are considered minor, temporary, and less
2408 than significant.

2409

2410 Where appropriate, revegetation through seeding of grasses, planting of trees, and
2411 reshaping of borrow areas would be done as soon as practical after completion of, or concurrent
2412 with, construction activities. This in turn would minimize the length of time soils are exposed
2413 and area habitat is unusable.

2414

2415 **Alternative 4 (100 plus 1.5 feet of margin)**

2416

2417 Construction of Alternative 4 would result in temporary impacts to wildlife. These
2418 impacts would be caused by the increased human activity and noise associated with the
2419 construction efforts, and impacts to grassland, wetland vegetation, and terrestrial habitat resulting
2420 from the increased toe width of the levee, the increased width of seepage berms, and when
2421 obtaining borrow material. Construction activities would not be conducted along the entire
2422 length of the levee all at once, so wildlife would only avoid those areas where construction is
2423 occurring to the extent that they feel threatened. Decreased loafing would occur in adjacent
2424 areas during construction activities.

2425

2426 Wildlife which normally traverses the areas under construction would have to travel
2427 greater distances during hunting and foraging, which would in turn increase wildlife use and
2428 competition in neighboring areas. Loss of area habitat types would affect area wildlife by
2429 temporarily and permanently removing summer and winter habitat used by a variety of local and
2430 migratory species, and suitable trees used by squirrel, raccoon, opossum, and various species of
2431 passerines. Wetlands, grasslands, young trees and the associated buds and seeds that provide a
2432 staple food source for area wildlife would be removed. Cottontail rabbits that feed on plants in
2433 open areas along the levees and within the forested areas, and mice that are associated with the
2434 areas grasslands that would be grubbed and reshaped would be left in the open and forced to find
2435 alternative shelter. Rabbits and mice provide a prey base for larger carnivores such as snakes,
2436 coyotes, foxes, and raptors. The temporary absence of the prey species would cause a temporary
2437 absence of the predatory species. Because of the variety of species affected in the immediate area
2438 of construction, this impact could be considered substantial if long-term. However, the
2439 construction related impacts would be temporary in nature, and many of these species would
2440 immediately return to the site following construction. Therefore, the impacts to area wildlife are
2441 considered minor, temporary, and less than significant.

2442

2443 Where appropriate, revegetation through seeding of grasses, planting of trees, and
2444 reshaping of borrow areas would be done as soon as practical after completion of, or concurrent
2445 with, construction activities. This in turn would minimize the length of time soils are exposed
2446 and area habitat is unusable. In time, these areas would revert to pre-construction conditions and
2447 area wildlife could once again feed, breed, and shelter in these areas.

2448

2449 **“No Action” Alternative**

2450

2451 The “No Action” alternative would involve no construction activity, no impacts to area
2452 vegetation, and no change in project operations. Therefore, no effects on wildlife resources in
2453 the study area would be expected.

2454

2455 4.4.3 Aquatic Ecosystem (including fisheries and wetlands)

2456

2457 Impacts to aquatic resources, including fisheries and wetlands, were assessed by
2458 determining whether the alternatives under consideration would result in the loss of these aquatic
2459 resources.

2460

2461 **Preferred Alternative**

2462

2463 Construction of the preferred alternative is not expected to result in significant impacts to
2464 fisheries, including the pallid sturgeon, in the Missouri River because the levees under
2465 consideration are from one quarter to one half mile from the river. The proposed modification to
2466 the levee is not expected to alter the thalweg or any part of the river itself (including shallow
2467 water habitat), and the extensions to the levee toe and seepage berms would occur mainly on the
2468 landside of the levee. The proposed project will remove young trees and modify wetland areas
2469 which provide leaf drop and nutrients to the surrounding area and to the river itself during times
2470 of out-of-bank flows. This nutrient load is made available to Missouri River fishes when river
2471 waters flood onto the floodplain. Lands adjacent to the area will provide this function during the
2472 construction phase of the project, and impacted areas will re-establish/revert to existing
2473 conditions over time. Therefore, the proposed project is expected to have less than significant
2474 effects on Missouri River fisheries.

2475

2476 A total of 4.9 acres of farmed wetlands will be permanently impacted as the width of the
2477 levee toe is increased. Wetlands provide numerous functions and values such as temporary
2478 storage of surface water, maintenance of subsurface hydrology, cycling of nutrients, removal of
2479 “hazardous” elements and compounds, detainment of particulates, export of organic carbon,
2480 varied plant communities, habitat for wildlife, unique areas of open space, and opportunity for
2481 research and pleasure. Impacts to wetlands riverward of the existing levees and within borrow
2482 areas will be short-term, minimal, and less than significant as these areas will quickly revegetate
2483 after completion of construction. Impacts to landward wetlands and those within the riverward
2484 areas of levee expansion will be permanent. This permanent loss of wetlands would contradict
2485 the Corps’ policy of “no net loss of wetland habitat” unless measures to avoid, minimize, and
2486 mitigate their loss is implemented. Sufficient mitigation to offset the impacts to wetland habitat
2487 resulting from this alternative has been proposed as part of the proposed alternative to provide a

2488 no net loss of wetland habitat and is detailed above in the Vegetation section. Therefore, impacts
2489 to area wetlands are considered less than significant.

2490
2491 To offset the loss of approximately 4.9 acres of farmed wetlands occurring along the toe
2492 of the existing levee units, similar amounts of wetlands will be re-established onsite in
2493 accordance with the Corps of Engineers Regulatory Guidance Letter dated December 24, 2002.
2494 Re-establishment will require the manipulation of the physical, chemical, and biological
2495 characteristics of existing areas within the borrow sites. This will be accomplished through the
2496 reshaping and scraping of borrow sites in order to expand their size equal to, or greater than, that
2497 which was lost. This will serve multiple purposes. First, borrow sites will be located in close
2498 proximity to where material is needed; thereby reducing haul time and expense. Second,
2499 obtaining borrow in the manner previously described will offset construction related impacts
2500 with like habitat and reduce mitigation costs.

2501
2502 **Alternative 2 (500 plus 1.5 feet of margin)**

2503
2504 Construction of Alternative 2 is not expected to result in significant impacts to fisheries
2505 in the Missouri River because the levee under consideration is from one quarter to one half mile
2506 from the river. The proposed modification to the levee is not expected to alter the thalweg or the
2507 river itself, and the extensions to the levee width and seepage berms would occur mainly on the
2508 landside of the levee. The proposed project will remove young trees and modify wetland areas
2509 which provide leaf drop and nutrients to the surrounding area. This nutrient load is made
2510 available to Missouri River fishes when river waters flow onto the floodplain. Lands adjacent to
2511 the area will provide this function during the construction phase of the project, and impacted
2512 areas will re-establish over time. Therefore, the proposed project is expected to have less than
2513 significant effects on fisheries.

2514
2515 A total of 6.2 acres of wetland habitat will be impacted as the width of the levee toe and
2516 seepage berms are increased. Wetlands provide numerous functions and values such as
2517 temporary storage of surface water, maintenance of subsurface hydrology, cycling of nutrients,
2518 removal of elements and compounds, detainment of particulates, export of organic carbon, varied
2519 plant communities, habitat for wildlife, unique areas of open space, and opportunity for research.
2520 Impacts to wetlands riverward of the existing levees and within borrow areas, will re-establish
2521 over time so these impacts will be minimal. However, landward wetlands and those within the
2522 riverward areas of levee expansion will be permanently lost. Sufficient mitigation to offset the
2523 impacts to wetland habitat resulting from this alternative has been proposed as part of the
2524 proposed alternative to provide a no net loss of wetland habitat and is detailed above in the
2525 Vegetation section. Therefore, impacts to area wetlands are considered less than significant.

2526
2527 **Alternative 3 (500 plus 3.0 feet of margin)**

2528
2529 Construction of Alternative 3 is not expected to result in significant impacts to fisheries
2530 in the Missouri River because the levee under consideration is from one quarter to one half mile
2531 from the river. The proposed modification to the levee is not expected to alter the thalweg or the
2532 river itself, and the extensions to the levee width and seepage berms would occur on the landside
2533 of the levee. The proposed project will remove young trees and modify wetland areas which

2534 provide leaf drop and nutrients to the surrounding area. This nutrient load is made available to
2535 Missouri River fishes when river waters flow onto the floodplain. Lands adjacent to the area will
2536 provide this function during the construction phase of the project, and impacted areas will re-
2537 establish over time. Therefore, the proposed project is expected to have less than significant
2538 effects on fisheries.
2539

2540 A total of 7.3 acres of wetland habitat will be impacted as the width of the levee toe and
2541 seepage berms are increased. Wetlands provide numerous functions and values such as
2542 temporary storage of surface water, maintenance of subsurface hydrology, cycling of nutrients,
2543 removal of elements and compounds, detainment of particulates, export of organic carbon, varied
2544 plant communities, habitat for wildlife, unique areas of open space, and opportunity for research.
2545 Impacts to wetlands riverward of the existing levees and within borrow areas, will be temporary
2546 and re-establish over time so are considered minimal. However, landward wetlands and those
2547 within the riverward areas of levee expansion will be permanently lost. Sufficient mitigation to
2548 offset the impacts to wetland habitat resulting from this alternative has been proposed as part of
2549 the proposed alternative and is detailed above under the Vegetation section. Therefore, impacts
2550 to area wetlands are considered less than significant.
2551

2552 **Alternative 4 (100 plus 1.5 feet of margin)**
2553

2554 Construction of Alternative 4 is not expected to result in significant impacts to fisheries
2555 in the Missouri River because the levees under consideration are from one quarter to one half
2556 mile from the river. The proposed modification to the levee is not expected to alter the thalweg
2557 or any part of the river itself (including shallow water habitat), and the extensions to the levee toe
2558 and seepage berms would occur mainly on the landside of the levee. The proposed project will
2559 remove young trees and modify wetland areas which provide leaf drop and nutrients to the
2560 surrounding area and to the river itself during times of out-of-bank flows. This nutrient load is
2561 made available to Missouri River fishes when river waters flood onto the floodplain. Lands
2562 adjacent to the area will provide this function during the construction phase of the project, and
2563 impacted areas will re-establish/revert to existing conditions over time. Therefore, this
2564 alternative is expected to have less than significant effects on Missouri River fisheries.
2565

2566 A total of 4.2 acres of wetland habitat will be permanently impacted as the width of the
2567 levee toe is increased. Wetlands provide numerous functions and values such as temporary
2568 storage of surface water, maintenance of subsurface hydrology, cycling of nutrients, removal of
2569 “hazardous” elements and compounds, detainment of particulates, export of organic carbon,
2570 varied plant communities, habitat for wildlife, unique areas of open space, and opportunity for
2571 research and pleasure. Impacts to wetlands riverward of the existing levees within borrow areas
2572 will be short-term, minimal, and less than significant. However, landward wetlands and those
2573 within the riverward areas of levee expansion will be permanently lost. This permanent loss of
2574 wetlands would contradict the Corps’ policy of “no net loss of wetland habitat” unless measures
2575 to avoid, minimize, and mitigate their loss is implemented. Sufficient mitigation to offset the
2576 impacts to wetland habitat resulting from this alternative would be similar to preferred
2577 alternative and is detailed above under the Vegetation section. Therefore, impacts to area
2578 wetlands are considered less than significant.
2579

2580 **“No Action” Alternative**

2581
2582 The “No Action” alternative would involve no construction activity and no change in
2583 project operations. Effects on the aquatic ecosystem would be similar as described above in the
2584 vegetation section under this alternative.

2585
2586 4.4.4 Threatened and Endangered Species

2587
2588 Impacts to Federal and state listed threatened and endangered species were assessed as to
2589 the potential for the project to modify or destroy critical habitat, jeopardize the continued
2590 existence of a listed species, or result in the taking of an individual or the habitat upon which
2591 they depend. Important fish and wildlife habitats for listed species within the project area are
2592 associated with the river and are generally riverward of the main levees. Important threatened
2593 and endangered species habitats include the river, side channels and chutes, cut-off islands and
2594 sloughs, tributary confluences, floodplain scour lakes and blow holes created by past floods,
2595 floodplain forests, emergent wetlands, and former borrow areas. The highest value habitats are
2596 located on the Missouri side of the river around Lake Contrary between river mile 437 and 444
2597 and outside of the proposed project area.

2598
2599 **Preferred Alternative**

2600
2601 The species listed in table 4-1 below were evaluated for impacts because suitable habitat
2602 for these species occurs within the project site and may be altered as a result of construction
2603 activities. The other species that were previously described in Section 3 were not evaluated
2604 because no documented occurrence of these species was found in the immediate project area. A
2605 total of 4.9 acres of wetland habitat and 19.7 acres of terrestrial habitat will be permanently
2606 impacted by the proposed project. The impact to these habitats will be limited to the amount
2607 necessary to complete the levee raise, and any impacts to wetlands and trees landward and within
2608 the berm extension areas riverward of the levee will be mitigated. A sufficient amount of similar
2609 habitat occurs adjacent to the proposed project site for use by these species so impacts are
2610 considered to be less than significant.

2611
2612 Table 4-1. Species Considered by the Proposed Project.

2613

Species	Status	Preferred habitat
American burying beetle	Kansas State Endangered	Agricultural lands, mowed areas, riparian forests
Eastern spotted skunk	Kansas State Threatened	Brushy grasslands and woodland edges
Snowy plover	Kansas State Threatened	Sparsely vegetated wetlands and impoundment shorelines
White-faced ibis	Kansas State Threatened	Wetlands and impoundments

2614
2615 Construction of the preferred alternative is not expected to result in adverse impacts to
2616 fisheries in the Missouri River, including the pallid sturgeon, because the levees under
2617 consideration are from one quarter to one half mile from the river. The proposed modification to

2618 the levee is not expected to alter the thalweg or any part of the river itself (including shallow
2619 water habitat), and the extensions to the levee toe and seepage berms would occur mainly on the
2620 landside of the levee. No adverse effects to bald eagles are expected as construction of the
2621 preferred alternative will not substantially reduce habitat used for feeding, breeding, or sheltering
2622 of this species (avoidance of any larger older growth trees greater than 50 feet tall and/or 24-
2623 inches diameter of breast height within 100 feet of the water's edge). After coordinating with the
2624 USFWS and the relevant state agencies, it is the Corps' determination that the proposed action
2625 would have no adverse effect on federally listed or State listed threatened or endangered species.
2626

2627 **Alternative 2 (500 plus 1.5 feet of margin)**
2628

2629 The species listed in table 4-1 were considered because suitable habitat for these species
2630 occurs within the project site and may be altered as a result of construction activities. A total of
2631 6.2 acres of wetland habitat and 22 acres of terrestrial habitat will be impacted by this alternative.
2632 The impact to these habitats will be limited to the amount necessary to complete the levee raise
2633 and any impacts to wetlands landward and within the berm extension areas riverward, of the
2634 levee will be mitigated. A sufficient amount of similar habitat occurs adjacent to the proposed
2635 project site for use by these species so impacts are considered to be less than significant.
2636

2637 **Alternative 3 (500 plus 3.0 feet of margin)**
2638

2639 The species listed in table 4-1 were considered because suitable habitat for these species
2640 occurs within the project site and may be altered as a result of construction activities. A total of
2641 7.3 acres of wetland habitat and 24.1 acres of terrestrial habitat will be impacted by this
2642 alternative. The impact to these habitats will be limited to the amount necessary and any impacts
2643 to wetlands landward and within the berm extension areas riverward, of the levee will be
2644 mitigated. A sufficient amount of similar habitat occurs adjacent to the proposed project site for
2645 use by these species so impacts are considered to be less than significant.
2646

2647 **Alternative 4 (100 plus 1.5 feet of margin)**
2648

2649 The species listed in table 4-1 were considered because suitable habitat for these species
2650 occurs within the project site and may be altered as a result of construction activities. A total of
2651 4.2 acres of wetland habitat and 16 acres of terrestrial habitat will be impacted by this alternative.
2652 The impact to these habitats will be limited to the amount necessary to complete the levee raise
2653 and any impacts to wetlands landward and within the berm extension areas riverward of the
2654 levee will be mitigated. A sufficient amount of similar habitat occurs adjacent to the proposed
2655 project site for use by these species so impacts are considered to be less than significant.
2656

2657 **“No Action” Alternative**
2658

2659 The “No Action” alternative would involve no construction activity and no change in
2660 project operations. No reshaping of riverward wetland areas would occur so increases in their
2661 functions would not be provided. Effects on threatened and endangered species in the study area
2662 would remain status quo.
2663

2664 **4.5 Socio-Economic Environment**

2665

2666 4.5.1 Demography

2667

2668 Any alternative allowing the R471-460 levee to regain certification would help avert an
2669 otherwise likely population decline in the right bank Elwood/Wathena area as well as help
2670 stabilize population levels in the entire study area, possibly even setting the stage for modest
2671 future population increases. Recertification would be accomplished by Alternatives 1, 2, and 3
2672 but not by Alternative 4. Normal operations would continue at the Missouri Air Guard base,
2673 resulting in the continued presence in the right bank area of several hundred trainees and
2674 employees. Besides directly supporting population levels in the Elwood/Wathena area, the
2675 presence of the National Guard and their spending on area retail and services would help
2676 maintain the healthy economic climate that is vital to long term population maintenance and
2677 growth. Recertification also would reduce costs to residents and business owners due to
2678 increased flood insurance premiums and stricter building code requirements, removing
2679 disincentives that might cause businesses and residents to relocate from the Elwood area and
2680 result in a sharp population reduction.

2681

2682 Although effects in the L-455 area would be more modest, the maintenance of one of the
2683 metro area’s largest employers along with the retail and service demand associated with the base
2684 should be a stabilizing influence on the population of St. Joseph. In addition to the benefits of
2685 levee recertification, reduced flood damage potential also would remove another possible source
2686 of future population decline in the Elwood/Wathena area. All four of the build alternatives
2687 would provide increased flood damage reduction in the R471-460 area, with the greatest benefits
2688 provided by alternative 3, 2, 1, and 4 respectively. Alternatives 3 and 2 also would produce
2689 additional flood damage reduction in the L-455 area, while Alternatives 1 and 4 would not.
2690 Finally, modest transitory population increases could occur in both the right and left bank areas
2691 in connection with project construction. Alternatives 1, 2, and 3 would be beneficial to the
2692 Demography of the St. Joseph metropolitan area. Alternative 4 could have adverse affects to the
2693 area.

2694

2695 **“No Action” Alternative**

2696

2697 If the levee is not improved and returned to certification standards, the Missouri Air
2698 Guard base that dominates the R471-460 area probably would be closed. This would reduce
2699 both the right bank and the St. Joseph metropolitan area population by removing several hundred
2700 trainees from the study area. The Elwood/Wathena area, which already struggles to attract
2701 economic development, would be saddled with additional burdens, greater flood damage
2702 potential, and increased costs due to flood insurance premiums and building elevation
2703 requirements in its efforts to retain and strengthen its economic base. The lost jobs and incomes
2704 would depress retail activity around Elwood and Wathena, and these effects could be felt even in
2705 the left bank urban area. A declining population in the Elwood/Wathena area would be the likely
2706 result. Population growth in the L-455 area also would probably be adversely affected in the
2707 long term. The “no Action” alternative could have adverse affects to the project area.

2708

2709

2710 4.5.2 Development and Economy

2711
2712 Implementation of alternatives to improve the R471-460 and L-455 levee units would
2713 result in direct and indirect economic benefits to the entire study area. First, costly flood damage
2714 for business owners and residents would be prevented in all but the most catastrophic flood
2715 events. In the R471-460 area, all four alternatives considered would increase physical flood
2716 damage reduction, with the greatest damage prevention provided by (in order) alternatives 3, 2,
2717 and 1. Alternative 4 also would provide significant flood damage reduction, although less than
2718 the other three alternatives. In the L-455 area, alternatives 2 and 3 produce physical flood
2719 damage reduction benefits in the industrial, residential and agricultural portions of the area,
2720 while alternatives 1 and 4 produce no such benefits on the left bank. The L-455 area also would
2721 indirectly benefit from flood damage reduction in the R471-460 area since the St. Joseph airport
2722 would be better protected.

2723
2724 Second, the regulatory burdens of decertification in the right bank area, including flood
2725 insurance expenses and requirements to elevate new buildings, would be eliminated; making it
2726 easier to build new homes, expand existing businesses and facilities and open new ones.
2727 Alternatives 1, 2 and 3 would allow R471-460 to regain certification, while alternative 4 would
2728 not. In addition, recertification would greatly reduce the likelihood of losing the Air National
2729 Guard base as well as other businesses and facilities in the right bank area. Continued operation
2730 of these facilities in and around Elwood would keep hundreds of jobs and incomes in the study
2731 area and would provide continued consumer demand that would bolster retail and service
2732 concerns on both the left and right banks. Prospects for progressive future economic
2733 development in the study area, particularly in and around Elwood, would be greatly
2734 strengthened. Finally, construction of any of the four alternatives would provide short and
2735 medium term study area impacts in terms of additional jobs, incomes and spending.

2736
2737 **“No Action” Alternative**

2738
2739 Failure to implement any of the four construction alternatives would result in a
2740 continuing potential for catastrophic flood damage in the R471-460 area. The rural
2741 Elwood/Wathena area, which already struggles to attract economic development, would be
2742 saddled with additional burdens – continuing potential for catastrophic economic losses due to
2743 physical flood damage affecting all properties in the protected area as well as increased
2744 regulatory costs due to stricter building codes and new flood insurance premiums. The Missouri
2745 Air National Guard base almost certainly would relocate from the study area, and other large
2746 businesses and facilities in the R471-460 area also could flee the ongoing flood risk. Expansion
2747 of existing businesses would be discouraged. Many current residents would relocate from the
2748 Elwood/Wathena area and few new residents would replace them. On the left bank, residual
2749 annualized economic flood losses in the L-455 area, while much less severe than on the right
2750 bank, would continue to be an issue in the no action case. Loss of the ANG base on the right
2751 bank would be detrimental to the left bank area since several hundred area jobs would be lost
2752 along with associated consumer demand for retail and services. The main St. Joseph area airport
2753 would continue to be subject to severe flood damage and operational interruptions, adversely
2754 affecting businesses on the left bank. Retail and service businesses in St. Joseph would be hurt
2755 by the decline of the nearby Elwood area.

2756 4.5.3 Land Use

2757
2758 The following applies equally to alternatives 1, 2, and 3. Land use in the area following
2759 construction of the levee project will convert portions of existing land use types to permanently
2760 unusable area. As the levee is expanded, deciduous trees, shrubland, grassland, wetlands,
2761 naturally bare areas, and cultivated lands will be replaced with fill. The resulting impacts to area
2762 wildlife habitat have been minimized and offset to the maximum extent as described earlier in
2763 this EA. Impacts on developed areas will be minimal, temporary, and construction related.
2764 Increased development could occur within the area floodplain but would be subject to future
2765 floodplain management plans. Construction will require the Herzog Sand and Gravel Company
2766 to temporarily move current stockpiles of material so that the seepage berms may be constructed.
2767 Following construction, the stockpiles may be returned to their original “resting spots”. This
2768 impact is believed to be short-term, construction related, and insignificant. Impacts resulting
2769 from Alternative 4 would be similar to the No Action Alternative below.

2770
2771 **No Action” Alternative**

2772
2773 The “No Action” alternative would involve no construction activity and no change in
2774 project operations. This condition would likely not change land use from existing conditions and
2775 thereby limit increases in economic development. This could have a substantial impact to the
2776 area economy but would likely be a less than significant impact overall.

2777
2778 4.5.4 Transportation

2779
2780 **Preferred Alternative**

2781
2782 Construction of the preferred alternative will result in slight disruptions of traffic through
2783 the St. Joseph metropolitan area. These disruptions would result from an increase in the use of
2784 roads and byways by construction related equipment. The disruption is expected to be less than
2785 significant.

2786
2787 After project completion, area roads are expected to experience minimal to no flooding
2788 during the 100-year event. Thus, operation of the completed project will have a substantial
2789 beneficial affect to area roads and byways.

2790
2791 **Alternative 2 (500 plus 1.5 feet of margin)**

2792
2793 Construction of Alternative 2 will result in slight disruptions of traffic through the St.
2794 Joseph metropolitan area. These disruptions would result from an increase in the use of roads
2795 and byways by construction related equipment. Traffic under this alternative is expected to be
2796 slightly greater than the preferred alternative because the increased level of flood damage
2797 reduction would likely require an increase in the usage of the roads and byways by construction
2798 related equipment over a longer period of time. However, the disruption is expected to be less
2799 than significant.

2800

2801 After project completion, area roads are expected to experience minimal to no flooding
2802 during the 500-year event. Thus, operation of the completed project will have a substantial
2803 beneficial affect to area roads and byways.

2804

2805 **Alternative 3 (500 plus 3.0 feet of margin)**

2806

2807 Construction of Alternative 3 will result in slight disruptions of traffic through the St.
2808 Joseph metropolitan area. These disruptions would result from an increase in the use of roads
2809 and byways by construction related equipment. Traffic under this alternative is expected to be
2810 slightly greater than the preferred alternative because the increased level of flood damage
2811 reduction would likely require an increased in the usage of the roads and byways by construction
2812 related equipment over a longer period of time. However, the disruption is expected to be less
2813 than significant.

2814

2815 After project completion, area roads are expected to experience minimal to no flooding
2816 during the 500-year event. Thus, operation of the completed project will have a substantial
2817 beneficial affect to area roads and byways.

2818

2819 **Alternative 4 (100 plus 1.5 feet of margin)**

2820

2821 Construction of Alternative 4 would result in slight disruptions of traffic through the St.
2822 Joseph metropolitan area. These disruptions would result from an increase in the use of roads
2823 and byways by construction related equipment. The disruption is expected to be less than
2824 significant.

2825

2826 After project completion, area roads will still experience minimal flooding during the
2827 100-year event. Thus, operation of the completed project could pose a negative effect to area
2828 roads and byways.

2829

2830 **“No Action” Alternative**

2831

2832 The “No Action” alternative would involve no construction activity and no change in
2833 project operations. This condition could pose a problem to transportation during a 100-year
2834 flood event. Area roads could be flooded impairing evacuation and rescue of the local
2835 population. As such, negative impacts to transportation could occur as a result of the no action
2836 alternative.

2837

2838 4.5.5 Utilities/Water supply

2839

2840 **Preferred Alternative**

2841

2842 The utilities in the project area consist of five known utility lines within the right bank
2843 unit. These lines will be subject to a raise as a result of the proposed project. The utility lines
2844 will be protected during relocation with no or minimal anticipated interruption in service. There
2845 are no known utility lines within the area of the left bank unit subject to a raise. As such, the

2846 impacts to utilities and water supply lines from the proposed project are believed to be less than
2847 significant.

2848

2849 **Alternative 2 (500 plus 1.5 feet of margin)**

2850

2851 The impacts under this alternative would be similar to those listed for the preferred
2852 alternative.

2853

2854 **Alternative 3 (500 plus 3.0 feet of margin)**

2855

2856 The impacts under this alternative would be similar to those listed for the preferred
2857 alternative.

2858

2859 **Alternative 4 (100 plus 1.5 feet of margin)**

2860

2861 The impacts under this alternative would be similar to those listed for the preferred
2862 alternative.

2863

2864 **“No Action” Alternative**

2865

2866 The “No Action” alternative would involve no construction activity and no change in
2867 utility relocation. The No Action Alternative would have no significant impact on the utilities
2868 and water supply lines in the St. Joseph metropolitan area.

2869

2870 4.5.6 Flood damage reduction

2871

2872 **Preferred Alternative**

2873

2874 Construction of the preferred alternative would result in an increased level of flood
2875 damage reduction for the St. Joseph metropolitan area by allowing passage of the one percent
2876 flood event with 90 percent reliability. Additionally, the preferred alternative would allow for
2877 FEMA to re-certify the existing levee. FEMA re-certification could result in lower flood
2878 insurance policies, increased flood damage reduction to the St. Joseph metropolitan area
2879 infrastructure, and increased economic growth. The preferred alternative would have a
2880 substantial beneficial impact to the St. Joseph metropolitan area.

2881

2882 **Alternative 2 (500 plus 1.5 feet of margin)**

2883

2884 Construction of alternative 2 would result in an increased level of flood damage reduction
2885 for the St. Joseph metropolitan area over that of the preferred alternative. This alternative would
2886 allow passage of the 0.2 percent (500-year plus 1.5 feet of margin) flood event with 90 percent
2887 reliability. Additionally, the increased level of flood damage reduction alternative would allow
2888 FEMA to re-certify existing levees. FEMA re-certification could result in lower flood insurance
2889 policies, increased flood damage reduction to the St. Joseph area infrastructure, and increased
2890 economic growth. The increased level of flood damage reduction alternative would have a

2891 substantial beneficial impact to the St. Joseph metropolitan area over that of the preferred
2892 alternative.

2893 **Alternative 3 (500 plus 3.0 feet of margin)**

2894

2895 Construction of alternative 3 would result in an increased level of flood damage reduction
2896 for the St. Joseph metropolitan area over that of the preferred alternative. This alternative would
2897 allow passage of the 0.2 percent (500-year plus 3.0 feet of margin) flood event with 90 percent
2898 reliability. Additionally, the increased level of flood damage reduction alternative would allow
2899 FEMA to re-certify existing levees. FEMA re-certification could result in lower flood insurance
2900 policies, increased flood damage reduction to the St. Joseph area infrastructure, and increased
2901 economic growth. The further increased level of flood damage reduction alternative would have
2902 a substantial beneficial impact to the St. Joseph metropolitan area over that of the preferred
2903 alternative.

2904

2905 **Alternative 4 (100 plus 1.5 feet of margin)**

2906

2907 Construction of Alternative 4 would result in an increased level of flood damage
2908 reduction for the St. Joseph metropolitan area by allowing passage of the one percent flood event
2909 with 75 percent reliability. However, this alternative would not allow FEMA to re-certify the
2910 levee. This in-turn would not allow lower flood insurance policies, would only slightly increase
2911 flood damage reduction to the St. Joseph metropolitan area infrastructure, and could possibly
2912 stymie economic growth. It could have a negative impact to the St. Joseph metropolitan area
2913 through decreased economic development.

2914

2915 **“No Action” Alternative**

2916

2917 The “No Action” alternative would involve no construction activity and no change in
2918 project operations. This alternative would not allow FEMA re-certification of the area levees,
2919 would increase chances of area flooding, and could potentially stymie economic development in
2920 the area. The alternative would have a substantial negative impact on the St. Joseph
2921 metropolitan area.

2922

2923 **4.5.7 Recreation**

2924

2925 The following applies equally to all four of the build alternatives. Recreational use in the
2926 project area primarily involves boating and fishing. Most of the land in the project area is
2927 privately owned and access limited. Some hiking and wildlife viewing is conducted within the
2928 project area, and these activities could be temporarily impacted during construction periods. It is
2929 believed that hiking and wildlife viewing will be returned to their pre-construction state
2930 following construction; thus the impacts will be short-term, construction related, and
2931 insignificant.

2932

2933

2934

2935

2936

2937 **“No Action” Alternative**

2938

2939 The “No Action” alternative would involve no construction activity and no change in
2940 project operations. Therefore, no effects to recreational resources in the study area would be
2941 expected.

2942

2943 4.5.8 Archaeological & Historic Resources

2944

2945 **All Build Alternatives**

2946

2947 The Corps initiated Section 106 coordination with the Kansas and Missouri State Historic
2948 Preservation Officers (SHPO’s) in 2001. At that time, the Corps recommended that no
2949 archeological survey be required for a majority of the proposed levee work, because the
2950 proposed levee was to be constructed on accreted land and on land previously disturbed by the
2951 construction of the existing levee. A small segment of the study area in Kansas was
2952 recommended for survey. Both SHPO’s concurred with these recommendations. The
2953 archeological survey was conducted in 2002. No archeological sites or materials were identified
2954 during the survey and no further archeological investigations on the levee alignment are
2955 recommended. The Kansas SHPO concurred with this recommendation on July 8, 2002; with
2956 the stipulation that any additional ground disturbing activities (e.g. borrow areas), be submitted
2957 for review prior to construction.

2958

2959 In 2006, the Corps identified the general location of potential borrow areas for the
2960 proposed project. All of these areas were located in portions of the project adjacent to the levees.
2961 In a letter to the SHPO (March 7, 2006), the Corps recommended that based on their findings
2962 that no survey be conducted for the potential borrow areas because they are located on accreted
2963 land, land previously disturbed by past borrowing activity, and land that has very low potential
2964 for containing intact archeological sites. The SHPO concurred with these recommendations in a
2965 letter dated March 23, 2006. As required, the Corps will coordinate the project with affiliated
2966 Native American tribes potentially impacted by the proposed work.

2967

2968 If additional ground disturbing activities are needed for the project, further coordination
2969 with the SHPO’s and Native American tribes will be required. Also, in the unlikely event that
2970 archeological deposits or other cultural resources are encountered during construction, work in
2971 the area of discovery would cease and the discovery investigated and coordinated with the
2972 appropriate SHPO and federally recognized Native American tribes.

2973

2974 No historic properties are recorded within the area of the proposed alternatives. These
2975 alternatives, all following the same alignment but with differing footprint widths, were found to
2976 have a low potential for unrecorded archeological sites because they are primarily situated on
2977 accreted land and land previously disturbed by construction of the existing levee. Based on those
2978 factors, the Corps recommended no further investigations be conducted for any of the
2979 alternatives. The Kansas and Missouri SHPO’s have concurred with these recommendations.

2980

2981 The locations of the recorded shipwrecks will be avoided during borrow or dredge
2982 material acquisition. If these areas cannot be avoided, then additional investigations and SHPO
2983 coordination will be done. Also, if a new alignment is chosen or different borrow locations are

2984 selected for the project, further coordination with SHPO and Native American tribes will be
2985 conducted. For all of the build alternatives, no impacts to archaeological or historic resources
2986 are anticipated.

2987
2988 **“No Action” Alternative**

2989
2990 The “No Action” alternative would result in no ground disturbances and would not have
2991 an effect on cultural resources.

2992
2993 4.5.9 Environmental Justice

2994
2995 **Preferred Alternative**

2996
2997 The majority of the persons in the proposed project area reported their race as “White”.
2998 This is followed by Blacks, Hispanic/Latino, Other races, Native American/ Alaskan, Asian, and
2999 finally Pacific Islander. When the total populations of the other than white races are summed,
3000 only a very small percentage consists of “minority” races. There is no reason to believe that the
3001 St. Joseph flood damage reduction study would have a disproportionate adverse effect on
3002 minority populations in the study area.

3003
3004 The level of education and/or literacy rates for the adult population provides a critical
3005 measure of the likelihood and the ability of the community to know about and participate in
3006 public meetings, to comment on written proposals and to otherwise participate in the decision-
3007 making process. From the Census 2000 data, over 80% of residents in each county are high
3008 school graduates. Thus, there are generally no reasons to believe that the educational levels of
3009 the residents within these counties would prohibit them from engaging in the public decision-
3010 making process.

3011
3012 Information on whether languages other than English are spoken among the population,
3013 and percentage distribution of these languages, is important in determining effective public
3014 participation processes. According to the U.S. Census Bureau (2000), 96% of individuals age
3015 five and over speak English. The percent of language other than English that is spoken in the
3016 area is about 2.8%. Thus, there are generally no reasons to believe that the language of the
3017 residents within these counties would prohibit them from engaging in the public decision-making
3018 process.

3019
3020 Children under age five and elderly populations above age 65 are considered to be
3021 sensitive populations that may experience disproportionate impacts from environmental
3022 stressors. From the data presented in Section 3.3.10 above, there is no reason to believe that the
3023 proposed flood damage reduction project would have a disproportionate adverse impact on this
3024 sector of the sensitive population. Overall, the impacts from the proposed project are equally
3025 shared across racial and economic spectrums, thus, the impacts are not considered to be
3026 disproportionate.

3027
3028
3029

3030 **Alternative 2 (500 plus 1.5 feet of margin)**

3031
3032 Alternative 2 would have the same effects on the “sensitive population indicators” as the
3033 preferred alternative described above.

3034
3035 **Alternative 3 (500 plus 3.0 feet of margin)**

3036
3037 Alternative 3 would have the same effects on the “sensitive population indicators” as the
3038 preferred alternative described above.

3039
3040 **Alternative 4 (100 plus 1.5 feet of margin)**

3041
3042 Alternative 4 would have the same effects on the “sensitive population indicators” as the
3043 preferred alternative described above.

3044
3045 **“No Action” Alternative**

3046
3047 The No Action Alternative could make the St. Joseph metropolitan area more susceptible
3048 to area flooding during the 100-year flood event. Because the area population contains more
3049 minorities over that of the State average; a negative, but less than significant impact, could occur
3050 to the sensitive population indicators within the project area.

3051
3052 **4.6 Cumulative Impacts**

3053
3054 The combined incremental effects of human activity are referred to as cumulative
3055 impacts. While these effects may be insignificant on their own, accumulated over time and from
3056 various sources can result in serious degradation of the environment. The analysis must consider
3057 past, present and reasonably foreseeable actions in the study area. The analysis must include
3058 consideration of actions outside of the Corps, to include other State and Federal agencies. As
3059 required by NEPA, the Corps has prepared the following assessment of cumulative impacts
3060 related to the alternatives being considered in this EA.

3061
3062 The potential impacts resulting from the no action alternative have been analyzed and; for
3063 the most part, there will be no significant impacts to most of the human environment. Exception
3064 to this analysis can be found in the areas of human safety and economic development. The
3065 overall potential impacts of the proposed project have been analyzed; and are considered
3066 minimal because the actions consist primarily of improvements to an already existing flood
3067 damage reduction system.

3068
3069 The methodology used to determine the potential for substantial cumulative impacts
3070 included the following:

- 3071
3072 1. Identify the location and extent of impacts resulting from the proposed flood damage
3073 reduction action during both the construction and operational phase.

3074

3075 2. Identify all past, present, and reasonably foreseeable future public and private actions
3076 from existing reports and through interviews with local planning agencies that may result in
3077 cumulative impacts. These actions are defined as actions occurring regionally or in the project
3078 boundary area and includes demographic trends, land use changes, Corps programs, other
3079 governmental agency actions, and past and current private development in the area surrounding
3080 the proposed project. Foreseeable future actions include plans that have been identified and
3081 defined with respect to a future timeframe and general location for the proposed development or
3082 activity.

3083
3084 3. Determine the cumulative impact zone. The boundary of the cumulative impact
3085 analysis zone varies according to the resource evaluation category considered. For many of the
3086 resource categories considered, the impacts of the proposed action are not expected to extend
3087 beyond the footprint of the project boundaries.

3088
3089 4. Determine the substantial impacts. The determination of substantial impacts for the
3090 cumulative analysis is defined in 40 CFR, §1508.27 (Regulations for Implementing the National
3091 Environmental Policy Act). It requires consideration of both the intensity and context of the
3092 impacts evaluated.

3093
3094 5. The impacts of past, present, and reasonably foreseeable future actions, in association
3095 with implementation of the proposed activity, are discussed with respect to each of the resource
3096 evaluation categories. The discussion of the no action alternative focuses on identifying the
3097 anticipated impacts of not implementing the proposed action.

3098
3099 **Past Actions**

3100
3101 **Rosecrans Air National Guard Base**

3102
3103 Rosecrans Air National Guard Base consists of approximately 302 acres of land located
3104 between Kansas and Missouri on an oxbow island just west of the Missouri River and St. Joseph,
3105 Missouri. There are four sites in this area that have soil or groundwater contamination requiring
3106 further characterization and possible remedial actions. Primary contaminants of concern are:
3107 aircraft fuels, chlorinated solvents, strippers, waste oils, toluene, polynuclear aromatic
3108 hydrocarbons, various organic chemicals, arsenic and cadmium. The underground storage tank
3109 site has one or more tanks known to have leaked fuel.

3110
3111 **Rosecrans Field Rifle Range**

3112
3113 This 59.3 acre site is in St. Joseph, Missouri. The Department of Defense began using
3114 this site in 1942. The former rifle range is now divided between private owners, the Park
3115 Department of the city of St. Joseph and the State Highway Commission. There is possible
3116 contamination of heavy metals at this site.

3117
3118
3119
3120

3121 **Missouri River**

3122
3123 Man-made features and natural processes have affected the Missouri River conditions. A
3124 major man-made feature that effects water surface elevations includes the Missouri River Levee
3125 System.

3126
3127 The Missouri River has been subject to many natural processes that have affected river
3128 stage. A general decline river stage is anticipated to occur during low flows (20,000 cfs to
3129 100,000 cfs), and a general increase in river stage is anticipated to occur during high flows
3130 (<100,000 cfs). These flow and stage fluctuations are primarily attributed to the accretion of
3131 land and subsequent vegetation establishment behind dikes placed for navigation channel
3132 alignment.

3133
3134 The establishment of woody vegetation, primarily trees, stabilizes the accreted land from
3135 erosion and allows the accretion and vegetation cycle to continue further into the channel.
3136 Substantial accretion and tree establishment within the project area has occurred along both
3137 banks of the Missouri River.

3138
3139 Accreted land tree growth leads to rising stages for a given flow as conveyance area is
3140 decreased and over bank roughness is substantially increased. The accretion/vegetation cycle is
3141 also partially responsible for the decreasing stages of less than bank-full events. The existing
3142 dikes and accreted land has confined flow to the navigation channel, thereby inducing higher
3143 velocities and a general decline in the bed elevation.

3144
3145 In accordance with the *USFWS 2003 Amendment to the 2000 Biological Opinion on the*
3146 *Operation of the Missouri Mainstem Reservoir System and the Operation and Maintenance of*
3147 *the Missouri River Bank Stabilization and Navigation Project*, the Corps is working on the
3148 restoration of shallow water habitat (SWH) for the federally endangered pallid sturgeon along
3149 the Missouri River. Restoration includes excavating notches, pilot channels and chutes,
3150 dredging, and dike modifications.

3151
3152 By constructing these river control modifications, accreted land is either removed or
3153 allowed to erode. The accreted lands removed by these modifications are replaced with shallow
3154 slack water areas that provide a rich environment for the pallid sturgeon as well as other wildlife.
3155 While providing an ecological benefit through diversifying the Missouri River ecosystem, the
3156 SWH program also helps deter the accretion/vegetation cycle contributing to the upward stage
3157 trends of high flows in the Missouri River. The design of these dike/bank modifications
3158 discourages further accretion at that location and encourages bank loss at each site, thereby
3159 increasing conveyance. With the ongoing SWH work along the Missouri River it is assumed that
3160 this continued widening of the channel will negate any further effects due to accretion and
3161 vegetation of those accreted lands. The 1993 flood calibration fully accounted for all changes in
3162 the fluvial geomorphology of the Missouri River that affect high stages in the project area.

3163
3164 Population growth has occurred in almost all of the project area, especially within
3165 established urban areas. Expansion of these urban areas and associated habitat loss probably
3166 represents the most serious threat to fish and wildlife resources in the project area. Urban areas

3167 continue to expand onto traditionally agricultural lands and on the floodplain. The Federal
3168 Emergency Agency’s National Flood Insurance Program currently regulates development on the
3169 floodplain. Although minimizing development within the mapped 100-year flood plain, this
3170 program does not prevent development on the natural floodplain outside of the 100-year
3171 floodplain boundary.
3172

3173 Per FEMA mapping, the areas currently protected by the existing levees are outside of
3174 the 100-year floodplain. Development that occurs within the floodplain would not be in
3175 violation of Executive Order 11988. These protected areas are urbanized and development has
3176 been in place for many years. Development induced by the levees is expected to occur because
3177 open space remains.
3178

3179 These actions have resulted in substantial changes in land use and in adverse effects on
3180 water quality, vegetation, and riparian and riverine habitat. Groundwater quality from the
3181 contamination at the Air National Guard Base and Field Rifle Range are of general concern.
3182 However, based on the scope and associated construction of the proposed project, no cumulative
3183 effects are anticipated.
3184

3185 **Present Actions:**
3186

3187 The Mid-America Regional Council (MARC), bi-state, and regional economic
3188 development agencies will continue to develop a growth management plan and program focused
3189 on:

- 3190 • Developing a consistent set of planning and development policies, and zoning and
3191 building code regulations to be applied equally to the cities and surrounding areas.
- 3192 • Working with homebuilders to stimulate the construction of affordable single and
3193 multi-family housing.
- 3194 • Working with federal, state and local agencies to coordinate
3195 expansion/augmentation of public streets, water and sewerage systems serving the
3196 areas surrounding the project site; improve schools, commercial services, quality
3197 of life programs, and job opportunities for residents.
- 3198 • Promoting the use of Best Management Practices and other environmental
3199 controls during construction activities, which have reduced the potential impact of
3200 these activities on surface waters.
- 3201 • Constructing roadways and other facilities, which may have resulted in short- and
3202 long-term increases in:
 - 3203 ○ Levels of particulate matter released into the atmosphere.
 - 3204 ○ Noise levels in the surrounding area.
 - 3205 ○ Soil displacement and subsequent erosion leading to an increase in
3206 sediment load in surface waters.
- 3207 • Existing dredging operations near project sites may have resulted in:
 - 3208 ○ The release of particulate matter and carbon monoxide to the atmosphere.
 - 3209 ○ Increased noise levels in the surrounding community.
 - 3210 ○ Modification in the sediment load, contaminants and debris within the
3211 surface waters of the Missouri River within the region.

- 3212 • Industrial operations in the area, which have resulted in the release of pollutants
3213 into the atmosphere, including particulate matter.
- 3214 • Vehicle-related air emissions and noise associated with traffic.
- 3215 • Prior levee and water control construction activities which have altered the natural
3216 flow of the river during both normal flow and flood flow conditions.
- 3217 • Activities associated with the annual maintenance of the Missouri River Bank
3218 Stabilization and Navigation Project.
- 3219 • The effects of prior flooding and borrow activities in the foreshore area.
- 3220 • Past industrial activities in the area that have resulted in groundwater
3221 contamination.
- 3222 • Development in the floodplain that has resulted in increased impermeable
3223 surfaces such as buildings, roadways, and parking lots. The increase in
3224 impermeable surface has resulted in a decrease in recharge to the alluvial aquifer,
3225 and a corresponding increase in the amount of surface water runoff.
- 3226 • Development and road building may have resulted in run off containing
3227 petroleum compounds that could infiltrate groundwater, resulting in potential
3228 degradation of groundwater quality.
- 3229 • Development and road construction, which has resulted in soil being removed or
3230 disturbed, which has led to localized erosion.
- 3231 • Vehicle and equipment use, which could have resulted in the absorption by
3232 sediment of petroleum compounds contained in run-off from roads and parking
3233 lots.
- 3234 • Construction activities included in the consideration of past and present actions
3235 include the existing facilities on-site, plus construction projects currently in
3236 progress. The construction, alteration, repair, rehabilitation and maintenance of
3237 buildings, structures, site improvements, and utility systems, as required, to
3238 ensure that properties are capable of meeting the requirements of changing
3239 initiatives and programs.
- 3240 • Fuel and petroleum product storage and dispensing operations including the
3241 operation of remotely located fuel and petroleum product storage and dispensing
3242 facilities, as well as the past operation of petroleum wells in the area.
- 3243 • The routine, ongoing maintenance of federal, state, county, and local highways,
3244 roads, and bridges. Contacts with the State of Missouri Department of
3245 Transportation, county and local officials confirmed that emphasis is being placed
3246 on maintenance and repair of existing transportation systems.
- 3247 • Utility system construction, installation, operation, maintenance and repair actions
3248 within the area. These actions include electrical, water, and gas distribution
3249 systems; storm and sanitary sewer collection systems; solid waste collection; and
3250 communications systems that must be operated and maintained to support
3251 continued operational requirements.
- 3252 • The continued use and maintenance of numerous features which affect the natural
3253 flow of the Missouri River near the project area.
- 3254 • Natural resources management including the continuation of activities designed to
3255 enhance the existing fish, wildlife and plant habitats present within the floodplain
3256 and the Missouri River.

- 3257 • Protection and enhancement of threatened and endangered species.
- 3258 • The establishment and maintenance of wildlife water units and sedimentation
- 3259 basins; improving water quality by maintaining vegetative cover and minimizing
- 3260 soil losses.
- 3261 • Identification and mapping of known or potential jurisdictional wetland areas.
- 3262 • Creation of wetland mitigation sites as part of legally required wetland mitigation
- 3263 for filling / destroying wetlands.
- 3264 • Habitat changes as a result of river flooding and development in the area.
- 3265 • Past and present archeological and cultural surveys and reconnaissance of the
- 3266 project area.
- 3267 • The continuation of various activities intended to support the recreation needs of
- 3268 the entire community within established and enforced limits.
- 3269 • Population growth.
- 3270 • A net regional in-migration of population stimulated by industrial development,
- 3271 and the recreation and retirement industries.
- 3272 • An increase in the tourist and recreational industry in the region.
- 3273 • New housing construction.
- 3274 • Increase in school enrollments.
- 3275 • Expansion of the local municipal and regional service delivery systems such as
- 3276 health care, fire and police protection, etc.
- 3277 • Private sector activities in manufacturing, retail and commercial development
- 3278 around the boundaries of the project area that have specifically impacted the
- 3279 natural and human environment include: 1) small manufacturing and major
- 3280 industrial plant activity, 2) the operation of commercial and retail outlets
- 3281 3) quarry operations, 4) power plant operations, and 5) the maintenance, repair
- 3282 and construction of facilities required to support these activities. The interaction
- 3283 of these different private sector projects and activities in the past has resulted in:
- 3284 ○ Warehousing and supply storage operations including the maintenance,
- 3285 operation and execution of central warehousing and supply storage
- 3286 functions on-site, including the receipt of deliveries, off-loading of
- 3287 materials, inspection of materials, inventory, marking of materials,
- 3288 storage, maintenance in storage, issue, turn-in, packing, crating and
- 3289 shipping of all classes of supply materials.
- 3290 ○ Vehicle and equipment maintenance in the area has also had a past and
- 3291 present impact on the environment.

3292

3293 These actions have resulted in substantial changes in land use and in adverse effects on

3294 water quality, vegetation, and riparian and riverine habitat. However, it appears that based on the

3295 intensity and extent of the effects of the proposed project, there would be no appreciable

3296 cumulative effects on natural resources or on cultural resources in the project area. Improved

3297 flood damage reduction may result in possible cumulative effects on the socio-economic

3298 resources in the area.

3299

3300

3301

3302

3303 **Reasonably Foreseeable Future Actions:**

3304

3305 The Transportation Equity Act for the 21st Century provides authorizations for highways,
3306 highway safety, and public transportation. In this act, Congress re-emphasized the need and
3307 importance of conducting metropolitan transportation planning activities. To accomplish these
3308 planning activities, the Saint Joseph Metropolitan Planning Organization, in cooperation with the
3309 Missouri Department of Transportation, is planning for and developing surface transportation
3310 plans and program for the Saint Joseph metropolitan area.

3311

3312 The Long Range Transportation Plan is a 20-year forecast which must consider a wide
3313 range of social, environmental, energy, and economic factors in determining overall regional
3314 goals and how transportation can best meet these goals. One of the major goals of the plan is to
3315 incorporate environmental planning early in overall plan formulation.

3316 These actions will likely result in changes in land use and in adverse effects on water
3317 quality, vegetation, and riparian and riverine habitat. However, it appears that based on the
3318 intensity and extent of the effects of the proposed project, there would be no appreciable
3319 cumulative effects on natural resources or on cultural resources in the project area. Improved
3320 flood damage reduction may result in possible cumulative effects on the socio-economic
3321 resources in the area.

3322

3323 The proposed project would allow the right-bank unit to be in compliance with FEMA
3324 and certified. With potential for payment for flood damages and many people believing that the
3325 likelihood of flooding is diminished, more floodplain and flood-prone land landward of the
3326 levees could be developed. This would result in more wildlife habitat being converted and more
3327 habitat fragmentation. However, because the intent of the proposed project is to provide
3328 reliability in passing the 100-year event (as originally constructed), no plans are immediately in
3329 place to convert these areas to increased development. Any changes in land use and subsequent
3330 development would be based on and in coordination with floodplain development ordinances.

3331

3332 **Conclusions**

3333

3334 Based on the analysis of past, present and foreseeable future activities along the Missouri
3335 River system, the changes of the existing line of flood damage reduction within the St. Joseph
3336 metropolitan area reach under the recommended plan cause minor changes within existing
3337 project boundaries. These changes involve raises of the existing levee units R471-460 and L-
3338 455, expansion of the adjacent underseepage control features, and modification of structural
3339 drainage features. These improvements will provide a system that will pass the 1% chance (100-
3340 yr) flood event with 92% reliability, greater than the minimum needed for FEMA certification.
3341 This increase will be affected without creating substantive changes in river morphology or
3342 hydrology, habitat changes along the river, or impacts to terrestrial or aquatic resources.

3343

3344 Hydraulic changes along the Missouri River analyzed using the HEC-RAS model showed
3345 no impacts to the flood stage height under 1% event flood conditions. Stage height increases
3346 may occur for the extreme events (greater than 0.5% event) with the impacts ranging from 0.40
3347 feet to 0.80 feet. The location of these impacts would range from river miles 454 to 370 with the
3348 maximum impacts seen between river mile 325 and 335. These magnitudes of impacts were

3349 determined using a hydrograph similar to that seen in the Flood of 1993. A change in
3350 hydrograph shape may cause these impacts to vary slightly. Impacts to wetlands, trees and
3351 scrub-shrub habitat would occur. However, these impacts along with onsite measures to offset
3352 these impacts would not result in substantial changes to the local or regional habitat or a loss of
3353 natural resources to the river and the public using those resources.
3354

3355 Based on the analysis provided in this EA, the recommended plan of constructing flood
3356 damage reduction reliability improvements within the St. Joseph metropolitan area will not result
3357 in significant impacts to river reaches upstream or downstream of the project area. As such,
3358 cumulative impacts of the recommended plan are not considered significant.

3359
3360

5. List of Preparers

NAME	TITLE	AREA OF EXPERTISE
Eric S. Lynn, P.E.	Project Manager	Overall Study Manager/ Plan Formulation
Allan Holland	Economist	Economics
Eric Shumate, P.E.	Hydrologist	Hydrology and Hydraulic Modeling
Chuck Sellmeyer	Geospatial Analyst	Geographical Information Systems/Mapping
Stephanie Voss	Mechanical Engineer	Hazards, Toxics, and Radioactive Wastes
Mary Lucido Tim Meade	Cultural Resource Specialists	Cultural Resources
Lora Vacca	Real Estate Specialist	Real Estate Requirements and Transactions
Bob Finneran	Operations Technician	Operations Management and Inspections
Pat Miramontez	Cost Estimator	Cost Estimating and Engineering
Matthew Vandenberg	Environmental Resource Specialist	NEPA Compliance and EA Development
Marvin Parks	Structural Engineer	Structural Engineering and Analysis
John Giacomo	Mechanical Engineer	Mechanical Engineering
Charles Detrick	Geotechnical Engineer	Geotechnical Engineering and Local Protection
Steve Jirousek	Geologist	Geology
Ken Luetkemeyer	Construction Specialist	Construction

Ron Jansen, P.E.	Civil Engineer	Civil Engineering and Pump Station Analysis
John Grothaus, P.E.	Chief, Plan Formulation Section	Project Formulation and Policy

3389 **7. Glossary**

3390

3391 Emergency Action Plan - a predetermined plan of action to be taken to reduce the potential for
3392 property damage and loss of life in an area affected by a dam break.

3393

3394 Failure - the uncontrolled release of water from a dam.

3395

3396 Floodplain - an area adjoining a body of water or natural stream that has been or may be covered
3397 by floodwater.

3398

3399 Flood routing - the determination of the attenuating effect of storage on a flood passing through a
3400 valley, channel, or reservoir.

3401

3402 Foundation of levee - the natural material on which the dam structure is placed.

3403

3404 Freeboard - the vertical distance between a stated water level and the top of the levee/floodwall.

3405

3406 Grout cutoff - a barrier produced by injecting grout into a vertical zone, usually narrow
3407 horizontally, in the foundation to reduce seepage under a dam.

3408

3409 Hydrograph - a graphic representation of discharge, stage, or other hydraulic property with
3410 respect to time for a particular point on a stream.

3411

3412 I Outlet - an opening through which water can be freely discharged from a reservoir.

3413

3414 Peak flow - the maximum instantaneous discharge that occurs during a flood.

3415

3416 Piping - the progressive development of internal erosion by seepage.

3417

3418 PMF (Probable Maximum Flood) - a flood that would result from the most severe combination
3419 of critical meteorological and hydrologic conditions possible in the region.

3420

3421 Pressure relief well and collector system - the pressure relief well is a vertical well or borehole,
3422 usually downstream of impervious cores and/or cutoffs, designed to collect and direct seepage
3423 through or under a levee to reduce uplift pressure under or within a levee. The well is designed
3424 to prevent piping of the foundation soil. A line of such wells forms a drainage curtain that
3425 generally discharges the collected water into a collector ditch.

3426

3427 Riprap - a layer of large un-coursed stones, broken rock, or precast blocks placed in random
3428 fashion on the upstream slope of an embankment dam as bank protection.

3429

3430 Seepage - the interstitial movement of water that may take place through a dam, its foundation,
3431 or its abutments.

3432

3433 Under-seepage - the interstitial movement of water through a foundation.

3434	8. Acronyms
3435	
3436	DCAR – Draft Coordination Act Report
3437	cfs – cubic feet per second
3438	COE – Corps of Engineers
3439	CWA – Clean Water Act
3440	DEIS – Draft Environmental Impact Statement
3441	EA – Environmental Assessment
3442	EAP – Emergency Action Plan
3443	EPA – U.S. Environmental Protection Agency
3444	ER – Engineering Regulation
3445	ESA – Endangered Species Act
3446	FCAR-Final Coordination Act Report
3447	GLO – Government Land Office
3448	KCD – Kansas City District (Corps)
3449	KDA – Kansas Department of Agriculture
3450	KDHE – Kansas Department of Health and Environment
3451	KDWP – Kansas Department of Wildlife and Parks
3452	KGS – Kansas Geological Survey
3453	KSR – Kansas River
3454	KWO – Kansas Water Office
3455	NEPA – National Environmental Policy Act
3456	NHPA – National Historic Preservation Act
3457	NOA – Notice of Availability
3458	NOI – Notice of Intent
3459	PAR – Population at Risk
3460	PMF – probable maximum flood
3461	ROD – Record of Decision
3462	USACOE – U.S. Army Corps of Engineers
3463	USFWS – U.S. Fish and Wildlife Service
3464	USGS – United States Geological Service

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



APPENDICES

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Final Environmental Assessment**



1 **Table 5**
 2 **Missouri River Levee System, Units L-455 and R471-460, Flood Damage Reduction Study – Summary of Impacts**
 3

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Costs	\$190,650,916* (2006 dollars) *Damage from 1993 flood was \$114,500,000 in 1993 dollars. This was compounded at 4% over 13 years.	\$32,686,000 (2005 dollars).	\$91,928,504 (2005 dollars).	\$120,485,125 (2005 dollars).	\$18,500,000 (2005 dollars).
Time To Complete	Represents the current operation.	The approximate time to complete this alternative is estimated at	The approximate time to complete this alternative is estimated at	The approximate time to complete this alternative is estimated at	The approximate time to complete this alternative is estimated at
Geology, Minerals, And Soils	No effects to geology, minerals, or soils are expected under this alternative.	No effects to geology, minerals, or soils are expected under this alternative.	No effects to geology, minerals, or soils are expected under this alternative.	No effects to geology, minerals, or soils are expected under this alternative.	No effects to geology, minerals, or soils are expected under this alternative.
WATER QUALITY	No effects to water quality under this alternative.	Insignificant adverse effects resulting from vegetation removal, reduced filtering effects, and reduced levee overtopping (contact with historic floodplain). Short-term, minor construction related erosion impacts.	Insignificant adverse effects resulting from vegetation removal, reduced filtering effects, and reduced levee overtopping (contact with historic floodplain). Short-term, minor construction related erosion impacts. These impacts would be slightly increased over the preferred alternative due to the increased size of the project and time to complete.	Insignificant adverse effects resulting from vegetation removal, reduced filtering effects, and reduced levee overtopping (contact with historic floodplain). Short-term, minor construction related erosion impacts. These impacts would be slightly increased over Alternative 2 due to the increased size of the project and time to complete.	Insignificant adverse effects resulting from vegetation removal, reduced filtering effects, and reduced levee overtopping (contact with historic floodplain). Short-term, minor construction related erosion impacts. These impacts would be slightly decreased from the preferred alternative due to the decreased size of the project and time to complete.
Air Quality	No effects to air quality would be expected under this alternative.	Insignificant, localized, temporary, and construction related adverse impacts including combustion related emissions from vehicle engine exhaust and fugitive dust from earthmoving operations.	Insignificant, localized, temporary, and construction related adverse impacts including combustion related emissions from vehicle engine exhaust and fugitive dust from earthmoving operations. These impacts are expected to be slightly higher than the preferred alternative due to the increased size of the project and time to complete.	Insignificant, localized, temporary, and construction related adverse impacts including combustion related emissions from vehicle engine exhaust and fugitive dust from earthmoving operations. These impacts are expected to be slightly higher than Alternative 2 due to the increased size of the project and time to complete.	Insignificant, localized, temporary, and construction related adverse impacts including combustion related emissions from vehicle engine exhaust and fugitive dust from earthmoving operations.

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Noise	No effects to area noise would be expected under this alternative.	Insignificant, localized, temporary, and construction related adverse impacts resulting from heavy earthmoving equipment use at the project site and on area roads during mobilization.	Insignificant, localized, temporary, and construction related adverse impacts resulting from heavy earthmoving equipment use at the project site and on area roads during mobilization. These impacts are expected to be slightly higher than Alternative 1 due to the increased size of the project and time to complete.	Insignificant, localized, temporary, and construction related adverse impacts resulting from heavy earthmoving equipment use at the project site and on area roads during mobilization. These impacts are expected to be slightly higher than Alternative 2 due to the increased size of the project and time to complete.	Insignificant, localized, temporary, and construction related adverse impacts resulting from heavy earthmoving equipment use at the project site and on area roads during mobilization. These impacts are expected to be slightly less than Alternative 1 due to the decreased size of the project and time to complete.
Visual Quality	No effects to visual quality would be expected under this alternative.	Insignificant, localized, temporary, and construction related adverse impacts resulting from construction equipment, stockpiling of materials, and the clearing, grubbing, and sloping of the existing levee and during borrow operations. No increased visual quality effects upon project completion as a levee currently exists on the project site.	Insignificant, localized, temporary, and construction related adverse impacts resulting from construction equipment, stockpiling of materials, and the clearing, grubbing, and sloping of the existing levee and during borrow operations. These impacts are expected to be slightly higher than Alternative 1 due to the increased size of the project and time to complete. No increased visual quality effects upon project completion are expected as a levee currently exists on the project site.	Insignificant, localized, temporary, and construction related adverse impacts resulting from construction equipment, stockpiling of materials, and the clearing, grubbing, and sloping of the existing levee and during borrow operations. These impacts are expected to be slightly higher than Alternative 2 due to the increased size of the project and time to complete. No increased visual quality effects upon project completion are expected as a levee currently exists on the project site.	Insignificant, localized, temporary, and construction related adverse impacts resulting from construction equipment, stockpiling of materials, and the clearing, grubbing, and sloping of the existing levee and during borrow operations. These impacts are expected to be slightly less than Alternative 1 due to the decreased size of the project and time to complete. No increased visual quality effects upon project completion are expected as a levee currently exists on the project site.
Hazardous Waste Management	No effects to hazardous waste management would be expected under this alternative.	No effects to hazardous waste management would be expected under this alternative.	No effects to hazardous waste management would be expected under this alternative.	No effects to hazardous waste management would be expected under this alternative.	No effects to hazardous waste management would be expected under this alternative.

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Vegetation	No effects to vegetation would be expected under this alternative.	Insignificant, temporary, and construction related impacts to 1,139 (likely less) acres of accreted secondary trees and shrublands resulting from borrow excavation. Insignificant, temporary, and construction related impacts to existing levee grasslands. Permanent loss of 7.0 acres of secondary trees and 12.7 acres of shrublands resulting from the levee footprint. Offset proposed.	Insignificant, temporary, and construction related impacts to 1,139 acres of accreted secondary trees and shrublands resulting from borrow excavation. Insignificant, temporary, and construction related impacts to existing levee grasslands. Permanent loss of 7.6 acres of secondary trees and 14.4 acres of shrublands resulting from the levee footprint. Offset proposed.	Insignificant, temporary, and construction related impacts to 1,139 acres of accreted secondary trees and shrublands resulting from borrow excavation. Insignificant, temporary, and construction related impacts to existing levee grasslands. Permanent loss of 8.1 acres of secondary trees and 16 acres of shrublands resulting from the levee footprint. Offset proposed.	Insignificant, temporary, and construction related impacts to 1,139 (likely less) acres of accreted secondary trees and shrublands resulting from borrow excavation. Insignificant, temporary, and construction related impacts to existing levee grasslands. Permanent loss of 5.8 acres of secondary trees and 10.2 acres of shrublands resulting from the levee footprint. Offset proposed.
Wildlife	No effects to wildlife would be expected under this alternative.	Temporary effects to the variety and numbers of local and migrating species as a result of the temporary, construction related impacts from increased human activities and noise associated with construction; the temporary grassland, wetland, and terrestrial habitat effects associated with levee construction and borrow operations; and the permanent loss of 7.0 acres of secondary tree growth, 12.7 acres of shrubland and 4.9 acres of wetlands from levee footprint. Offset proposed.	Temporary effects due to the variety and numbers of local and migrating species as a result of the temporary, construction related impacts from increased human activities and noise associated with construction; the temporary grassland, wetland, and terrestrial habitat effects associated with levee construction and borrow operations; and the permanent loss of 7.6 acres of secondary tree growth, 14.4 acres of shrubland and 6.2 acres of wetlands from levee footprint. Offset proposed.	Temporary effects due to the variety and numbers of local and migrating species as a result of the temporary, construction related impacts from increased human activities and noise associated with construction; the temporary grassland, wetland, and terrestrial habitat effects associated with levee construction and borrow operations; and the permanent loss of 8.1 acres of secondary tree growth, 16 acres of shrubland, and 7.3 acres of wetlands from levee footprint. Offset proposed.	Temporary effects due to the variety and numbers of local and migrating species as a result of the temporary, construction related impacts from increased human activities and noise associated with construction; the temporary grassland, wetland, and terrestrial habitat effects associated with levee construction and borrow operations; and the permanent loss of 5.8 acres of secondary tree growth, 10.2 acres of shrubland and 4.2 acres of wetlands from levee footprint. Offset proposed.
Aquatic Ecosystem (Including Wetlands And Fish)	No effects to the aquatic ecosystem, including wetlands and fish, would be expected under this alternative.	No effects to fish would be expected under this alternative. Insignificant, temporary, and construction related impacts to wetlands within the 1,139 acres (likely less) of accreted lands resulting from borrow excavation. Permanent loss of 4.9 acres of wetlands resulting from the levee footprint. Offset proposed.	No effects to fish would be expected under this alternative. Insignificant, temporary, and construction related impacts to wetlands within the 1,330 acres of accreted lands resulting from borrow excavation. Permanent loss of 6.2 acres of wetlands resulting from the levee footprint. Offset proposed.	No effects to fish would be expected under this alternative. Insignificant, temporary, and construction related impacts to wetlands within the 1,330 acres of accreted lands resulting from borrow excavation. Permanent loss of 7.3 acres of wetlands resulting from the levee footprint. Offset proposed.	No effects to fish would be expected under this alternative. Insignificant, temporary, and construction related impacts to wetlands within the 1,139 acres (likely less) of accreted lands resulting from borrow excavation. Permanent loss of 4.2 acres of wetlands resulting from the levee footprint. Offset proposed.

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Threatened And Endangered Species	No effects to threatened and endangered species would be expected under this alternative.	Alternative 1 will not adversely affect any threatened or endangered species or result in adversely modifying or destroying critical habitat. Some adverse effects will result during construction and through wetland and terrestrial habitat loss. These adverse effects will be minimized and off-set, thus no significant impacts are expected.	Alternative 2 will not adversely affect any threatened or endangered species or result in adversely modifying or destroying critical habitat. Some adverse effects will result during construction and through wetland and terrestrial habitat loss. These adverse effects will be minimized and off-set, thus no significant impacts are expected.	Alternative 3 will not adversely affect any threatened or endangered species or result in adversely modifying or destroying critical habitat. Some adverse effects will result during construction and through wetland and terrestrial habitat loss. These adverse effects will be minimized and off-set, thus no significant impacts are expected.	Alternative 4 will not adversely affect any threatened or endangered species or result in adversely modifying or destroying critical habitat. Some adverse effects will result during construction and through wetland and terrestrial habitat loss. These adverse effects will be minimized and off-set, thus no significant impacts are expected.
Demographics	Substantial adverse effects to demographics could result under the No Action Alternative. The Missouri Air Guard base would likely close. The Elwood area would fail to attract economic development, could be flooded, residents could expect higher flood insurance expense and building elevation requirements, and would likely lose area population. Similar adverse effects could be expected in portions of Wathena and St. Joseph.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial adverse effects to demographic distributions could result under Alternative 4. Similar adverse effects could occur as under the No Action Alternative due to the levee not receiving FEMA re-certification.
Development and Economy	Substantial adverse effects to development and economy of the local area could result under this Alternative. The development and economy of the local communities could be limited as these areas would fail to attract an influx of people and business.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial beneficial effects to Elwood and Wathena, Kansas and St. Joseph, Missouri in the form of economic development, reduced flooding potential, reduced insurance expense, and possible increase to population resulting in increased tax revenues and further economic development.	Substantial adverse effects to development and economy of the local communities could result under Alternative 4. The development and economy of the local communities could be limited as these areas would fail to attract an additional people and businesses.

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Land Use	No adverse effects to land use would be expected under this alternative. This condition could change existing land use as present developed areas may close and could revert back to “natural” habitat over time. No future development would be expected.	Insignificant, local, and permanent adverse effects in the form of land conversion to permanent levee. Insignificant, local, and temporary adverse effects in the form of relocation of Herzog Sand and Gravel stockpiles. Increased development could occur within the area floodplain but would be subject to future floodplain management plans.	Insignificant, local, and permanent adverse effects in the form of land conversion to permanent levee. Insignificant, local, and temporary adverse effects in the form of relocation of Herzog Sand and Gravel stockpiles. Increased development could occur within the area floodplain but would be subject to future floodplain management plans.	Insignificant, local, and permanent adverse effects in the form of land conversion to permanent levee. Insignificant, local, and temporary adverse effects in the form of relocation of Herzog Sand and Gravel stockpiles. Increased development could occur within the area floodplain but would be subject to future floodplain management plans.	No adverse effects to land use would be expected under this alternative. This condition could change existing land use as present developed areas may close and could revert back to “natural” habitat over time. No future development would be expected.
Transportation	Substantial adverse effects to transportation could result under this alternative. Area roads could be flooded under the 100 year event impairing evacuation and rescue.	Insignificant, temporary, and construction related adverse effects in the form of increased traffic on area roads during construction. After project completion, area roads would be protected from flooding during the 100-year event. Thus, operation of the completed project will have a substantial beneficial effect to area transportation.	Insignificant, temporary, and construction related adverse effects in the form of increase traffic on area roads during construction. These impacts are expected to be slightly higher than Alternative 1 due to the increased size of the project and time to complete. After project completion, area roads would be protected from flooding during a 500-year event. Thus, operation of the completed project will have a substantial beneficial effect to area transportation.	Insignificant, temporary, and construction related adverse effects in the form of increase traffic on area roads during construction. These impacts are expected to be slightly higher than Alternative 2 due to the increased size of the project and time to complete. After project completion, area roads would be protected from flooding during a 500-year event. Thus, operation of the completed project will have a substantial beneficial effect to area transportation.	Substantial adverse effects to transportation could result under this alternative. Area roads could be flooded under a 100 year event impairing evacuation and rescue.
Utilities and Waste Water Supply	No effects to utilities/water supply would be expected under this alternative.	No effects to utilities/water supply would be expected under this alternative.	No effects to utilities/water supply would be expected under this alternative.	No effects to utilities/water supply would be expected under this alternative.	No effects to utilities/water supply would be expected under this alternative.
Flood Damage Reduction	Substantial adverse effects to flood damage reduction would result under this alternative. FEMA would likely not re-certify the levee. Flooding to Wathena, Elwood, and St. Joseph would be highly likely during a 100-year event. Economic development would be stymied.	Substantial beneficial effects in increased flood damage reduction to the St. Joseph metropolitan area during the 100-year flood event.	Substantial beneficial effects in increased flood damage reduction to the St. Joseph metropolitan area during the 500-year flood event.	Substantial beneficial effects in increased flood damage reduction to the St. Joseph metropolitan area during the 500-year flood event.	Substantial adverse effects to flood damage reduction would result under this alternative. FEMA would likely not re-certify the levee. Flooding to Wathena, Elwood, and St. Joseph would be highly likely during a 100-year event. Economic development would be stymied.

ALTERNATIVES ►	“No Action” Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FACTORS ▼					
Recreation	There would be no impacts to recreation under this alternative.	Insignificant, temporary, and construction related adverse affect to recreation in the form of impaired hiking and wildlife viewing. After construction, these recreational activities would revert to existing conditions.	Insignificant, temporary, and construction related adverse affect to recreation in the form of impaired hiking and wildlife viewing. These impacts are expected to be slightly longer in duration than Alternative 1 due to the increased size of the project and time to complete. After construction, recreational activities would revert to existing conditions.	Insignificant, temporary, and construction related adverse affect to recreation in the form of impaired hiking and wildlife viewing. These impacts are expected to be slightly longer in duration than Alternative 2 due to the increased size of the project and time to complete. After construction, recreational activities would revert to existing conditions.	Insignificant, temporary, and construction related adverse affect to recreation in the form of impaired hiking and wildlife viewing. After construction, these recreational activities would revert to existing conditions. No construction related impacts to recreation along L-455.
Archaeological and Historic Resources	There would be no impacts to archaeological and historic resources under this alternative.	There would be no impacts to archaeological and historic resources under this alternative.	There would be no impacts to archaeological and historic resources under this alternative.	There would be no impacts to archaeological and historic resources under this alternative.	There would be no impacts to archaeological and historic resources under this alternative.
Environmental Justice	Sensitive population indicators in the project area would experience no greater threat to flooding over that of the rest of the area population. Therefore, there would be no environmental justice issues as a result of this alternative.	This alternative will not exert a disproportionate impact on low income and/or minority populations. The beneficial and adverse impacts are equally shared across the racial and economic spectrums.	This alternative will not exert a disproportionate impact on low income and/or minority populations. The beneficial and adverse impacts are equally shared across the racial and economic spectrums.	This alternative will not exert a disproportionate impact on low income and/or minority populations. The beneficial and adverse impacts are equally shared across the racial and economic spectrums.	This alternative will not exert a disproportionate impact on low income and/or minority populations. The beneficial and adverse impacts are equally shared across the racial and economic spectrums.

Table 6
Compliance of Preferred Alternative with Environmental Protection
Statutes and Other Environmental Requirements

Federal Polices	Compliance
Archeological Resources Protection Act, 16 U.S.C. 470, et seq.	Full Compliance
Clean Air Act, as amended, 42 U.S. C. 7401-7671g, et seq.	Full Compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full Compliance
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full Compliance
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.	Full Compliance
Federal Water Project Recreation Act, 16 U.S.C. 4601-12, et seq.	Full Compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Full Compliance
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full Compliance
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et seq.	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full Compliance
Wild and Scenic River Act, 16 U.S.C. 1271, et seq.	Full Compliance
Protection & Enhancement of the Cultural Environment (Executive Order 11593)	Full Compliance
Floodplain Management (Executive Order 11988)	Full Compliance
Protection of Wetlands (Executive Order 11990)	Full Compliance
Environmental Justice (Executive Order 12898)	Full Compliance

NOTE: Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or post authorization).

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri**

Section 404(b)(1) Evaluation

Clean Water Act Section 404(b)(1) authorized the development of guidelines for specification of disposal sites for dredged or fill material by the U.S. Environmental Protection Agency (USEPA) in conjunction with the U.S. Army Corps of Engineers (Corps). The USEPA subsequently developed and adopted the Section 404(b)(1) guidelines in conjunction with the Corps (40 CFR Part 230). The purpose of these guidelines is to “restore and maintain the chemical, physical, and biological integrity of the waters of the United States through the control of discharges of dredged or fill material”. This document reviews the compliance of the proposed flood damage reduction alternative for the Missouri River Levee System Units L-455 and R471-460 with these guidelines.

I. Description of the Flood Damage Reduction Project

Location

The Missouri River Levee System Units L-455 and R471-460 are located from Missouri River miles 445 to 452 adjacent to Doniphan County, Kansas and Andrew and Buchanan counties, Missouri.

General Description

The Corps, at the request and with the cooperation of the City of St. Joseph, the Elwood-Gladdened Drainage District (Right Bank, Kansas), the St. Joseph Airport Drainage District (Right Bank, Missouri), and the South St. Joseph Levee District (Left Bank), the non-Federal sponsors, of the Levee Units L-455 and R471-460, has undertaken the Flood Damage Reduction Study, at Kansas and Missouri. This existing levee system protects areas in St. Joseph, Buchanan and Andrew Counties, Missouri and areas in Elwood and Wathena, Doniphan County, Kansas. The purpose of this study is to determine whether one or more plans for increasing the level of flood damage reduction is technically viable, economically feasible, and environmentally acceptable, or if no action is warranted. Failure of any part of the existing flood damage reduction system during a major flood would have substantial adverse impacts on the human environment, including property damage and potential loss of human life. Four alternatives were considered and include: Raise the Right Levee Section using earthen material to the one-hundred year level of flood damage reduction with 90 percent reliability, and a corresponding raise to the Left Levee Section in specific areas to accept the slight rise in water surface elevations resulting from the initial raise (PREFERRED); Raise the Right Levee Section to an Increased Level of Flood Damage Reduction (Alternative 2 - 500-year event plus 1.5 feet of freeboard), with a corresponding raise to the Left levee unit; Raise the Right Levee Section to a Further Increased Level of Flood Damage Reduction (Alternative 3 - 500-year event plus 3.0 feet of freeboard), with a corresponding raise to the Left levee unit, and the “No Action” Alternative.

Detailed descriptions of each alternative are provided in Chapter 2 of The Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Study EA.

Site construction activities that would be subject to regulation under Section 404 of the Clean Water Act include:

- obtaining borrow material from lands riverward of the existing levee, and

- placing fill material on the Flood Damage Reduction site in jurisdictional waters during construction of the increased levee and seepage berms.

Authority and Purpose

This study is being conducted under the authority provided by Section 216 of the 1970 Flood Control Act. This Act provides authority to reexamine completed civil works projects. Section 216 reads as follows:

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

Section 216 of the 1970 Flood Control Act provided continuing authority to examine completed Federal projects to determine whether the projects are providing benefits as intended. The results of this examination indicate that raising the level of flood damage reduction provided by the St. Joseph levee unit system may be technically and economically feasible without unacceptable environmental or social impacts. Accordingly, a Federal interest exists in designing and constructing improvements because of the potential to benefit the National economy.

Purpose: The purpose of the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Project in Kansas and Missouri is to restore the reliability of the units to reduce damages from potential flooding on the Missouri River in the vicinity of St. Joseph, Missouri, in order to provide for re-certification of the levees by the Federal Emergency Management Agency (FEMA).

Need: The need of the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Project in Kansas and Missouri is restore the reliability of the units to reduce damages from potential flooding on the Missouri River in the vicinity of St. Joseph, Missouri because this level is lacking, and to allow FEMA to re-certify the levee. If the levee remains de-certified, the economic impact of a flood event will be borne entirely by the local communities.

General Description of Dredged or Fill Material

(1) The existing levee will require grading for the purpose of reshaping and preparing the initial levee slope. The existing levee is composed primarily of fill material that was borrowed from accreted lands adjacent to the project area when the levee was originally built. The existing material contains a mixture of sand, silts and clays with varying content of organic materials. The proposed levee raise and seepage berm extensions will be composed of similar materials. Fill will be obtained from adjacent accreted lands that, in some instances, may be the same borrow areas previously used.

(2) The approximate quantity of fill material proposed for construction of the flood damage reduction project includes approximately 1,882,445 bank cubic yards.

(3) The source of the fill material will be borrowed from accreted land riverward of the existing levees in both Kansas and Missouri. For Kansas, two borrow areas have been identified and are located at approximately river miles 454.9 to 451.9 and river miles 446.7 to 443.4. For Missouri, one borrow area has been identified and is located at approximately river miles 442.6 to 442.9.

Description of the Proposed Discharge Site

(1) Location. Borrow soils would be placed within the floodplain of the Missouri River on Levee Units R471-460 and L-455 between River Miles 437 and 457 to facilitate an earthen levee raise and the construction of underseepage control measures. Wetland determinations conducted

by Corps personnel revealed that approximately 4.9 acres of farmed wetlands would be filled as a result of the levee footprint expansion. See Appendix B of the EA for project location maps, borrow site areas, and accreted land surveys.

(2) Size. The proposed borrow areas include approximately 1,304 acres of land in Kansas: located riverward of the existing levee at river miles 454.9 to 451.9 and river miles 442.6 to 442.9. Additionally, a lesser area of approximately 30 acres of land in Missouri is located at river miles 442.6 to 442.9. These areas represent the total borrow areas and not the total amount of borrow to be obtained.

(3) Type of Site/Habitat. The proposed project site consists of an existing levee with strips of upland grassland and small amounts of deciduous trees. The borrow areas for the proposed project site consists of accreted lands containing secondary willow and cottonwood tree growth, shrubland vegetation, and farmed wetlands. During construction of the flood damage reduction project, some farmed wetlands will be eliminated due to fill. Obtaining borrow material will be conducted in a manner as to reduce impacts on the area. Such minimization measures will include, but not be limited to, shallow scrapes and reshaping along existing wetland areas to increase their functions, deeper diggings (eight to ten feet) in areas where trees and shrubs occur to reduce acreage impacted to these vegetation types, and ensuring a minimum of two feet of blanket material (capable of retaining water) is left in place to ensure the areas function as wetlands. Please see Section 4.4.3 of the EA for a complete description of the affects to wetland areas.

(4) Timing and Duration. Timing and duration of construction and borrow operations will be determined after final plans and specifications are made.

Description of Disposal Method

The disposal method will be as necessary for construction of each project element.

II. Factual Determinations

The 404(b)(1) guidelines (40 CFR Part 230, Subpart B, Section 230.11) require the determination in writing of the potential short-term and long-term affects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment. These factual determinations are presented below.

Physical Substrate Determinations

(1) Substrate Elevation and Slope. The bottom surface elevation of the borrow sites will be irregular to create greater diversity and habitat. The borrow excavation from area sites will result in depths which will be dependant on results from test pits dug to determine initial thickness of usable material. A minimum of approximately two feet of blanket material (soil capable of retaining water) will then be left in place to ensure wetland functions are obtained after the fill material has been excavated.

(2) Type of Fill Material. Fill material will consist of a mixture of sand, silts and clays with varying content of organic materials.

(3) Dredge/Fill Material Movement. The fill material will be stabilized on the levee and seepage berms and should not be subject to erosion.

(4) Physical Effects on Benthos. Benthic organisms may be displaced during construction activities.

Water Circulation, Fluctuation, and Salinity Determination

(1) Water Column Effects. Standing water and soils periodically inundated will be permanently and temporarily impacted during and following construction. Turbidity and erosion will be controlled during and following construction.

(2) Current Patterns and Circulation. Construction of the Flood Damage Reduction project will have minimal and temporary construction related impacts on the current hydrologic circulation patterns.

(3) Normal Water Level Fluctuation and Salinity Gradients. Surface and ground water levels will be minimally affected during construction. Salinity levels will not be affected by the proposed project.

Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There may be a temporary increase in turbidity levels in the project area during construction. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity will not be exceeded.

(2) Effects on the Chemical and Physical Properties of the Water Column. There may be temporary impacts to the chemical and physical properties of nearby waters during construction activities. Borrow material will be dug and placed using traditional construction equipment (bull dozers, track-hoes, bobcats, etc). There are no acute or chronic chemical impacts anticipated as a result of construction. An environmental protection plan, prepared during detailed design, will address concerns regarding monitoring of equipment, maintenance and security of fuels, lubricants etc.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the construction area. This effect will be temporary, limited to the immediate area of construction, and will have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released by the project.

(d) Aesthetics. The aesthetic quality of the water in the immediate area of the project may be temporarily affected by turbidity during construction. This will be a short-term and localized condition.

(3) Effects to Biota.

(a) Primary Productivity and Photosynthesis. Impacts on primary production within approximately 5.0 acres of impacted wetland areas will be minimized through on-site mitigation of similar habitat.

(b) Suspension/Filter Feeders. An increase in turbidity from construction related progress could adversely impact burrowing invertebrate filter feeders within and adjacent to the immediate construction area. It is not expected that a short-term, temporary increase in turbidity will have any long-term negative impact on these highly fecund organisms.

(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

Contaminant Determinations

Material which will be obtained from the borrow sites will not introduce, relocate, or increase contaminants at the fill area.

Aquatic Ecosystem and Organism Determination

(1) Effects to Plankton. No adverse impacts on autotrophic or heterotrophic organisms are anticipated.

(2) Effects on Benthos. No adverse impacts to benthic organisms are anticipated.

(3) Effects on the Aquatic Food Web. No adverse impacts on aquatic organisms are anticipated. There is expected to be a relatively minor temporary effect on the aquatic food web due to construction activities. Wetlands impacted on the landside of the levee, and those filled on the river side of the levee, will be mitigated on-site in order to maintain wetland function and values.

(4) Effects on Special Aquatic Sites. A total of approximately 4.9 acres of wetlands will be permanently lost within the project area due to fill, reconstruction of levee slopes, and associated levee maintenance. However, minimization measures to reduce impacts have been incorporated into construction plans; thus, the impacts have been off-set.

(5) Endangered and Threatened Species. There will be no significant adverse impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Some minor impacts to endangered and threatened species may occur during construction but will be reduced or avoided through timing restrictions. While some existing habitat will be lost as a result of obtaining borrow, re-establishment of this habitat will occur in the long-term. Refer to Section 4.4.4 of the EA for measures that will be implemented to protect endangered and threatened species.

(6) Other Wildlife. No adverse long-term impacts to small foraging mammals, reptiles, birds, or wildlife in general are expected.

(7) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions are discussed in the EA.

Proposed Disposal Site Determinations

(1) Determination of Compliance with Applicable Water Quality Standards. All State permits will be obtained prior to construction activities and coordination with Missouri Department of Natural Resources will ensure Section 401 – Water Quality Certification and Section 402 – National Pollution Discharge Elimination System Storm Water Discharge Permits have been obtained.

(2) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Recreational and commercial fisheries would not be impacted by the implementation of the project.

(c) Water Related Recreation. Water related recreation in the immediate vicinity of construction will likely be impacted during construction activities. This will be a short-term impact.

(d) Aesthetics. The existing environmental setting may be impacted during construction. Construction activities cause a temporary increase in noise and air pollution from equipment as well as some temporary increase in turbidity. These impacts are not expected to adversely affect the aesthetic resources over the long term and once construction ends, conditions will return to pre-project levels. Trees removed landward of the levee will be replaced.

(e) Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of the placement of fill at the project site.

(f) Determination of Secondary Effects on the Aquatic Ecosystem. There will be no secondary impacts on the aquatic ecosystem as a result of the construction.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge

The 404(b)(1) guidelines (40 CFR Part 230, Subpart B, Section 230.12) require written findings as to whether the proposed disposal site for the discharge of dredged or fill material:

- complies with the 404(b)(1) guidelines;
- complies with the 404(b)(1) guidelines with inclusion of appropriate and practical discharge conditions to minimize pollution or adverse effects to the affected aquatic ecosystems; or
- does not comply with the 404(b)(1) guideline requirement.

These findings are presented below.

Finding 1 – Adaptation of the 404(b)(1) Guidelines

No significant adaptations of the guidelines were made relative to this evaluation.

Finding 2 – Other Practicable Alternatives with Less Adverse Impact on Aquatic Ecosystems

No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States. Also, no practicable alternative exists that is significantly less damaging than the proposed alternative. Although Alternative 4 would impact less wetland area, the difference is not significant and would not result in a discernable difference in impacts on the aquatic ecosystem. Finally, although Alternative 4 is somewhat less damaging, it does not accomplish the overall project purpose, and therefore, is not a practicable alternative.

Finding 3 – Inclusion of Conditions to Minimize Pollution and/or Adverse Effects to the Affected Aquatic Ecosystems

As described in the EA, mitigation is proposed to minimize pollution, loss of wetland habitat, and adverse effect on the existing aquatic ecosystem in, and adjacent to, the Missouri River. On-site aquatic habitat will be lost, but will be replaced on-site. Mitigation measures relevant to reducing these effects are discussed in Chapter 4 of the EA.

Finding 4 – State Water Quality Standards

The discharge of fill materials will not cause or contribute to violations of any applicable State water quality standards. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act. State water quality certifications (Kansas and Missouri) will be obtained before construction.

Finding 5 – Endangered and Threatened Species

The placement of fill materials for implementation of the proposed project will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

Finding 6 – Significant Degradation of U.S. Waters

The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

Finding 7 – Compliance Conclusion

Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action. Turbidity will be monitored so that if levels exceed State water quality standards, the contractor will be required to cease work until conditions return to normal. On the basis of the guidelines, the proposed fill of wetlands are specified as complying with the requirements of these guidelines. The discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines and is considered the least environmentally damaging practicable alternative.

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



APPENDIX A

Notice of Intent to Prepare a Draft EIS

**Missouri River Levee System
Units L-455 and R-471-460
Flood Damage Reduction Study
Kansas and Missouri
Draft Environmental Impact Statement**



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

5. James T. Blake, Deputy to the Commander, PEO STRI.
6. Paul Bogosian, Deputy Program Executive for Aviation, AAE.
7. T. Kevin Carroll, Program Executive Officer, Enterprise Information Structure, AAE.
8. Donald L. Damstetter, Jr., Deputy Assistant Secretary for Plans, Programs, and Resource, OASA (Acquisition, Logistics & Technology).
9. Edward G. Elgart, Director, CECOM Acquisition Center.
10. Kevin J. Flamm, Program Manager for Chemical Demilitarization Operations OASA (Acquisition, Logistics & Technology).
11. Craig D. Hunter, Deputy Assistant Secretary of the Army (Defense Exports and Cooperation), OASA (Acquisition, Logistics & Technology).
12. Joann H. Langston, Competition Advocate of the Army, Army Acquisition Executive Support Agency.
13. Russell W. Lenz, Director, Simulation and Training Technology Center, Research, Development and Engineering Command.
14. BG Michael R. Mazzucchi, Program Executive Officer, Command, Control, and Communications (Tactical).
15. Steven L. Messervy, Program Manager, Joint Simulation Systems, Army Acquisition Executive Support Agency.
16. Levator Norsworthy, Jr., Deputy General Counsel (Acquisition), Office of the General Counsel.
17. Michael A. Parker, Deputy to the Commander, U.S. Army Soldier & Biological Chemical Command.
18. John C. Perrapato, Deputy Program Executive Officer, Command and Control Systems, AAE.
19. Sheila J. Proffitt, Deputy Program Executive Officer, Air and Missile Defense, AAE.
20. Sandra O. Sieber, Director, Army Contracting Agency.
21. Albert P. Puzzuoli, Deputy Program Executive Officer, Armored Systems Modernization, AAE.
22. Wimpy D. Pybus, Deputy Assistant Secretary of the Army for Integrated Logistics Support, OASA (Acquisition, Logistics & Technology).
23. BG Stephen M. Seay, Program Executive Officer, PEO STRI.
24. BG Jeffrey A. Sorenson, Program Executive Officer, Tactical Missiles.
25. MG John M. Urias, Program Executive Officer, Air Missile Defense/ Deputy Command General for Research, Development and Acquisition, U.S. Army Space and Missile Defense Command.

26. MG Joseph L. Yakovac, Program Executive Officer, Ground Combat Systems.

Luz D. Ortiz,
Army Federal Register Liaison Officer.
 [FR Doc. 03-29008 Filed 11-19-03; 8:45 am]
 BILLING CODE 3710-06-M

DEPARTMENT OF DEFENSE

Department of the Army

Performance Review Board Membership for the U.S. Army Office of the Surgeon General

AGENCY: Department of the Army, DoD.

ACTION: Notice.

SUMMARY: Notice is given of the names of members of a Performance Review Board for the Department of the Army.

EFFECTIVE DATE: November 13, 2003.

FOR FURTHER INFORMATION CONTACT: Marilyn Ervin, U.S. Army Senior Executive Service Office, Assistant Secretary of the Army, Manpower & Reserve Affairs, 111 Army Pentagon, Washington, DC 20310-0111.

SUPPLEMENTARY INFORMATION: Section 4314(c)(1) through (5) of Title 5, U.S.C., requires each agency to establish, in accordance with regulations, one or more Senior Executive Service performance review boards. The boards shall review and evaluate the initial appraisal of senior executives' performance by supervisors and make recommendations to the appointing authority or rating official relative to the performance of these executives.

The members of the Performance Review Board for the U.S. Army Office of The Surgeon General are:

1. MG Kenneth L. Farmer, Chairperson, Deputy Surgeon General.
2. Mr. Mark R. Lewis, Director, Plans, Resources and Operations, Office of the Deputy Chief of Staff, G-1.
3. Ms. Zita M. Simutis, Director, Army Research Institute.
4. Mr. Jack E. Hobbs, Project Director, Army Workload and Performance System.

Luz D. Ortiz,
Army Federal Register Liaison Officer.
 [FR Doc. 03-29009 Filed 11-19-03; 8:45 am]
 BILLING CODE 3710-06-M

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Intent To Prepare a Draft Environmental Impact Statement for a Flood Damage Reduction Study, Missouri River Levees System Units L-455 and R 471-460, Buchanan County, MO and Doniphan County, KS

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DoD.

ACTION: Notice of intent.

SUMMARY: The U.S. Army Corps of Engineers, Kansas City District (KCD), intends to prepare a Draft Environmental Impact Statement (DEIS) and Feasibility Study of flood damage reduction measures for property currently afforded flood protection by the Missouri River Levee System (MRLS) Units L-455 and R 471-460, in Buchanan County, Missouri and Doniphan County, Kansas. The purpose of this DEIS is to consider the economic, environmental, and social impacts that may occur as a result of various alternatives being considered in a flood damage reduction study, concerning flood protection provided by the existing MRLS Units L-455 and R 471-460. The study would determine the existing level of flood protection as well as possible flood damage reduction measures beyond what currently exists, under the authority of Section 216 of the 1970 Flood Control Act.

FOR FURTHER INFORMATION CONTACT: Ms. Maria Chastain-Brand, Formulation Section, Planning Branch, ATTN: CENWK-PM-PF, U.S. Army Engineer District, Kansas City, 601 East 12th Street, Kansas City, MO 64106-2896, Phone 816-983-3107 or Maria E. Chastain-Brand@usace.army.mil.

SUPPLEMENTARY INFORMATION:

1. The U.S. Army Corps of Engineers, KCD, intends to prepare a DEIS and Feasibility Study of flood damage reduction measures for property currently afforded flood protection by the MRLS Units L-455 and R 471-460, in Buchanan County, Missouri and Doniphan County, Kansas. The purpose of this DEIS is to consider the economic, environmental, and social impacts that may occur as a result of various alternatives being considered in a flood damage reduction study. The Study would determine the existing level of flood protection as well as possible flood damage reduction measures beyond what currently exists, under the authority of Section 216 of the Flood Control Act.

2. The MRLS Units L-455 and R 471-460, are existing flood damage reduction projects which provide local flood protection for agricultural needs, the metropolitan area of St. Joseph, Missouri and the communities of Wathena and Elwood in Kansas. The two levees units are located on opposite sites of the Missouri River.

Levee unit L-455 is located on the left bank of the Missouri River in Buchanan County, Missouri, and connects to high ground in the southwestern part of St. Joseph, Missouri. The levee unit extends from Missouri River mile 447.3 downstream to mile 437.3 and then upstream along Contrary Creek. Levee unit L-455 is 15.6 miles long, averages 13 feet in height, and protects approximately 7,500 acres of urban and rural areas from flooding. Rural lands consist of about 6,500 acres. Urban lands include industrial, commercial, and residential areas of the city of St. Joseph, Missouri, including the residential and recreational development in the Lake Contrary area.

Levee unit R 471-460 is located on the right bank of the Missouri River between river mile 441.7 and 456.6 in eastern Doniphan County, Kansas, and a portion of western Buchanan County, Missouri. This levee unit is 13.8 miles long, averages 14.8 feet in height and protects approximately 13,500 acres of rural and urban areas from flooding. Rural lands consist of about 10,000 acres. Urban lands include the communities of Elwood and Wathena, Kansas. It also includes the area within an oxbow, which is a part of St. Joseph, Missouri and contains the Rosecrans Memorial Air National Guard Base.

3. KCD's study will evaluate the no action alternative as well as various structural and non-structural alternatives to determine:

- a. Flood damage reduction costs and benefits;
- b. Regional social and economic impacts; and
- c. Environmental impacts and mitigation measures.

Reasonable alternatives KCD will examine include the feasibility of various structural and non-structural measures to reduce flood damage within areas protected by the existing MRLS Units L-455 and R 471-460. Structural alternatives may include reinforcing the existing structures, raising the existing levee with earth fill, floodwalls with a corresponding rise of appurtenances, or other change to the existing levee systems. Non-structural measures may include the development of contingency plans.

4. Scoping Process

a. A public workshop/scoping meeting will be held in the spring of 2004 in St. Joseph, MO area. The exact date, time, and location of the scoping meeting will be announced when the details are finalized. Additional workshops and meetings will be held as the study progresses to keep the public informed. Coordination meetings will be held as needed with the affected/concerned local, State, and Federal governmental entities, and tribes. These workshops and meetings, as well as any meetings which were previously held regarding this project, will serve as the collective scoping process for the preparation of the DEIS. Draft documents forthcoming from the study will be distributed to Federal, State, and local agencies, as well as interested members of the general public, for review and comment.

b. Potential issues to be analyzed in depth include evaluations of:

- (1) Level of flood protection provided by the existing flood protection project and need for increased level of protection;
- (2) Costs and benefits associated with alternatives that increase the flood protection level of the existing flood protection project;
- (3) Fish and wildlife resources;
- (4) Recreation;
- (5) Cultural resources.

c. Environmental consultation and review will be conducted in accordance with the requirements of the National Environmental Policy Act of 1969, as per regulations of the Council of Environmental Quality (code of Federal Regulations Parts 40 CFR 1500-1508), and other applicable laws, regulations, and guidelines.

5. The anticipated date of availability of the DEIS for public review is late 2004.

Luz D. Ortiz,
Army Federal Register Liaison Officer.
[FR Doc. 03-29010 Filed 11-19-03; 8:45 am]
BILLING CODE 3710-KN-M

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Intent To Prepare a Draft Programmatic Environmental Impact Statement for Coastal Erosion Protection and Community Relocation, Shishmaref, AK

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DoD.

ACTION: Notice of intent.

SUMMARY: The U.S. Army Engineer District, Alaska, intends to prepare a Draft Programmatic Environmental Impact Statement (DEIS) to evaluate the feasibility of constructing erosion protection alternatives and community relocation alternatives at Shishmaref, Alaska. Shishmaref, population 562, is on a barrier island on the Chukchi Sea on the northwestern coast of Alaska. The shoreline at the community is being rapidly eroded by storm waves possibly because the ice pack has been forming later in the autumn than in the past, allowing more of the force of late season storm energy to reach the shore. The programmatic DEIS will determine whether Federal action is warranted, and if so, and community relocation is selected, site alternatives will be addressed in more detail in a second tier of the EIS process.

FOR FURTHER INFORMATION CONTACT:
Lizette Boyer (907) 753-2637, Alaska District, U.S. Army Corps of Engineers, Environmental Resources Section (CEPOA-EN-CW-ER), P.O. Box 6898, Elmendorf AFB, AK 99506-6898. E-mail: Lizette.P.Boyer@poa02.usace.army.mil.

SUPPLEMENTARY INFORMATION: This study is authorized under Section 203, 33 U.S.C. Tribal Partnership Program. The community of Shishmaref has existed on Sherichief Island for centuries. The four-mile-long island, formed by littoral drift, is steadily eroding along the Chukchi Sea. As early as the 1950's the community began taking steps to fight the annual erosion problem. Strong wave and current action cause massive scouring and erosion of the fine sand embankment. Bank revetment structures (gabions filled with sand and concrete mattresses) were installed but failed to stop the erosion for long. Severe fall storms in 1989, 1990, and 1997 undermined the protective structures and caused buildings to be moved or abandoned. The late formation of the shorefast ice pack in recent years aggravates erosion damage during fall storms. Without shore protection structures and continued maintenance of them, all the community infrastructure is in jeopardy.

The programmatic DEIS will consider alternatives including the continuation of erosion protection structures to prevent land and property losses. The community has obtained funding for efforts to protect a stretch of the beach to the west of the school property where a Bureau of Indian Affairs road is at risk. The Corps of Engineers currently is conducting an emergency bank protection study to protect the school. Longer term protection for the

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

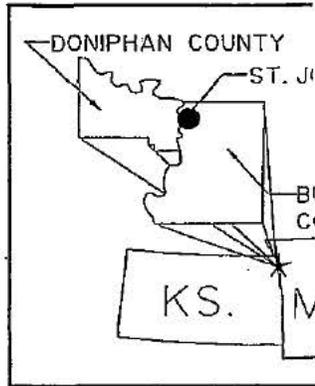
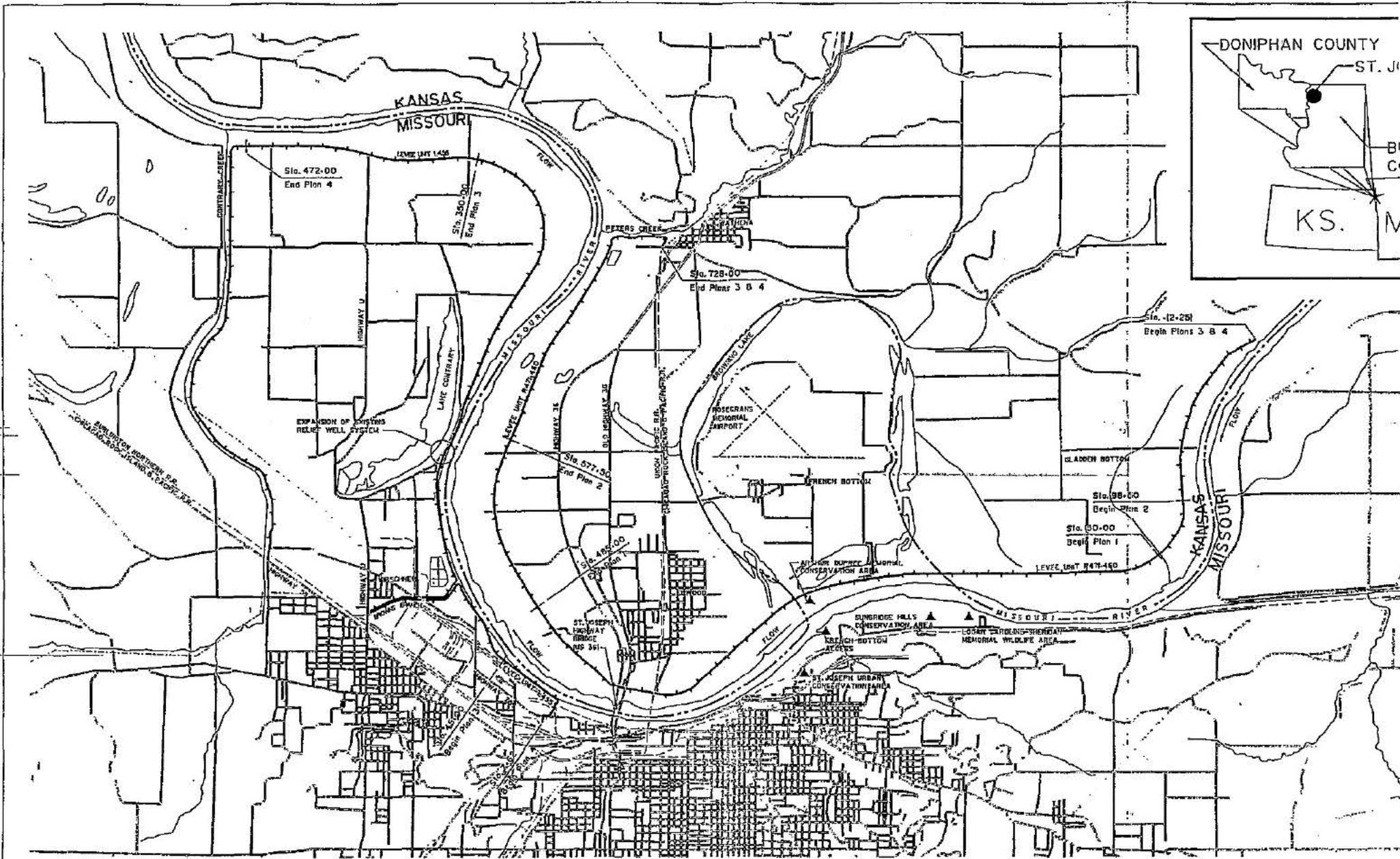


APPENDIX B

Maps of Project Site:
Location
Habitat Types and Borrow Areas
Shipwrecks

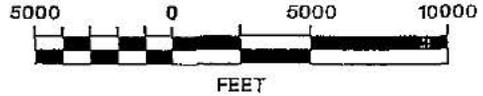
**Missouri River Levee System
Units L-455 and R-471-460
Flood Damage Reduction Study
Kansas and Missouri
Draft Environmental Impact Statement**





-KEY-

- EXISTING LEVEES
- STATE BOUNDARY

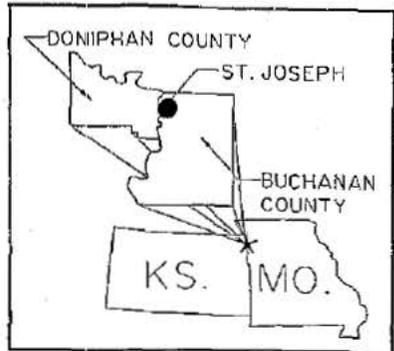
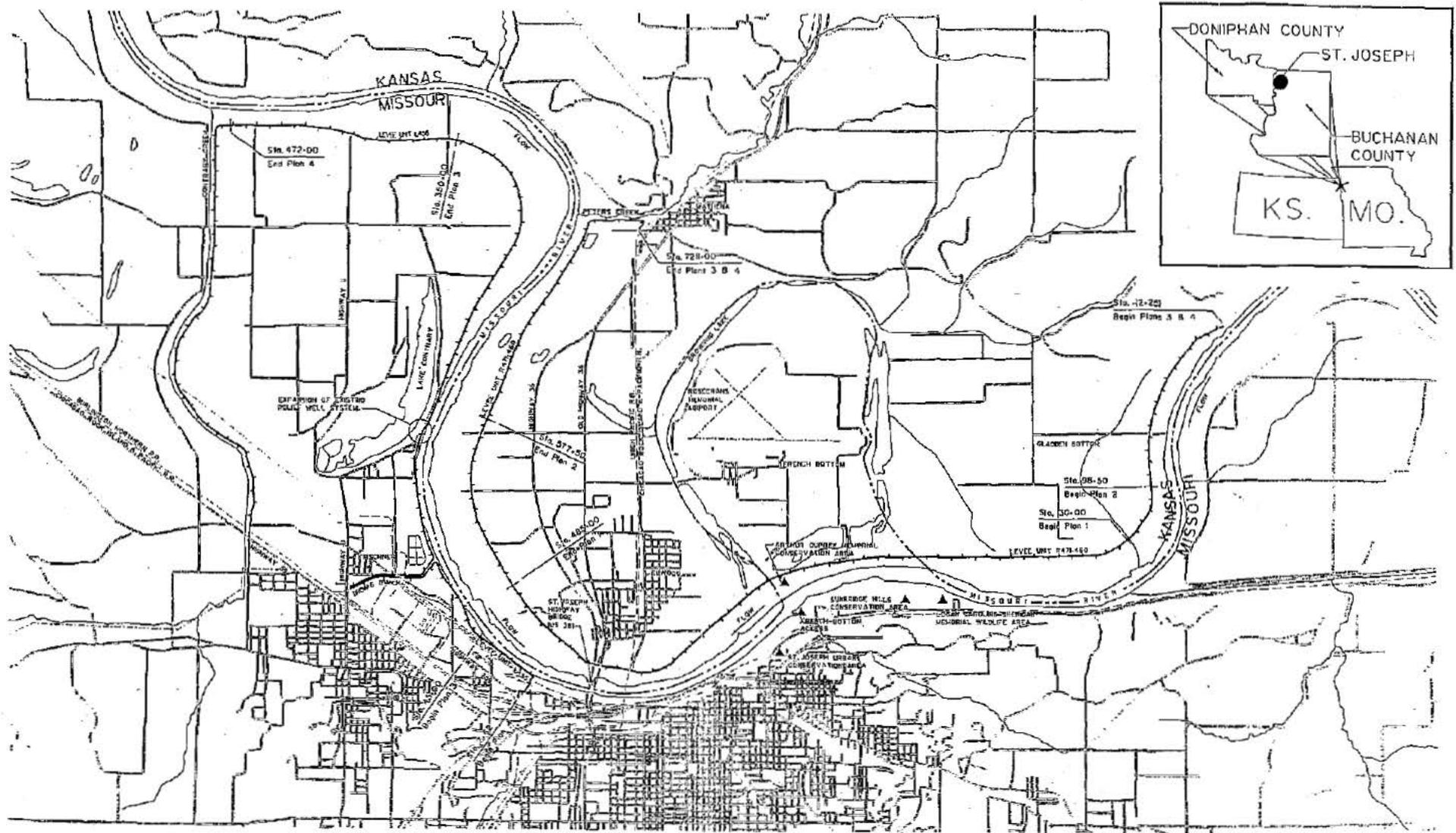


HDR Engineering, Inc.

**Location Of Plans For Levee Raises
Units R471-460 And L455 And Of
Expansion Of Relief Well System**

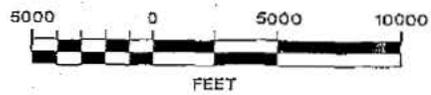


C.O.E. ST. JOSEPH LEVEE STUDY
U.S.A.C.E. Contract DACW41-95-C-0062
HDR Project 02285-008-133



-KEY-

- EXISTING LEVEES
- STATE BOUNDARY

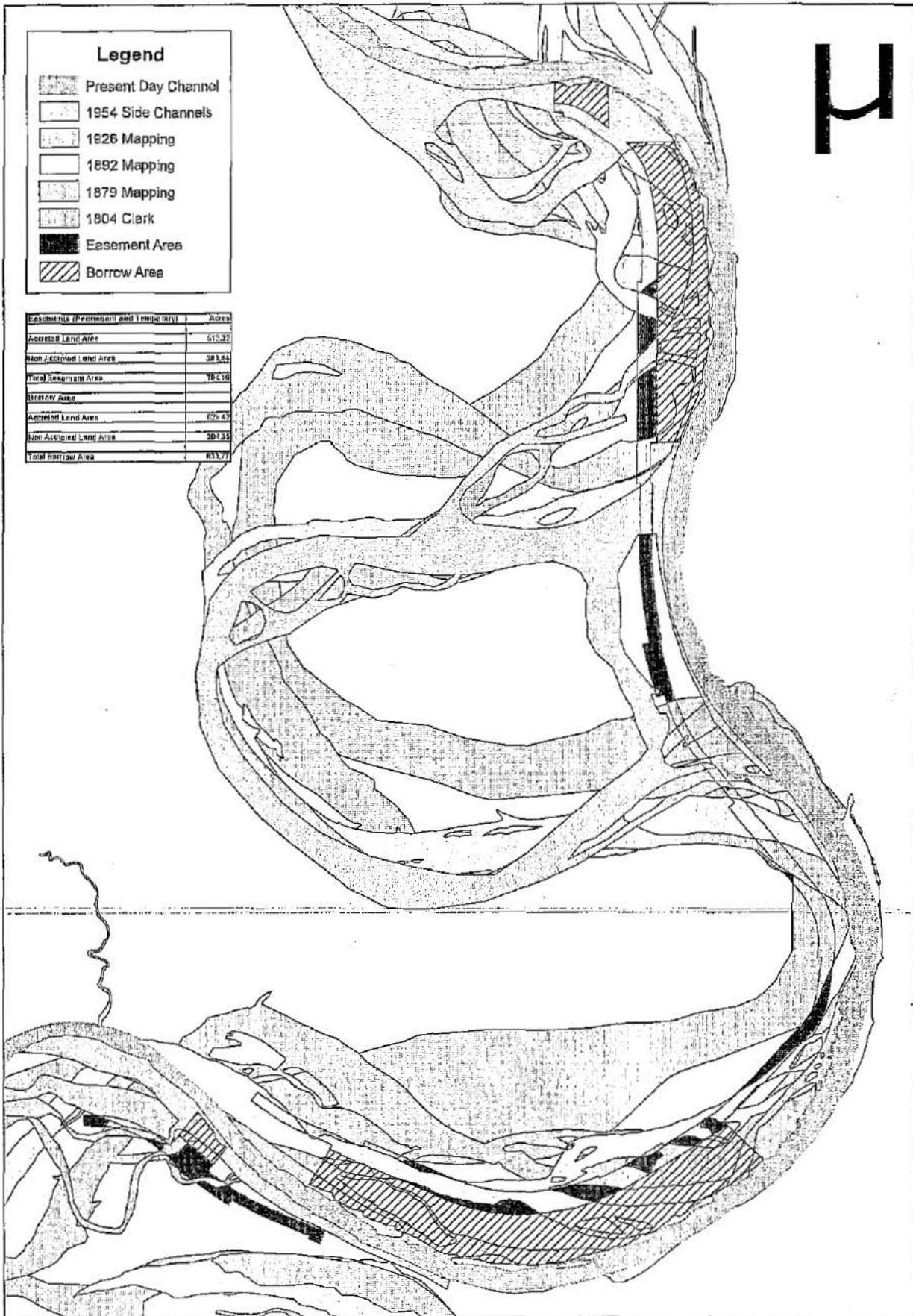


Location Of Plans For Levee Raises
Units R471-460 And L455 And Of
Expansion Of Relief Well System



C.O.E. ST. JOSEPH LEVEE STUDY

St. Joe Levees - Easements with Accreted Lands

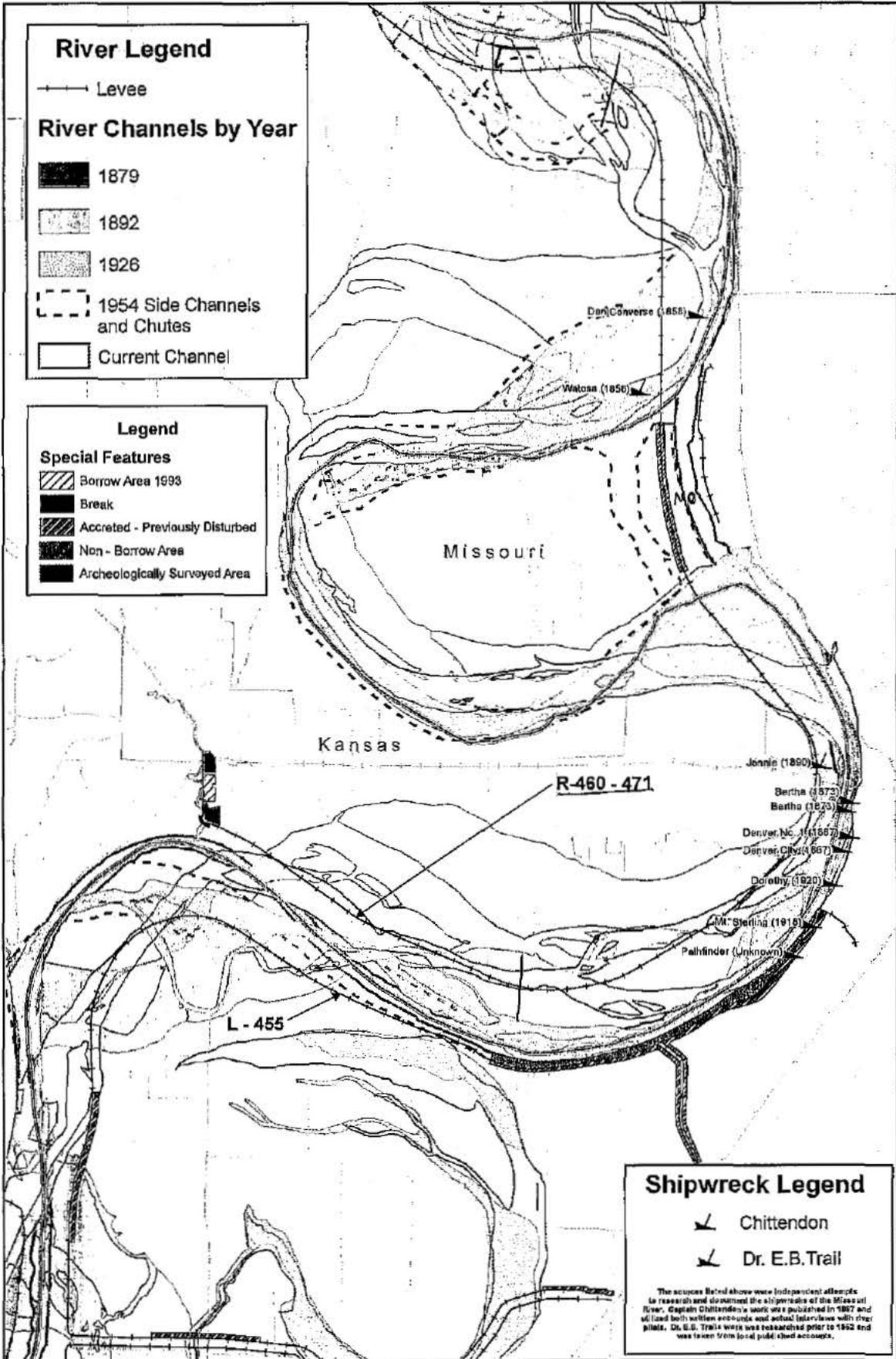


USERS SHOULD REFER CORRECTIONS, ADDITIONS, AND COMMENTS FOR IMPROVING THIS PRODUCT TO: GDS COORDINATOR, UNITED STATES ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT OFFICE, 601 EAST 12TH, ROOM 612, KANSAS CITY, MISSOURI 64106



Prepared and Produced by the
U.S. Army Corps of Engineers
Kansas City District

L-455 R- 460-471



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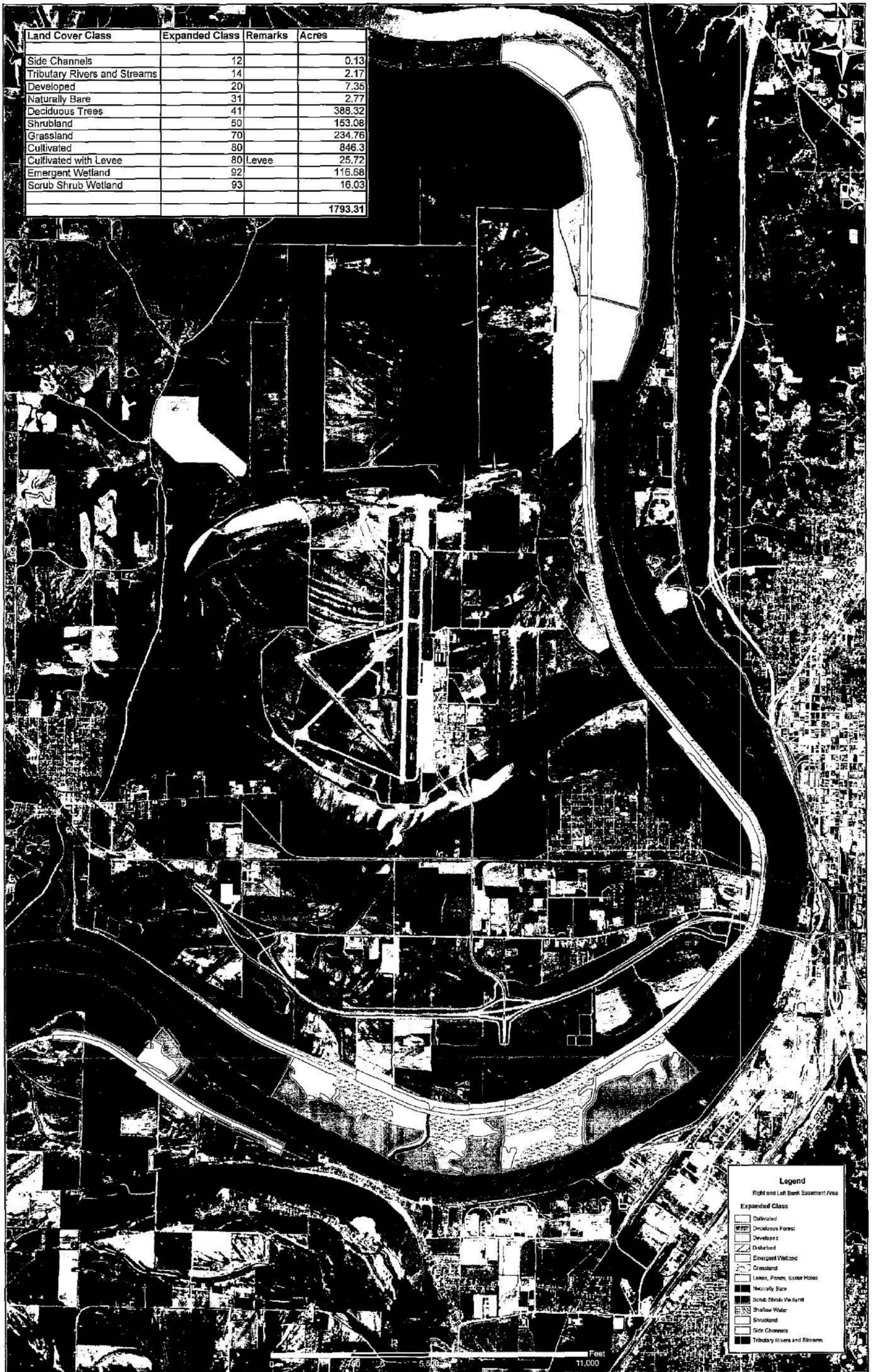


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Kansas City District

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Land Cover Areas in Proposed St. Joe Levee Easement Area

Land Cover Class	Expanded Class	Remarks	Acres
Side Channels	12		0.13
Tributary Rivers and Streams	14		2.17
Developed	20		7.35
Naturally Bare	31		2.77
Deciduous Trees	41		388.32
Shrubland	50		153.08
Grassland	70		234.76
Cultivated	80		846.3
Cultivated with Levee	80	Levee	25.72
Emergent Wetland	92		116.68
Scrub Shrub Wetland	93		16.03
			1793.31



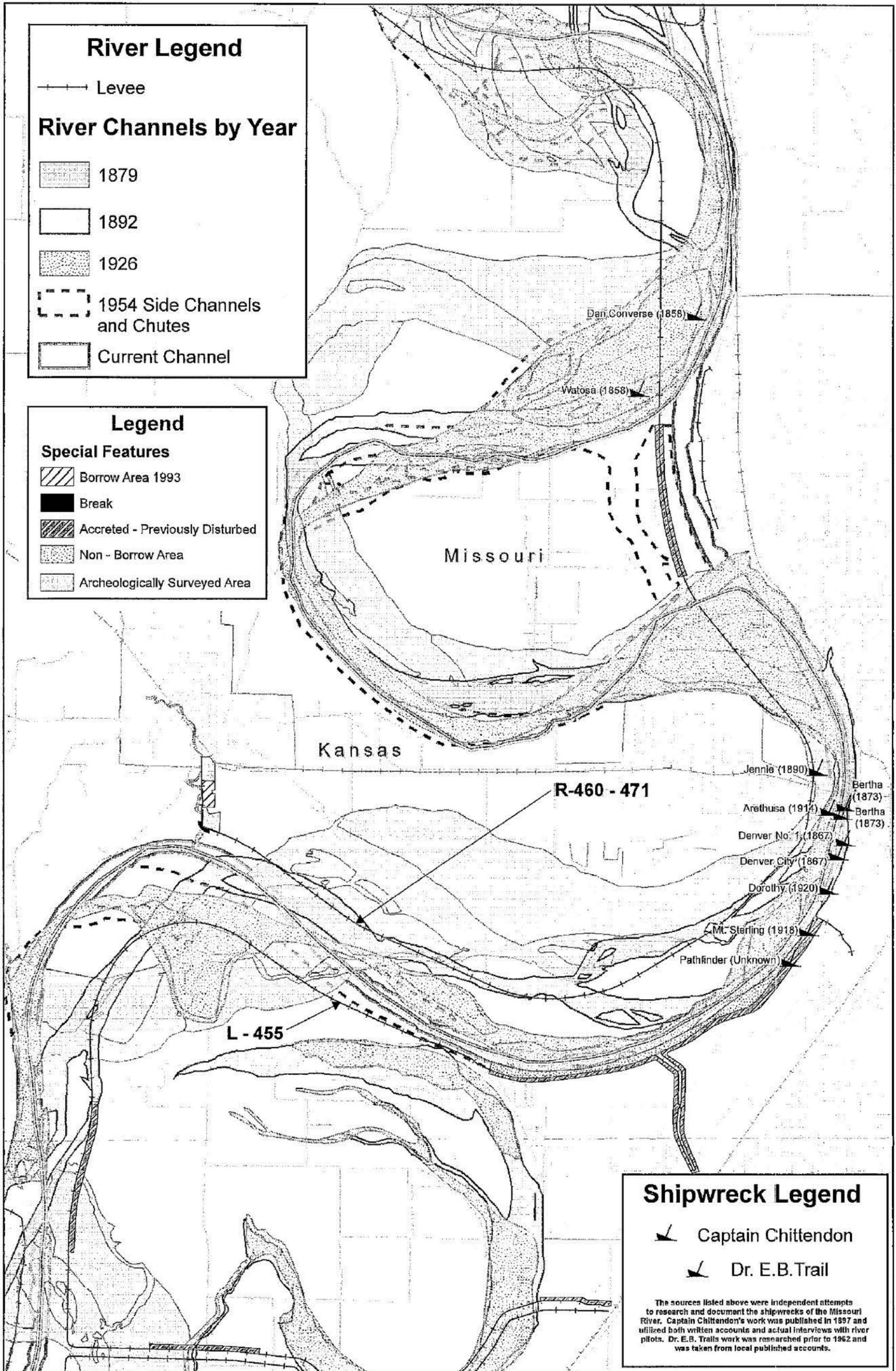
Legend
Right and Left Bank Easement Area

Expanded Class

- Cultivated
- Deciduous Forest
- Developed
- Disturbed
- Emergent Wetland
- Grassland
- Lakes, Ponds, Scour Holes
- Naturally Bare
- Scrub Shrub Wetland
- Shallow Water
- Shrubland
- Side Channels
- Tributary Rivers and Streams

0 2,500 5,000 11,000 Feet

River Levees L455 and R460-471



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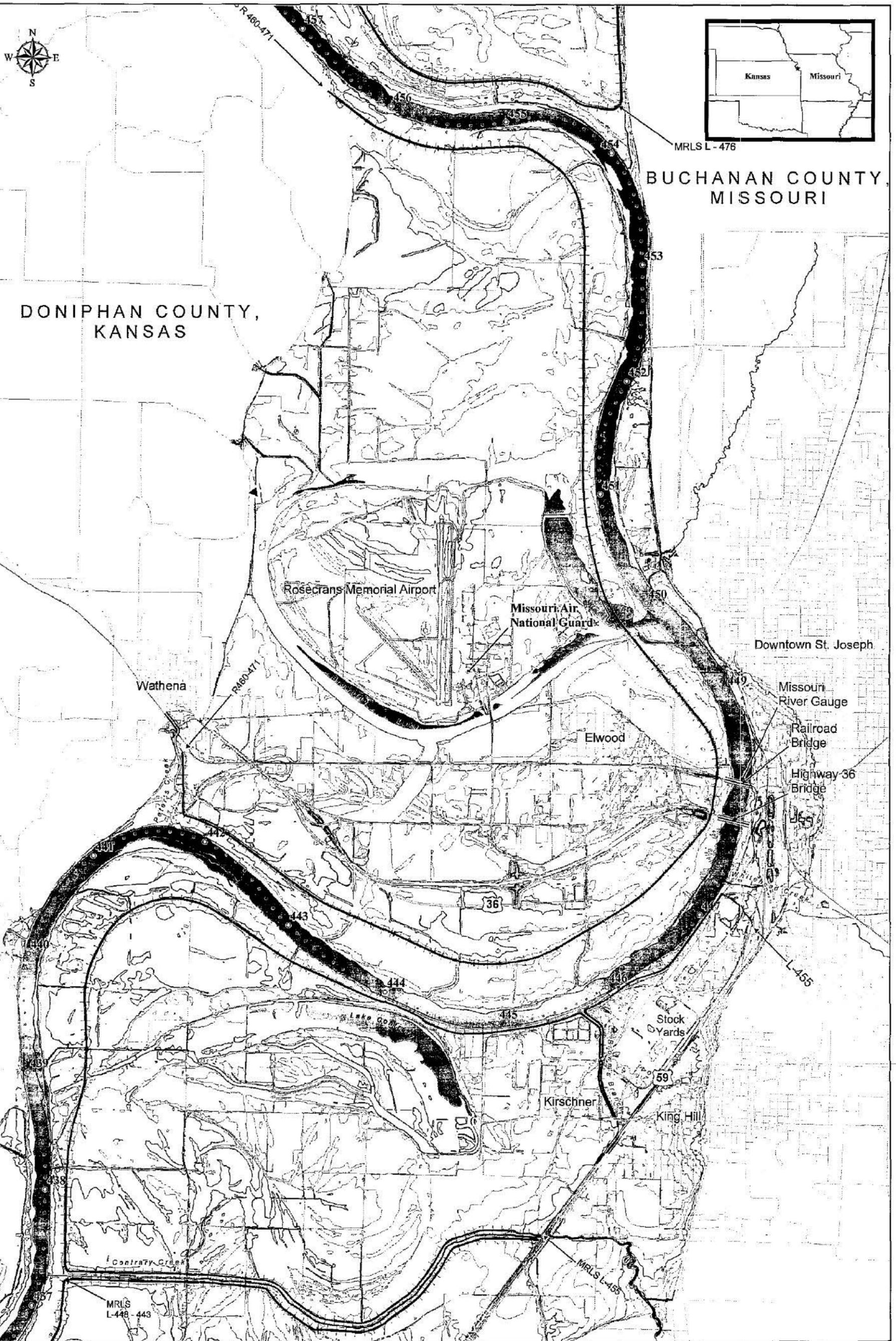
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Kansas City District

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MRLS L-455 and R460-471
FEASIBILITY STUDY AREA



BUCHANAN COUNTY,
MISSOURI

DONIPHAN COUNTY,
KANSAS

Wathena

Rosecrans Memorial Airport

Missouri Air National Guard

Elwood

Downtown St. Joseph

Missouri River Gauge

Railroad Bridge

Highway 36 Bridge

Stock Yards

Kirschner

King Hill

MRLS
L-448 - 443

MRLS L-455



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



APPENDIX C

Scoping Comments

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Environmental Assessment**



PUBLIC MEETINGS, SCOPING, AND WORKSHOPS

On March 19, 1996, a meeting in St. Joseph was held with the potential sponsors from the levee districts and representatives of the Cities of St. Joseph, Elwood, and Wathena to disseminate the results of the study and to solicit views concerning the study findings. As a result of this meeting, the local sponsors expressed an interest in proceeding to feasibility studies.

On October 29, 2002, the Corps and FEMA held a public meeting in Elwood, Kansas at the Elwood Community Center to explain to the residents the increased risk of flooding in the area. A similar meeting was held on October 30, 2002 in Wathena, Kansas.

The Corps initial scoping workshops were conducted during the fall of 1995 and included meetings with local, state and Federal agencies, organizations and the general public.

On September 13, 1995, the Corps held a public information workshop at the Holiday Inn in St. Joseph, Missouri to provide notification to the public that a Federal study had been initiated, and to solicit information and views about water resource problem and potential solutions in the study area. Comments were solicited from the public at this initial meeting in which approximately 50 people attended. No substantial opposition or controversial comments were received as a result of the public scoping meeting.

A draft EIS was prepared and provided to resource agencies for review as well as to Corps personal for Internal Technical Review. Based on comments received, a determination was made to revert back to preparation of an EA because impacts were not deemed significant and are readily being mitigated.

No significant comments have been received from any government agency, private organization or the public as a result of meetings, workshops, and public notices for this project

On August 1, 2006, a description of the proposed project was circulated to the public and resource agencies through Public Notice No. 200501489 issued jointly by the Kansas City District; the Missouri Department of Natural Resources, Water Pollution Control Program; and the Kansas Department of Health and Environment. The Public Notice included a thirty-day comment period that ended on August 31, 2006, and provided instructions for the public to provide comments on the proposed project. The public notice also included information on the Corps preliminary determination to prepare a Finding of No Significant Impact (FONSI) for the project and a draft Section 404(b)(1) Evaluation. The public notice was mailed to individuals, agencies, and businesses listed on the NWK-Regulatory Branch's general, state of Missouri and Buchanan County mailing lists, as well as the state of Kansas and Doniphan County mailing lists. A copy of the public notice is included in this appendix, along with a copy of the mailing lists.

The following comments were received during the Public Comment period:

1. The Missouri Department of Conservation (MDC), in an email dated August 3, 2006, requested additional information on levee raise elevations in the Arthur Dupree Conservation Area. **RESPONSE:** The MDC were provided with levee raise specifications for this areas as well as a map detailing the permanent and temporary right-of-way easements.
2. The Wyandotte Nation, in a facsimile dated August 3, 2006, stated that based on the topographic and hydrologic setting of the project, archaeological materials could be encountered, and should such be encountered, requested that the Nation be immediately contacted. **RESPONSE:** The Wyandotte Nation will be immediately contacted should any archaeological materials be encountered.
3. The Pawnee Nation of Oklahoma, in an email dated August 4, 2006, stated that they had no objection to the proposed project.
4. The Federal Aviation Administration, in a letter dated August 4, 2006, stated they had no comments regarding environmental matters.
5. The Kansas State Historical Society, in a letter dated August 4, 2006, stated that the proposed project should have no effect on properties listed on the National Register of Historic Places or otherwise identified in "their" files.
6. The Osage Tribe of Oklahoma, in a letter dated August 9, 2006, stated that the proposed project area could have religious or cultural significance to the Osage Tribe, and that should archeological materials such as bone, pottery, chipped stone, etc. become exposed that work cease and that they be contacted. **RESPONSE:** The Osage Tribe of Oklahoma will be immediately contacted should any archaeological materials be encountered.
7. The Omaha Tribe of Nebraska, in a letter dated August 15, 2006, stated that the proposed project area is within their historical lands; however, because the area has been

previously disturbed, they had no objections to the proposed project. The Tribe further stated that should archeological materials become exposed during construction, that work cease and that they be immediately contacted. **RESPONSE:** The Omaha Tribe of Nebraska will be immediately contacted should any archaeological materials be encountered.

8. The Save the Lake Committee, in a letter dated August 16, 2006, stated that dredged material from Lake Contrary should be used, in part, for the levee raise. **RESPONSE:** Beneficial reuse of dredged material is an excellent strategy that results in a "win-win" solution for compatible projects. However, the Study did not consider dredging Lake Contrary as a source of fill because there are concerns with the probable organic content at the bottom of the lake and the likelihood the dredged material would not be free draining material. The borings in the vicinity of the levee adjacent Lake Contrary indicate zones of silty sands as well as zones of silt and clay materials. Some borings indicate poorly graded sands which would work well with a dredging and fill operation for the underseepage berms; however, it would be difficult to separate the free draining sands from the zones that are not free draining. Organic material is not recommended as a levee structural fill or a fill other than topsoil, which has a limited thickness. Placement of saturated material that is not free draining precludes proper compaction and will introduce instability and long term consolidation (i.e., settlement).

9. The State of Missouri Emergency Management Agency (State), in a memorandum dated August 28, 2006, stated that any development associated with the project that is located within a special flood hazard area, as identified by the Federal Emergency Management Agency, must meet requirements of the State of Missouri Executive Order 98-03 and local floodplain management ordinances. To meet these requirements, a floodplain development permit must be obtained prior to the commencement of any construction/development activities. Further, the State stated that if the development is also located within a regulatory floodway a "No-Rise" Certificate and statement as to the effects of possible flooding, prepared by a licensed engineer and to current FEMA standards, also is required before the development can be permitted. **RESPONSE:** The comment is noted. The US Army Corps of Engineers will obtain any required permits concerning development within a special flood hazard area (SFHA) at the time of the finalized design and prior to any construction activity. The intention of the design at this time is that any raises and widening of the existing levee will occur on the landside of the levee. Thus, there should be no encroachments within the regulatory floodway other than removal of some riverward borrow material during the construction process

10. The Kansas Department of Wildlife and Parks, in a letter dated August 29, 2006, provided a formal response to previous emails and conversations between the Department and the Corps. The letter reiterated that no significant impacts to either state or federally listed threatened or endangered species would occur, and the impacts to area wetlands and vegetation has been minimized and avoided. The Department reminded the Corps that no Department of Wildlife and Parks permits or special authorizations are currently required and that any dredging to obtain borrow material is strongly discouraged. Additionally, the Department stated that should any design changes be made in project

plans, the project sponsor must contact the Department to verify continued applicability. **RESPONSE:** The formal response comments were noted and appreciated. No dredging is currently planned, and the Corps will notify the Department of any changes in project plans.

11. The U.S. Fish and Wildlife Service, in a facsimile dated August 30, 2006, provided the following comments:

a. The Service stated that a discrepancy in levee raise was noted in the Feasibility Study, where Alternative 1 would raise the levee 2 and 2/3 feet while elsewhere in the document a raise of 3.37 feet would be conducted. **RESPONSE:** The maximum height of levee raise necessary to achieve the design profile elevation for unit R471-460 is 3.37 feet. The reference to two and two-thirds feet is the specific height of raise at the economic index point. The purpose and determination of the economic index point is discussed in Section 3.1.3 of Appendix C of the Feasibility Report.

b. The Service stated that impacts to migratory songbirds were not addressed and stated that the Migratory Bird Treaty Act and Executive Order 13112 Section 2(3) (invasive species) should be included in the documentation. **RESPONSE:** The Corps will ensure that project construction minimizes impacts to migratory birds by avoiding breeding times and by minimizing the cutting of trees. Bare and farmed areas will be considered first when obtaining borrow. To ensure Executive Order 13112 Section 2(3) is complied with, the Corps will seek to detect and respond rapidly to and control populations of invasive species in the mitigation areas in a cost-effective and environmentally sound manner, will monitor invasive species populations accurately and reliably, and will restore native species and habitat conditions in the project area in areas where reed canary grass currently existing.

c. The Service stated that they would not recommend, support, or advocate wetland mitigation in areas protected, restored, or targeted for protection or restoration under Federal programs designed to increase the Nation's wetland base (i.e., Elwood Bottoms and the Missouri River Fish and Wildlife Mitigation Program). **RESPONSE:** Because the MRFWMP is seeking to restore the Elwood Bottoms (adjacent to L-455) area under the MRFWMP, the Corps will seek only those areas north of Highway 36 to off-set the impacts to farmed wetlands resulting from the levee expansion.

d. The Service recommended that disturbed areas (levees) be reseeded with appropriate native species indigenous to the local area. They further stated that rye, brome and fescue are not native and should not be use. **RESPONSE:** The Corps will use native grass species to the extent practicable. However, the Kansas City District requirements for seeding and mulching of levee embankments dictate the use of grass species (such as fescue, brome, and rye) that sprout quickly to limit erosion, that can be readily mowed in order to facilitate levee inspection to ensure levee stability, and that help prevent the burrowing of animals that could disrupt levee integrity.

e. The Service stated that the dates identified in the Environmental Assessment were not the actual dates of issuance and expiration of the Public Notice. **RESPONSE:** The Corps intended to publish the Public Notice earlier in the environmental process but had missed the date that was originally contained in the Environmental Assessment. The date has since been updated in the Environmental Assessment.

f. The Service stated that the Best Management Practices (BMP's) discussed in Alternative 1 should be described in more detail. **RESPONSE:** The Corps has expanded these BMP's.

g. The Service recommends that wetland mitigation for emergent wetlands be at a ratio of 1:1.5 and mitigation for forested wetlands be at a ratio of 2:1 and questioned why the Corps is proposing only a 1:1 mitigation ratio. **RESPONSE:** The Corps used the Fish and Wildlife Service wetland database and maps to identify wetlands which might be impacted by the proposed project. This information revealed that emergent and forested wetlands occurred on the landside of the levee at locations that would be filled as the levee toe expands. Upon on-site investigation (photo taken and available) the Corps noted that these areas were actually farmed wetlands. To provide a no net loss of wetland habitat, and to be consistent with the USFWS Coordination Act Report of farmed wetlands, the Corps will be off-setting impacts to these habitats at a 1:1 ratio. The Corps apologizes for the confusion.

h. The Service questioned where in the borrow areas will wetland mitigation actually take place. **RESPONSE:** Specific locations have yet to be identified at the Feasibility stage. The Corps understands the Service's stance on not off-setting impacts in the Elwood Bottoms area, and the Corps will not off-set its impacts in this area. As construction approaches, more detailed information will be available to make these determinations. The Corps will continue to coordinate with the Service and resource agencies on this issue.

i. The Service stated that Section 3.2.2 Wildlife was not updated with information provided by the Service. **RESPONSE:** This section has since been updated and the Corps appreciates the Service's assistance.

j. The Service stated that Section 3.2.3 Aquatic Ecosystem was not updated with information provided by the Service. **RESPONSE:** This section has since been updated and the Corps appreciates the Service's assistance.

k. The Service provided information on the Indiana bat, stated that suitable habitat for the Indiana bat may exist in the project area, and recommended that the Corps identify the extent of suitable habitat in the project area in both Kansas and Missouri. If suitable roost trees are proposed to be removed, the Service recommends that a survey of the area be made to determine the presence or absence of bats. If bats would be impacted, the Service stated that further consultation under Section 7 of the Act would be required. **RESPONSE:** The Corps included the information from the Service on Indiana bat in the Environmental Assessment. The Corps had previously stated that suitable roost habitat

may occur along the Missouri River. As construction approaches, the Corps will survey the area for bat habitat per the Service's recommendation and also invites the Service to participate in this activity. Coordination between the Corps and the Service will continue as this time line nears.

l. The Service was concerned about allowing borrow areas to naturally revegetate due to the reed canary grass, an exotic and aggressively invasive species. **RESPONSE:** The Corps has included adaptive management in the Monitoring Plan to identify and rectify situations deemed unfitting. The spread of reed canary grass will be included in this effort.

m. The Service stated that unavoidable impacts to wetlands at borrow sites have mitigation concurrent with or shortly after project completion and that restoration be in-kind to ensure that no habitat value is lost. **RESPONSE:** The Corps does not anticipate negative impacts to wetlands in the borrow areas, none the less, the comment is noted and will be followed should negative impacts occur.

FWS Response to Selected Corp's Comments on FWS Recommendations in the Draft Fish and Wildlife Coordination Act.

a. Comment on native plant species (Recommendation Number 4) used during re-seeding operations. **RESPONSE:** Comment previously noted and appreciated.

b. Comment on wetland mitigation (Recommendation Number 6) proposed sites. **RESPONSE:** Exact wetland mitigation sites within the borrow areas have not been made at this time. The scraping and reshaping of wetlands will be conducted on wetlands within the borrow areas not along the farmed wetlands at the toe of the levee. No off-set will be conducted in the Elwood Bottoms area per the Service's recommendation. A map will be provided to the Service as the project nears construction and these areas are more readily identifiable.

c. Comment on encouraging wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee units (Recommendation Number 9). **RESPONSE:** Wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee units will be encouraged where practicable.

d. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project (Recommendation Number 10). **RESPONSE:** The updated information from the Service on footwear, clothing, and other sampling equipment has been included in the list of BMP's.

FWS Recommendations from the Final Fish and Wildlife Coordination Act

a. Take of borrow material from riverward areas should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project. **RESPONSE:** Agreed. The Corps has already coordinated take of borrow material with Corps MRFWMP team members, and this coordination will continue as the project reaches the final design stage.

b. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. The Corps should focus on bare or cropland areas for borrow. **RESPONSE:** Concur. The Corps will seek the recommended areas for borrow material.

c. Reconsideration of the Levee Setback alternative. **RESPONSE:** Comment Noted. This alternative has been analyzed and based on land ownership, land price, environmental benefits gained vs. total costs, this alternative was reconsidered and not selected.

d. Levees and levee easements should be seeded with native vegetation. **RESPONSE:** Concur. Coordination with the Service for an approved seed mix will be conducted.

e. Removal of mature cottonwoods and other native vegetation should be avoided where possible, and if removed, replaced with woody vegetation by establishing 2 acres for every one impacted. **RESPONSE:** Mature cottonwoods and other "high value" habitat trees will be avoided during the project. Should any be removed, it will be off-set at a 2:1 ratio.

f. Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects at a minimum of 1.5:1 for emergent wetlands, 2:1 for forested wetlands, and 1:1 for farmed wetlands. **RESPONSE:** Concur. The Corps will be off-setting its impacts to farmed wetlands at a 1:1 ratio.

g. Encourage wetland development and hydrological reconnection to the river at existing and proposed borrow areas. **RESPONSE:** Concur. Comment noted above.

h. Best Management Practices to prevent transport of invasive species to and from the construction sites should be included as an integral component of the project. **RESPONSE:** Concur. Comment noted above.

Opportunities to Provide Fish and Wildlife Enhancement through the Project

a. Establish native vegetation riverward of the levee segments where riparian woodlands are sparse or nonexistent or where the invasive species, reed canary grass, has become established. If possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, and floodplain pond that would eliminate reed canary grass. **RESPONSE:**

The Corps, in coordination with the Service, will seek to obtain borrow and/or plant native species in the areas identified to enhance the project area.

b. All disturbed areas should be immediately planted with native vegetation following construction. **RESPONSE:** The Corps will revegetate with native vegetation following construction and will coordinate with the Service to obtain a list of native seed and plants for this purpose.

Appendix E

The Service stated that Appendix E did not appear to be updated to include revised information. **RESPONSE:** This appendix has been updated per the Service's revised information.

Appendix J

General Comments

a. The Service recommends a plant list, containing both common and scientific names, which includes all plants proposed to be used for any component of the project be included in the mitigation plan. **RESPONSE:** The mitigation plan contains a list of trees and shrubs to be planted. A list of grass species is being developed and will be provided to the Service upon its completion.

b. The Mitigation Plan does not conform to the Multi-Agency Compensatory Mitigation Checklist and Supplement: Compensatory Mitigation Plan Checklist included as part of the Kansas City District's Notice of Implementation of the Multi-Agency Compensatory Mitigation Checklist and the National Research Council's Mitigation Guidelines (PN 200400295). **RESPONSE:** This Checklist was used to formulate the Mitigation Plan.

c. Mitigation Goals and Objectives. Mitigation in MRFWMP lands. **RESPONSE:** Comment previously addressed. Mitigation will not occur in these lands.

d. Mitigation Site Selection and Justification. The Service stated that a map would be helpful to identify mitigation sites. **RESPONSE:** As the project gets closer to the construction phase, exact mitigation sites will be determined, mapped, and a map will be provided to the Service. Existing seed banks containing reed canary grass should not be used to supplement new wetland areas. **RESPONSE:** Concur. Locating proposed wetland mitigation adjacent to existing wetlands may negatively impact the existing wetland. **RESPONSE:** Wetlands mitigation will be designed to ensure that they function as anticipated. Adapted management will be used to assess and make changes as necessary.

e. Monitoring Plan. Any monitoring conducted on MRFWMP lands should include MRFWMP team members. **RESPONSE:** Concur. MRFWMP team members will be informed of any monitoring conducted on these lands.

f. Performance Measures. The performance measures should include measurable outcomes and a contingency plan if the mitigation fails during the monitoring period. **RESPONSE:** Concur. This information has been added to the Mitigation Plan.

g. Site Protection and Maintenance. Mitigation sites should be protected in perpetuity and a maintenance plan should be developed to address invasive species management. **RESPONSE:** Concur. This information has been added to the Mitigation Plan.

Public Notice 200501489

The proposed work statement states that the anticipated raise varies along its entire length from zero to two and one half feet. **RESPONSE:** The proposed raise will be from zero to 3.37 feet.

Additional Comments

a. The Service recommends that the Corps give first consideration for borrow areas along the banks of the river as a way to increase shallow water habitat in coordination with the MRFWMP team. **RESPONSE:** The Corps has coordinated with the MRFWMP team concerning borrow areas. As the project approaches the construction phase, the Corps will continue this coordination to ensure compatible use and selection of borrow areas.

b. New information on the Indiana bat. The Service recommends that the Corps identify the extent of suitable bat habitat in the project area, and evaluate potential effects to the habitat. **RESPONSE:** The Corps will conduct a survey to identify the extent of suitable bat habitat in the project area prior to construction to determine if suitable roost trees are present, and invites the Service to attend.

12. The Department of Natural Resources, in a letter dated August 31, 2006, provided the following comments:

a. Water Resources. The Department was concerned with impacts to area wetlands and stated that standard Best Management Practices should be employed to adhere to the Missouri Clean Water Law. **RESPONSE:** Concur. The Corps will seek to mitigate impacts to wetlands through avoidance, minimization, and mitigation. Any unavoidable impacts to wetlands will be off-set on-site to ensure a no net loss of wetland habitat. The Corps also will be implemented Best Management Practices to ensure adherence to the Clean Water Law.

b. Hazardous Wastes. The Department provided a list of up-dated superfund listed properties and recommended the Corps verify these locations to determine which site, if any, might impact the proposed project. **RESPONSE:**The list of superfund sites will be verified by the Corps prior to construction to ensure these sites do not impact the proposed project.

August 28, 2006 Public Meeting Comments

A public meeting to present background information and the recommendations contained in the Draft Feasibility Report and Environmental Assessment was held August 28, 2006, at the Elwood Community Center. Twenty-seven members of the public attended including representatives of the local sponsors, adjacent property owners, local elected officials, upstream and downstream levee districts, and state agencies. Five written comment forms were received during the public meeting. The names and contact information of those submitting comments, the comment, and the response of the Corps of Engineers, is detailed below.

Comment 1

Submitted by: James Rader
Mayor, City of Elwood
508 So. 8th Box 143
Elwood, Kansas 66024
913-365-2812
816-262-5154

Comment: I have lived in Elwood for 69 ½ years. I have been here through the flood of 1952 and also 1993. We have had extensive commercial development here since 1973. I feel this will stop without the recommended work done on the levees. Also the personal trauma of going through a flood and the cleaning and repairs afterward more than justify the cost of these extensions. Thank you for your work, Jim Rader.

Response: Comment noted and appreciated.

Comment 2

Submitted by: John Osborne
314 Center P.O. 27
Elwood, Kansas 66024
913-365-2804
jarvisandjack@msn.com

Comment: I was here in "93" and along with my friends & neighbors, listened to State & Federal official pacify Elwood residents. All I ask for myself and all Elwood resident is "Do what you say you'll do & don't say you will & then don't." Most people who have had any dealing with FEMA or the Corp, are very skeptical of everything the say & do.

We all want to live in a safe community, & I for one support your efforts. Thank you, John Osborne.

Response: Comment noted and appreciated.

Comment 3

Submitted by: Doug Shepherd
President, South St. Joseph Levee & Drainage District
4070 SW State Route U
St. Joseph, Missouri 64504
816-262-5297
shepherdfarm@aol.com

Comment: Why is there proposed work for levee between 205+00 to 295+00 when our trouble spot in 1993 was in the area of 107+70. Where we had to sandbag the levee to contain flood water. In the proposed work area we didn't have any problem.

Response: Appendix B of the Feasibility Study has identified the reach of the levee in the vicinity of station 107+70 as a reach requiring additional field surveys during Preconstruction, Engineering, and Design (PED). A little over 300-feet of levee in this area has been identified as suspect and may require a levee cap approximately a minimum of 0.6 of a foot thickness. Your comment of your first hand experience during the flood of 1993 and the additional field surveys during PED will most likely result in a short length the levee at this location receiving fill on its crown sufficient to remove the low spot.

Comment 4

Submitted by: Laipple Farms
1409 Treece Rd.
Wathena, Kansas 66090
785-989-4990

Comment: If the improvements to the existing levee system is carried out we are concerned where the borrow area or dirt will be obtained? We are not willing to give any borrow areas or dirt for these improvements. There have been several borrow areas given on this land through the years. We depend on this land for our living. There is no difference between this business and any other business. There is no drainage for the three (3) creeks that drain into the old river channel, that drain through Gladden Bottom. The channel is about filled up. It should be dredged out going East, to the tubes that are there. If the old channel would be cleaned out, this material could be used for the improvements on the existing levee.

Response: Potential borrow areas are currently designated as those areas adjacent to the levee on the river side. Generally, borrow locations are chosen nearest to the project site

to offset additional haul distances and cost and/or processing cost, if any. Furthermore, areas of significant tree growth and wildlife habitat are avoided. This is in accordance with Corps guidance. However, final locations and quantities that will be taken from each site are not finalized. During the Pre-Construction Engineering and Design (PED) phase, alternative locations and the use of dredged material will be considered. . If you are aware of borrow sources capable of producing acceptable fill material in the quantities necessary for construction of the selected plan, those locations should be provided to this office for consideration during PED.

Comment 5

Submitted by: John Cox
Airport Levee member
1008 NW Rosecrans Rd.
St. Joseph, Missouri 64503
816-271-4886
johncox@ci.st-joseph.mo.us

Comment: Since the Mo Air National Guard 139th AW has the greatest investment protected by the R471-460 levee system. Why can't the DOD fund the O&M and/or levee system improvements?

Response: Cost-sharing requirements for Civil Works projects were established by Congress in the Water Resources Development Act of 1986. For a project of this type, a 65/35 split between the Federal government and local interests is required, without regard to the value or nature of investment within the existing system.

Public Meeting Comment 6 (received by mail 31 August 2006)

Submitted by: Gary Laipple
Farmer
1225 Tioga Rd.
Wathena, KS 66090
785-989-3482

Comment: Our family farm runs along the river from north of river mile 454 then south to river mile 452. We went through the construction of the levee with all the right of way and borrow area. We filled the borrow areas and deep plowed the haul roads. We have also been through various floods, including the "1993 flood" which was devastating to our family farm. So perhaps you can understand why our family is against any destruction of our farm, which includes the borrow areas and right of ways. Here are several alternatives for borrow areas. (1) Government Land along the river south of our farm which is river mile #451. (2) Dredge the old river channel. This would provide dirt plus drainage for the bottom. (3) Haul dirt from the bluff. (4) Dredge dirt out of the Missouri river. Please consider an alternative for the borrow areas other than our farm.

Also if berms are extended we should be allowed to farm them instead of taking the ground out of production.

Response: Same response as Public Meeting Comment 4 with the addition that extension of underseepage berms will be conducted using temporary easements and the ground will revert back to the property owner after completion of construction. Farming of underseepage berm areas is allowed.

Public Meeting Comment 7

Submitted by: Jan B. Laipple
1409 Treece Rd.
Wathena, Kansas 66090
785-989-4990

Comment: I am opposed to giving any dirt (borrow areas) or material of any kind, concerning stations 100+00 – 120+00 – 140+00 – 160+00 – 180+00 – 200+00 – 220+00. I am also against parting with any additional land. Create the borrow areas South of the above stations. (Stations – 240+00 – 260+00 – 280+00 – 300+00 – 320+00.) This land is not being farmed. Dredge the material out of the present river channel. Material could also be obtained out of the old river channel prior to 1952. A levee could be constructed East and West to the North of Rosecrans Airport. The obstructions and bottleneck at stations 400+00 – 420+00 – 440+00 could be corrected. This would help the flow of the river and help prevent flooding. The river should be maintained for navigation, not for preservation of wildlife. Dikes should be maintained to keep the river channel navigable. Moving products up and down the river is a much cheaper way of moving them. We have spent a lifetime building and paying for this farm. The land affected is priceless. This is how my families' livelihood is obtained. Thank you.

Response: See response to Public Meeting Comment 4 regarding borrow locations and evaluation of possible alternative sources. Levee realignment and setback is significantly more expensive than a raise in the existing location. The cost would outweigh the benefits of the project and cause a greater financial impact to the local levee districts. Federal laws and regulations require the Corps of Engineers to examine the environmental impacts of proposed actions and propose alternatives to minimize or mitigate those impacts. The management of the Missouri River for various purposes and the maintenance of the channel dikes is beyond the scope of this study.

Public Meeting Comment 8

Submitted by: Pat Higdon
11897 Hwy 36
Easton, MO 64443
816-473-3011

Comment: The public meeting in Elwood, KS, was informative and I understand the plan and necessity of improving the levee. I currently farm ground on both sides of the levee. It was not made clear how the construction of the levee will affect my acreage economically and what expected length of time. Where will the dirt (ground) come from for the project? Will I lose acreage? Will I be compensated for the loss of crop production effected during the project? Please respond – Pat Higdon

Response: Borrow (soil) material for the levee raise is currently proposed to come from the areas between the levee and the river. Specific locations and quantities from each location have not been fully developed. Construction of the entire project is estimated to take three years, however, impacts to specific location within the project should be less than that. Permanent loss of acreage may occur and will be compensated through the negotiation and purchase of a permanent right-of-way easement. Similarly, temporary impacts during construction will be compensated through the negotiation of temporary easements. Impacts to specific parcels will be refined during the Pre-Construction Engineering and Design (PED) phase and, when available, will be coordinated with each individual affected property owner.

Vandenberg, Matthew D NWK

From: Mike_LeValley@fws.gov
Sent: Tuesday, September 05, 2006 10:38 AM
To: White, Christopher M NWK
Cc: Vandenberg, Matthew D NWK; Susan_Blackford@fws.gov; Dan_Mulhern@fws.gov
Subject: Re: Proposed Answer to HQ Comment on EA for St. Joe Levees re EA

Chris: Your response accurately reflects our discussions regarding bald eagle habitat and the subject project. Let me know if (and when) you will need a formal letter from me regarding our concurrence. Thanks.

Michael J. LeValley
Kansas Ecological Services Field Office Supervisor U.S. Fish and Wildlife Service
2609 Anderson Avenue
Manhattan, KS 66502
785-539-3474, Ext. 105
785-539-8567, Fax

"White, Christopher M NWK" <Christopher.M.White@nwk02.usace.army.mil>	<Mike_LeValley@fws.gov>	To
09/04/2006 07:30 AM	"Vandenberg, Matthew D NWK" <Matthew.D.Vandenberg@nwk02.usace.army.mil>	cc
		Subject
	Proposed Answer to HQ Comment on EA for St. Joe Levees re EA	

Mike,

Could you please look over the below statement and let me know if this accurately reflects our discussions and your understanding of the issues?

I really appreciate you help in this and the cooperation of the service. Please note that the last sentence in our answer is only a draft, but I wanted to make sure that I phrased it correctly.

If possible could you let me know on Tuesday morning as we need to get this to HQ by noon Tues.

If you happen to read this on Monday and you have questions, I am at home: 816-347-2672.

Thanks,

Chris White

This is the HQ comment followed by our proposed answer:
a. Endangered Species Act. There is an apparent disagreement between

the Corps and the U.S. Fish and Wildlife Service concerning the affect of the project on the threatened bald eagle. The discussion in Section 4.4.4 of the EA states that the Corps has determined that the proposed action would have no adverse affect on Federal or State listed species. The USFWS, as noted on page 11 of the June 30, 2006 Fish and Wildlife Coordination Act draft report, has determined that the project may adversely impact the bald eagle, and page 17 of the FWCAR contains specific measures designed to minimize impacts to the eagle.

According to the USFWS/NOAA Endangered Species consultation handbook, where a Federal action agency makes a "no effect" determination with regard to a listed species, no consultation pursuant to Section 7 of the Endangered Species Act is required; and, no further coordination is needed to comply with the Act. However, Section 7 consultation is required in the event of a "may affect" determination. As the Federal action agency, the Corps has the responsibility for the determination of "affect" for a listed species, and does not have to accept the determination of the agency with ESA jurisdiction (USFWS). However, in this case the District should contact the USFWS to clarify the affect determination for the bald eagle. The results of the discussion concerning the affect of the project on the bald eagle should be included in the final report and EA.

NWK Response: The draft and final USFWS Coordination Act Reports (page 11) explain when Federal Agencies are required to consult under Section 7 of the ESA. They state: "If a project may affect listed species, the Corps of Engineers should initiate formal Section 7 consultation." The third paragraph of page 11 of the Final CAR states: "This project may adversely impact the bald eagle by removing trees from the levee footprint and from the borrow areas." An email to the USFWS was sent to clarify that mature cottonwoods (24-inches dbh, over 50 feet tall, and within 100-feet of the water's edge) will be avoided by project construction activities, thus avoiding any affects to bald eagle. The other secondary cottonwoods along the levee footprint are much less dbh than 24-inches, are not over 50 feet tall, and are $\frac{1}{4}$ to $\frac{1}{2}$ mile from the water's edge. These trees do not constitute eagle habitat. However, recognizing that trees are important to the environment, the Service has stated that an adverse impact may occur (removal of trees is bad for wildlife) but that an affect (an action that causes harm or harassment to listed species and, thus, triggers Section 7) is not likely. The Field Supervisor at the Fish and Wildlife Service is currently working with the Corps and is in agreement with this determination.



Matt Blunt, Governor • Doyle Childers, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

August 31, 2006

Kansas City District, Corps of Engineers
Christopher M. White, Ph.D.
St. Joseph Levees Project
601 E. 12th Street
Kansas City, Missouri 64106-2896

Re: Draft Environmental Assessment and Draft Feasibility Report for Flood Damage Reduction on Missouri River Units R471-460 and L-455

Dear Dr. White:

The Missouri Department of Natural Resources has reviewed the Draft Environmental Assessment and Draft Feasibility Report for Flood Damage Reduction on Missouri River Units R471-460 and L-455. The department's comments are provided below.

The department has no record of ever receiving a Draft Environmental Impact Statement on this project. Consequently, these comments constitute the first comments by the department on the proposed project.

Water Resources

One of the department's concerns in a setting adjacent to a major water body is the presence of wetlands. The document describes the present wetlands as small pockets in meander scars and within the riparian area. In the area of concern (+- 21,000 acres) there are only 741 acres of scattered wetland – just 3.5 percent of the area. These are made up of 545 acres of forested wetland, 65 acres of scrub/shrub wetlands, and 131 acres of emergent wetlands. While exact figures are not immediately available, it is safe to say that this is much reduced from the historic acreage. While permanent impacts to the remaining wetlands from the proposed project would be relatively small, temporary impacts will likely be incurred during construction. Even small impacts on these diminished resources should be avoided to the extent possible. The employment of standard Best Management Practices should ensure protection of water quality and adherence to Missouri Clean Water Law.

**HAZARDOUS WASTE PROGRAM
Superfund Sections
SITE STATUS REPORT BY DISTRICT**

As of Monday, August 28, 2006

Buchanan County

Region: Kansas City
Ombudsman: Kansas City

1 ABC Recyclers

2902 S. 11th Street
St. Joseph

64503

County: Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: 1
Land Use(s):
Contaminants:
Contaminated Media:

Site Description History

The site is the former location of a meat packing plant, Dugdale Packing, of which a portion was leased to a recycling operation known as ABC Recyclers. Neither business is still operating. When the recycling company left, they left behind several 55-gallon drums of paint waste.

Recent Activities

Last Revised: 05/20/1998

An Integrated PA/SI was completed on March 29, 1996 with a recommendation for a PRP lead removal action. There are at least 15 55-gallon drums of hazardous waste on-site. A current lessee of the property indicated an interest in removing the hazardous and non-hazardous drums from the site. Investigator Al Wallen is overseeing this action. Apparently, Mr. Butts, the lessee, and the owner, June Ide, collaborated to hire an environmental contractor from Kansas City to do remove the drums sometime in late March. SEU is currently waiting for a closure report from Al.

2 Brooner & Associates

802 S. 5th Street
St. Joseph

64501-3676

County: Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site:
Land Use(s):
Contaminants:
Contaminated Media:

Site Description History

This site was discovered during the investigation of St. Joseph FMGP #3.

Recent Activities

Last Revised: 05/20/1998

During the SI sampling for the St. Joseph FMGP #3 site, on September 17-18, 1997, DNR staff observed 10-15 drums stored outside on the property. Some of the drums appeared to have leaked. A soil sample collected as part of the FMGP investigation revealed low levels of TCE (42 ppb). Since Brooner & Associates is a currently active business, and the TCE is not thought to be related to the FMGP site, this information was forwarded to the KCRO for their consideration. Additional work may be conducted under RCRA authority.

3 Byers Commercial Storage

18th and Penn Street
St. Joseph

64507

County: Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: less than 1
Land Use(s): Drum/Container Storage, Warehouse
Contaminants: Dioxin, Pesticides
Contaminated Media:

Site Description History

This site is a warehouse, where a number of cancelled pesticides were stored in 55-gallon drums. The building became contaminated with dioxin and other pesticides through spillage and leakage of containers. EPA has completed a removal of the drummed wastes, which were shipped off-site for inceneration. The building interior has been cleaned, and wipe tests were submitted to EPA.

Recent Activities

Last Revised: 05/20/1998

The site has not been accepted as cleaned up as of this update, since the groundwater issue has not been completely addressed.

4 Farmland Industries

Fourth & Seneca Street
St. Joseph

64504

County: Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: 1-2
Land Use(s): Pesticide Manufacturing/Use
Contaminants: Metals, Pesticides
Contaminated Media: Soil

Site Description History

The site is contaminated with high concentrations of pesticides. This contamination occurred between 1959 & 1980 from the formulation of organochlorine pesticides.

Recent Activities

Last Revised: 01/01/2006

BNSF submitted the annual report for the closed farmland site on 6/26/06.

The report detailed the monthly inspections and maintenance of the protective cap. During the entire course of monthly inspections, no erosion nor signs of trespass were observed. Regular maintenance (mowing) took place through out the year. No significant maintenance activities were performed during the last year, and none are expected in the next year. Judith McDonough submitted the report on behalf of BNSF.

5 McArthur Drive Landfill

McArthur Drive and Water Works Road
St. Joseph

64505

County: Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: 14
Land Use(s): Landfill/Industrial, Landfill/Municipal
Contaminants: Pesticides
Contaminated Media: Soil

Site Description History

Recent Activities

Last Revised: 06/14/2004

On 6/14/2004 the department received a copy of the annual Groundwater, Surface Water, and Sediment Monitoring Report from EPA.

6 Nufarm

317 Florence Rd.
St. Joseph

64504-1071

County Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: 1+
Land Use(s): Herbicide Manufacturing/use
Contaminants: Dioxin, Herbicides
Contaminated Media: Soil

Site Description History

Several companies have operated herbicide formulation facilities at the site since 1956. From 1956 - 1975, Amchem Products operated a herbicide formulation and metalworking facility on the original 7.84-acre parcel. From 1975 - 1986, Union Carbide operated the facility. In 1986, Rhone-Poulenc purchased the herbicide formulation facility. The company acquired only that portion (2.5 acres) of the property that contained the facility. Union Carbide retained the remaining 5.34 vacant acres. Finally, in December 1997, Rhone-Poulenc sold the 2.5-acre property and facility to Nufarm Inc.

Contamination at the property dates from the period between 1956 and 1975 when herbicides containing dioxin were formulated (2,4-D and 2,4,5-T). The 5.34-acre property retained by Union Carbide is the former location of a lagoon used for waste disposal. The 2.5-acre Nufarm Site contains the storage tank and rail area, where railroad cars transporting chemicals and herbicides were loaded and unloaded. Spillage during the loading process is the probable source of on-site contamination of soils. In 1985, samples taken by the U. S. Environmental Protection Agency as part of a PA/SI show dioxin levels above the commonly used residential health-based benchmark for dioxin (1 part per billion (ppb)) at 7.1 ppb in the rail area, and at 4.5 and 3.4 ppb at the surface in the storage tanks area. Soil samples collected in 1988 and 1995 by the site owner's consultant revealed the presence of 2,4-D, dioxin and 2,4,5-TP (Silvex). A composite sample analyzed for Silvex failed the Toxicity Characteristic Leaching Procedure (TCLP) at 4.6 ppm.

The Nufarm Site was listed on the Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri (Registry) on August 3, 1998. The Union Carbide Site is also listed on the Registry. The site is located in

Recent Activities

Last Revised: 06/27/2003

25 acre area located next to Union Carbide Site. Area is clean. No water standing. Area locked when not in use. Signs are posted.

7 Pigeon Hill Landfill (Norris and Sons)

South of Hwy O, 10 miles south of St. Joseph
St. Joseph

64501

County Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: 40 acres
Land Use(s): Landfill/Municipal
Contaminants: Metals, Pesticides, Solvents
Contaminated Media: Groundwater, Soil

Site Description History

The site is a closed former municipal sanitary landfill for the city of St. Joseph. Several tons of industrial waste have been disposed of at the site. The site has been capped and vegetated, but has had erosion and leachate

Recent Activities

Last Revised: 06/27/2003

Area is fenced barbwire with signs. Gates are locked, good grass coverage. No signs of erosion.

11

8 Rosecrans Field Rifle Range

Riverview Drive
 St. Joseph 64501 County Buchanan
 Region: Kansas City
 Ombudsman: Kansas City

Size of Site: 0.5 acres
 Land Use(s): Military Installation, Recreational use
 Contaminants: Lead
 Contaminated Media: Soil

Site Description History

Rosecrans Field Rifle Range, also known as Camp Petree, was used in conjunction with the Rosecrans Army Air field in the early 1940s. Camp Petree was used as an overflow camp and rifle range for the training of troops stationed at the Army Air Field. The range was declared surplus in 1945. Live ammunition, mostly consisting of 0.22 caliber bullets were fired at the range. Nothing larger than 50 caliber was used. More recently, the site was used by a local

Recent Activities

Last Revised: 04/08/2003

The Abbreviated Preliminary Assessment (APA) Report was completed on 4/4/03. The APA investigation included surface soil sampling at the former firing range. No lead contamination was detected. Based on the absence of a release of hazardous substances at the site, no further CERCLA assessment is recommended at this time. The site is recommended for archival from CERCLIS.

12

9 St. Joseph FMGP #1

S. 4th & Cedar
 St. Joseph 64501 County Buchanan
 Region: Kansas City
 Ombudsman: Kansas City

Size of Site:
 Land Use(s): FMGP
 Contaminants: Coal Tar
 Contaminated Media:

Site Description History

Recent Activities

Last Revised:

None.

10 St. Joseph FMGP #3

802 S. 5th St. (South 6th & Lafayette)
 St. Joseph 64501-3676 County Buchanan
 Region: Kansas City
 Ombudsman: Kansas City

Size of Site: 3
 Land Use(s): FMGP
 Contaminants: Coal Tar
 Contaminated Media:

Site Description History

This site is a former manufactured gas plant (FMGP).

Recent Activities

Last Revised: 01/08/1999

The SI report was completed on December 15, 1998. We are currently negotiating a voluntary deed restriction option with the two property owners of the former FMGP to restrict subsurface excavation. If appropriate restrictions are placed on the property deeds, no further action will be necessary under Superfund authority.

13 Union Carbide

317 West Florence Road
St. Joseph

64504

County Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site: approx. 5.5
Land Use(s): Herbicide Manufacturing/use, Pesticide Manufacturing/Use
Contaminants: Dioxin, Pesticides
Contaminated Media: Soil

Site Description History

Several companies have operated herbicide formulation facilities at the site since 1956. From 1956 - 1975, Amchem Products operated a herbicide formulation and metalworking facility on the original 7.84-acre parcel. From 1975 - 1986, Union Carbide operated the facility. In 1986, Rhone-Poulenc purchased the herbicide formulation facility. The company acquired only that portion (2.5 acres) of the property that contained the facility. Union Carbide retained the remaining 5.34 vacant acres. Finally, in December 1997, Rhone-Poulenc sold the 2.5-acre property and facility to Nufarm Inc.

Contamination at the property dates from the period between 1956 and 1975 when herbicides containing dioxin were formulated (2,4-D and 2,4,5-T). The 5.34-acre property retained by Union Carbide is the former location of a lagoon used for waste disposal. The 2.5-acre Nufarm Site contains the storage tank and rail area, where railroad cars transporting chemicals and herbicides were loaded and unloaded. In 1985, samples taken by the U. S. Environmental Protection Agency as part of a PA/SI show dioxin levels above the commonly used residential health-based benchmark for dioxin (1 part per billion (ppb)).

The Union Carbide Site was listed on the Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri (Registry) on December 12, 1996. The Nufarm Site is also listed on the Registry.

Recent Activities

Last Revised: 05/01/2003

The area was fenced with chain link fence. Gate for entry use was locked and posted with two signs. Cap was in fair condition with grass a little sparse in some areas. No significant water erosion was noted.

14 Varco-Pruden Buildings

2250 Lower Lake Road
St. Joseph

64504

County Buchanan
Region: Kansas City
Ombudsman: Kansas City

Size of Site:
Land Use(s):
Contaminants: Solvents
Contaminated Media:

Site Description History

The Varco-Pruden Buildings site is an active manufacturing facility of pre-fabricated metal buildings. From 1984 to 1990, xylene, which is used as a paint solvent was stored in an Underground Storage Tank (UST). Subsequent removal of the UST and characterization of the area of the UST revealed soil and shallow groundwater contamination. The Superfund Section will provide oversight for the final phase of cleanup of the site.

Recent Activities

Last Revised: 03/30/2005

On March 30, 2005 a Pre-CERCLIS Site Screening Report was submitted to EPA Region 7. The Site Screening Report concluded that the site was successfully cleaned up and that no further action under CERCLA was warranted and that CERCLIS enter was not recommended.

St Joseph Tank Sites

Facility Id	Remediation	Active	Facility Name	Address	Facility Zip
ST0020459	R006284	Yes	SHOP & HOP #5	308 MAIN ST	64485
ST0009197	R005321	No	GRAY AUTOMOTIVE PRODUCTS	1313 S 4TH	64501
ST0005402	R006435	No	WIRE ROPE CORPORATION OF	609 N 2ND ST	64501
ST0005418			WYETH COMPANY, INC	101 JULES	64501
ST0005419	R002585	No	MIDLAND BOTTLING CO, INC	1422 S 6TH ST	64501
ST0005470	R006410	No	ST JOSEPH CITY YARDS	2316 S 3RD ST	64501
ST0005496			ROWLANDS AMOCO	801 MITCHELL	64501
ST0009044			RIVERMART 66	320 EDMOND	64501
ST0009327	R006412	No	CENTRAL FIRE STATION	401 S 7TH ST	64501
ST0009332	R006501	No	AVIATION FACILITY	RT 7 (OLD MOTOR POOL)	64501
ST0009341	R005620	No	HILAND DAIRY DIVISION	221 S 5TH ST	64501
ST0018825			LAW ENFORCEMENT CENTER	501 FARAON ST	64501
ST0010857	R007684	Yes	MISSOURI GAS ENERGY	402 CEDAR	64501
ST0009505	R007688	Yes	SEAMAN & SCHUSKE METAL WORKS CO	1215 SOUTH 4TH ST	64501
ST0019161	R006761	Yes	IMPERIAL SUPER GAS INC	811 S 6TH ST	64501
ST5700050	R001245	No	CITY OF ST JOE - FARAON ST LAGOON	FARAON ST	64501
ST0002419			BROWN TRANSFER & STORAGE	MESSANIE ST BETWEEN 5TH &	64502
ST0007412			HILLYARD INDUSTRIES	302 N 4TH ST	64502
ST0005454	R003231	No	GARAGE	613 ATCHISON	64502
ST0010440	R003160	No	HOLMES FREIGHT LINES, INC	801 HICKORY	64503
ST5800670	R004589	No	FAA STJ LOC	ROSECRANS FIELD	64503
ST5800636	R004450	No	FAA-ST JOSEPH RCAG	ROSECRAN'S FIELD-MUNICIPAL	64503
ST5710013	R006887	No	R-F HOLDINGS INC	8TH & MONTEREY NW CORNER	64503
ST0008755	R004704	No	MCNEILL GRAVE MARKER CO	1401 SOUTH 9TH ST	64503
ST0005490	R003924	Yes	CRISWELL PETROLEUM PROD, CO	916 S 9TH	64503
ST0005396	R001363	Yes	BURLINGTON NORTHERN RAILROAD CO	500 LAKE BLVD	64504
ST0005491	R007135	Yes	ALBAUGH INC	4900 PACKERS AVE	64504
ST0008584	R004585	No	VARCO-PRUDEN BLDGS	2250 LOWER LAKE RD	64504
ST0013633			DELUXE TRUCK STOP LLC	4500 PACKERS AVE	64504
ST0005491	R003608	No	ALBAUGH INC	4900 PACKERS AVE	64504

KANSAS

DEPARTMENT OF WILDLIFE AND PARKS

KATHLEEN SEBELIUS, GOVERNOR

8/29/2006

Track: 20060121

DP

Ref: D1.1101

Mr. Matt Vandenberg
USACOE, Env. Res. Section
Room 843, 601 E. 12th Street
Kansas City, MO 64106

Dear Mr. Vandenberg:

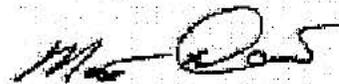
We have reviewed PN 200501489, an application by the USACOE, Kansas City District to raise existing levees along the Missouri River in Levee System Units L-455 and R-471-460 in order to meet requirements established by the Federal Emergency Management Agency. The project was reviewed for potential impacts on crucial wildlife habitats, current state-listed threatened and endangered wildlife species, and public recreation areas for which this agency has some administrative authority.

We have had previous correspondence on the project through review of the Draft EIS and the Feasibility Report and Environmental Assessment. Those reports concluded that no significant impacts to either state or federally listed threatened or endangered species would occur. The project has addressed mitigation of wetlands, and although a significant amount of acreage (1,300+) will be impacted by borrow areas and expansion of the levee footprint, impacts crucial wildlife habitats such as riparian timber will be minimized and avoided. We would like to remind the applicant that any dredging activity that may be proposed in the future with the project would need a permit from the Kansas Department of Wildlife and Parks and is strongly discouraged.

No Department of Wildlife and Parks permits or special authorizations are required. Because the Department's recreational land obligations, state threatened and endangered species list and critical habitat designations periodically change; if construction has not started within one year of the date of this review, or if design changes are made in the project plans, the project sponsor must contact this office to verify continued applicability of this review assessment. For our purposes, we consider construction started when advertisements for bids are distributed.

Thank you for the opportunity to provide these comments and recommendations.

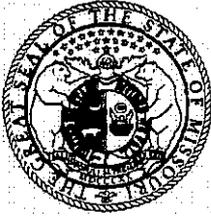
Sincerely,



Nate Davis, Aquatic Ecologist
Environmental Services Section

xc: KDWP Reg FW Sup, Wolfe KDWP Dist Bio, Whiteaker KBS, Liechti
KDHE, Mueldener USFWS, LeValley USEPA, Mulder MDC, Miller

EMERGENCY MANAGEMENT AGENCY



DEPARTMENT OF PUBLIC SAFETY
OFFICE OF THE ADJUTANT GENERAL

PO Box 116, Jefferson City, Missouri 65102
Phone: 573/526-9100 Fax: 573/634-7966
E-mail: mosema@mail.state.mo.us



MEMORANDUM

**TO: US Army Corps of Engineers – Kansas City District
Draft Environmental Assessment & Feasibility Report
On R460-471 & L-455 Flood Damage Reduction Projects**

**FROM: Dale Schmutzler, Floodplain Management Officer
Missouri State Emergency Management Agency**

REF: City of St. Joseph and Buchanan County, Missouri

DATE: August 28, 2006

The City of St. Joseph and Buchanan County, Missouri are participants in the National Flood Insurance Program (NFIP). Any development associated with this project located within a special flood hazard area (SFHA), as identified by the Federal Emergency Management Agency (FEMA), must meet the requirements of the State of Missouri Executive Order 98-03 and local floodplain management ordinances. This would require obtaining a floodplain development permit for the proposed project. This permit must be obtained prior to the commencement of any construction/development activities.

If the proposed development is also located within a regulatory floodway, a "No-Rise" Certificate and statement as to the effects of possible flooding, is required before the development can be permitted. This analysis must be performed by a licensed engineer and to current FEMA standards.

If you have any questions concerning this memo or the requirements of Executive Order 98-03, please feel free to contact me a (573) 526-9135.

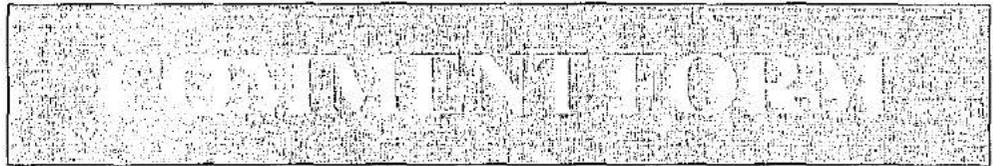
DS:psh

cc: Community Files – City of St. Joseph
Buchanan County



US Army Corps
of Engineers ®
Kansas City District

Meeting Date: August 28, 2006



PUBLIC MEETING

DRAFT ENVIRONMENTAL ASSESSMENT AND FEASIBILITY REPORT
ON R460-471 AND L-455 FLOOD DAMAGE REDUCTION PROJECTS

Name: <u>John Cox</u>	Address: <u>1008 NW Rosecrans Rd.</u>
Affiliation: <u>Airport Levee member</u>	<u>616 S. ...</u>
[Redacted]	P: [Redacted]

Please write your comments and turn in the form at the sign-in desk. Your comments may also be mailed to the address on the reverse side. Comments must be postmarked by August 31, 2006. Comments can also be e-mailed to matthew.d.vandenberg@usace.army.mil

Since the Mo Air National Guard 139th AW has the greatest investment protected by the R 471-460 levee system. Why can't the DOD fund the O&M and/or levee system improvements?

Continue on the other side



US Army Corps
of Engineers ®
Kansas City District

Meeting Date: August 28, 2006



PUBLIC MEETING

DRAFT ENVIRONMENTAL ASSESSMENT AND FEASIBILITY REPORT
ON R460-471 AND L-455 FLOOD DAMAGE REDUCTION PROJECTS

Name: <u>JOHN OSBORNE</u> _____ _____	Address: _____ _____ _____
---------------------------------------------	----------------------------------

_____ write your comments and turn in the form at the sign-in desk. Your comments may also be mailed to the address on the reverse side. Comments must be postmarked by August 31, 2006. Comments can also be e-mailed to matthew.d.vandenberg@usace.army.mil

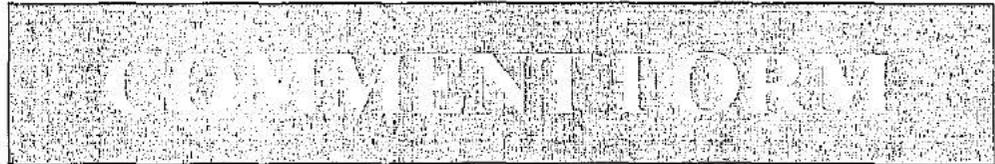
I WAS HERE IN '93" AND ALONG WITH MY FRIENDS,
& NEIGHBORS, LISTENED TO STATE & FEDERAL OFFICIALS
PACIFY ELWOOD RESIDENTS. ALL I ASK FOR MYSELF & ALL
ELWOOD RESIDENTS IS "DO WHAT YOU SAY YOU'LL DO &
DON'T SAY YOU WILL, & THEN DON'T. ^{HAD}
MOST PEOPLE WHO HAVE ANY DEALING WITH
FEMA OR THE CORP, ARE VERY SKEPTICAL
OF EVERYTHING THEY SAY & DO.
WE ALL WANT TO LIVE IN A SAFE
COMMUNITY, & I FOR ONE SUPPORT YOUR EFFORTS.
THANK YOU,
John Osborne

Continue on the other side



Meeting Date: August 28, 2006

US Army Corps
of Engineers ®
Kansas City District



PUBLIC MEETING

DRAFT ENVIRONMENTAL ASSESSMENT AND FEASIBILITY REPORT
ON R460-471 AND L-455 FLOOD DAMAGE REDUCTION PROJECTS

Name: <u>JAMES RADER</u> _____ _____ _____	Address: _____ _____ _____ _____
-----------------------------------------------------	-------------------------------------------

Please write your comments and turn in the form at the sign-in desk. Your comments may also be mailed to the address on the reverse side. Comments must be postmarked by August 31, 2006. Comments can also be e-mailed to matthew.d.vandenberg@usace.army.mil

I have lived in Elwood for 69 1/2 years. I have been here through the flood of 1982 and also 1993. We have had extensive commercial development here since 1973. I feel this will stop without the recommended work done on the levees. Also the personal trauma of going through a flood and the cleaning and repairs afterward do not justify the cost of these extensions.

Thank you for your work

Jim Rader

Continue on the other side



US Army Corps
of Engineers ®
Kansas City District

Meeting Date: August 28, 2006

COMMENT FORM

PUBLIC MEETING

DRAFT ENVIRONMENTAL ASSESSMENT AND FEASIBILITY REPORT
ON R460-471 AND L-455 FLOOD DAMAGE REDUCTION PROJECTS

Name: <u>Doug Shepherd</u> [Redacted]	Address: [Redacted] [Redacted] [Redacted]
------------------------------------------	-------------------------------------------------

Please write your comments and turn in the form at the sign-in desk. Your comments may also be mailed to the address on the reverse side. Comments must be postmarked by August 31, 2006. Comments can also be e-mailed to matthew.d.vandenberg@usace.army.mil

Why is there proposed work for levee between 205+00 to 295+00 when our trouble spots in 1993 was in the area of 107+70. Where we had to sandbag the levee to contain flood water. In the proposed work areas we didn't have any ~~problem~~ problem

Continue on the other side



Meeting Date: August 28, 2006

US Army Corps of Engineers®
Kansas City District

COMMENT FORM

PUBLIC MEETING

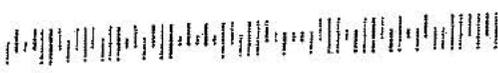
DRAFT ENVIRONMENTAL ASSESSMENT AND FEASIBILITY REPORT
ON R460-471 AND L-455 FLOOD DAMAGE REDUCTION PROJECTS

Name: <u>GARY LAIPPLE</u>	Address: [REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Please write your comments and turn in the form at the sign-in desk. Your comments may also be mailed to the address on the reverse side. Comments must be postmarked by August 31, 2006. Comments can also be e-mailed to matthew.d.vandenberg@usace.army.mil

Our family farm runs along the river from north of river mile 454 then south to river mile 452. We went through the construction of the levee with all the right of ways and borrow areas. We filled the borrow areas and deep plowed the ball roads. We have also been through various floods, including the "1993 flood" which was devastating to our family farm. So perhaps you can understand why our family is against any destruction of our farm which includes the borrow areas and right of ways. Here are several alternatives for borrow areas: (1) Government land along the river south of our farm which is river mile #451. (2) Dredge the old river channel. This would provide dirt & plus drainage for the bottom. (3) Haul dirt from the bluff. (4) Dredge dirt out of the Missouri river. Please consider an alternative for the borrow areas other than our farm. Also if it helps

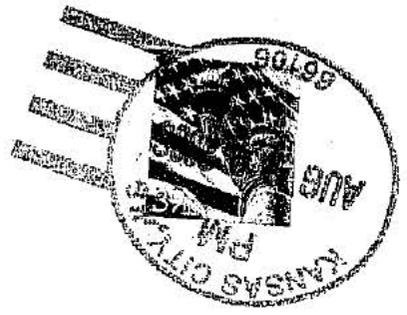
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Gary P. Laipple



66090



Dr. Christopher M. White
CENWK-PM-PR
Kansas City District, Corps of Engineers
601 East 12th Street
Kansas City, Missouri 64106-2896



US Army Corps
of Engineers
Kansas City District

we extended use should be allowed to farm them instead of taking the ground out of production.

tape here



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, Kansas 66503-6172



Received 8/31/06

August 28, 2006

Christopher White, Ph.D.
St Joseph Levees Project
Kansas City District, Corps of Engineers
601 East 12th Street
Kansas City, Missouri 64106-2896

Dear Dr. White:

We have reviewed the Draft Feasibility Report and Draft Environmental Assessment (DEA) which included the mitigation plan, received August 3, 2006, for the Missouri River Levees System R-471-460 and L-455. The following comments are provided by the U.S. Fish and Wildlife Service (Service) for your consideration. This letter also includes our comments to Public Notice 200501489 for the same project.

GENERAL COMMENTS

The Service appreciates the coordination between the Service and the U.S. Army Corps of Engineers (Corps) throughout the development of this project and values the efforts made to address our concerns. Five alternatives were carried forward for analysis in the EA. Alternative 1, the Locally Preferred Plan and NED preferred alternative, appears to meet the objectives of the project with the least amount of impacts to fish and wildlife habitat including wetlands. While Alternative 4 has fewer impacts it does not meet the project's objective of obtaining FEMA recertification for the right bank levee. Alternatives 2 and 3 meet the project's objectives but have increased impacts to fish and wildlife habitat. "No Action" is the fifth alternative.

Alternative 1 will increase the right bank levee from zero to 3.37 feet in height and the left bank levee from zero to less than one foot in height. This will also require an increase to the levee toe width and an extension to the seepage berms associated with the levee.

SPECIFIC COMMENTS

Feasibility Study

Section IX - G. Economic Analysis and Screening of Plans

Page 38 – The Corps stated that "Alternative 1 is a levee raise of about 2 and 2/3 feet for the R471-460 unit..." Elsewhere in the document the stated raise for the R471-460 unit is 3.37 feet.

Section X. Description of the Selected Plan – C. Environmental and Cultural Considerations

Page 49 – The statement is made that “impacts within the 1,139 acres (R471-460) and 30 acres (L-455) of secondary tree growth and shrubland at the borrow sites would be considered temporary in nature and is expected to be less than significant.” This statement does not appear to take into consideration that borrowing within these areas may impact Federal trust resources, i.e. migratory songbirds. Impacts to migratory songbirds could occur due to changing one habitat type to another, e.g. changing forest or shrubland to deepwater. It is unlikely that forest or shrubland would re-establish in that area. This loss would likely permanently impact migratory songbirds. In addition, although the tree growth may be secondary and relatively young, they are closer to a mature and more valuable stage than newly established trees.

The Corps has not provided any discussion of the measures that will be taken to comply with the Migratory Bird Treaty Act.

Finding of No Significant Impact (FONSI)

Mitigation Measures

In the preceding Draft Feasibility Report (DFR) the statement was made that wetlands filled from the levee construction would be mitigated adjacent to the impacted wetland. However in the FONSI it appears that the Corps is planning to mitigate those wetland losses and habitat losses in the areas being purchased for the MRFWMP. This is against Service policy i.e. “Where habitats are protected restored, or targeted for protection or restoration under Federal programs designed to increase the Nation’s wetlands base, the Service will not recommend, support, or advocate the use of such lands as compensatory mitigation for habitat losses authorized under the section 10/404 wetlands regulatory permit program.”

The Corps has not provided any discussion of the measures that will be taken to comply with either the Migratory Bird Treaty Act or Executive Order 13112 Section 2 (3) which directs Federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere and to ensure that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions.

We recommend that disturbed areas are reseeded with appropriate native plant species indigenous to the local area. The rye, brome and fescue that the Corps has stated will be used in grassland areas are not native. The Service is willing to assist the Corps in developing plant lists for each area.

Public Availability

The issuance and ending dates for Public Notice Number 200501489 are incorrect. The Public Notice was issued on August 1, 2006 and expires on August 31, 2006.

Draft Environmental Assessment

2.2.1 Alternative 1 (Preferred Alternative)

Line 495 - The Best Management Practices (BMP) listed should be described in detail. Commenting agencies and the public may know of alternative methods that would produce better results, be more cost effective, etc. or may have concerns about the methods proposed by the Corps.

Line 508 – The Corps is proposing 1:1 mitigation of wetland losses for both emergent and forested wetlands through the scraping and reshaping of lands adjacent to impacted areas. The Service strongly recommends that emergent wetlands be mitigated at a 1.5:1 ratio and forested wetlands be mitigated at a 2:1 ratio. These ratios are consistent with the Fish and Wildlife Service, Region 6 Wetland Mitigation Policy (provided in both the Draft and Final Coordination Act Reports) for concurrent creation or restoration for mitigation wetlands. These ratios are also what the Kansas City District Corps typically requires for other Section 404 permit applicants. Recommended ratios for enhancement are greater than those for concurrent creation or restoration. Replacement ratios of greater than 1:1 are recommended because of the uncertainty of wetland creation and the amount of time required to develop fully functioning wetlands from either an area that will be allowed to revegetate naturally or planted with seedlings of wetland species. It is doubtful areas in this part of the floodplain will hold water if they don't now so the amount of wetland created through this option may be greatly limited.

From the above statement in the EA it appears that the Corps is proposing to mitigate wetland losses adjacent to the wetland loss caused by fill from the levee footprint. However, statements in other parts of the DFR and FONSI could be interpreted that the Corps is proposing to mitigate in the MRFWMP lands. As discussed under the FONSI comments, mitigating wetland losses in the MRFWMP land would be against Service policy.

3.2 Biological Environment

3.2.2 Wildlife

This section has not been updated to include new information in the Service's Final Coordination Act Report (FCAR).

3.2.3 Aquatic Ecosystem

This section has not been updated to include new information in the Service's FCAR.

3.2.4 Threatened and Endangered Species

The piping plover, bald eagle, least tern, and pallid sturgeon are on the Federal threatened and endangered species list in both Kansas and Missouri.

Line 912 – Indiana bat. As the Corps has stated, the Indiana bat (*Myotis sodalists*), federally listed as endangered, has been found throughout much of northern Missouri and may occur in

suitable habitat along the river during the summer. The Service believes that suitable habitat may exist in the project area and that no surveys for the Indiana bat have been performed in the project area. Therefore the Service recommends that the Corps identify the extent of suitable habitat in the project area, both on the Kansas and Missouri sides, and evaluate potential effects to that habitat. If suitable roost trees are proposed to be removed, the Service recommends a survey, to determine the presence or absence of Indiana bats, be conducted by a qualified biologist. Survey efforts should include using a combination of mist nets and bat detection devices [e.g. "Anabat" (© Titley Electronics, Ballina, New South Wales, Australia)]. If it is determined that a survey for Indiana bats is needed, please contact the Missouri Ecological Services Field Office to obtain specific information regarding survey protocol. If surveys indicate that Indiana bats are using trees proposed to be removed during their breeding season (April 1 to September 30) further consultation with the Service under section 7 of the ESA will be required.

The Service provides the following information on the Indiana bat:

From late fall through winter Indiana bats in Missouri hibernate in caves in the Ozarks and Ozark Border Natural Divisions. During the spring and summer, Indiana bats utilize living, injured (e.g. split trunks and broken limbs from lightning strikes or wind), dead or dying trees for roosting throughout the state. Indiana bat roost trees tend to be greater than 9 inches diameter at breast height (dbh) (optimally greater than 20 inches dbh) with loose or exfoliating bark. Most important are structural characteristics that provide adequate space for bat to roost.

Preferred roost sites are located in forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree, which is usually within 1 km (0.61 mile) of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests.

4. Environmental effects of the Proposed Alternatives

4.3.2 Water Quality – Preferred Alternative

Line 1589 - Because of the prevalence of canary reed grass, an exotic and aggressive invasive species, allowing the vegetation in these areas to reestablish naturally over time may cause these areas to become dominated by reed canary grass.

4.1 Vegetation - Preferred Alternative

Line 1991 – As previously discussed, the Service strongly recommends that emergent wetland be mitigated at a 1.5:1 ratio and that forested wetlands are mitigated at a 2:1 ratio.

Line 2020 – This section states that the completed levee side slopes would be seeded and mulched with a native warm-season seed mix following project completion. However, statements made in the FONSI state that rye, brome and fescue would be used on the levee, while Corps comments to Service Recommendations (Appendix D) lists several other non-native species that may be used. The Service recommends that the native, warm season seed mix is used on the levee side slopes. The Service is willing to work with the Corps to develop appropriate plant lists.

Alternative 2, Line 2064 and Alternative 3, Line 2123 – Unavoidable impacts to wetlands at borrow sites should have compensatory mitigation concurrent with or shortly after project completion to ensure that no habitat value is lost. In addition, wetlands impacted by borrow operations should be restored in-kind, e.g. from emergent wetland to emergent wetland with similar native plant communities re-established.

Appendix D

Corps of Engineers Comments to Recommendations on the U.S. Fish and Wildlife Services' Draft Fish and Wildlife Coordination Act Report (DCAR).

Please note that some of these recommendations have been revised in the Final Fish and Wildlife Coordination Act (FCAR). The Services' responses to the Corps comments to the Services' recommendations in the DCAR are followed immediately by the Services' recommendations from the FCAR.

FWS Responses to Selected Corps' Comments on FWS Recommendations in the Draft Fish and Wildlife Coordination Act

Fish and Wildlife Service Recommendation Number 4 - Levees and levee easements should be seeded with native, warm-season grasses such as switch grass.

Corps Comment – “Only native plant species will be used during re-seeding operations. The following species are generally used for levee reseeded: Switchgrass (*Panicum Virgatum*), Sand Lovegrass (*Eragrostis Trichodes*), Yellow Sweet Clover (*Melilotus Officinalis*), Creeping Foxtail (*Alopecurus Arundinaceus*), Tall Wheatgrass (*Agropyron Elongatum*), and Yellow sweet Clover (*Melilotus Officinalis*)”

Service Response - Creeping foxtail, tall wheatgrass, and yellow sweet clover are not native to Kansas or the North American Continent. In addition, the FONSI stated that the levees would be seeded to rye, brome and fescue which are also not native to Kansas. The Service is willing to assist the Corps in developing an appropriate native seed mix.

Fish and Wildlife Service Recommendation Number 6. – The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.

Corps Comment - “...With this in mind the Corps has selected “off-set” sites” where wetlands still exist and has chosen restoration over creation...”

Service Response - It is unclear from the Draft Feasibility Study, Draft Environmental Assessment and the Draft Mitigation Plan exactly where these off-set sites are located. In the above documents statements are made that the wetlands impacted from the footprint of the levee would be mitigated adjacent to the impacted wetland through scraping and shaping. This indicates creation of a wetland, not restoration as lands adjacent to the wetland impact may not currently be a wetland. In other parts of the document statements made could be interpreted that wetland impacts would be mitigated through the creation/expansion of wetlands in the borrow

areas. As previously discussed, this is unacceptable if those borrow areas are located on the MRFWMP lands. A map showing proposed wetland mitigation areas would be extremely helpful.

Fish and Wildlife Service Recommendation Number 9. – Encourage wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee units.

Corps Comment - “Only riverside areas have been identified for obtaining borrow material. Landside wetlands that are impacted as a result of levee widening will be off-set by using the minimization and mitigation measures identified in Section 4.4.1 Vegetation.

Service Response: We believe that the Corps has misunderstood our recommendation. Our intent was to encourage the development/enhancement of wetland areas in old borrow areas landside of the levee near the project area. These areas could be used to provide compensatory mitigation for the wetlands impacted from the levee footprint. Establishing a hydrological connection from these old borrow areas to the Missouri River would benefit the river and its wildlife.

Fish and Wildlife Service Recommendation Number 10. – Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

Corps Comment - “...As such, this recommendation has been incorporated throughout the project where construction equipment will be used.”

Service Response - Footwear and other clothing as well as sampling equipment used during monitoring are also effective vectors to transport invasive species and measures should be included to minimize the risk of transporting invasive species from infested areas to non-infested areas through these means. The Service is willing to assist the Corps in identifying BMPs to address this issue.

FWS Recommendations from the Final Fish and Wildlife Coordination Act

1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project (MRFWMP) team to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area and about the construction plans for the final design of the borrow areas. The MRFWMP should also be given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.

2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.

3. Reconsideration of the Levee Setback alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised.
4. Levees and levee easements should be seeded with native, warm-season grasses such as switch grass.
5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.
6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects at a minimum of 1.5:1 ratio for emergent wetland and at a 2:1 ratio for forested wetland. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.
7. Encourage wetland development and hydrological reconnection to the river at existing and proposed borrow areas.
8. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

9. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where the invasive species, reed canary grass (*Phalaris arundinacea*), has become established. If possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, and floodplain ponds that would eliminate reed canary grass.
10. All disturbed areas should be immediately planted with native vegetation following construction. Due to the presence of reed canary grass, an exotic and aggressively invasive species, these areas would likely become a monoculture of reed canary grass if allowed to revegetate naturally.

Appendix E

It does not appear that this section has been updated to include revised information in the Service's Final Fish and Wildlife Coordination Act Report.

Appendix J - Mitigation Plan

General Comments

The Service recommends that a plant list, containing both common and scientific names, which includes all plants proposed to be used for any component of the project be included in the mitigation plan.

The Mitigation Plan does not conform to the Multi-Agency Compensatory Mitigation Checklist and Supplement: Compensatory Mitigation Plan Checklist included as part of the Kansas City District's Notice of Implementation of the Multi-Agency Compensatory Mitigation Checklist and the National Research Council's Mitigation Guidelines (Public Notice 200400295).

1. Mitigation Goals and Objectives: It appears that the Corps is planning to mitigate wetland losses in the areas being purchased for the MRFWMP. As previously discussed this is against Service policy, i.e. "Where habitats are protected restored, or targeted for protection or restoration under Federal programs designed to increase the Nation's wetlands base, the Service will not recommend, support, or advocate the use of such lands as compensatory mitigation for habitat losses authorized under the section 10/404 wetlands regulatory permit program...". If that is the case, the Corps will need to look for other areas to mitigate wetland losses. One possibility to mitigate wetlands may be in old borrow areas landward of the levee as discussed in the DCAR Recommendation 9.

It is also not clear if wetlands were delineated in the proposed borrow areas. If not, any wetlands in these areas should be delineated prior to the start of construction to ensure that they are not impacted or changed in habitat type.

3. Mitigation Site Selection and Justification:

The Service's Kansas Field Office did not participate in the identification or selection of borrow sites or mitigation sites. A map of proposed mitigation sites would be extremely helpful.

If the existing seed bank contains invasive species, such as reed canary grass, it should not be used. Using soil and seed banks containing reed canary grass will likely produce a wetland dominated by this species which will have marginal value as wildlife habitat.

Locating a proposed mitigation site adjacent to a wetland does not ensure that the site will develop into a functioning wetland. It is doubtful that areas in this part of the floodplain will hold water if they do not currently do so. Therefore, we believe that this type of activity represents creation and not restoration. In addition, this type of activity has a potential, however slight, to negatively impact the existing wetland by accidental draining, creating more area than existing hydrology can support, or by changing one habitat type to another, e.g. emergent wetland to deepwater habitat or forested wetland to emergent wetland.

5. Monitoring Plan:

Any monitoring conducted on MRFWMP lands should include MRFWMP team members.

6. Performance Measures:

The performance measures are very subjective. Performance measures should include measurable outcomes, e.g. an 85% survival rate of planted material or 90% percentage of ground covered by vegetation after the first year. The mitigation plan should also include contingency plans if the mitigation fails during the monitoring period.

7. Site Protection and Maintenance:

Mitigation sites should be protected in perpetuity. A maintenance plan should be developed to address invasive species management.

Public Notice 200501489

The Proposed Work statement states that the anticipated raise varies along its length from zero to two and one half feet. The Draft Feasibility Study and Draft EA state that the raise will be from zero to 3.37 feet.

Additional Comments

1. The creation of shallow water habitat may be more compatible to the objectives of the MRFWMP team than the creation of wetland in the Elwood Bend area and it would help the Corps meet its shallow-habitat goals under the 2003 Amended Biological Opinion. In addition, borrow from the banks of the river may be superior for the use of fill as it would not contain roots and other vegetation that may be in fill obtained from the limited riparian/forest habitats which still occur on the Missouri River floodplain and are essentially limited to areas riverward of the levees. The Service strongly recommends that the Corps give first consideration for borrow areas along the banks of the river as a way to increase shallow water habitat. These areas should be chosen and designed in close coordination with the MRFWMP team. The Service will work with the states and the Corps to develop specific recommendations if suitable borrow can be found along the banks of the river.

2. Because the Service has provided new information and recommendations concerning the Indiana bat, we wish to repeat it in this section to ensure that it is not overlooked. The Indiana bat (*Myotis sodalists*), federally listed as endangered, has been found throughout much of northern Missouri and may occur in suitable habitat along the river during the summer. The Service believes that suitable habitat may exist in the project area and that no surveys for the Indiana bat have been performed in the project area. Therefore the Service recommends that the Corps identify the extent of suitable habitat in the project area, both on the Kansas and Missouri sides, and evaluate potential effects to that habitat. If suitable roost trees are proposed to be removed, the Service recommends a survey, to determine the presence or absence of Indiana bats, be conducted by a qualified biologist. Survey efforts should include using a combination of mist nets and bat detection devices [e.g. "Anabat" (© Titley Electronics, Ballina, New South Wales, Australia)]. If it is determined that a survey for Indiana bats is needed, please contact the Missouri Ecological Services Field Office to obtain specific information regarding survey protocol. If surveys indicate that Indiana bats are using trees proposed to be removed during their breeding season (April 1 to September 30) further consultation with the Service under section 7 of the ESA will be required.

The Service provides the following information on the Indiana bat:

From late fall through winter Indiana bats in Missouri hibernate in caves in the Ozarks and Ozark Border Natural Divisions. During the spring and summer, Indiana bats utilize living, injured (e.g. split trunks and broken limbs from lightning strikes or wind), dead or dying trees for roosting throughout the state. Indiana bat roost trees tend to be greater than 9 inches diameter at breast height (dbh) (optimally greater than 20 inches dbh) with loose or exfoliating bark. Most important are structural characteristics that provide adequate space for bat to roost.

Preferred roost sites are located in forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree, which is usually within 1 km (0.61 mile) of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests.

3. The Corps has not provided any discussion of the measures that will be taken to comply with the Migratory Bird Treaty Act.

Thank you for the opportunity to comment on this project. If you have any questions, please contact me or [REDACTED]

Sincerely,



Mike LeValley
Field Supervisor

cc: EPA, Kansas City, KS (Wetland Protection Section)
KDWP, Pratt, KS (Environmental Services)
KDHE, Topeka, KS (Bureau of Water)
FWS, Columbia, MO
FWS, Region 6, Regional Office, Denver, CO (Connie Young-Dubovsky)
Missouri Department of Conservation, Jefferson City, MO (Jane Epperson)

MJL/shb

Save The Lake Committee

5810 Lake Front Lane
St. Joseph, MO 64504
(816) 835-2757

August 16, 2006

Christopher M. White, Ph.D.
St. Joseph Levees Project
Kansas City District, Corps of Engineers
601 E. 12th Street
Kansas City, MO 64106-2896

**Re: Army Corps of Engineers, Kansas City District Permit No. 200501489
Public Notice**

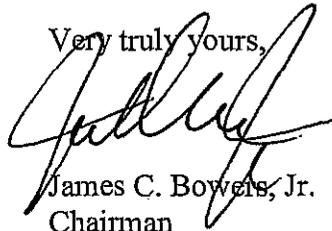
Dear Dr. White:

I am the Chairman of the Save The Lake Committee (STLC) which is dedicated to the restoration of Lake Contrary, Buchanan County, Missouri. Lake Contrary is immediately adjacent to the proposed Missouri River flood damage reduction project. The proposed work includes raising the existing Missouri River levees to allow re-certification of the levee by FEMA.

The notice identifies a borrow area on the Missouri side consisting of approximately 30 acres of land along River Miles 442.6 to 442.9. STLC has no objection to the use of this borrow area. However, we believe a better borrow area would be dredge material from the bottom of Lake Contrary. STLC has been working with the Corps of Engineers and other interested parties for the last several years in an attempt to fund a restoration project that involves, in part, dredging material from the Lake. We have identified de-watering sites adjacent to the River in close proximity to where the 10-mile levee raising restoration work will take place. STLC would appreciate your reconsideration of the borrow area to include the dredge material from Lake Contrary.

STLC fully supports the levee improvement project.

Very truly yours,



James C. Bowers, Jr.
Chairman

cc: Joan Bennett
Ron Martin
Matthew D. Vandenberg
Ted Hartsig

OMAHA TRIBE OF NEBRASKA

P. O. Box 368
Macy, Nebraska 68039

EXECUTIVE OFFICER

Eleanor Baxter, Chairperson
Orville Cayou, Vice-Chairman
Crystal Appleton, Treasurer
Rodney Morris, Secretary



(402) 837-5391
FAX (402) 837-5308

MEMBERS

Mitch Parker
Bert Walker
Barry D. Webster

August 15, 2006

Mr. Matthew Vandenberg
U.S. Army Corps of Engineers
Environmental Resources Section
601 East 12th Street, Room 843
Kansas City, MO 64106

RE: Permit #200501489

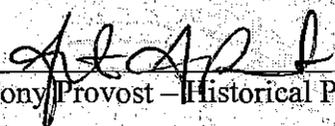
Dear Mr. Vandenberg:

I am writing this letter in regards to the comment letter received by the Omaha Tribe in regards to a response for comment according to the National Historic Preservation Act.

It is our intention to state yes, it is our historical lands. However, if there has been previous disturbance of soil then no response should be required. Also, that if there should or happen to be an inadvertent discovery, your process should immediately be to contact me at the address of this letter.

The contact person will be myself and if you have any other questions, please do not hesitate to contact us at your convenience. I can be reached at (402) 846-5166.

Thank you for your time and attention.


Tony Provost - Historical Preservation Officer



TRIBAL HISTORIC PRESERVATION OFFICE

August 9, 2006

U.S. Army Corps of Engineers
Environmental Resources Section
Attn: Mr. Matthew Vandenberg
601 East 12th St.
Room 843
Kansas City, MS 64106

Re: Permit No. 200501489

To Whom It May Concern:

The Osage Tribe of Oklahoma has evaluated the above reference sites, and we have determined that the site could have religious or cultural significance to the Osage Tribe being our former reservation & homeland. However, if construction activities should expose Osage archeological materials, such as bone, pottery, chipped stone, etc., we ask that construction activities cease, and this office be contacted so that an evaluation can be made.

Should you have any questions, you can reach me at [REDACTED]

Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Samantha R. Gillett".

Samantha R. Gillett
Acting Project Specialist

ONTHPO reference number: 80406008

Vandenberg, Matthew D NWK

From: Vandenberg, Matthew D NWK
Sent: Tuesday, August 08, 2006 9:39 AM
To: 'Stuart Miller'
Cc: Harold Kerns; Mitch Miller; Lynn, Eric S NWK
Subject: RE: St. Joe Levee PN

Attachments: Exhibit B 2 of 6 Preferred_2.pdf; SHEET 3.pdf



Exhibit B 2 of 6 Preferred_2... (156 KB)
SHEET 3.pdf (156 KB)

Gentlemen,

Attached are two PDF files which I hope will answer your question. SHEET 3 provides the levee raises at the locations in question. Exhibit B is a map showing the temporary easement (approximately 14 acres) and the permanent easement (approximately 10 acres) that will be required to implement the project. If additional information is required, please do not hesitate to contact me again. Thanks,

Matthew Vandenberg

-----Original Message-----

From: Stuart Miller [mailto:stuart.miller@mda.mo.gov]
Sent: Thursday, August 03, 2006 10:43 AM
To: Vandenberg, Matthew D NWK
Cc: Harold Kerns; Mitch Miller
Subject: St. Joe Levee PN

Hi Matthew, our regional staff has the following questions about the St. Joe Levee public notice. Please copy me on your response. Thanks

Harold and I (Mitch Miller) have spent some time this morning looking these over. It seems to me we need more detail at a finer scale to understand how this might impact the Arthur Dupree CA (roughly RM 449.7 to 451.5). We need to know what raises in elevation occur within this section, because greater than 1 foot will result in a change in the centerline of the levee. Also this section is where they are proposing the 20 pressure relief wells illustrated in sheet reference # 7. Portions of the Dupree area lie on both sides of the levee in this stretch, so bottom line, we need more information.

Stuart Miller
Policy Coordinator
Missouri Department of Conservation
PO Box 180
Jefferson City, MO 65102-0180
[REDACTED]
573-526-4495 (FAX)



U.S. Department
Of Transportation

**Federal Aviation
Administration**

Central Region
Iowa, Kansas
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106-2325

August 4, 2006

Mr. Christopher M. White, Ph.D.
St. Joseph Levees Project
Kansas City District, Corps of Engineers
601 E. 12th Street
Kansas City, MO 64106-2896

Dear Mr. White:

The Federal Aviation Administration (FAA) reviews other federal agency environmental from the perspective of the FAA's area of responsibility; that is, whether the proposal will have effects on aviation and other FAA responsibilities. We generally do not provide comments from an environmental standpoint. Therefore, we have reviewed the material furnished with the August 1, 2006, transmittal letter, concerning the St. Joseph, Missouri, Flood Damage Reduction Study, Missouri River, and have no comments regarding environmental matters.

However, we remind you that you will need to consider whether or not the project will require formal notice and review from an airspace standpoint. The requirements for this notice may be found in Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace. This regulation is contained under Subchapter E, Airspace of Title 14 of the Code of Federal Regulations. We would like to remind you that if any part of the project exceeds notification criteria under FAR Part 77, notice should be filed at least 30 days prior to the proposed construction date. Questions concerning this matter should be directed to Ms. Brenda Mumper at [REDACTED]

Sincerely,

Todd M. Madison, P.E.
Environmental Specialist

Vandenberg, Matthew D NWK

From: Repatriation Tribal Historic Preservation Office [REDACTED]

Sent: Friday, August 04, 2006 10:34 AM

To: Vandenberg, Matthew D NWK

Subject: Permit 200501489

Dear Sir; This is to advise you that the Pawnee Nation has no objection to this project .
Thank You.

Francis Morris
Repatriation Coordinator/THPO
Pawnee Nation of Oklahoma

Groups are talking. We're listening. Check out the [handy changes to Yahoo! Groups.](#)

8/7/2006

KANSAS

Kansas State Historical Society
Jennie Chinn, *Executive Director*

KATHLEEN SEBELIUS, GOVERNOR

August 4, 2006

Matthew Vandenberg
Environmental Resources Section
U.S. Army Corps of Engineers
601 East 12th Street
Kansas City, Missouri 64106

RE: Levee Construction Along the Missouri River
Permit No. 200501489
Doniphan County

Dear Mr. Vandenberg:

Earlier this year, the above referenced project was reviewed by our office in accordance with 36 CFR 800. In a letter dated March 23, 2006 (attached) we concluded that the project as proposed should have no effect on properties listed on the National Register of Historic Places or otherwise identified in our files. This office continues to have no objection to implementation of the project.

Any changes to the project, which include additional ground disturbing activities, will need to be reviewed by this office prior to beginning construction. If construction work uncovers buried archeological materials, work should cease in the area of the discovery and this office should be notified immediately.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214).

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer



Patrick Zollner
Deputy SHPO



LEGISLATIVE SERVICES

Chief

P.O. Box 250
Wyandotte, OK 74378
Phone (918) 678-2297/96
Fax (918) 678-3087



Karlene Roskoh
2nd Chief

825 North 7th Street
Kansas City, KS 66101
(913) 321-8107
(913) 321-8158 Fax

TRANSMITTAL LETTER

DATE: 8-3-06 TIME: 4:10 pm

FAX NUMBER: 816-389-2025

PLEASE DELIVER TO: Matthew Vandenberg

FROM: Wyandotte Nation

MESSAGE: PN# 200501489

Comments

PAGES FOLLOWING: 3 (INCLUDING COVER SHEET)

CONTACT PERSON: Kathleen Welch 918.678.2297 Ext. 235

If pages are illegible or incomplete, please call (918.) 678.2297

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Leaford Bearskin
Chief
P.O. Box 250
Wyandotte, OK 74370



Earlene Roskob
2nd Chief

Aug. 3, 2006

U.S. Army Corps of Engineers
Environmental Resources Section
ATTN: Matthew Vandenberg
601 E 12th St., Room 843
Kansas City, MO 64106

Dear Mr. Vandenberg,

We have received and reviewed the documentation submitted concerning the referenced project listed on your letter of August 1, 2006. The following projects are as:

PN # 200501489

Based on the topographic and hydrologic setting of your project, archaeological materials could be encountered. Documentation on any historic archaeological site discovered requires immediate notification to the Wyandotte Nation and a proper archaeological field inspection is necessitated, as stated under Section 106 Process of the National Historic Preservation Act. We do not need to be included in the consulting process at this time. On future sites, if you do not receive a response from the Wyandotte Nation within 30 days, then please know that our office has no interest in that site. However if as previously stated, should you find any archaeological artifacts or human remains, please contact the Wyandotte Nation immediately.

If you should have any questions or comments, please do not hesitate to contact our office.
Thank you for your consideration and cooperation.

Sincerely yours,

A handwritten signature in cursive script that reads "Janice R. Wilson".

Janice R. Wilson
Wyandotte Nation Environmental Technician

Ramona Reid
Councilperson

Vivian Fink
Councilperson

Norman Hildebrand
Councilperson

Juanita McQuiston
Councilperson

PUBLIC NOTICE



US Army Corps
of Engineers
Kansas City District

Permit No. 200501489
Issue Date: August 1, 2006
Expiration Date: August 31, 2006

30-Day Notice

JOINT PUBLIC NOTICE: This public notice is issued jointly with the Missouri Department of Natural Resources, Water Pollution Control Program and the Kansas Department of Health and Environment. The Department of Natural Resources and the Kansas Department of Health and Environment will use the comments to this notice in deciding whether to grant Section 401 water quality certification. Commenter's are requested to furnish a copy of their comments to the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102 or the Kansas Department of Health and Environment, Bureau of Water - Watershed Management Section, 1000 SW Jackson Street, Suite 420, Topeka, Kansas 66612-1367.

APPLICANT: Kansas City District, Corps of Engineers
Room 834, PM-PR
601 E. 12th Street
Kansas City, Missouri 64106-2896

PROJECT LOCATION (As shown on the attached drawings): The proposed flood damage reduction project involves the Missouri River levee units L-455 and R471-460. These units collectively comprise the protective works that provide flood protection for areas in St. Joseph, Buchanan County, Missouri and Elwood and Wathena, Doniphan County, Kansas.

AUTHORITY: Section 404 of the Clean Water Act (33 USC 1344). This project is being conducted under the authority provided by Section 216 of the 1970 Flood Control Act. This Act provides authority to reexamine completed civil works projects to determine whether the projects are providing benefits as intended.

ACTIVITY: PROPOSED WORK: The U.S. Army Corps of Engineers (USACE) proposes to raise existing Missouri River levees units R471-460 and L-455 to improve the adequacy of the levee units to reduce damages from potential flooding on the Missouri River. This will be accomplished by raising the existing levees using earth fill. A substantial portion (approximately ten miles) of the levee unit R471-460 would be raised to a level sufficient to pass the one percent (100-year) flood with a 90 percent level of reliability, thereby allowing for re-certification of the levee by FEMA. The anticipated raise varies along its length from zero to two and one half feet.

KANSAS

KSR&C No. 01-10-172

Kansas State Historical Society
Jennie Chinn, *Executive Director*

KATHLEEN SEBELIUS, GOVERNOR

March 23, 2006

Timothy Meade
Cultural Resource Manager
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: Levee Construction Along the Missouri River
Doniphan County

Dear Mr. Meade:

In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed your letter describing plans to raise Missouri River Levee System Units L-455 and R-471 – 460 in Doniphan County, Kansas. In addition, we have reviewed previous correspondence related to the project (KSR&C #01-10-172). Given the factors outlined in your letter, we concur with the conclusion that the proposed project will have no effect on historic properties as defined in 36 CFR 800. This office has no objection to the project.

Any changes to the project, which include additional ground disturbing activities, will need to be reviewed by this office prior to beginning construction. If construction work uncovers buried archeological materials, work should cease in the area of the discovery and this office should be notified immediately.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at [REDACTED].

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer

Patrick Zollner
Deputy SHPO

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



APPENDIX D

**U.S. Fish & Wildlife Service Coordination Act Report
(Draft and Final)
and
State Agency Coordination
Letters**

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Environmental Assessment**





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, Kansas 66503-6172

August 9, 2006

Dr. Christopher White
U.S. Army Corps of Engineers, Kansas City District
601 E 12th Street
Kansas City, MO 64106-2896

Dear Dr. White:

This Final Fish and Wildlife Coordination Act Report (FCAR) is provided pursuant to the Fiscal Year 2006 Scope-of-Work Agreement for the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Study, Kansas and Missouri, between the U.S. Fish and Wildlife Service (Service) and the Kansas City District, Corps of Engineers. This FCAR was prepared in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), and constitutes the report of the Secretary of the Interior on the project within the meaning of Section 2 (b) of this Act.

As requested on July 17, 2006 (Matthew Vandenberg pers. comm. and email on July 20, 2006) the FCAR incorporates an evaluation of impacts associated with the new alternative, Alternative 4 as well as an evaluation of impacts associated with the seepage and stability berms.

Please note that modifications from the DCAR have been made to the Terrestrial Resources (amphibian and reptile list), Aquatic Resources (Missouri River fish population list) and Recommendations sections in response to review comments. Other minor modifications have been made throughout the document.

Cooperation and information utilized in preparation of this report was obtained from the Kansas Department of Wildlife and Parks (KDWP), the Missouri Department of Conservation (MDC), and the Kansas City District, Corps of Engineers.

Comments from the KDWP, MDC, Fish and Wildlife Service Columbia, MO Field Office and the Fish and Wildlife Service, Region 6, Regional Office have been reflected in the Final Coordination Act Report.

We appreciate the opportunity to discuss impacts to fish and wildlife anticipated by implementation of this project.

If we can be of any assistance please call Ms. Susan Blackford, of my staff, at [REDACTED] ext. 102.

Sincerely,

A handwritten signature in black ink that reads "Michael J. LeValley". The signature is written in a cursive style with a large, prominent "M" and "L".

Michael J. LeValley
Field Supervisor



FINAL
FISH AND WILDLIFE
COORDINATION ACT REPORT
FOR THE
MISSOURI RIVER LEVEE SYSTEM
UNITS L-455 AND R-471-460
FLOOD DAMAGE REDUCTION STUDY
KANSAS AND MISSOURI

PREPARED FOR THE

The Kansas City District
U.S. Army Corps of Engineers
Kansas City, Missouri

Prepared by
U.S. Fish and Wildlife Service
Kansas Ecological Services Field Office
Manhattan, Kansas
August, 2006

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EXECUTIVE SUMMARY

The Kansas City District, Army Corps of Engineers (Corps), is in the process of developing a feasibility study for flood damage reduction measures for the city of St. Joseph, in Buchanan and Andrew Counties, Missouri and the towns of Elwood and Wathena, in Doniphan County, Kansas. This Final Fish and Wildlife Coordination Act Report describes the study area, identifies important aquatic and terrestrial resources, evaluates impacts of flood damage reduction measures, and describes mitigation measures.

The project area is highly urbanized inside the existing levee system. The primary impact from a fish and wildlife perspective will be the loss of terrestrial habitat from levee construction, permanent loss of wetlands from levee construction, and temporary loss of terrestrial habitat due to construction activities and borrow construction. One borrow area, known as Elwood Bend, has been proposed for purchase for inclusion in the Missouri River Fish and Wildlife Mitigation Program (MRFWMP). Inappropriate use or pattern of borrow from this area could diminish its value to the MRFWMP. The Fish and Wildlife Service (Service) recommends the following:

RECOMMENDATIONS

1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project (MRFWMP) team to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area and about the construction plans for the final design of the borrow areas. The MRFWMP should also be given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.
2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.
3. Reconsideration of the Levee Setback alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised.

4. Levees and levee easements should be seeded with native, warm-season grasses such as switch grass.
5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.
6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects at a minimum of 1.5:1 ratio for emergent wetland and at a 2:1 ratio for forested wetland. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.
7. Encourage wetland development and hydrological reconnection to the river at existing and proposed borrow areas.
8. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

9. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where the invasive species, reed canary grass (*Phalaris arundinacea*), has become established. If possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, and floodplain ponds that would eliminate reed canary grass.
10. All disturbed areas should be immediately planted with native vegetation following construction. Due to the presence of reed canary grass, an exotic and aggressively invasive species, these areas would likely become a monoculture of reed canary grass if allowed to revegetate naturally.

INTRODUCTION

This Final Fish and Wildlife Coordination Act Report (FCAR) evaluates the effects on fish and wildlife resources of proposed alternatives identified for increasing the level of flood protection for areas in Kansas and Missouri near St. Joseph, Missouri and Elwood, Kansas. The considered alternatives consist primarily of earthen levee raises of two levee units, Levee Unit L-455 and Levee Unit R-471-460. These units collectively comprise the protective works that provide flood protection for areas in the city of St. Joseph, in Buchanan and Andrew Counties, Missouri and the cities of Elwood and Wathena, in Doniphan County, Kansas (Figure 1).

The south St. Joseph Levee Unit L-455 is located on the left bank of the Missouri River in Buchanan County, Missouri. It extends from the mouth of Whitehead Creek (Missouri River mile marker 447.3) ten miles downstream to Contrary Creek (Missouri River mile marker 437.3) and provides flood protection for a flood prone area within the southwest section of the City of St. Joseph. The Levee Unit R-471-460 is located on the right bank of the Missouri River between river miles 441.7 and 456.6 in eastern Doniphan County, Kansas, and northwestern Buchanan County, Missouri.

The right bank levee, R-471-460 was overtopped during the flood of 1993. The stated need for the Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Project in Kansas and Missouri is to allow passing of the one percent flood event with 90 percent reliability under both the existing and future conditions. This level is currently lacking and the Federal Emergency Management Agency (FEMA) is considering de-certification for the right bank levee. If the levee is decertified the economic impact of a flood event will be borne entirely by the local communities

Work on this project is based on agreements in the FY2006 Scope of Work to evaluate impacts to fish and wildlife resources from the NED-Preferred alternative, and Alternatives 2 and 3. On July 20, 2006, the Corps added Alternative 4 and requested that we evaluate it. This study was carried out under authority and in accordance with provisions of the U.S. Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 et seq.).

The Fish and Wildlife Service has not provided any previous Planning Aid Letters or Planning Aid Reports on the Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Project in Kansas and Missouri. The Service provided a Draft Fish and Wildlife Coordination Act Report dated June 2006. We have reviewed the Corps' Pre-Draft Environmental Impact Statement (EIS), Draft Environmental Assessment (EA), and Draft Mitigation Plan.

The Kansas Department of Wildlife and Parks (KDWP) and the Missouri Department of Conservation (MDC) have cooperated in the preparation of this report and concur with its contents.

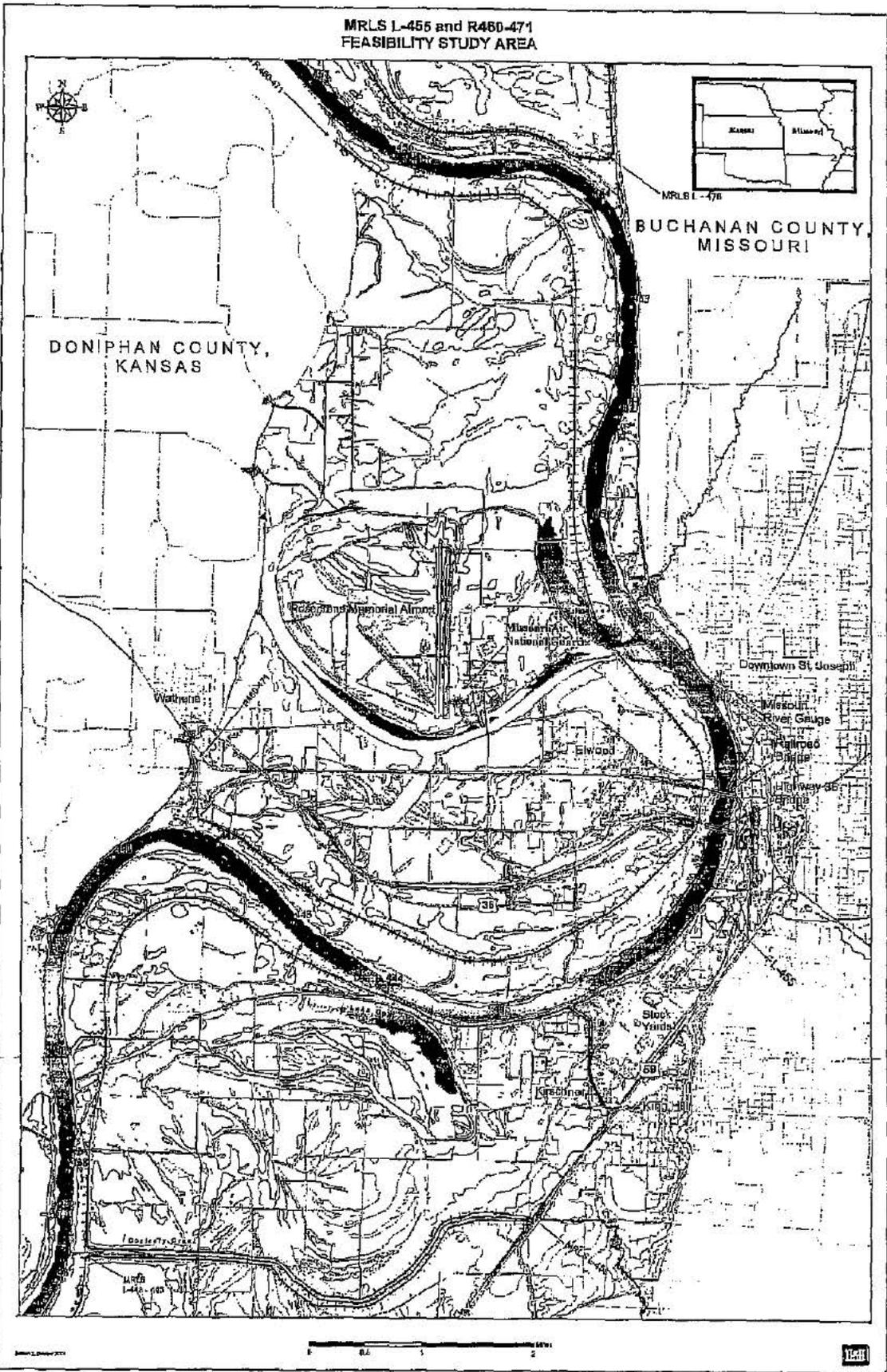


Figure 1.

DESCRIPTION OF THE PROJECT AREA

The site of St. Joseph was first noted in the journal of Lewis and Clark during their Journey of Discovery in 1804. Following the organization of the State of Missouri in 1821, Joseph Robidoux established the Blacksnake Hills trading post in 1826 at this site. In 1843 Robidoux platted the town of St. Joseph naming it after his patron saint. The town remained relatively small until the 1848 California Gold Rush when it became important as a departure point for the westward journey to the gold fields for hundreds of thousands of settlers and again in the 1850s during the Pike's Peak gold rush. In 1859 the railroad reached St. Joseph assuring its role as a supply and distribution point to the western half of the country. St. Joseph's proximity to the Missouri River and accessibility by way of river, rail, and land was to provide the impetus for phenomenal growth throughout the 19th century. The Pony Express operated in 1860 and 1861 with St. Joseph serving as its eastern terminus. In the 1870's St. Joseph became established as a leading wholesale center. A stockyard was opened in 1887 and several meat packing plants were established during the next forty years. The city currently has a population of approximately 74,000.

Elwood, Kansas was first established in 1856 under the name of Roseport. It also benefited from its association with the Missouri River serving as an important steamboat port with ferry service to St. Joseph. In the 1850s, thousands of emigrants outfitted in Elwood for their journey to Oregon and California. It was the first Kansas station on the Pony Express and the site of the first railroad construction west of the Missouri River. Much of the old town was washed away when the Missouri River undermined the banks. The current town has a population of approximately 1,176.

The Missouri River, one of the largest rivers in the United States, originates in southwestern Montana and flows about 2,315 miles to join the Mississippi River near St. Louis, Missouri. It drains approximately 424,300 square miles above Saint Joseph, Missouri. The River Mile (RM) references used in this report are measured upstream from the confluence of the Missouri River with the Mississippi River. The topography of the study area is generally represented by hills and uplands, which rise from 100 feet to 200 feet above the Missouri River floodplain. The Missouri River borders the eastern bluffs in the northern part of the city, and then crosses over to border the western bluffs opposite the southern part of the city. Its floodplain is three to five miles wide at Saint Joseph. Tributaries to the Missouri River in the St. Joseph study area in Missouri include Blacksnake Creek, Whitehead Creek, and Contrary Creek. On the Kansas side, Peters Creek joins the Missouri River south of the town of Wathena. Several unnamed tributaries to the Missouri River are also in the Kansas portion of the project area. An area called French Bottoms occupies the interior of an old oxbow of the Missouri River. Browning Lake is the remainder of the old channel. The Rosecrans Memorial Airport was built in the French Bottoms.

The project area is predominantly an alluvial flood plain underlain by bedrock of the Pennsylvanian System, Kansas City Group. Pennsylvania strata generally consist of inter-bedded sandstone, shale, limestone, clay, and coal. Limestone is the most abundant

resource present and it is mined for materials primarily used for road and highway construction.

In addition to limestone, sand and gravel are locally important mineral resources. The historic production of these resources is from flood plain and in-channel deposits of major streams. Crushed limestone has replaced stream gravels as the predominant coarse aggregate in cement. Upland terrace and glacial deposits are important sources of sand and gravel in the southeastern and northwestern portions of Missouri.

Soils within the project area have primarily developed as a result of the wind-borne deposition of fine-grained material (loess) and the deposition of material on land by streams (alluvium). Loess deposits are visible on the exposed valley walls adjacent to the Missouri River. Missouri River floodplain soils belong to the Haynie-Urban Land-Leta association. Soils of the upland, loess hills are of the Knox-Judson-McPaul and the Marshall-Ladoga-Gara associations. The soil associations generally consist of deep, nearly level, well drained to somewhat poorly drained soils comprised of river-deposited sand, silt, and clay.

The flood plain or bottoms area is three to five miles wide in the St. Joseph study area and is characterized by low-lying, nearly level terrain. The uplands are composed of steep to moderately sloping hills composed of loess or loamy soils. Buchanan County and Doniphan County consist of several soils types, which are either hydric, prime farmland, or both.

Water quality of the Missouri River tributaries in St. Joseph has been severely impacted by urban development. Significant segments of five out of the seven tributaries in the study area have been placed underground in conduits and are used as a combined sanitary/storm water sewer system. The remaining two tributaries, Roy's Branch and Contrary Creek, drain relatively undeveloped areas.

The Missouri River near St. Joseph is classified as a permanent flow general warm water fishery resource. A general warm water resource provides protection to both game and non-game fish occurring in the area. The River provides a water source for irrigation, livestock/wildlife watering, aquatic life protection, boating, drinking water supply, and industrial withdrawal.

Terrestrial Resources

A review of historical conditions on the Missouri River can facilitate an understanding of how the river formerly functioned, and suggest the ecological functions and processes that were essential to development of such an abundant and rich array of fish and wildlife resources. However, clearly defining historical conditions is somewhat problematic, since most of the more detailed quantitative and qualitative descriptions of the Missouri River occurred during or after major episodes of human impact. Nevertheless, we can broadly surmise how the presettlement Missouri River appeared.

The Missouri River, presettlement, was free-flowing, without the restrictions of dams and diversions. The river water was extremely sediment laden and turbid, in comparison, current flow is fairly clear. Flows varied dramatically and fluctuated widely in response to rains. Sustained high flows occurred in the spring and early summer in response to snow melts.

The higher flow events resulted in over bank flooding, often over extensive reaches of the valley floor. Overflow areas were covered by dense forests of riparian vegetation. Some accounts place the riparian band as extending up to 14 -15 miles along each side of the river and encompassing at least one-half million acres. Extensive swamps, marshes, floodplain pools, and other diverse and expansive wetlands were also nourished by the regular flooding events.

Bank erosion and river meander, the basic forces for most riverine ecological processes and functions, were unimpeded. Erosion was most active on the outsides of the numerous meander bends, where the highest velocities impinged directly on the earthen substrates. As one bank was eroded, the opposite bank experienced sediment accretion. Some of the meanders became cut off from the river, forming oxbow lakes and other broad, highly diverse channel overflow areas. Erosion also resulted in the input into the river of large volumes of woody debris of a broad range of sizes, types, and complexities into the river. The fish, wildlife, and riparian vegetation of the river were in a dynamic equilibrium, adjusted to, and dependent upon the cycle of erosion, deposition, and changing channel pattern as the river slowly swung back and forth across its meander belt. The ecological health and productivity of the river at any point in time were dependent on periodic rejuvenation associated with these natural processes and changes.

Significant environmental changes and impacts have occurred in the past one-hundred and fifty years. Only fragments remain of the extensive riparian forests and wetlands which have been largely removed through urbanization and land clearing for agricultural purposes. The river is controlled by dozens of dams on the main stem and tributaries. The river is sediment starved. The lower river is channelized and largely confined by levees and bank stabilization, and overall, is a mere remnant of the ecologically dynamic and complex system of the past (USFWS 2005).

Remnants of the "oak-hickory-maple" upland forest vegetation type are present on the steep hillsides adjacent to the Missouri River floodplains. In addition to the species of sugar maple, white and black oak, and hickories for which this upland vegetation type is named, other hardwood species present include American sycamore, beech, black walnut, bur and chinkapin oak, hackberry, American and slippery elm, hawthorn, honeylocust, redbud, and dogwood. The understory consists of regeneration of the above species and the ground layer includes: violets, poison ivy, Virginia creeper, greenbrier, and honeysuckle and other species.

Most of the vegetation in the study area has been greatly impacted by urban development and agricultural land clearing. In general, the upper reaches of the tributaries draining the area are located in the more established, residential neighborhoods and the lower reaches

are located in the intensively developed business district and croplands. The banks along Roy's Branch, Contrary Creek, and limited areas along the upper reaches of the other tributaries do contain tracts of riparian timber. A mix of sycamore, cottonwood, maple, oak, and hickory dominates these areas. Other areas along the upper reaches of the tributaries are in residential development, parkland, or various stages of successional recovery.

Three vegetation types generally dominated the project area: floodplain forest (*Populus-Salix*), oak-hickory-maple forest (*Quercus-Carya-Acer*), and openings of bluestem prairie (*Andropogon-Panicum-Sorghastrum*). Although the project area's floodplains have been largely cleared for development and agriculture, there are bands of riparian forest habitat located riverward of the levee units. Predominant tree species found in these riparian bands include eastern cottonwood, willows, box elder, green ash, silver maple, and American sycamore. The understory includes reproduction of these species, plus some redbud, dogwood, black cherry, and various shrubs. The ground layer in the riparian bands varies from sparse to dense vegetation and contains primarily poison ivy, Virginia creeper, honeysuckle, greenbrier, and gooseberry, and various other species. A monoculture of reed canary grass was observed in much of the area between the levee easement and the band of riparian forest at the water's edge on the Kansas side of the project area.

Mammals associated with the remaining wooded riparian habitat include the white-tailed deer, eastern cottontails, and red and gray squirrels. Aquatic and terrestrial furbearers are important parts of the ecosystem, and those present in the area include the beaver, mink, and muskrat (dependent on the aquatic habitat) and opossum, coyote, raccoon, and striped skunk (dependent on terrestrial habitat). However, small mammals, such as mice, voles, rats, and bats account for the majority of the species present. The white-tailed deer is the only naturally occurring large mammal still common in developed urban areas. Eastern wild turkeys are present in the open, less developed floodplain areas.

The avifauna of the study area includes permanent residents, summer residents, transients, and winter residents. The project area provides year-around habitat for approximately 31 bird species, with another 67 species using the project area for nesting and another 14 species as winter residents only. Over 110 species use the river corridor during the fall migration. Summer resident species associated with aquatic habitats include waterfowl, wading birds, and selected passerines. Summer waterfowl are dominated by wood ducks which nest in wooded bottomlands and rear their young in nearby aquatic habitats. Nesting by other waterfowl, primarily mallards, is minor. Wading birds, such as the great blue heron and green heron, utilize shallow areas as foraging habitat.

Waterfowl and shorebirds are dominant transient species associated with aquatic habitats. The most numerous and impressive migration is that of the snow goose, particularly in the spring. Other migrating species include the Canada goose, mallard, and pintail.

Amphibians found in the study area include the American toad, Rocky Mountain toad, Blanchard's cricket frog, Cope's gray treefrog, Great Plains toad, Woodhouse's toad, northern cricket frog, eastern gray treefrog, boreal chorus frog, western chorus frog, smallmouth salamander, plains spadefoot toad, plains leopard frog, bullfrog, Great Plains narrowmouth toad. Reptiles that may be found in the study area include the snapping turtle, painted turtle, false map turtle, ornate box turtle, slider, smooth softshell turtle, spiny softshell turtle, five-lined skink, Great Plains skink, northern prairie skink, six-lined racerunner, western worm snake, ringneck snake, eastern hognose snake, racer, rat snake, prairie kingsnake, red milksnake, gophersnake, northern water snake, brown snake, western ribbon snake, common garter snake, copperhead, and timber rattlesnake. The northern leopard frog and western fox snake may also be present in the study area (Collins 1993).

Wetlands

Wetlands exist within the project area as small pockets, old meander scars, and within the riparian strips. An old oxbow of the Missouri River (French Bottoms) was cut off when the river changed its course during the flood of 1952. Remnants of the oxbow remain as Browning Lake, an area protected by levee unit R471-460. Lake Contrary is in the area protected by levee L-455. It is currently being studied by the Corps for a restoration project.

National Wetland Inventory database (NWI) maps for the project area indicate that there are many wetlands in the project area. These wetlands are permanently flooded, seasonally flooded, temporarily flooded, or semi-permanently flooded and include forested, broad leaved deciduous, and scrub shrub vegetation. In addition, there are areas classified as palustrine unconsolidated bottom, intermittently exposed (PUBG) which are typically mud or sand flats. Some of the wetlands are natural and some are man-made.

Historically, wet mesic bottomland forest was the most extensive bottomland forest natural community in Missouri (Nelson 1987). This community has a diversity of tree species such as pin oak, cottonwood, river birch, green ash, and hackberry, cherry, sweetgum, hawthorn, dogwood, hickories, wildplum, persimmon, maples, elm, and sassafras. A well-developed understory is often present, containing poison ivy, elm, nettle, and honeysuckle. These communities provide habitat for a wide variety of resident and migratory wildlife. Forested wetlands have been found to support significantly higher abundance and diversity of bird species compared to upland forests (Brinson 1981).

A jurisdictional wetland determination will be necessary if levee alignments or borrow areas directly impact wetlands. The quantity and quality of existing wetlands will determine the amount of compensation necessary to offset project losses. A wetland mitigation plan would be developed in coordination with at least the Corps, Service, Environmental Protection Agency (EPA), Kansas Department of Wildlife and Parks (KDWP) and the Missouri Department of Conservation (MDC). This plan would include site locations, time frames, construction plans, a monitoring plan, progress reports, and

standards of success. This plan would be a condition of any Section 404 permit issued for the project. The plan should be implemented regardless of the regulatory nature of the wetland. Minimum replacement ratios for compensatory wetland mitigation should be based on the following guidelines:

U.S. Fish and Wildlife Service, Region 6
Wetland Mitigation Policy Guidance (8/97)
Recommended Minimum Replacement Ratios

<u>Mitigation Type</u>	<u>Ratio</u>	<u>Type of Wetland Being Mitigated</u>
Advance Creation	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Creation	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Restoration	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Restoration	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Enhancement	3:1	forested, scrub-shrub
	2:1	emergent
Concurrent Enhancement	4:1	forested, scrub-shrub
	3:1	emergent

Aquatic Resources

The Missouri River has undergone considerable change since the Louisiana Purchase in 1803. The historical Missouri River provided a wide array of habitats within its wide, shallow bed. The braided channels were divided by sand islands and varied in depth and speed of current, from swift chutes to calm sloughs, backwaters, and oxbows. The River had constant flow, although the volume varied enormously. Its water was muddy except at low stages (Cross and Collins 1995). Modifications to the natural Missouri River floodplain ecosystem have been immense and ongoing for more than 150 years. Presently, 35 percent of the river's length is impounded, 32 percent is channelized or stabilized, and the remaining 33 percent is freeflowing (Schmulbach and others, 1992). Major civil works projects involved channelization, channel maintenance, and impoundment and reservoir operation. Agricultural, industrial, and urban development within the basin also significantly modified the Missouri River and its adjoining floodplain.

Presently all of the Missouri River from Sioux City, Iowa to its mouth at Saint Louis, Missouri is channelized. Even during flooding only about 10 percent of the original floodplain is inundated, as high agricultural and urban levees confine the river to a width of approximately 500 feet from Kansas City north (USFWS 1980). The impacts of channelization have been numerous and severe on the physical, chemical, and biological

structure and function of the Missouri River and its floodplain. The most damaging of these alterations to aquatic communities has been the nearly complete isolation of the river from its floodplain, subsequent loss of floodplain habitat, drastic reduction in area and diversity of river channel habitats, and increased velocity of the main channel.

Missouri River fish populations have been significantly affected by channel alterations in the project area. Most indigenous fish species still remain, but have suffered serious population declines. Cross and Collins (1995) state that fishes characteristic of the Missouri River are typical of large turbid rivers and include sturgeon (pallid and shovelnose), paddlefish, goldeye, gizzard shad, smallmouth buffalo, bigmouth buffalo, blue sucker, channel, blue, and flathead catfish, burbot, sauger, and freshwater drum. The abundant minnow fauna consists of species adapted to muddy water which includes the flathead chub, sicklefin chub, sturgeon chub, speckled chub, plains minnow, western silvery minnow, silverband shiner, river shiner, and sand shiner (Cross and Collins 1995). Other fish species that may be present near the project site include river carpsucker, shortnose gar, longnose gar, gizzard shad, chestnut lamprey, goldeye, red shiner, brassy minnow, silver chub, quillbacks, black buffalo (Pflieger 1997, Cross and Collins 1995). Introduced species include common carp, bighead carp, and grass carp (Cross and Collins 1995).

Threatened and Endangered Species

Section 7(c) of the Endangered Species Act (87 Stat. 884, as amended), requires Federal Agencies to ask the Secretary of the Interior, acting through the Service, whether any listed or proposed endangered or threatened species may be present within an area proposed for construction. If the project may affect listed species, the Corps of Engineers should initiate formal Section 7 consultation with this office. If there will be no effect, or if the Fish and Wildlife Service concurs in writing there will be beneficial effects, further consultation is not necessary. An activity which harasses any listed species and disrupts its normal breeding, feeding, or sheltering activities to the extent that harm or injury results is a prohibited taking under the ESA.

As a result of habitat losses and flow regime changes, two species dependent on the river are federally-listed as endangered or threatened and are found in this section of the Missouri River.

The bald eagle (*Haliaeetus leucocephalus*), federally listed as threatened, may be expected to occur along any river or at any reservoir in Kansas or Missouri. Eagles utilize areas where live large trees and snags provide perch sites in proximity to open water, where they feed on fish and waterfowl. This project may adversely impact the bald eagle by removing trees from the levee footprint and from the borrow areas. In addition, if any project activity appears likely to harass or disturb any bald eagle observed at or near any construction site the Service should be notified prior to commencement of the activity, so that an assessment may be made of the potential for adverse impacts.

The pallid sturgeon (*Scaphirhynchus albus*), federally listed as endangered, occurs throughout the Missouri River reach. This species has been recently captured in the Missouri River in the project area. (Miller 2006 per. comm.). Information gained by recent capture and tagging research indicates that pallid sturgeons use nearly all the habitats found in the Missouri River during their life spans. Sturgeons have been found in tributary mouths, over sandbars, along main channel borders, and in deep holes elsewhere in the Missouri River. Small sturgeons have been captured in off-channel backwaters. Adults are often found in deep, swift flowing water, especially during winter months while young and larval pallids are found in areas of lower velocities out of the thalweg.

Because so little is known about the pallid sturgeon, much of the previous information available about the reproduction or spawning activities of the pallid sturgeon was, extrapolated from what is known about shovelnose sturgeons. Shovelnose sturgeon spawn over substrates of rock, rubble, or gravel in the main channel of the Missouri/Mississippi Rivers and major tributaries, or on wing dams in the main stem of larger rivers. Spawning was suspected to occur in the relatively swift water in or near the main channel. Initiation of shovelnose sturgeon spawning migrations have been associated with increased flows in May and June and water temperatures from 61° F to 70° F (USFWS 1993).

Destruction and alteration of habitats by human modification of the river system is believed to be the primary cause of declines of the pallid sturgeon. It is unlikely that successfully reproducing populations of pallid sturgeons can be recovered without restoring habitat elements of the Missouri and Mississippi Rivers necessary for the species continued survival. The construction of levees has contributed to the alteration of pallid sturgeon habitat by eliminating major natural floodways, which annually inundated and isolated many floodplain lakes, reduced the area of the floodplain, and changed erosion and accretion processes. In addition, bank stabilization, sediment trapping in reservoirs and channelization has led to bed degradation. The reduced amount of floodplain the river can access has diminished the availability of organic matter used by aquatic invertebrates which make up a large proportion of the of the pallid sturgeon's diet during early life stages. In addition, aquatic invertebrates are a primary food source for small fish which the pallid prefers as adults. Portions of the Missouri River 20 miles upstream and downstream of the mouths of the Kansas River and Platte Rivers are high priority reaches for recovery of the pallid sturgeon (USFWS 1993).

Kansas State Law (K.S.A. 32-504, 32-507: effective May 1, 1981) requires persons undertaking or sponsoring a publicly funded or State or Federally Assisted action which is likely to impact endangered or threatened wildlife habitats where they are likely to occur, to obtain a project action permit from the Secretary of the Kansas Department of Wildlife and Parks (KDWP) prior to initiation of such action. This list should be requested from the Environmental Services Section, Kansas Department of Wildlife and Parks, 512 SE 25th Ave., Pratt, KS 67124-8174.

KDWP maintains an internet site containing county lists and species information at http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species. State of Kansas listed threatened and endangered species for Doniphan County, Kansas listed on this site include sicklefin chub (*Macrhybopsis meeki*), flathead chub (*Platygobio gracilis*), western silvery minnow (*Hybognathus argyritis*), chestnut lamprey (*Ichthyomyzon castaneus*), eastern spotted skunk (*Spilogale putorius interrupta*), silverband shiner (*Notropis shumard*) peregrine falcon (*Falco peregrinus*), silver chub (*Macrhybopsis storeriana*), smooth earth snake (*Virginia valeriae*), and sturgeon chub (*Macrhybopsis gelida*). In addition, the following Federally listed threatened and endangered species are also listed by the State as occurring in Doniphan County, Kansas: American burying beetle (*Nicrophorus americanus*), Eskimo curlew (*Numenius borealis*), least tern (*Sterna antillarum*), and piping plover (*Charadrius melodus*).

The State of Kansas lists the following species as Species in Need of Conservation: black tern (*Chlidonias niger*), blue sucker (*Cycleptus elongates*), brassy minnow (*Hybognathus hankinsoni*), cerulean warbler (*Dendroica cerulea*), eastern hognose snake (*Heterodon platirhinos*), plains minnow (*Hybognathus placitus*), river shiner (*Notropis blennius*), short-eared owl (*Asio flammeus*), southern flying squirrel (*Glaucomys volans*), and timber rattlesnake (*Crotalus horridus*). As these lists are subject to change the Corps should contact the Kansas Department of Wildlife and Parks, Environmental Services directly.

According to the Missouri Department of Conservation's Natural History Data Base (1999) there are occurrences of state listed species or communities in the project area. Species and concerns should be requested from the Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.

DESCRIPTION OF THE PROJECT ALTERNATIVES

The five alternatives considered for this Coordination Act Report are: 1) Raise the Right Levee Section using earthen material to the one-hundred year level of flood protection with 90 percent reliability, and a corresponding raise to the Left Levee Section in specific areas to accept the slight rise in water surface elevations resulting from the initial raise (PREFERRED); 2) Raise the Right Levee Section to an Increased Level of Protection (500-year event plus 1.5 feet of freeboard), with a corresponding raise to the Left levee unit; 3) Raise the Right Levee Section to a Further Increased Level of Protection (500-year event plus 3.0 feet of freeboard), with a corresponding raise to the Left levee unit, and 4) Raise the Right Levee Section only using earthen fill to the 100 year level of flood protection with 75 percent reliability and 5) the "No Action" Alternative. The Corps of Engineers' Draft EA identifies Alternative 1 as the Preferred Alternative.

Alternative 1: Modifying Existing Levees to Design Level to provide a higher level of flood protection than that which currently exists. This is the current preferred alternative. This modification is accomplished by raising the existing levee using earth fill. A significant portion of the levee unit R-471-460 would be raised to a level sufficient to pass the one percent (100-year) flood with a 90 percent level of reliability, allowing for re-certification of the levee by FEMA. The anticipated right bank raise varies along its

length from zero to 3.37 feet. Increases in levee height would result in corresponding increases in levee toe width and seepage berms. The overall width increase from the expanded levee and seepage berms would range from approximately 35 feet to 372.5 feet landward of the right bank levee unit and approximately 29 feet to 50 feet riverward of this same levee unit. Extension of the levee toe width and seepage berms would impact a total of approximately 285 acres of land landward of the levee and approximately 77 acres of land riverward of the existing levee.

Additionally, a raise to the right bank levee would require minor raises (less than one foot) at specific locations along the left bank levee to accept the increased rise in water surface elevation resulting from the initial work. These increased elevations to the left bank will also increase toe width and seepage berms by approximately 136.5 feet to 490 feet landward of the levee unit and approximately 41.5 feet riverward of the existing levee. Extension of the levee toe width and seepage berms will impact approximately 43 acres of land landward of the levee and approximately 54 acres of land riverward of the existing levee.

Expanding the levees would result in the permanent removal of approximately 1.6 acres of secondary tree growth and 4.7 acres of shrubland landward of the levees and 5.4 acres of secondary tree growth and 8.0 acres of shrublands riverward of the levee. The permanent impact to these habitats is expected to be substantial because it will be kept from growing on the levee areas through normal levee maintenance practices. The Corps is proposing to measures to mitigate the loss through the on-site planting of 7.0 acres of "in-kind" trees and 12.7 acres of shrubland vegetation.

Proposed borrow areas include riverward areas in both Kansas and Missouri (Figure 2). In Kansas, the borrow areas consist of approximately 1,139 acres of land located from River Miles 454.9 to 451.9 and from River Miles 446.7 to 443.4. For Missouri, the borrow area consists of approximately 30.4 acres of land along River Miles 442.6 to 442.9. Over the entire project area, including the impacts from borrow material excavation and riverward berm expansion, approximately 388 acres of secondary tree growth and approximately 136 acres of shrubland could be temporarily impacted. The Corps is proposing to allow these areas to naturally revegetate over time. Additional steps have been proposed to minimize effects to this habitat. Minimization measures include, but are not limited to, avoiding this habitat by first using bare and/or cropland areas, varying bottom depths of excavated borrow sites, creating islands within the borrow site through avoidance of specified areas, spacing borrow areas apart from one another by approximately 500 feet to provide areas of no disturbance, and avoiding any larger "old growth" trees.

Construction work to extend the seepage berms would result in temporary impacts to approximately 274 acres of primarily agricultural land with minor amounts of secondary tree growth and shrubland on the right bank levee and 44 acres of similar land use on the left-bank levee. The Corps is proposing to allow these areas to revert back to their existing conditions as no levee maintenance activities will be conducted over the top of seepage berm areas.

Modifying the two levees would permanently impact approximately 4.4 acres of emergent wetlands landward of the levees and approximately 0.5 acre of forested wetlands riverward of the two levees. The areas would be filled and sloped, thereby inhibiting the ponding of water. The Corps is proposing to mitigate a total of 4.4 acres of emergent wetlands and 0.5 acres of forested wetlands on site and adjacent to the impacted wetlands concurrently with construction activities. Wetland impacts are proposed to be offset through the scraping and reshaping of the impacted areas to expand the existing wetland area equal to that which was lost.

Some of the wetlands along both levees may be enrolled in the Wetland Reserve Program. To the extent possible, these areas will be avoided and lands outside these protected areas will be used for borrow sites. Should WRP lands be impacted the Corps will utilize measures provided in the NRCS Engineering Field Handbook, May 1997, Chapter 13 "Wetland Restoration, Enhancement, or Creation" and the "Erodible Land and Wetland Conservation and Reserve Program" provisions of the Food Security Act of 1985, as amended, to avoid/reduce impacts and to provide for a more natural setting following construction. These minimization measures would be similar to those identified above.

Grassland strips occurring on and adjacent to the levee and the toe would be temporarily impacted during construction grading, sloping, and grubbing as the width of the levee and seepage berm expand. Impacts would be temporary but would cease to provide habitat to existing wildlife during project construction and for approximately two to three years after project completion or until the grassland vegetation is well established. The completed levee slopes would be seeded and mulched with a native warm-season mix following project completion.

Alternative 2: Modifying Existing Levees to an increased level (500-year event plus 1.5 feet of freeboard) of protection would raise the levees by an average of 2.5 feet along its entire length, an increase to the levee toe width, and extension to the seepage berms associated with the levee and the excavation of approximately 1,139 acres riverward of R471-460 and 30 acres riverward of L-455 of borrow material. Although impacts from this alternative exceed the project boundary set at no more than 500 feet from the center line of the existing levee, they were only reported to the boundary limit. Impacts would be greater than Alternative 1. Approximately 7.6 acres of secondary tree growth and 14.4 acres of shrubland would be impacted. A total of 6.2 acres of wetlands are anticipated to be filled as a result of this alternative. Mitigation ratios similar to Alternative 1 are proposed.

Alternative 3: Modifying Existing Levees to a further increased level (500-year event plus 3.0 feet of freeboard) of protection would result in raising the existing levee by approximately 3.5 feet along the entire levee, an increase to the levee toe width, an extension to the seepage berms associated with the levee, and the excavation of approximately 1,139 acres riverward of R471-460 and 30 acres riverward of L-455 of borrow material. Although impacts from this alternative exceed the project boundary set at no more than 500 feet from the center line of the existing levee, they were only

reported to the boundary limit. Impacts from this alternative would be greater than either Alternative 1 or Alternative 2. Alternative 3 would result in the permanent impact of 2.7 acres of secondary tree growth and 8 acres of shrubland landward of the levees and 5.4 acres of secondary growth trees and 8 acres of shrubland riverward of the levees. Wetland impacts are calculated at approximately 7.3 acres from this alternative. Mitigation ratios similar to Alternative 1 are proposed.

Alternative 4: Modifying the existing right bank levee to provide a higher level of flood protection than currently exists using earthen fill (100-year plus 1.5 feet freeboard). This alternative would not allow for re-certification of the levee by FEMA. The right bank levee would be raised by zero to 1.2 feet, with an increase to the levee toe width, an extension to the seepage and stability berms associated with the levee, and borrow excavation within an area approximately 1,139 acres riverward of R471-460, and approximately 30 acres riverward of L-455. A raise to the left bank would not be required. Approximately 1.3 acres of secondary tree growth and approximately 4.0 acres of shrubland landward of the levees and approximately 4.5 acres of secondary growth trees and 6.2 acres of shrublands riverward of the levees would be lost. Wetland impacts are calculated at approximately 3.7 acres of emergent wetland landward of the levees and approximately 0.5 acres of forested wetlands riverward of the levees. Mitigation measures ratios to Alternative 1 are proposed.

“No Action” Alternative: The “No Action” alternative would involve no construction activity and no change in project operations. No borrow material would be obtained so no impacts to forested areas or shrub habitat would occur. The no action alternative would maintain these vegetation resources in the study area as status quo. Additionally, because the borrow areas would not be used, no reshaping of riverward areas to increase functions of existing wetland acreage and fishery habitat would occur.

OTHER PROJECT ALTERNATIVES

Several structural modifications were considered to reduce the frequency of damaging overflows including channel modifications, upstream reservoirs and levee setbacks. These modifications were eliminated from further consideration due to economic infeasibility, ineffectiveness in providing an adequate level of protection for the study area, the costs outweighed the benefits, or the environmental impacts that would result from a particular alternative were far greater than the preferred alternative.

Levee Setbacks would have removed a section of levee unit R471-460 from river mile 449 downstream to river mile 447.5 and reconstructed it landward. The objective of this alternative was to achieve a uniform 3,000 foot floodway within the study area consistent with the original Pick-Sloan Plan for flooding width above Kansas City, Missouri. This alternative was removed from further consideration because total benefits were less than the cost of construction. However, the cooperating agencies of the Missouri River Fish and Wildlife Mitigation Project (MRFWMP), which includes the Corps, are looking at levee setbacks as one component of the project. If levee setbacks were completed in

cooperation with the MRFWMP, with the costs shared by both projects, the cost/benefit ratio might be more favorable and would help meet the objectives of both projects.

The Corps has also considered dredging the river for levee fill. This could have negative implications for the pallid sturgeon and other fish.

FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

The Missouri side of the project area is primarily urban consisting of industrial, commercial development with major roads and bridges, secondary roads, and housing developments on and above the floodplain. The Kansas side of the levee project contains similar development. Existing wildlife habitat is scarce, and of generally low quality due to habitat fragmentation and loss of habitat from the development that has been ongoing for more than a hundred and fifty years. Without the flood damage reduction project FEMA may de-certify the levee leaving the local communities to bear the economic impact of further flood events. This may result in the decrease of future development in the floodplain and flood prone areas of the Missouri River behind the levees and may even cause the abandonment of existing development. Cropland may also be abandoned, converted to other open space uses or enrolled in the Conservation Reserve Program (CRP) or the Wetland Reserve Program (WRP). All of these actions could actually increase the quantity and quality of wildlife habitat available in the area.

FISH AND WILDLIFE WITH THE PROJECT

The project would presumably keep the levees in compliance with FEMA and under their certification. With payments for flood damages more secure and many people believing that the likelihood of flooding is diminished, more floodplain and floodprone land landward of the levees would likely be developed. This would result in more wildlife habitat being converted and more habitat fragmentation.

The proposed borrow area known as Elwood Bend contains some of the highest quality wildlife habitat in the project area in a large unfragmented tract. Work in this area will displace wildlife that currently use the area due to disturbances from noise, dust, human activity, machinery and destruction of habitat. Depending on construction timing, this displacement could result in serious consequences to wildlife such as loss of reproduction and possible death of individual animals from accidents (crossing roads and unknown hazards in new areas), starvation, competition for other areas, etc. There is little refuge habitat in close proximity to the project area and available habitat is presumably at carrying capacity which further reduces the likelihood of wildlife surviving the displacement and intensifies the competition for the limited habitat available. Although the temporal displacement may be relatively short, the repercussions could be long-term. Impacts to migrating songbirds are of particular concern. Existing wildlife travel corridors linking the borrow areas and other areas of suitable floodplain upstream and downstream of the borrow area should be maintained during project construction. If the

Elwood Bend area is used as a borrow site, it would also be beneficial to allow early successional stages of woody and annual vegetation to grow landward of the levee to facilitate movement through the cropland outside of the growing season.

Large trees suitable for bald eagle habitat are present in the Elwood Bend borrow site and in other areas riverward of the levee. Trees 50 feet or greater in height and/or trees greater than 24 inches diameter at breast height (dbh) should be avoided. Many smaller trees are also present in the site. While these trees are young now, they are closer to a mature and more valuable stage than newly established trees and should be avoided if at all possible.

Habitat gains in quality could be realized if the Corps works closely with the MRFWMP team and constructively takes borrow to enhance habitat to meet the objectives of that program. However, there is an abundance of cropland and bare ground inside and outside the levee that could be used for borrow areas instead of the Elwood Bend area. Soils taken from these areas would be relatively free of the trash and debris (tree roots, vegetation, etc.) common to borrow taken from vegetation riparian areas. Borrow locations should be located in cropland or other bare ground as much as possible. Another option is to take borrow from areas infested with reed canary grass, an invasive species, and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, and floodplain ponds that would eliminate this species.

The loss of levee brome grasses during heightening of the existing levee system will be a short-term loss. Re-seeding the levee to warm season grasses such as switch grass would reduce erosion, better insure the integrity of the levee system during floods and provide higher value wildlife habitat than brome.

Previous modifications within the Missouri River channel and floodplain has had an adverse effect on fish and wildlife habitat. The Missouri River surface area has declined more than 50 percent. The river channel is now deep, has swift currents, and decreased habitat diversity. River backwaters, chutes, sandbars, and oxbow lakes have been lost to floodplain development. Both proposed borrow areas are riverward of the levee. One is primarily cropland and should not cause significant impacts to wildlife. The other is the Elwood Bend area as previously discussed. Work in this area could cause significant short and long-term impacts to wildlife.

Construction activities would cause temporary, short-term impacts to fish and wildlife from noise, dust, and the presence of workers and machinery. Runoff from construction areas, access roads, staging areas and unprotected fills could degrade water quality inside the levee system. Accidental spills of fuels, lubricants, hydraulic fluids, and other petrochemicals would be harmful to aquatic life.

Removal of fill from the cropland area has the potential to cause the loss of farmed wetland. Farmed wetland should be delineated within the borrow site and should be avoided if possible. If an unavoidable loss is incurred, the quantity and quality of the farmed wetland will determine the amount of compensation necessary to offset project

losses. The wetland mitigation plan for all wetland impacts should be developed in coordination with the Corps, Service, EPA, KDWP and MDC. This plan should include site locations, time frames, construction plans, a monitoring plan, progress reports, and standards of success. This plan should be a condition of any permit issued for the project. The proposed Mitigation Plan is lacking many of these components. The completed plan should be implemented regardless of whether impacted wetlands are classified as jurisdictional for purposes of the Clean Water Act.

Mitigation Discussion

The Service has established a mitigation policy used as guidance in determining resource categories and recommending mitigation measures (46 FR: 7644-7663).

We have determined that most of the wildlife habitat that would be affected by the raising of existing levees (levee footprints and easements) is in Resource Category No. 4 (habitats of medium to low value). For this category, loss of habitat value should be minimized.

Forested wetland and riparian woodland are consistent with Resource Category No. 2 that is, habitats are of high value that are relatively scarce or becoming scarce on a national or regional basis. Losses attributed to the project would require in-kind mitigation (replacement of habitat value lost with equal habitat values of the same kind of habitat as those eliminated). The cost of mitigating habitat losses should be included as a project cost.

Whenever possible, we recommend upland trees within the construction right-of-way remain undisturbed. While the trees may be young now, they are closer to a mature and more valuable stage than newly established trees.

Trees at least 50 feet tall and /or 24-inches dbh within 100 feet of the water's edge should be avoided. Removal of these trees may adversely affect the habitat of the bald eagle.

Under the Migratory Bird Treaty Act (MBTA), construction activities in prairies, wetlands, stream and woodland habitats, including the removal of upland borrow, and those that occur on bridges (e.g., which may affect swallow nests on bridge girders) that would otherwise result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. To minimize impacts to birds protected under the MBTA, construction areas should be surveyed for the presence of nesting birds during the general migratory bird nesting season of March through August. Disturbance of nesting areas should be avoided until nesting is completed.

Vegetation clearing and construction related soil disturbances can cause sediment-laden runoff to enter waterways. To minimize impacts associated with erosion, contractors should employ silt curtains, coffer dams, dikes, straw bales or other suitable erosion control measures adjacent to floodplain water bodies or tributaries affected by the project.

Sediment control measures are not necessary adjacent to the Missouri River because it is sediment starved, although downstream water supply intakes are a concern. Construction related petrochemical spills can also negatively impact fish and wildlife resources. Therefore, measures should be implemented prior to construction to minimize the likelihood of petrochemical spills.

Invasive species have been identified as a major factor in the decline of native flora and fauna and their ecosystems and impact aquatic resources. Invasive species of particular concern in Kansas are the zebra mussel (*Dreissena polymorpha*), purple loosestrife (*Lythrum salicaria*), Johnson grass (*Sorghum halepense*), sericea lespedeza (*Lespedeza cuneata*), and reed canary grass (*Phalaris arundinacea*). Executive order 13112 Section 2 (3) directs Federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere and to ensure that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions. Proactive measures to prevent the inadvertent spread of exotic and invasive species would appear to satisfy this directive. Therefore we recommend the implementation of the following Best Management Practice (BMP).

All equipment brought on site will be thoroughly washed to remove dirt, seeds, and plant parts. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water (hotter than 40°C or 104°F) and dried for a minimum of five days before being used at this project site. In addition, before transporting equipment from the project site all visible mud, plants, and fish/animals will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with the water will be cleaned and dried following the above procedure.

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 project related creation of wildlife habitat, over and above that required to mitigate losses attributable to project construction.

Native trees, grasses, and forbs, noted for their high wildlife value, could be established along the landward and stream side base of the existing levee system. This might help offset future losses due to increased encroachment along the river once flood protection is increased once again. Switch grass often takes longer to become fully established; however when established, stands of native vegetation provide excellent soil binding characteristics, valuable wildlife habitat and require fewer maintenance costs. The Service, Missouri Department of Conservation, the Kansas Department of Wildlife and Parks, and the Natural Resource Conservation Service offer assistance programs and could work with the cities of St. Joseph, Elwood and Wathena and the project sponsors to develop vegetation management plans.

RECOMMENDATIONS

1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project (MRFWMP) team to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area and about the construction plans for the final design of the borrow areas. The MRFWMP should also be given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.
2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.
3. Reconsideration of the Levee Setback alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised.
4. Levees and levee easements should be seeded with native, warm-season grasses such as switch grass.
5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.
6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects at a minimum of 1.5:1 ratio for emergent wetland and at a 2:1 ratio for forested wetland. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.
7. Encourage wetland development and hydrological reconnection to the river at existing and proposed borrow areas.
8. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

9. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where the invasive species, reed canary grass (*Phalaris arundinacea*), has become established. If possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, and floodplain ponds that would eliminate reed canary grass.

10. All disturbed areas should be immediately planted with native vegetation following construction. Due to the presence of reed canary grass, an exotic and aggressively invasive species, these areas would likely become a monoculture of reed canary grass if allowed to revegetate naturally.

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, Kansas 66503-6172

June 30, 2006

Colonel Michael Rossi
U.S. Army Corps of Engineers, Kansas City District
601 E 12th Street
Kansas City, MO 64106

Dear Colonel Rossi:

This Draft Fish and Wildlife Coordination Act Report (DCAR) is provided pursuant to the Fiscal Year 2006 Scope-of-Work Agreement for the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Study, Kansas and Missouri, between the U.S. Fish and Wildlife Service (Service) and the Kansas City District, Corps of Engineers. Your agency has indicated that this kind of information would be useful in project planning and in avoiding environmentally sensitive areas during project development. This DCAR was prepared in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), and will in its final form constitute the report of the Secretary of the Interior on the project within the meaning of Section 2 (b) of this Act.

Cooperation and information utilized in preparation of this report was obtained from the Kansas Department of Wildlife and Parks (KDWP), the Missouri Department of Conservation (MDC), and the Kansas City District. The Service is concurrently soliciting comments from the KDWP, MDC, and the Fish and Wildlife Service Columbia, MO Field Office. Their comments and recommendations will be reflected in the Final Coordination Act Report (FCAR). Their concurrence letters, if they are forthcoming, will be sent to you along with our final report.

We appreciate the opportunity to discuss impacts to fish and wildlife anticipated by implementation of this project and would appreciate any comments you or your staff have on the DCAR by July 21, 2006.

If we can be of any assistance please call Ms. Susan Blackford, of my staff, at [REDACTED] ext. 102.

Sincerely,

Michael J. LeValley
Field Supervisor



DRAFT
FISH AND WILDLIFE
COORDINATION ACT REPORT
FOR THE
MISSOURI RIVER LEVEE SYSTEM
UNITS L-455 AND R-471-460
FLOOD DAMAGE REDUCTION STUDY
KANSAS AND MISSOURI

PREPARED FOR THE

The Kansas City District
U.S. Army Corps of Engineers
Kansas City, Missouri

Prepared by
U.S. Fish and Wildlife Service
Kansas Ecological Services Field Office
Manhattan, Kansas
June, 2006

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EXECUTIVE SUMMARY

The Kansas City District, Corps of Engineers, is in the process of developing a feasibility study for flood damage reduction measures for the city of St. Joseph, in Buchanan and Andrew Counties, Missouri and Elwood and Wathena, Doniphan County, Kansas. This Draft Fish and Wildlife Coordination Act Report describes the study area, identifies important aquatic and terrestrial resources, evaluates impacts of flood damage reduction measures, and describes mitigation measures.

The project area is highly urbanized inside the existing levee system. The primary impact from a fish and wildlife perspective will be the loss of terrestrial habitat from levee construction, permanent loss of wetlands from levee construction, temporary loss of terrestrial habitat due to construction activities and borrow construction. One borrow area, known as Elwood Bend, has been proposed for purchase for inclusion in the Missouri River Fish and Wildlife Mitigation Program (MRFWMP). Inappropriate use or pattern of borrow from this area could diminish its value to the MRFWMP. The Fish and Wildlife Service recommends the following:

RECOMMENDATIONS

1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project (MRFWMP) to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area, the construction plans for the final design of the borrow areas and given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.
2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.
3. Reconsideration of the Levee Setback alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised.
4. Levees and levee easements should be seeded with native, warm-season grasses such as switch grass.

5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.

6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.

7. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

8. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where invasive species, i.e. reed canary grass, has become established. If it is possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, floodplain ponds that would eliminate this species.

9. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where invasive species, i.e. reed canary grass, has become established. If it is possible to borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, floodplain ponds that would eliminate this species.

10. Encourage wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee units.

INTRODUCTION

This Draft Fish and Wildlife Coordination Act Report (DCAR) evaluates the effects on fish and wildlife resources of proposed alternatives identified for increasing the level of flood protection for areas in Kansas and Missouri near St. Joseph, Missouri and Elwood, Kansas. The considered alternatives consist primarily of earthen levee raises of two levee units, Levee Unit L-455 and Levee Unit R-471-460. These units collectively comprise the protective works that provide flood protection for areas in St. Joseph, Buchanan and Andrew Counties, Missouri and Elwood and Wathena, Doniphan County, Kansas (Figure 1).

The south St. Joseph Levee Unit L-455 is located on the left bank of the Missouri River in Buchanan County, Missouri. It extends from the mouth of Whitehead Creek (Missouri River mile marker 447.3) ten miles downstream to Contrary Creek (Missouri River mile marker 437.3) and provides flood protection for a flood prone area within the southwest section of the City of St. Joseph. The Levee Unit R-471-460 is located on the right bank of the Missouri River between river miles 441.7 and 456.6 in eastern Doniphan County, Kansas, and northwestern Buchanan County, Missouri.

Both units were overtopped during the flood of 1993. The stated need for the Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Project in Kansas and Missouri is to allow passing of the one percent flood event with 90 percent reliability under both the existing and future conditions. This level is currently lacking and FEMA is considering de-certification for the levee. If the levee is decertified the economic impact of a flood event will be borne entirely by the local communities

Work on this project is based on agreements in the FY2006 Scope of Work to evaluate impacts to fish and wildlife resources from the NED-Preferred alternative, and Alternatives 2 and 3. This study was carried out under authority and in accordance with provisions of the U.S. Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 et seq.).

The Fish and Wildlife Service has not provided any previous Planning Aid Letters or Planning Aid Reports on the Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Project in Kansas and Missouri. We have reviewed the Corps of Engineers draft, Pre-Draft EIS and Draft Mitigation Plan.

The Kansas Department of Wildlife and Parks (KDWP) and the Missouri Department of Conservation (MDC) have cooperated in the preparation of this report and concur with its contents as indicated in the attached letters dated XXX.

DESCRIPTION OF THE PROJECT AREA

The site of St. Joseph was first noted in the journal of Lewis and Clark during their Journey of Discovery in 1804. Following the organization of the State of Missouri in

Figure 1.

1821, Joseph Robicoux established the Blacksnake Hills trading post in 1826 at this site. In 1843 Robicoux platted the town of St. Joseph naming it after his patron saint. The town remained relatively small until the 1848 California Gold Rush when it became important as a departure point for the westward journey to the gold fields for hundreds of thousands of settlers and again in the 1850s during the Pike's Peak gold rush. In 1859 the railroad reached St. Joseph assuring its role as a supply and distribution point to the western half of the country. St. Joseph's proximity to the Missouri River and accessibility by way of river, rail, and land was to provide the impetus for phenomenal growth throughout the 19th century. The Pony Express operated in 1860 and 1861 with St. Joseph serving as its eastern terminus. In the 1870's St. Joseph became established as a leading wholesale center. A stockyard was opened in 1887 and several meat packing plants were established during the next forty years. The city currently has a population of approximately 74,000.

Elwood, Kansas was first established in 1856 under the name of Roseport. It also benefited from its association with the Missouri River serving as an important steamboat port with a ferry service to St. Joseph. In the 1850s, thousands of emigrants outfitted in Elwood for their journey to Oregon and California. It was the first Kansas station on the Pony Express and the site of the first railroad construction west of the Missouri River. Much of the old town was washed away when the Missouri River undermined the banks. The current town has a population of approximately 1,176.

The Missouri River, one of the largest rivers in the United States, originates in southwestern Montana and flows about 2,315 miles to join the Mississippi River near St. Louis, Missouri. It drains approximately 424,300 square miles above Saint Joseph, Missouri. The River Mile (RM) references used in this report are measured upstream from the confluence of the Missouri River with the Mississippi River. The topography of the study area is generally represented by hills and uplands, which rise from 100 feet to 200 feet above the Missouri River floodplain. The Missouri River borders the eastern bluffs in the northern part of the city, and then crosses over to border the western bluffs opposite the southern part of the city. Its floodplain is three to five miles wide at Saint Joseph. Tributaries to the Missouri River in the St. Joseph study area in Missouri include Blacksnake Creek, Whitehead Creek, and Contrary Creek. On the Kansas side, Peters Creek joins the Missouri River south of the town of Wathena. Several unnamed tributaries to the Missouri River are also in the Kansas portion of the project area. An area called French Bottoms occupies the interior of an old oxbow of the Missouri River. Browning Lake is the remainder of the old channel. The Rosecrans Memorial Airport was built in the French Bottoms.

The project area is predominantly an alluvial flood plain underlain by bedrock of the Pennsylvanian System, Kansas City Group. Pennsylvania strata generally consist of inter-bedded sandstone, shale, limestone, clay, and coal. Limestone is the most abundant resource present and it is mined for materials primarily used for road and highway construction.

In addition to limestone, sand and gravel are locally important mineral resources. The historic production of these resources is from flood plain and in-channel deposits of major streams. Crushed limestone has replaced stream gravels as the predominant coarse aggregate in cement. Upland terrace and glacial deposits are important sources of sand and gravel in the southeastern and northwestern portions of Missouri.

Soils within the project area have primarily developed as a result of the wind-borne deposition of fine-grained material (loess) and the deposition of material on land by streams (alluvium). Loess deposits are visible on the exposed valley walls adjacent to the Missouri River. Missouri River floodplain soils belong to the Haynie-Urban Land-Leta association. Soils of the upland, loess hills are of the Knox-Judson-McPaul and the Marshall-Ladoga-Gara associations. The soil associations generally consist of deep, nearly level, well drained to somewhat poorly drained soils comprised of river-deposited sand, silt, and clay.

The flood plain or bottoms area is three to five miles wide in the St. Joseph study area and is characterized by low-lying, nearly level terrain. The uplands are composed of steep to moderately sloping hills composed of loess or loamy soils. Buchanan County and Doniphan County consist of several soils types, which are either hydric, prime farmland, or both.

Water quality of the Missouri River tributaries in St. Joseph has been severely impacted by urban development. Significant segments of five out of the seven tributaries in the study area have been placed underground in conduits and are used as a combined sanitary/storm water sewer system. The remaining two tributaries, Roy's Branch and Contrary Creek, drain relatively undeveloped areas.

The Missouri River near St. Joseph is classified as a permanent flow general warm water fishery resource. A general warm water resource provides protection to both game and non-game fish occurring in the area. The River provides a water source for irrigation, livestock/wildlife watering, aquatic life protection, boating, drinking water supply, and industrial withdrawal.

Terrestrial Resources

A review of historical conditions on the Missouri River can facilitate an understanding of how the river formerly functioned, and suggest the ecological functions and processes that were essential to development of such an abundant and rich array of fish and wildlife resources. However, clearly defining historical conditions is somewhat problematic, since most of the more detailed quantitative and qualitative descriptions of the Missouri River occurred during or after major episodes of human impact. Nevertheless, we can broadly surmise how the presettlement Missouri River appeared.

The river at this time was free-flowing, without the restrictions of dams and diversions. The River water was extremely sediment laden and turbid, in comparison, current flow is

fairly clear. Flows varied dramatically and fluctuated widely in response to rains. Sustained high flows occurred in the spring and early summer in response to snow melts.

The higher flow events resulted in over bank flooding, often over extensive reaches of the valley floor. Overflow areas were covered by dense forests of riparian vegetation. Some accounts place the riparian band as extending up to 14 -15 miles along each side of the river and encompassing at least one-half million acres. Extensive swamps, marshes, floodplain pools, and other diverse and expansive wetlands were also nourished by the regular flooding events.

Bank erosion and river meander, the basic forces for most riverine ecological processes and functions, were unimpeded. Erosion was most active on the outsides of the numerous meander bends, where the highest velocities impinged directly on the earthen substrates. As one bank was eroded, the opposite bank experienced sediment accretion. Some of the meanders became cut off from the river, forming oxbow lakes and other broad, highly diverse channel overflow areas. Erosion also resulted in the input of large volumes of woody debris of a broad range of sizes, types, and complexities into the river. The fish, wildlife, and riparian vegetation of the river were in a dynamic equilibrium, adjusted to, and dependent upon the cycle of erosion, deposition, and changing channel pattern as the river slowly swung back and forth across its meander belt. The ecological health and productivity of the river at any point in time were dependent on periodic rejuvenation associated with these natural processes and changes.

Significant environmental changes and impacts have occurred in the past one-hundred and fifty years. Only fragments remain of the extensive riparian forests and wetlands which have been largely removed through urbanization and land clearing for agricultural purposes. The river is controlled by dozens of dams on the main stem and tributaries. The river is sediment starved. The lower river is channelized and largely confined by levees and bank stabilization, and overall, is a mere remnant of the ecologically dynamic and complex system of the past (USFWS 2005).

Remnants of the "oak-hickory-maple" upland forest vegetation type are present on the steep hillsides adjacent to the Missouri River floodplains. In addition to the species of sugar maple, white and black oak, and hickories for which this upland vegetation type is named, other hardwood species present include American sycamore, beech, black walnut, bur and chinkapin oak, hackberry, American and slippery elm, hawthorn, honeylocust, redbud, and dogwood. The understory consists of regeneration of the above species and the ground layer includes: violets, poison ivy, Virginia creeper, greenbrier, and honeysuckle and other species.

Most of the vegetation in the study area has been greatly impacted by urban development and agricultural land clearing. In general, the upper reaches of the tributaries draining the area are located in the more established, residential neighborhoods and the lower reaches are located in the intensively developed business district and croplands. The banks along Roy's Branch, Contrary Creek, and limited areas along the upper reaches of the other tributaries do contain tracts of riparian timber. A mix of sycamore, cottonwood, maple,

oak, and hickory dominates these areas. Other areas along the upper reaches of the tributaries are in residential development, parkland, or various stages of successional recovery.

Three vegetation types generally dominated the project area: floodplain forest (*Populus-Salix*), oak-hickory-maple forest (*Quercus-Carya-Acer*), and openings of bluestem prairie (*Andropogon-Panicum-Sorghastrum*). Although the project area's floodplains have been largely cleared for development and agriculture, there are bands of riparian forest habitat located riverward of the levee units. Predominant tree species found in these riparian bands include eastern cottonwood, willows, box elder, green ash, silver maple, and American sycamore. The understory includes reproduction of these species, plus some redbud, dogwood, black cherry, and various shrubs. The ground layer in the riparian bands varies from sparse to dense vegetation and contains primarily poison ivy, Virginia creeper, honeysuckle, greenbrier, and gooseberry, and various other species. A monoculture of reed canary grass was observed in much of the area between the levee easement and the band of riparian forest at the water's edge on the Kansas side of the project area.

Mammals associated with the remaining wooded riparian habitat include the white-tailed deer, eastern cottontails, and red and gray squirrels. Aquatic and terrestrial furbearers are important parts of the ecosystem, and those present in the area include the beaver, mink, and muskrat (dependent on the aquatic habitat) and opossum, coyote, raccoon, and striped skunk (dependent on terrestrial habitat). However, small mammals, such as mice, voles, rats, and bats account for the majority of the species present. The white-tailed deer is the only naturally occurring large mammal still common in developed urban areas. Eastern wild turkeys are present in the open, less developed floodplain areas.

The avifauna of the study area includes permanent residents, summer residents, transients, and winter residents. The project area provides year-around habitat for approximately 31 bird species, with another 67 species using the project area for nesting and another 14 species as winter residents only. Over 110 species use the river corridor during the fall migration. Summer resident species associated with aquatic habitats include waterfowl, wading birds, and selected passerines. Summer waterfowl are dominated by wood ducks which nest in wooded bottomlands and rear their young in nearby aquatic habitats. Nesting by other waterfowl, primarily mallards, is minor. Wading birds, such as the great blue heron and green heron, utilize shallow areas as foraging habitat.

Waterfowl and shorebirds are dominant transient species associated with aquatic habitats. The most numerous and impressive migration is that of the snow goose, particularly in the spring. Other migrating species include the Canada goose, mallard, and pintail.

Common amphibians found in the study area include the tiger salamander, bullfrog, leopard frog, plains toad, northern cricket frog, striped chorus frog, plains spadefoot toad, Rocky Mountain toad, western chorus frog, and plains leopard frog. Common reptiles that may be found in the study area include the snapping turtle, ornate box turtle, painted

turtle, smooth and spiny soft-shelled turtles, the rough-scaled lizard, collared lizard, Texas horned lizard, prairie skink, Great Plains skink, six-lined racerunner, and glass-snake lizard. The prairie ringneck snake, eastern hognose snake, racer, bullsnake, prairie kingsnake, common watersnake, blotched kingsnake, plains blackhead snake, red-sided garter snake, copperhead, massasauga, and the timber rattlesnake may either be common or present in the study area.

Wetlands

Wetlands exist within the project area as small pockets, old meander scars, and within the riparian strips. An old oxbow of the Missouri River (French Bottoms) was cut off when the river changed its course during the flood of 1952. Remnants of the oxbow remain as Browning Lake, an area protected by levee unit R471-460. Lake Contrary is in the area protected by levee L-455.

National Wetland Inventory database (NWI) maps for the project area indicate that there are many wetlands in the project area. These wetlands are permanently flooded, seasonally flooded, temporarily flooded, or semi-permanently flooded and include forested, broad leaved deciduous, and scrub shrub vegetation. In addition, there are areas classified as palustrine unconsolidated bottom, intermittently exposed (PUBG) which are typically mud or sand flats. Some of the wetlands are natural and some are man-made.

Historically, wet mesic bottomland forest was the most extensive bottomland forest natural community in Missouri (Nelson 1987). This community has a diversity of tree species such as pin oak, cottonwood, river birch, green ash, and hackberry, cherry, sweetgum, hawthorn, dogwood, hickories, wildplum, persimmon, maples, elm, and sassafras. A well-developed understory is often present, containing poison ivy, elm, nettle, and honeysuckle. These communities provide habitat for a wide variety of resident and migratory wildlife. Forested wetlands have been found to support significantly higher abundance and diversity of bird species compared to upland forests (Brinton 1981).

A jurisdictional wetland determination will be necessary if levee alignments or borrow areas directly impact wetlands. The quantity and quality of existing wetlands will determine the amount of compensation necessary to offset project losses. A wetland mitigation plan would be developed in coordination with at least the Corps, Service, EPA, KDWP and the MDC. This plan would include site locations, time frames, construction plans, a monitoring plan, progress reports, and standards of success. This plan would be a condition of any Section 404 permit issued for the project. The plan should be implemented regardless of the regulatory nature of the wetland. Minimum replacement ratios for compensatory wetland mitigation should be based on the following guidelines:

U.S. Fish and Wildlife Service, Region 6
Wetland Mitigation Policy Guidance (8/97)
Recommended Minimum Replacement Ratios

<u>Mitigation Type</u>	<u>Ratio</u>	<u>Type of Wetland Being Mitigated</u>
Advance Creation	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Creation	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Restoration	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Restoration	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Enhancement	3:1	forested, scrub-shrub
	2:1	emergent
Concurrent Enhancement	4:1	forested, scrub-shrub
	3:1	emergent

Aquatic Resources

The Missouri River has undergone considerable change since the Louisiana Purchase in 1803. Modifications to the natural Missouri River floodplain ecosystem have been immense and ongoing for more than 150 years. Presently, 35 percent of the river's length is impounded, 32 percent is channelized or stabilized, and the remaining 33 percent is freeflowing (Schmulbach and others, 1992). Major civil works projects involved channelization, channel maintenance, and impoundment and reservoir operation. Agricultural, industrial, and urban development within the basin also significantly modified the Missouri River and its adjoining floodplain.

Presently all of the Missouri River from Sioux City, Iowa to its mouth at Saint Louis, Missouri is channelized. Even during flooding only about 10 percent of the original floodplain is inundated, as high agricultural and urban levees confine the river to a width of approximately 500 feet from Kansas City north (USFWS 1980). The impacts of channelization have been numerous and severe on the physical, chemical, and biological structure and function of the Missouri River and its floodplain. The most damaging of these alterations to aquatic communities has been the nearly complete isolation of the river from its floodplain, subsequent loss of floodplain habitat, drastic reduction in area and diversity of river channel habitats, and increased velocity of the main channel.

Missouri River fish populations have been significantly affected by channel alterations in the project area. Most indigenous fish species still remain, but have suffered serious population declines. The rivers' fishery is characterized by species typical of large, turbid rivers including the smallmouth buffalo, bigmouth buffalo, common carp, river carpsucker, shortnose gar, and channel catfish. Gizzard shad is the dominant forage

species. Besides channel catfish other sport species present are the flathead and blue catfishes, white crappie, freshwater drum, green sunfish, and bluegill. Other forage and nongame species present include various minnows and shiners.

Threatened and Endangered Species

Section 7(c) of the Endangered Species Act (87 Stat. 884, as amended), requires Federal Agencies to ask the Secretary of the Interior, acting through the Service, whether any listed or proposed endangered or threatened species may be present within an area proposed for construction. If the project may affect listed species, the Corps of Engineers should initiate formal Section 7 consultation with this office. If there will be no effect, or if the Fish and Wildlife Service concurs in writing there will be beneficial effects, further consultation is not necessary. An activity which harasses any listed species and disrupts its normal breeding, feeding, or sheltering activities to the extent that harm or injury results is a prohibited taking under the ESA.

As a result of habitat losses and flow regime changes, two species dependent on the river are federally-listed as endangered or threatened and are found in this section of the Missouri River.

The bald eagle (*Haliaeetus leucocephalus*), federally listed as threatened, may be expected to occur along any river or at any reservoir in Kansas or Missouri. Eagles utilize areas where live large trees and snags provide perch sites in proximity to open water, where they feed on fish and waterfowl. This project may adversely impact the bald eagle by removing trees from the levee footprint and from the borrow areas. In addition, if any project activity appears likely to harass or disturb any bald eagle observed at or near any construction site the Service should be notified prior to commencement of the activity, so that an assessment may be made of the potential for adverse impacts.

The pallid sturgeon (*Scaphirhynchus albus*), federally listed as endangered, occurs throughout the Missouri River reach. This species has been recently captured in the project area. (Miller 2006 per. comm.). Information gained by recent capture and tagging research indicates that pallid sturgeons use nearly all the habitats found in the Missouri River during their life spans. Sturgeons have been found in tributary mouths, over sandbars, along main channel borders, and in deep holes elsewhere in the Missouri River. Small sturgeons have been captured in off-channel backwaters. Adults are often found in deep, swift flowing water, especially during winter months while young and larval pallids are found in areas of lower velocities out of the thalweg.

Because so little is known about the pallid sturgeon, much of the previous information available about the reproduction or spawning activities of the pallid sturgeon was, extrapolated from what is known about shovelnose sturgeons. Shovelnose sturgeon spawn over substrates of rock, rubble, or gravel in the main channel of the Missouri/Mississippi Rivers and major tributaries, or on wing dams in the main stem of larger rivers. Spawning was suspected to occur in the relatively swift water in or near the main channel. Initiation of shovelnose sturgeon spawning migrations have been

associated with increased flows in May and June and water temperatures from 61° to 70° F (USFWS 1993).

Destruction and alteration of habitats by human modification of the river system is believed to be the primary cause of declines of the pallid sturgeon. It is unlikely that successfully reproducing populations of pallid sturgeons can be recovered without restoring habitat elements of the Missouri and Mississippi Rivers necessary for the species continued survival. The construction of levees has contributed to the alteration of pallid sturgeon habitat by eliminating major natural floodways, which annually inundated and isolated many floodplain lakes, reduced the area of the floodplain, and changed erosion and accretion processes. In addition, bank stabilization, sediment trapping in reservoirs and channelization has led to bed degradation. The reduced amount of floodplain the river can access has diminished the availability of organic matter used by aquatic invertebrates which make up a large proportion of the of the pallid sturgeon's diet during early life stages. In addition, aquatic invertebrates are a primary food source for small fish which the pallid prefers as adults. Portions of the Missouri River 20 miles upstream and downstream of the mouths of the Kansas River and Platte Rivers are high priority reaches for recovery of the pallid sturgeon (USFWS 1993).

Kansas State Law (K.S.A. 32-504, 32-507: effective May 1, 1981) requires person undertaking or sponsoring publicly funded or State or Federally Assisted action which is likely to impact endangered or threatened wildlife habitats where they are likely to occur, to obtain a project action permit from the Secretary of the Kansas Department of Wildlife and Parks (KDWP) prior to initiation of such action. This list should be requested from the Environmental Services Section, Kansas Department of Wildlife and Parks, 512 SE 25th Ave., Pratt, KS 67124-8174.

KDWP maintains an internet site containing county lists and species information at http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species. State of Kansas listed threatened and endangered species for Doniphan County, Kansas listed on this site include sicklefin chub (*Macrhybopsis meeki*), flathead chub (*Platygobio gracilis*), western silvery minnow (*Hybognathus argyritis*), chestnut lamprey (*Ichthyomyzon castaneus*), eastern spotted skunk (*Spilogale putorius interrupta*), silverband shiner (*Notropis shumard*) peregrine falcon (*Falco peregrinus*), silver chub (*Macrhybopsis storeriana*), smooth earth snake (*Virginia valeriae*), and sturgeon chub (*Macrhybopsis gelida*). In addition, the following Federally listed threatened and endangered species are also listed by the State as occurring in Doniphan County, Kansas: American burying beetle (*Nicrophorus americanus*), Eskimo curlew (*Numenius borealis*), least tern (*Sterna antillarum*), and piping plover (*Charadrius melodus*).

The State of Kansas lists the following species as Species in Need of Conservation: black tern (*Chlidonias niger*), blue sucker (*Cycleptus elongates*), brassy minnow (*Hybognathus hankinsoni*), cerulean warbler (*Dendroica cerulea*), eastern hognose snake (*Heterodon platirhinos*), plains minnow (*Hybognathus placitus*), river shiner (*Notropis blennioides*), short-eared owl (*Asio flammeus*), southern flying squirrel (*Glaucomys volans*), and timber

rattlesnake (*Crotalus horridus*). As these lists are subject to change the Corps should contact the Kansas Department of Wildlife and Parks, Environmental Services directly.

According to the Missouri Department of Conservation's Natural History Data Base (1999) there are occurrences of state listed species or communities in the project area. Species and concerns should be requested from the Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.

DESCRIPTION OF THE PROJECT ALTERNATIVES

Several structural modifications were considered to reduce the frequency of damaging overflows including channel modifications, upstream reservoirs and levee setbacks. These modifications were eliminated from further consideration either because the costs outweighed the benefits or the environmental impacts that would result from a particular alternative were far greater than the preferred alternative.

The three alternatives considered for this Coordination Act Report are: 1. Raise the Right Levee Section using earthen material to the one-hundred year level of flood protection with 90 percent reliability, and a corresponding raise to the Left Levee Section in specific areas to accept the slight rise in water surface elevations resulting from the initial raise: (PREFERRED); 2. Raise the Right Levee Section to an Increased Level of Protection (500-year event plus 1.5 feet of freeboard), with a corresponding raise to the Left levee unit; and 3. Raise the Right Levee Section to a Further Increased Level of Protection (500-year event plus 3.0 feet of freeboard), with a corresponding raise to the Left levee unit." The Corps of Engineers' Pre-Draft EIS identifies Alternative 1 as the Preferred Alternative.

Alternative 1. Modifying Existing Levees to Design Level to provide a higher level of flood protection than that which currently exists. This is the current preferred alternative. This modification is accomplished by raising the existing levee using earth fill. A significant portion of the levee unit R-471-460 would be raised to a level sufficient to pass the one percent (100-year) flood with a 90 percent level of reliability, allowing for re-certification of the levee by FEMA. The anticipated right bank raise varies along its length from zero to two feet. Increases in levee height would result in corresponding increases in levee toe width (approximately 6-feet on each side for a 2-foot increase in levee height). Additionally, a raise to the right bank levee would require minor raises (approximately 6-inches) at specific locations along the left bank levee to accept the increased rise in water surface elevation resulting from the initial work.

Proposed borrow areas include riverward areas in both Kansas and Missouri. In Kansas, the borrow area consist of approximately 1,304 acres of land located from River Miles 454.9 to 451.9 and from River Miles 446.7 to 443.4. For Missouri, the borrow area consists of approximately 30.4 acres of land along River Miles 442.6 to 442.9.

Alternative 2. Modifying Existing Levees to an increased level (500-year event plus 1.5 feet of freeboard) of protection. The Pre-Draft EIS did not identify any additional borrow areas for this alternative.

Alternative 3. Modifying Existing Levees to a further increased level (500-year event plus 3.0 feet of freeboard) of protection. The Pre-Draft EIS did not identify any additional borrow areas for this alternative.

OTHER PROJECT ALTERNATIVES

Several additional alternatives were considered during the scoping process but were not advanced for further study due to the economic infeasibility or ineffectiveness in providing an adequate level of protection for the study area. One alternative that was removed from further study was Levee Setbacks. This alternative would have removed a section of levee unit R471-460 from river mile 449 downstream to river mile 447.5 and reconstructed it landward. The objective of this alternative was to achieve a uniform 3,000 foot floodway within the study area consistent with the original Pick-Sloan Plan for flooding width above Kansas City, Missouri. This alternative was removed from further consideration because total benefits were less than the cost of construction. However, the cooperating agencies of the Missouri River Fish and Wildlife Mitigation Project (MRFWMP), which includes the Corps, are looking at levee setback as one component of the project. Working in cooperation with the MRFWMP may make this a more viable option for some sections of the levees and help to fulfill the objectives of both proposals.

The Corps has also considered dredging the river for levee fill. This could have negative implications for the pallid sturgeon and other fish.

FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

The Missouri side of the project area is primarily urban consisting of industrial, commercial development with major roads and bridges, secondary roads, and housing developments on and above the floodplain. The Kansas side of the levee project contains similar development. Existing wildlife habitat is scarce, and of generally low quality due to habitat fragmentation and loss of habitat from the development that has been ongoing for more than a hundred and fifty years. Without the flood damage reduction project FEMA may de-certify the levee leaving the local communities to bear the economic impact of further flood events. This may result in the decrease of future development in the floodplain and flood prone areas of the Missouri River behind the levees and may even cause the abandonment of existing development. Cropland may also be abandoned, converted to other open space uses or enrolled in CRP or WRP. All of these actions could actually increase the quantity and quality of wildlife habitat available in the area.

FISH AND WILDLIFE WITH THE PROJECT

The project would presumably keep the levees in compliance with FEMA and under their certification. With payments for flood damages more secure and many people believing that the likelihood of flooding is diminished, more floodplain and floodprone land landward of the levees would likely be developed. ~~This would result in more wildlife habitat being converted and more habitat fragmentation.~~

The proposed borrow area known as Elwood Bend contains some of the highest quality wildlife habitat in the project area in a large unfragmented tract (Figure 2). Work in this area will displace wildlife that currently use the area due to disturbances from noise, dust, human activity, machinery and destruction of habitat. Depending on construction timing, this displacement could result in serious consequences to wildlife such as loss of reproduction and possible death of individual animals from accidents (crossing roads and unknown hazards in new areas), starvation, competition for other areas, etc. There is little refuge habitat in close proximity to the project area and is presumably at carrying capacity which further reduces the likelihood of wildlife surviving the displacement and intensifies the competition for the limited habitat available. Although the temporal displacement may be relatively short, the repercussions could be long-term. Impacts to migrating songbirds are of particular concern. Existing wildlife travel corridors linking the borrow areas and other areas of suitable floodplain upstream and downstream of the borrow area should be maintained during project construction. If the Elwood Bend area is used as a borrow site, it would also be beneficial to allow early successional stages of woody and annual vegetation to grow landward of the levee to facilitate movement through the cropland outside of the growing season.

Large trees suitable for bald eagle habitat are present in the Elwood Bend borrow site and in other areas riverward of the levee. Trees greater than 12 inches diameter at breast height (dbh) should be avoided. Many smaller trees are also present in the site. While these trees are young now, they are closer to a mature and more valuable stage than newly established trees and should be avoided if at all possible.

Habitat gains in quality could be realized if the Corps works closely with the MRFWMP team and constructively takes borrow to enhance habitat to meet the objectives of that program. However, there is an abundance of cropland and bare ground inside and outside the levee that could be used for borrow areas instead of the Elwood Bend area. Soils taken from these areas would be relatively free of the trash and debris (tree roots, vegetation, etc.) common to borrow taken from vegetation riparian areas. Borrow locations should be located in cropland or other bare ground as much as possible. Another option is to take borrow from areas infested with reed canary grass, an invasive species, and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, floodplain ponds that would eliminate this species.

The loss of levee brome grasses during heightening of the existing levee system will be a short-term loss. Re-seeding the levee to warm season grasses such as switch grass would

reduce erosion, better insure the integrity of the levee system during floods and provide higher wildlife habitat than brome.

Figure 2

Previous modifications within the Missouri River channel and floodplain has had an adverse effect on fish and wildlife habitat. The Missouri River surface area has declined more than 50 percent. The river channel is now deep, has swift currents, and decreased habitat diversity. River backwaters, chutes, sandbars, and oxbow lakes have been lost to floodplain development. Both proposed borrow areas are riverward of the levee. One is primarily cropland and should not cause significant impacts to wildlife. The other is the Elwood Bend area as previously discussed. Work in this area could cause significant short and long-term impacts to wildlife.

Construction activities would cause temporary, short-term impacts to fish and wildlife from noise, dust, and the presence of workers and machinery. Runoff from construction areas, access roads, staging areas and unprotected fills could degrade water quality inside the levee system. Accidental spills of fuels, lubricants, hydraulic fluids, and other petrochemicals would be harmful to aquatic life.

Removal of fill from the cropland area has the potential to cause the loss of farmed wetland. Farmed wetland should be delineated within the borrow site and should be avoided if possible. If an unavoidable loss is incurred, the quantity and quality of the farmed wetland will determine the amount of compensation necessary to offset project losses. The wetland mitigation plan would be developed in coordination with the Corps, EPA, KDWP and MDC. This plan should include site locations, time frames, construction plans, a monitoring plan, progress reports, and standards of success. This plan should be a condition of any permit issued for the project. The proposed Mitigation Plan is lacking many of these components. The completed plan should be implemented regardless of whether impacted wetlands are classified as jurisdictional for purposes of the Clean Water Act.

Although the floodway cross section will remain essentially unchanged, the heightened levees will increase flood stages downstream and upstream at very high flood stages. Flood crests may increase in height (the water has no place to go but up) and floodwaters will be impounded upstream. In 1993, the constricted Missouri River floodplain prevented the Kansas River from draining. This caused water to back up in the Kansas River, flooding far into the state of Kansas (White House Interagency Flood Plain Management Review Committee, 1994). The Corps is planning to increase the height of levees in the Kansas City area. With increased levee heights in the St. Joseph, Missouri and Kansas City, Kansas and Kansas City, Missouri areas other levee districts upstream and downstream may face the need to build their own levees even higher to avoid increased flood damages. Such cumulative effects should be addressed during the feasibility phase and NEPA documents.

Mitigation Discussion

The Service has established a mitigation policy used as guidance in determining resource categories and recommending mitigation (46 FR: 7644-7663).

We have determined that most of the wildlife habitat that would be affected by the raising of existing levees (levee footprints and easements) is in Resource Category No. 4 (habitats of medium to low value). For this category, loss of habitat value should be minimized.

Forested wetland and riparian woodland are consistent with Resource category No. 2 that is, habitats are of high value that are relatively scarce or becoming scarce on a national or regional basis. Losses attributed to the project would require in-kind mitigation (replacement of habitat value lost with equal habitat values of the same kind of habitat as those eliminated). The cost of mitigating habitat losses should be included as a project cost.

Whenever possible, we recommend upland trees within the construction right-of-way remain undisturbed. While the trees may be young now, they are closer to a mature and more valuable stage than newly established trees.

Trees at least 50 feet tall and /or 24-inches dbh within 100 feet of the water's edge should be avoided. Removal of these trees may adversely affect the habitat of the bald eagle.

Under the Migratory Bird Treaty Act (MBTA), construction activities in prairies, wetlands, stream and woodland habitats, including the removal of upland borrow, and those that occur on bridges (e.g., which may affect swallow nests on bridge girders) that would otherwise result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. To minimize impacts to birds protected under the MBTA, construction areas should be surveyed for the presence of nesting birds during the general migratory bird nesting season of March through August. Disturbance of nesting areas should be avoided until nesting is completed.

Vegetation clearing and construction related soil disturbances can cause sediment-laden runoff to enter waterways. To minimize impacts associated with erosion, contractors should employ silt curtains, coffer dams, dikes, straw bales or other suitable erosion control measures adjacent to floodplain water bodies or tributaries affected by the project. Sediment control measures are not necessary adjacent to the Missouri River because it is sediment starved, although downstream water supply intakes are a concern. Construction related petrochemical spills can also negatively impact fish and wildlife resources. Therefore, measures should be implemented prior to construction to minimize the likelihood of petrochemical spills.

Invasive species have been identified as a major factor in the decline of native flora and fauna and their ecosystems and impact aquatic resources. Invasive species of particular concern in Kansas are the zebra mussel (*Dreissena polymorpha*), purple loosestrife (*Lythrum salicaria*), Johnson grass (*Sorghum halepense*), sericea lespedeza (*Lespedeza cuneata*), and reed canary grass (*Phalaris arundinacea*). Executive order 13112 Section 2 (3) directs Federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere and to ensure that all feasible and prudent measures to minimize risk

of harm will be taken in conjunction with the actions. Proactive measures to prevent the inadvertent spread of exotic and invasive species would appear to satisfy this directive. Therefore we recommend the implementation of the following BMP.

All equipment brought on site will be thoroughly washed to remove dirt, seeds, and plant parts. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water (hotter than 40°C or 104°F) and dried for a minimum of five days before being used at this project site. In addition, before transporting equipment from the project site all visible mud, plants, and fish/animals will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with the water will be cleaned and dried following the above procedure.

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 project related creation of wildlife habitat, over and above that required to mitigate losses attributable to project construction.

Native trees, grasses and forbs, noted for their high wildlife value, could be established along the landward and stream side base of the existing levee system. This might help offset future losses due to increased encroachment along the river once flood protection is increased once again. Switch grass often takes longer to become fully established; however when established, stands of native vegetation provide excellent soil binding characteristics, valuable wildlife habitat and require fewer maintenance costs. The Service, Missouri Department of Conservation, the Kansas Department of Wildlife and Parks, and the Natural Resource Conservation Service offer assistance programs and could work with the cities of St. Joseph, Elwood and Wathena and the project sponsors to develop vegetation management plans.

RECOMMENDATIONS

1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Project (MRFWMP) to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area, the construction plans for the final design of the borrow areas and given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.

2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and

wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.

3. Reconsideration of the Levee Setback alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised.

4. Levees should be seeded with native warm season grasses such as switch grass.

5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.

6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1.0 to 1.0 ratio.

The following recommendations describe opportunities to provide fish and wildlife enhancement through the project.

7. The Corps should coordinate with the MFWMP to enhance the diversity of aquatic and terrestrial wildlife habitat in the area. The MFWMP may provide the opportunity to set levees back, create shallow water, chutes, and backwater areas, and enhance and restore riparian areas.

8. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where invasive species, i.e. reed canary grass, has become established. If it is possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, floodplain ponds that would eliminate this species.

9. Encourage wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee units.

10. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

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**Corps of Engineers Response to Recommendations
on the
U.S. Fish and Wildlife Services[†]
Draft Fish and Wildlife Coordination Act Report**

Fish and Wildlife Service Recommendation Number 1. The take of borrow from areas riverward of the levees should be closely coordinated with the Missouri River Fish and Wildlife Mitigation Program (MRFWMP) to creatively construct areas that will conform to the objectives of the MRFWMP. This is particularly important in the proposed borrow area south of the City of Elwood, known as Elwood Bend, as it has been identified for inclusion in the MRFWMP. The MRFWMP team should be closely consulted about the take of borrow from the area, the construction plans for the final design of the borrow areas and given approval rights for the borrow design plans. If the Corps and the project sponsors are unable to work with the MRFWMP, the Elwood Bend area should be eliminated from the plan.

RESPONSE: Agree. The Corps has coordinated closely with Corps Mitigation Team Members to inform them of the work being proposed, particularly in the Elwood Bend area. Land in this area is of great interest to the Mitigation Team and Corps Mitigation Team Members ensured that they will coordinate with other agency members to obtain broad "buy-in" on project features. As the project moves closer to the construction phase, increased participation will likely ensue.

Fish and Wildlife Service Recommendation Number 2. Riparian and wetland habitats should be avoided to the maximum extent practicable when selecting borrow sites for the proposed levee raises and compensatory mitigation should be undertaken for unavoidable impacts. Since channelization, levee construction and floodplain development have already resulted in dramatic loss of riparian and wetland habitats in the Missouri River basin, the Corps should focus on bare or cropland areas for borrow.

RESPONSE: Agree. The Corps uses a step-down procedure to first avoid impacts to sensitive areas, then minimize impacts to the maximum extent, and finally mitigate for any unavoidable impacts. The Corps will use this step-down procedure while obtaining borrow for construction of the preferred alternative by first seeking use of bare ground and cropland. In cases where avoiding sensitive areas is not possible, the Corps will incorporate the minimization measures provided by the Natural Resource Conservation Service as outlined in Chapter 13 of the Wetland Restoration, Enhancement, or Creation Engineering Field Handbook as well as other minimization measures provided in the EA at Section 4.4.1 Vegetation. Unavoidable impacts to sensitive habitat areas will be mitigated as again outlined in Section 4.4.1 Vegetation.

Fish and Wildlife Service Recommendation Number 3. Reconsideration of the Levee Setback Alternative. The Levee Setback alternative was eliminated from further consideration because total benefits from this alternative were far less than the cost of

construction. However, the MRFWMP team is considering setting back levees to improve habitat. Coordination with the MRFWMP may make it feasible to set back some portions of levees as part of this project thereby reducing impacts from those portions of the levees that would still need to be raised:

RESPONSE: The levee setback alternative was reconsidered following agency comments received from the US Fish and Wildlife Service, the Kansas Department of Wildlife and Parks, and the Missouri Department of Conservation and additional information was obtain. Based on this information, as provided below, the levee setback alternative was not carried forward for additional analysis.

Levee Setback/Realignment. Two options are available for possible realignment of Unit R471-460. At approximately river mile 448, the levee moves closer to the river, narrowing the floodway and creating a constriction, called by some a "pinch point", during high flow events. This constriction could be reduced by realignment of the levee in this location, or the unit could be realigned further upstream to provide a wider floodway upstream of the pinch point for increased floodplain storage during high flow events.

Levee Setback

The narrow point in the levee alignment at approximately river mile 448 coincides with the river bend immediately upstream of Unit L-455. Setting back Unit R471-460 at this location would provide for a wider floodway during high flow events. This location also coincides with the locations of an active Union Pacific railroad bridge and the double-span bridge carrying US Highway 36. There is significant business development, including a large construction company, located between the two bridges immediately inside the protected area. Both bridges would likely require extensive modification and the existing businesses would have to be relocated to achieve significant levee setback. The Corps estimates that a levee setback in this location could lower the general water surface profile in this vicinity up to half a foot; however, this is not enough to offset the overtopping concern for the remainder of the unit. Bridge modification, real estate acquisition, business demolition and relocation, and new levee construction would all contribute to a significantly higher cost for this alternative comparative to other proposed alternatives. Environmental benefits would be marginally enhanced by the creation of a short reach of new riverside floodplain habitat relative to the currently existing resources in the area. The economic benefits of the alternative would be negatively impacted by the loss of businesses in the area and the increased cost. It is clear from preliminary analysis that the marginal hydraulic and environmental benefits of a setback of the levee in the vicinity of river mile 448 would not offset the significant adverse economic, engineering, transportation, and social impacts that would be incurred to the project.

Levee Realignment in Upstream Portion of Unit R471-460

Upstream of the pinch point, consideration was given to methods to expand the floodway to provide storage during high flow events. In this area, the levee could be realigned

toward the bluffs, and existing levee alignment removed, providing increased floodplain volume and connectivity to the river. Alternatively, the old levee alignment could remain, and could be allowed to overtop and fail during high flows, providing some increment of additional storage during large floods. In order to achieve certified protection for the communities and facilities in the study area, the new section of levee could be constructed north of Rosecrans Airport starting near river mile 452 to connect the existing levee with the bluff to the west. Requirements and anticipated impacts of this new levee are as follows:

- Formulating an alternative that allows for the overtopping and failure of an existing levee does not meet the stated Planning Objectives of this study.
- Nearly three miles of new levee would need to be constructed, requiring significant real estate acquisition, additional material borrow sites, new drainage structures, and possible a road closure structure at the tie-in to the bluff. This feature would involve a significant cost increase.
- There is no guarantee that real estate agreements would be easily reached with existing land owners and condemnation may be necessary. Such negotiations, and additional construction time, would likely cause a protracted time delay that would prolong the exposure of residents to impacts and risk from the currently decertified levee.
- Approximately six miles of the existing levee downstream of river mile 452 would still be subject to an overtopping concern that would need to be addressed to restore FEMA certification.
- The introduction of a new levee section into an existing levee system will increase the annual operation and maintenance costs.
- The new alignment would permanently remove some agricultural ground from production due to construction and would allow significant additional acreage of productive agricultural property to remain subject to impact from lesser floods. Some existing benefits of the existing project would be lost by removing this property from the certified protection area.
- The new alignment would cross the flight path in close proximity to the airport creating a right-of-way encroachment and safety issue that likely would not be acceptable to the Air Guard or the Federal Aviation Administration.
- The existing levee cannot be removed without specific authorization from Congress. Removal of the remaining existing levee section would likely be legally, politically, and socially unacceptable. The remaining existing levee section would likely still be maintained in operation by the local entities and if maintained in accordance with the program, would be eligible for flood disaster relief under the provision of Public Law 84-99. Future claims for Federal

assistance for flood fighting and damage restoration would likely increase. With the existing levee section still in place, the incremental floodplain benefits associated with a realignment of the Federal project in the north would be marginal.

- No additional environmental benefits would be realized if the existing levee would stay in place and the existing agricultural land would remain in production. To realize any environmental benefits from realignment, the existing levee would have to be removed entirely and the land reverting to a natural riparian state, which may require the government to buy-out the existing agricultural property at considerable additional expense to the project.
- Significant political and public protest likely would be encountered by any proposal to remove property from the protected area or physically remove any existing section of levee.

It should be noted that in consultation with District counsel, it was determined that these actions may not be within the authority of the Modifications to Completed Works to remove a significant portion of the levee system, or construct a major new levee realignment.

A point-by-point consideration of the cost impacts to construct a new levee section, including all aspects discussed herein, indicated that realignment options would likely be greater than the cost of other alternatives proposed in the same area. Due to anticipated higher costs, a potential decrease in existing project benefits, and serious concerns over the social impacts of the proposal to the area communities, the levee realignment alternative was not carried forward for additional analysis.

Fish and Wildlife Service Recommendation Number 4. Levees should be seeded with native warm season grasses such as switchgrass.

RESPONSE: Agree. Only native plant species will be used during re-seeding operations. The following species are generally used for levee reseeded: Switchgrass (*Panicum Virgatum*), Sand Lovegrass (*Eragrostis Trichodes*), Yellow Sweet Clover (*Melilotus Officinalis*), Creeping Foxtail (*Alopecurus Arundinaceus*), Tall Wheatgrass (*Agropyron Elongatum*), and Yellow sweet Clover (*Melilotus Officinalis*).

Fish and Wildlife Service Recommendation Number 5. Removal of mature cottonwoods, and other native vegetation should be avoided where possible, and if they are removed, replace woody vegetation by establishing 2 acres of native vegetation for every acre impacted.

RESPONSE: The Corps will avoid mature trees with a DBH of 12 inches or greater to the extent possible. Should impacts occur that are unavoidable, the Corps will off-set these impacts at a 1:1 ratio based on US Army Corps of Engineer mitigation procedures.

Fish and Wildlife Service Recommendation Number 6. The Corps should create wetland mitigation habitat to compensate for the loss of wetland acreage from construction of the projects. If farmed wetland is directly impacted by borrow activities it should be mitigated at a 1:0 to 1:0 ratio:

RESPONSE: The Corps policy on wetlands is one of "no net loss". As such, the Corps will be off-setting all unavoidable impact to wetlands resulting from the proposed project. However, the U.S. Army Corps of Engineers and the Environmental Protection Agency Mitigation Memorandum of Agreement states that, "because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered" (Fed. Regist. 60(Nov.28):58605). With this in mind, the Corps has selected "off-set" sites where wetlands still exist and has chosen restoration over creation realizing that these selected sites likely will contain the proper substrate, seed sources, and appropriate hydrological condition for wetland success.

Fish and Wildlife Service Recommendation Number 7. The Corps should coordinate with the MFWMP to enhance the diversity of aquatic and terrestrial wildlife habitat in the area. The MFWMP may provide the opportunity to set levees back, create shallow water, chutes, and backwater areas, and enhance and restore riparian areas.

RESPONSE: Agree. The Corps has already coordinated with MFWMP members to ensure that the maximum environmental opportunities can be gained from the proposed project. Additional coordination will be taking place as the project moves closer to the construction phase to mesh needs of the preferred alternative with those of the Mitigation Project.

Fish and Wildlife Service Recommendation Number 8. Establish native vegetation riverward of levee segments where riparian woodlands are sparse or nonexistent or where invasive species, i.e. reed canary grass, has become established. If it is possible, borrow from reed canary grass areas and replace with permanent water or seasonal inundation such as chutes, deeper water wetlands, backwaters, floodplain ponds that would eliminate this species.

RESPONSE: Agree. Every opportunity will be made to first obtain borrow material from areas of lowest habitat quality, including areas of invasive species. Coordination meetings with MFWMP team members have already begun to determine the best possible borrow material techniques to maximize benefits between the two projects.

Fish and Wildlife Service Recommendation Number 9. Encourage wetland development and hydrological reconnection to the river at existing borrow areas landward of the levee.

RESPONSE: Only riverside areas have been identified for obtaining borrow material. Landside wetlands that are impacted as a result of levee widening, will be off-set by using the minimization and mitigation measures identified in Section 4.4.1 Vegetation.

Fish and Wildlife Service Recommendation Number 10. Best Management Practices to prevent the transport of invasive species to or from the construction sites should be included as an integral component of the project.

RESPONSE: Agree. This is an excellent comment as the unintentional transport of invasive species often results in catastrophic reproductive events that in turn diminish the diversity of natural environments by producing areas of monotypic vegetation or introducing predatory species that forage unfettered. As such, this recommendation has been incorporated throughout the project where construction equipment will be used.

KANSAS

DEPARTMENT OF WILDLIFE AND PARKS

KATHLEEN SEBELIUS, GOVERNOR

4/25/2006

Track: 20060121

DP

Ref: D1.1101

Mr. Eric Lynn
St. Joseph Levees Project Manager
Kansas City District, Corps of Engineers
Room 700, 601 E. 12th Street
Kansas City, MO 64106-2896

Dear Mr. Lynn:

We have reviewed the *Draft EIS* for the Flood Damage Reduction Study on the Missouri River Levee System Units L-455 and R-471-460 received by our office on March 6, 2006 via email from Mr. Matthew Vandenberg. The project was reviewed for potential impacts on crucial wildlife habitats, current state-listed threatened and endangered wildlife species, and public recreation areas for which this agency has some administrative authority.

The study was performed to determine what alternatives would be suitable for the levee system to meet the 1% flood protection with 90% reliability in order to accommodate FEMA requirements. The abstract identifies four alternatives analyzed for the study:

1. Raise levee to accommodate the 1% flood with 90% reliability (3' freeboard)
2. Raise levee to accommodate the 0.2% flood with 1.5' freeboard
3. Raise levee to accommodate 0.2% flood with 3' freeboard
4. Do nothing

The preferred alternative was #1, to raise the levee to meet compliance with FEMA. Information indicates that approximately 1300 acres of land in Kansas will be affected, either as borrow areas or by expansion of the footprint of the levee. The report indicated only 7.6 acres of secondary growth deciduous timber and 2.25 acres of wetlands would be impacted (4.4.1). It was concluded that no significant impacts to either state or federally listed threatened or endangered species would occur.

In reviewing the document, we did not come across any information as to why the levee is out of compliance (change in FEMA regs., breach of 1993, settling, inaccurate construction?).

Levee setbacks were not analyzed in the upstream portions of the levee system, only in the pinch area between Elwood, KS and St. Joseph, MO and no economic data was provided as to what made setbacks less feasible than levee raises. What factors limited moving the levee landward in these areas to allow for the River to access its floodplain? By raising the levee you are creating a situation that could lead to even more serious flooding in the event of a breach, such that occurred in 1993 in this R471-460.

Has the Corps considered any potential impacts on the proposed Missouri River Fish and Wildlife Mitigation Project, specifically in reference to the Shallow Water Habitats restoration at various public land sites in this reach of the River? Our office reviewed Public Notice 2004008885 issued by the

Kansas City District Corps office on March 10, 2004 for a project to restore shallow water habitat in the area (Lisa Peterson contact).

Would the levee raise prevent the overtopping and breaching of the levee like what occurred in 1993? It is our understanding that the flooding that occurred that year is the precursor for the study.

We recommend mitigation of any wetlands permanently filled by the expansion of levee footprints at a ratio of 3:1.

Any dredging activity is strongly discouraged with the project. In addition, this type of action would require a permit issued by the KDWP to the project sponsor and may include survey requirements of fish communities and mitigation.

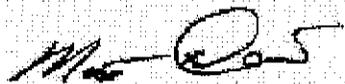
Not all state-listed species were addressed in the no-significant impact determination (ie. Western Earth Snake)

In addition to the information in the Draft EIS, other information should include:

1. A map of the delineated land uses; along with borrow areas and the expanded footprint overlaid.
2. A map of the delineated wetlands according to wetland type
3. Proposed mitigation areas.

Thank you for the opportunity to provide these comments and recommendations.

Sincerely,

A handwritten signature in black ink, appearing to read "Nate Davis", written over a light gray grid background.

Nate Davis, Aquatic Ecologist
Environmental Services Section

xc: KDWP Reg FW Sup, Wolfe
KDWP Dist Bio, Whiteaker
KBS, Liechti
KDHE, Mueldener
USFWS, LeValley
USEPA, Mulder

KANSAS

DEPARTMENT OF WILDLIFE AND PARKS

KATHLEEN SEBELIUS, GOVERNOR

4/25/2006

Mr. Eric Lynn
St. Joseph Levees Project Manager
Kansas City District, Corps of Engineers
Room 700, 601 E. 12th Street
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Track: 20060121
DP
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Comment:

In reviewing the document we did not come across any information as to why the levee is out of compliance (change in FEMA regulations, breach of 1993, settling, inaccurate construction?).

Response:

This levee was constructed approximately 50 years ago after the 1952 flood. These were 100 year levees and were designed to contain a discharge of 324,000 cfs. The 1993 flood was a 500 year event and overtopped the levees. There were some small changes that occurred and the levees provided somewhat less than the 100 year flood protection it provided as constructed, and this is the reason for the levee reevaluation and reconstruction. The levee is still being reconstructed to provide 100 year protection as per the Sponsor and even when reconstructed would not contain another 500 year event. The levee would be constructed to meet FEMA certification for the 100 year or 1% event.

Comment:

Levee setbacks were not analyzed in the upstream portions of the levee system, only in the pinch area between Elwood, KS and St. Joseph, MO and no economic data was provided as to what made setbacks less feasible than levee raises. What factors limited moving the levee landward in these areas to allow for the River to access its floodplain? By raising the levee you are creating a situation that could lead to even more serious flooding in the event of a breach, such that occurred in 1993 in this R471-460.

Response:

Levee Setback/Realignment. Two options are available for possible realignment of Unit R471-460. At approximately river mile 448, the levee moves closer to the river, narrowing the floodway and creating a constriction, called by some a "pinch point", during high flow events. This constriction could be reduced by realignment of the levee in this location, or the unit could be realigned further upstream to provide a wider floodway upstream of the pinch point for increased floodplain storage during high flow events.

Levee Setback

The narrow point in the levee alignment at approximately river mile 448 coincides with the river bend immediately upstream of Unit L-455. Setting back Unit R471-460 at this location would provide for a wider floodway during high flow events. This location also coincides with the locations of an active Union Pacific railroad bridge and the double-span bridge carrying US Highway 36. There is significant business development, including a large construction company, located between the two bridges immediately inside the protected area. Both bridges would likely require extensive modification and the existing businesses would have to be relocated to achieve significant levee setback. The Corps estimates that a levee setback in this location could lower the general water surface profile in this vicinity up to half a foot; however, this is not enough to offset the overtopping concern for the remainder of the unit. Bridge modification, real estate acquisition, business demolition and relocation, and new levee construction would all contribute to a significantly higher cost for this alternative comparative to other proposed alternatives. Environmental benefits would be marginally enhanced by the creation of a short reach of new riverside floodplain habitat relative to the currently existing resources in the area. The economic benefits of the alternative would be negatively impacted by the loss of businesses in the area and the increased cost. It is clear from preliminary analysis that the marginal hydraulic and environmental benefits of a setback of the levee in the vicinity of river mile 448 would not offset the significant adverse economic, engineering, transportation, and social impacts that would be incurred to the project.

Levee Realignment in Upstream Portion of Unit R471-460

Upstream of the pinch point, consideration was given to methods to expand the floodway to provide storage during high flow events. In this area, the levee could be realigned toward the bluffs, and existing levee alignment removed, providing increased floodplain volume and connectivity to the River. Alternatively, the old levee alignment could remain, and could be allowed to overtop and fail during high flows, providing some increment of additional storage during large floods. In order to achieve certified protection for the communities and facilities in the study area, the new section of levee could be constructed north of Rosecrans Airport starting near river mile 452 to connect the existing levee with the bluff to the west. Requirements and anticipated impacts of this new levee are as follows:

Formulating an alternative that allows for the overtopping and failure of an existing levee does not meet the stated Planning Objectives of this study.

Nearly three miles of new levee would need to be constructed, requiring significant real estate acquisition, additional material borrow sites, new drainage structures, and possibly a road closure structure at the tie-in to the bluff. This feature would involve a significant cost increase.

There is no guarantee that real estate agreements would be easily reached with existing land owners and condemnation may be necessary. Such negotiations, and additional construction time, would likely cause a protracted time delay that would prolong the exposure of residents to impacts and risk from the currently decertified levee.

Approximately six miles of the existing levee downstream of river mile 452 would still be subject to an overtopping concern that would need to be addressed to restore FEMA certification.

The introduction of a new levee section into an existing levee system will increase the annual operation and maintenance costs.

The new alignment would permanently remove some agricultural ground from production due to construction and

would allow significant additional acreage of productive agricultural property to remain subject to impact from lesser floods. Some existing benefits of the existing project would be lost by removing this property from the certified protection area.

The new alignment would cross the flight path in close proximity to the airport creating a right-of-way encroachment and safety issue that likely would not be acceptable to the Air Guard or the Federal Aviation Administration.

The existing levee cannot likely be removed without specific authorization from Congress. Removal of the remaining existing levee section would likely be legally, politically, and socially unacceptable. The remaining existing levee section would likely still be maintained in operation by the local entities and if maintained in accordance with the program, would be eligible for flood disaster relief under the provision of Public Law 84-99. Future claims for Federal assistance for flood fighting and damage restoration would likely increase. With the existing levee section still in place, the incremental floodplain benefits associated with a realignment of the Federal project in the north would be marginal.

No additional environmental benefits would be realized if the existing levee would stay in place and the existing agricultural land would remain in production. To realize any environmental benefits from realignment, the existing levee would have to be removed entirely and the land allowed to revert to a natural riparian state, which may require the government to buy-out the existing agricultural property at considerable additional expense to the project.

Significant political and public protest likely would be encountered by any proposal to remove property from the protected area or physically remove any existing section of levee.

It should be noted that in consultation with District counsel, it was determined that it may not be within the authority of the Modifications to Completed Works to remove a significant portion of the levee system, or construct a major new levee realignment.

A point-by-point consideration of the cost impacts to construct a new levee section, including all aspects discussed herein, indicated that realignment options would likely be greater than the cost of other alternatives proposed in the same area. Due to anticipated higher costs, a potential decrease in existing project benefits, and serious concerns over the social impacts of the proposal to the area communities, the levee realignment alternative was not carried forward for additional analysis.

Comment:

Has the Corps considered any potential impacts on the proposed Missouri River Fish and Wildlife Mitigation Project, specifically in reference to the Shallow Water Habitats restoration at various public land sites in this reach of the River? Our office reviewed Public Notice 2004008885 issued by the Kansas City District Corps office on March 10, 2004 for a project to restore shallow water habitat in the area (Lisa Peterson contact).

Response:

The Corps has considered potential impacts on the Missouri River Fish and Wildlife Mitigation project. As stated previously, the levee protection provided by the reconstructed levee will not change present Missouri River high water conditions. All borrow areas will however be constructed on the riverward side of the levee and would provide habitat. The Missouri river which once flowed around the Rosecrans Memorial Airport / Missouri National Guard flight facilities, was cut off by the flood of 1952, and now is surrounded on all sides by the old degraded cutoff oxbows of Browning Lake. These old Missouri River oxbow lakes are owned by KDWP and MDC and would provide good mitigation sites for certain types of habitat, if developed recognizing the needs of, and with the cooperation of the Rosecrans Memorial Airport to attract only wildlife that would be compatible with airport operations. Federal Aviation Agency regulations would determine the type of development of terrestrial, and aquatic mitigation within the flight zones to prevent flight accidents. The City of Elwood, the City of Wathena, highways, numerous roads, and all associated infrastructure would also inhibit much mitigation development. Even so, the Corps is looking at restoration opportunities along the entire Missouri River. The Corps is presently working to

acquire riparian floodplain lands along the R-471-460 levee Unit from willing sellers as part of the Missouri River Fish and Wildlife Mitigation Project. In this particular area, the Corps is specifically working on restoring approximately 1,000 acres of shallow water and terrestrial habitat on the Missouri River from the St. Joseph Bridge to Wathena and located on both sides of the R-471-460 levee. KDWP will manage this area through a cooperative agreement with the Corps. The Corps also is working on a Section 514 Missouri River Habitat Enhancement project at Contrary Lake on the Missouri side to restore aquatic wetland and terrestrial riparian habitat. Both the states of Kansas and Missouri are working with the Corps in the management of mitigation and restoration sites.

Comment:

Would the levee raise prevent the overtopping and breaching of the levee like what occurred in 1993? It is our understanding that the flooding that occurred that year is the precursor for the study.

Response: The information gathered from the 1993 flood did indeed cause impetus for a levee reevaluation. However, the flood of 1993 was a 500 year event. R-471-460 is a 100-year levee. The levee raise would insure the entire length provides the designed 100-year protection. If a 500-year flood should occur again, this levee would probably be overtopped.

Comment: We recommend mitigation of any wetlands permanently filled by the expansion of levee footprints at a ratio of 3:1.

Response: Corps of Engineers guidance has authorized the Kansas City District mitigate the wetland losses for the levee rehabilitation on a 1:1 basis. Mitigation of wetlands on a larger basis would require that the KDWP meet with the corps and discuss the specific needs that require additional mitigation measures should additional mitigation be necessary. Please recognize that the Corps is also embarking on purchasing, planning, and constructing a Missouri river Fish and Wildlife Mitigation site with forest, prairie, wetlands and shallow water habitat, to be restored on the Kansas side of the Missouri River. Contrary Lake, located on the east side of the Missouri River, would also be restored under the Section 514 Missouri River Enhancement program.

Comment:

Any dredging activity is strongly discouraged with the project. In addition, this type of action would require a permit, issued by the KDWP to the project sponsor and may include survey requirements of fish communities and mitigation.

Response:

Dredging is one alternative that could be used for obtaining borrow material. Dredging for a levee could occur from either a borrow pit or from the Missouri River. The National Environmental Policy Act (NEPA) requires that all alternatives must be evaluated in an environmental assessment. However, Missouri River dredging is not a Corps preferred alternative for obtaining borrow and therefore the Corps did not select Missouri River dredging as a preferred borrow method.

Comment:

Not all state-listed species were addressed in the no-significant impact determination (ie. Western Earth Snake)

Response:

The Western Earth Snake has been addressed in the EA. The levee reconstruction would not cause impact to the Western Earth Snake or to its critical habitat because the levee reconstruction would occur within the floodplain adjacent to the Missouri river and not near the uplands where the habitat of the Western Earth Snake occurs.

Comment:

In addition to the information in the Draft EIS, other information should include:

1. A map of the delineated land uses; along with borrow areas and the expanded footprint overlaid.
2. A map of the delineated wetlands according to wetland type
3. Proposed mitigation areas.

Response:

All of these three areas of interest are discussed in the Draft Environmental Assessment or the Draft Feasibility Report.

Thank you for the opportunity to provide these comments and recommendations.

Sincerely,

Nate Davis, Aquatic Ecologist
Environmental Services Section

xc: KDWP Reg FW Sup,
Wolfe KDWP Dist Bio,
Whiteaker KBS, Liechti
KDHE, Mueldener
USFWS, LeValley
USEPA, Mulder



MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 573/751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TDD)

JOHN D. HOSKINS, Director

May 12, 2006

Eric S. Lynn
St. Joseph Levee Project Manager
U.S. Army Corps of Engineers
Kansas City District
Room 700
601 E. 12th Street
Kansas City, MO 64106-2896

Subject: MDC Comments, Draft EIS, St. Joseph Levee Project

Dear Mr. Lynn,

Thank you for the opportunity to comment on the draft environmental impact statement for the St. Joseph Levee Project, Units L-455, R-471 and R-460. The Missouri Department of Conservation's (MDC) mission is to protect and manage the fish, forest and wildlife resources in Missouri; to serve the public and facilitate their participation in resource management activities; and to provide opportunity for all citizens to use, enjoy and learn about fish, forest and wildlife resources. MDC participates in project review when projects might affect those resources. Comments, questions, and recommendations are for your consideration and are offered to reduce negative impacts to natural resources in the project area.

The U.S. Army Corps of Engineers has referred to the Missouri River floodplain in the vicinity of St. Joseph and Elwood as a "pinch point," possessing a narrow floodway (<3,000 feet). While the proposed levee raise may reduce flooding impacts in one area, it may exacerbate flooding in another. How does the proposed project address the "pinch point" concern in the St. Joseph area? Given the large scope and expense of this public project, a levee set back alternative should be considered.

Once the final EIS is out for public comment, MDC will make additional comments.

Thank you for your consideration of this comment.

Sincerely,



JANE EPPERSON
POLICY SUPERVISOR

c: Harold Kerns, Mitch Miller, Stuart Miller

COMMISSION

STEPHEN C. BRADFORD
Cape Girardeau

CHIP MCGEEHAN
Marshfield

CYNTHIA METCALFE
St. Louis

LOWELL MOHLER
Jefferson City



MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180

Telephone: 573/751-4115 Missouri Relay Center: 1-800-735-2966 (TDD)

JOHN D. HOSKINS, Director

May 12, 2006

Eric S. Lynn
St. Joseph Levee Project
Manager U.S. Army Corps of
Engineers Kansas City District
Room 700
601 E. 12th Street
Kansas City, MO 64106-2896

Subject: MDC Comments, Draft EIS, St. Joseph Levee Project

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Comment:

The U.S. Army Corps of Engineers has referred to the Missouri River floodplain in the vicinity of St. Joseph and Elwood as a "pinch point," possessing a narrow floodway (<3,000 feet). While the proposed levee raise may reduce flooding impacts in one area, it may exacerbate flooding in another. How does the proposed project address the "pinch point" concern in the St. Joseph area? Given the large scope and expense of this public project, a levee set back alternative should be considered.

Response:

Levee Setback/Realignment. Two options are available for possible realignment of Unit R471-460. At approximately river mile 448, the levee moves closer to the river, narrowing the floodway and creating a constriction, called by some a "pinch point", during high flow events. This constriction could be reduced by realignment of the levee in this location, or the unit could be realigned further upstream to provide a wider floodway upstream of the pinch point for increased floodplain storage during high flow events.

Levee Setback

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Both bridges would likely require extensive modification and the existing businesses would have to be relocated to achieve significant levee setback. The Corps estimates that a levee setback in this location could lower the general water surface profile in this vicinity up to half a foot; however, this is not enough to offset the overtopping concern for the remainder of the unit. Bridge modification, real estate acquisition, business demolition and relocation, and new levee construction would all contribute to a significantly higher cost for this alternative comparative to other proposed alternatives. Environmental benefits would be marginally enhanced by the creation of a short reach of new riverside floodplain habitat relative to the currently existing resources in the area. The economic benefits of the alternative would be negatively impacted by the loss of businesses in the area and the increased cost. It is clear from preliminary analysis that the marginal hydraulic and environmental benefits of a setback of the levee in the vicinity of river mile 448 would not offset the significant adverse economic, engineering, transportation, and social impacts that would be incurred to the project.

Levee Realignment in Upstream Portion of Unit R471-460

Upstream of the pinch point, consideration was given to methods to expand the floodway to provide storage during high flow events. In this area, the levee could be realigned toward the bluffs, and existing levee alignment removed, providing increased floodplain volume and connectivity to the River. Alternatively, the old levee alignment could remain, and could be allowed to overtop and fail during high flows, providing some increment of additional storage during large floods. In order to achieve certified protection for the communities and facilities in the study area, the new section of levee could be constructed north of Rosecrans Airport starting near river mile 452 to connect the existing levee with the bluff to the west. Requirements and anticipated impacts of this new levee are as follows:

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The new alignment would cross the flight path in close proximity to the airport creating a right-of-way encroachment and safety issue that likely would not be acceptable to the Air Guard or the Federal Aviation Administration.

The existing levee cannot likely be removed without specific authorization from Congress. Removal of the remaining existing levee section would likely be legally, politically, and socially unacceptable. The remaining existing levee section would likely still be maintained in operation by the local entities and if maintained in accordance with the program, would be eligible for flood disaster relief under the provision of Public Law 84-99. Future claims for Federal assistance for flood fighting and damage restoration would likely increase. With the existing levee section still in place, the incremental floodplain benefits associated with a realignment of the

Federal project in the north would be marginal.

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A point-by-point consideration of the cost impacts to construct a new levee section, including all aspects discussed herein, indicated that realignment options would likely be greater than the cost of other alternatives proposed in the same area. Due to anticipated higher costs, a potential decrease in existing project benefits, and serious concerns over the social impacts of the proposal to the area communities, the levee realignment alternative was not carried forward for additional analysis.

Once the final EIS is out for public comment, MDC will make additional comments.

Thank you for your consideration of this comment.

Sincerely,

JANE EPPERSON
POLICY SUPERVISOR

c: Harold Kerns, Mitch Miller, Stuart Miller

6-13-06



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

REPLY TO
ATTENTION OF:

Larry Sabata,
Resource Soil Scientist
USDA/NRCS
3231 SW VanBuren Street
Topeka, Kansas 66611

Subject: Farmland Conversion Impact Rating

Dear Mr. Sabata:

The purpose of this letter is to transmit 3 copies, with maps, of the Farmland Conversion Impact Rating form in order to comply with the Farmland Protection Policy Act (7 U.S.C. 4201, et. Seq).

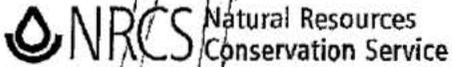
The proposed project under consideration is the Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Study Doniphan County Kansas and Buchanan County Missouri. This preferred alternative for this project is to raise the above identified levee units thereby encroaching on agricultural land in the area. A total of approximately 37.5 acres will be permanently impacted along the entire project area in order to construct the levee raise and accompanying seepage berms (see enclosed maps).

Please review the enclosed forms to determine if the site of the proposed project contains prime, unique, statewide or local important farmland. If you have any questions or concerns regarding the enclosed forms, please do not hesitate to contact me at the letterhead address, by phone [REDACTED] fax [REDACTED] or by email at [REDACTED]. Thank you in advance for your cooperation.

Sincerely,

Matthew D. Vandenberg
Environmental Resource Specialist

Encls.



3915 Oakland Avenue, Suite 103, St. Joseph, MO. 64506

Kacirik

June 26, 2006

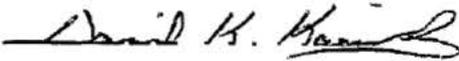
Mr. Matthew D. Vandenberg
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas city, Missouri 64106

Dear Mr. Vandenberg,

Enclosed is the Farmland Conversion Rating (form AD-1006) for the Missouri River Levee Expansion project in Buchanan County Missouri. Sites A and B contain Prime Farmland. After you, or the funding agency, have completed parts VI and VII, please return one copy to my office.

If you have any questions, please call me at 816-232-6555 ext. 138.

Sincerely,



David K. Kacirik
Area Resource Soil Scientist

enclosure:

cc: Rodney C. Saunders, District Conservationist, NRCS, St. Joseph, MO

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request	6/13/06
Name Of Project	Missouri River Flood Damage Reduction Project	Federal Agency Involved	US Army Corps of Engineers
Proposed Land Use	Levee Expansion	County And State	Buchanan County, Missouri

PART II (To be completed by NRCS)		Date Request Received By NRCS	6-16-06
Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply -- do not complete additional parts of this form).		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Acres Irrigated
			Average Farm Size 234
Major Crop(s) Corn, Soybeans	Farmable Land In Govt. Jurisdiction Acres: 213230 % 80.4	Amount Of Farmland As Defined In FPPA Acres: 213230 % 80.4	
Name Of Land Evaluation System Used LESA	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS 6-26-06	

PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	19.8	6.1			
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site	19.8	6.1	0.0	0.0	

PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland	19.8	6.1			
B. Total Acres Statewide And Local Important Farmland	-				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.001	0.001			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	19.9%	9.4			

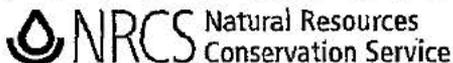
PART V (To be completed by NRCS) Land Evaluation Criterion	0	0	0	0
Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	86	100		

PART VI (To be completed by Federal Agency)		Maximum Points			
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))					
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	10	10			
4. Protection Provided By State And Local Government	0	0			
5. Distance From Urban Builtup Area	5	5			
6. Distance To Urban Support Services	10	10			
7. Size Of Present Farm Unit Compared To Average	0	0			
8. Creation Of Nonfarmable Farmland	0	0			
9. Availability Of Farm Support Services	0	0			
10. On-Farm Investments	1	1			
11. Effects Of Conversion On Farm Support Services	0	0			
12. Compatibility With Existing Agricultural Use	0	0			
TOTAL SITE ASSESSMENT POINTS	51	51	0	0	0

PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	86	100	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	51	51	0	0	0
TOTAL POINTS (Total of above 2 lines)	137	151	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used?
		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Reason For Selection:



3915 Oakland Avenue, Suite 103, St. Joseph, MO. 64506

May 8, 2006

Mr. Matthew D. Vandenberg
Dept. of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, MO 64106

Dear Mr. Vandenberg

I am responding to the Farmland Conversion Impact Rating (Form AD-1006) that you addressed to Patricia Hufford, of the Natural Resources Conservation Service, in St. Joseph, Missouri.

- The AD-1006 can not be completed; as you have combined acres from Kansas and Missouri. I do not have authority to complete this form for any acres in Kansas.

I suggest you pursue the following course of action:

- Resubmit the for AD-1006 to me, for **only the acres to be converted in Missouri.** send to:
- David Kacirek, Resource Soil Scientist, USDA/NRCS, 3915 Oakland Avenue, Suite 103, St. Joseph, MO 64506
- Attach a map that **clearly delineates the acres to be converted.** (topography map or aerial photo)
- For the **Kansas portion** of this project, send your Farmland Conversion Impact Rating request to: Larry Sabata, Resource Soil Scientist, USDA/NRCS, 3231 SW VanBuren St., Topeka, KS 66611.

Please call if you have any questions.
Sincerely,

A handwritten signature in black ink that reads "David K. Kacirek".

David K. Kacirek
Resource Soil Scientist, NRCS
816-232-6555 x138



"A Partner in Conservation Since 1935"

United States Department of Agriculture
Natural Resources Conservation Service
760 South Broadway
Salina, Kansas 67401-4604

Phone: 785-823-4500
FAX: 785-823-4540
www.ks.nrcs.usda.gov

April 28, 2006

Mr. Eric S. Lynn
St. Joseph Levees Project Manager
U.S. Army Corps of Engineers
601 E. 12th Street, Room 700
Kansas City, Missouri 64106-2896

Dear Mr. Lynn:

The following comments are related to the St. Joseph Flood Damage Reduction Project. We realize the extensive work on this document by the U. S. Army Corps of Engineers and we appreciate the coordination with the Natural Resources Conservation Service (NRCS) and the opportunity to comment.

NRCS supports the proposal related to the issue of impacts associated with the excavation of borrow material for levee construction. The NRCS has provided technical coordination and it appears the plan includes increasing wetland acres with the project. Specifically, Chapter 4.4.1, Vegetation, Preferred Alternative, describes this process. The increase in wetlands will minimize the temporary effects of sedimentation caused by construction and this process will meet federal goals to increase wetland acres.

Sincerely,

HAROLD L. KLAEGE
State Conservationist

cc:

James J. Krueger, State Resource Conservationist, NRCS, Salina, Kansas
Kenneth A. Kuiper, State Biologist, NRCS, Salina, Kansas

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

An Equal Opportunity Provider and Employer



United States Department of Agriculture
Natural Resources Conservation Service
1125 Westport Drive
Manhattan, Kansas 66502-2860

"A Partner in Conservation Since 1935"

Phone: 785-776-5182
FAX: 785-539-7983
www.ks.nrcs.usda.gov

June 22, 2006

Matthew D. Vandenburg
Department of the Army
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

Re: Missouri River Levee System Units L-455, R-471-460.

Dear Mr. Vandenburg:

Thank you for the opportunity to review the proposed Missouri River Levee System improvements in Doniphan County, Kansas.

Attached to this letter is the Farmland Conversion Impact Rating form (AD-1006) that you have requested to be filled out regarding the prime farmland and soils of state-wide importance that will be converted as part of the project. As for other negative environmental concerns regarding the project, I see none at this time.

I would also like to take this opportunity to inform you of a change in contact person in the event you should have future requests of this nature. Please send all environmental review requests to:

Harold L. Klaege
State Conservationist
Natural Resources Conservation Service
760 S. Broadway
Salina, Kansas 67401

Your cooperation in this matter would be deeply appreciated. Thank you.

If I can be of further assistance, please let me know.

Sincerely,

Alan R. Boerger
Resource Conservationist

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An Equal Opportunity Provider and Employer

5.017
Cc: Lynn Thurlow, Soil Conservationist, NRCS, Salina, Kansas.
Mechelle Foos, District Conservationist, NRCS, Troy, Kansas.
Ken Hoffman, ASTC(FO), NRCS, Manhattan, Kansas.

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)	Date Of Land Evaluation Request	6/13/06
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Name Of Project	Missouri River Flood Damage Reduction Project	Federal Agency Involved	US Army Corps of Engineers
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Proposed Land Use	Levee Expansion	County And State	Doniphan County, Kansas
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PART II (To be completed by NRCS)	Date Request Received By NRCS	6/21/06
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Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply -- do not complete additional parts of this form).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Acres Irrigated	1,500	Average Farm Size	396 ac.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------	-----------------	-------	-------------------	---------

Major Crop(s)	Corn - Soybeans	Farmable Land In Govt. Jurisdiction	Acres: 157,800 % 62	Amount Of Farmland As Defined in FPPA	Acres: 39,800 % 16
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Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS	6/22/06
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PART III (To be completed by Federal Agency)	Alternative Site Rating			
	Site A	Site B	Site C	Site D

A. Total Acres To Be Converted Directly	37.5			
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B. Total Acres To Be Converted Indirectly				
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C. Total Acres In Site	37.5	0.0	0.0	0.0
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PART IV (To be completed by NRCS) Land Evaluation Information				
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A. Total Acres Prime And Unique Farmland	37.5			
------------------------------------------	------	--	--	--

B. Total Acres Statewide And Local Important Farmland	37.5			
-------------------------------------------------------	------	--	--	--

C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	21			
-------------------------------------------------------------------------	----	--	--	--

D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	98			
------------------------------------------------------------------------------------	----	--	--	--

PART V (To be completed by NRCS) Land Evaluation Criterion	0	0	0	0
-------------------------------------------------------------------	---	---	---	---

Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	0	0	0	0
-----------------------------------------------------------------------	---	---	---	---

PART VI (To be completed by Federal Agency)	Maximum Points				
----------------------------------------------------	----------------	--	--	--	--

Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))					
---------------------------------------------------------------------------	--	--	--	--	--

1. Area In Nonurban Use					
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2. Perimeter In Nonurban Use					
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3. Percent Of Site Being Farmed					
---------------------------------	--	--	--	--	--

4. Protection Provided By State And Local Government					
------------------------------------------------------	--	--	--	--	--

5. Distance From Urban Builtup Area					
-------------------------------------	--	--	--	--	--

6. Distance To Urban Support Services					
---------------------------------------	--	--	--	--	--

7. Size Of Present Farm Unit Compared To Average					
--------------------------------------------------	--	--	--	--	--

8. Creation Of Nonfarmable Farmland					
-------------------------------------	--	--	--	--	--

9. Availability Of Farm Support Services					
------------------------------------------	--	--	--	--	--

10. On-Farm Investments					
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11. Effects Of Conversion On Farm Support Services					
----------------------------------------------------	--	--	--	--	--

12. Compatibility With Existing Agricultural Use					
--------------------------------------------------	--	--	--	--	--

TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
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PART VII (To be completed by Federal Agency)					
-----------------------------------------------------	--	--	--	--	--

Relative Value Of Farmland (From Part V)	100	0	0	0	0
------------------------------------------	-----	---	---	---	---

Total Site Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
-----------------------------------------------------------------------	-----	---	---	---	---

TOTAL POINTS (Total of above 2 lines)	260	0	0	0	0
---------------------------------------	-----	---	---	---	---

Site Selected:	Date Of Selection	Was A Local Site Assessment Used?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Reason For Selection:



STATE OF KANSAS
DEPARTMENT OF WILDLIFE & PARKS

Operations Office
512 SE 25th Avenue
Pratt, KS 67124-8174
316/672-5911 FAX 316/672-6020



Ref: D1.0501
Doniphan
950580

LETTER OF TRANSMITTAL

This will transmit current localized list(s) of threatened and endangered species for your reference. The information provided is current as of the date shown on each list. As we gain additional natural history information about the listed species, county occurrences, and/or critical habitat, designations are subject to change.

The transmission of this information does not constitute in any way a formal review from our agency, nor does it grant clearance of any project.

To obtain a formal review, please send detailed project information including plans and information to fully describe the proposed action to the Environmental Services Section at the letterhead address. This information includes but is not limited to: engineering plans or sketch of proposed work, map showing how the action will alter the landscape, complete description and limits of any construction work to be accomplished including location and size of any excavation and fill areas, plus any other information pertinent to the proposed action. Also, attach an aerial photo/sketch map of areas to be affected by the proposed action showing existing land and vegetative cover characteristics. Details to be shown include woodland, rangeland, tame pasture, cropland, wetlands, stream, springs, water impoundments, plus any other appropriate landscape characteristics. Description of any stream within the affected area should include estimated width and depth.

Environmental Services Section



THREATENED AND ENDANGERED SPECIES
KNOWN OR LIKELY TO OCCUR
IN
DONIPHAN COUNTY, KANSAS

American Burying Beetle (*Nicrophorus americanus*) - Endangered: Formerly occurred throughout temperate eastern North America including the eastern one-third of Kansas. Historic Kansas records exist for Doniphan county. Last recorded in Kansas in 1940. Endangered nationally.

Bald Eagle (*Haliaeetus leucocephalus*) - Endangered: Known to occur as a regular winter resident along the Missouri River. Prefers mature riparian woodland along the river. Critical habitat has been designated. Endangered nationally.

Chestnut Lamprey (*Ichthyomyzon castaneus*) - Threatened: Known to occur in the Missouri River main stem. Spawns over clean gravel in small tributary streams. Spawning has not been documented in Kansas. Critical habitat has been designated.

Eastern Spotted Skunk (*Spilogale putorius interrupta*) - Threatened: May occur in suitable habitat. Prefers brushy grasslands and woodland edges. May also use abandoned or little used farm buildings.

Eskimo Curlew (*Numenius borealis*) - Endangered: Formerly a regular spring transient using bare fields and heavily grazed or burned grasslands. Has not been recorded in Kansas since 1902. A few birds may still migrate through the state. Endangered nationally.

Flathead Chub (*Platygobio gracilis*) - Threatened: May occur in the Missouri River main stem. Prefers turbid streams with unstable sand bottoms. Critical habitat has been designated.

Least Tern (*Sterna antillarum*) - Endangered: Known to occur as an occasional seasonal transient or summer visitant at waters where forage fish are abundant. Endangered nationally.

Pallid Sturgeon (*Scaphirhynchus albus*) - Endangered: Known to occur in the Missouri River main stem. Prefers swift turbid rivers with firm sand substrate. Critical habitat has been designated. Endangered nationally.

Peregrine Falcon (*Falco peregrinus*) - Endangered: May occur as an uncommon seasonal transient or winter visitant at areas where waterfowl concentrate. Endangered nationally.

Piping Plover (*Charadrius melodus*) - Threatened: May occur as a rare seasonal transient at sparsely vegetated shores of streams, marshes, or impoundments. Threatened nationally.



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

September 27, 1995

Mr. Howard Thelen, Project Manager
HDR Engineering, Inc.
8404 Indian Hills Drive
Omaha, Nebraska 68114-4049

Re: Flood Control Project

Dear Mr. Thelen:

Thank you for your letter of September 11, 1995 regarding threatened and endangered species within the proposed project area.

Department staff examined map and computer files for federal and state rare, threatened and endangered species and determined that sensitive species or communities are known to occur on the immediate site or surrounding area. Please refer to the enclosed Heritage Database report for details. It also includes "additional information for planning purposes." Incorporating these recommendations into project design will help assure adverse project impacts are minimal.

This report reflects information we currently have in our database. We provide this information for planning purposes only; it should not be regarded as a definitive statement as to the presence or absence of rare/endangered species or high-quality natural communities. We may need to conduct additional on-site inspections to verify the presence or absence of such species or communities.

Thank you for the opportunity to review and comment.

Sincerely,

DAN F. DICKNEITE
PLANNING DIVISION CHIEF

Enclosure

ATTACHMENT G-5

COMMISSION

ANITA B. GORMAN
Kansas City

RANDY HERZOG
St. Joseph

JOHN POWELL
Rolla

RONALD J. STITES
Plattsburg



September 22, 1995
Page: 1

HDR Engineering, Inc.
Flood Control Project
St. Joseph, MO - Buchanan County

No listed plants or animals are known to occur on the project site.

The following species and/or natural communities are known from the vicinity of the project site.

SCIENTIFIC NAME	COMMON NAME	FED STATUS	STATE STATUS	DATE	TOWN/RANGE SEC	MANAGED AREA
PODILYMBUS PODICEPS	PIED-BILLED GREBE		R	1993	056N036W	15
LYGODESMA JUNCEA	SKELETON PLANT		WL	1900	057N035W	06
LYGODESMA JUNCEA	SKELETON PLANT		WL	1900	057N035W	29

The following Managed Areas are located in the vicinity of the project site.

MANAGED AREA	OWNER	TOWN/RANGE SEC
ARTHUR DUPREE NEH CONSERVATION AREA	HDC	057N035W 07
FRENCH BOTTOM ACCESS	HDC	057N035W 06
LOGAN (CAROLINE SHERIDAN) NEH WA	HDC	058N035W 30 AND SEC 31
ROBIDOUX LANDING	ST. JOSEPH CITY	057N035W 06
ST. JOSEPH URBAN CONSERVATION AREA	HDC	057N035W 10
SUNBRIDGE HILLS CONSERVATION AREA	HDC	058N035W 30 AND SEC 31

Additional information for planning purposes.

Overwintering bald eagles may occur in the project area, as they are common winter residents in big river habitats and major lakes where they feed on fish.

Pallid sturgeons are big river fish that may range widely in the Mississippi River and Missouri River system. Because the preferred habitat and range of the species are unknown, any project that modifies big river habitat or impacts water quality should consider the possible impact to pallid sturgeon populations.

FEDERAL STATUS - The federal status is derived from the provisions of the federal Endangered Species Act, which is administered by the U.S. Fish and Wildlife Service. The Endangered Species Act provides federal protection for plants and animals listed as Endangered or Threatened. E = Endangered T = Threatened A, B, C = Candidate for Federal Listing.

MISSOURI STATUS - The state status is determined by the Department of Conservation under Constitutional authority. Rule 3CSR10-4.111 of the Wildlife Code of Missouri and certain state statutes apply to state listed species. E = Endangered R = Rare SU = Status Undetermined WL = Watch List EXT = Extirpated XTN = Extinct.

Great blue heron rookeries, natural communities and geologic features may also occur on this printout. The status given these elements is provided for informational purposes only. C = Common, - = No status. These elements are not necessarily afforded protection through endangered species law or statute.



HDR Engineering, Inc.
Flood Control Project
St. Joseph, MO - Buchanan County

Additional information for planning purposes (cont).

Indiana bats roost and raise young under the bark of trees in riparian forests and upland forests near perennial streams in north Missouri. Favored roosts are large diameter (>9" dbh; best are >21" dbh) dead oaks and hickories, and living shagbark hickory. Other tree species such as elm, cottonwood, ash, and maple, if they have exfoliating bark, also may be used as roosts. Indiana bats especially need snags standing in openings, at edges, or where tree canopy is sparse. Projects should avoid or minimize the removal of potential roost trees from riparian zones or from woodlots within 0.6 mile of perennial streams or permanent water. If removal of potential roost trees is unavoidable, it should be done when Indiana bats are not likely to be present, i.e., between 15 September and 1 April. During the course of development, if possible, leave snags standing. Indiana bats feed upon terrestrial and aquatic insects; they preferentially forage in and around the canopy of riparian and floodplain forest, but also along forest/field edges and fence rows. Therefore, mature forest canopy should be enhanced and stream quality not degraded.

Streams in the area should be protected from soil erosion, water pollution and instream activities that modify or diminish aquatic habitats.

FEDERAL STATUS - The federal status is derived from the provisions of the federal Endangered Species Act, which is administered by the U.S. Fish and Wildlife Service. The Endangered Species Act provides federal protection for plants and animals listed as Endangered or Threatened. E = Endangered T = Threatened A, B, C = Candidate for Federal listing.

MISSOURI STATUS - The state status is determined by the Department of Conservation under Constitutional authority, Rule 3CSR10-4.111 of the Wildlife Code of Missouri and certain state statutes apply to state listed species. E = Endangered R = Rare SU = Status Undetermined WL = Watch List EXT = Extirpated XTI = Extinct.

Great blue heron rookeries, natural communities and geologic features may also occur on this printout. The status given these elements is provided for informational purposes only. C = Common, - = No status. These elements are not necessarily afforded protection through endangered species law or statute.

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



APPENDIX E

**Common Mammals, Birds, Amphibians, Reptiles and Fish
of the Project Area**

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Environmental Assessment**



Common Mammals, Birds, Amphibians, Reptiles and Fish of the Project Area

Common mammals that may be found in the study area include:

white-tailed deer (<i>Odocoileus virginianus</i>)	coyote (<i>Canis latrans</i>)
opossum (<i>Didelphis marsupialis</i>)	raccoon (<i>Procyon lotor</i>)
cottontail rabbit (<i>Sylvilagus floridanus</i>)	muskrat (<i>Ondatra zibethica</i>)
beaver (<i>Castor canadense</i>)	badger (<i>Taxidea taxus</i>)
striped skunk (<i>Mephitis mephitis</i>)	fox squirrel (<i>Sciurus niger</i>)
plains pocket gopher (<i>Geomys bursarius</i>)	little brown bat (<i>Myotis lucifugus</i>)
least shrew (<i>Cryptotis parva</i>)	hoary bat (<i>Lasiurus cinereus</i>)
eastern wood rat (<i>Neotoma floridana</i>)	eastern mole (<i>Scalopus</i>
<i>aquaticus</i>)	
big brown bat (<i>Eptesicus fuscus</i>)	
meadow jumping mouse (<i>Zapus hudsonius</i>)	
woodland white-footed mouse (<i>Peromyscus leucopus</i>)	
plains harvest mouse (<i>Reithrodontomys montanus</i>)	
western harvest mouse (<i>Reithrodontomys megalotis</i>)	
prairie white-footed mouse (<i>Peromyscus maniculatus</i>)	
thirteen-lined ground squirrel (<i>Spermophilus tridecemlineatus</i>)	

Common resident or migrant birds that may be found in the study area include:

great blue heron (<i>Ardea herodias</i>)	belted kingfisher (<i>Ceryle alcyon</i>)
green heron (<i>Butorides virescens</i>)	whip-poor-will (<i>Caprimulgus vociferus</i>)
blue-winged teal (<i>Anas discors</i>)	western kingbird (<i>Tyrannus verticalis</i>)
wood duck (<i>Aix sponsa</i>)	horned lark (<i>Cremophila alpestris</i>)
mallard (<i>Anas platyrhynchos</i>)	blue jay (<i>Cyanocitta cristata</i>)
red-tailed hawk (<i>Buteo jamaicensis</i>)	purple martin (<i>Progne subis</i>)
black-eyed chickadee (<i>Parus atricapillus</i>)	rock dove (<i>Columba livia</i>)
tufted titmouse (<i>Parus bicolor</i>)	barred owl (<i>Strix varia</i>)
starling (<i>Sturnus vulgaris</i>)	common crow (<i>Corvus brachyrhynchos</i>)
American kestrel (<i>Falco sparverius</i>)	warbling vireo (<i>Vireo gilvus</i>)
turkey vulture (<i>Cathartes aura</i>)	yellow-breasted chat (<i>Decteria virens</i>)
house sparrow (<i>Passer domesticus</i>)	bobwhite quail (<i>Colinus virginianus</i>)
robin (<i>Turdus migratorius</i>)	morning dove (<i>Zenaida macroura</i>)
western meadowlark (<i>Sturnella neglecta</i>)	field sparrow (<i>Spizella pusilla</i>)
red-winged blackbird (<i>Agelaius phoeniceus</i>)	American coot (<i>Fulica americana</i>)
common grackle (<i>Quiscalus quiscula</i>)	killdeer (<i>Charadrius vociferus</i>)
Harris' sparrow (<i>Zonotrichia querula</i>)	spotted sandpiper (<i>Actitis macularia</i>)
tree sparrow (<i>Spizella arborea</i>)	great horned owl (<i>Bubo virginianus</i>)
chipping sparrow (<i>Spizella passerina</i>)	

screech owl (*Otus asio*)
common night hawk (*Chordeiles minor*)
red-bellied woodpecker (*Centurus carolinus*)
red-headed woodpecker (*Melanerpes erythrocephalus*)
house wren (*Troglodytes aedon*)
eastern wild turkey (*Meleagris gallopavo*)
brown thrasher (*Toxostoma rufum*)

Common reptiles that may be found in the study area include:

snapping turtle (*Chelydra serpentina*)
painted turtle (*Chrysemys picta*)
false map turtle (*Gratemys pseudogeographica*)
ornate box turtle (*Terrapene ornata*)
slider (*Trachemys spp.*)
smooth soft-shelled turtle (*Apalone mutica*)
spiny soft-shelled turtle (*Apalone spinifera*)
common five lined skink (*Eumeces fasciatus*)
great plains skink (*Eumeces obsoletus*)
northern prairie skink (*Eumeces septentrionalis*)
six-lined racerunner (*Cnemidophorus sexlineatus*)
western worm snake (*Carphophis vermis*)
ringneck snake (*Diadophis spp.*)
Eastern hog-nosed snake (*Heterodon platyrhinos*)
Racer (*Coluber constrictor*)
black rat snake (*Pantherophis obsoleta*)
prairie king snake (*Diadophis punctatus arnyi*)
red milksnake (*Lampropeltis triangulum*)
gophersnake (*Pituophis melanoleucus*)
northern water snake (*Nerodia sipedon*)
brown snake (*Storeria dekayi*)
western ribbon snake (*Thamnophis proximus*)
common garter snake (*Thamnophis sirtalis*)
copperhead (*Agkistrodon contortrix*)
northern leopard frog (*Rana pipiens*)
western fox snake (*Elaphe vulpine*)

Common amphibians that may be found in the study area include:

American toad (*Bufo americanus*)
Rocky Mountain toad (*Bufo woodhousii*)
Cope's gray treefrog (*Hyla chrysoscelis*)
Great Plains toad (*Bufo cognatus*)
Northern cricket frog (*Acris crepitans*)
Eastern gray treefrog (*Hyla versicolor*)
Boreal chorus frog (*Pseudacris triseriata*)

Smallmouth salamander (*Ambystoma texanum*)
Great Plains narrowmouth toad (*Gastrophryne olivacea*)
Blanchard's cricket frog (*Acris crepitans*)
Woodhouse's toad (*Anaxyrus woodhousii*)
Western chorus frog (*Pseudacris triseriata*)
Plains spadefoot toad (*Sepa bombifrons*)
plains leopard frog (*Rana blairi*)
bullfrog (*Rana catesbeiana*)

Principal fish species of the Lower Kansas and Missouri Rivers at Kansas City:

channel catfish (<i>Ictalurus punctatus</i>)*	blue catfish (<i>Ictalurus furcatus</i>)
gizzard shad (<i>Dorsoma cepedianum</i>)*	flathead catfish (<i>Pygodictis olivaris</i>)
shortnose gar (<i>Lepisosteus platostomus</i>)*	longnose gar (<i>Aplodinotus</i>
<i>grunniens</i>)	
carp (<i>Cyprinus carpio</i>)*	bluegill (<i>Lepomis macrochirus</i>)
goldeye (<i>Hiodon alosoides</i>)	fathead minnow (<i>Pimephales promelas</i>)
sand shiner (<i>Notropis ludibundus</i>)	white crappie (<i>Pomoxis</i>
<i>annularis</i>)	
freshwater drum (<i>Aplodinotus grunniens</i>)	quillback (<i>Carpiodes</i>
<i>cyprinus</i>)	
black bullhead (<i>Ameiurus melas</i>)	river carpsucker (<i>Carpiodes</i>
<i>carpio</i>)*	
bigmouth buffalo (<i>Ictiobus cyprinellus</i>)	walleye (<i>Stizostedion</i>
<i>vitreum</i>) smallmouth buffalo (<i>Ictiobus bubalus</i>)*	green sunfish (<i>Lepomis</i>
<i>cyanellus</i>) shovelnose sturgeon (<i>Scaphirhynchus platorhynchus</i>)	
shorthead redhorse (<i>Moxostoma macrolepidotum</i>)	

*Dominant species

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



APPENDIX F

**Common Trees, Shrubs
and Grasses of the Study Area**

**Missouri River Levee System
Units L-455 and R-471-460
Flood Damage Reduction Study
Kansas and Missouri
Draft Environmental Impact Statement**



Appendix F

Common Trees, Shrubs and Grasses of the Study Area

Predominant tree species found on the project lands include:

American elm (<i>Ulmus americana</i>)	honey locust (<i>Gliditsia triancanthos</i>)
sycamore (<i>Platanus occidentalis</i>)	osage-orange (<i>Maclura pomifera</i>)
black walnut (<i>Juglans nigra</i>)	redbud (<i>Cercis canadensis</i>)
bur oak (<i>Quercus macrocarpa</i>)	slippery elm (<i>Ulmus rubra</i>)
chinkapin oak (<i>Quercus muehlenbergii</i>)	green ash (<i>Fraxinus pennsylvanica</i>)
eastern cottonwood (<i>Populus deltoides</i>)	mulberry (<i>Morus rubra</i>)
hackberry (<i>Celtis occidentalis</i>)	eastern red cedar (<i>Juniperous virginiana</i>)
hawthorn (<i>Crataegus sp.</i>)	

Deciduous shrubs on the project lands include:

rough leaf dogwood (<i>Cornus drummondii</i>)	smooth sumac (<i>Rhus glabra</i>)
buckbrush (<i>Symphoricarpos orbiculatus</i>)	gooseberry (<i>Ribes missouriense</i>)
elderberry (<i>Sambucus canadensis</i>)	poison ivy (<i>Rhus radicans</i>)
fragrant sumac (<i>Rhus aromatica</i>)	prairie rose (<i>Rosa arkansana</i>)

Grass cover on the project lands include:

big bluestem (<i>Andropogon gerardii</i>)	Kentucky bluegrass (<i>Poa pratensis</i>)
little bluestem (<i>Schizaccharium scoparium</i>)	vervain (<i>Verbena sp.</i>)
indiangrass (<i>Sorghastrum nutans</i>)	windmill grass (<i>Chloris verticillata</i>)
switchgrass (<i>Panicum virgatum</i>)	tall dropseed (<i>Sporobolus asper</i>)
tumblegrass (<i>Schedonnardus paniculatus</i>)	

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



APPENDIX G

Section 404 of the Clean Water Act
Compliance Review Documents
(Public Notice/Draft 404(b)(1) Evaluation)

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Environmental Assessment**



PUBLIC NOTICE



US Army Corps
of Engineers
Kansas City District

Permit No. 200501489
Issue Date: August 1, 2006
Expiration Date: August 31, 2006

30-Day Notice

JOINT PUBLIC NOTICE: This public notice is issued jointly with the Missouri Department of Natural Resources, Water Pollution Control Program and the Kansas Department of Health and Environment. The Department of Natural Resources and the Kansas Department of Health and Environment will use the comments to this notice in deciding whether to grant Section 401 water quality certification. Commenter's are requested to furnish a copy of their comments to the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102 or the Kansas Department of Health and Environment, Bureau of Water – Watershed Management Section, 1000 SW Jackson Street, Suite 420, Topeka, Kansas 66612-1367.

APPLICANT: Kansas City District, Corps of Engineers
Room 834, PM-PR
601 E. 12th Street
Kansas City, Missouri 64106-2896

PROJECT LOCATION (As shown on the attached drawings): The proposed flood damage reduction project involves the Missouri River levee units L-455 and R471-460. These units collectively comprise the protective works that provide flood protection for areas in St. Joseph, Buchanan County, Missouri and Elwood and Wathena, Doniphan County, Kansas.

AUTHORITY: Section 404 of the Clean Water Act (33 USC 1344). This project is being conducted under the authority provided by Section 216 of the 1970 Flood Control Act. This Act provides authority to reexamine completed civil works projects to determine whether the projects are providing benefits as intended.

ACTIVITY: PROPOSED WORK: The U.S. Army Corps of Engineers (USACE) proposes to raise existing Missouri River levees units R471-460 and L-455 to improve the adequacy of the levee units to reduce damages from potential flooding on the Missouri River. This will be accomplished by raising the existing levees using earth fill. A substantial portion (approximately ten miles) of the levee unit R471-460 would be raised to a level sufficient to pass the one percent (100-year) flood with a 90 percent level of reliability, thereby allowing for re-certification of the levee by FEMA. The anticipated raise varies along its length from zero to two and one half feet.

Increases in levee height would result in corresponding increases in levee toe and seepage berm width. Additionally, minor raises (less than one foot) at specific locations along the left bank levee (L-455) to accept the minor increased rise in water surface elevation resulting from the initial work would also be required.

Borrow areas currently identified for the proposed levee raise include riverward areas in both Kansas and Missouri. For Kansas, the borrow areas consist of approximately 1,139 acres of land located from River Miles 454.9 to 451.9 and from River Miles 446.7 to 443.4. For Missouri, the borrow area consists of approximately 30 acres of land along River Miles 442.6 to 442.9. These sites consist of accreted lands with secondary tree growth, shrublands, and wetlands.

WETLANDS: A preliminary jurisdictional determination indicated that approximately 4.9 acres of emergent and shrub-scrub wetlands landward of the existing levees would be permanently impacted from expanding the levee width. During construction of the project, the Corps will offset the wetland lost through various minimization measures coordinated with the assistance of the Natural Resources Conservation Service and US Fish and Wildlife Service. These measures include, but are not limited to, scraping and reshaping of area wetlands to the existing size equal to, or greater than, that which was lost; varying bottom depths of excavated borrow sites to create diversity in newly created wetland areas; excavating deep in other borrow areas to minimize removal of trees; creating islands within some of the borrow sites through avoidance of specified areas; spacing borrow areas apart from one another by approximately 500 feet to provide areas of no disturbance; and, avoiding larger "old growth" trees (9 inch or larger DBH).

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) OF 1968, as amended: The Corps originally published a Notice of Intent to prepare an Environmental Impact Statement in the *Federal Register* on November 20, 2003 (Vol.68, No. 224, page 65450). However, after considerable review and re-evaluation of the project impacts, a determination was made that the project would not result in significant degradation of the human environment; and therefore, the proposed project would support a Finding of No Significant Impact (FONSI). The Corps will utilize comments received in response to this Public Notice to complete its evaluation of the project for compliance with the requirements of NEPA, and other Federal, state, and local regulations. The Corps has made a preliminary determination that the project as proposed would not be contrary to the public interest and is in compliance with the Section 404(b)(1) Guidelines.

DRAWINGS: The attached drawings provide location details of the proposed project.

PROPERTY ADJACENT TO PROJECT AREA: Property owners adjacent to the proposed project area will be notified directly to inform them of the project and to request their comments.

CULTURAL RESOURCES: The proposed project has been reviewed in compliance with the National Historic Preservation Act of 1966 (Public Law 89-665). Background research consisted of a review of the National Register of Historic Places (NRHP), a site records search, and a review of historic channel and shipwreck maps. No historic properties listed in the NRHP were identified in the project area. A search of records with the Kansas and Missouri State Historic Preservation Officers (SHPO's) identified no previously recorded archeological sites or historic

structures in the immediate area. An accreted land study conducted by the Corps found that the entire project area consists of accreted land, with most of the accretion occurring since 1879. Because the project area consists of recently accreted land and no archeological sites, historic structures, or shipwrecks have been recorded in the project area, it is unlikely that the project would impact historic properties or sites that may be eligible for inclusion on the NRHP. Therefore, we have recommended no further investigations be conducted. The Kansas and Missouri State Historic Officers both concurred with this determination. However, the Corps will take into consideration any information from affiliated Native American tribes or the public on any sites or traditional cultural properties that may be of concern.

ENDANGERED SPECIES: In compliance with the Endangered Species Act, a preliminary determination has been made that the described work is not likely to adversely affect species designated as threatened or endangered or adversely modify or destroy critical habitat. In order to complete our evaluation of this activity, comments are being 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.

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 Department of the Army authorization 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 authorization 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 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 an authorization for this

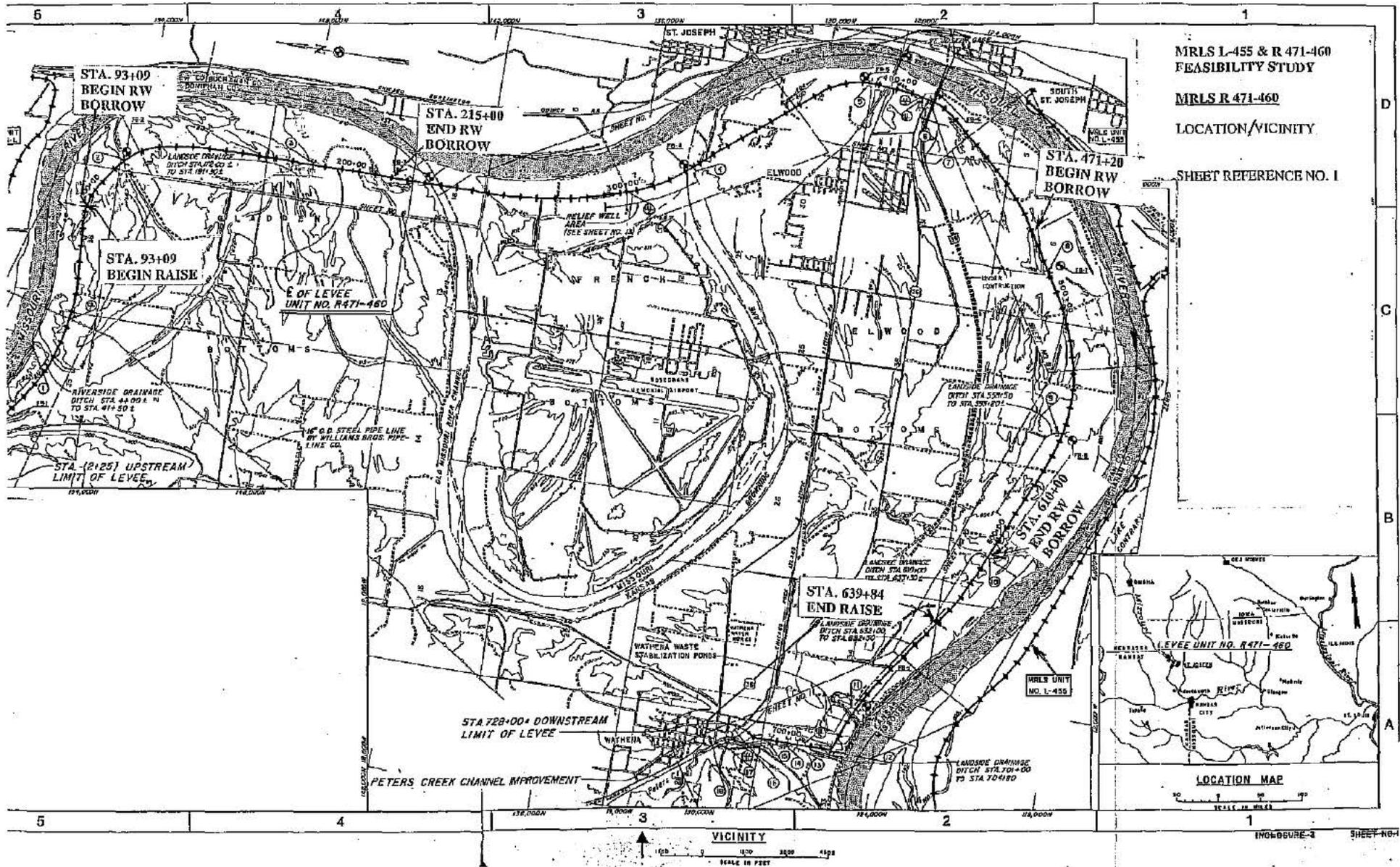
proposal. To make this decision, comments are used to address impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are used in preparation of an Environmental Assessment pursuant to the National Environmental 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 an authorization 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 authorization. Copies of all comments, including names and addresses of commenter's, may be provided to the applicant. Comments should be mailed to the address shown below.

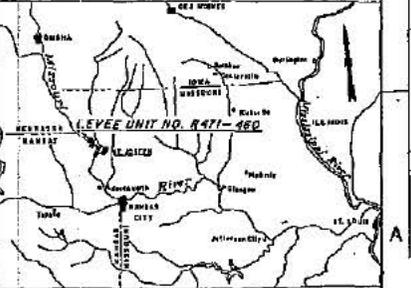
PUBLIC HEARING: Any person may request, in writing, prior to the expiration date of this public notice, that a public hearing be held to consider this application. Such requests shall state, with particularity, the reasons for holding a public hearing.

ADDITIONAL INFORMATION: Additional information may be obtained by contacting Mr. Matthew Vandenberg, U.S. Army Corps of Engineers, Environmental Resources Section, 601 East 12th Street, Room 843, Kansas City, Missouri 64106, at telephone 816-389-3146, (FAX 816-389-2025) or via e-mail at matthew.d.vandenberg@us.army.mil. All comments to this public notice should be directed to the above address.

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.

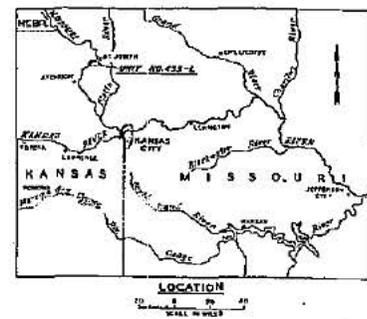
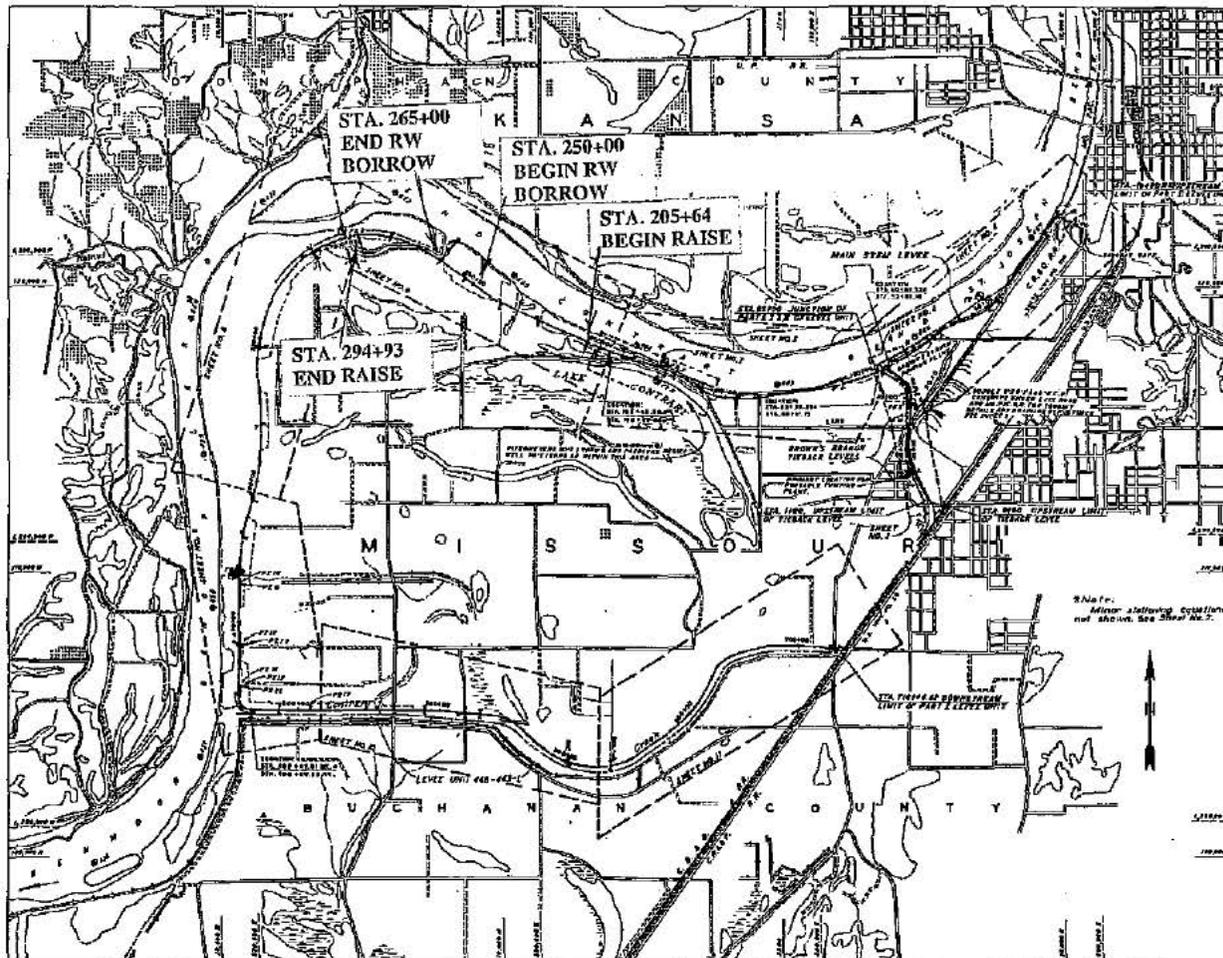


MRLS L-455 & R 471-460
 FEASIBILITY STUDY
 MRLS R 471-460
 LOCATION/VICINITY
 SHEET REFERENCE NO. 1



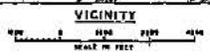
VICINITY
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ENCLOSURE-3
 SHEET NO. 1



GENERAL NOTES

Paradeirs from Corps of Engineers Aerial Survey of 1952.
 Topography of plan sheets from U.S.C. of E. plane-table surveys of 1934, 1955 and 1956.
 Elevations referred to mean sea level are based on the U.S.C. & G.S. 1929 general adjustment.
 Alignment based on plane co-ordinate system with Missouri River Commission Identification Station "WESTON" as origin.
 Weather grid system.
 Mercator (Missouri, west zone) grid system.
 Missouri River Mile based on 1960 Adjustment.



LEGEND

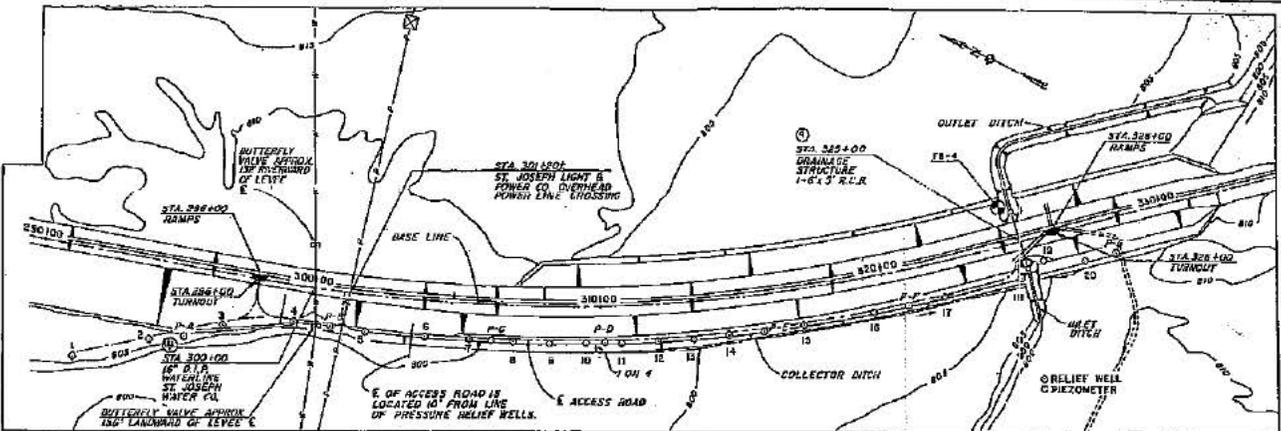
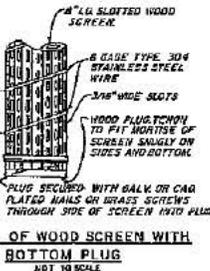
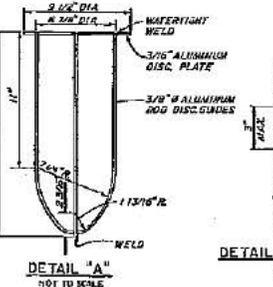
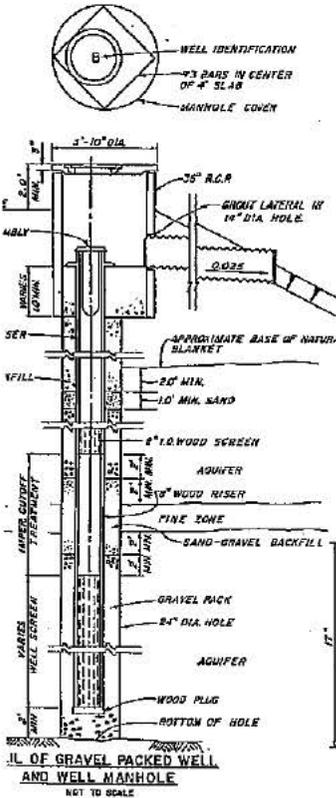
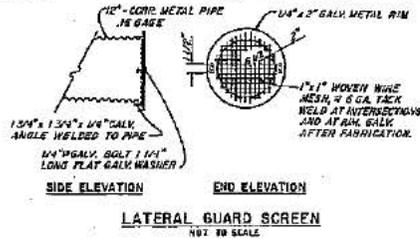
Levee Unit No. L 455	-----
Other levees	-----
New or improved channel	-----
Drainage structure	-----
Ramp	-----
Risrap slope protection	-----
Freeboard gate	-----
Forecasting gate	-----
Pumping plant	-----
Piezometer	-----
Pressure relief valve	-----
Miles above mouth of Missouri River	-----
Underseepage control berm	-----

MRLS L-455 & R 471-460
 FEASIBILITY STUDY

MRLS L 455

LOCATION/VICINITY

SHEET REFERENCE NO. 2



NO.	LOCATION STATION	RANGE	DISCH. ELEV.	BOT. MOLE WELL	SCREEN ELEVATIONS		TOTALS (EST.)									
					UPPER SEC. TOP	LOWER SEC. BOT.	QUANTITY IN LINEAR FEET									
					TOP	BOT.	SCREEN	RISE	MAN-VALVE	CONDM.	HL.	LATERALS				
1	281+00	345 R.	803	715.8	712.5	718.8	717.5	22	33	7	72.5	13.8	11	17.8		
2	284+00	340 R.	803	713.0	714.0	720.0	724.0	744.0	714.0	44	42.5	7	48	13.9	11	17.8
3	287+00	340 R.	803	713.0	716.0	720.0	718.0			44	42.8	1	76	13.8	11	17.2
4	289+00	330 R.	804	714.8	715.0	748.0	744.5	752.8	718.0	40	47.8	8	87	15.8	11	15.0
5	302+00	330 R.	804	714.0	714.0	758.0	758.0	718.0		40	45.5	1	78	15.6	8	12.0
6	304+00	340 R.	804	714.0	718.0	722.0	768.0	748.0	718.0	44	41.5	5	67	13.5	8	15.0
7	303+00	330 R.	803	714.0	718.0	747.0	743.0	747.0	718.0	24	81.8	13	23	12.8	8	17.5
8	307+00	330 R.	803	714.0	718.0	748.0	748.0	748.0	718.0	40	43.0	18	61	12.5	11	24.0
9	308+00	330 R.	803	714.8	715.0	736.0	732.5	742.0	715.0	40	45.3	17	87.8	14.8	11	24.0
10	309+00	330 R.	803	715.0	718.0	748.0	748.0	748.0	718.0	40	43.5	10.5	53.5	12.5	11	21.0
11	310+00	330 R.	803	715.8	720.0	764.0	760.0	752.0	720.0	38	42.3	24.0	50.7	12.3	11	21.5
12	313+00	330 R.	803	714.8	720.0	778.0	778.0	744.0	744.0	32	48.0	81.0	62.8	12.2	11	21.8
13	313+00	330 R.	803	716.0	718.0	760.0	774.0	744.0	724.0	32	49.5	24.8	47.5	12.5	11	21.5
14	314+00	330 R.	804	719.0	741.0	810.0	777.0	745.0	724.0	28	84.0	24	44.0	12.5	8	12.0
15	317+00	330 R.	803	720.0	724.0	777.0	781.0	748.0	745.0	30	46.0	10.1	60.0	12.0	6	8.3
16	319+00	330 R.	803	721.4	724.0	780.0	784.0	782.0	724.0	44	36.0	13	80.6	12.0	6	8.3
17	322+00	330 R.	803	727.0	728.0	777.0	761.0	748.0	745.0	36	43.3	16	51.6	12.4	8	8.9
18	324+00	330 R.	803	728.0	731.5	772.5	752.5	725.5	741.5	26	34.0	8	55.0	12.4	11	13.5
19	325+00	330 R.	803	727.0	731.0	778.0	771.0	747.0	731.0	24	48.5	21	52.0	12.2	11	20.0
20	327+00	330 R.	803	728.0	734.5	764.5	718.5	742.5	734.5	24	50.0	01.0	82.0	12.3	6	8.3

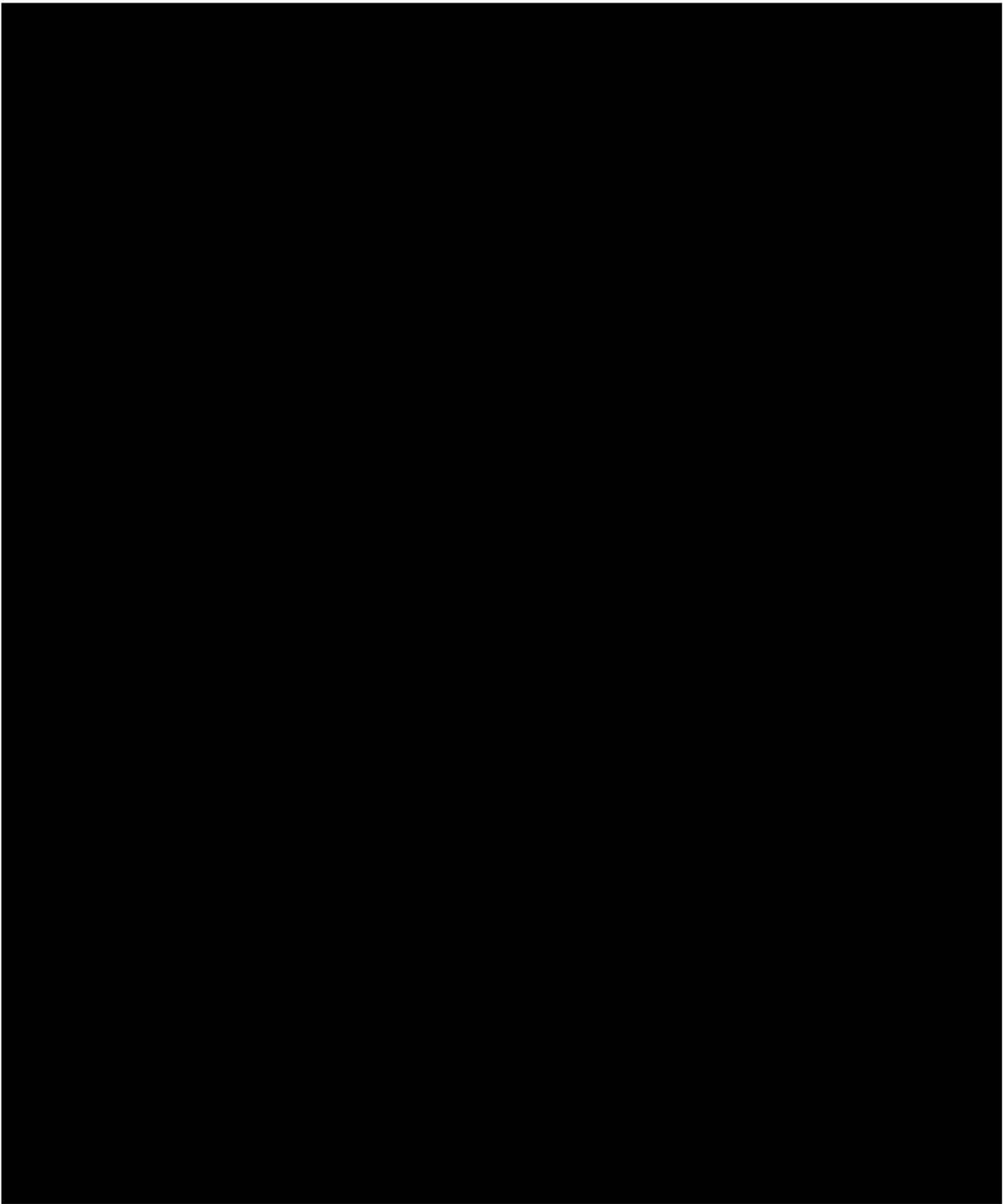
* WELL NO. 10 HAS MIDDLE SECTION OF SCREEN EL. 762.0 TO EL. 761.0
WELL NO. 13 HAS MIDDLE SECTION OF SCREEN EL. 764.0 TO EL. 760.0

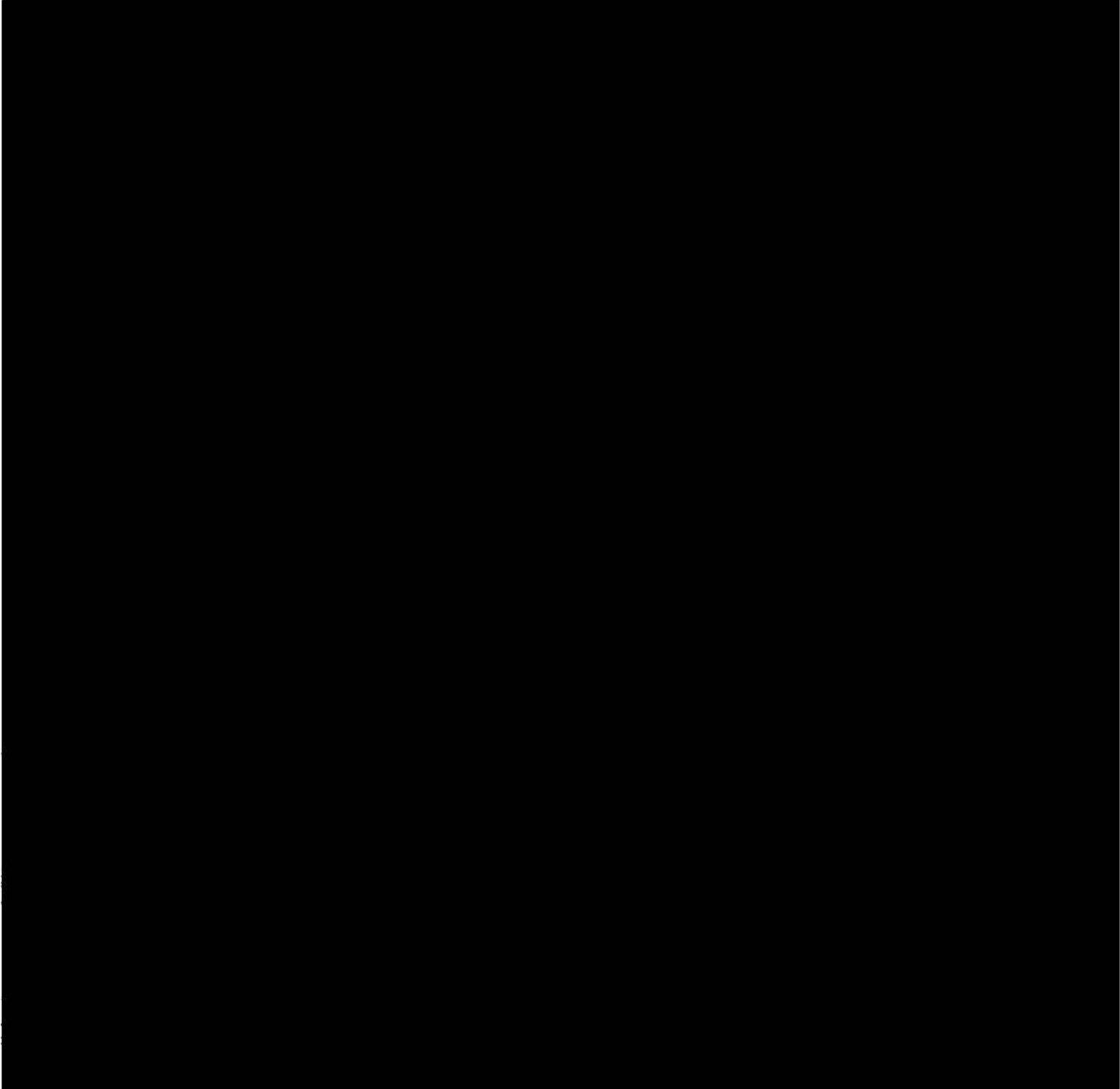
- NOTES:**
1. Details show existing pressure relief wells. Existing pressure relief wells to be abandoned in-place.
 2. Replacement pressure relief wells located the same distance out from the levee but offset 5-feet from the existing pressure relief well.
 3. Replacement pressure relief wells will be 8-inch diameter stainless steel assemblies. Outfall will be similar to the existing details.

MRLS L-455 & R 471-460
FEASIBILITY STUDY

MRLS R 471-460
PRESSURE RELIEF WELLS

SHEET REFERENCE NO. 7





Laipple Farms, Inc.
Route 1

Rosecrans Memorial Airport
100B NW Rosecran Raod




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COURTHOUSE
TROY, KS 66087


KANSAS CHIEF
P.O. BOX 369
TROY, KS 66087-0369


WATHENA TIMES
P.O. BOX 368
WATHENA, KS 66090


MISSOURI BASIN ADVISORY COMMITTEE
JULIAN L. GEIGER, CHAIRPERSON
1128 HALDERMAN STREET
LEAVENWORTH, KS 66048-6634

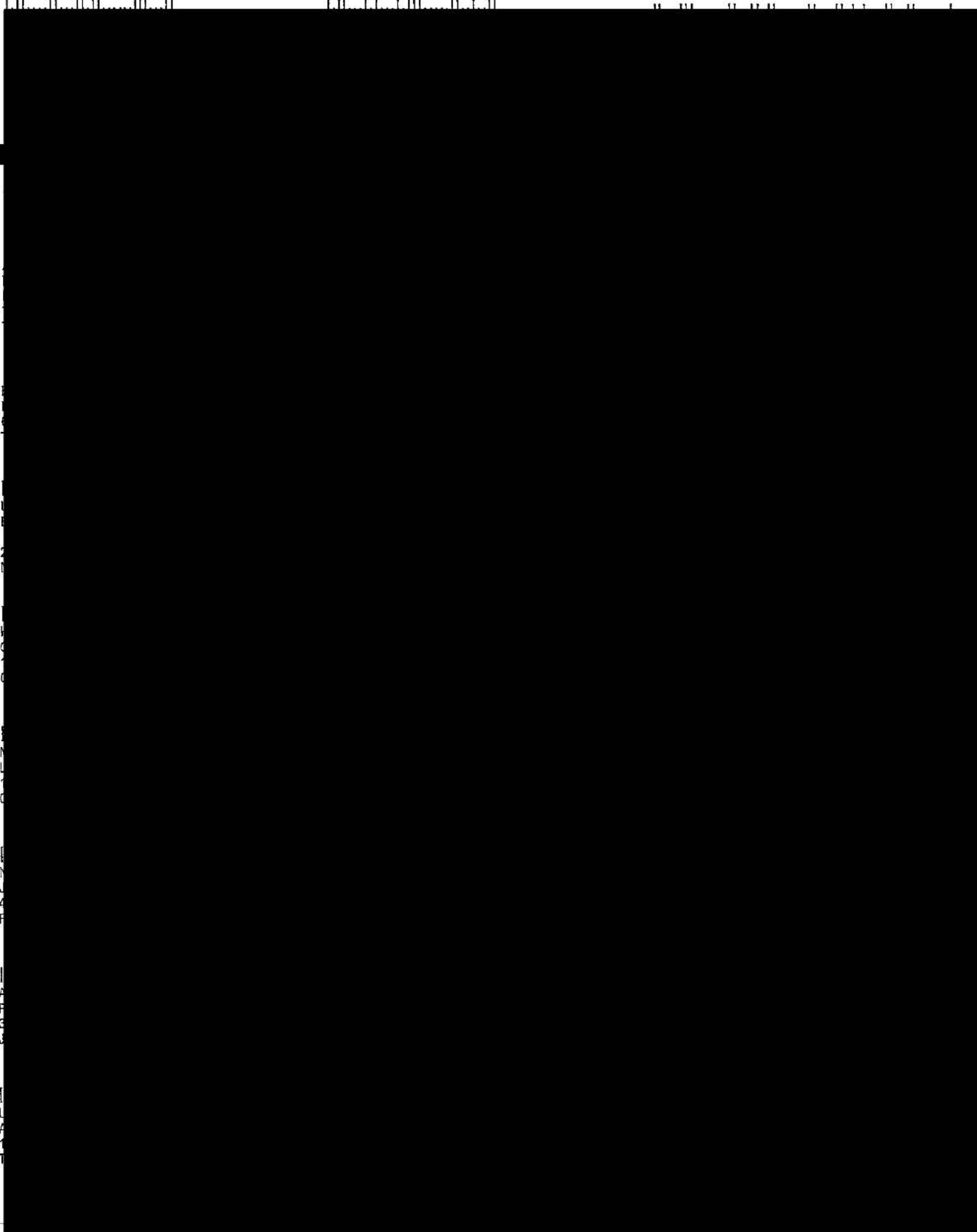
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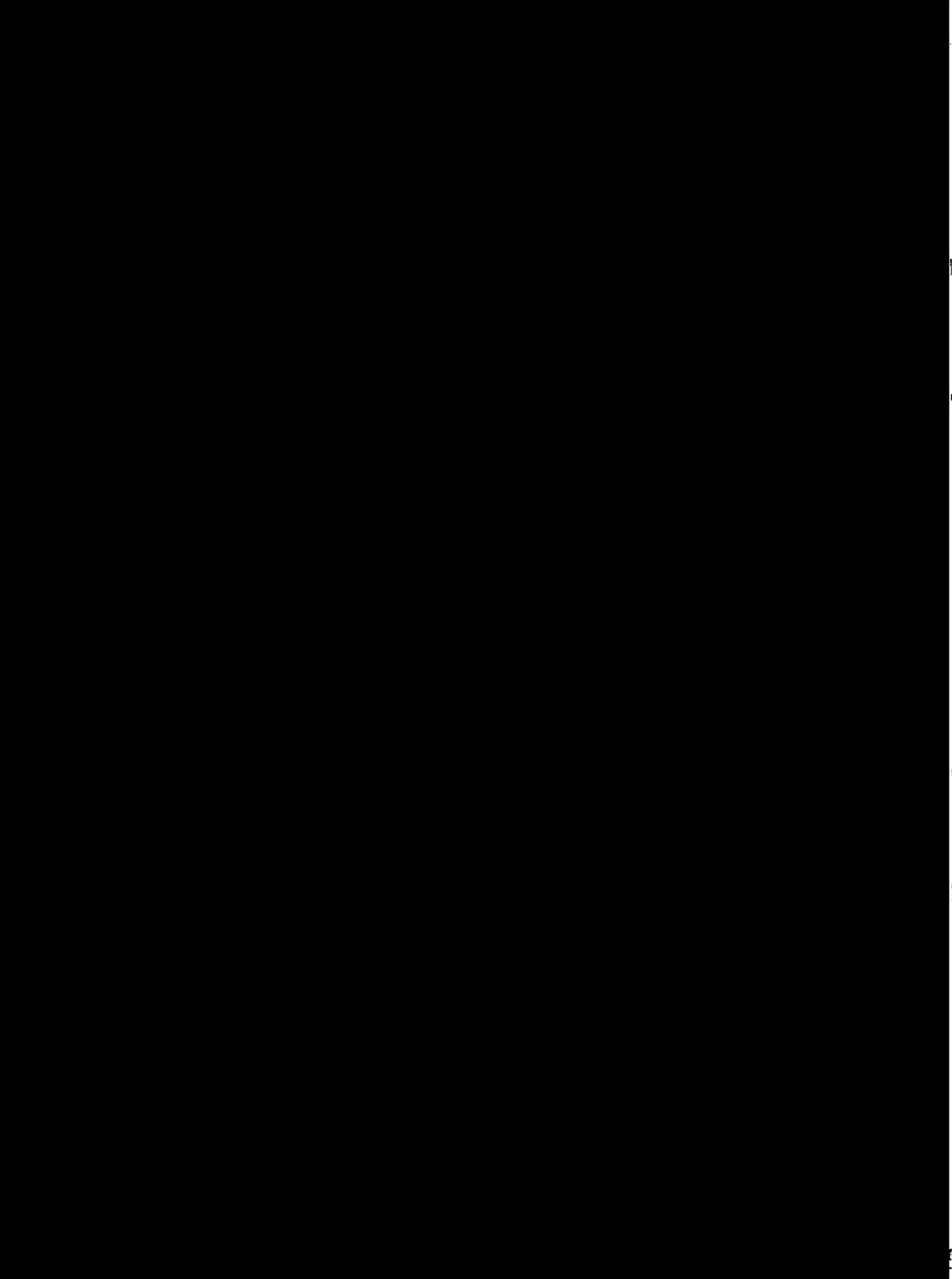
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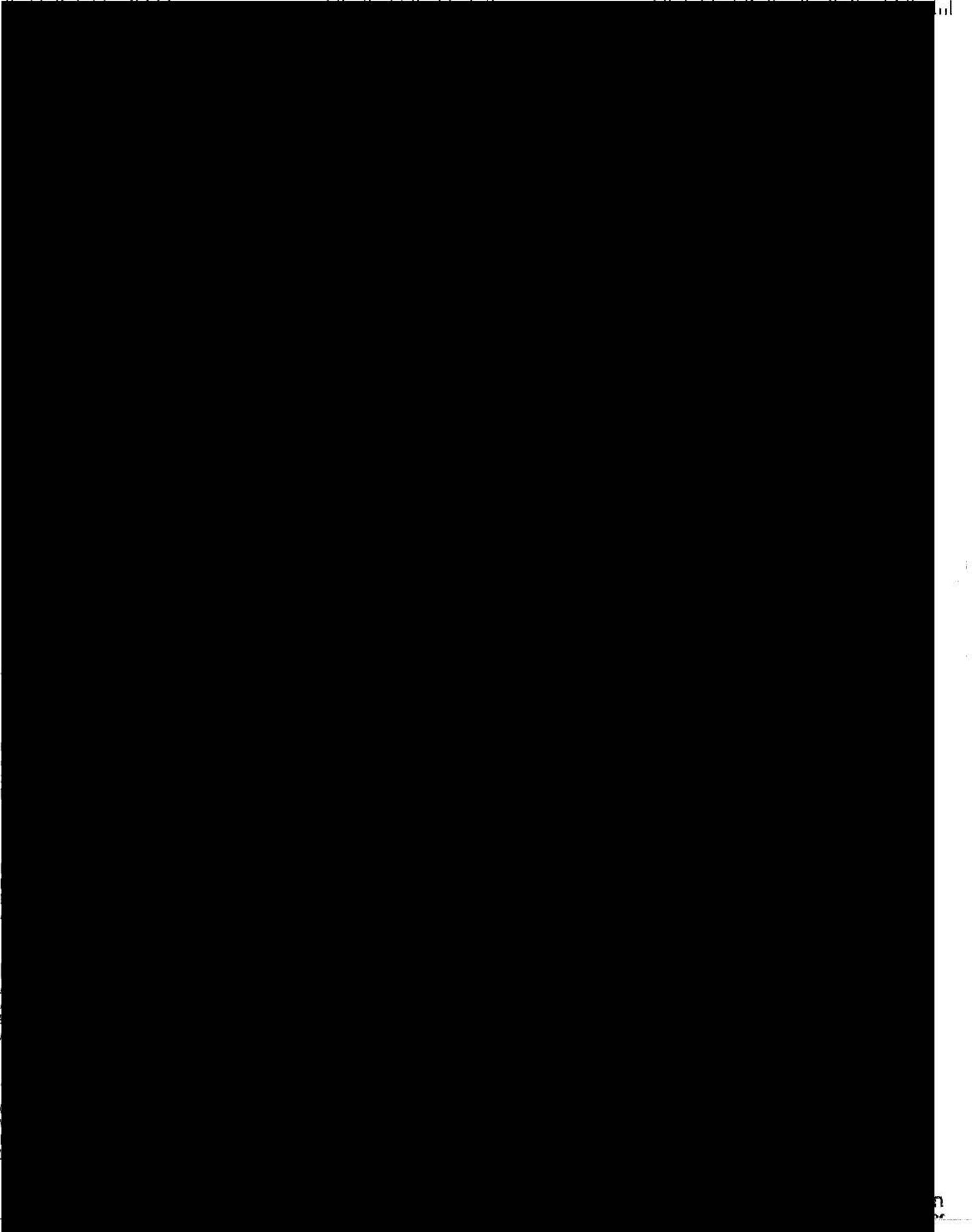


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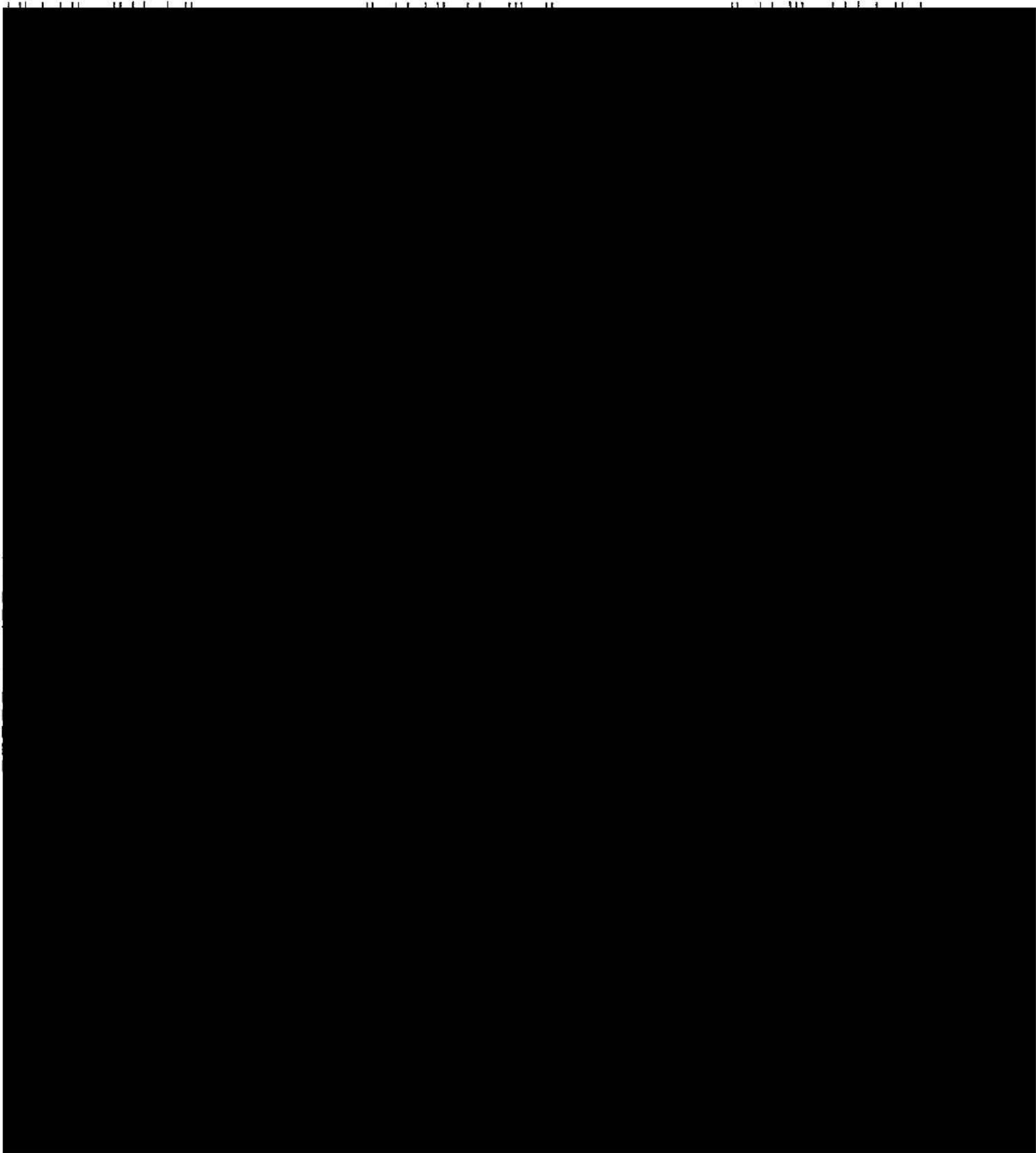
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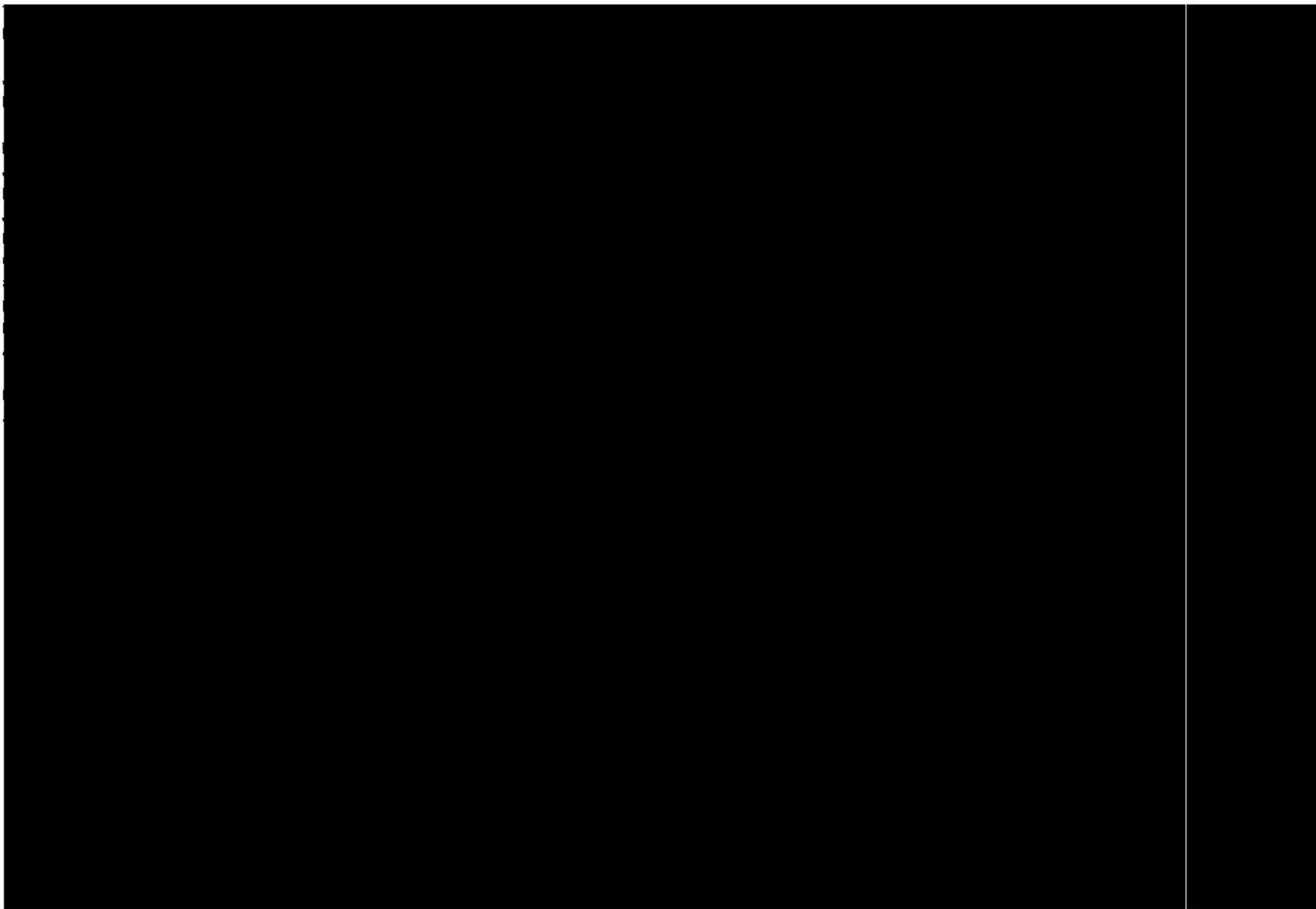


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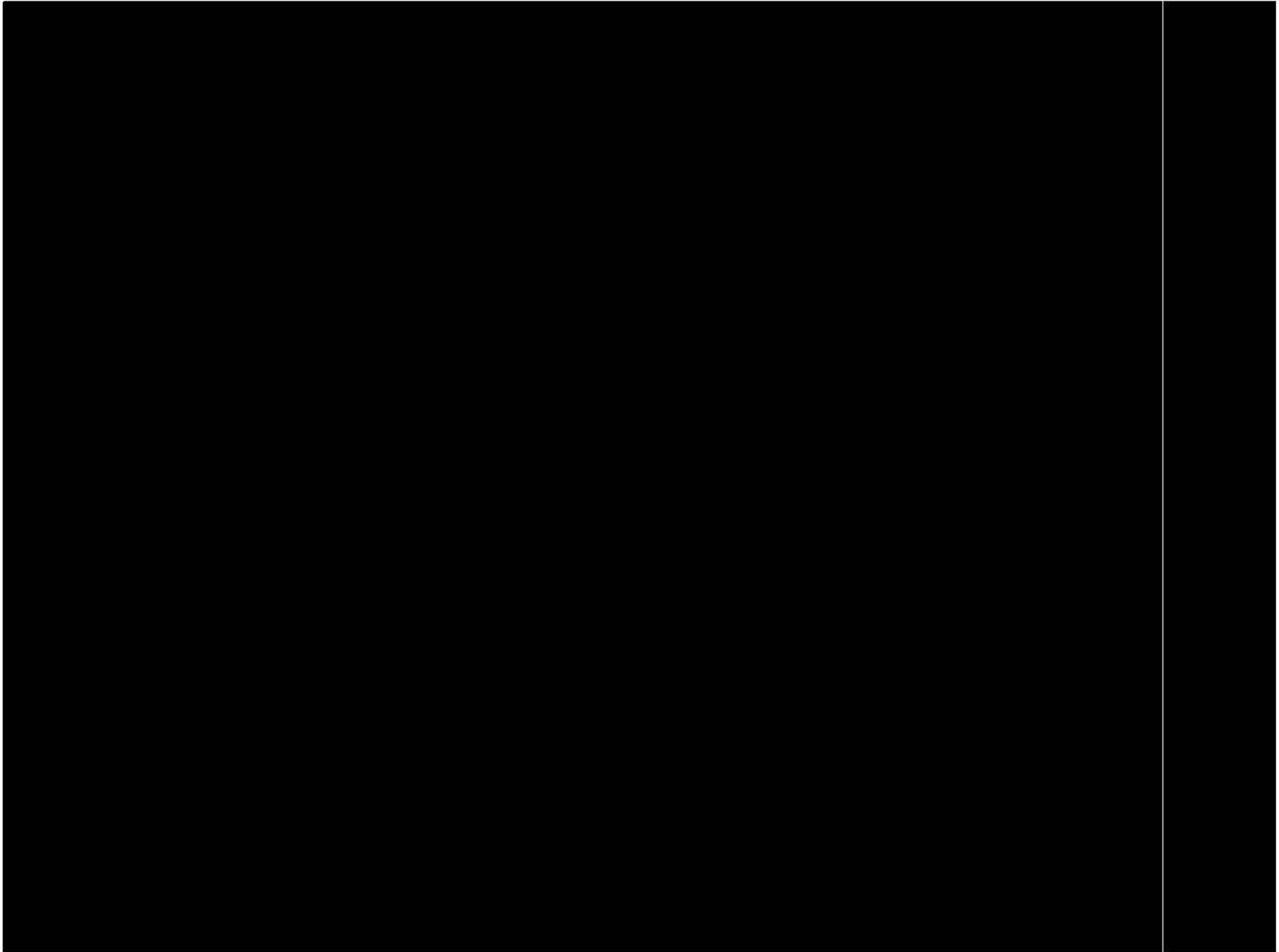


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Contacts



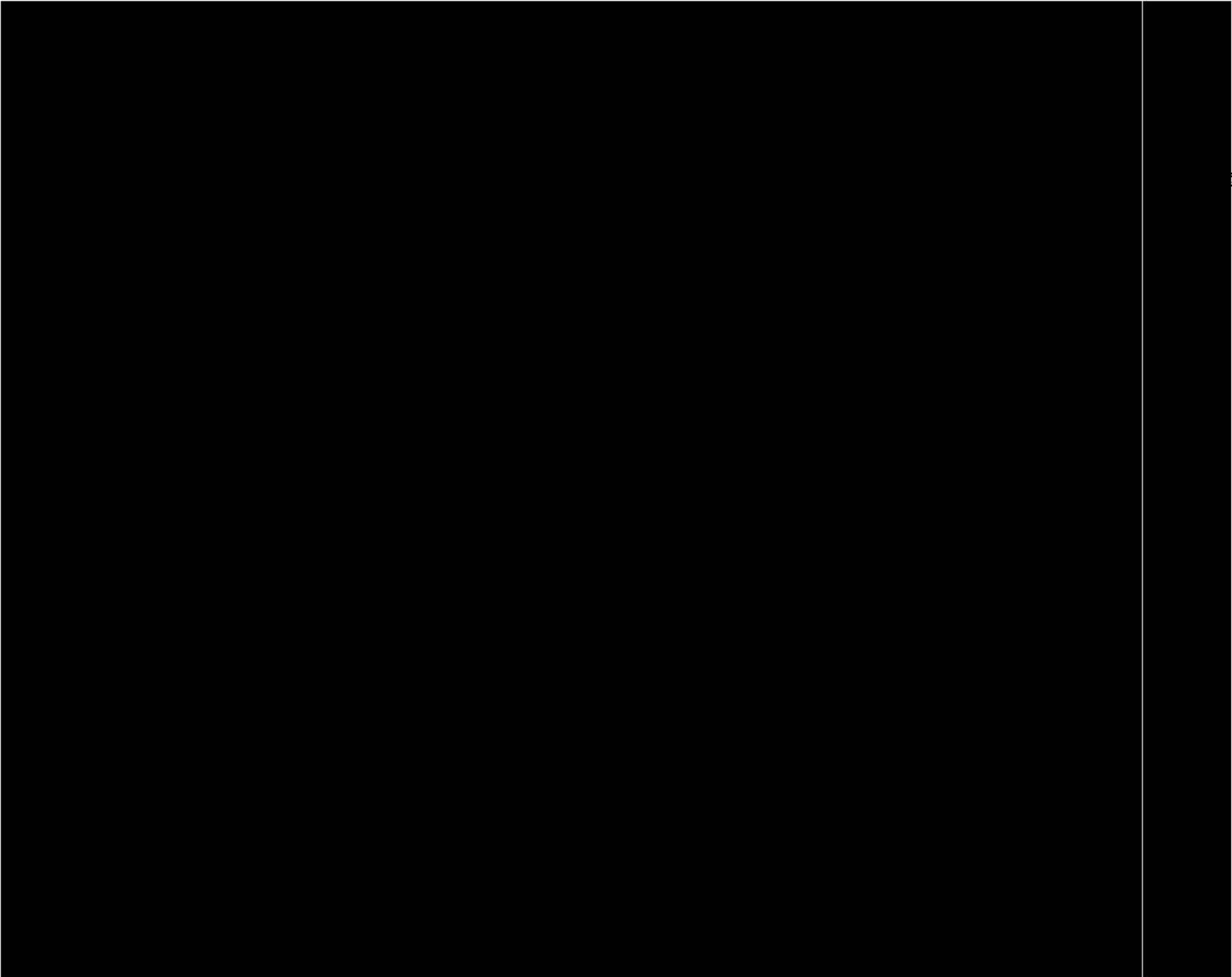
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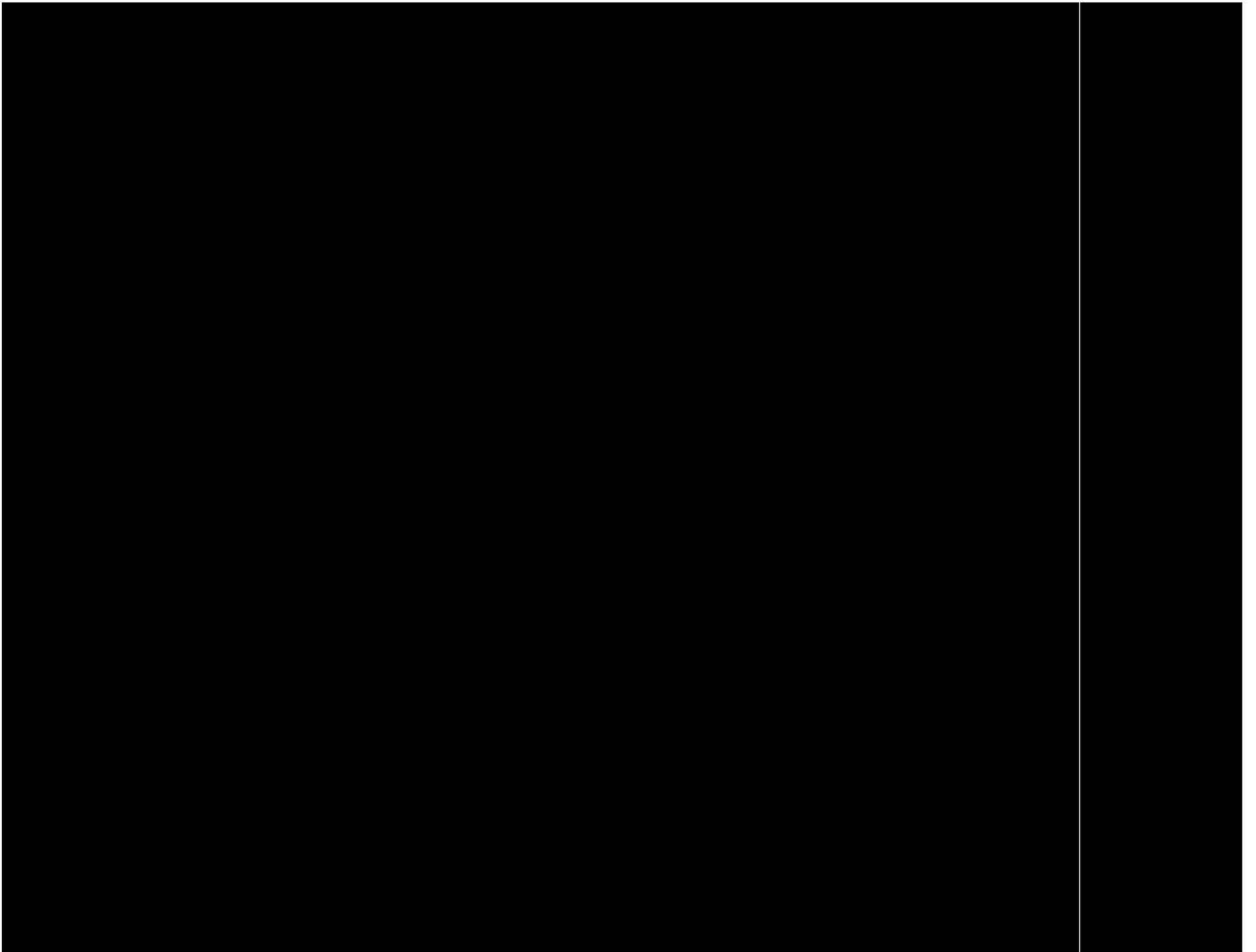
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Missouri River Levee System
Units L-455 and R-471-460
Flood Damage Reduction Study
Kansas and Missouri

Section 404(b)(1) Evaluation

Clean Water Act Section 404(b)(1) authorized the development of guidelines for specification of disposal sites for dredged or fill material by the U.S. Environmental Protection Agency (USEPA) in conjunction with the U.S. Army Corps of Engineers (Corps). The USEPA subsequently developed and adopted the Section 404(b)(1) guidelines in conjunction with the Corps (40 CFR Part 230). The purpose of these guidelines is to "restore and maintain the chemical, physical, and biological integrity of the waters of the United States through the control of discharges of dredged or fill material". This document reviews the compliance of the proposed flood damage reduction alternative for the Missouri River Levee System Units L-455 and R-471-460 with these guidelines.

I. Description of the Flood Damage Reduction Project

Location

The Missouri River Levee System Units L-455 and R-471-460 are located from Missouri River miles 445 to 452 adjacent to Doniphan County, Kansas and Andrew and Buchanan counties, Missouri.

General Description

The Corps, at the request and with the cooperation of the City of St. Joseph, the Elwood-Gladded Drainage District (Right Bank, Kansas), the St. Joseph Airport Drainage District (Right Bank, Missouri), and the South St. Joseph Levee District (Left Bank), the non-Federal sponsors, of the levee units L-455 and R-471-460, has undertaken the Flood Damage Reduction Study, at Kansas and Missouri. This existing levee system protects areas in St. Joseph, Buchanan and Andrew Counties, Missouri and areas in Elwood and Wathena, Doniphan County, Kansas. The purpose of this study is to determine whether one or more plans for increasing the level of flood protection is technically viable, economically feasible, and environmentally acceptable, or if no action is warranted. Failure of any part of the existing flood protection system during a major flood would have substantial adverse impacts on the human environment, including property damage and potential loss of human life. Four alternatives were considered and include: Raise the Right Levee Section using earthen material to the one-hundred year level of flood protection with 90 percent reliability, and a corresponding raise to the Left Levee Section in specific areas to accept the slight rise in water surface elevations resulting from the initial raise (PREFERRED); Raise the Right Levee Section to an Increased Level of Protection (Alternative 2 - 500-year event plus 1.5 feet of freeboard), with a corresponding raise to the Left levee unit; Raise the Right Levee Section to a Further Increased Level of Protection (Alternative 3 - 500-year event plus 3.0 feet of

freeboard), with a corresponding raise to the Left levee unit, and the "No Action" Alternative.

Detailed descriptions of each alternative are provided in Chapter 2 of The Missouri River Levee System Units L-455 and R-471-460 Flood Damage Reduction Study EA.

Site construction activities that would be subject to regulation under Section 404 of the Clean Water Act include:

- obtaining borrow material from lands riverward of the existing levee, and
- placing fill material on the Flood Damage Reduction site in jurisdictional waters during construction of the increased levee and seepage berms.

Authority and Purpose

This study is being conducted under the authority provided by Section 216 of the 1970 Flood Control Act. This Act provides authority to reexamine completed civil works projects. Section 216 reads as follows:

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

Section 216 of the 1970 Flood Control Act provided continuing authority to examine completed Federal projects to determine whether the projects are providing benefits as intended. The results of this examination indicate that raising the level of protection provided by the St. Joseph levee unit system may be technically and economically feasible without unacceptable environmental or social impacts. Accordingly, a Federal interest exists in designing and constructing improvements because of the potential to benefit the National economy.

Purpose: The purpose of the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Project in Kansas and Missouri is to restore the reliability of the units to reduce damages from potential flooding on the Missouri River in the vicinity of St. Joseph, Missouri, in order to provide for re-certification of the levees by the Federal Emergency Management Agency (FEMA).

Need: The need of the Missouri River Levee System Units L-455 and R471-460 Flood Damage Reduction Project in Kansas and Missouri is restore the reliability of the units to reduce damages from potential flooding on the Missouri River in the vicinity of St. Joseph, Missouri because this level is lacking, and to allow FEMA to re-certify the

levee. If the levee remains de-certified, the economic impact of a flood event will be borne entirely by the local communities.

General Description of Dredged or Fill Material

(1) The existing levee will require grading for the purpose of reshaping and preparing the initial levee slope. The existing levee is composed primarily of fill material that was borrowed from accreted lands adjacent to the project area when the levee was originally built. The existing material contains a mixture of sand, silts and clays with varying content of organic materials. The proposed levee raise and seepage berm extensions will be composed of similar materials. Fill will be obtained from adjacent accreted lands that, in some instances, may be the same borrow areas previously used.

(2) The approximate quantity of fill material proposed for construction of the flood damage reduction project includes approximately 1,882,445 bank cubic yards.

(3) The source of the fill material will be borrowed from accreted land riverward of the existing levees in both Kansas and Missouri. For Kansas, two borrow areas have been identified and are located at approximately river miles 454.9 to 451.9 and river miles 446.7 to 443.4. For Missouri, one borrow area has been identified and is located at approximately river miles 442.6 to 442.9.

Description of the Proposed Discharge Site

(1) Location. Borrow soils would be placed within the floodplain of the Missouri River on levee units R-471-460 and L-455 between River Miles 437 and 457 to facilitate an earthen levee raise and the construction of underseepage control measures. Wetland determinations conducted by Corps personnel revealed that approximately 4.9 acres of forested and emergent wetlands would be filled as a result of the levee footprint expansion. See Appendix B of the EA for project location maps, borrow site areas, and accreted land surveys.

(2) Size. The proposed borrow areas include approximately 1,304 acres of land in Kansas: located riverward of the existing levee at river miles 454.9 to 451.9 and river miles 442.6 to 442.9. Additionally, a lesser area of approximately 30 acres of land in Missouri is located at river miles 442.6 to 442.9. These areas represent the total borrow areas and not the total amount of borrow to be obtained.

(3) Type of Site/Habitat. The proposed project site consists of an existing levee with strips of upland grassland and small amounts of deciduous trees. The borrow areas for the proposed project site consists of accreted lands containing secondary willow and cottonwood tree growth, shrubland vegetation, and manmade emergent wetlands. During construction of the flood damage reduction project, some emergent wetlands will be eliminated due to fill. Obtaining borrow material will be conducted in a manner as to reduce impacts on the area. Such minimization measures will include, but not be limited to, shallow scrapes and reshaping along existing wetland areas to increase their functions, deeper diggings (eight to ten feet) in areas where trees and shrubs occur to reduce acreage impacted to these vegetation types, and ensuring a minimum of two feet of blanket material (capable of retaining water) is left in place to ensure the areas function as

wetlands. Please see Section 4.4.3 of the EA for a complete description of the affects to wetland areas.

(4) Timing and Duration. Timing and duration of construction and borrow operations will be determined after final plans and specifications are made.

Description of Disposal Method

The disposal method will be as necessary for construction of each project element.

II. Factual Determinations

The 404(b)(1) guidelines (40 CFR Part 230, Subpart B, Section 230.11) require the determination in writing of the potential short-term and long-term affects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment. These factual determinations are presented below.

Physical Substrate Determinations

(1) Substrate Elevation and Slope. The bottom surface elevation of the borrow sites will be irregular to create greater diversity and habitat. The borrow excavation from area sites will result in depths which will be dependant on results from test pits dug to determine initial thickness of usable material. A minimum of approximately two feet of blanket material (soil capable of retaining water) will then be left in place to ensure wetland functions are obtained after the fill material has been excavated.

(2) Type of Fill Material. Fill material will consist of a mixture of sand, silts and clays with varying content of organic materials.

(3) Dredge/Fill Material Movement. The fill material will be stabilized on the levee and seepage berms and should not be subject to erosion.

(4) Physical Effects on Benthos. Benthic organisms may be displaced during construction activities.

Water Circulation, Fluctuation, and Salinity Determination

(1) Water Column Effects. Standing water and soils periodically inundated will be permanently and temporarily impacted during and following construction. Turbidity and erosion will be controlled during and following construction.

(2) Current Patterns and Circulation. Construction of the Flood Damage Reduction project will have minimal and temporary construction related impacts on the current hydrologic circulation patterns.

(3) Normal Water Level Fluctuation and Salinity Gradients. Surface and ground water levels will be minimally affected during construction. Salinity levels will not be affected by the proposed project.

Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There may be a temporary increase in turbidity levels in the project area during construction. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity will not be exceeded.

(2) Effects on the Chemical and Physical Properties of the Water Column. There may be temporary impacts to the chemical and physical properties of nearby waters during construction activities. Borrow material will be dug and placed using traditional construction equipment (bull dozers, track-hoes, bobcats, etc). There are no acute or chronic chemical impacts anticipated as a result of construction. An environmental protection plan, prepared during detailed design, will address concerns regarding monitoring of equipment, maintenance and security of fuels, lubricants etc.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the construction area. This effect will be temporary, limited to the immediate area of construction, and will have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released by the project.

(d) Aesthetics. The aesthetic quality of the water in the immediate area of the project may be temporarily affected by turbidity during construction. This will be a short-term and localized condition.

(3) Effects to Biota.

(a) Primary Productivity and Photosynthesis. Impacts on primary production within approximately 5.0 acres of impacted wetland areas will be minimized through on-site mitigation of similar habitat.

(b) Suspension/Filter Feeders. An increase in turbidity from construction related progress could adversely impact burrowing invertebrate filter feeders within and adjacent to the immediate construction area. It is not expected that a short-term, temporary increase in turbidity will have any long-term negative impact on these highly fecund organisms.

(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

Contaminant Determinations

Material which will be obtained from the borrow sites will not introduce, relocate, or increase contaminants at the fill area.

Aquatic Ecosystem and Organism Determination

(1) Effects to Plankton. No adverse impacts on autotrophic or heterotrophic organisms are anticipated.

(2) Effects on Benthos. No adverse impacts to benthic organisms are anticipated.

(3) Effects on the Aquatic Food Web. No adverse impacts on aquatic organisms are anticipated. There is expected to be a relatively minor temporary effect on the aquatic food web due to construction activities. Wetlands impacted on the landside of the levee, and those filled on the river side of the levee, will be mitigated on-site and in-kind in order to maintain their functional values.

(4) Effects on Special Aquatic Sites. A total of approximately 4.9 acres of wetlands will be permanently lost within the project area due to fill, reconstruction of levee slopes, and associated levee maintenance. However, minimization measures to reduce impacts have been incorporated into construction plans; thus, the impacts have been off-set.

(5) Endangered and Threatened Species. There will be no significant adverse impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Some minor impacts to endangered and threatened species may occur during construction but will be reduced or avoided through timing restrictions. While some existing habitat will be lost as a result of obtaining borrow, re-establishment of this habitat will occur in the long-term. Refer to Section 4.4.4 of the Draft EA for measures that will be implemented to protect endangered and threatened species.

(6) Other Wildlife. No adverse long-term impacts to small foraging mammals, reptiles, birds, or wildlife in general are expected.

(7) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions are discussed in the Draft EA.

Proposed Disposal Site Determinations

(1) Determination of Compliance with Applicable Water Quality Standards. All State permits will be obtained prior to construction activities and coordination with Missouri Department of Natural Resources will ensure Section 401 – Water Quality Certification and Section 402 – National Pollution Discharge Elimination System Storm Water Discharge Permits have been obtained.

(2) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Recreational and commercial fisheries would not be impacted by the implementation of the project.

(c) Water Related Recreation. Water related recreation in the immediate vicinity of construction will likely be impacted during construction activities. This will be a short-term impact.

(d) Aesthetics. The existing environmental setting may be impacted during construction. Construction activities cause a temporary increase in noise and air pollution from equipment as well as some temporary increase in turbidity. These impacts are not expected to adversely affect the aesthetic resources over the long term and once construction ends, conditions will return to pre-project levels. Trees removed landward of the levee will be replaced.

(e) Determination of Cumulative Effects on the Aquatic Ecosystem.

There will be no cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of the placement of fill at the project site.

(f) Determination of Secondary Effects on the Aquatic Ecosystem. There will be no secondary impacts on the aquatic ecosystem as a result of the construction.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge

The 404(b)(1) guidelines (40 CFR Part 230, Subpart B, Section 230.12) require written findings as to whether the proposed disposal site for the discharge of dredged or fill material:

- complies with the 404(b)(1) guidelines;
- complies with the 404(b)(1) guidelines with inclusion of appropriate and practical discharge conditions to minimize pollution or adverse effects to the affected aquatic ecosystems; or
- does not comply with the 404(b)(1) guideline requirement.

These findings are presented below.

Finding 1 – Adaptation of the 404(b)(1) Guidelines

No significant adaptations of the guidelines were made relative to this evaluation.

Finding 2 – Other Practicable Alternatives with Less Adverse Impact on Aquatic Ecosystems

No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

Finding 3 – Inclusion of Conditions to Minimize Pollution and/or Adverse Effects to the Affected Aquatic Ecosystems

As described in the Draft EA, mitigation is proposed to minimize pollution, loss of wetland habitat, and adverse effect on the existing aquatic ecosystem in, and adjacent to, the Missouri River. On-site aquatic habitat will be lost, but will be replaced by in-kind habitat on-site. Mitigation measures relevant to reducing these effects are discussed in Chapter 4 of the Draft EA.

Finding 4 – State Water Quality Standards

The discharge of fill materials will not cause or contribute to violations of any applicable State water quality standards. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

Finding 5 – Endangered and Threatened Species

The placement of fill materials for implementation of the proposed project will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

Finding 6 – Significant Degradation of U.S. Waters

The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

Finding 7 – Compliance Conclusion

Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action. Turbidity will be monitored so that if levels exceed State water quality standards, the contractor will be required to cease work until conditions return to normal. On the basis of the guidelines, the proposed fill of wetlands are specified as complying with the requirements of these guidelines. The discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines and is considered the least environmentally damaging practicable alternative.

US Army Corps of Engineers, Kansas City District



APPENDIX H

Cultural Resource

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Draft Environmental Impact Statement**



KANSAS

KSR&C No. 01-10-172

Kansas State Historical Society
Jennie Chinn, Executive Director

KATHLEEN SEBELIUS, GOVERNOR

March 23, 2006

Timothy Meade
Cultural Resource Manager
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: Levee Construction Along the Missouri River
Doniphan County

Dear Mr. Meade:

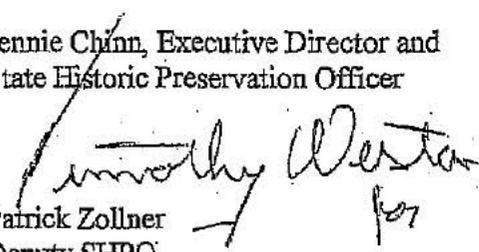
In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed your letter describing plans to raise Missouri River Levee System Units L-455 and R-471 - 460 in Doniphan County, Kansas. In addition, we have reviewed previous correspondence related to the project (KSR&C #01-10-172). Given the factors outlined in your letter, we concur with the conclusion that the proposed project will have no effect on historic properties as defined in 36 CFR 800. This office has no objection to the project.

Any changes to the project, which include additional ground disturbing activities, will need to be reviewed by this office prior to beginning construction. If construction work uncovers buried archeological materials, work should cease in the area of the discovery and this office should be notified immediately.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214).

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer


Patrick Zollner
Deputy SHPO



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896
October 23, 2001

REPLY TO
ATTENTION OF:

Environmental Resources Section
Planning Branch

Dr. Ramon S. Powers
State Historic Preservation Officer
Attention: Mr. Will Banks
Kansas State Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Dear Dr. Powers:

The U.S. Army Corps of Engineers, Kansas City District, is conducting a Feasibility Study of flood damage reduction measures for property currently afforded flood protection by the Missouri River Levee System (MRLS) Unit R 471-460. MRLS R 471-460 is in Doniphan County, Kansas and Buchanan County, Missouri.

The Feasibility Study will determine the existing level of flood protection as well as possible flood damage reduction measures beyond what currently exists. Flood damage reduction measures may include reinforcing the existing structures, raising the existing levee with earth fill or floodwalls with a corresponding rise of appurtenances, and/or development of contingency plans. Following the Feasibility Study, plans and specifications will be prepared for the measures recommended. Land alterations would depend on the selected alternative and these alterations could occur anywhere along the existing levee. Land disturbance could include the placement of fill material landward and/or riverward of the existing levee, construction of access roads, and excavation for borrow materials. Borrow activities could occur riverward or landward in the immediate vicinity of the levee, however, the locations of the borrow areas have not been determined at this time. Coordination with Federal, State, and local agencies as well as the public is required prior to a making a decision on implementation of any of the study alternatives.

In 1996, HDR Engineering Inc., under contract to the Corps of Engineers, conducted a literature/background investigation of prehistoric and historic sites for the document *Reconnaissance Report Missouri River Levee System Units L-455 and R-460-471*. This included consultation with your office. HDR Engineering Inc. found no sites within the same general locale designated for the Feasibility Study area. The limits of the present Feasibility Study area have not been specifically defined, but no disturbance is anticipated to be near any site locations listed in the 1996 report (enclosed). We are requesting an update from your office to advise if any additional sites have been recorded in the Feasibility Study area since the 1996 archeological investigation was completed.

The following maps and aerial mosaic were examined to determine the extent of accreted and disturbed lands in the Feasibility Study area:

- a. Abandoned Shipwrecks on Missouri River and Channel Maps of 1879 and 1954, Sheet 11;
- b. Missouri River Commission Map of 1893;
- c. Missouri River, Kansas City to Sioux City, Revisions from Airplane, October 8 & 14, 1926; and
- d. Aerial Photographic Mosaic of MRLS R 471-460 (flown in 2000).

These maps and mosaic demonstrate Missouri River Channel meanders and sand deposits, levee/other construction, and development that have covered most of the Feasibility Study area. Enclosed for your review are transparencies and hard copies of: the MRLS R 471-460 Levee Feasibility Study area (marked in red) in Kansas and the Missouri River channel maps (that can be overlain aligned on the bluffs) to show the levee alignment and former channels that are now accreted lands.

At this early stage of the Feasibility Study, we are planning to conduct an intensive archeological survey of non-accreted lands and any accreted lands with recorded cultural resources. However, archeological surveys are not proposed for: accreted lands formed by deposits of modern alluvium; a non-accreted area surveyed during the 1993 flood event (enclosed); heavily timbered mature stands that will not be land altered; and lands disturbed by past levee construction or other development.

Only two portions of the Feasibility Study area are non-accreted. There is only one small portion unaffected by the above conditions. Enclosures 3 and 4 are highlighted to show the areas that we propose to survey.

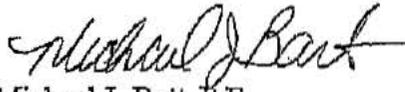
The 2000 aerial mosaic, sent under separate cover, indicates disturbance in the southernmost section of the proposed archeological survey area still evident from a levee break during the 1993 flood event. An archeological survey would confirm the degree of disturbance in this area. The mosaic also shows that the other non-accreted portion of the study area, between the Highway 36 and railroad bridges east of Elwood, Kansas, was severely disturbed by development and does not require survey.

The Abandoned Shipwrecks map indicates four possible locations of sunken vessels, the *Dan Converse*, *Watosa*, *Jennie* and *Arethusa*, in the vicinity of the Feasibility Study area. The exact locations of wrecks are unknown because they are deeply buried at least 15 or more feet below ground surface. Any proposed borrow activities would be limited in depth to avoid affecting buried shipwrecks.

In addition to asking for updated site information, the Kansas City District is requesting your concurrence that the area proposed for archeological survey is sufficient and that the remainder of the Feasibility Study area requires no field investigation.

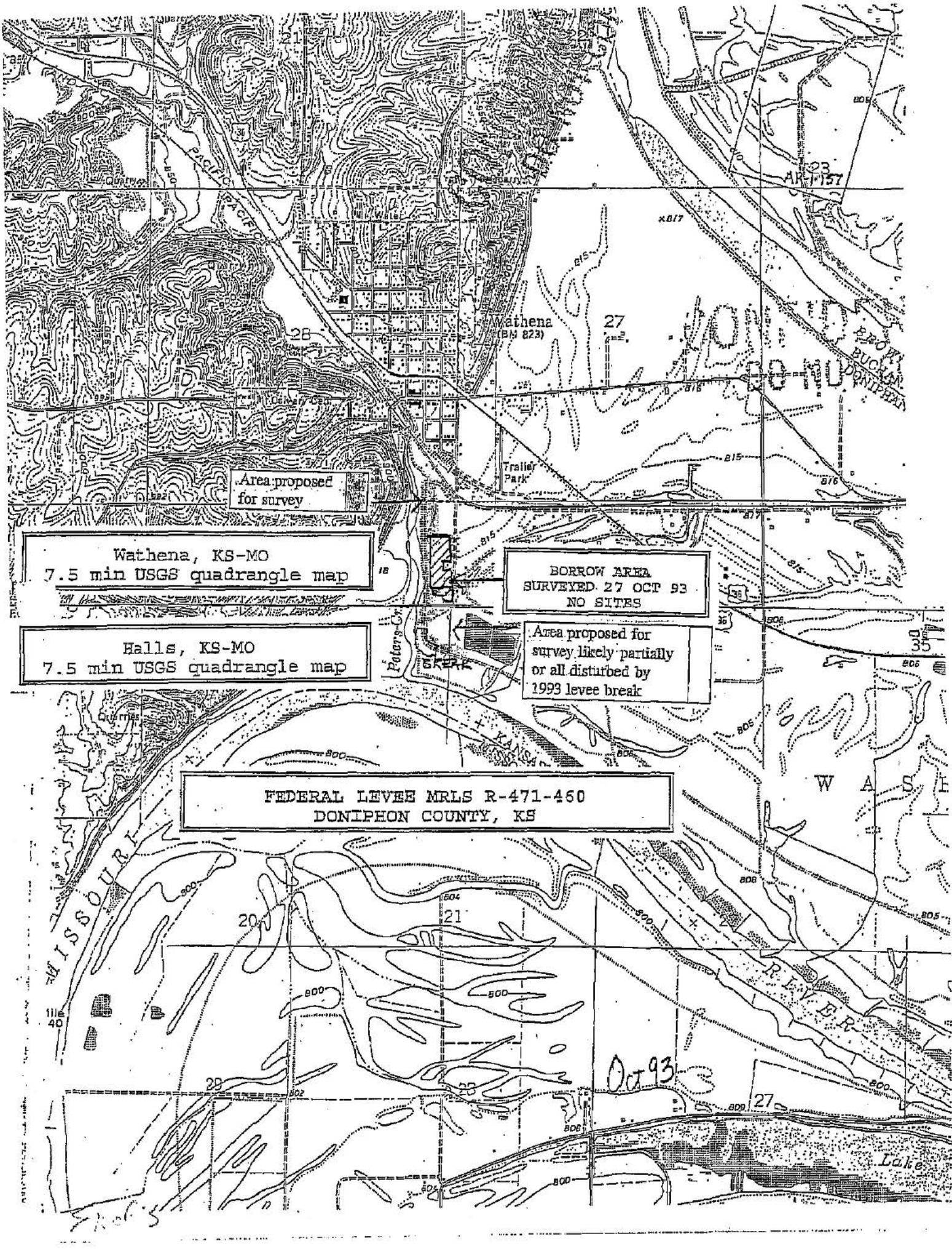
Your comments are requested by November 26, 2001. If you have any questions, please contact Ms. Mary Lucido, of my staff, at [REDACTED]

Sincerely,



Michael J. Batt, P.E.
Chief, Planning Branch

Enclosures



Area proposed for survey

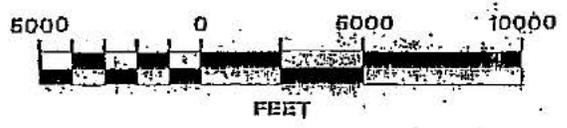
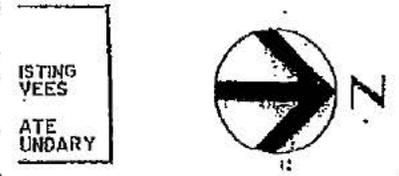
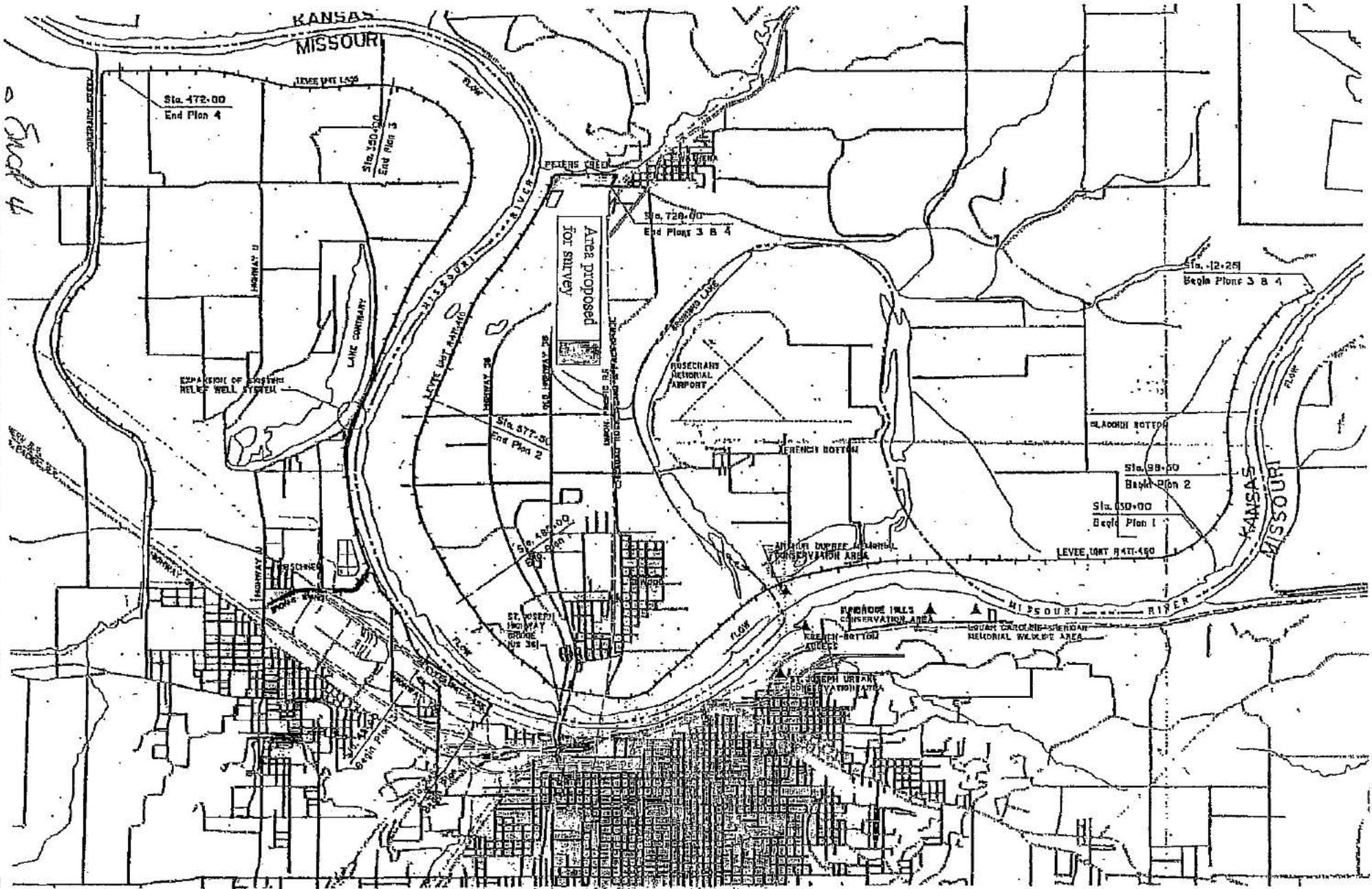
BORROW AREA SURVEYED 27 OCT 93 NO SITES

Halls, KS-MO 7.5 min USGS quadrangle map

Area proposed for survey likely partially or all disturbed by 1993 levee break

FEDERAL LEVEE MRLS R-471-460 DONIPHON COUNTY, KS

Oct 93



EXISTING VEES
ATE UNDIARY

HDR

HDR Engineering, Inc.

Location Of Plans For Levee Raise Units R471-460 And L455 And O Expansion Of Relief Well System.



C.O.E. ST. JOSEPH LEVEE STUDY
U.S.A.C.E. Contract DACW41-95-C-0062
HDR Project 102285-008-133

CULTURAL RESOURCE ASSESSMENT
Section 106 Review

CONTACT PERSON/ADDRESS

C:

Michael J. Bart, P.E.
Chief, Planning Branch
Corps of Engineers, Kansas City District
700 Federal Building
Kansas City, Missouri 64108-2898

John Madras, DNR/WPSC
Mary Lucido, COE/KC

PROJECT:

MRLS L-455 & R 471-460

FEDERAL AGENCY

COE

COUNTY:

BUCHANAN

The State Historic Preservation Office has reviewed the information submitted on the above referenced project. Based on this review, we have made the following determination:



After review of initial submission, the project area has a low potential for the occurrence of cultural resources. A cultural resource survey, therefore, is not warranted.



Adequate documentation has been provided (36 CFR Section 800.11). There will be "no historic properties affected" by the current project.

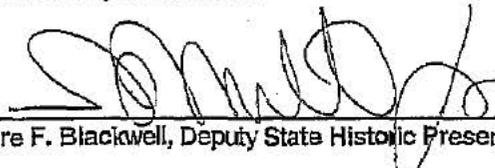


An adequate cultural resource survey of the project area has been previously conducted. It has been determined that for the proposed undertaking there will be "no historic properties affected".



The proposed undertaking will have "no adverse effect" on properties listed on or determined eligible for listing in the National Register of Historic Places.

For the above checked reason, the State Historic Preservation Office 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: 
Claire F. Blackwell, Deputy State Historic Preservation Officer

November 6, 2001
Date

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
P.O. Box 176, Jefferson City, Missouri 65102

For additional information, please contact Judith Deel, (573) 751-7862. Please be sure to refer to the project number:
010-BN-02



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896
October 30, 2001

REPLY TO
ATTENTION OF:

Environmental Resources Section
Planning Branch

Ms. Claire Blackwell
Deputy State Historic Preservation Officer
Attention: Ms. Judith Deel
Department of Natural Resources
P. O. Box 176
Jefferson City, Missouri 65102-0176

Dear Ms. Blackwell:

The U.S. Army Corps of Engineers, Kansas City District is conducting a Feasibility Study of flood damage reduction measures for property currently afforded flood protection by the Missouri River Levee System (MRLS) Units L-455 and R 471-460. MRLS L-455 is in Buchanan County, Missouri and MRLS R 471-460 is in Buchanan County, Missouri and Doniphan County, Kansas. A relatively short reach of MRLS R 471-460 is located in Missouri and will be addressed in this correspondence. The remainder of MRLS R 471-460 is located in Kansas and will be addressed in correspondence to that State Historic Preservation Officer.

The Feasibility Study will determine the existing level of flood protection as well as possible flood damage reduction measures beyond what currently exists. Flood damage reduction measures may include reinforcing the existing structures, raising the existing levees with earth fill or floodwalls with a corresponding rise of appurtenances, and/or development of contingency plans. Following the Feasibility Study, plans and specifications will be prepared for the measures recommended. Land alterations would depend on the selected alternative and these alterations could occur anywhere along the existing levees. Land disturbance could include the placement of fill material landward and/or riverward of the existing levees, construction of access roads, and excavation for borrow materials. Borrow activities could occur riverward or landward in the immediate vicinity of the levees, however, the locations of the borrow areas have not been determined at this time. Coordination with Federal, State, and local agencies as well as the public is required prior to a making a decision on implementation of any of the study alternatives.

In 1996, HDR Engineering, Inc., under contract to the Corps of Engineers, conducted a literature/background investigation of prehistoric and historic sites for the document *Reconnaissance Report Missouri River Levee System Units L-455 and R-460-471*. This included consultation with your office. HDR Engineering, Inc. found no sites within the same general locale designated for the Feasibility Study area. The limits of the present Feasibility Study area have not been specifically defined, but no disturbance is anticipated to be near any site locations listed in the 1996 report (enclosed). An October 5, 2001 files search with the Archaeological

Survey of Missouri revealed no additional sites were recorded in the vicinity of the Feasibility Study area since the 1996 archeological investigation was completed.

The following maps and aerial mosaics were examined to determine the extent of accreted and disturbed lands in the Feasibility Study area:

- a. Abandoned Shipwrecks on Missouri River and Channel Maps of 1879 and 1954, Sheet 11;
- b. Missouri River Commission Map of 1893;
- c. Missouri River, Kansas City to Sioux City, Revisions from Airplane, October 8 & 14, 1926; and
- d. Aerial Photographic Mosaics of the entire MRLS L-455 levee and sections of non-accreted lands along L-455 (flown in 1997 [black and white] and in 2000 [color]) and R 471-460 (flown in 2000 [color]).

These maps and mosaics demonstrate Missouri River Channel meanders and sand deposits, levee/other construction, and development that have covered most of the Feasibility Study area. Enclosed for your review are transparencies and hard copies of: the MRLS L-455 and R 471-460 Levees Feasibility Study areas (marked in red) in Missouri and the Missouri River channel maps (that can be overlain aligned on the bluffs and railroad tracks) to show the levee alignments and former channels that are now accreted lands.

At this early stage of the Feasibility Study, we are proposing to conduct an intensive archeological survey along specific sections of MRLS L-455, but no portion of MRLS R 471-460 in Missouri. The 1951 flood altered the river alignment by cutting a channel near the present location of MRLS R 471-460 in Missouri. Although this portion of the Feasibility Study area is comprised of non-accreted land, it was extensively disturbed by construction to stabilize the channel cut-off created in 1951 and build the adjacent levee to such an extent that additional disturbance would not impact any historic properties. It is proposed that cultural resources field investigation of MRLS R 471-460 in Missouri is not necessary.

Enclosed is a map highlighted with three undisturbed, non-accreted land areas that we propose to survey along MRLS L-455. The map also shows disturbed non-accreted lands in which no survey is proposed. Archeological survey is not proposed in: accreted lands formed by deposits of modern alluvium; heavily timbered mature stands that will not be land altered; and lands disturbed by past levee construction or other development. The 1997 and 2000 aerial mosaics, sent under separate cover, are keyed to the map and show the non-accreted lands and disturbances.

The Abandoned Shipwrecks map indicates two possible locations of sunken vessels, the *Mi. Sterling* and the *Pathfinder*, in the vicinity of the Feasibility Study area. The exact locations of wrecks are unknown because they are deeply buried at least 15 or more feet below ground surface. Any proposed borrow activities would be limited in depth to avoid affecting buried shipwrecks.

The Kansas City District is requesting your concurrence that the areas proposed for archeological survey are sufficient and that the remainder of the MRLS L-455 and R 471-460 located in the Missouri portion of the Feasibility Study area require no field investigation. Your comments are requested by December 3, 2001.

If you have any questions, please contact Ms. Mary Lucido, of my staff, at 816-983-3139.

Sincerely,

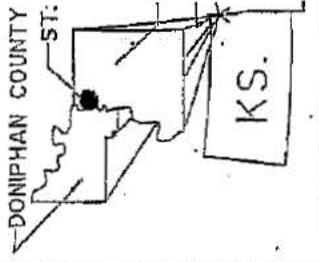


Michael J. Bart, P.E.
Chief, Planning Branch

Enclosures

CF:

PM-PF/Detrick (w/encl)



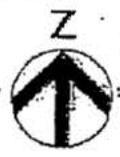
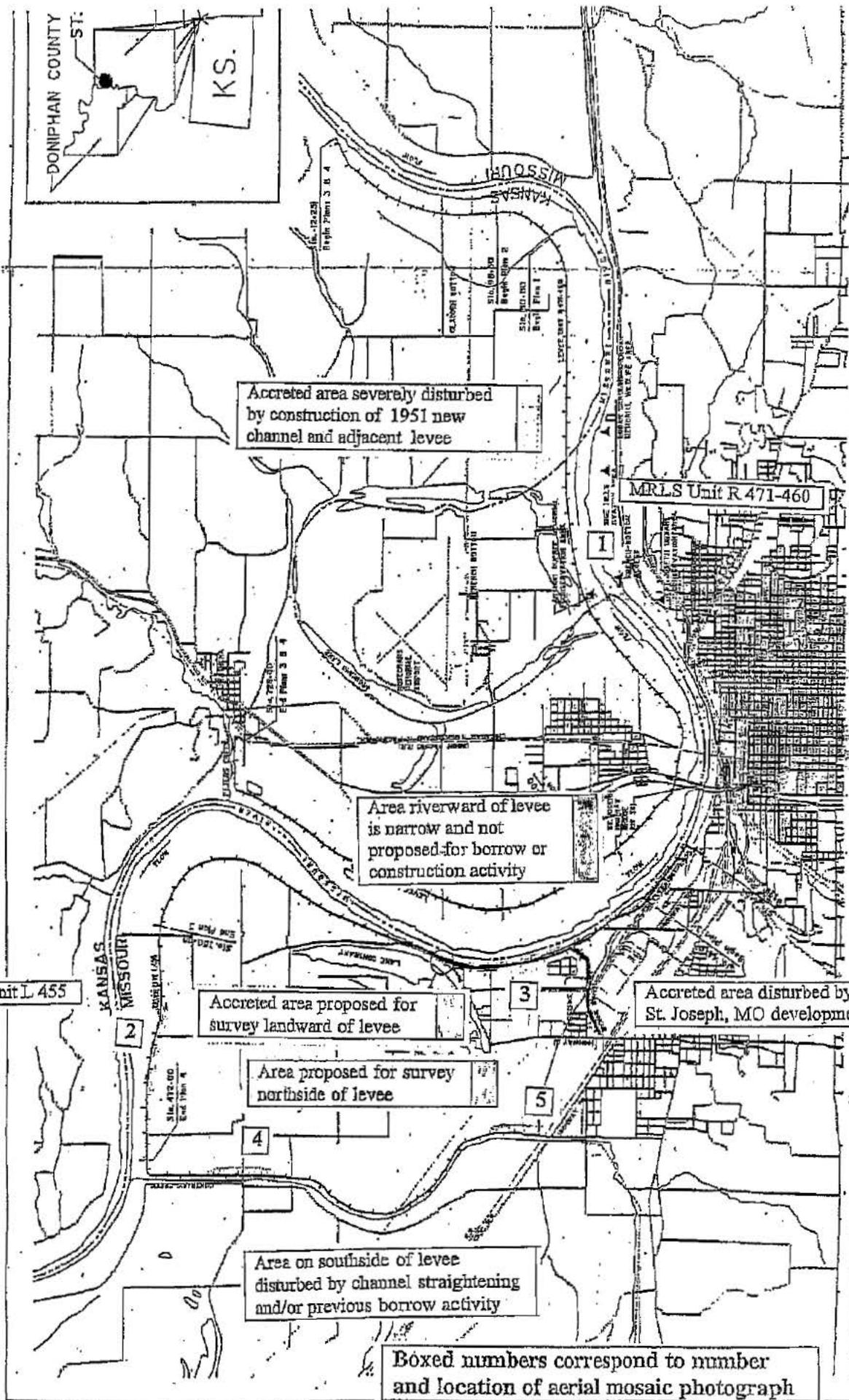
Location Of Plans For Levee Raises
Units R471-460 And L455 And Of
Expansion Of Relief Well System

U.S. Army Corps of Engineers
U.S.A.C.E. Contract DACW41-95-C-0082
HQ: Product/Project Code 153



HDR Engineering, Inc.

HDR



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EXISTING LEVEES
STATE BOUNDARY

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KANSAS

STATE

HISTORICAL

SOCIETY

◆
Cultural Resources
Division

◆
6425 S.W. 6th Avenue
Topeka, Kansas
66615-1099

PHONE# (785) 272-8681
FAX# (785) 272-8682
TTY# (785) 272-8683

◆
**KANSAS HISTORY
CENTER**

Administration
Center for Historical Research
Cultural Resources
Education / Outreach
Historic Sites
Kansas Museum of History
Library & Archives

HISTORIC SITES

Adair Cabin
Constitution Hall
Cottonwood Ranch
First Territorial Capitol
Fort Hays
Goodnow House
Grinter Place
Hollenberg Station
Kaw Mission
Marais des Cygnes Massacre
Mine Creek Battlefield
Native American Heritage
Museum
Pawnee Indian Village
Pawnee Rock
Shawnee Indian Mission

November 8, 2001

Michael J Bart
Kansas City District, Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106-2896

RE: Feasibility Study of Flood Damage Reduction Measures
Doniphan County, Kansas

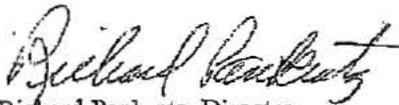
Dear Mr. Bart:

Our office has received and reviewed your correspondence dated October 23, 2001, concerning the above referenced project. Our site files do not indicate that there have been any additional archeological sites recorded in the proposed project area. Our office concurs that the areas proposed for archeological survey are sufficient in scope, and that there are no other locations in the proposed study area that warrant additional field investigations.

If you have any questions or need additional information concerning these comments, please contact Will Banks at [REDACTED] ext. 214.

Sincerely,

Ramon Powers
State Historic Preservation Officer


Richard Pankratz, Director
Historic Preservation Office



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

REPLY TO
ATTENTION OF:

June 21, 2002

Environmental Resources Section
Planning Branch

Dr. Ramon S. Powers
State Historic Preservation Officer
Kansas State Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615-1099

Dear Dr. Powers:

On October 23, 2001, the Kansas City District sent a letter to your office on the Feasibility Study of flood damage reduction measures for property currently afforded flood protection by the Missouri River Levee System (MRLS) Unit R 471-460. MRLS R 471-460 is in Doniphan County, Kansas, and Buchanan County, Missouri. That letter identified those portions of the Kansas side of the levee for which we proposed an archeological survey. Your letter response of November 8, 2001, (enclosed) concurred that these were the only areas within the Feasibility Study area in Kansas that required survey.

On May 15, 2002, an archeological survey was conducted in the agreed upon survey areas. No cultural materials were found. A report of findings on the field investigation, a map of the surveyed areas, and digital photographs of ground conditions are enclosed for your information. There are no historic properties that would be affected by the proposed undertaking. We feel no additional historic properties investigation is necessary for the Feasibility Study area.

Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f), we have made a determination of "No Historic Properties Affected" for the proposed undertaking. The Kansas City District is requesting your written concurrence of this determination. Also, please provide your concurrence that no additional historic properties investigation is necessary.

Please provide your response by July 24, 2002. If you have any questions, please contact Ms. Mary Lucido, of my staff, [REDACTED]

Sincerely,

Michael J. Bart, P.E.
Chief, Planning Branch

Enclosures

Archeological Field Survey of Two Areas in Kansas of the Missouri River Levee System
(MRLS) Unit R 471-460 in Doniphan County, Kansas

A field survey was conducted in two areas adjoining Federal Levee MRLS R-471-460 along Peters Creek south of Wathena, Kansas on 15 May 2002. The locale was divided into two sections. The northern survey section was approximately 9.438 acres. The southern survey section was about 9.138 acres and mostly scoured and refilled/leveled because of the 1993 flood. *(The middle section, in-between the survey areas, was examined during the 1993 flood for a possible borrow area, but no sites were found there. No borrow was taken from there, but it had been cleared for cultural resources.)*

Both the northern and southern areas consisted of agricultural fields recently planted to corn, which was no more than three inches in height. There was no standing stubble, and very little plant debris from last year's crop, making surface visibility 90% or better throughout both fields. There had recently been a soaking rain, but soil conditions were mostly dry, with slightly muddy areas in a very few small low-lying spots.

A walkover survey was performed with parallel courses about 5 meters apart. No shovel tests were necessary because of the excellent visibility. No artifacts or evidence of any sort of prehistoric occupation was found. In fact, the northern unit had no lithics of any sort, and the southern unit had only a scattering of river gravel and glacial erratics in one small spot, which stood out because the remainder of the field was bare soil. The river gravel and glacial erratics were located in the vicinity of a previous levee break and repair work associated with the 1993 flood event.

Digital photographs, taken during the survey, are enclosed. The photographs, labeled to show the North Field and South Field, illustrate the typical soil and ground conditions.



**KANSAS
STATE
HISTORICAL
SOCIETY**

Cultural Resources Division
Extension 240

6425 S.W. 6th Avenue
Topeka, Kansas
66615-1099
PHONE# (785) 272-8681
FAX# (785) 272-8682
TTY# (785) 272-8683

**KANSAS HISTORY
CENTER**

Administration
Center for Historical Research
Cultural Resources
Education / Outreach
Historic Sites
Kansas Museum of History
Library & Archives

HISTORIC SITES

- Adair Cabin
- Constitution Hall
- Cottonwood Ranch
- First Territorial Capitol
- Fort Hays
- Goodnow House
- Grimmer Place
- Hollenberg Station
- Kaw Mission
- Marais des Cygnes Massacre
- Mine Creek Battlefield
- Native American Heritage Museum
- Pawnee Indian Village
- Pawnee Rock
- Shawnee Indian Mission

July 8, 2002

Michael J Bart
Kansas City District Corps of Engineers
700 Federal Building
Kansas City MO 64106-2896

RE: Feasibility Study of Flood Damage Reduction Measures - KSR&C # 01-10-172
Doniphan County

Dear Mr. Bart:

In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed the report entitled *Archeological Field Survey of Two Areas in Kansas of the Missouri River Levee System (MRLS) Unit R 471-460 in Doniphan County, Kansas*. We concur with the conclusion that the proposed project will have no effect on historic properties as defined in 36 CFR 800. This office has no objection to implementation of the project.

Any changes to the project, which include additional ground disturbing activities, will need to be reviewed by this office prior to beginning construction. If construction work uncovers buried archeological materials, work should cease in the area of the discovery and this office should be notified immediately.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Will Banks 785-272-8681 (ex. 214) or Jennifer Epperson (ex. 225). On all future correspondence regarding this project, please reference the KSR&C number listed above.

Sincerely,

Mary R. Allman
State Historic Preservation Officer

Richard Pankratz, Director
Cultural Resources Division



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

March 14, 2006

REPLY TO
ATTENTION OF

Environmental Resources Section
Planning Branch

Ms. Jennie A. Chinn
Executive Director, State Historic Preservation Officer
Kansas State Historical Society
6425 S. W. 6th Avenue
Topeka, Kansas 66615-1099

Dear Ms. Chinn:

The U.S. Army Corps of Engineers, Kansas City District, is planning to raise Missouri River Levee System Units L-455 and R-471-460 in Doniphan County, Kansas and Buchanan County, Missouri. The Kansas portion of the project was previously coordinated with your office in October 2001 and July 2002 (KSR&C#01-10-172). This letter continues Section 106 coordination for the proposed project.

The 2001 letter coordinated the proposed project area, the results of a cultural resources background reconnaissance conducted for the Corps, and the results of an accreted land study. Based on the results of the background and accreted land study the Corps recommended an archeological survey for a portion of the project area and no further work for the remainder of the area. On November 8, 2001, your office concurred with these recommendations. On June 21, 2002, the Corps coordinated the results of the completed survey of the agreed upon area. No cultural resource sites or materials were identified during the survey. In a letter dated June 21, 2002, the Corps recommended no further work in the proposed project area. SHPO concurred with this recommendation on July 8, 2002, with the stipulation that any additional ground disturbing activities be submitted for review prior to construction.

The Kansas City District has now identified potential borrow locations for the proposed project located in Doniphan County, Kansas, and Buchanan County, Missouri (Figure 1). The identified borrow areas are located riverward of the existing levee. The exact borrow locations and amounts needed have yet to be determined but would be taken from locations within the areas identified in Figures 1 and 2. Borrow material, or a portion of the borrow, may also be dredged from the current river channel. The amount of borrow needed would depend on the selected level of flood protection (i.e. protection for a 500 year flood event would require a higher levee than a 100 year protection raise and would therefore require more borrow material). The exact depth of impact for obtaining the borrow has not been determined. However, based on the existing conditions and the needs of past similar projects it's estimated that the depth of borrow would be less than 10 feet below the present ground surface. The total area for the

proposed borrow areas is 933.7 acres. The area for the levee easement that was coordinated with your office in 2001 and 2002 is 794 acres.

A cultural resources reconnaissance report for the proposed project was completed for the Corps in May of 1996 and coordinated with the Kansas SHPO. No National Register of Historic Places (NRHP) sites or other archeological sites were identified within the project area. In November 2001, SHPO confirmed that no additional sites had been recorded within the study area. However, a number of shipwrecks have been recorded in the vicinity of the project including the Dan Converse (1858), the Watosia (1858), Jennie (1890), Bertha (1873), Denver No.1 (1867), Denver City (1867), Dorothy (1920), Mt. Sterling (1918), and Pathfinder (unknown) (Figure 3). All of the shipwrecks are located near the proposed borrow locations and/or the modern Missouri River channel. These areas will be avoided during borrowing activities or during river dredging if that option is selected.

The Kansas City District has updated the accreted lands study of the proposed project area including the proposed borrow locations (Figure 4). The study was undertaken by using GIS to overlay historic Corps of Engineer Missouri River channel maps from 1804, 1879, 1892, 1926, 1954, and present maps to show the various locations of the river channel. The former channel locations are then considered accreted land. The study found that the majority (629.42 acres) of the borrow areas have been determined to be accreted land from the historic channel maps. The remainder of the borrow areas, 304.35 acres, (shown in white in Figure 4) could not be positively identified as accreted by the historic maps from the specific years. However, based on the location of the undetermined areas it is likely that most or all of this area is accreted land as well.

In addition, it is likely that the proposed borrow areas have been previously disturbed by past borrowing activity. A review of construction schematics for the existing levee system from 1962 show that the borrow material obtained for this past levee construction was taken largely from the same areas as proposed for the present borrow (Figure 5a and b). Since the construction of the present levees these borrow areas have largely filled in with recent alluvial deposit.

In sum, no historic properties, archeological sites, or historic structures are recorded within the proposed project area. Shipwrecks located in the vicinity of the project will be avoided during construction, borrowing, and dredging activities. The proposed borrow easements are situated in areas that have been identified as accreted land or are likely accreted land. In addition, the majority of these areas were previously used as borrow locations as indicated on 1962 schematics.

Given the lack of previously recorded sites, the avoidance of the shipwreck locations, the accreted lands, and previous disturbances in the area; it is unlikely that the project will impact historic properties. Therefore, we recommend that no archeological survey be conducted for the proposed project.

At this time we are requesting your concurrence that the project will have no affect on historic properties and that the project be allowed to proceed with no further consultation with your

office. If in the unlikely event that archeological materials are discovered during project construction, work in the area of discovery will cease and the discovery investigated by a qualified archeologist. The findings on the discovery would be coordinated with your office and appropriate federally recognized Native American tribes, if appropriate.

Thank you for your consideration in this matter. If you have any questions or have need of further information please contact me at [REDACTED] or at Timothy.M.Meade@usace.army.mil.

Sincerely,

Timothy Meade
Cultural Resource Manager

Enclosure



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

March 14, 2006

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Thank you for your consideration in this matter. If you have any questions or have need of further information please contact me at [REDACTED] or at Timothy.M.Meade@usace.army.mil.

Sincerely,

Timothy Meade
Cultural Resource Manager

Enclosure

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



APPENDIX I

**Corps of Engineers Regulatory Wetland
Jurisdictional Determination**

**Missouri River Levee System
Units L-455 and R471-460
Flood Damage Reduction Study
Kansas and Missouri
Draft Environmental Impact Statement**



6 May 2005

MEMORANDUM FOR RECORD - FOR PM-PR

SUBJECT: Request for Review of Offsite Wetland Determination for Feasibility Study of MRLS L455 and R460-471 Increase Flood Protection Project.

1. At the request of PM-PR, OD-R has completed a review of the wetland delineation for the subject project. The project number for this request is 200501489. Please reference this number in all correspondence regarding the project.
2. OD-R concurs with the methods employed to complete the offsite determination and the field verification of the wetland areas. Therefore, OD-R concurs with the findings.
3. Any questions concerning the information furnished should be directed to me at [REDACTED] or (FAX 816-426-2321).



Douglas R. Berka
Regulatory Project Manager, OD-R

Encls.
JD Form
Memorandum thru OD-R
Attachments 1-7

JURISDICTIONAL DETERMINATION
U.S. Army Corps of Engineers

Revised 8/13/04

DISTRICT OFFICE: Kansas City District (CENWIK)
FILE NUMBER: 200501489

PROJECT LOCATION INFORMATION:

State: Missouri and Kansas
County: Buchanan and Doniphan
Center coordinates of site (latitude/longitude):
Approximate size of area (parcel) reviewed, including uplands: Approx. 5000 acres.
Name of nearest waterway: Missouri River
Name of watershed: Missouri River

JURISDICTIONAL DETERMINATION

Completed: Desktop determination Date: May 6, 2005
Site visit(s) Date(s):

Jurisdictional Determination (JD):

Preliminary JD - Based on available information, there appear to be (or) there appear to be no "waters of the United States" and/or "navigable waters of the United States" on the project site. A preliminary JD is not appealable (Reference 33 CFR part 331).

Approved JD - An approved JD is an appealable action (Reference 33 CFR part 331).
Check all that apply:

There are "navigable waters of the United States" (as defined by 33 CFR part 329 and associated guidance) within the reviewed area. Approximate size of jurisdictional area:

There are "waters of the United States" (as defined by 33 CFR part 328 and associated guidance) within the reviewed area. Approximate size of jurisdictional area: acres.

There are "isolated, non-navigable, intra-state waters or wetlands" within the reviewed area.

Decision supported by SWANCC/Migratory Bird Rule Information Sheet for Determination of No Jurisdiction.

BASIS OF JURISDICTIONAL DETERMINATION:

A. Waters defined under 33 CFR part 329 as "navigable waters of the United States":

The presence of waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

B. Waters defined under 33 CFR part 328.3(a) as "waters of the United States":

(1) The presence of waters, which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

(2) The presence of interstate waters including interstate wetlands¹.

(3) The presence of other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate commerce including any such waters (check all that apply):

(i) which are or could be used by interstate or foreign travelers for recreational or other purposes.

(ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

(iii) which are or could be used for industrial purposes by industries in interstate commerce.

(4) Impoundments of waters otherwise defined as waters of the US.

(5) The presence of a tributary to a water identified in (1) - (4) above.

(6) The presence of territorial seas.

(7) The presence of wetlands adjacent² to other waters of the US, except for those wetlands adjacent to other wetlands.

Rationale for the Basis of Jurisdictional Determination (applies to any boxes checked above). If the jurisdictional water or wetland is not itself a navigable water of the United States, describe connection(s) to the downstream navigable waters. If B(1) or B(3) is used as the Basis of Jurisdiction, document navigability and/or interstate commerce connection (i.e., discuss site conditions, including why the waterbody is navigable and/or how the destruction of the waterbody could affect interstate or foreign commerce). If B(2, 4, 5 or 6) is used as the Basis of Jurisdiction, document the rationale used to make the determination. If B(7) is used as the Basis of Jurisdiction, document the rationale used to make adjacency determination: The identified wetland areas are on the floodplain of the Missouri River and therefore are considered adjacent to a navigable water of the United States.

Lateral Extent of Jurisdiction: (Reference: 33 CFR parts 328 and 329)

- Ordinary High Water Mark indicated by:
- clear, natural line impressed on the bank
 - the presence of litter and debris
 - changes in the character of soil
 - destruction of terrestrial vegetation
 - shelving
 - other: Wetland Boundary
- High Tide Line indicated by:
- oil or scum line along shore objects
 - fine shell or debris deposits (foreshore)
 - physical markings/characteristics
 - tidal gages
 - other:

- Mean High Water Mark indicated by:
- survey to available datum; physical markings; vegetation lines/changes in vegetation types.

- Wetland boundaries, as shown on the attached wetland delineation map and/or in a delineation report prepared by: David Hibbs, Biologist, Kansas City District Corps of Engineers, PM-PR

Basis For Not Asserting Jurisdiction:

- The reviewed area consists entirely of uplands.
- Unable to confirm the presence of waters in 33 CFR part 328(a)(1, 2, or 4-7).
- Headquarters declined to approve jurisdiction on the basis of 33 CFR part 328.3(a)(3).
- The Corps has made a case-specific determination that the following waters present on the site are not Waters of the United States:
- Waste treatment systems, including treatment ponds or lagoons, pursuant to 33 CFR part 328.3.
 - Artificially irrigated areas, which would revert to upland if the irrigation ceased.
 - Artificial lakes and ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing.
 - Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
 - Water-filled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States found at 33 CFR 328.3(a).
 - Isolated, intrastate wetland with no nexus to interstate commerce.
 - Prior converted cropland, as determined by the Natural Resources Conservation Service. Explain rationale:
 - Non-tidal drainage or irrigation ditches excavated on dry land. Explain rationale:
 - Other (explain):

DATA REVIEWED FOR JURISDICTIONAL DETERMINATION (mark all that apply):

- Maps, plans, plots or plat submitted by or on behalf of the applicant.
- Data sheets prepared/submitted by or on behalf of the applicant.
- This office concurs with the delineation report, dated _____, prepared by (company):
- This office does not concur with the delineation report, dated _____, prepared by (company):
- Data sheets prepared by the Corps.
- Corps' navigable waters' studies:
- U.S. Geological Survey Hydrologic Atlas:
- U.S. Geological Survey 7.5 Minute Topographic maps:
- U.S. Geological Survey 7.5 Minute Historic quadrangles:
- U.S. Geological Survey 15 Minute Historic quadrangles:
- USDA Natural Resources Conservation Service Soil Survey:
- National wetlands inventory maps:
- State/Local wetland inventory maps:
- FEMA/FIRM maps (Map Name & Date):
- 100-year Floodplain Elevation is: (NGVD)
- Aerial Photographs (Name & Date): February 2000
- Other photographs (Date):
- Advanced Identification Wetland maps:
- Site visit/determination conducted on: November 2002
- Applicable/supporting case law:
- Other information (please specify): USDA, Farm Service Agency compliance slides

¹Wetlands are identified and delineated using the methods and criteria established in the Corps Wetland Delineation Manual (87 Manual) (i.e., occurrence of hydrophytic vegetation, hydric soils and wetland hydrology).

²The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are also adjacent.

200501489

CENWK-PM-PR

16 December 2002

MEMORANDUM FOR RECORD, THRU OD-R

SUBJECT: MRLS L455 AND R460-471 Increased Flood Protection
Feasibility Study, Wetland Jurisdictional Determination

1. The U.S. Army Corps of Engineers, Kansas City District, has begun a Feasibility Study and NEPA review of flood damage reduction measures for property currently afforded flood protection by the Missouri River Levee System (MRLS) Units L-455 and R 471-460, in Buchanan County, Missouri and Doniphan County, Kansas (Figure 1). The purpose of the study and NEPA review is to consider the economic, environmental, and social impacts that may occur as a result of various alternatives being considered in a flood damage reduction study, concerning flood protection provided by the existing MRLS Units L-455 and R 471-460. Structural alternatives may include reinforcing the existing structures, raising the existing levee with earth fill or floodwalls with a corresponding rise of appurtenances. The purpose of this memorandum is to outline and document the procedures used to make an off-site jurisdictional wetland determination for the potentially affected project area.

2. The MRLS Units L-455 and R 471-460, are existing flood damage reduction projects which provide local flood protection for agricultural areas, the metropolitan area of St. Joseph, Missouri and the communities of Wathena and Elwood in Kansas. The two levee units are located on opposite sides of the Missouri River.

Levee unit L-455 is located on the left bank of the Missouri River in Buchanan County, Missouri, and adjoins the southwestern part of St. Joseph, Missouri. The levee unit extends from Missouri River mile 447.3 downstream to mile 437.3 and then upstream along Contrary Creek. Levee unit L-455 is 15.6 miles long, averages 13 feet in height, and protects approximately 7,500 acres of urban and rural areas from flooding. Rural lands consist of about 6,500 acres. Urban lands include industrial, commercial, and residential areas of the city of St. Joseph, Missouri, including the residential and recreational development in the Lake Contrary area.

Levee unit R 471-460 is located on the right bank of the Missouri River between river mile 441.7 and 456.6 in eastern Doniphan County, Kansas, and a portion of western Buchanan County, Missouri. This levee unit is 13.8 miles long, averages 14.8 feet in height and protects approximately 13,500 acres of rural and urban areas from flooding. Rural lands consist of about 10,000 acres. Urban lands include the communities of Elwood and Wathena, Kansas. It also includes the area within the oxbow, which is a part of St. Joseph, Missouri and contains the Rosecrans Memorial Airport and the Missouri Air National Guard Base.

3. The procedures used to make this off-site jurisdictional wetland determination for the potentially affected project area followed the basic process outlined by the "Kansas Wetland Conventions, A Technical Document for Wetland Determinations/Delineations

in Kansas" (Attachment 1). The potentially affected project area (determination area) consisted of approximately 2,000 feet on each side of MRLS Units L-455 and R 471-460, a lineal strip 2,000 feet perpendicular from the centerline on each side of each levee. The wetland determination was conducted during the Fall of 2002, September through December. I, the undersigned, conducted the determination based on past professional experience. The determination utilized four primary sources of data for recording on a base map: Soil Survey Data, National Wetland Inventory Data, Farm Service Agency aerial slide data, and high-resolution aerial photography. Other sources of information that were considered and consulted with included the U.S.G.S. topographic maps, the Missouri River Wetland Hydrology Tool (attachment 2), and drainage ditches/structures through the existing levees.

4. The off-site wetland determination utilized high-resolution aerial photography from February 2000 for two purposes. First, the aerial photograph was used as the base map for recording the four primary sources of data for the determination. These base maps are included as Attachment 3, which includes the recording of all four primary sources of data, described below. Second, the high-resolution aerial photography was one tool used to record the location of likely wetland areas through photo interpretation. These areas are identified on the base map as yellow areas.

5. The off-site wetland determination included a review of Farm Service Agency aerial slide data. The review followed the procedures described in the Kansas Wetland Conventions concerning a representative sample of growing season slides; remote sensing wetland signatures such as shallow surface water, changes in tillage patterns, patches of greener vegetation and crop stress, to name a few; and methods for recording these signatures on preliminary and base maps. The Doniphan County, KS slides were reviewed in the county office on 30 September 2002. The aerial slides reviewed for each section were from March 1997, Sept. 1998, July 1999, Aug. 2000, and Aug. 2001. The Buchanan County, MO slides were reviewed in the county office on 7 October 2002. The aerial slides reviewed for each section were all from late July in '97, '98, '99, '00, and '01. The slides included equal numbers of "wet" and "dry" prior rainfall conditions. The exact sections, townships and ranges reviewed, along with the dates and colors used to review the aerial slides, are included in Attachment 4. The sheets (KS) and the clear overlays (MO) used to record the wetland signatures for each slide are included in Attachment 5. This data was then reviewed and evaluated for areas to include on the base map. Areas that were identified as having wetland signatures for at least 3 out of the 5 years reviewed were checked and included on the base map as green areas.

6. The off-site wetland determination included a review of NRCS Soil Survey Data. The review followed the procedures described in the Kansas Wetland Conventions for review of soil surveys and for positive indicators of hydric soils. Soil data evaluated for Doniphan Co, KS and Buchanan Co, MO is included in Attachment 6. This data and the soil surveys were then reviewed and evaluated for areas to include on the base map. Areas that were identified as having positive indicators of hydric soils and a potential for wetlands were included on the base map as orange areas.

7. The off-site wetland determination included a review of National Wetland Inventory (NWI) map data. The NWI maps were reviewed from arc-view data layers and double-checked against existing NWI hard copy maps. Areas that were identified as having wetland or water designations were included on the base map as pink areas.

8. After all four sources of data were included on the base map, the off-site wetland determination entered the final stage of the evaluation. The data was then reviewed and evaluated for areas to include on the final wetland determination map. Generally, areas that were identified as having potential for jurisdictional wetlands in at least 3 out of the 4 sources of data reviewed were checked and included on the final wetland determination map. However, occasionally areas with 2 out of the 4 sources of information were checked and included on the final wetland determination map for obvious areas where soil survey and NWI data were lacking. This final wetland determination map was then transferred on to the overall MRLS L455 and R460-471 Flood Protection Feasibility Study Map as a GIS layer for Wetlands. The final wetland jurisdictional determination map (Wetlands L455 and R471-460) is attached as Attachment 7.

9. The final wetland jurisdictional determination map was double checked in the field by performing a pedestrian survey. This was done by driving on the top of both levees for the entire length of the project and observing for areas of inconsistency in the field with areas on the final determination map. It was very evident that the wetland areas matched up well with the drainage patterns in the farm fields and the ditches and drainage structures under the levees. It appeared the final determination map was accurate. It is also worth noting that the determination relied heavily on the five years of Farm Service Agency aerial slide data. The types of wetlands included in the final wetland jurisdictional determination map are quite diverse and include, but are not limited to, farmed wetlands, oxbows, borrow pits, drainage ditches, scour holes, natural depressions, riverine wetlands and wetlands returning to natural conditions in NRCS CRP and WRP tracts. The types of wetlands are not categorized on the map, but are included here for information only.

10. Questions concerning the above-described off-site wetland determination should be directed to myself at x-3136.



David Hibbs
Biologist, PM-PR

Encl:
1 Fig.
7 Attach.

Mitigation Plan
for
Missouri River Levee System
Units L-455 and R-471-460
Flood Damage Reduction
Kansas and Missouri

1. Mitigation Goals and Objectives

- Wetlands provide numerous functions and values such as temporary storage of surface water, maintenance of subsurface hydrology, cycling of nutrients, removal of “hazardous” elements and compounds, detainment of particulates, export of organic carbon. Wetlands also contain varied plant communities, habitat for wildlife, unique areas of open space, and opportunity for research and pleasure. The wetlands at the project site likely provide combinations of these functions and; therefore, impacts to them need to be off-set.
- To off-set the loss of approximately 4.9 acres of farmed wetlands occurring along the toe of the existing levee units, similar amounts of wetlands will be re-established on-site in accordance with the USFWS recommendations from their August 9, 2006, Fish and Wildlife Coordination Act Report and the Corps of Engineers Regulatory Guidance Letter dated December 24, 2002. Re-establishment will require the manipulation of the physical, chemical, and biological characteristics of existing areas within the borrow sites. This will be accomplished through the reshaping and scraping of borrow area wetlands in order to expand their size equal to, or greater than, that which was lost. This will serve multiple purposes. First, borrow sites will be located in close proximity to where material is needed, thereby, reducing haul time and expense. Second, obtaining borrow in the manner previously described will off-set construction related impacts with in-kind habitat and reduce mitigation costs. Mitigation will not occur in MRFWMP lands (e.g., Elwood Bottoms).
- Riparian and associated upland woodlands provide year-round habitat for numerous terrestrial species. Mammals associated with these habitats include white-tailed deer, red and grey squirrels, eastern cottontail rabbits, raccoons, coyotes, gray and red fox, skunks, opossums, mink, beaver and muskrat. Small mammals such as mice, rats, voles, and bats account for the majority of species present, and in most cases provide the prey for higher-order predators. Moreover, approximately sixty-seven migratory species of birds nest in these habitats in addition to the resident species found in these areas. Riparian areas will be avoided and impacted woodlands will be off-set as described below.
- To off-set the loss of approximately 7.0 acres of secondary growth trees and 12.7 acres of shrubland habitat, similar acres of woodland habitat will be established on-site in areas of bare ground, or where reed canary grass or other exotic species have grown, if this land is available. The USFWS has recommended a 2:1 compensatory mitigation ratio for mature cottonwoods and “other” native vegetation. However, because the trees to be removed are secondary growth

trees, the Corps will be offsetting impacts with a 1:1 ratio. Additionally, because the Corps will be planting "higher-value" species (e.g., mast producing trees) than those removed, the offset will provide greater benefits to the area. The attached Tree, Shrub, and Groundcovers specification provides the basis for how this offset will be accomplished.

- The overall goals and objectives for this activity is no net loss of any function or value of the affected wetland or terrestrial areas.

2. Baseline Information for Impact and Proposed Mitigation Sites

- Soils within the project area have primarily developed as a result of the wind-borne deposition of fine-grained material (loess) and the deposition of material on land by streams (alluvium). Missouri River floodplain soils belong to the Haynie-Urban Land-Leta association. These soils are considered to be partially hydric and not erodible by water or wind. The flood plain or bottoms area is three to five miles wide in the St. Joseph study area and is characterized by low-lying, nearly level terrain.
- Vegetation in the project area consists, in part, of floodplain forest (*Populus-Salix*). Although the project area's floodplains have been largely cleared for development, there are bands of riparian forest habitat located riverward of the levee units. Predominant tree species found in these riparian bands include eastern cottonwood, willows, box elder, green ash, silver maple, and American sycamore. The understory includes reproduction of these species, plus some redbud, dogwood, black cherry, and various shrubs. The ground layer in the riparian bands varies from sparse to dense vegetation and contains primarily poison ivy, Virginia creeper, honeysuckle, greenbrier, gooseberry, and various other species. Most of the vegetation in the study area has been greatly impacted by urban development. In general, the project area consists of established, residential neighborhoods and intensively developed business district and croplands, except riverward of the levees where more natural vegetation occurs.
- Hydrology landward of the levees occurs mainly from precipitation events where as hydrology riverward of the levee is predominately from precipitation and Missouri River overflow.
- The existing wetland vegetation in the area consists of cattails, sedges (*Carex*), smartweed (*Polygonum*), arrowhead (*Sagittaria*), and American lotus (*Nelumbo lutea*), willows (*Salix*), maples (*Acer spp.*), ash (*Fraxinus spp.*), and birch (*Betula spp.*) among others.

3. Mitigation Site Selection and Justification

- Mitigation sites will be identified and selected during borrow site selection and in coordination with Kansas and Missouri resource agencies. Consensus was reached that while obtaining borrow material for levee raises, innovative construction methods could be employed to scrape and reshape lands adjacent to existing wetlands riverward of the levees in order to expand their size equal to, or greater than, that which was lost.

- The mitigation method to be employed would restore and expand on-site wetlands and would use existing seed banks, which in turn, would provide similar vegetation replacement to that which is lost. The mitigation proposed reduces the cost of seeking off-site real estate to off-set wetland impacts and increases the likelihood of success by utilizing real estate adjacent to existing wetlands. Woodland replacement will involve the use of some similar species, obtained from local nurseries, plus “higher value” mast-producing species such as hickory, pecan, and oaks. Tree plantings would concentrate on areas of bare soil or areas where exotic species, such as reed canary grass, have become established.
- Preparation of the mitigation has been coordinated with the Missouri River Fish and Wildlife Mitigation Project team to ensure compatible goals in developing fish and wildlife habitat are met and objectives such as maximizing aquatic and terrestrial habitat, maximizing species diversity, and optimizing habitat conditions for this particular site are achieved. Mitigation will not occur in the Elwood Bottoms area.

4. Mitigation Work Plan

- The mitigated wetlands would be within the proposed borrow areas located in Kansas between River Miles 454.9 to 451.9 and between River Miles 446.7 to 443.4. In Missouri, mitigated wetlands would be located between River Miles 442.6 to 442.9.
- The construction plan would consist of, but not be limited to, re-establishing riverward wetlands concurrently with construction activities. During construction, shallow scraping, reshaping, and re-contouring of existing wetlands and scour features would be conducted as applicable. Side slopes would be varied, 1V:4H to 1V:1.5 H, bottom elevations would be irregular, and habitat islands left throughout borrow sites to allow greater diversity in natural revegetation and water depths. Off-setting impacted wetlands concurrently with levee construction activities will likely reduce overall mitigation costs.
- The hydrology required for success of these wetlands will stem solely from precipitation and Missouri River overflow. Vegetation will regenerate naturally from the existing seed bank. Borrow excavation sites will be spread out and contain “islands” to provide natural buffer areas and greater diversity.
- All equipment brought on site will be thoroughly washed to remove dirt, seeds, and plant parts. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water (40 degrees C/104 degrees F) and dried for a minimum of five days before being used at the project site. In addition, before transporting equipment from the project site all visible mud, plants, and fish/wildlife will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with the water will be cleaned and dried following the above procedure.

5. Monitoring Plan

- Site visits will be made by Corps personnel during construction, post construction during operations and maintenance inspections, after mitigation plantings are complete, and during years one, three, and five. Site assessments will be made, vegetation growth and types documented, hydrology noted, and photos taken and compared after each visit to help make determinations and future recommendations.

6. Performance Standards

- Success of the scraped and reshaped wetlands will be based on existing conditions and how well the re-established wetlands mimic these conditions. Establishment of similar vegetation, hydrology and function performance will be used as the performance standard. Vegetation surveys of both existing and restored wetlands will be conducted by Corps personnel. This will include photo documentation (at specific points to be determined) and a determination of plant species composition in order to provide a comparable format for future monitoring activities. Post construction monitoring in years 1, 3, and 5 will provide data to illustrate how well the restored wetlands are mimicking the existing wetland. In the event that the re-established wetlands do not function similar to the existing wetlands (including establishment of similar vegetation) within year 3, re-evaluation of the techniques used to re-establish the wetlands and a determination as to why the site is not functioning will be made. The results of this re-evaluation will be used to prepare a new monitoring plan to sufficiently off-set the original wetland loss, and will include an additional off-set to compensate for time lost.

7. Site Protection and Maintenance

- Current access to the proposed borrow areas is limited and hard to reach by the general public. Much of the area is in private ownership and enrolled in the Conservation Reserve Program. Thus, protection of these areas from the general public falls under private property laws and regulations.
- No maintenance plan has been developed at this time. The areas will be allowed to regenerate naturally and will make use of natural hydrology and existing seedbank. Based on the data obtained from the post construction monitoring, the use of adaptive management may be required in order to reach appropriate goals and objectives.
- Establishment of exotic and/or invasive species will be noted during on-site investigations and photo documented, if warranted. In the event of the establishment of large monotypic exotic and/or invasive species, a plan for eradication will be developed and implemented within year 3 to assure establishment of in-kind wetland and woody vegetation.

TREES, SHRUBS, AND GROWDCOVERS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

Datascape Nomenclature Guide available from American Nurserymen Publishing Co., 77 W. Washington Street, Suite 2100, Chicago, IL 60602-2904.

American Association of Nurserymen, Inc. "American Standard for Nursery Stock", Z60.1-1973, or latest edition.

Available from: American Association of Nurserymen, Inc., 230 Souther Building, Washington, D.C. 20005.

1.2 DESCRIPTION OF WORK

The work covered by this Section consists of furnishing all plants and related materials, supervision, labor, equipment, appliances and services necessary for and incidental to completing all operations in connection with the planting of trees, shrubs, ground covers and other such materials in strict accordance with these Specifications and subject to the terms and conditions of the Contract. The work shall include, but not be limited to, the following within the Contract limits:

- 1.2.1 Excavating and backfill as required for all plant materials;
- 1.2.2 Furnishing and incorporating of fertilizer;
- 1.2.3 Furnishing and planting of trees, shrubs and other plant material as indicated;
- 1.2.4 Maintenance; and
- 1.2.5 Replacement of unsatisfactory plant material.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having no designation are for information only. The following shall be submitted in accordance with Section 01330: SUBMITTAL PROCEDURES.
SD-13 Certificates

Plant Material Inspection Certificates; GA-PR.

Fertilizer; GA. Ground Cloth; GA-RE. Mycorrhizal Inoculant; GA-RE.

Certified analysis by a recognized laboratory shall be submitted before delivery to the site.

1.4 CERTIFICATES OF INSPECTION

All necessary Inspection Certificates shall accompany the invoice for each shipment or order of stock, as may be required by law, for the necessary transportation, and such certificates shall be filed, prior to the acceptance of such material, with the Contracting Officer's Representative (COR).

1.5 ACCEPTANCE

1.5.1 Inspection

Inspection of the work to determine completion of the contract, exclusive of the possible replacement of plants, will be made by the COR upon written notice requesting such inspection submitted at least 10 days prior to the anticipated date.

1.5.2 Notification

After inspection of the work, the Contractor will be notified in writing by the COR of acceptance of all work exclusive of the possible replacement of plants subject to guaranty; or, if there are any deficiencies, of the requirement for completion of the work.

1.6 GUARANTEE

1.6.1 Guarantee Terms

All plant material shall be guaranteed by the Contractor for a period of six months from the date of acceptance to be in good, healthy, and flourishing condition. In addition, the Contractor shall guarantee a minimum of 95% of each species to be in good, healthy, and flourishing condition for a period of one year or one full growing season, whichever is longer, from the date of acceptance.

1.6.2 Replacement

The Contractor shall replace, without cost to the Government, and as soon as weather conditions permit, dead plants or plants not in a vigorous thriving condition, as determined by the COR and PM-PR (Mr. Vandenberg/816-389-3146) at the end of the six month and one year guarantee periods. Replacement plantings shall be of the same species as the species being replaced, unless

otherwise directed/approved by PM-PR and the COR. The number of bare root stock replacement plantings at the one-year period shall be such that any planted areas which average less than 95% survival shall be replanted to the original number of trees/shrubs planted. The root pruned method (RPM) plantings also shall be replaced to the original number of RPM trees planted. Replacement plantings shall be subject to all requirements stated in these Specifications.

1.7 MAINTENANCE

Maintenance shall begin immediately after each plant is planted and shall continue throughout the length of the Contract and guarantee period, until final acceptance of the planting by PM-PR and the COR. All new plantings shall be maintained until final acceptance. Maintenance activities shall include insect and disease control, watering, removal of dead or damaged plants materials, resetting plants to proper grades and/or upright position, and other necessary operations.

1.8 CONTRACTOR'S RESPONSIBILITY

1.8.1 Examination of Drawings

The Contractor shall examine all drawings relating to the work required and visit the site to become fully informed as to all existing conditions and limitations as they apply to the work, and its relation to all construction work.

1.8.2. Agreement to Conditions

No consideration will be granted for any alleged misunderstanding of the materials to be furnished or the extent and nature of the work to be done, it being understood that the tender of the proposal carries with it the agreement to all items and conditions specified, referred to herein, or indicated on the contract drawing.

1.8.3. Liability

The Contractor shall be liable for any damages to property caused by operations under this section and shall, without any additional costs to the Government, restore to their original condition all area disturbed or damaged by construction, including structures, lawns, pavement, curbs, etc.

1.8.4. Cooperation and Coordination

Cooperation and coordination of all planting and maintenance operations with the COR and PM-PR (Mr. Vandenberg/816-389-3146) is imperative for the successful completion/acceptance of the work.

1.9 PLANT SCHEDULE

1.9.1 Supply of Plants

The Contractor shall supply plants as shown in the Plant Schedule contained herein, and as specified subject to the conditions under the paragraph titled "Contractor's Responsibilities".

1.9.2 Height and Spread

Height is shown as an approximate dimension from the ground to the top of the previous year's growth. The top spread is shown as the approximate spread of the top at the principle width.

1.9.3 Ball Size

If plants are collected, the ball size shall be at least the size required by American Standards for Nursery Stock.

1.9.4 Schedule

The schedule of Plant Material to be furnished and planted is contained herein.

1.10 TESTS AND INSPECTIONS

1.10.1 Notification of Source Available

Within 30 days following acceptance of the bid, the Contractor shall notify the COR and PM-PR (Mr. Vandenberg/816-389-3146) of the plant material sources the Contractor proposes to use and required/desired to be inspected or tested.

1.10.2 Plant Material Inspection Certificates

The Contractor shall be responsible for all Certificates of Inspection of plant materials that may be required by Federal, State, or other authorities to accompany shipments of plants. The Contractor shall furnish the COR with copies of the Certifications that all plants conform to the standards of the American Association of Nurserymen.

1.10.3 Pre-Planting Inspection

All plant materials must be inspected and approved before they are planted. Inspection and approval of plants by the COR at the place of growth or upon delivery shall be for quality, size, and vitality only, and shall not in any way impair the right of rejection for failure to meet other requirements during progress of work.

1.10.4 Analyses and Tests

Analyses and tests of materials, if required, such as fertilizers, insecticides, etc., shall be made in accordance with the current method of the Association of Official Agricultural Chemists.

1.10.5 Certified Analyses

Certified analyses by a recognized laboratory of Fertilizer, etc., shall be submitted by the Contractor, at the Contractor's expense, for the COR's approval before delivery to the site. Packaged and sealed standard products accompanied by the manufacturer's or the vendor's analyses, complying with specification requirements, will be acceptable.

1.10.6 Approval of Materials

Approval of materials shall not be construed as final acceptance and the COR reserves the right to analyze, for comparison with Specification requirements, any or all materials delivered for use under this Section. The cost of such tests will be borne by the Government. Should these tests indicate noncompliance with Specification requirements, the COR will charge the entire costs of such tests to the Contractor. All rejected material shall be removed from the site and replaced with acceptable material.

1.11 DELETED

1.12 PLANT SCHEDULE

<u>Botanical/Common Name</u>	<u>Plants/Acre</u>	<u>Total</u>
Trees: Root Pruned Method (RPM) (3-gallon containers)	170/Acre (10' X 10' Spacing)	
Bare Root (BR) (Seedlings)		
<i>Acer saccharinum</i> /Silver Maple (BR)	25	175
<i>Carya laciniosa</i> /Shellbark Hickory (RPM)	6	42
<i>Carya illinoensis</i> /Pecan (BR)	30	210
<i>Celtis occidentalis</i> /Hackberry (BR)	25	175
<i>Fraxinus pennsylvanica</i> /Green Ash (BR)	20	140
<i>Morus alba</i> /White Mulberry (BR)	20	140
<i>Nyssa sylvatica</i> /Black Gum (BR)	30	210
<i>Quercus bicolor</i> /Swamp White Oak (RPM)	4	28
<i>Quercus palustris</i> /Pin Oak (RPM)	4	28
<i>Quercus macrocarpa</i> /Bur Oak (RPM)	6	42

<u>Botanical/Common Name</u>	<u>Plants/Acre</u>	<u>Total</u>
Shrubs	*60/Acre (6' within row X 8' between rows)	
* Shrub plantings should be placed in groups to allow openings between shrub lines and travel lanes between shrub plantings (e.g., spacing between groups of rows would be about 20-50 feet, depending on the particular site).		
<i>Cercis Canadensis</i> /Eastern Redbud (BR)	15	195
<i>Cornus racemosa</i> /Gray Dogwood (BR)	15	195
<i>Ilex decidua</i> /Deciduous holly (BR)	15	195
<i>Ilex verticillata</i> /Winterberry (BR)	15	195

PART 2 PRODUCTS

2.1 COMMERCIAL FERTILIZERS

Commercial fertilizers shall conform to all applicable state fertilizer laws, and shall be delivered in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Fertilizer shall be controlled-released pellets, tablets, or packets (two-year duration), and be of the size, weight, quantity, and analysis recommended by the manufacturer for the type of plants specified. Root stimulator shall be used at the time of planting in accordance with the manufacturer's recommendations.

2.2 HERBICIDE

Herbicides shall be applied, according to label directions, over the top of dormant seedlings or root pruned potted specimens. Herbicides shall be applied in strips at least four feet wide or in circles with a radius of two feet with each seedling centered in the sprayed area. In order to assure that seedlings are dormant when sprayed, herbicide must be applied at the time of planting or within 48 hours of removal from cold storage.

2.3 MULCH/GROUND CLOTH

Mulch shall consist of horticultural grade shredded hardwood or cypress bark, free of sticks, stones, clay, or other foreign materials. Mulch shall be of such character as not to be easily displaced by wind. Ground cloth shall be a non-woven geotextile fabric no less than 36-inches square manufactured from polypropylene fibers. The fabric weight shall be no less than eight ounces per square yard, and shall possess a Minimum Average Roll Value (MARV) or 90 gallons per minute per square foot of material as tested in accordance with ASTM

D4491, and a puncture resistance of 130 pounds as tested in accordance with ASTM D4833.

2.4 WATER

Water, pumps, hoses, and other equipment required for the distribution of water shall be furnished by the Contractor.

2.5 PLANT MATERIAL

All bare-root planting stock shall be of conservation grade or better. The bare root seedlings shall be at least one-year old and at least 12-inches in height. A root to shoot ratio must be maintained at a range of 1:1 to 1:1.5. The taproot shall not be shortened to less than eight inches in length. Any variations in size must be approved by the COR and PM-PR (Mr. Vandenberg/816-389-3146).

All root pruned method potted stock shall consist of plant materials grown using the root pruning technique that develops a heavy, fibrous root system in a pot that is three-gallons in size. Minimum seedling height is three feet, minimum caliper of 5/8-inch at the tree base, measured at six inches above the soil line. Seedlings shall be maintained in a dormant condition until planted.

2.5.1 Plant Schedule

The Plant schedule preceding this Section forms a part of these Specifications.

2.5.2 Nomenclature

The scientific and common names of plants herein specified conform to the approved names given in the Datascope Nomenclature Guide. Names of varieties not included therein conform generally with names accepted in the nursery trade.

2.5.3 Quantities

Quantities necessary to complete the planting are indicated in the Plant Schedule.

2.5.4 Substitutions

Substitutions will not be permitted. If proof is submitted that any plant specified is not reasonably obtainable, a proposal will be considered for use of the nearest equivalent size or variety with an equitable adjustment of contract price. Any proposed substitution must be approved by PM-PR (Mr. Vandenberg/816-389-3146). All efforts shall be made to avoid use of substitutions due to considerable earlier coordination/planning efforts.

2.5.5 Quantity and Size

Plants shall be sound, healthy, vigorous, and free from insect pests, plant diseases, injuries, and after-effects thereof. Plants shall be moist but free of mold and defects, and have well-developed root systems. Plant materials which do not conform to this description or condition will be discarded, removed from the project site, and shall be replaced by the Contractor.

All plants shall be equal to or exceed the minimum, acceptable sizes, measurements, and specifications specified in Sections herein. Planting stock shall be measured before pruning and/or planting, with branches in normal position.

All plants and all tree trunks shall be measured when the branches are in their normal position. Dimensions for height and spread as contained herein refer to the main body of the plant and not from branch tip to branch top. No pruning of branches to obtain the required height shall be done before the plants are delivered to the site, unless so approved by the COR.

Nursery-grown plants shall mean plants which are healthy vigorous plants, lined out in rows in a nursery, which are annually cultivated, sprayed, pruned and fertilized in accordance with good horticultural practices as required by the American Association of Nurserymen, Inc.

All plants shall be nursery-grown unless otherwise specified. All plants must be acclimated to area conditions. All plants shall be freshly dug; neither heeled-in plants nor plants from cold storage will be accepted. All nursery-grown plants shall have been transplanted or root-pruned at least once in the past three years.

No trees which have had their leaders cut or which have been so damaged that cutting is necessary will be accepted.

Planting stock specified to be furnished in a size range shall be interpreted to mean that no less than 50 percent of the trees shall be of the maximum size specified.

Plants larger in size than specified herein may be used if approved by the COR, but the use of larger plants shall not increase the contract price. If the use of larger plants is approved, the roots lengths and root mass balls of the planting stock must be of sufficient length to meet the root to shoot ration specified earlier in this Section. Plants grown in containers shall be fully rooted throughout the earth ball within the container, but not root bound. All container plants must be acclimated to area conditions.

2.6 MYCORRHIZAL INOCULANT

The container shall provide mycorrhizal inoculant for use with the planting of Root Pruned Method and Bare Root materials. The inoculant shall be GRO-Life Mycorrhizal Tablets or equal.

PART 3 EXECUTION

3.1 DIGGING, WRAPPING, and HANDLING

3.1.1 Protection

All plants shall be handled in such manner as to avoid unnecessary damage of any kind. No plants shall be bound with wire or rope at any time in order to prevent bark damage or breakage of branches. Plants shall not be handled or carried by the trunks or stems. Roots shall be especially protected at all times from drying. Plants which cannot be planted immediately upon delivery shall be protected from heat and prevented from drying wind and sun by healing-in any Bare Root stock and covering adjoining area and the root masses of all Root Pruned Method stock, or other protection if approved by the COR. The Contractor shall be responsible for replacement of all plants lost to improper protection and/or handling.

3.1.2 Labeling

Durable, legible labels stating in weather-resistant ink the correct botanical and common plant names and sizes, as specified in the Plant Schedule, shall be securely attached to all plants, bundles or packages of plants of a single species and size, or plant containers delivered to the plant site for the purpose of inspection and plant identification.

3.1.3 Shipment and Delivery

Bare Root seedlings shall be delivered to the site in a dormant state and shall be maintained in a dormant state by the Contractor until planted.

The Contractor shall promptly notify the COR in advance of the time and manner of delivery of plants, and shall furnish an itemized list in duplicate of the actual quantity of plant materials in each delivery, in order to ensure satisfactory coordination of delivery, and to expedite the required inspection at the point of delivery. The itemized duplicate list of the plant material for each delivery shall include the pertinent data as specified in the Plant Schedule and otherwise herein. These itemized lists and the necessary certificates to accompany each plant and/or shipment shall be delivered to the COR prior to acceptance and planting of the plant material.