US Army Corps of Engineers
St. Louis District

ENVIRONMENTAL ASSESSMENT
WITH
DRAFT FINDING OF NO SIGNIFICANT IMPACT

LEVEE REPAIR (PL 84-99):
WINFIELD-PIN OAKS
LEVEE AND DRAINAGE DISTRICT
LINCOLN COUNTY, MISSOURI

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LEVEE REPAIR (PL 84-99): WINFIELD-PIN OAK LEVEE AND DRAINAGE DISTRICT LINCOLN COUNTY, MISSOURI

1. PURPOSE, NEED, AND SUMMARY OF ACTION

This document is an Environmental Assessment with an attached Draft Finding of No Significant Impact for levee repairs to the Winfield-Pin Oaks Levee and Drainage District (L&DD). It describes levee damage, repair alternatives, the existing environment, and potential environmental impacts associated with each alternative. Under Public Law 84-99 (PL 84 – 99), Drainage Districts whose levees are within the federal levee system can request federal assistance with flood damage repairs. The damages sustained in the high water event in spring/summer 2015 consisted of four breaches over a 1,000 foot reach caused by flash flooding on Bob's Creek and two areas of severe riverside scour erosion along Bob's Creek. The recommended repair for the series of breaches is to partially remove the embankment placed by the levee district, replace with borrow, and then re-compact and grade to its original section within the previous footprint.

The purpose of this federal action is to restore the level of flood protection to that which existed prior to the 2015 flood events. Without federal involvement through the PL 84-99 program, it is unlikely that the L&DD has the financial ability to restore the level of protection according to Corps of Engineers standards.

The environmental impacts of the repair would include temporary noise, air pollution, localized erosion, and disturbance to vegetation on the levees and associated work areas. Temporary impacts would cease after construction completion and vegetation reestablished in the repaired area.

1.1 AUTHORIZATION

PL 84-99, an amendment to the Flood Control Act of 1962, authorizes the U.S. Army Corps of Engineers (Corps) to assist Levee and Drainage Districts in the repair of both federal (Corps constructed, locally operated and maintained) and non-federal (constructed by non-federal interests or by the Work Projects Administration) flood control projects damaged by flooding. The Winfield-Pin Oaks L&DD is a non-federal project that is active in the Corps' Rehabilitation and Inspection Program (RIP). Therefore Winfield-Pin Oaks L&DD is eligible for Flood Control and Coastal Emergency (FCCE) funding authorized by PL 84-99.

1.2 LEVEE SYSTEM DESCRIPTION

The Winfield-Pin Oaks L&DD is located about 47 miles northwest of St. Louis, Missouri, in Lincoln County, Missouri. The levee district includes two levees systems; the Winfield levee and the Winfield-Pin Oaks levee. The Winfield-Pin Oaks levee system is west of the Winfield levee system which is adjacent to the right descending bank of the Mississippi River from approximately river mile 241 to mile 239 above the confluence with the Ohio River. The northern flank of the levee borders McLean Creek and the south flank borders Bob's Creek (Figure 1). The leveed area provides flood risk reduction to $1.1M in property value, 146 residences, 105 structures, and approximately 1,600 acres used primarily for agriculture. The levee system was designed for a 16-year flood with 2 feet of freeboard. The system is 4.95 miles long and consists of earthen levee with a representative crown width of 8 feet and representative water and land side slopes of 1:3. The system includes three pump stations and five gravity drains.

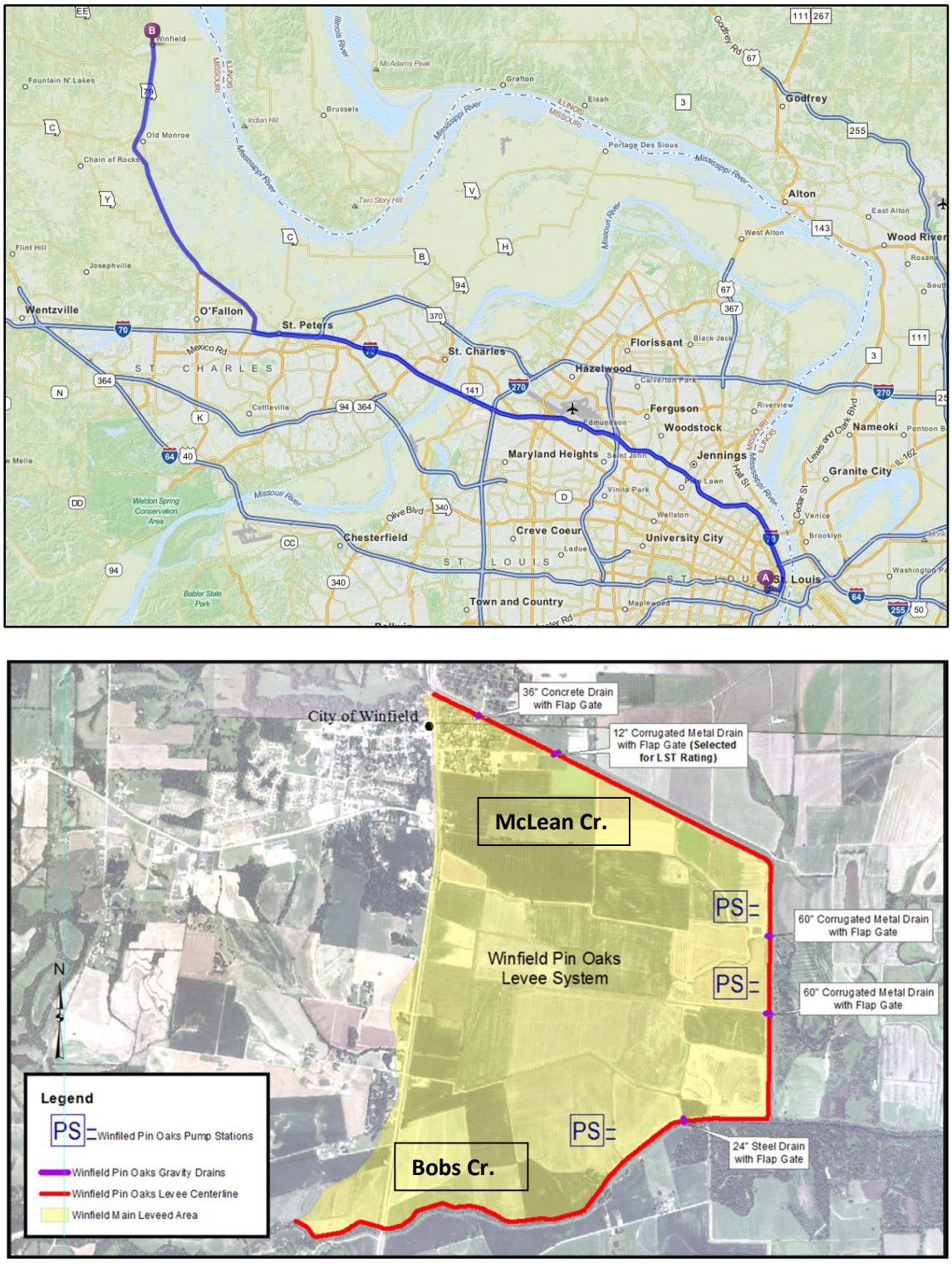


Figure 1. Location of Winfield-Pin Oaks Levee and Drainage District

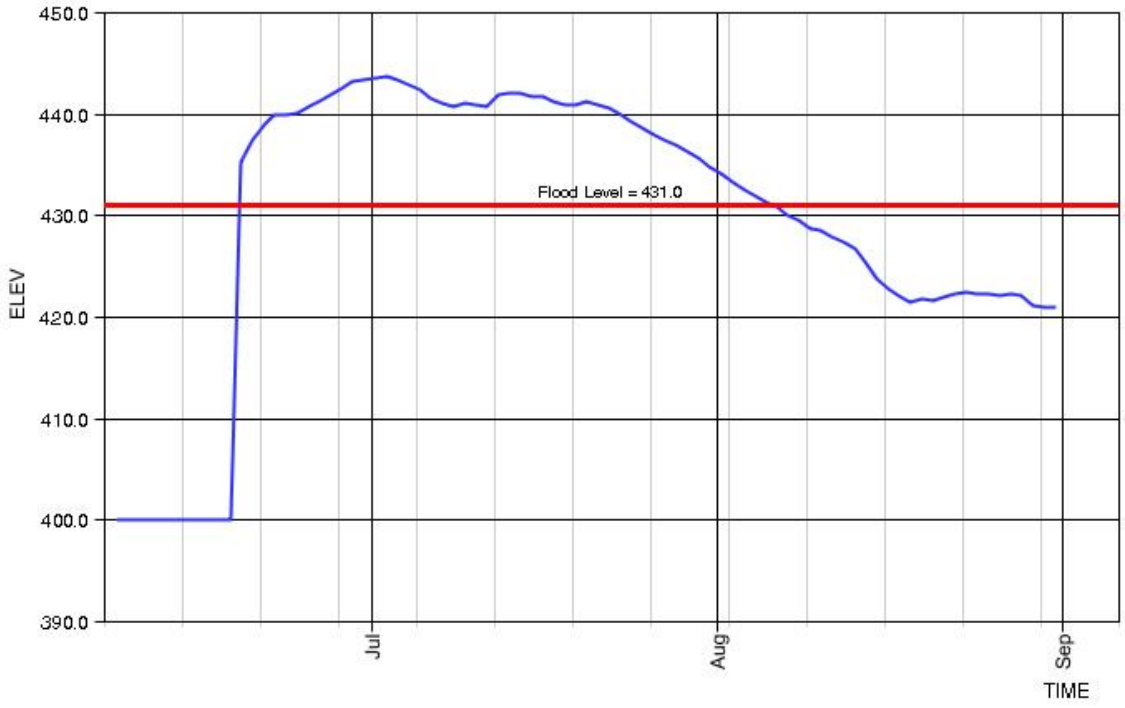


Figure 2. River stage at the Lock and Dam #25 tailwater gage (river mile 241).

The nearest river gage to the Winfield-Pin Oaks Levee and Drainage District is the Lock and Dam #25 Tailwater (L&D25 TW) Gage located at Mississippi River mile 241.2. As shown in Figure 2, the L&D25 TW gage peaked on July 2, 2015, with a reading of 443.93 ft. elev. This reading was 5.93 feet above the flood stage of 31 feet.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 DAMAGES

Erosion Type III (major erosion greater than 18 inches deep, measured in cubic yards. Repaired by stripping, preparing, placing embankment, and compacting in lifts): Two areas of severe scour erosion near the west end of the southern flank along Bob's Creek. The first area is 160 feet long and within 5 feet of the levee crown. The second area is 75 feet long and into the levee crown. A setback levee, 50 feet landside of the original levee footprint, is the only feasible repair. Approximately 10,000 CY of embankment material would be required (Figure 3).

Breaches (a rupture, break, or gap in the levee system, measured in cubic yards. Repaired by stripping, preparing, placing embankment, and compacting in lifts): A series of four breaches (within a 1000 –foot stretch) beginning 700 feet west of Highway 79 at Bob's Creek. The breaches are 165 feet, 150 feet, 110 feet, and 110 feet in length. The levee district has degraded the top of the adjacent levee to partially fill in the breaches in order to restore a reduced level of protection. An estimated 5,000 cubic yards of additional borrow material would be required to restore the levee to its original grade and section (Figure 3).

Figure 3. Creek-side scour and multiple breach locations.

2.2 ALTERNATIVES

The National Environmental Policy Act (42 U.S.C. §§4321-4370h) requires that in analyzing alternatives to a proposed action a federal agency consider an alternative of "No Action." Likewise, Section 73 of the WRDA of 1974 (PL93-251) requires federal agencies to give consideration to nonstructural measures to reduce or prevent flood damage.

2.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the federal government would not repair the damages to the Winfield-Pin Oaks levee under PL 84-99 authority or funding sources. The levee would be susceptible to further erosion at the damaged sites. The current damages would decrease flood protection, thereby increasing risks to individuals, structures, businesses, and agricultural activities within the leveed areas.

2.2.2 NONSTRUCTURAL ALTERNATIVE

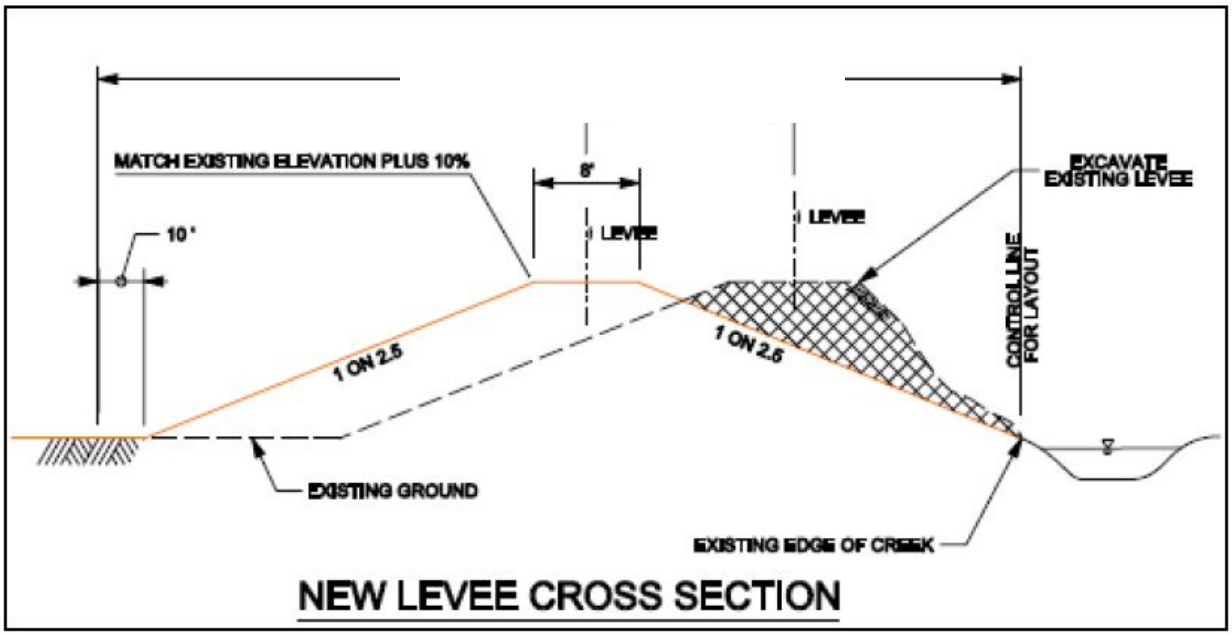
Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from nonstructural measures is accomplished by changing the land use within the floodplains, or by accommodating existing uses to the flood hazard. Examples include flood proofing, relocation of structures such as levees, flood warning and preparedness systems, and regulation of floodplain uses. This allows flood waters to spread out over a larger area reducing flood heights and damages. Under PL 84-99, the Corps has the authority to pursue a non-structural alternative only if the project sponsor requests such an alternative. The Winfield-Pin Oaks L&DD declined to request the pursuit of a non-structural alternative; therefore, this alternative was eliminated from further consideration.

2.2.3 TENTATIVELY SELECTED PLAN: REPAIR OF LEVEE WITH FEDERAL ASSISTANCE

Under this alternative, the federal government would assist with repairs to the damaged areas to a pre-flood level of protection. A team including members of the St. Louis District's Design Branch and Geotechnical Branch were involved with developing the most economical and efficient design for repair. Structural repair would reconstruct the levee to pre-flood section and grade at the locations of the four breaches (Figure 4). A setback levee would be constructed no more than 50 feet landside of the existing levee to repair the two areas with severe scour erosion.

Type III erosion repair.

Type III areas would be repaired by stripping, disking, filling and compacting in layers, as necessary, until the original slope and grade of the levee are attained. Where filling is required, borrow material would be added to repair sites to restore areas to pre-flood grade. All repair areas would then be reseeded when conditions are suitable for grass germination to prevent or minimize erosion (Figure 4).



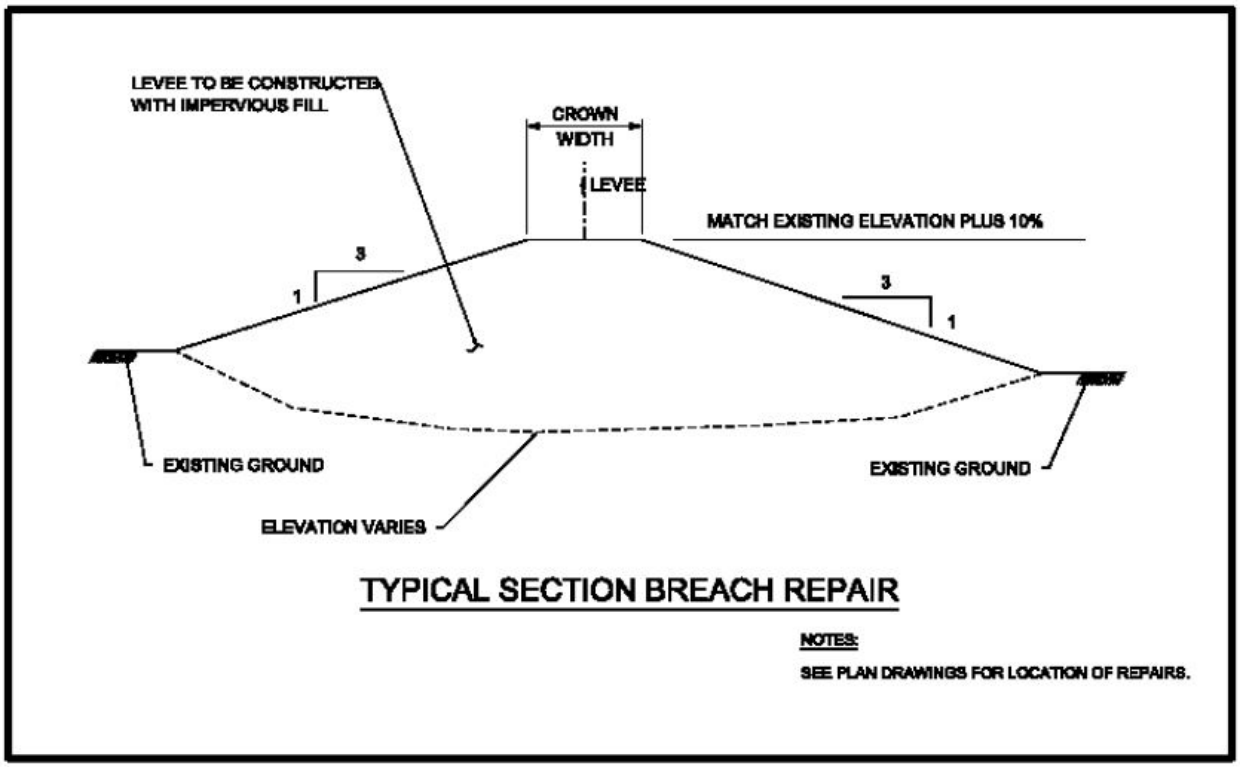


Figure 4. Proposed section/structural repairs for scour and breaches.

Breach repairs

Repair of the levee breaches will include removal of the remaining existing material within the breaches to natural grade using excavators and/or dozers and filling the scour holes areas below natural grade with compacted fill. After the scour holes are filled with the compacted fill and the material is removed, the suitable material which was removed and borrow material will be added to the breached section of the levee in compacted lifts using compactors to restore the levee to original level of protection.

Levee setback

Approximately 600 feet of levee will be setback along a new alignment. The setback levee will be constructed in compacted lifts using suitable material from the existing scoured levee and borrow material. The realigned levee will be constructed to restore the levee to the original level of protection.

Borrow material for repairs.

The estimated borrow quantity for the repair to the Winfield-Pin Oaks levee is 5,000 cubic yards. There was one potential site identified that could serve as an area for borrow removal for repair of the Winfield-Pin Oaks levee (Figure 6).

The borrow site consists of a 2 acre elliptical parcel along the southwestern boundary of the drainage district. This borrow site consists of a raised ridge extending generally northward from Bob's Creek near the levee breach. The site does not contain hydric soils or wetland hydrology. Under the topsoil, the site is a natural clay ridge, rising approximately 10 feet above grade. The material is made of lean clay that is geotechnically suitable. The borrow depth will not exceed 3 feet and excavation will not be allowed within 300 feet of the existing levee toe. The borrow area will be gently sloped to drain to the west and south. The agricultural field will continue to be farmed. In addition, the borrow area did not appear to contain waters of the U.S. This proposed borrow site is recommended for use in the breach repairs.

Construction limits

An area of 20 feet from the landside and riverside toe of the levee and 500 feet adjacent to repair areas on both sides have been established for construction activities. As currently planned, no trees would be removed as part of these repairs.

Access and staging areas

Staging areas and access routes to the repair sites would be established to avoid and minimize environmental impacts. Existing access points such as roads, rights of way, and levees are within a reasonable distance of the construction sites and would be utilized. Currently, the creation of haul roads, other than existing access points, is not deemed necessary.

Environmental protection measures

Within the designated contractor work areas, the following protective and preventative measures shall be followed.

- No fill shall be excavated or permanently placed except where required for erosion.
- There shall be no removal of trees.
- Changes in the project must be coordinated with the regulatory and environmental branch of the Corps of Engineers through the contracting officer. If tree removal becomes necessary, it would require additional coordination with interested agencies, additional documentation, and possibly mitigation.
- All contractor work areas shall be re-vegetated.

2.3 MITIGATION

All activities associated with levee repairs would be conducted to avoid and minimize environmental impacts. No wetland or emergent wetland impacts are anticipated. No forested wetland impacts are anticipated. Mitigation would not be required.

2.4 EVALUATION AND COMPARISON OF ALTERNATIVE PLANS

Under Alternative 1 (No Action) the levee system would remain in its damaged state with a reduced level of protection. This would increase the frequency and risk of monetary damages to croplands, structures, and infrastructure in the event of future flooding. The levee district declined to request the pursuit of a Non-Structural Alternative; therefore, Alternative 2 - Nonstructural Measures, is not included in the comparison of alternative plans. Under Alternative 3 (Preferred Alternative - Repair of Levees with Federal Assistance), damaged levees would be repaired to pre-flood conditions. Table 1 contains a summary of the impacts associated with the Action and the No Action Alternatives.

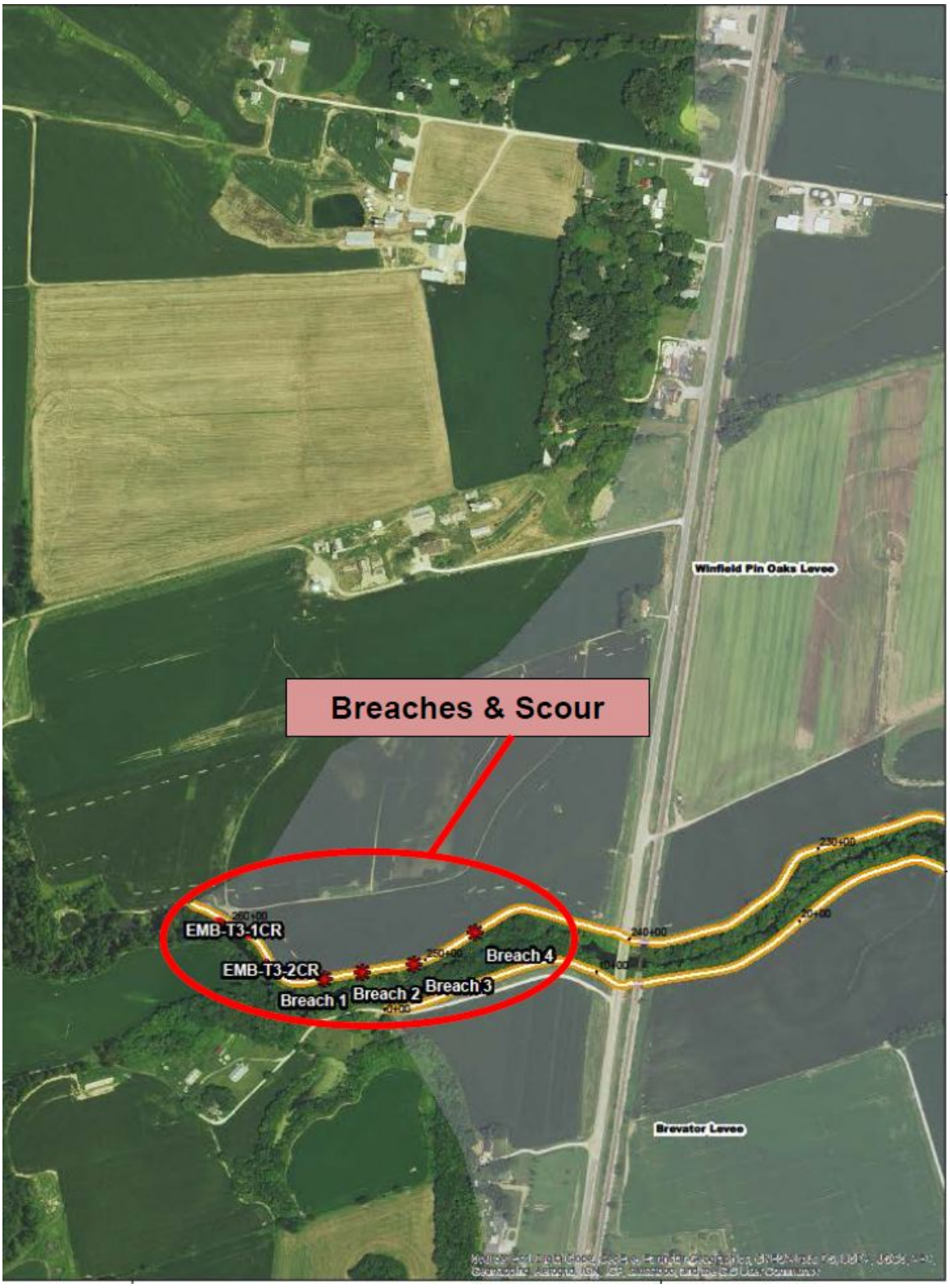


Figure 5. Location of breaches and scour.

Figure 6. Proposed levee setback, borrow site and breaches

Table 1. Comparison of project alternatives.

Resources	Alternatives	
	No Action	**Tentatively Selected Plan**
Physical Resources	Flooding may occur if the levees are not repaired and the levee's integrity is compromised during a flood. Estimated that protection is reduced to 2.52-year flood level with current damages.	Levee and slide repairs would meet the Federal standard. The area inside levees would be flooded only when flood stages exceed levee designs.
	Increased potential for further erosion of levee and sedimentation within L&DDs during flood events.	Temporary minor impacts to water and air quality during construction.
	Does not meet project objective of making repairs to Federal standard.	Meets project objective of pre-flood level of protection.
Biological Resources	If levee system is compromised, there is potential for beneficial impacts due to a potential increase in floodplain wetland habitat.	Construction would be confined to the levee and borrow area which may result in minor temporary impacts.
	Federally listed threatened and endangered species would not be adversely impacted.	There are no suitable bat trees that would be cleared; therefore, the proposed action should have no effect on listed species.
	Meets project objective of minimal environmental impacts.	Meets project objective of minimal environmental impacts.
Socioeconomic Resources	The L&DDs would be susceptible to future floods and potential negative impacts to L&DDs and regional economy due to levee damages.	Repair of levee would result in the protection of croplands and structures from floods - up to the pre-flood condition
	Does not meet project objective of protecting the socioeconomic value of the L&DDs.	Meets project objective of protecting the economic value of the L&DDs.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the biological, physical, and social environments of the affected project area relative to the alternatives under consideration. Relevant resources are addressed in terms of their present condition, their projected condition under the No Action alternative and the expected effects of the Tentatively Selected Plan.

3.1 Federally Threatened and Endangered Species, Lincoln County, MO:

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, a list of species and critical habitat was acquired from the USFWS website on 10 November 2015 (USFWS 2009) for Lincoln County, MO (Table 2). Habitat requirements and impacts of the federal action are discussed for each species below.

Table 2. List of federally threatened and endangered species and their habitat potentially occurring in Lincoln County, MO.

Common Name (Scientific Name)	Classification	Habitat
Indiana bat (*Myotis sodalis)*	Endangered	Caves, mines (hibernacula); small stream corridors with well-developed riparian woods; upland forests (foraging)
Northern long-eared bat (*Myotis septentrionalis*)	Threatened with 4(d) rule	Caves and mines; rivers and reservoirs adjacent to forests
Least tern (*Sterna antillarum)*	Endangered	Bare alluvial and dredged spoil islands
Piping plover (*Charadrius melodus*) – Northern Great Plains Breeding Population	Threatened	Riverine Sandbars
Rufa Red knot (*Calidris canutus rufa*)	Threatened	Shorebird that migrates through Missouri - irregularly observed feeding on mudflats, sandbars, shallowly flooded areas and pond margins along the Missouri and Mississippi Rivers from May 1 through September 30
Decurrent false aster *(Boltonia decurrens*)	Threatened	Disturbed alluvial soils
Running buffalo clover (*Trifolium stoloniferum*)	Endangered	Disturbed bottomland meadows

Indiana Bat

This species has been noted as occurring in several Illinois and Missouri counties. Indiana bats are considered to potentially occur in any area with forested habitat. Indiana bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula include caves and abandoned mines. Females emerge from hibernation in late March or early April to migrate to summer roosts. Females form nursery colonies under the loose bark of trees (dead or alive) and/or in cavities, where each female gives birth to a single young in June or early July. A maternity colony may include from one to 100 individuals. A single colony may

utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. Some males remain in the area near the winter hibernacula during the summer months, but others disperse throughout the range of the species and roost individually or in small numbers in the same types of trees as females. The species or size of tree does not appear to influence whether Indiana bats utilize a tree for roosting provided the appropriate bark structure is present. However, the use of a particular tree does appear to be influenced by weather conditions, such as temperature and precipitation (USFWS 2007a, USFWS 1999).

During the summer, Indiana bats frequent the corridors of small streams with well-developed riparian woods, as well as mature bottomland and upland forests. They forage for insects along stream corridors, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fence rows, and over farm ponds and in pastures. It has been shown that the foraging range for the bats varies by season, age and sex and ranges up to 81 acres (33 ha). Suitable Indiana bat summer habitat may be located in the forested areas in and adjacent to the Winfield-Pin Oaks L&DD.

No Action **–** Current status anticipated to remain the same.

Federal Action **–** The proposed project would not affect any caves or foraging habitat. As currently planned, this project involves no tree clearing. Therefore, it is expected that The Tentatively Selected Plan is not likely to adversely affect the Indiana bat.

Northern Long-Eared Bat

The northern long-eared bat is sparsely found across much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. Northern long-eared bats spend winter hibernating in large caves and mines. During summer, this species roosts singly or in colonies underneath bark, in cavities, in crevices of both live and dead trees. Foraging occurs in interior upland forests. Forest fragmentation, logging and forest conversion are major threats to the species. One of the primary threats to the northern long-eared bat is the fungal disease, white-nose syndrome, which has killed an estimated 5.5 million cave hibernating bats in the Northeast, Southeast, Midwest and Canada. Suitable northern long-eared bat summer habitat may be located in the forested areas in and adjacent to the Winfield-Pin Oaks L&DD.

No Action **–** Current status anticipated to remain the same.

Federal Action **–** The proposed project would not affect any caves or foraging habitat. As currently planned, this project involves no tree clearing. Therefore, it is expected that The Tentatively Selected Plan is not likely to adversely affect the Indiana bat.

Interior Least Tern

Interior least tern historic breeding range includes the Mississippi River system (Jones, 2000, USFWS 1990). Surveys of the Mississippi River have found the majority of breeding colonies occur south of Cairo, IL. However, breeding birds have been found in Scott and Mississippi

counties. The characteristics required for suitable breeding grounds include “bare alluvial islands or sandbars”, food, and appropriate water regime. Least terns arrive at breeding grounds in late April and the breeding season is complete by early September (USFWS 1990).

No Action **–** Current status anticipated to remain the same.

Federal Action **–** Levee repairs would take place within the footprint of the levee and would not impact any interior least tern habitat. The Tentatively Selected Plan is not likely to adversely affect the interior least tern.

Piping Plover

The piping plover is a small shorebird about the size of a robin. It has a sandy colored back and white underparts, with a single black neck band, a short stout orange bill and orange legs. Piping plovers arrive in the Northern Great Plains to breed around mid-April and fly south by mid to late August.

The Northern Great Plains population of piping plovers nest on the shorelines and islands of alkali (salty) lakes in North Dakota and Montana. They nest on sandbar islands and reservoir shorelines along the Missouri River and reservoirs in Montana, North Dakota, South Dakota, and Nebraska. In Nebraska, they nest on the Platte River system, Niobrara, Loup, and Elkhorn rivers as well as limited locations in Minnesota and Colorado. Most of the Northern Great Plains plovers winter along the Texas coast, extending into Mexico.

For nesting, piping plovers make shallow scrapes in the sand which they line with small pebbles or rocks. The female lays three to four eggs and both parents share in incubation duties. The eggs hatch after about 28 days, and the young leave the nest within hours. The chicks can forage for themselves immediately, but remain near their parents for several weeks for protection and temperature control (brooding or shading). Depending on food availability, it takes the young from around 18 to 28 days to begin flying.

In the late 1800’s, piping plovers’ feathers were used in the millinery (hat) trade, and the species was heavily hunted. Starting in the 1930’s, dam construction, water diversion and water withdrawals changed river flow regimes and drastically reduced the amount of available nesting habitat. Human-caused changes to the landscape have increased the number and type of predators, decreasing nest success and chick survival. A five-year review of the piping plovers’ Endangered Species Act listing was completed in September 2009. The current recovery plan was finalized in 1988. Recovery plan revision began in 2010 (USFWS 2015).

No Action **–** Current status anticipated to remain the same.

Federal Action **–** Levee repairs would take place within the footprint of the levee and would not impact any piping plover habitat. The Tentatively Selected Plan is not likely to adversely affect the interior least tern.

Rufa Red Knot

Red knots migrate long distances between nesting areas in mid- and high arctic latitudes and southern nonbreeding habitats as far north as the coastal United States (low numbers) and southward to southern South America. Populations including subspecies *rufa* migrate in large flocks northward through the contiguous United States mainly March-early June, southward July-August (Harrington 2001). Arrival in breeding areas occurs in late May or early June; most have departed breeding areas by mid-August. The migration stops of red knots that spend the boreal winter in Tierra del Fuego and Patagonian Argentina (subspecies *rufa*) are mainly along the Atlantic coast of South America (mainly Chile, Argentina, and Brazil) and the Atlantic and Gulf of Mexico coasts of North America (González et al. 2006), including staging areas on the coasts of Hudson and James bays (Harrington 2001).

No Action **–** Current status anticipated to remain the same.

Federal Action **–** No occurrences of this species are known from the project area. The Tentatively Selected Plan is not likely to adversely affect the rufa red knot.

Decurrent False Aster

The decurrent false aster is presently known from scattered localities on the floodplains of the Illinois River, and Mississippi River from its confluence with the Missouri River south to Madison County, Illinois. Decurrent false aster grows in wetlands, on the borders of marshes and lakes, and on the margins of bottomland oxbows and sloughs. Historically, this plant was found in wet prairies, marshes, and along the shores of some rivers and lakes. The species favors recently disturbed areas and flooding may play a role in maintaining its habitat. Current habitats include riverbanks, old fields, roadsides, mudflats and lake shores. It primarily prefers a moist habitat but can tolerate drought (MDC 2008a).

In Missouri, decurrent false aster distribution is restricted to the Mississippi River floodplain from the Illinois River southward. Current populations are fewer and more isolated than in historical times. Former distribution of this plant included Lincoln, St. Charles, St. Louis, and Cape Girardeau counties. Presently it is only known to occur in St. Charles County (MDC 2008a).

No Action **–** Current status anticipated to remain the same.

Federal Action **–** No occurrences of this species are known from the project area. The Tentatively Selected Plan is not likely to adversely affect the decurrent false aster.

Running Buffalo Clover

Running buffalo clover requires periodic disturbance and a somewhat open habitat to successfully flourish, but it cannot tolerate full-sun, full-shade, or severe disturbance. Historically, running buffalo clover was found in rich soils in the ecotone between open forest and prairie. Those areas were probably maintained by the disturbance caused by bison. Today, the species is found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and

along streams and trails. Clearing land for agriculture and development has led to elimination of populations, loss of habitat, and fragmentation of the clover populations that remain. Small, isolated populations of running buffalo clover are prone to extinction from herbivory, disease, and inbreeding.

Running buffalo clover was historically widespread and ranged from Nebraska to West Virginia. It has disappeared from all known historic sites in Missouri. It formerly occurred in the southern two-thirds of the state. There are historical records from Jasper, Wayne, Cooper, and St. Louis counties. It was considered extirpated from Missouri until as recently as 1989, when some plants were reported growing in an unattended pile of topsoil in St. Louis. One natural site for running buffalo clover was discovered in Madison County in 1994 and another was discovered in Maries County in 1998 (MDC 2008b). The dense turf formed by the cool season grass, regular mowing or agricultural production prevent Running Buffalo Clover from germinating.

No Action **–** Current status anticipated to remain the same.

Federal Action **–** No occurrences of this species are known from the project area. The Tentatively Selected Plan is not likely to adversely affect the running buffalo clover.

Bald Eagle

Although the bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list of threatened and endangered species in 2007, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits unregulated take of bald eagles, including disturbance. The U.S. Fish and Wildlife Service developed the National Bald Eagle Management Guidelines (USFWS 2007a, 2007b, 2007c) to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute disturbance.

No Action **–** Current status anticipated to remain the same.

Federal Action **–** No occurrences of this species are known from the project area. The Tentatively Selected Plan is not likely to adversely affect the bald eagle.

3.2 Water Resources

Existing – The loading against the Winfield-Pin Oaks levee was a result of Mississippi River backwater flooding. The four breaches of the Winfield-Pin Oaks levee were sustained on a portion of the levee west of MO Hwy 79 as a result of flash flooding along Bob's Creek. No critical aquatic habitats or wetlands are present within the footprint of the project.

No Action – Without repair, flooding waters would directly enter the interior of the drainage district potentially causing extensive damage to homes and properties. In addition, the other

damaged portions of the levee would likely erode further and the levee would be more likely to fail in these areas.

Federal Action - A temporary increase in water turbidity resulting from erosion may occur during construction around repair operations and borrow removal. These impacts would cease shortly after construction completion and pre-flood conditions would be reestablished.

3.3 Topography, Geology, and Soils

Existing - The levee district lies in the floodplain of the Mississippi River. The landscape is typical ridge and swale topography created by the river as it migrated across the floodplain. The low ridges in the floodplain typically are composed of sandy or silty material, while the lower swales have surface soils that are typically silty clays.

No Action - Without flooding, land use and soils in this area would remain in agricultural use. With flooding, sedimentation and scour would occur and cropland would be inaccessible until flood waters receded.

Federal Action – Land would remain in agricultural use similar to pre-flood conditions. Soil conditions in the borrow area would change because of clay removal. Agricultural land uses would continue.

3.4 Prime Farmland

Existing – Winfield-Pin Oaks L&DD protects approximately 1,600 acres of prime farmland. Currently, all available farmland within the levee district is being farmed.

No Action – Under this alternative, the level of flood protection is reduced, increasing the risk of prime farmland flooding.

Federal Action - Levee repairs would ensure protection to prime farmland.

3.5 Vegetation

Existing – On the land side of the repair sites, the area is predominantly agricultural lands. The river side of the levee consists of a mix of cottonwood, willow, box elder, and sycamore along with other emergent herbaceous wetland plants consistent with frequently disturbed Mississippi River riparian zones. Vegetation on the levee consists of mowed cool season grasses.

No Action – Agricultural lands within the drainage district would continue to be farmed but would be disrupted by periodic flooding.

Federal Action - Disturbances to levee vegetation (predominantly cool season grasses) would occur during repairs. After repair, the area would be reseeded with similar vegetation resulting

in no long term vegetation impacts. Areas protected by the levees would remain in their current agricultural status.

3.6 Wildlife

Existing – The floodplain forest, wet meadow, aquatic, and agricultural habitats in the area support a wide variety of wildlife common to the Mississippi River farmed and un-farmed floodplain. The proposed repair areas do not provide quality wildlife habitat because of regular disturbances from mowing, burrowing mammal control, and other maintenance activities. Therefore, it is unlikely that the repair area supports significant wildlife populations.

No Action – Without flooding, fauna and associated habitat would remain unchanged. With flooding, fauna would be displaced and habitat would be impacted by flood waters.

Federal Action - Wildlife populations occupying the natural areas adjacent to the levee toe would be disturbed by noise, increased water turbidity, and exhaust. These impacts would cease shortly after construction completion. No tree clearing or disturbance would be necessary to remove borrow or repair the sites. No significant impacts to biological resources are anticipated.

3.7 Fisheries

Existing – Common fish species occurring in Mississippi River and associated backwaters in Lincoln County include gar, gizzard shad, common carp, emerald shiner, silver carp, buffalo, catfish, sunfish, and freshwater drum.

No Action - Without flooding, there would be no impacts to fisheries. With flooding, fish would have access to a large area of floodplain habitat. This would benefit spawning and rearing of many fish species.

Federal Action - Species utilizing big river aquatic habitats typically inhabit a diversity of water velocities, depths, and turbidity levels during various life stages. Any temporary increase in turbidity from erosion due to construction should have no long term adverse impacts to fish or their habitat.

3.8 Air Quality

Existing – The Clean Air Act of 1963 requires the U.S. Environmental Protection Agency (EPA) to designate National Ambient Air Quality Standards (NAAQS). The EPA has identified standards for seven pollutants: lead, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter less than 10 microns in diameter, and particulate matter less than 2.5 microns. Lincoln County, Illinois currently meets all EPA air quality standards (USEPA 2009).

No Action – There would be no change in air quality under this alternative.

Federal Action - Repair activities would result in dust and exhaust from equipment. A minor short-term reduction in air quality would occur. After repair completion, air quality would return to existing conditions.

3.9 Hazardous, Toxic and Radioactive Waste (HTRW) Sites

The U.S. Army Corps of Engineers (USACE) regulations (ER-1165-132) and District policy requires procedures be established to facilitate early identification and appropriate consideration of potential HTRW in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting Phase I Environmental Site Assessment (ESA). USACE specifies that these assessments follow the process/standard practices for conducting Phase I ESA's published by the American Society for Testing and Materials.

Existing - Historically, HTRW (crude petroleum product) has been identified during pilot geotechnical borings. This design has taken this into account and made efforts to avoid known areas. However, if HTRW material is discovered that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government would determine if the material is hazardous. If material is not hazardous or poses no danger, the Government would direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government would consider issuing a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions".

No Action - There would be no change under this alternative.

Federal Action - Impacts are anticipated to be the same as the No Action Alternative.

3.10 Noise

Existing - Ambient noise in the study area is generated by wildlife, human activities and vehicular traffic.

No Action - There would be no change in noise under this alternative.

Federal Action - The proposed project would be expected to temporarily increase noise levels near the repair and associated worksites. The U.S. Environmental Protection Agency has set a limit of 85 decibels on the A scale (the most widely used sound level filter) for eight hours of continuous exposure to protect against permanent hearing loss. Based upon similar construction activities conducted in the past, noise above this level would not be expected to occur for periods longer than eight hours. Noise levels would return to normal after construction completion.

3.11 Socioeconomic

Existing - The area protected by the Winfield-Pin Oaks L&DD is characterized as being rural and agricultural. Based on an economic analysis of the Winfield-Pin Oaks L&DD system, the project average annual benefits are estimated to be $858,000 with average annual costs of $64,000, yielding a Benefit to Cost Ratio of 13.3 to 1. An economic analysis scope was developed for the project and is part of the Project Information Report dated 15 October 2015.

No Action - Without flooding, there would be no socioeconomic impacts. With flooding there could be considerable agricultural and residential economic losses.

Federal Action - Local agriculture and agri-businesses would benefit from levee repair and subsequent restoration of the pre-flood level of protection. The proposed initial levee repairs would not require residential displacement and could provide short-term employment for local contractors and laborers.

3.12 Environmental Justice

Existing – The standard unit of analysis for environmental justice is the census-designated Block Group. The Winfield-Pin Oaks L&DD is located entirely in Lincoln County. Lincoln County is roughly 640 square miles. According to the 2010 census data the population of Lincoln County is 52,566 persons, which is roughly a 35% increase in numbers since the year 2000 census which recorded 38,944 persons.

No Action – Without flooding, there would be no change from current conditions. With flooding, damage, sedimentation and scour would occur. This would impair the ability of landowners to use their land resulting in economic losses and displacement of landowners.

Federal Action - The local agriculture and agri-business economy would benefit from levee repair and subsequent restoration of the pre-flood level of protection. The repairs would also provide short-term employment partially funded by federal money. No adverse impacts (such as displacement) to minority citizens is anticipated under the Tentatively Selected Plan.

3.13 Cultural Resources:

No Action - Without flooding, there would be no change from current conditions. With flooding, there is the potential for damage to culturally significant sites protected by the levee.

Federal Action - The proposed repairs to the levee within the Winfield-Pin Oaks drainage districts would have no effect upon significant historic properties (archaeological remains or standing structures). The borrow area identified for repairs in the L&DDs is in the vicinity of multiple archaeological sites: 23LN1, and 23LN144 to 23LN148. The borrow area consists of a knoll that was surveyed by Harl et al. (1986). No site was recorded on the knoll at that time. St. Louis District archaeologists surveyed the knoll top and found a few scattered lithic items. Two 1m x 1m test units were excavated on the knoll to determine the extent of archaeological material and the potential for subsurface cultural remains. The test units revealed a thin layer

of top soil (approx. 6-10 inches deep) covering a thick, sterile and ancient stratum of red-brown clay. A very sparse collection of lithic debitage was recovered from the test units. The testing indicates that if any intact archaeological deposits once existed in the borrow area, they have been destroyed by agricultural activity and erosion. The use of this borrow material would have no effect upon historic properties.

The location of the proposed setback levee lies on the southwest edge of the reported location of site 23LN144. Harl, et al. (1986) reported the site as a Middle or Late Woodland habitation site, possibly a site occupied during the summer months to exploit riverine resources. A pedestrian survey of the location in December, 2015 indicated that the site was outside the proposed project area. Artifacts were scattered on the surface at the site's location but were absent or very sparsely scattered in the project area. A 1m x 1m test unit located along the axis of the proposed setback levee did not recover any artifacts and revealed a uniform stratigraphy of clayey silt to a depth of 80cm. Artifacts were noted in the outwash areas near the levee breaches and it is believed that these were originally incorporated in the levee fill during construction. The surface of the project area has been severely disturbed by agriculture, construction of the levee and temporary measures to repair the breaches. There are no significant cultural remains along the axis of the proposed setback levee.

In the unlikely event that earthmoving activities associated with the proposed repairs did impact potentially significant archeological/historic remains, all construction activities and earthmoving actions in the immediate vicinity of the remains would be held in abeyance until the potential significance of the remains could be determined. The precise nature of such investigations would be developed by the Saint Louis District in concert with the professional staff of the Missouri State Historic Preservation Office (SHPO).

All actions taken would be in accordance with the National Historic Preservation Act of 1966, as amended (NHPA). The NHPA requires that any Federal undertaking consider the effects to historic properties and consultation with State Historic Preservation Officers and the Advisory Council on Historic Preservation. This act is further codified in 36 CFR Part 800, Protection of Historic Properties. Should any actions result in the collection of data or material from historic properties, such information and objects shall be cared for in accordance with 36 CFR Part 79, Curation of Federally Owned and Administered Archaeological Collections. St. Louis District has initiated consultation with the Missouri SHPO. Any future actions would be coordinated with the SHPO's concurrence.

3.14 Cumulative Impacts

Existing - System-wide repairs to levees would be currently underway. Final repairs would involve returning the levee breaches to the same alignment and level of protection as existed prior to the high water events of 2015. Temporary impacts from noise, air, and water pollution would occur; however, repair sites are widely scattered throughout the St. Louis District and therefore additive effects of these impacts would be negligible. The Winfield-Pin Oaks L&DD PL84-99 project along with several other levees would require borrow material for levee repairs. Borrow for the majority of these projects would come from agriculture areas, and previously identified borrow areas. Some PL84-99 projects sustained damage that is infeasible

to repair on the original levee alignment. For new levee alignments, some acreage would be removed from agricultural use causing a minor loss to overall farm production and increase in floodplain habitat. The widely scattered nature of repair sites and shallow excavation depth of borrow sites would reduce impacts and no long term adverse impacts are expected.

No Action – Existing scours and breaches would be expected to expand further threatening the integrity of the levee system.

Federal Action – Levees would be returned to their original level of protection prior to the high water events of 2015. Temporary impacts from noise, air, and water pollution would occur; however, additive effects of these impacts would be negligible. These repairs are not anticipated to decrease the post-flood productivity of lands riverward or landward of the levee system.

4. ENVIRONMENTAL REGULATORY CONSTRAINTS

The Tentatively Selected Plan was subject to compliance review with all applicable environmental regulations and guidelines. The Tentatively Selected Plan was determined to be in full compliance with all applicable acts and legislation with exceptions as noted in the table below. The Corps of Engineers Regulatory Branch has reviewed the proposed project and determined that levee repair work does not require any permits under Section 404 of the Clean Water Act.

Table 3. Compliance review.

Federal Policies	Compliance
Bald and Golden Eagle Protection Act, 16 USC 668	Full
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Full
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Partial[1]
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	Full
Executive Order 11990 (Protection of Wetlands)	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Full
Fish and Wildlife Coordination Act, 16 USC 661-666c	Full
Food Security Act of 1985, 7 USC varies	Full
Migratory Bird Treaty Act, 1918	Full
Land and Water Conservation Fund Act, 16 USC 460d-4601	Full
National Environmental Policy Act, 42 USC 4321- 4347	Partial[2]
National Historic Preservation Act, 16 USC 470 *et seq.*	Partial[3]
Noise Pollution and Abatement Act, 42 USC 7691-7642	Full
Resource, Conservation, and Rehabilitation Act, 42 USC 6901-6987	Full
Rivers and Harbors Appropriation Act, 33 USC 401-413	Full

Water Resources Development Acts of 1986 and 1990	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full

Full compliance: having met all requirements of the statute for the current stage of planning
1Full compliance to be achieved with agreement from the U.S. Fish and Wildlife Service on Endangered Species impacts.
2 Full compliance to be achieved with the District Engineer's signing of the Finding of No Significant Impact
3 Full compliance to be achieved with the State Historic Preservation Officer's concurrence in the District's EA conclusions.

5. COORDINATION WITH OTHER STATE AND FEDERAL AGENCIES

Coordination has been ongoing with this project and the proposed initial repairs have been coordinated with respective State and Federal agencies.

This EA and Draft FONSI was provided to the following state and federal agencies for their review, comments, and concurrence during the 30 day public comment period, 4 February 2016 – 7 March 2016.

U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
Federal Emergency Management Agency
Natural Resources Conservation Service
Missouri Department of Natural Resources
Missouri Historic Preservation Office
Missouri Emergency Management Agency

To assure compliance with the NEPA, Endangered Species Act, and other applicable environmental laws and regulations, coordination with these agencies would continue as required throughout the planning and construction phases of the proposed levee repairs.

6. LIST OF PREPARERS

Michael L. Kessler, PMP	Role: Project Manager
Sheila McCarthy, Project Manager	Role: Project Manager
Bryan Dirks, Civil Engineer	Role: Civil Engineer
Jim Barnes, Archaeologist	Role: Archeological compliance
Rick Archeski, Environmental Engineer	Role: HTRW
Ken Cook, Biologist	Role: Environmental Assessment

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DRAFT FINDING OF NO SIGNIFICANT IMPACT

PUBLIC LAW 84-99
WINFIELD PIN OAKS LEVEE SYSTEM
WINFIELD LEVEE AND DRAINAGE DISTRICT
LINCOLN COUNTY, ILLINOIS

1. I have reviewed the document concerned with the proposed levee repairs to the Winfield Pin Oaks Levee System. The purpose of this project is to repair levee sections damaged by an extended high water event during the summer of 2015. Repairs would return the drainage district to pre-flood conditions in an expedient manner.

2. I have also evaluated pertinent data concerning practicable alternatives relative to my decision on this action. As part of this evaluation, I have considered the following alternatives:

a. No Action: Under the no-action alternative, the Federal government would not repair the flood damaged levees. It is assumed that, because of the cost of repairs, the levee district would not repair the levee.

b. Repair of Levees with Federal Assistance (Tentatively Selected Plan): Under this alternative, the federal government would repair the damaged areas to the pre-flood level of protection. Since the Winfield Pin Oaks Levee System is active in the USACE Rehabilitation and Inspection Program, it is eligible for Flood Control and Coastal Emergency funding authorized by PL 84-99.

3. The possible consequences of these alternatives have been studied for physical, biological, cultural, social and economic effects. Major findings of this investigation include the following:

a. The no action plan was evaluated and subsequently rejected primarily based upon the higher potential for future flooding and damage to area farms.

b. Borrow for the final levee repair would come from the area deemed acceptable by the borrow inspection team. The selected borrow site location is shown in the Environmental Assessment (EA) as Figure 6. Levee repairs would be seeded using a mixture of fast germinating perennial grasses when conditions are suitable for grass germination.

c. No appreciable effects to general environmental conditions (air quality, noise, water quality) would result from the recommended plan.

d. The recommended plan is not expected to cause significant adverse impacts to aesthetic quality, recreational use, or general fish and wildlife resources.

e. The recommended plan is not expected to cause unacceptable adverse impacts to riparian habitat, bottomland hardwood forest, or other wetlands.

f. No Federally endangered or threatened species would be adversely impacted by the recommended plan.

g. No prime farmland would be adversely impacted as a result of the recommended plan.

h. No significant impacts to historic properties (cultural resources) are anticipated as a result of the recommended plan.

i. Under the recommended plan, local economies would benefit through an increased labor demand to carry out levee repairs. Agricultural land and structures within the drainage district would be provided with pre-2015 flood protection.

4. The following environmental commitments are part of the recommended plan:

a. If any suspected hazardous materials are found, the USACE would notify the Missouri Department of Natural Resources, and the hazardous materials would be removed in an approved manner before proceeding with the project.

b. For those areas where some erosion may occur from borrow excavations, levee repairs, and staging or storage areas, silt screens or hay bales would be used to reduce siltation into surrounding waterways based on a pre-approved Environmental Protection Plan which includes provisions for erosion control and the protection of natural habitat.

c. The USACE would use fast germinating grass mixtures on restored levee areas to reduce any further erosion.

5. Based upon the EA of the recommended plan, no significant impacts on the environment are anticipated. The proposed action has been coordinated with appropriate resource agencies, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with this action.

_____ _____

Date

Anthony P. Mitchell
Colonel, U.S. Army
District Commander

APPENDIX A – PERTINENT CORRESPONDANCE

CULTURAL

-----Original Message-----
From: Koenig, Chris J MVS
Sent: Monday, December 21, 2015 10:46 AM
To: 'llonghorn@astribe.com' <llonghorn@astribe.com>; 'radushane@gmail.com' <radushane@gmail.com>; 'kim.jumper@shawnee-tribe.com' <kim.jumper@shawnee-tribe.com>; 'sheila-bird@cherokee.org' <sheila-bird@cherokee.org>; 'ukbthpo-larue@yahoo.com' <ukbthpo-larue@yahoo.com>; 'nalligood@delawarenation.com' <nalligood@delawarenation.com>; 'bobermeyer@delawaretribe.org' <bobermeyer@delawaretribe.org>; 'kelli.mosteller@potawatomi.org' <kelli.mosteller@potawatomi.org>; 'melissa.cook@fcpotawatomi-nsn.gov' <melissa.cook@fcpotawatomi-nsn.gov>; 'rtwilliamson@mbpi.org' <rtwilliamson@mbpi.org>; 'earlmeshigaud@hannahville.org' <earlmeshigaud@hannahville.org>; 'jrodwan@nhbpi.com' <jrodwan@nhbpi.com>; 'michael.zimmerman@pokagonband-nsn.gov' <michael.zimmerman@pokagonband-nsn.gov>; 'jrw@pbpnation.org' <jrw@pbpnation.org>; 'bill.quackenbush@ho-chunk.com' <bill.quackenbush@ho-chunk.com>; 'smith_deleon77@yahoo.com' <smith_deleon77@yahoo.com>; 'mfee@iowas.org' <mfee@iowas.org>; 'rfields@iowanation.org' <rfields@iowanation.org>; 'kentcollier@kickapootribeofoklahoma.com' <kentcollier@kickapootribeofoklahoma.com>; 'Fred.thomas@ktik-nsn.gov' <Fred.thomas@ktik-nsn.gov>; 'smassey@sacandfoxnation-nsn.gov' <smassey@sacandfoxnation-nsn.gov>; 'gbahr@sacandfoxcasino.com' <gbahr@sacandfoxcasino.com>; Buffalo, Jonathan <director.historic@meskwaki-nsn.gov>; 'dhunter@miamination.com' <dhunter@miamination.com>; Hunter, Andrea MVS External Stakeholder <ahunter@osagetribe.org>; 'lpappenfort@peoriatribe.com' <lpappenfort@peoriatribe.com>; 'ebandy@quapawtribe.com' <ebandy@quapawtribe.com>
Cc: Hayworth, Roberta L MVS <Roberta.Hayworth@usace.army.mil>; Barnes, James E MVS <James.E.Barnes@usace.army.mil>; Malin-Boyce, Susan B MVS <Susan.B.Malin-Boyce@usace.army.mil>; Pulliam, Christopher B MVS <Christopher.B.Pulliam@usace.army.mil>
Subject: USACE, St. Louis District, Proposed Levee Breaches Repair and Path Forward

Good Morning,

The St. Louis District is contacting you in accordance with the provisions of the National Historic Preservation Act of 1966, as amended, to determine if your Tribe has concerns regarding a proposed undertaking. I have been assisting Roberta Hayworth with the St. Louis District Tribal Liaison duties for the last year. Roberta, who is on vacation until January 4th, 2016, has asked that I contact you on her behalf regarding this proposed undertaking.

As the tribal contact representative, I am contacting you regarding an emergency response to four levee breaches in Missouri. Specifically, the Winfield-Pin Oaks Levee District (Lincoln County, Missouri) has requested the assistance of the St. Louis District, U.S. Army Corps of Engineers under Public Law 84-99 (Flood Control and Coastal Emergency Act) to repair damages to their levee. The damage consists of four breaches in the levee and erosion of the creek bank threatening the levee stability. A setback levee, or realignment of the levee, is proposed to diminish the threat caused by creek bank erosion. Further, fill and repair of the four breaches is also warranted. The proposed repairs will be accomplished using material from the existing levee and additional borrow material. Repairs to the levee need to be completed prior to the occurrence of high water levels in the spring of 2016.

Attached is a locational map of the breach area (in relation to St. Louis), a map specifically outlining the breach locations and the proposed setback realignment, and a map of the previously recorded archaeological sites and surveys (with the proposed borrow location). As noted on the map of archaeological sites, the project area and proposed borrow area is located within part of previously recorded prehistoric archaeological site 23LN1. Prehistoric archaeological site 23LN1 was originally recorded in the early twentieth century as a heavy lithic scatter on a second terrace overlooking Bob's Creek to the south. The original site form also mentions a mound, but its specific location was not noted. A subsequent archaeological survey in 1986 revisited site 23LN1. The survey produced artifacts from the Late Archaic time period through the Mississippian time period and was designated as a habitation site. The survey report specified that the mound had been excavated at some point in time and the entire site suffered from decades of plowing and subsequent erosion.

Further, the proposed borrow area is located on an isolated ridge, which is currently under cultivation. An initial pedestrian survey (conducted earlier this month) of the ridge discovered sparsely scattered lithics across the surface. Based on the initial survey, it appears cultural remains on this ridge have been degraded by plowing and erosion. The topsoil is approximately 20-25 centimeters thick. Underneath the topsoil is a sterile, heavy red clay. A pedestrian survey was also performed over the footprint of the proposed setback levee. Sparsely scattered lithics were also noted in this project area.

Prior to approving the material from the ridge as borrow and initiating construction of the setback levee, the St. Louis District is proposing to conduct Phase II archaeological testing on the ridge and the footprint of the proposed levee realignment in early January 2016. The proposed archaeological testing will consist of 1 meter by 1 meter test units, excavated to a sterile subsoil, to provide information in determining the current eligibility status of 23LN1. If subsurface features or significant cultural material is encountered, excavation will immediately cease and an alternate borrow material location will be selected. Further, should subsurface features or significant cultural material be discovered in the footprint of the proposed levee realignment, excavation will immediately cease and additional planning will be required to determine alternative approaches to addressing the creek bank erosion.

If you have any concerns regarding the proposed emergency undertaking or the proposed archaeological testing, please respond by January 4th. Please feel free to contact me between now and January 4th at 314-331-8151 or chris.j.koenig@usace.army.mil (and please cc Roberta Hayworth at roberta.hayworth@usace.army.mil). Further, we can provide updates and a conclusive report upon completion of the emergency survey.

Thank you in advance for your time and we greatly appreciate your understanding in this timely and sensitive PL84-99 emergency response.

Respectfully,
Chris Koenig, M.A., RPA
Archaeologist
USACE St. Louis District
MCX-CMAC-EC-Z
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