

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT
APPROVED APRIL 2012

Submitted pursuant to 42 U.S.C. 4332 (2) (c) by the
U.S. Department of Transportation
Federal Highway Administration



Kentucky Transportation Cabinet
Division of Environmental Analysis



July 2012



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July 2012
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David M. Waldner
Kentucky Transportation Cabinet

July 27, 2012
Date of Approval

[Signature]
Federal Highway Administration

Recommended by Antwon Gooden 7/23/12

The following individuals may be contacted for additional information concerning the projects:

Mr. Anthony Gooden
Environmental Specialist
Kentucky FHWA
John C. Watts Federal Building
330 West Broadway
Frankfort, KY 40601
(502) 223-6742

Mr. David Waldner, PE
Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622
(502) 564-7250



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**Finding of No Significant Impact (FONSI)
for
Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122**

INTRODUCTION

The City of Paducah, Kentucky (the City) proposes to construct a boat launch facility and a marina/transient dock as part of their waterfront development effort. The City has completed a master plan for the development and revitalization of the Paducah riverfront which includes an analysis of existing conditions, and recommendations to enhance the cultural, historical, recreational, tourism and economic development plan. Based on gathered information, meetings, and public input, a *Riverfront Redevelopment Plan* was created in August-September 2006. The projects, as proposed, would result in certain modifications to the human and natural environment. The significance of the environmental impacts as a result of the proposed actions are unknown; therefore, the projects meet the criteria under 23 CFR 771.115(c) for conducting an Environmental Assessment. The EA was completed in March 2012 and approved by the Kentucky Transportation Cabinet-Division of Environmental Analysis and the Federal Highway Administration on April 9, 2012.

PURPOSE & NEED

The City of Paducah, Kentucky is proposing (1) the construction of a boat launch facility on city-owned property which will encompass the corridor along Burnett Street from 8th Street to the Ohio River and approximately 500 feet along 6th Street on each side of Burnett Street. The site comprises approximately 30 acres± near mile marker 936 along the Ohio River, and (2) the construction of a marina/transient dock facility on city/county-owned property within an area that will extend from the floodwall at the end of Jefferson Street westward for approximately 2,200 linear feet while extending approximately 550 linear feet at its maximum (transient dock portion) into the Ohio River. The site comprises approximately 42 acres± of riverbank, including the existing Schultz Park, and water surface near mile marker 935. The limits affecting land for the marina/transient dock vary north of the existing floodwall then diverge to the river at the northeastern end of Park Avenue. The project areas are indicated on the location map shown as Figure 1. The proposed boat launch project involves construction within an area comprised of upland woods, one agricultural field, a narrow wooded strip of Ohio River bank, and an open field. The proposed marina/transient dock facility project involves construction within the undeveloped riverbank and Schultz Park as well as surface waters of the Ohio River.

Project Purpose & Need

The purpose of the boat launch project is to relocate the existing boat ramp facility located at the northeastern end of Broadway Street while at the same time allowing for the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point along the Ohio River. The relocation of the boat launch facility will reduce congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats. The purpose of the marina/transient dock is to provide accommodations for transient boaters and local recreational boat owners. The need

for the marina/transient dock is to provide loading/unloading facilities for transient boats and to provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown Paducah allowing boaters to refuel, dine, purchase supplies, etc. Currently, recreational boaters are required to dock on the riverbank near downtown Paducah. The closest on-water refueling/marina facilities for recreational boaters are located 33 miles upstream at Golconda, IL (Mile Marker 902). The proposed boat launch and marina/transient dock sites have been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah.

Existing Facilities

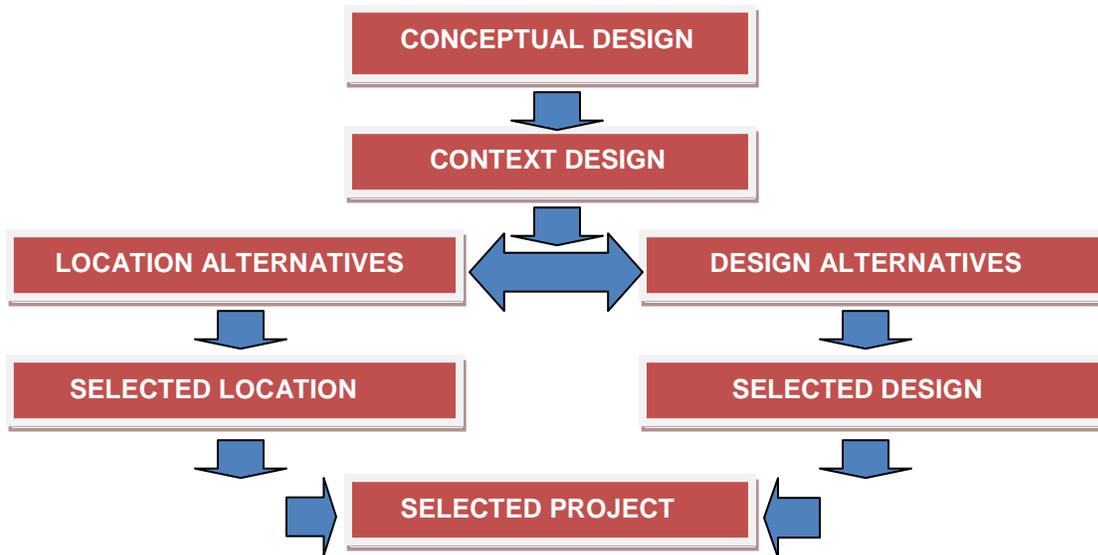
The City of Paducah, Kentucky is proposing two projects under the Environmental Assessment (EA). The projects include: (1) the construction of a boat launch facility on city-owned property which will encompass the corridor along Burnett Street from 8th Street to the Ohio River and approximately 500 feet along 6th Street on each side of Burnett Street. The site comprises approximately 30 acres± near mile marker 936 along the Ohio River, and (2) the construction of a marina/transient dock facility on city/county-owned property within an area that will extend from the floodwall at the end of Jefferson Street westward for approximately 2,200 linear feet while extending approximately 550 linear feet at its maximum (transient dock portion) into the Ohio River. The site comprises approximately 42 acres± of riverbank, including the existing Schultz Park, and water surface near mile marker 935. The limits affecting land for the marina/transient dock vary north of the existing floodwall then diverge to the river at the northeastern end of Park Avenue. The proposed boat launch project involves construction within an area comprised of upland woods, one agricultural field, a narrow wooded strip of Ohio River bank, and an open field. The proposed marina/transient dock facility project involves construction within the undeveloped riverbank consisting of riprap and limited vegetation, the existing Schultz Park, and surface waters of the Ohio River.

Proposed Facilities

The City of Paducah (the City) proposes to relocate the boat launch facility on the undeveloped, city-owned property described above with the facility being comprised of: (1) a boat ramp located on the bank of the Ohio River in the north-central portion of the site having five lanes and open 24 hours a day, (2) a paved parking area adjacent to the boat ramp with 100 parking spaces and adequate room for vehicle ingress/egress, and (3) an access road to the site as an extension of Burnett Street constructed in the location of an existing dirt/gravel road along the eastern boundary of the site. The City proposes to construct a marina/transient dock facility with the marina portion of the facility comprised of: (1) a floating dock system, (2) a projected 150 slips to be installed in phases with a portion to be reserved for transient boaters, (3) a fuel dock with gasoline and diesel fuel, (4) two aboveground fuel storage tanks and an enclosure located at the foot of the floodwall, (5) a marina administration building with showers and stores, (6) utilities including fuel, potable water, electricity, and sanitary pump out, and (7) a gangway entrance shared with the transient boat dock with a secure entrance. The transient dock portion of the facility will be comprised of: (1) a floating dock system also designed as a wave attenuator, (2) dockage for transient vessels on both sides of the dock, (3) one gangway system made up of a combination of gangway sections, (4) a walking path and public access along the gangway and dock, (5) fishing opportunities without fish cleaning amenities, (6) fixed ladders, (7) potable water and electrical pedestals, and (8) lighting and handrail with benches along the center of the dock. As part of the marina/transient dock project, the existing Schultz Park will be enhanced and will include: a gangway/ramp system to the marina/transient dock, an

ALTERNATIVES

The City of Paducah, Kentucky has evaluated alternatives for the proposed boat launch facility and the marina/transient dock through the consideration of alternative site locations as well as alternative project designs in the process of developing the currently proposed “build” alternatives. The process for the selected project decision making is as follows:



LOCATION

Alternatives Considered But Eliminated

Boat Launch

Alternatives for the location of the proposed boat launch were considered and eliminated utilizing a hierarchy of constraints based on the philosophy behind the riverfront redevelopment plan. The hierarchy used for locating suitable properties consisted of (1) distance from downtown Paducah, (2) available city/county owned properties, (3) level of existing development on the properties in question, and (4) level of probable impact to cultural, social, and environmental resources. The purpose of the boat launch project is to relocate the existing boat ramp facility located at the northeastern end of Broadway Street while at the same time allowing for the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point along the Ohio River. This relocation of the boat launch facility will reduce congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats.

Location alternative #1 for the boat launch was located on undeveloped property, along the Ohio River immediately southeast of and contiguous to the Midwest Gas Terminal Barge Access property off of the North 6th Street/Campbell Street intersection. The property is owned by the Paducah/McCracken Visitors Bureau and is zoned *General Business Zone (B-3)*. It was determined that this location did not provide adequate room for ingress, egress, parking, and ramping of boats nor was the site on appropriately-zoned city-owned property; therefore, other

locations were sought for the boat launch facility. Location alternative #2 for the boat launch is located on undeveloped property, approximately 0.6 miles downstream of location alternative #1 along the river, on city-owned property, and downstream of the Paducah City Water intakes. This location has a current land use zoning group of *Conservancy Zone (C-1)* which is considered public open space. This location was found to be adequate in size to provide necessary ingress, egress, parking, ramping of boats, fishing tournaments, year-round boating needs, and could be developed further to include picnicking and camping. However, due to a 102" combined sewer outfall for the wastewater treatment plant and the associated drainage ditch along the western boundary directing flows to the river, the boat launch was repositioned approximately 400 linear feet southeastward (upstream) within the same parcel and its ingress/egress changed from the southwestern portion of the property to the southeastern portion of the property. This re-positioning is considered as location alternative #3. Location alternative #3 is considered the "consensus location" for the proposed facility.

Marina/Transient Dock

Alternatives for the location of the proposed marina/transient dock facility were also considered and eliminated utilizing a hierarchy of constraints based on the philosophy behind the riverfront redevelopment plan. The hierarchy used for locating suitable properties consisted of (1) distance from downtown Paducah, (2) available city/county owned properties, (3) level of existing development on the properties in question, and (4) level of probable impact to cultural, social, and environmental resources. The purpose of the marina/transient dock is to provide accommodations for transient boaters and local recreational boat owners. The need for the marina/transient dock is to provide loading/unloading facilities for transient boats and to provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown Paducah allowing boaters to refuel, dine, purchase supplies, etc. Currently, recreational boaters are required to dock on the riverbank near downtown Paducah. The closest on-water refueling/marina facilities for recreational boaters are located 33 miles upstream at Golconda, IL (Mile Marker 902).

Location alternative #1 for the marina/transient dock facility was comprised of separate locations for a marina and floating dock. The marina was proposed to be located along the Ohio River on Executive Inn (presently removed) property owned by the Paducah/McCracken Visitors Bureau. The current land use zoning group for this location is *General Business Zone (B-3)*. The floating dock was proposed on the Ohio River at the end of Broadway Street on city-owned property. The current land use zoning group for this location is *Conservancy Zone (C-1)*. The marina and floating dock were separated by approximately 3,500 feet in location alternative #1. After consideration, location alternative #1 was not chosen because it does not meet the purpose and need since the marina is approximately 0.7 miles from the downtown area and the breakwater to protect the marina is not feasible to construct due to the depth of the river and the distance from the existing river bank.

Location alternative #2 for the marina/transient dock facility was comprised of separate locations for a marina and large dock (cruise dock). The marina was proposed to be located on both city-owned and Crouse Corporation property north of the Carson Four Rivers Center at the confluence of the Ohio and Tennessee rivers. This location has current land use zoning groups of *Conservancy Zone (C-1)* and *Heavy Industrial Zone (M-2)*. The large dock (cruise dock) was proposed to be located on city-owned property at the end of Broadway Street approximately 900 feet downstream of the marina. This property is currently zoned

Conservancy Zone (C-1). After consideration, location alternative #2 was not chosen for the following reasons:

- The facility position decreases the available navigation channel of the river.
- The facility position increases the potential for interference with existing and future planned river operations.
- The marina is not positioned entirely on city-owned property.

Location alternative #3 for the marina/transient dock facility was comprised of a combination of an excursion dock and a protected marina/transient dock facility. This facility was to be located along the Ohio River between Martin Luther King, Jr. Drive (extended) and Jefferson Street on city-owned property. The property is currently zoned *Conservancy Zone (C-1)*. According to the U.S. Fish & Wildlife Service (USFWS), the marina/transient dock project is in close proximity to several federally protected mussel records known to occur within the Ohio River. A mussel survey was conducted for the marina/transient dock area from August 5-8, 2008 and after review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species at the marina/transient dock location. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels was completed and submitted to USFWS for concurrence. The results of the BA indicated that the proposed marina/transient dock location is likely to adversely affect three federally protected mussel species. Formal consultation on the matter was initiated by the Federal Highway Administration (FHWA) to the USFWS and as a result, a Biological Opinion (BO) was issued by the USFWS for impacts to the three species. The BO concluded that the marina/transient dock project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. However, after consideration of the potential impacts to freshwater mussels, location alternative #3 was not chosen and an alternative location was sought.

No Build Alternative

Boat Launch

The “no-build” alternative for the boat launch project was considered as a baseline for comparison but because of the need to reduce congestion and vehicle parking associated with recreational fishing activities at the northeastern end of Broadway Street, this alternative is not considered acceptable. In addition, the “no-build” alternative for the boat launch will not allow the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point. Not building the boat launch project will inhibit new tourism, recreation, and economic development opportunities for the city.

Marina/Transient Dock

The “no-build” alternative for the marina/transient dock project was considered as a baseline for comparison, but because of the need to (1) provide loading/unloading facilities for transient boats, and (2) provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown, this alternative is not considered acceptable. The “no-build” alternative for the marina/transient dock will not allow the city to fully capitalize on its recreational, cultural, and historical ties with the river, and the economic opportunities that these present. Not building the marina/transient dock facility will inhibit new tourism, recreation, and economic development opportunities for the city.

Selected Location Alternative

Boat Launch

Location alternative #3 is considered the “consensus” location (selected location alternative) for the proposed facility. Location alternative #3 for the boat launch facility is located along the river approximately 400 linear feet upstream of location alternative #2, on the same undeveloped city-owned property but still downstream of the Paducah City Water intakes. The boat launch was shifted in this manner to utilize the existing entrance to the subject property via the Burnett Street/North 6th Street intersection and to lessen the impact on the combined sewer drainage ditch. This location maintains a land use zoning group of *Conservancy Zone (C-1)* which is considered public open space. This location was chosen as the selected location alternative through the synthesis of community, stakeholder, river industry, and city input. The proposed boat launch site has been selected to satisfy the purpose and need for the facility which is to reduce congestion and vehicle parking at the northeastern end of Broadway Street associated with recreational fishing activities such as launching and trailering of boats, and allow for the transition of the downtown riverfront area back to its historic use. The location alternatives for the boat launch are detailed in Figure 2.



Figure 2

Marina/Transient Dock

Location alternative #4 is considered the “consensus” location (selected location alternative) for the proposed facility based on the review of location alternatives #1, #2 and #3. Location alternative #4 for the marina/transient dock facility is on city/county-owned property a distance of 500 linear feet downstream (northwest) of location alternative #3 to lessen the potential impacts to freshwater mussels. The “consensus” marina/transient dock facility location has been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah. The location alternatives for the marina/transient dock facility are detailed in Figure 3.

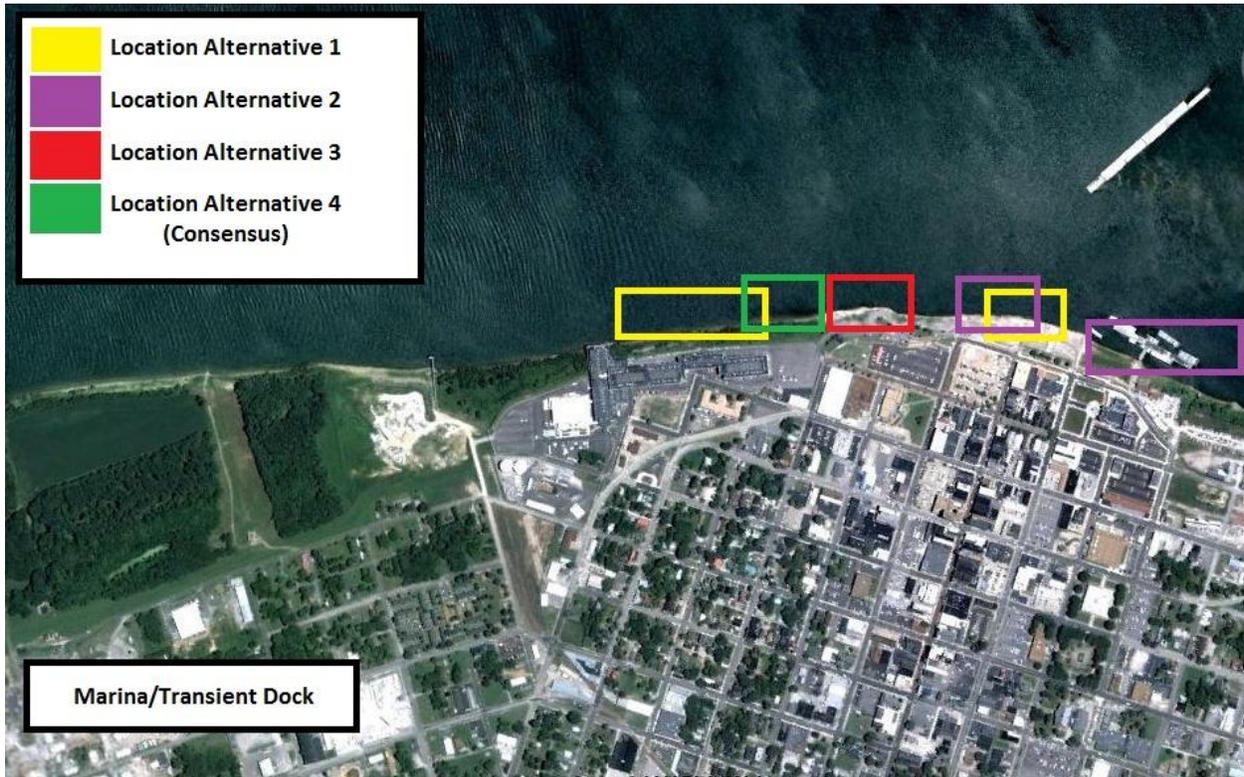


Figure 3

DESIGN

Alternatives Considered But Eliminated

Boat Launch

Two design alternatives were evaluated for the boat launch facility. Both alternatives would relocate the existing boat ramp facility located at the northeastern end of Broadway Street allowing for the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point along the Ohio River. This relocation of the boat launch facility would reduce congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats.

Boat Launch Design Alternatives

- ***Alternative #1***
- ***Alternative #2 (Consensus)***

The design alternatives would both provide ingress/egress at the Burnett Street/North 6th Street intersection, parking, and a boat launch area on the bank of the Ohio River. Design alternative #1 includes: (1) one boat ramp located on the bank of the Ohio River in the north-central portion of the site having five lanes and open 24 hours a day, (2) one paved parking and trailering area adjacent to the boat ramp providing 100 parking spaces and adequate maneuvering area, and (3) an access road to the site as an extension of Burnett Street and constructed in the location of an existing gravel/dirt access road along the eastern boundary of the site. The need for future parking expansion requires a second alternative to this design. Design alternative #2 is the “consensus” design and is identical to alternative #1 with the exception of an additional 4.3 acres for parking.

Marina/Transient Dock

The design for the marina/transient dock facility commenced with the approved *Riverfront Redevelopment Plan*, continued through context design, and culminated with a “consensus” design alternative after the consideration of a number of design alternatives. The context design and consensus design alternative were documented and further refined in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* in December 2007. In addition to addressing the fundamental purpose and need for the project, the *Riverfront Redevelopment Plan* and the *MOU* both address the goal to enhance existing amenities in order to “recapture” the riverfront. This includes creating an interface and area of public gathering for not only transient boaters, but also for local public use and enjoyment. To that end, the *MOU* outlined a number of basic context elements that were established to be fundamental to the success and goals of the project. The salient context elements presented in the *MOU* can be summarized as follows:

- Locate the marina and dock facilities strategically to avoid impacts to river traffic.
- Construct the transient dock parallel with the river’s direction of flow to limit current forces and to serve as a wave attenuator for the marina.
- Provide a debris deflector upstream of the marina to protect against floating debris, ice and break-away barges from both the Ohio and Tennessee Rivers for all river stages

- Accommodate river stage fluctuations from elevation 299 to 341.8 (100-yr WSE).
- Enhance existing amenities at Schultz Park.
- Utilize the existing opening at Monroe Street as the pedestrian access point through the floodwall to connect the riverfront to the downtown area.
- Maximize public accessibility to the river up to elevation 322.
- Preserve and enhance existing viewsheds.
- Utilize the existing floodwall in its existing condition without modification.
- Maintain vehicular access through Schultz Park.
- Provide a marina with boat slips that includes:
 - Fuel, electricity, potable water and sanitary pump out facilities.
 - Store and administration building

The development of alternatives documented in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* focused primarily on three separate concepts that are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. The *MOU* does not include the documentation of two other marina/transient dock design alternatives that were evaluated and eliminated early in the design development process, namely, sheet pile retaining walls and floating barrier. The *Riverfront Redevelopment Plan* and the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* are included in this document as Appendix N and Appendix O, respectively.

A brief summary of mass fill (alternative #1), sheet pile retaining walls (alternative #2), and the floating barrier (alternative #3) is provided below.

Marina/Transient Dock Design Alternatives

- ***Mass Fill (Alternative #1)***
 - ***Design Concept #1***
 - ***Design Concept #2***
 - ***Design Concept #3 (Consensus)***
- ***Sheet Pile Retaining Walls (Alternative #2)***
- ***Floating Barrier (Alternative #3)***

Design Alternative #1- Mass Fill

Three concepts were evaluated for design alternative #1 (mass fill) for the marina/transient dock facility. Each of the concepts would serve the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Each of the concepts would enhance Schultz Park and would have landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities in common. The three concepts each consist of the construction of a landform expansion of Schultz Park through the placement of clean fill material within the Ohio River to form a peninsula and construction of a floating dock and marina on the downstream side of the peninsula. Fill material is placed by truck or barge on an approximate 3H:1V slope to create the peninsula to an elevation 338 (near the 100-yr river elevation). This landform provides passive protection of the marina and transient dock from floating debris, ice and barge impact for all river stages. Access to the floating dock is provided

Paducah Boat Launch & Marina/Transient Dock FONSI

by elevated walkway/gangways. The land-based improvements of Schultz Park include reconstruction of parking, slope protection walkways and enhanced vegetation. The amount of fill material used to create the landform has been limited to construct a suitable deflector for debris. The three concepts are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. Concept #1 includes an observation tower, bioengineered slope protection, a park overlook, a lawn & sculpture park, pedestrian link to downtown via Monroe Street, an interpretive levee trail, the marina, and the transient dock. Concept #2 includes the amenities provided in Concept #1 with the addition of terraced seating and terraced lawn & gardens. Concept #3 includes the amenities provided in Concept #2 with the addition of a marina/transient dock building, steps leading down to the Ohio River, a connection to the existing amenities to the immediate east, and the adaptive use of existing structures and interpretive landmarks. Concept #3 does not include an observation tower. Each of the three design concepts will require that fill be placed in the Ohio River in order to provide landform and shore protection. Concept #3 requires the most fill impact to the Ohio River while Concept #1 has the least. Table 1 summarizes the amenities and features of the three concepts as well as the selected concept (Consensus). The Consensus is a combination of specific amenities/features taken from the three mass fill alternative concepts and requires the same amount of fill as Concept #3. The anticipated capital construction cost for the Consensus is \$ 13.0M.

TABLE 1- MASS FILL DESIGN CONCEPTS

Amenities and/or Features	Concepts			
	Concept #1	Concept #2	Concept #3	Consensus
Observation Tower	X	X	----	----
Bioengineered Slope Protection	X	X	X	X
Park Overlook	X	X	X	X
Lawn/Sculpture Park	X	X	X	X
Interpretive Levee Trail	X	X	X	X
Marina	X	X	X	X
Transient Dock	X	X	X	X
Promenade/Pedestrian Link to Downtown	X	X	X	X
Terraced Seating		X	X	X
Terraced Lawn & Garden		X	X	X
Marina/Transient Dock Building			X	X
Steps to the Ohio River			X	----
Connectivity to Existing Amenities			X	X
Adaptive Use of Existing Landmarks			X	X
Rock Outcropping to the River				X
Vertical axis wind turbines				X
Estimated Fill (cubic yards)	160,000	220,000	265,000	265,000
Estimated Construction Cost	\$ 11.1M	\$ 12.2M	\$ 12.7M	\$ 13.0M

Design Alternative #2- Sheet Pile Retaining Wall

Design alternative #2 is similar to design alternative #1 (mass fill) except that the mass fill material is placed within a vertical sheet pile wall up to an elevation of approximately 302 feet above MSL. This alternative also provides protection for the marina against floating debris. Access to the floating dock is provided by elevated walkway/gangways; however, the river's edge will not be accessible. The land-based improvements to Schultz Park include reconstruction of parking and enhanced vegetation.

This alternative addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. However, with this alternative, access to the river for non-boaters is limited and there is minimum enhancement to the useable area in Schultz Park. Based on preliminary soil boring data, it was anticipated that sheet piling lengths on the order of 60 feet would be required as well as the potential for pre-drilling and significant tie-backs and dewatering. When compared with alternative #1 (\$ 11-13M), the anticipated capital construction cost for such sheet piling (\$ 17.4M) is much greater and the life expectancy is much less than with mass fill. Contrary to design alternative #1, this alternative would isolate pedestrians from interacting with the river at the river's edge due to the necessary hand-railing protections required to provide adequate safety. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #2 was eliminated.

Design Alternative #3- Floating Barrier

Design alternative #3 consists of a floating barrier structure that would provide debris/barge protection for the marina, wave attenuation, and access to the dock/marina. This alternative represents the Consensus Plan presented in the approved *Riverfront Redevelopment Plan* of March 2007. This floating barrier consists of a series of precast concrete barges linked together to form one continuous, articulated floating dock string. This articulated dock string is attached to multiple piers constructed at intervals along the dock to provide anchorage. Access to the dock would be provided through an elevated walkway/gangway from the existing Schultz Park riverbank. With this alternative, the only fill material placed in the river is associated with construction of the anchor piers for the floating dock and the anchorage for the marina. The land-based improvements of Schultz Park would include reconstruction of parking, slope protection, walkways and enhanced vegetation.

Design alternative #3 addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Although design alternative #3 minimizes the amount of fill material placed in the river when compared with design alternatives #1 and #2, the alternative poses significant challenges associated with the design and construction of a suitable structure that can accommodate the river current, debris load, ice load and significant range of river fluctuations (elevation 299 to 338 feet above MSL). Because the barrier would be subject to very significant lateral loading, it is estimated that the piers would be constructed of concrete caissons on the order of 8' to 10' diameter, and/or sheet pile cells on the order of 20' diameter, each with significant foundations. It has been estimated that each pier would likely extend approximately 60 feet above normal pool elevation directly in front of Schultz Park, thus significantly obstructing the viewshed from the park and surrounding areas. The floating barrier would be

anchored using a guide rail system to each cell and would rise and fall with the river elevation. This guide rail system poses a significant maintenance obligation, and in the event of a failure or binding, portions of the dock would become submerged. This would result in an unacceptable risk to public safety as well as damage to the floating infrastructure. Furthermore, the floating barrier would be susceptible to major structural damage and potential loss of life in the event of impact from a break-away barge. When compared with alternative #1 (\$ 11-13M), the anticipated capital construction cost for the floating barrier (\$ 15.7M) is greater. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #3 was eliminated.

No Build Alternative

Boat Launch

The “no-build” alternative for the boat launch project was considered as a baseline for comparison but because of the need to reduce congestion and vehicle parking associated with recreational fishing activities at the northeastern end of Broadway Street, this alternative is not considered acceptable. In addition, the “no-build” alternative for the boat launch will not allow the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point. Not building the boat launch project will inhibit new tourism, recreation, and economic development opportunities for the city.

Marina/Transient Dock

The “no-build” alternative for the marina/transient dock project was considered as a baseline for comparison, but because of the need to (1) provide loading/unloading facilities for transient boats, and (2) provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown, this alternative is not considered acceptable. The “no-build” alternative for the marina/transient dock will not allow the city to fully capitalize on its recreational, cultural, and historical ties with the river, and the economic opportunities that these present. Not building the marina/transient dock facility will inhibit new tourism, recreation, and economic development opportunities for the city.

Selected Design Alternative

Boat Launch

Design alternative #2 includes the amenities provided in alternative #1 with the addition of 4.3 acres of future parking area. The required elevation of the boat ramp was minimized in alternative #2, resulting in a reduction in the construction footprint and associated impacts of 0.7 acres of the Ohio River to 0.5 acres. The selected design alternative is a result of the evaluation of the two design alternatives described above. The basic premise of this decision is the opportunity to relocate the existing boat launch away from the northeastern end of Broadway Street so that this area can be converted back to its original use as a riverboat landing and community focal point along the Ohio River. This relocation of the boat launch facility would reduce congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats. Design alternative #2 was chosen as the selected alternative based on the potential for future parking needs (an additional 4.3 acres) as well as the reduction of the construction footprint and associated impacts of the Ohio River from 0.7 acres to 0.5 acres. Design alternative #2 will provide (1) one boat ramp located on the bank of

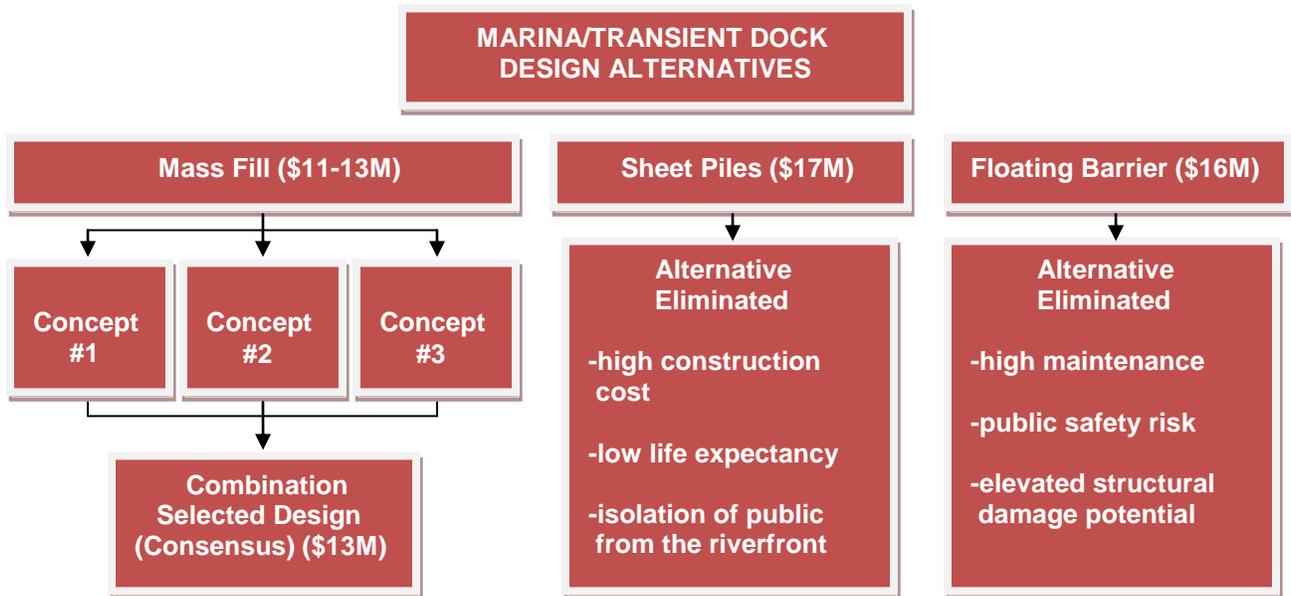
Paducah Boat Launch & Marina/Transient Dock FONSI

the Ohio River in the north-central portion of the site having five lanes and open 24 hours a day, (2) one paved parking and trailering area adjacent to the boat ramp providing 100 parking places and adequate maneuvering area, and (3) an access road to the site as an extension of Burnett Street and constructed in the location of an existing gravel/dirt access road along the eastern boundary of the site. Paducah Power System will supply lighting in the boat launch area after construction of the project. The lighting system will be overhead electric with standard, basic fixtures. There are no other city-owned properties along the riverfront that will accommodate the development of the boat launch facility. Design alternative #2 is included as Figure 4.

Marina/Transient Dock

The selected design alternative (consensus) is based on design alternative #1 (mass fill). It has been determined that the mass fill alternative is the best approach to provide long-term stability and protection of the City's infrastructure (marina and dock assets), address the purpose and need for the project, and enhance the Schultz Park and the riverfront interface with the public. In the consensus design alternative (Mass Fill- Concept #3), the size of the mass fill is expanded slightly in order to increase the usable area of Schultz Park for additional amenities including a pedestrian promenade and terraced seating at the river's edge. The selected design alternative will enhance Schultz Park and include landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities. Specifically, the selected design includes: bioengineered slope protection, a river overlook, lawn & sculpture park, pedestrian link to downtown via Monroe Street, terraced seating, terraced lawn & gardens, an interpretive levee trail, a marina/transient dock building, rock outcropping leading down to the Ohio River, the adaptive use of existing structures and interpretive landmarks, a connection to the existing amenities to the immediate east, the marina, and the transient dock. The marina/transient dock will have three individual sets of four pipe piles that will support the "floating" gangway deck system. The most elevated portion of this support system will be vertical axis wind turbines at the top of each of the pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. Lighting within the marina/transient dock facility will consist of pole-mounted pedestrian lights, pathway lighting along the transient dock, mounted gangway lights, and submersible inset lights for the stairways.

A summary of the marina/transient dock alternatives analysis is detailed below. The selected design alternative layout (Mass Fill- Consensus) is included as Figure 5.



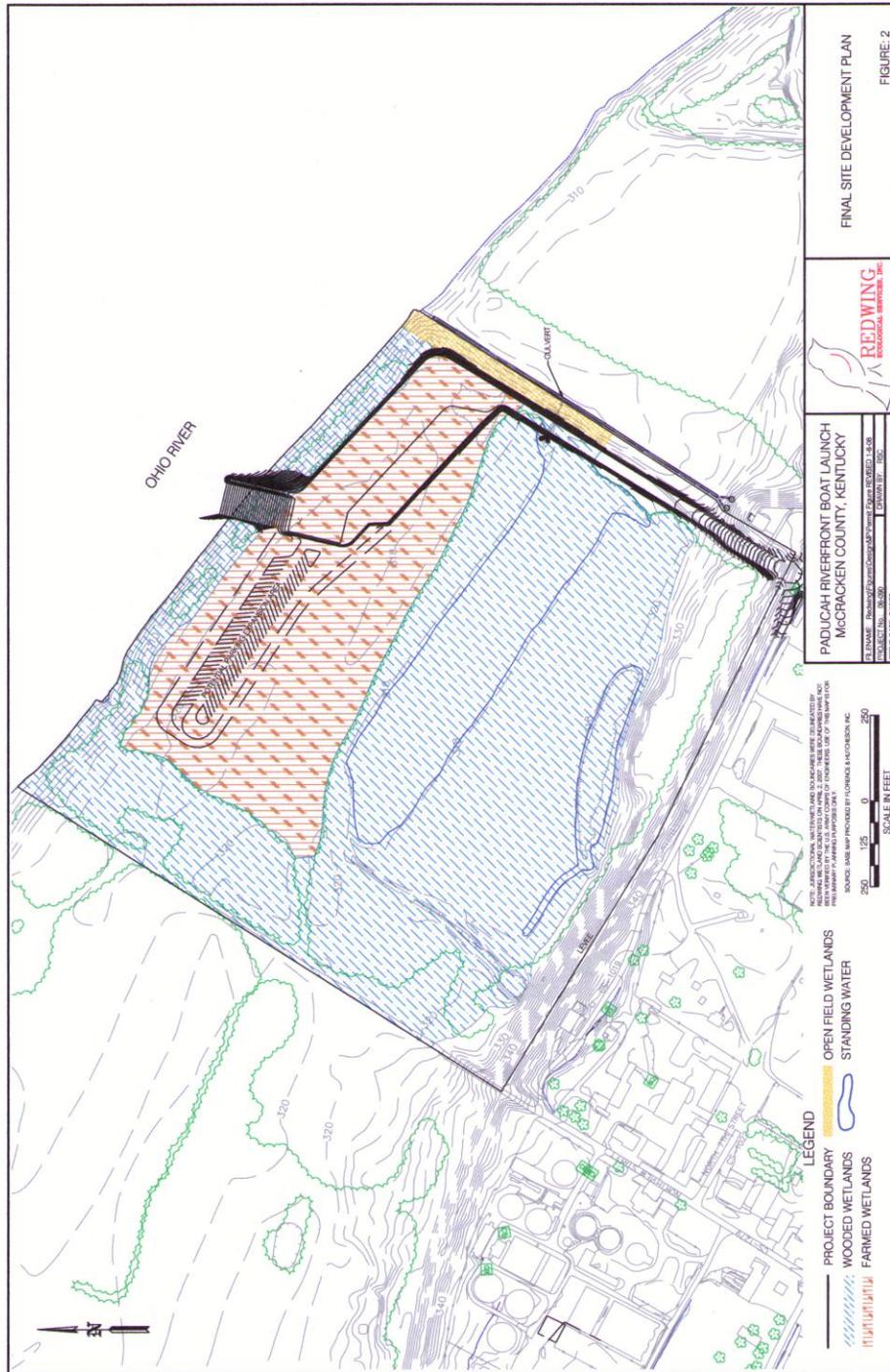


Figure 4

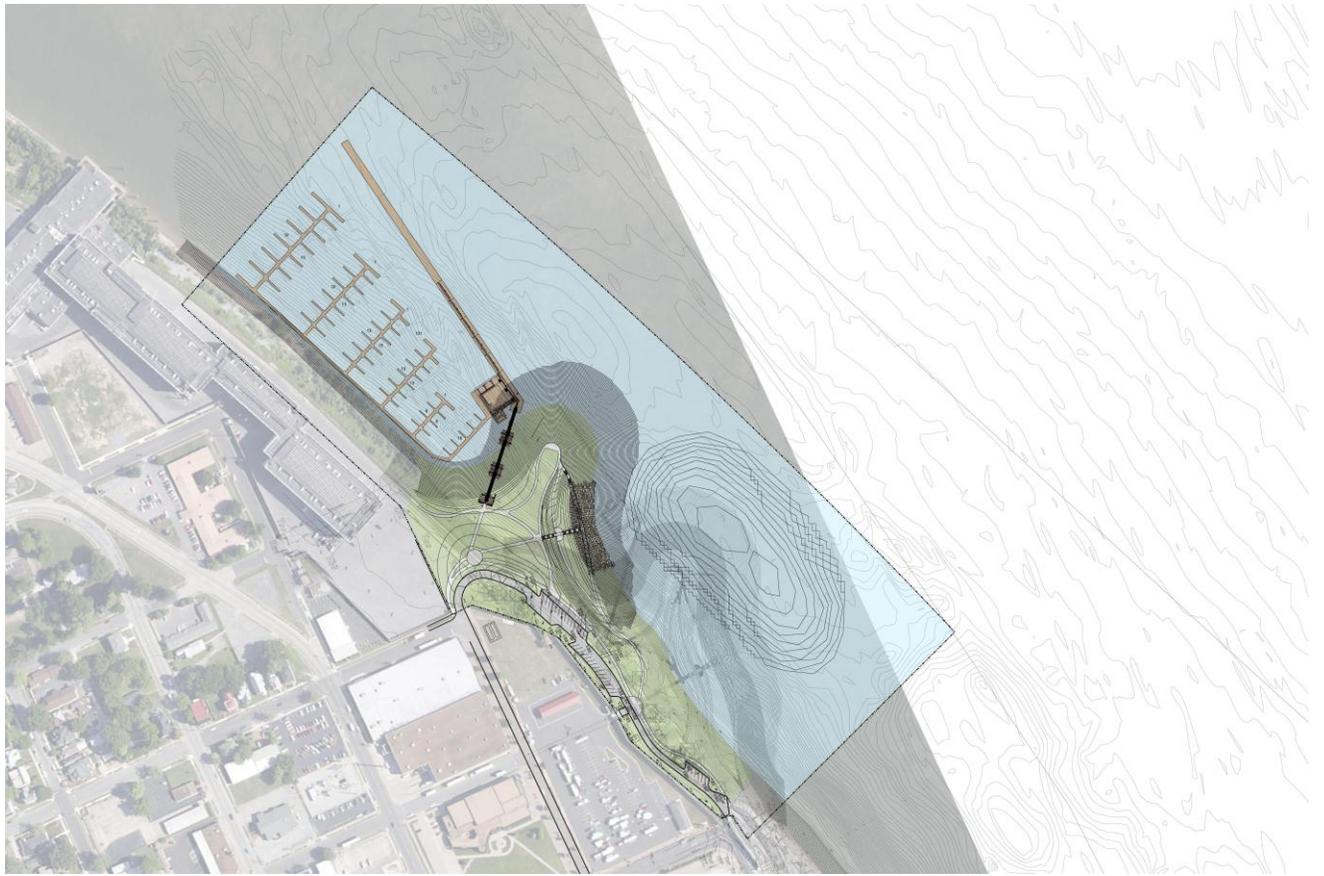


Figure 5

Environmental Impacts of the Selected Alternatives

The following table summarizes the impacts associated with the selected alternatives:

TABLE 2- ENVIRONMENTAL IMPACTS SUMMARY

Impact Category	Impacts	
	Boat Launch	Marina/Transient Dock
Air Quality	None*	None*
Noise	None#	None#
Water Quality & Streams	0.5 acres^ (Mitigated)	6.2 acres^
Floodplains	Yes	Yes
Wetlands	9.2 acres (Mitigated)	None
Wild & Scenic Rivers	None	None
Federal Threatened/Endangered Species	Mitigated**	Mitigated**
State Threatened/Endangered Species	Mitigated**	Mitigated**
Historic Structures or Districts	None%	None%
Archaeological Sites	None%	None%
Surface Water/Land Use	Ohio River	Ohio River
Community Impacts	None	None
Displacements & Relocations	None	None
Farmland	Minimal	None
Environmental Justice	None	None
Pedestrian & Bicycle Facilities	None	None
UST/Hazardous Materials	None	None
Visual Impacts@	None	Minimal
Construction Activities	Minimal	Minimal
Section 4(f) and/or 6(f)	None	Schultz Park
Section 9 Bridge Permit	None	None
Federal Permits	Sections 404 & 10	Sections 404 & 10
State Permits	Sections 401, 402, and Floodplain	Sections 401, 402, and Floodplain

* Project areas are in attainment for criteria pollutants. Emissions from combustion engines are considered trivial activities and are not regulated. Commitments have been made for construction activities to reduce emissions.

Construction activities are exempted between 7 A.M. and 6 P.M. on weekdays.

^ Consists of 0.5 acres of the Ohio River at the boat launch and 1.60 acres of fill along the riverbank, 4.56 acres of fill in the riverbed, and 0.07 acres for mooring anchors at the marina/transient dock. Due to the relatively limited nature of the marina/transient dock impacts in relation to the overall Ohio River system, no mitigation is required for the project for impacts to water resources.

** Commitments have been made to reduce impacts to Indiana bats. Mussel surveys have been conducted at both project sites. Biological Assessment (BA) documents that estimate impacts to mussels have been submitted to USFWS. A Biological Opinion (BO) has been completed by USFWS with terms/conditions required.

% Architectural & archaeological surveys have been conducted with no impacts recorded.

@ Structural pipe piles supporting the floating gangway system of the marina/transient dock. Consultation on visual impacts has been completed.

Paducah Boat Launch & Marina/Transient Dock FONSI

ENVIRONMENTAL IMPACTS & MITIGATION

Air Quality

The selected alternatives will have no impacts on air quality.

Noise

Noise impacts associated with the proposed boat launch and marina/transient dock will occur during construction of the facilities; however, construction is conditionally exempt from the City Noise Ordinance. The vertical axis wind turbines proposed for the marina/transient dock have a working noise level of 53 dB at 10-12 feet. This noise level will be attenuated further due to the distance from the downtown area and will be well below the criteria in the local noise ordinance. The Kentucky Transportation Cabinet submitted noise impact documentation to the Kentucky Heritage Cabinet on May 10, 2012 for the proposed wind turbines. The Kentucky Heritage Council concluded on May 11, 2012 that the cumulative effect of the wind turbines will not pose an adverse effect to historic resources. It is concluded that the use of the boat launch and marina/transient dock facilities will create certain noise levels that have been estimated to be attenuated well below criteria required in the local noise ordinance.

Water Quality & Stream Impacts

Potential Impacts

According to the jurisdictional waters/wetlands survey conducted by Redwing Ecological Services, Inc. (Redwing) on April 2-3, 2007, the proposed boat launch development will result in unavoidable impacts to 9.7 acres of jurisdictional waters of the U.S., including: 0.5 acres of the Ohio River, 8.3 acres of farmed wetlands, 0.7 acres of wooded wetlands, and 0.2 acres of open field wetlands. The development has minimized and avoided water/wetland impacts by focusing impacts on the low quality farmed wetlands and limiting impacts to the higher quality wooded wetlands. Less than 2% of wooded wetlands on site are proposed for impact. There are no blue-line streams within the project site with the exception of the Ohio River. The City of Paducah (the City) received a Stream Construction Permit (Permit #16689) and a Section 401 Water Quality Certification (Permit #2008-0029-1) from the Division of Water within the Kentucky Department for Environmental Protection (Kentucky Division of Water) on September 7, 2007, and April 8, 2008, respectively, as well as the necessary permit renewals prior to expiration. The City received a Section 10/Section 404 Permit (Permit #LRL-2007-811-GJD) from the U.S. Corps of Engineers (USCOE) on May 23, 2008. An Individual Section 402 (KPDES Stormwater) Permit will also be obtained for the project. An Engineering "No Impact" Certification which certifies that the boat launch facility will not impact the 100-year flood elevations, floodway elevations, and floodway widths on the Ohio River was acquired by the City on May 30, 2007.

According to the jurisdictional waters/wetlands survey conducted for the marina/transient dock by Redwing on May 14, 2008, the proposed development will result in unavoidable impacts to jurisdictional/navigable waters of the U.S. along 2,200 feet of the Ohio River. Impacts include 1.60 acres of fill along the riverbank, 4.56 acres of fill in the riverbed, and 0.07 acres of impact for the mooring anchors for expansion of Schultz Park, providing public access to the river, and anchoring of floating docks. Redwing has submitted applications to the USCOE and the Kentucky Division of Water, for a Section 401 Water Quality Certification, Section 10

Navigable Waters Permit, and a Section 404 Permit for the proposed marina/transient dock. An Individual Section 402 (KPDES Stormwater) Permit will also be obtained for the project. These permits will be obtained before construction commences on the marina/transient dock. A Stream Construction Permit (Permit #17643) was acquired by the City of Paducah on May 1, 2012. It is anticipated that no mitigation will be required for water resource impacts due to the limited nature of the impacts in relation to the overall Ohio River system. As a condition of the Stream Construction Permit acquired from the Kentucky Division of Water, an Engineering “No Impact” Certification which certifies that the marina/transient dock will not impact the 100-year flood elevations, floodway elevations, and floodway widths on the Ohio River is required.

According to the U.S. Fish & Wildlife Service (USFWS), the proposed boat launch and marina/transient dock projects are in close proximity to several federally protected mussel records known to occur within the Ohio River. The Mussel Survey Report was submitted to the USFWS on September 25, 2008. After review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species, *Potamilus capax* (Fat Pocketbook), at both the boat launch and marina/transient dock locations. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels, specifically the Fat Pocketbook mussel, was completed and submitted to USFWS on December 19, 2008 for concurrence. The results of the BA indicated that the proposed boat launch project is likely to adversely affect three federally protected species: *Potamilus capax* (Fat Pocketbook), *Lampsilis abrupta* (Pink Mucket), and *Plethobasus cooperianus* (Orangefoot Pimpleback). Formal consultation on the matter was initiated by the Federal Highway Administration (FHWA) to the USFWS on February 12, 2010. As a result, a Biological Opinion (BO) was issued on July 6, 2010 and revised on December 21, 2010 by the USFWS for impacts to the three species. The BO concluded that the boat launch and marina/transient dock projects are not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. However, in order to be exempt from Section 9 of the Endangered Species Act of 1973 (the Act) for “take” of a listed species, FHWA must comply with non-discretionary terms and conditions which implement reasonable and prudent measures and outline reporting/monitoring requirements.

Since the completion of the initial Biological Assessment (BA) and Biological Opinion (BO) for impacts to federally protected mussel species in December 2008 and July 2010, respectively, (1) the reach for the marina/transient dock has been categorized as an Outstanding State Resource Water (OSRW) due to the presence of federally-protected mussels by the Kentucky Division of Water (November 2010), (2) the U.S. Fish & Wildlife Service (USFWS) has determined that additional mussel species are proposed for listing under the Endangered Species Act of 1973 (the Act) (January 2011), and (3) the marina/transient dock project area has been shifted 500 linear feet downstream (northwest) from its original position.

The additional species proposed for listing are *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose) as endangered and *Quadrula cylindrica* (Rabbitsfoot) as either threatened or endangered. As a result of this proposal, the Federal Highway Administration (FHWA) requested a formal conference opinion from the USFWS on March 4, 2011 for three endangered species likely to be listed prior to the completion of the boat launch and marina/transient dock projects. The conference was requested to take into account the effects of the two projects on *Quadrula cylindrica* (Rabbitsfoot), *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose). The US Fish and Wildlife Service (USFWS) completed the formal conference

opinion on July 13, 2011. USFWS concurred that the projects will likely adversely affect the Rabbitsfoot and Sheepnose and will not likely adversely affect the Spectaclecase.

The marina/transient dock project area has been shifted 500 linear feet downstream (northwest) of its original position in order to minimize potential impacts to freshwater mussels. This shift is a result of the findings based on additional mussel surveys in October 2010 and October 2011 after the marina/transient dock reach was categorized as an Outstanding State Resource Water (OSRW). The additional mussel surveys indicated varying mussel bed densities along the Ohio River shoreline. The proposed marina/transient dock project has been shifted downstream to a less-dense mussel assemblage area. A new Biological Assessment (BA) was completed for the boat launch and new marina/transient dock project site by Redwing on January 3, 2012. FHWA submitted their request for formal consultation to USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch and new marina/transient dock project areas. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012. In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, FHWA and the City of Paducah must comply with the following terms and conditions of the Biological Opinion (BO):

- Implement proposed actions in the Biological Assessment (BA) and mussel conservation measures listed in the Biological Opinion (BO),
- Develop a Mussel Relocation Plan and obtain USFWS written approval prior to the initiation of the relocation efforts,
- Contribute \$20,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for monitoring the Schultz Park expansion area and the site relocated mussels will be placed,
- Contribute \$71,706 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for the preservation, creation, enhancement, and/or protection of federally listed mussel habitat in the lower Ohio River,
- Contribute \$37,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used in the recovery efforts for the four federally listed mussels addressed in the Biological Opinion (BO), thereby minimizing the take expected to occur on the project,
- Notify the USFWS office in Louisville, KY upon locating a dead, injured, or sick individual of an endangered or threatened species followed by contacting the USFWS office in Frankfort, KY.

Efforts to Avoid/Minimize Impacts and Mitigation

The boat launch site has been designed to reduce environmental impacts by utilizing an existing roadway corridor and existing agricultural field for the entrance roadway and parking area. Other designs for this site would result in significantly greater impacts to higher quality wooded wetlands. Although the proposed alternative site design results in the impacts to approximately 9.7 acres of wetlands, only about 0.7 acres of wooded wetlands will be impacted. These impacts are limited to fringe areas and will not fragment the existing forest. No viable alternative boat launch site exists within the immediate vicinity of downtown Paducah. The selected site minimizes ecological impacts while still meeting the river access needs of the community. A mitigation plan was developed by Redwing Ecological Services, Inc. (Redwing) for the boat launch project to provide compensation for unavoidable impacts to approximately

9.7 acres of waters/wetlands by construction. The impacts and committed mitigation for the boat launch project is as follows with measurements in acres unless stated:

Feature	Size	Impacted	Mitigation Ratio	Mitigation Required	Type	Size	Ratio	Credit
Wooded	37.0	0.7	3:1	2.1	Preservation	34.4	10:1	3.4
Wooded	37.0	0.7	3:1	2.1	Restoration	7.3	1:1	7.3
Farmed	16.0	8.3	1:1	8.3	-----	-----	-----	-----
Open Field	1.0	0.2	2:1	0.4	-----	-----	-----	-----
Up. Forest	-----	0.0	-----	-----	Preservation	3.4	10:1	0.3
Ohio River	-----	0.5 (250')	2:1	1.0 (500')	Restoration	765'	1:1	765'
TOTAL	54.0	9.7 (250')		10.8 (500')		45.1		11.0*

* Includes 765' of riparian buffer restoration

These mitigation requirements will be met with on-site wetland preservation and restoration. The 11.0 acres of proposed mitigation more than compensates for impacts to wetlands (10.8 acres of required mitigation) by the proposed boat launch facility. The major components of the mitigation plan include wetland preservation, wetland restoration, and upland buffer preservation. Approximately 34.4 acres of existing high quality forested wetland will be permanently preserved under a conservation easement/deed restriction within a designated conservation area. Approximately 7.3 acres of existing farmed wetland will be restored to forested wetland through planting of native wetland tree species. Approximately 3.4 acres of existing forested upland buffer will be permanently preserved under a conservation easement/deed restriction. Approximately 765 linear feet of wooded riparian buffer will be restored along the Ohio River through planting of native trees.

The proposed marina/transient dock site represents the least environmentally damaging alternative for meeting the river access needs of the community. The proposed development will result in unavoidable impacts to jurisdictional/navigable waters of the U.S. along 2,200 feet of the Ohio River. Impacts include 1.60 acres along the riverbank, 4.56 acres of fill in the riverbed, and 0.07 acres of impact for the mooring anchors for expansion of Schultz Park, providing public access to the river, and anchoring of floating docks. It is anticipated that no mitigation will be required for water resource impacts due to the limited nature of the impacts in relation to the overall Ohio River system.

During construction of the boat launch and marina/transient dock facilities, erosion and sediment-laden storm water runoff may occur at a greater degree than presently occurring on existing terrain. Contractors will be required to design, install, and maintain best management practices (BMP) to prevent erosion and to control sediment-laden storm water runoff from leaving the construction sites. As in all construction sites, efforts to control these phenomena are not 100% efficient and therefore, it is expected that temporary erosion impacts will occur. The proposed projects are not expected to have any long-term impacts on the water quality of jurisdictional waters/wetlands or the Ohio River.

Cumulative & Indirect Impacts

The proposed boat launch site will have impacts to jurisdictional wetlands; however, compensatory mitigation has been designed through preservation and restoration of the wooded, farmed, and open field wetlands found within the project site. The proposed marina/transient dock will result in unavoidable impacts to jurisdictional/navigable waters of the U.S. along 2,200 feet of the Ohio River. Specifically, impacts include 1.60 acres of fill along the riverbank, 4.56 acres of fill in the riverbed, and 0.07 acres of impact for the mooring anchors. It is anticipated that no mitigation will be required for the marina/transient dock project due to the

limited nature of the water resource impacts in relation to the overall Ohio River system. No cumulative or indirect negative impacts are expected for either the boat launch or marina/transient dock site.

Exhibit Blue-line Streams

The boat launch project site has 16 acres of farmed wetland which are considered low quality and offer minimal wetland functions, particularly in terms of wildlife/aquatic habitat, water quality, and outdoor education/recreation. The site also has 37 acres of wooded wetlands. This acreage is of moderate to high quality, providing important wetland functions and values in terms of floodwater attenuation, water quality, wildlife habitat, aquatic habitat, and potential outdoor recreation and education. Habitat diversity of the wooded wetlands is enhanced by two depressions. An approximately one-acre depression is located in the south-central portion of the site. A seven-acre depression is located in the central portion of the site on the northern edge of the wooded wetlands. Neither of these depressions is associated with flows from blue-line streams but receive runoff from adjacent slopes, wet weather conveyances (ditches), and/or flooding from the Ohio River. The wooded wetland area contains man-made features associated with a pump station located immediately across the levee from the western portion of the site. A pond and ditch have been constructed at the base of the earthen flood wall in the southwest portion of the site to help control discharge from the pump station. Discharge flows are pumped into the pond, from where they flow approximately 200 feet along a constructed ditch to a culvert, which appears to conduct flows to the Ohio River. The blue-line stream feature shown on the USGS topographic map no longer exists and it is assumed that it was created to manage pump station discharges in the past. The marina/transient dock site consists of undeveloped riverbank consisting of riprap and limited vegetation, Schultz Park, and surface waters of the Ohio River. There are no wetlands or streams within the bounds of the project site with the exception of the river. There are no named streams within either of the project sites according to USGS topographic mapping, National Wetland Inventory, soils maps, and ecological study. The development of the proposed boat launch facility and marina/transient dock will not involve impacts to waters of the State/U.S. exclusive of the jurisdictional wetlands delineated in the ecological study and the Ohio River. A topographic map is included as Figure 6.

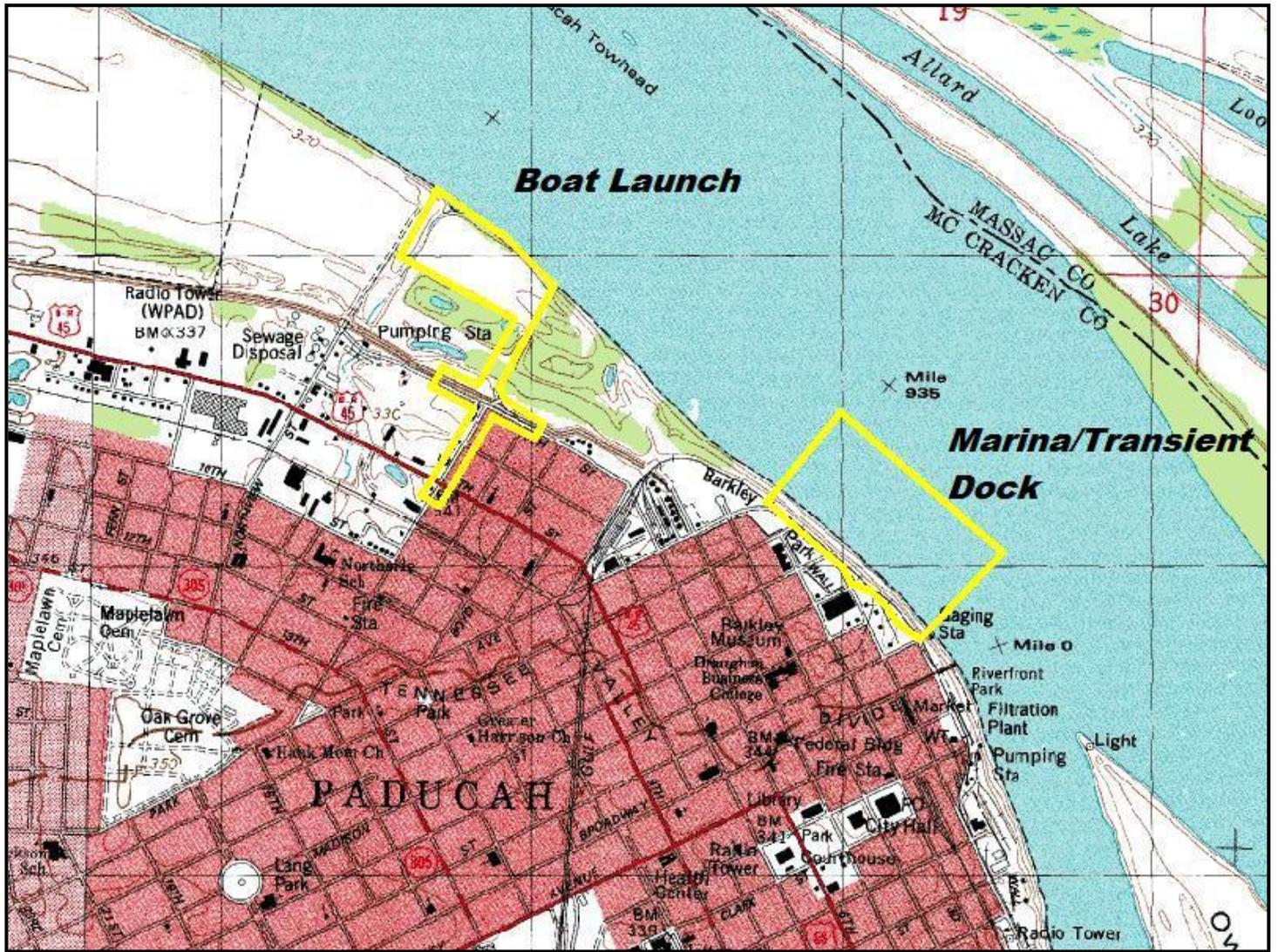


Figure 6

Floodplains

Identify 100-Year Floodplains using National Flood Insurance Program Maps

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRM) delineating both the special hazard areas and the risk premium zones applicable to a community. Specifically, the FIRM is used to (1) administer floodplain management regulations and to mitigate flood damage, (2) locate properties and buildings in flood insurance risk areas and mapped flood hazards, and (3) determine whether flood insurance is required when making loans or providing grants following a disaster for the purchase or construction of a building. Based on FIRM Community Panel Number 210152 0003E, October 8, 1982, the proposed boat launch and marina/transient dock projects would involve construction within the 100-year flood limits of the Ohio River floodplain. The projects are within Zone A14, Areas of 100-yr flood where base flood elevations and flood hazard factors have been determined. Flood Insurance Rate Maps for the proposed boat launch and marina/transient dock projects are included as Figures 7 and 8. Figure 9 details the mapping key used.

Identify Encroachments onto Floodplains

Both the boat launch and marina/transient dock projects are to provide public access to the riverfront property in or near downtown Paducah as part of the overall redevelopment efforts. These projects will encroach onto the associated floodplain of the Ohio River by the nature of their individual purposes and needs.

Efforts to Avoid and Minimize Encroachment

Efforts have been made to avoid and/or minimize encroachment impacts to the floodplain. The boat ramp located on the bank of the Ohio River in the north-central portion of the site will have an access road to the site as an extension of Burnett Street constructed in the location of an existing dirt/gravel road along the eastern boundary of the site; therefore, no new road alignment/footprint will be necessary. The marina portion of the marina/transient dock facility will be a floating dock system with the transient dock portion also being a floating dock system but also acting as a wave attenuator. Both projects will be inherent encroachments onto the floodplain.

Required Permits

Redwing Ecological Services, Inc. (Redwing) submitted a Joint Application for a Section 404 Individual Permit, a Section 10 Navigable Waters Permit, a Section 401 Water Quality Certification, and a Stream Construction Permit for the proposed boat launch project to the U.S. Army Corps of Engineers (USCOE) and the Kentucky Department for Environmental Protection, Division of Water (Kentucky Division of Water) on May 30, 2007 as well as an Addendum in February 2008. As a condition of the Stream Construction Permit acquired from the Kentucky Division of Water, an Engineering "No Impact" Certification which certifies that the marina/transient dock will not impact the 100-year flood elevations, floodway elevations, and floodway widths on the Ohio River has been completed for the boat launch project. All applicable permits have been obtained with the exception of the Section 402 (KPDES Stormwater) Permit which will also be obtained prior to construction. The subject project will require an Individual 402 Permit due to the Ohio River being designated as an Outstanding

State Resource Water (OSRW) as a result of the presence of federally-protected freshwater mussels. Redwing has submitted applications for a Section 404 Individual Permit, a Section 10 Navigable Waters Permit, and a Section 401 Water Quality Certification for the proposed marina/transient dock project to the USCOE and the Kentucky Division of Water. A Stream Construction Permit (Floodplain Permit) has been acquired by the City of Paducah on May 1, 2012. It is anticipated that no mitigation will be required for water resource impacts due to the limited nature of the impacts in relation to the overall Ohio River system. As a condition of the Stream Construction Permit acquired from the Kentucky Division of Water, an Engineering “No Impact” Certification which certifies that the marina/transient dock will not impact the 100-year flood elevations, floodway elevations, and floodway widths on the Ohio River is required. A Section 9 Bridge Permit issued by the U.S. Coast Guard is not required for either project since no construction of bridges, causeways, dams, or dikes are proposed. A Section 402 (KPDES Stormwater) Permit will also be obtained for the marina/transient dock project. The subject project will require an Individual 402 Permit due to the Ohio River being designated as an Outstanding State Resource Water (OSRW) as a result of the presence of federally-protected freshwater mussels.

Cumulative & Indirect Impacts

The proposed boat launch and marina/transient dock projects have been developed in accordance with Executive Order 11988 (Floodplain Management) and 23 CFR 650A (Location and Hydraulic Design of Encroachments on Flood Plains). Though both projects are within the 100-year floodplain, the projects are not expected to be a “significant encroachment” as defined in 23 CFR 650A nor are they expected to have an appreciable environmental impact on the base floodplain. The level of risk analogous with the probable areas of flooding and its consequences attributed to these encroachments is not expected to be any greater than that associated with the present conditions of each project area. The projects are not expected to have any increased cumulative or indirect impact potential for property loss and hazard to life.

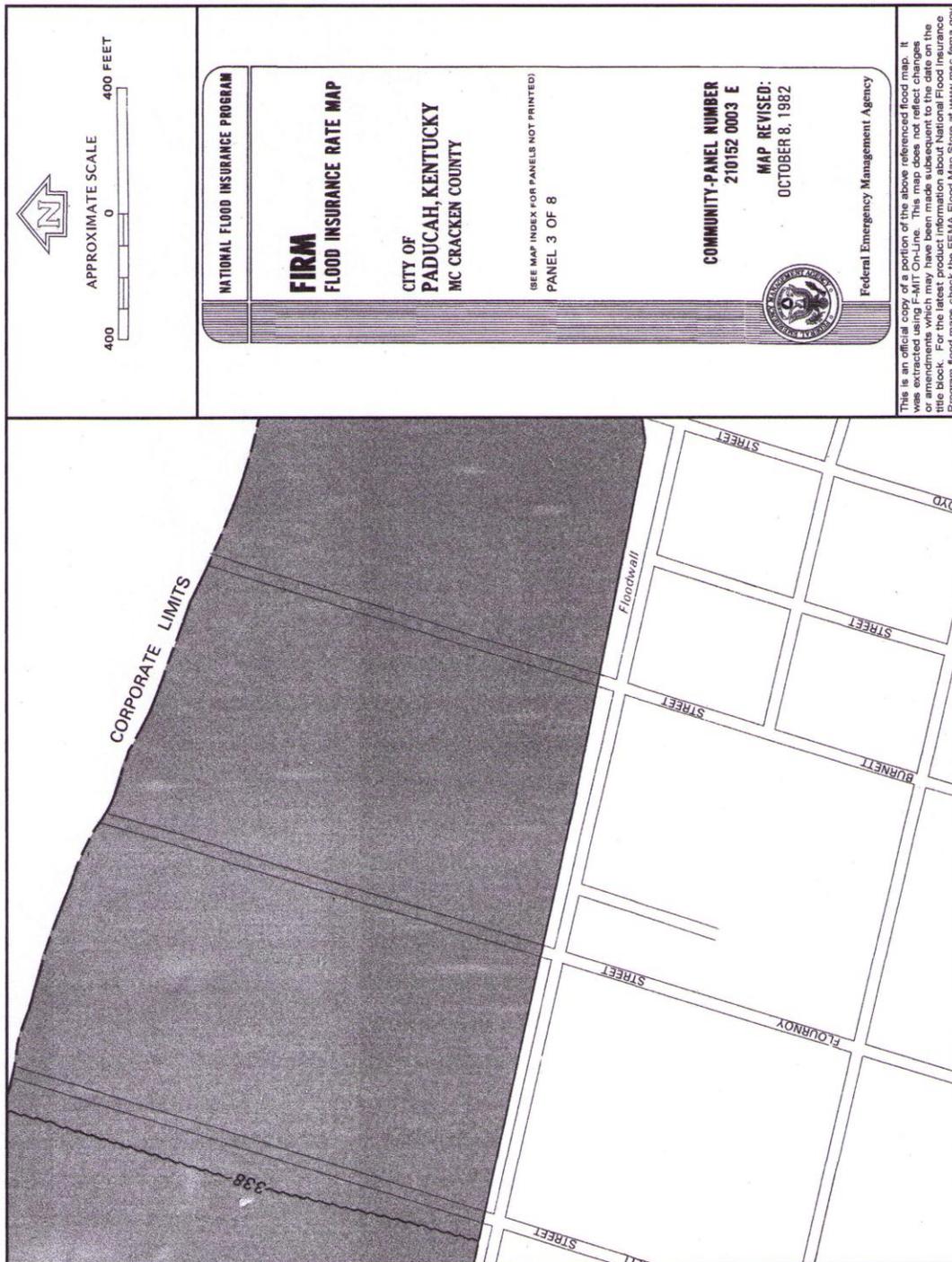


Figure 7

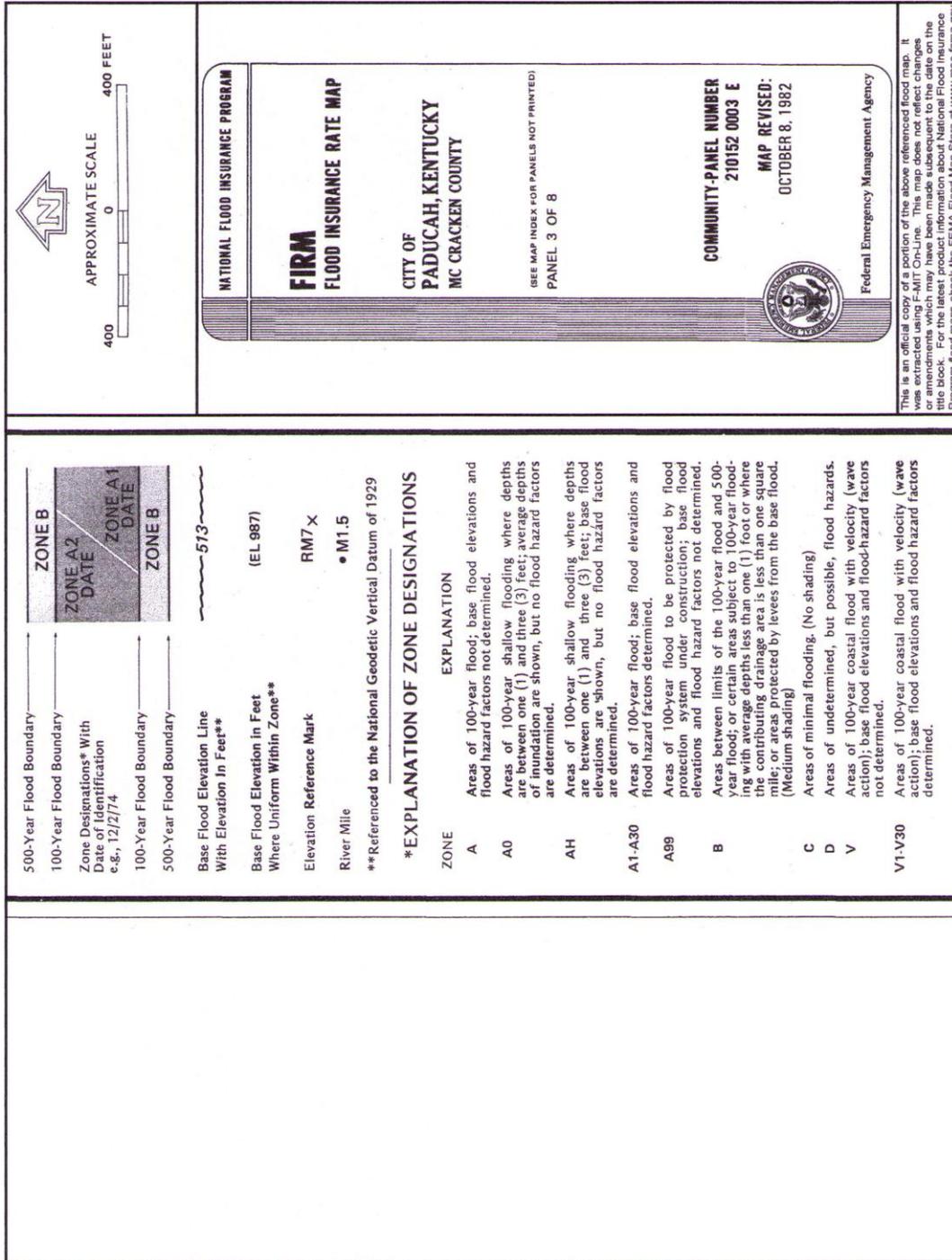


Figure 9

Wetlands

Baseline Conditions of Jurisdictional Wetlands & Waters of the U.S.

Wetland habitats are defined as those areas that are inundated by water with sufficient frequency and duration to support vegetation that is tolerant of saturated soil conditions. The U.S. Army Corps of Engineers utilizes specific hydrologic, soil, and vegetation criteria in establishing the boundary of wetlands under their jurisdiction.

Redwing Ecological Services, Inc. (Redwing) conducted a jurisdictional waters/wetlands survey as well as a terrestrial threatened/endangered species survey for the boat launch site on April 2-3, 2007 as part of a joint application for state and federal environmental permitting. The boat launch site consists predominantly of jurisdictional wetlands, which include wooded wetland habitat over the central portion of the site, farmed wetland in an active agricultural field area along the Ohio River in the northern portion of the site, and open field wetland along the eastern boundary of the site. The 16 acres of farmed wetland are considered low quality and offer minimal wetland functions, particularly in terms of wildlife/aquatic habitat, water quality, and outdoor education/recreation. The 37 acres of wooded wetlands are of moderate to high quality, providing important wetland functions and values in terms of floodwater attenuation, water quality, wildlife habitat, aquatic habitat, and potential outdoor recreation and education. Habitat diversity of the wooded wetlands is enhanced by two depressions. An approximately one-acre depression is located in the south-central portion of the site. A seven-acre depression is located in the central portion of the site on the northern edge of the wooded wetlands. Neither of these depressions is associated with flows from blue-line streams but receive runoff from adjacent slopes, wet weather conveyances (ditches), and/or flooding from the Ohio River. Based on available gauge data, all portions of the boat launch site below an elevation of 322 feet are considered to exhibit wetland hydrology. This includes the entire site with the exception of a narrow strip of land along the existing earthen flood wall to the south. The wooded wetland area contains man-made features associated with a pump station located immediately across the levee from the western portion of the site. A pond and ditch have been constructed at the base of the earthen flood wall in the southwest portion of the site to help control discharge from the pump station. Discharge flows are pumped into the pond, from where they flow approximately 200 feet along a constructed ditch to a culvert, which appears to conduct flows to the Ohio River. The blue-line stream feature shown on the USGS topographic map no longer exists and it is assumed that it was created to manage pump station discharges in the past. Redwing conducted a jurisdictional waters/wetlands survey as well as a terrestrial threatened/endangered species survey for the marina/transient dock site on May 14, 2008 as part of a joint application for state and federal environmental permitting. The marina/transient dock site consists of undeveloped riverbank with riprap, Schultz Park, limited vegetation, and surface waters of the Ohio River. There are no wetlands or streams within the bounds of the project site with the exception of the river in which the project area extends approximately 550 linear feet at its maximum (transient dock portion).

National Wetland Inventory (NWI) Mapping

The National Wetland Inventory (NWI) published by the Division of Habitat and Resource Conservation of the U.S. Fish & Wildlife Service was reviewed for the two proposed projects. The proposed boat launch site has a distinct wetland designation located in the southern centroid of the property surrounded by a designated wetland that makes up the southern half and northwest sections of the property. The designation in the southern centroid is

Paducah Boat Launch & Marina/Transient Dock FONSI

palustrine (nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens), emergent, persistent, and semipermanently flooded (PEM1F). The surrounding and northwestern designation is palustrine, forested, broad-leaved deciduous, and seasonally flooded (PFO1C). According to the jurisdictional waters/wetlands survey conducted by Redwing Ecological Services, Inc. (Redwing) on April 2-3, 2007, the proposed boat launch development consists predominantly of jurisdictional wetlands, which include wooded wetland habitat over the central portion of the site, farmed wetland in an active agricultural field area along the Ohio River in the northern portion of the site, and open field wetland along the eastern boundary of the site. Habitat diversity of the wooded wetlands is enhanced by two depressions. An approximate one-acre depression is located in the south-central portion of the site. A seven-acre depression is located in the central portion of the site on the northern edge of the wooded wetlands. Neither of these depressions is associated with flows from blue-line streams but receive runoff from adjacent slopes, wet weather conveyances (ditches), and/or flooding from the Ohio River. Based on available gauge data, all portions of the boat launch site below an elevation of 322 feet are considered to exhibit wetland hydrology. This includes the entire site with the exception of a narrow strip of land along the existing earthen flood wall to the south. According to the jurisdictional waters/wetlands survey conducted by Redwing on May 14, 2008, the proposed marina/transient dock site consists predominantly of riverbank and open water (Ohio River). There is no wetland designation within the bounds of the proposed marina/transient dock facility with the exception of the Ohio River. The Ohio River is designated lacustrine (topographic depression or dammed river channel), limnetic (deepwater habitat), unconsolidated bottom, and permanently flooded (L1UBHH). The findings as a result of the jurisdictional waters/wetlands surveys for the two projects conducted by Redwing are consistent with the NWI data. The NWI Map is included as Figure 10.

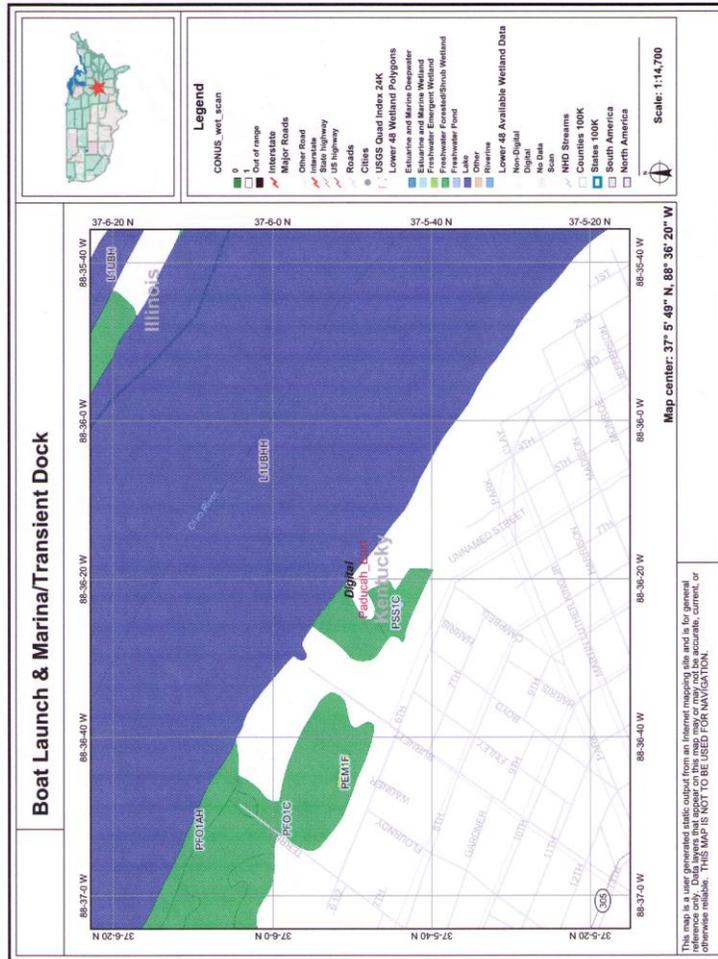


Figure 10

Potential Wetland Impacts

According to the jurisdictional waters/wetlands survey conducted by Redwing Ecological Services, Inc. (Redwing) on April 2-3, 2007, the proposed boat launch development will result in unavoidable impacts to 9.7 acres of jurisdictional waters of the U.S., including: 0.5 acres of the Ohio River, 8.3 acres of farmed wetlands, 0.7 acres of wooded wetlands, and 0.2 acres of open field wetlands. The development has minimized and avoided water/wetland impacts by focusing impacts on the low quality farmed wetlands and limiting impacts to the higher quality wooded wetlands. Less than 2% of wooded wetlands on site are proposed for impact.

According to the jurisdictional waters/wetlands survey conducted by Redwing on May 14, 2008, the proposed marina/transient dock will result in impacts to a total of 6.23 acres of jurisdictional waters which will be filled by the proposed project including 1.60 acres of riverbank above the normal pool, 4.56 acres of fill in the riverbed below normal pool, and 0.07 acres for

the mooring anchors. No wetlands were noted during the survey. National Wetland Inventory (NWI) mapping does not indicate any wetland designations within the bounds of the proposed marina/transient dock facility with the exception of the Ohio River.

Efforts to Avoid/Minimize Impacts and Mitigation

The boat launch site has been designed to reduce environmental impacts by utilizing an existing roadway corridor and existing agricultural field for the entrance roadway and parking area. Other designs for this site would result in significantly greater impacts to higher quality wooded wetlands. Although the proposed alternative site design results in the impacts to approximately 9.7 acres of wetlands, only about 0.7 acres of wooded wetlands will be impacted. These impacts are limited to fringe areas and will not fragment the existing forest. No viable alternative boat launch site exists within the immediate vicinity of downtown Paducah. The selected site minimizes ecological impacts while still meeting the river access needs of the community. A mitigation plan was developed by Redwing Ecological Services, Inc. (Redwing) for the boat launch project to provide compensation for unavoidable impacts to approximately 9.7 acres of waters/wetlands by construction.

The impacts and committed mitigation for the boat launch project is as follows with measurements in acres unless stated:

Feature	Size	Impacted	Mitigation Ratio	Mitigation Required	Type	Size	Ratio	Credit
Wooded	37.0	0.7	3:1	2.1	Preservation	34.4	10:1	3.4
Wooded	37.0	0.7	3:1	2.1	Restoration	7.3	1:1	7.3
Farmed	16.0	8.3	1:1	8.3	-----	-----	-----	-----
Open Field	1.0	0.2	2:1	0.4	-----	-----	-----	-----
Up. Forest	-----	0.0	-----	-----	Preservation	3.4	10:1	0.3
Ohio River	-----	0.5 (250')	2:1	1.0 (500')	Restoration	765'	1:1	765'
TOTAL	54.0	9.7 (250')		10.8 (500')		45.1		11.0*

* Includes 765' of riparian buffer restoration

These mitigation requirements will be met with on-site wetland preservation and restoration. The 11.0 acres of proposed mitigation more than compensates for impacts to wetlands (10.8 acres of required mitigation) by the proposed boat launch facility. The major components of the mitigation plan include wetland preservation, wetland restoration, and upland buffer preservation. Approximately 34.4 acres of existing high quality forested wetland will be permanently preserved under a conservation easement/deed restriction within a designated conservation area. Approximately 7.3 acres of existing farmed wetland will be restored to forested wetland through planting of native wetland tree species. Approximately 3.4 acres of existing forested upland buffer will be permanently preserved under a conservation easement/deed restriction. Approximately 765 linear feet of wooded riparian buffer will be restored along the Ohio River through planting of native trees.

Alternate sites for the marina/transient dock facility are currently established with structures, not protective of impacts from the Ohio & Tennessee Rivers, heavily vegetated, and/or not owned by the City of Paducah. The use of the city/county-owned, underutilized riverfront property chosen will allow the facility to be constructed with minimal ecological impacts. The proposed marina/transient dock site represents the alternative with the least environmental impacts for meeting the river access needs of the community. Since there are no wetlands within the marina/transient dock development site with the exception of the Ohio River, no compensatory mitigation will be required for wetland impacts.

During construction of the boat launch and marina/transient dock facilities, erosion and sediment-laden storm water runoff may occur at a greater degree than presently occurring on existing terrain. Contractors will be required to design, install, and maintain best management practices (BMP) to prevent erosion and to control sediment-laden storm water runoff from leaving the construction sites. As in all construction sites, efforts to control these phenomena are not 100% efficient and therefore, it is expected that temporary erosion impacts will occur. The proposed projects are not expected to have any long-term impacts on the water quality of jurisdictional waters/wetlands or the Ohio River.

Cumulative & Indirect Impacts

The proposed boat launch site will have impacts to jurisdictional wetlands; however, compensatory mitigation has been designed through preservation and restoration of the wooded, farmed, and open field wetlands found within the project site. The proposed marina/transient dock will be permitted through the U.S. Corps of Engineers and the Kentucky Department for Environmental Protection, Division of Water, for impacts to the Ohio River and the associated riverbank. It is anticipated that no compensatory mitigation will be required for these impacts due to the relatively limited nature of the impacts in relation to the Ohio River system. There are no cumulative or indirect impacts to wetlands, streams, etc. expected for the proposed projects.

Wild & Scenic Rivers

The selected alternatives will have no impacts on wild and scenic rivers.

Threatened & Endangered Species

Impacts to Federally Threatened/Endangered Species and/or Habitat

Boat Launch

Redwing Ecological Services, Inc., (Redwing) conducted a terrestrial threatened/endangered species survey of the boat launch area on April 2-3, 2007, as part of a joint application package for wetland and stream alteration permits. This survey concluded that the project site contains potential habitat for the federally endangered *Myotis sodalis* (Indiana bat). To ensure that no impacts to the Indiana bat will occur, tree clearing in the southeast corner and the western portion of the site will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction.

The USFWS reviewed the U.S. Army Corps of Engineers public notice issued on July 19, 2007, for the boat launch project. According to USFWS records, the Indiana bat (*Myotis sodalis*) has been documented within five miles of the site. Based on this information, the USFWS believes that (1) forested areas in the vicinity of or on the project area may provide potentially suitable summer roosting and foraging habitat, and (2) caves, rock shelters, and abandoned underground mines in the vicinity of and on the project area may provide potentially suitable winter hibernation habitat. The USFWS concurred with Redwing in that the proposed boat launch project will not likely adversely affect Indiana bats due to the absence of suitable winter habitat and the commitment that the removal of trees onsite will be coordinated with the

USFWS through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. The USFWS stated that the subject project is within close proximity to several federally protected mussel records known to occur within the Ohio River. A mussel survey was conducted by Redwing with the assistance of Copperhead Environmental Consulting, Inc. and Gannett Fleming Engineers & Architects, P.C., for the boat launch area from August 5-8, 2008. The Mussel Survey Report was submitted to the USFWS on September 25, 2008. After review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species, *Potamilus capax* (Fat Pocketbook), at the boat launch location. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels was completed and submitted to USFWS on December 19, 2008 for concurrence. The results of the BA indicated that the proposed boat launch project is not likely to adversely affect three federally protected species: *Potamilus capax* (Fat Pocketbook), *Lampsilis abrupta* (Pink Mucket), and *Plethobasus cooperianus* (Orangefoot Pimpleback). A Biological Opinion (BO) was issued on July 6, 2010 and revised on December 21, 2010 by the USFWS for impacts to the three species. The BO concluded that the boat launch project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. Since the completion of the initial Biological Assessment (BA) and Biological Opinion (BO), the U.S. Fish & Wildlife Service (USFWS) has determined that additional mussel species are proposed for listing as endangered under the Endangered Species Act of 1973 (the Act). As a result of this proposal, the Federal Highway Administration (FHWA) requested a formal conference opinion from the USFWS on March 4, 2011 for three endangered species likely to be listed prior to the completion of the boat launch project. The conference was requested to take into account the effects of the project on *Quadrula cylindrica* (Rabbitsfoot), *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose). The US Fish and Wildlife Service (USFWS) completed the formal conference opinion on July 13, 2011. USFWS concurred that the project will likely adversely affect the Rabbitsfoot and Sheepnose and will not likely adversely affect the Spectaclecase. A new Biological Assessment (BA) was completed by Redwing on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch project area. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012.

The Kentucky Department of Fish and Wildlife Resources (KDFWR) reviewed the boat launch project. The KDFWR Information System indicated that federal/state threatened and/or endangered fish and wildlife species are known to occur within close proximity to the area. The Indiana bat utilizes a wide array of habitats, including riparian forests, upland forest, and fencerows for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags. Trees in excess of 16 inches diameter at breast height are considered optimal for maternity colony roosts, but trees in excess of nine inches appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as three inches in diameter. Removal of suitable Indiana bat roost trees due to construction of the proposed project will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. KDFWR also stated that several federally listed mussel species are located within this portion of the Ohio River.

The Kentucky State Nature Preserves Commission (KSNPC) was contacted with the purpose of allowing them to review their database and comment on the boat launch project. They determined that no occurrences of the plants or animals and no occurrences of the exemplary natural communities that are monitored by the KSNPC are reported as occurring in

the boat launch area. KSNPC further expounded on specific species and their relationship to the project. *Myotis austroriparius* (Southeastern myotis) and *Myotis sodalis* (Indiana bat) are known to occur in the bottomland hardwood forest adjacent to the boat launch project area. In order to avoid impacts to bats, KSNPC recommends that bottomland forests and riparian corridors not be disturbed. *Nycticeius humeralis* (Evening bat) is known to occur within 10 miles of the project site. Summer habitats include bottomland forests, swamps, and riparian corridors. Many of the fish and mussel species listed by the KSNPC are believed to be extirpated or are known only through historical records. Some species; however, are still in existence in the area. These species are sensitive to increased turbidity, sediment, and other adverse influences on water quality. KSNPC data is not sufficient to guarantee absence of these species from the project site and they recommend that impacted streams be thoroughly surveyed by a qualified biologist prior to any in-stream disturbance. Mussel surveys were conducted by Redwing in August 2008 in the boat launch project area. Biological Assessments (BA) were submitted to USFWS through formal consultation by FHWA for Biological Opinions (BO) on impacts to listed mussels and/or habitat. *Sterna antillarum athalassos* (interior least tern) occurs near the project area and is typically found on bare or nearly bare alluvial islands and sand bars. *Ammodramus henslowii* (Henslow's sparrow) is associated with fallow hayfields, ungrazed pastures with scattered small trees and tall weeds, grassland, and brushland. *Accipiter striatus* (Sharp-shinned hawk) can be found in a variety of habitats from semi-open farmland to woodland openings and borders. This species typically nests in areas of extensive forest, especially areas with some evergreen trees. *Tyto alba* (Barn owl) can be found in hollow trees, old buildings, barns, silos, and other abandoned structures. If Barn owl habitat will be disturbed, the USFWS will be consulted prior to commencement. According to KSNPC, the reports reviewed summarize the existing information known to the Kentucky Natural Heritage Program at the time of the review regarding the biological elements or locations in question. The summary is not to be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Marina/Transient Dock

Redwing Ecological Services, Inc., (Redwing) conducted a terrestrial threatened/endangered species survey of the marina/transient dock area on May 14, 2008, as part of a joint application package for wetland and stream alteration permits. The U.S. Fish and Wildlife Service (USFWS) reviewed the marina/transient dock project. According to their records, several mussels which are endangered and one candidate for listing are known to occur in the Ohio River. These mussels include the following: *Cyprogenia stegaria* (Fanshell), *Pleurobema plenum* (Rough pigtoe), *Lampsilis abrupta* (Pink mucket), *Potamilus capax* (Fat pocketbook), *Plethobasus cooperianus* (Orangefoot pimpleback), *Pleurobema clava* (Clubshell), and *Plethobasus cyphus* (Sheepnose). The USFWS recommended a survey of the footprint of the project area and also a certain distance both upstream and downstream of the project site in order to determine the presence or absence of these mussel species in an effort to determine the potential impacts. A mussel survey was conducted by Redwing with the assistance of Copperhead Environmental Consulting, Inc. and Gannett Fleming Engineers & Architects, P.C., for the marina/transient dock project area from August 5-8, 2008. The Mussel Survey Report was submitted to the USFWS on September 25, 2008. After review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species, *Potamilus capax* (Fat Pocketbook), at the marina/transient dock location. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels was completed and submitted to USFWS on December 19, 2008 for concurrence. The results of the BA indicated that the proposed marina/transient dock project is likely to adversely affect three

federally protected species: *Potamilus capax* (Fat Pocketbook), *Lampsilis abrupta* (Pink Mucket), and *Plethobasus cooperianus* (Orangefoot Pimpleback). A Biological Opinion (BO) was issued on July 6, 2010 and revised on December 21, 2010 by the USFWS for impacts to the three species. The BO concluded that the marina/transient dock project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat.

Since the completion of the initial Biological Assessment (BA) and Biological Opinion (BO) for impacts to federally protected mussel species in December 2008 and July 2010, respectively, (1) the reach for the marina/transient dock has been categorized as an Outstanding State Resource Water (OSRW) due to the presence of federally-protected mussels by the Kentucky Division of Water (November 2010), (2) the U.S. Fish & Wildlife Service (USFWS) has determined that additional mussel species are proposed for listing under the Endangered Species Act of 1973 (the Act) (January 2011), and (3) the marina/transient dock project area has been shifted 500 linear feet downstream (northwest) from its original position.

The additional species proposed for listing are *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose) as endangered and *Quadrula cylindrica* (Rabbitsfoot) as either threatened or endangered. As a result of this proposal, the Federal Highway Administration (FHWA) requested a formal conference opinion from the USFWS on March 4, 2011 for three species likely to be listed prior to the completion of the boat launch and marina/transient dock projects. The conference was requested to take into account the effects of the project on *Quadrula cylindrica* (Rabbitsfoot), *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose). The US Fish and Wildlife Service (USFWS) completed the formal conference opinion on July 13, 2011. USFWS concurred that the project will likely adversely affect the Rabbitsfoot and Sheepnose and will not likely adversely affect the Spectaclecase.

The marina/transient dock project area has been shifted 500 linear feet downstream (northwest) of its original position in order to minimize potential impacts to freshwater mussels. This shift is a result of the findings based on additional mussel surveys in October 2010 and October 2011 after the marina/transient dock reach was categorized as an Outstanding State Resource Water (OSRW). The additional mussel surveys indicated varying mussel bed densities along the Ohio River shoreline. The proposed marina/transient dock project has been shifted downstream to a less-dense mussel assemblage area. A new Biological Assessment (BA) was completed for the boat launch and new marina/transient dock project site by Redwing on January 3, 2012. FHWA submitted their request for formal consultation to USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the new marina/transient dock project area. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012.

The Kentucky Department of Fish and Wildlife Resources (KDFWR) reviewed the marina/transient dock project. The KDFWR Information System indicated that federal/state threatened and/or endangered fish and wildlife species are known to occur within close proximity to the area. Specifically, *Myotis sodalis* (Indiana bat) and several federally listed mussel species are known to occur within the project area. Removal of suitable Indiana bat roost trees due to construction of the proposed project will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction.

The Kentucky State Nature Preserves Commission (KSNPC) was contacted with the purpose of allowing them to review their database and comment on the marina/transient dock project to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the KSNPC occur in area. *Myotis austroriparius* (Southeastern myotis) and *Myotis sodalis* (Indiana bat) are known to occur near the proposed project. A thorough survey for these species should be conducted by a qualified biologist if suitable habitat will be disturbed. The survey should include a search for potential roost and winter sites, and a mistnetting census at numerous points within the proposed corridor, particularly in preferred summer habitat. Summer foraging habitats include upland forests, bottomland forests and riparian corridors. Suitable roost and winter sites include sandstone and limestone caves, rockhouses, clifflines, auger holes, and abandoned mines. In order to avoid impacts to bats, bottomland forests and riparian corridors, particularly near caves, should not be disturbed. *Nycticeius humeralis* (Evening bat) occurs within the project area. Summer habitats include bottomland forests, swamps, and riparian corridors. In order to avoid impacts to these bats, a thorough survey should be conducted. The survey should include a search for potential roost and winter sites, and a mistnetting census at numerous points within the proposed corridor, particularly in preferred summer habitat. Aquatic species and habitats in the area are sensitive to increased turbidity, sediment, and other adverse influences on water quality. KSNPC data is not sufficient to guarantee absence of these species from the project site and they recommend that impacted streams be thoroughly surveyed by a qualified biologist prior to any in-stream disturbance. Mussel surveys were conducted by Redwing in August 2008, October 2010, and October 2011 in the marina/transient dock project area. Biological Assessments (BA) were submitted to USFWS through formal consultation by FHWA for Biological Opinions (BO) on impacts to listed mussels and/or habitat. *Sterna antillarum athalassos* (interior least tern) occurs near the project area and is typically found on bare or nearly bare alluvial islands and sand bars. *Haliaeetus leucocephalus* (Bald eagle) can be found near seacoasts, rivers, and large lakes. The species prefers to roost in conifers in winter in some areas. In winter, the species may associate with waterfowl concentrations or congregate in areas with abundant dead fish. *Ammodramus henslowii* (Henslow's sparrow) is associated with fallow hayfields, ungrazed pastures with scattered small trees and tall weeds, grassland, and brushland. *Accipiter striatus* (Sharp-shinned hawk) can be found in a variety of habitats from semi-open farmland to woodland openings and borders. This species typically nests in areas of extensive forest, especially areas with some evergreen trees. According to the Kentucky State Nature Preserves Commission (KSNPC), the reports reviewed summarize the existing information known to the Kentucky Natural Heritage Program at the time of the review regarding the biological elements or locations in question. The summary is not to be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The marina/transient dock facility area consists of undeveloped riverbank (rip rap), limited scrub vegetation, Schultz Park, and Ohio River surface waters; therefore, it is unlikely that any habitat is present with the exception of the listed mussel species as described above. It is unlikely that the proposed marina/transient dock facility will impact the terrestrial species described.

Affected Wildlife Migration Patterns

Western Kentucky hosts a variety of migratory birds, from wintering bald eagles, gulls, ducks, and geese, to neotropical migratory birds such as hummingbirds, warblers, and tanagers. Western Kentucky is also within two non-principal routes of the North American Migration Flyways; the Atlantic Flyway and the Mississippi Flyway. Both are migratory paths from Canada that cross the United States. Due to the minimum boat launch footprint in the Ohio

River, minimized and designed tree removal, and commitment to compensatory mitigation of wetland impacts in the form of conservation and restoration of wetlands, the boat launch project will not impact the migratory pattern of birds traveling within the two migration flyways. The marina/transient dock area is currently made up of undeveloped riverbank, Schultz Park, and water surface of the Ohio River. Due to the minimized marina/transient dock footprints and the absence of woodland vegetation on the riverbank, the marina/transient dock facility will not impact the migratory pattern of birds traveling within the two migration flyways.

Of the fifteen bat species known in the State of Kentucky, *Lasionycteris noctivagans* (Silver-haired bat), *Lasiurus borealis* (Red bat), *Lasiurus cinereus* (Hoary bat), and *Nycticeius humeralis* (Evening bat) are migratory. The Evening bat is a state species of concern and has been recorded in McCracken County, Kentucky. Ten species hibernate which includes *Myotis sodalis* (Indiana bat) and *Myotis austroriparius* (Southeastern myotis), with both having also been recorded in McCracken County, Kentucky. The Indiana bat is both a state and federally listed endangered species. The Southeastern myotis is a state endangered species and a federal species of management concern. One additional bat species, *Tadarida brasiliensis* (Brazilian Free-Tailed bat), is an accidental, autumn wanderer from the south. A survey of the boat launch project site concluded that the site contains potential habitat for the Indiana bat. To ensure that no impacts to the Indiana bat will occur, tree clearing in the southeast corner and the western portion of the site will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. There is no potential habitat for bat species within the marina/transient dock project area. Based on the minimized tree removal in the boat launch area as well as the lack of habitat in the marina/transient dock facility area, there should be no impacts to the migratory activities of bat species.

Location of Habitat, if present, and Avoidance Alternatives

Redwing Ecological Services, Inc., (Redwing) conducted a terrestrial threatened/endangered species survey of the boat launch area on April 2-3, 2007, as part of a joint application package for wetland and stream alteration permits. This survey concluded that the project site contains potential habitat for the federally endangered *Myotis sodalis* (Indiana bat). The wooded portion of the site contains scattered trees that represent potential summer roosting/maternity habitat for the Indiana bat. These include dead snags and live trees with loose, exfoliating bark and cracks. To ensure that no impacts to the Indiana bat will occur, tree clearing in the southeast corner and the western portion of the site will be coordinated with the USFWS through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. If clearing must be done outside of this period, detailed surveys and consultation with the U.S. Fish and Wildlife Service (USFWS) will be completed prior to the initiation of any disturbance activities. Redwing conducted a terrestrial threatened/endangered species survey of the marina/transient dock area on May 14, 2008 as part of a joint application package for stream alteration permits. The marina/transient dock facility area consists of undeveloped riverbank (rip rap), limited scrub vegetation, the existing Schultz Park, and Ohio River surface waters; therefore, it is unlikely that any habitat is present with the exception of the listed mussel species.

Both the boat launch and marina/transient dock projects involve the Ohio River. A mussel survey was conducted by Redwing with the assistance of Copperhead Environmental Consulting, Inc. and Gannett Fleming Engineers & Architects, P.C., for the boat launch and marina/transient dock areas from August 5-8, 2008. The Mussel Survey Report was submitted

to the USFWS on September 25, 2008. After review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species, *Potamilus capax* (Fat Pocketbook), at both the boat launch and marina/transient dock locations. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels was completed and submitted to USFWS on December 19, 2008 for concurrence. The results of the BA indicated that the proposed marina/transient dock project is likely to adversely affect three federally protected species: *Potamilus capax* (Fat Pocketbook), *Lampsilis abrupta* (Pink Mucket), and *Plethobasus cooperianus* (Orangefoot Pimpleback). A Biological Opinion (BO) was issued on July 6, 2010 and revised on December 21, 2010 by the USFWS for impacts to the three species. The BO determined that the boat launch and marina/transient dock projects are not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. Since the completion of the initial Biological Assessment (BA) and Biological Opinion (BO), the U.S. Fish & Wildlife Service (USFWS) has determined that additional mussel species are proposed for listing under the Endangered Species Act of 1973 (the Act) and the reach of the marina/transient dock area has been categorized as an Outstanding State Resource Water. As a result of this information, the Federal Highway Administration (FHWA) requested a formal conference opinion from the USFWS on March 4, 2011 for three species likely to be listed prior to the completion of the boat launch and marina/transient dock projects. The conference was requested to take into account the effects of the two projects on *Quadrula cylindrica* (Rabbitsfoot), *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose). The US Fish and Wildlife Service (USFWS) completed the formal conference opinion on July 13, 2011. USFWS concurred that the projects will likely adversely affect the Rabbitsfoot and Sheepnose and will not likely adversely affect the Spectaclecase. In addition, the marina/transient dock project area has been shifted 500 linear feet downstream (northwest) from its original position in order to minimize potential impacts to freshwater mussels. This shift is based on additional mussel surveys in October 2010 and October 2011 which details mussel bed densities in the area. A new Biological Assessment (BA) was completed by Redwing on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch and new marina/transient dock project areas. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012.

Biological Assessment Requirements and Section 7 Consultation Requirements

To comply with Section 7 of the Endangered Species Act of 1973, as amended, biological assessments are required to determine the potential for and/or presence of endangered and threatened species. Redwing Ecological Services, Inc. (Redwing) conducted a terrestrial threatened/endangered species survey of the boat launch and marina/transient dock areas on April 2-3, 2007, and May 14, 2008, respectively, as part of joint application packages for wetland and stream alteration permits. Redwing also conducted mussel surveys at the boat launch site and marina/transient dock site in August 2008, October 2010, and October 2011. Biological Assessments (BA) were submitted to USFWS through formal consultation by FHWA for Biological Opinions (BO) on impacts to listed mussels and/or habitat. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012. Letters of intent requesting comments and describing the project backgrounds, purpose and needs, and funding mechanisms were sent to the U.S. Fish and Wildlife Service, Kentucky Department of Fish and Wildlife Resources, and the Kentucky State Nature Preserves Commission. Each responded with discussion of the protection of one or more species known to occur in the areas of concern.

Mitigation of Impacts to Threatened/Endangered Species or Habitat

To ensure that no impacts to the Indiana bat will occur, tree clearing in the southeast corner and the western portion of the boat launch project site will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. Both the boat launch and marina/transient dock projects involve the Ohio River. Redwing conducted mussel surveys at the boat launch site and marina/transient dock site in August 2008, October 2010, and October 2011. Biological Assessments (BA) were submitted to USFWS through formal consultation by FHWA for Biological Opinions (BO) on impacts to listed mussels and/or habitat. The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012. In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, FHWA and the City of Paducah must comply with the following terms and conditions of the Biological Opinion (BO):

- Implement proposed actions in the Biological Assessment (BA) and mussel conservation measures listed in the Biological Opinion (BO),
- Develop a Mussel Relocation Plan and obtain USFWS written approval prior to the initiation of the relocation efforts,
- Contribute \$20,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for monitoring the Schultz Park expansion area and the site relocated mussels will be placed,
- Contribute \$71,706 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for the preservation, creation, enhancement, and/or protection of federally listed mussel habitat in the lower Ohio River,
- Contribute \$37,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used in the recovery efforts for the four federally listed mussels addressed in the Biological Opinion (BO), thereby minimizing the take expected to occur on the project,
- Notify the USFWS office in Louisville, KY upon locating a dead, injured, or sick individual of an endangered or threatened species followed by contacting the USFWS office in Frankfort, KY.

Aquatic and/or terrestrial habitat for both the boat launch and marina/transient dock projects is detailed in Figure 11.

Cumulative & Indirect Impacts

Endangered and threatened species research concluded that the boat launch project site contains potential habitat for the federally endangered *Myotis sodalis* (Indiana bat). To ensure that no impacts to the Indiana bat will occur, tree clearing in the southeast corner and the western portion of the site will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. Redwing conducted mussel surveys at the boat launch site and marina/transient dock site in August 2008, October 2010, and October 2011. Biological Assessments (BA) were submitted to USFWS through formal consultation by FHWA for Biological Opinions (BO) on impacts to listed mussels and/or habitat. Cumulative and indirect impacts are not expected since commitments have been made to reduce stress on bat and

mussel species that have the potential to be within the construction areas of the proposed boat launch and marina/transient dock facilities.

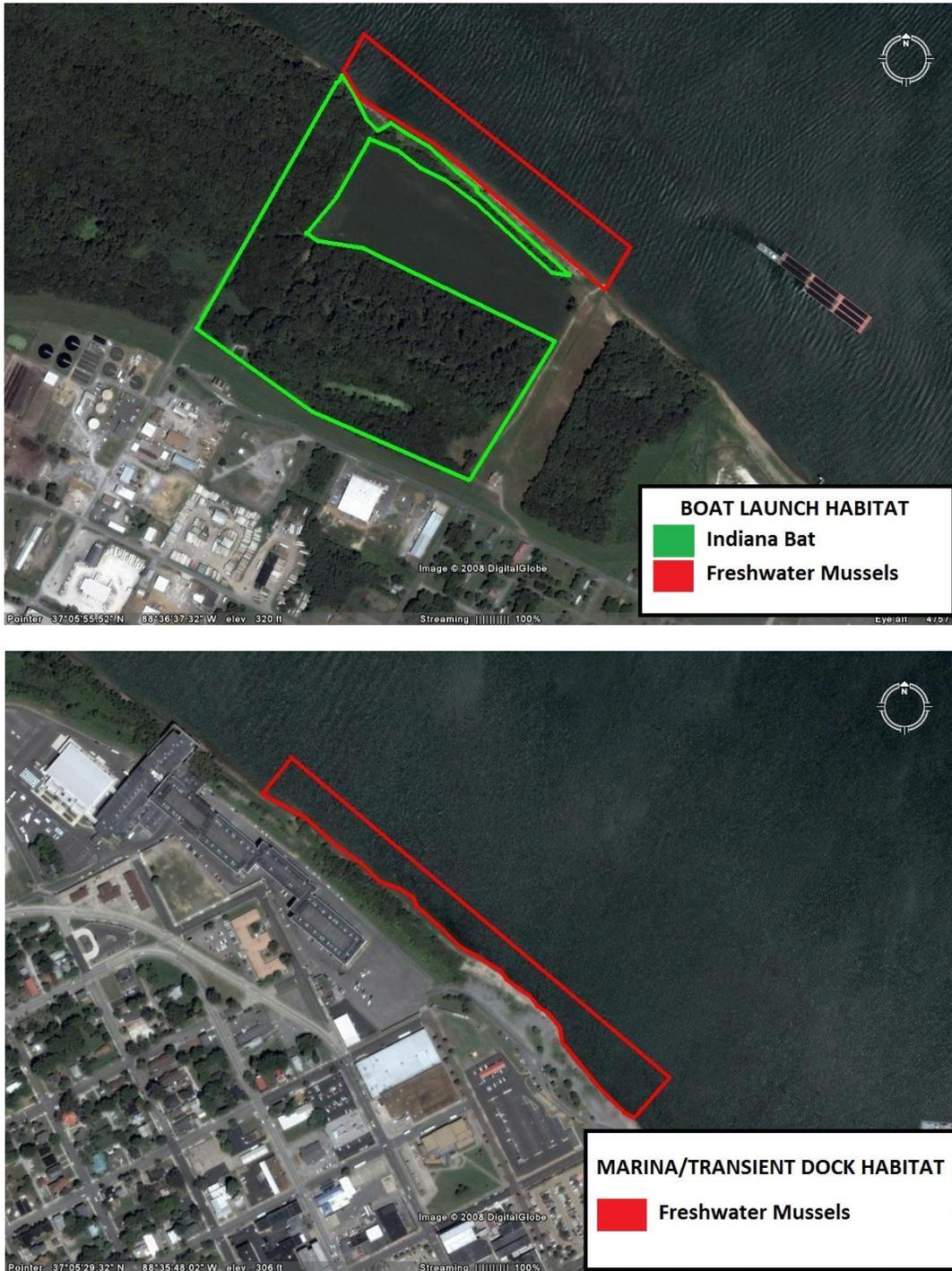


Figure 11

Section 106

Governing Regulations & Consulting Parties

Section 106 of the National Historic Preservation Act of 1966 as amended requires federal agencies to consider the effects of their actions on historic properties. Coordination with the Kentucky Heritage Council/State Historic Preservation Office (the Council) was conducted to identify and help predict the locations of significant archaeological and architectural resources in the vicinity of the proposed boat launch and marina/transient dock projects. The Council reviewed the boat launch and marina/transient dock projects. This review indicated that (1) the northwest portion of the boat launch project area and the marina/transient dock project area have the potential to contain archaeological sites that are eligible for listing in the National Register of Historic Places, and (2) there are numerous historic structures located within and adjacent to both project areas. The Council recommended that the boat launch and marina/transient dock project areas be surveyed to determine if the projects will impact archaeological sites as described. The Council also recommended that an architectural survey be conducted of the Area of Potential Effect (APE) for each project to determine if it will affect structures that are eligible for or listed in the National Register of Historic Places.

Native American Consultation (NAC) is held at a sovereign government to government level; therefore, the lead federal agency, Federal Highway Administration (FHWA), initiates consultations and discussions with interested tribes. FHWA has established specific NAC protocols with a number of federally-recognized tribes who have expressed interest in portions of Kentucky. When necessary, FHWA consults with the Chickasaw Nation, the Shawnee Tribe, the Absentee Shawnee Tribe of Oklahoma, the Eastern Shawnee Tribe of Oklahoma, and the Peoria Indian Tribe of Oklahoma for projects located in McCracken County. After review of archaeological survey reports, the Kentucky Transportation Cabinet submits the results to FHWA who then consults with the interested tribes if either prehistoric human remains and/or prehistoric artifacts are found. Results of the archaeological surveys are forwarded to the interested tribes for comment. After a period of 45 days has elapsed, FHWA collects all comments and submits the comments for inclusion in the Finding of No Significant Impact (FONSI). If one or more tribes express concern, additional consultation is conducted. Consultation is closed once the concerns are addressed or the tribes are invited to be signatories to a Memorandum of Agreement. If no prehistoric remains or artifacts are found in the surveys, no consultation with the tribes is required. A Phase I Archaeological Survey was conducted for the proposed boat launch and marina/transient dock sites by American Resources Group, Ltd. on May 10, 2008. The survey was achieved through a site file search by the Kentucky Heritage Council, a literature review, and an archaeological field survey. No archaeological sites were found within the proposed boat launch and marina/transient dock sites; therefore, no consultation with tribal representatives is required.

Additional Agency & Local Involvement

The City of Paducah's Historic & Architectural Review Commission (1) provides exclusive jurisdiction as a Board of Adjustment over historic zones and the Neighborhood Service Zone within the city, (2) reviews applications for a Certificate of Appropriateness or a Certificate of Zoning Compliance, and (3) reviews all nominations for the National Register of Historic Places at the local level. Local historic designations were also reviewed as part of the assessment. According to the City of Paducah Zoning Map, there are two historic zonings within the city limits as depicted in Figure 12. The two historic zonings are: Historic Commercial (H-1)

Paducah Boat Launch & Marina/Transient Dock FONSI

and Historical Neighborhood (H-2). The Historic Commercial (H-1) area is approximately 1,470 linear feet southeast of the proposed marina/transient dock facility and is also separated from the project area by the existing concrete flood wall. The Historic Commercial (H-1) area is approximately 5,500 linear feet southeast of the proposed boat launch site and is also separated from the project area by the existing flood wall. The Historical Neighborhood (H-2) area is approximately 660 linear feet southwest of the proposed marina/transient dock facility. The Historical Neighborhood (H-2) area is approximately 2,100 linear feet southeast of the proposed boat launch project. Both projects are separated from the historic areas by the existing flood wall. The approximate elevations of the proposed boat launch and the boat launch parking area are 310 and 320 feet above Mean Sea Level (MSL), respectively. The earthen floodwall elevation near the intersection of Burnett Street and North 6th Street is approximately 350 feet above MSL; therefore, the proposed boat launch facility will not have any significant visual impacts on nearby areas in Paducah. A public notice was published on January 24, 2010 for any persons wishing to participate as “consulting parties” in the decision-making process for historic and archaeological issues under the National Historic Preservation Act of 1966. There were no requests from persons to participate as “consulting parties.” No separate public hearing was required under the Act.

The proposed marina/transient dock will have a “floating” gangway deck system with a maximum elevation of 347 feet above MSL based on the maximum historic flood level. The elevation at the top of the flood wall at Harrison Street, Madison Street, and Monroe Street is approximately 349 feet above MSL; therefore, the gangway deck system, the marina, and the transient dock will not have any visual impacts on downtown Paducah. The marina/transient dock will have three individual sets of four pipe piles that will support the “floating” gangway deck system. The top of the pipe piles will be at an approximate elevation of 351 feet above MSL and positioned 390, 470, and 560 linear feet on the river side of the floodwall. The elevation at the top of the floodwall in this area is approximately 349 feet above MSL; therefore, the tops of the pipe piles will be above the floodwall. Vertical axis wind turbines will be placed at the top of each of the twelve pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. According to literature, the turbines are relatively “soundless” (53 dB @ 10-12 feet) and have non-reflecting surfaces to eliminate shadow strobing effects. The Kentucky Transportation Cabinet-Division of Environmental Analysis (KYTC) submitted a visual impact analysis to the Kentucky Heritage Council on March 19, 2012. The Kentucky Heritage Council concluded on April 19, 2012 that no historic properties will be affected by the wind turbines if it is also verified that noise levels are not significantly impacted. KYTC submitted noise impact documentation to the Kentucky Heritage Cabinet on May 10, 2012. The Kentucky Heritage Council concluded on May 11, 2012 that the cumulative effect of the wind turbines will not pose an adverse effect to historic resources.

Historic Structures or Districts

The selected alternatives will have no impacts on historic structures or districts.

Archaeological Sites

The selected alternatives will have no impacts on archaeological sites.

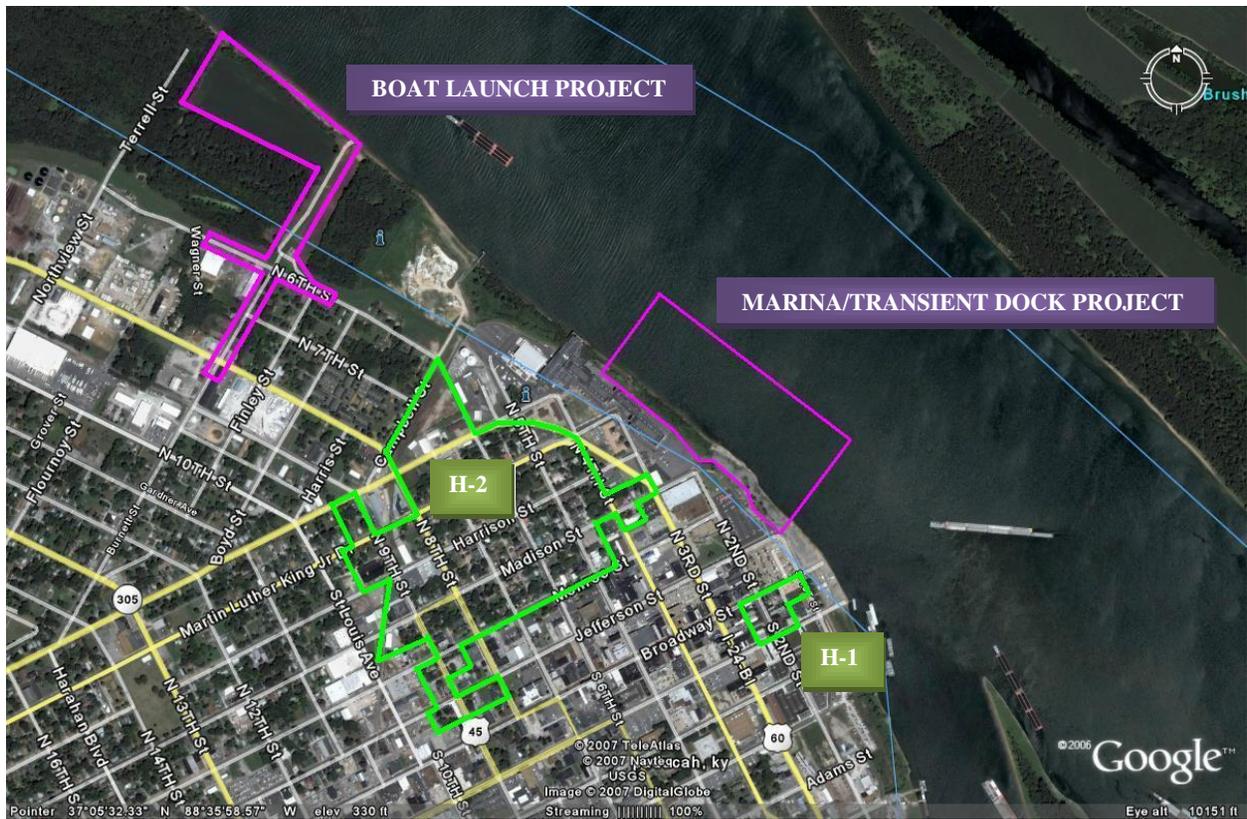


Figure 12

Surface Water/Land Use

Existing Surface Water/Land Use and Anticipated Changes in Use

The proposed boat launch facility project area consists of undeveloped upland woods, one agricultural field, a narrow wooded strip of Ohio River bank, and open field. There are no private, commercial, or industrial activities occurring on the property with the exception of City of Paducah water intakes in the extreme northeastern corner of the proposed site. There is also currently a gravel/dirt road paralleling the site eastern boundary leading to a single concrete boat ramp. The proposed marina/transient dock facility project area consists of undeveloped riverbank, Schultz Park, and surface waters of the Ohio River. There are no private, commercial, or industrial activities occurring on the property. The properties are owned by the City of Paducah and/or Paducah/McCracken County; therefore, the acquisition of additional right-of-way will not be required.

The boat launch facility will impact 9.2 acres of land through the proposed access road, parking, and boat ramp approach and 0.5 acres of the Ohio River through the placement of the boat ramp. This 9.7 acre impact is out of the overall 54 acres available of which 30 of the 54 total acres is considered the boat launch site. Therefore, 68% of the project site will maintain the current land use with a commitment to preserve 45 acres of wooded and upland forest wetlands as well as to restore 765 linear feet of riparian buffer along the Ohio River. The marina/transient dock project consists of approximately 42 acres comprised of riverbank (12 acres), including the existing Schultz Park, and water surface (30 acres) of the Ohio River. The marina/transient dock facility will directly impact 1.60 acres along the riverbank and 4.56 acres of riverbed through the placement of fill as well as 0.07 acres for the mooring anchors. Therefore, 85% of the project site will maintain its current utilization as riverbank and surface water.

Project Compatibility with Existing Water/Land Use Plans

The current zoning for both project areas is Conservancy Zone (C-1). According to the City of Paducah Zoning Ordinance, the Conservancy Zone is intended to establish a zone to meet the needs of the Ohio and Tennessee Rivers and their tributaries in times of flood and to prevent the undue loss of life and property by not allowing encroachment into the zone of uses which will either be damaged by flood or will increase floodwater heights. The principal permitted uses include: (1) open type uses such as loading and unloading areas, parking lots and gardens auxiliary to uses permitted in any adjoining district, (2) storage yards for equipment and material not subject to major flood damage, (3) water-port facilities, and (4) open-type public and private recreation facilities such as public parks. Conditionally permitted uses are special exceptions and require written approval of the Board of Adjustment as long as the requested use is determined to be of the same general character as the principal permitted uses. Both the boat launch and marina/transient dock projects are compatible with current water and land uses and will conform to the current zoning, specifically principal permitted uses (1), (3), and (4).

Cumulative & Indirect Impacts

Since the proposed projects are exclusive to the City of Paducah (the City) riverfront, portions of the Ohio River will be impacted through their subsequent development. The proposed boat launch facility will be a transfer of this amenity from the northern end of Broadway Street downstream to north of Burnett Street; therefore, no cumulative impact to the Ohio River will occur due to this project. The proposed marina/transient dock facility will be constructed in an area presently utilized as a riverfront amenity for the City; therefore, no cumulative impact to the Ohio River will result. No additional impacts to the Ohio River system will occur due to the similar utilization of the subject areas. No indirect impacts to the Ohio River system are expected as a result of the proposed projects.

Community Impacts

Community Cohesion

Community cohesion is “the magnitude or degree to which people reside and share activities.” The relationship between proposed actions and community life must be examined as part of the investigation of impacts that may cause personal, sociological, and/or psychological hardships. Proposed actions can not have significant impacts on the typical interaction among persons and groups nor can it cause significant change of the social relationships and patterns of a community. Community cohesion impacts include but are not limited to: increased traffic volumes, decreased safety for pedestrians and/or school children, neighborhood congestion, decreased property values, business relocations, residential relocations, increased noise levels, employment effects, and isolation. Since the proposed boat launch and marina/transient dock projects will be riverfront amenities and will be separated from the public by the existing floodwall, the projects will not produce any of the community cohesion impacts listed.

Another method to determine the impacts to community cohesion is the disruption of interdependency of persons or groups within a community. In this case, the businesses and residences in the immediate vicinity of the proposed boat launch (along N. 6th Street from Northview Street to Campbell Street) were identified and noted as to whether or not they are dependent upon one another. The businesses in the immediate vicinity of the marina/transient dock were also noted as to their interdependency.

There are ten inhabited single-family residences, two abandoned single-family residences, seven in-use business properties, and one abandoned business structure within the immediate area of the proposed boat launch project. All of the properties are separated from the proposed boat launch by the earthen floodwall. The seven active businesses are not dependent upon one another to sustain existence. There are no community centers, daycares, parks, or common areas within these property uses; therefore, no communal activities will be impacted. There are no apparent family groups or socially interdependent clusters within the area of the subject residences. There are no barriers associated with the proposed boat launch project that may cause isolation along N. 6th Street. None of the ten inhabited single-family residences and seven businesses will be required to be relocated. The only impacts to the residences and businesses may be re-arranged traffic patterns and noise caused by construction. Both of these impacts are temporary and will not cause cumulative affects to the neighboring properties. The purpose of the boat launch project is to relocate the existing boat ramp facility located at the northeastern end of Broadway Street allowing for the northeastern end of Broadway Street to be

converted back to its original use as a riverboat landing and community focal point along the Ohio River.

There are twenty one business entities, three parking lots, one public restroom facility, and one public park within the immediate area of the proposed marina/transient dock project. All of the properties are located on the opposite side of the concrete flood wall from the proposed marina/transient dock with the exception of Schultz Park. The businesses are not dependent upon one another to sustain existence but work together to provide riverfront/downtown amenities and/or employment to the public. The three parking areas are common to the immediate area of the proposed marina/transient dock project and serve the neighboring businesses; however, there are no reductions in parking spaces expected. None of the properties will be converted into different uses. The only impacts to the properties may be re-arranged traffic patterns and noise caused by construction. Both of these impacts are temporary and will not cause cumulative affects to the neighboring properties. The one permanent impact due to the proposed marina/transient dock is the enhancement of Schultz Park located on the opposite side of the concrete floodwall from the downtown merchants; however, the enhancement of Schultz Park complies with the purpose & need of the proposed marina/transient dock project. The purpose of the marina/transient dock is to provide accommodations for transient boaters and local recreational boat owners. This will provide a positive economic stimulus to the downtown area. It is a major goal of the Paducah Waterfront Plan that the business entities listed will be positively affected by the proposed marina/transient dock project.

Employment and Labor Force

According to the 2010 Census compiled by the U.S. Census Bureau, 55.7% of the city population that were 16 years of age and over was in the work force. The top three occupation categories in the work force were as follows: management and related occupations (30.1%), sales and office occupations (22.0%), and service occupations (22.6%). The top three industries of the work force were: educational services (18.1%), retail trade (15.2%), and arts, entertainment, recreation (14.5%). Classes of worker were: private wage and salary workers (84.3%), government workers (9.7%), and self-employed workers (5.7%). The median family income was \$42,645. The per capita income was \$20,430. Families below the poverty level were 18.1% of the population. Individuals below the poverty level were at 22.0%. The boat launch and marina/transient dock projects will not negatively impact employment in the downtown business district. It is the overall goal of the marina/transient dock project to enhance the riverfront amenities and therefore, increase opportunities for the public to use the resource. It is expected that the project will increase the available employment opportunities of the immediate area.

Community Resources

There are over eighteen parks within the Paducah City Parks System. Schultz Park will be directly affected by the proposed marina/transient dock facility since the project has been designed to redevelop and enhance the riverbank including the existing park. Riverfront Plaza and Wilson Stage will be indirectly affected by the proposed marina/transient dock facility since the project will visually change the riverfront amenities in the vicinity of the plaza and stage. The closest park to the boat launch site is Voor Park. The park is 0.8 miles south of the proposed boat launch.

There are over ninety churches listed in the City of Paducah. These churches serve a variety of faiths and/or denomination including but not limited to: Apostolic, Bahai, Baptist, Buddhism, Catholic, Church of Christ, Church of God, Jehovah's Witness, Jewish, Methodist, Nazarene, Pentecostal, Presbyterian, and Seventh Day Adventist. The closest church to the boat launch site is Bethel Baptist located 0.4 miles to the south. The closest church to the marina/transient dock facility is St. Francis De Sales located 0.4 miles to the south. Neither the proposed boat launch nor the proposed marina/transient dock facility will impact any religious groups of the local population.

There a number of public and private schools in the City of Paducah. Of the seventeen public schools in Paducah, eleven serve elementary students, five serve middle school students, and 5 serve high school students. Of the six private schools in Paducah, five serve elementary students, three serve middle school students, and two serve high school students. The closest school to the boat launch site is McNabb Elementary which is approximately 1.5 miles to the southwest. The closest school to the marina/transient dock is also McNabb Elementary which is 1.7 miles to the southeast. McNabb Elementary will not be impacted by the two subject projects. Paducah also serves college/technical school students through the Murray State University Paducah Regional Campus, Paducah Technical College, and the West Kentucky Community & Technical College. None of these higher education institutions will be impacted by the boat launch or marina/transient dock facilities due to fact that the closest of these three entities is over 2 miles in distance.

There are two hospital facilities in Paducah, Kentucky. Lourdes Hospital is located immediately off of I-24 approximately 4.0 miles southwest of the proposed boat launch and marina/transient dock sites. Western Baptist Hospital is located approximately 2.0 miles southwest of the two proposed project sites. Neither of the hospitals will be impacted by the boat launch or marina/transient dock facilities.

Paducah is served by a number of nursing homes/assisted living facilities. The closest facility of this type to both the boat launch and the marina/transient dock is the Paducah Centre for Health & Rehabilitation. This facility is located 0.7 miles southeast of the boat launch site and 0.1 miles south of the marina/transient dock facility. The Paducah Centre for Health & Rehabilitation facility will not be affected by the two projects.

McCracken County Public Library is located at 555 Washington Street in Paducah, Kentucky. The library is positioned approximately 1.2 miles southeast of the proposed boat launch facility and 0.4 miles south of the proposed marina/transient dock. Neither project will impact library services.

The closest campground to both the boat launch and marina/transient dock projects is the Fern Lake Campground located 4.8 miles west of the boat launch and 5.4 miles west of the marina/transient dock facility. The campground will not be affected by the two projects.

Paducah, Kentucky has various shopping and restaurant locations within the downtown area as well as on the perimeter of the city. The downtown shopping opportunities include: antiques, collectibles, art galleries, books, clothing & accessories, coffee & sweets, fabric & quilt shops, florists & special event accessories, food & beverage markets, general services, gifts, home décor, jewelry, lawn & garden, nature & health food, outdoor, photography, hobby, and music. The Kentucky Oaks Mall as well as other "big box retailers" is located immediately off of

I-24 approximately 5.0 miles west of the downtown Paducah area. Neither of the proposed projects will negatively impact the shopping and restaurant opportunities in the downtown area or on the perimeter of the city. Increased use of the riverfront amenities will most likely have a positive effect on the economic viability of downtown Paducah with this effect being one of the driving forces behind the redevelopment of the riverfront area.

Impacts on Travel Patterns, Accessibility, Community Facilities, Economic Vitality, Established Business Districts, and Public Safety.

Since the proposed boat launch and marina/transient dock facilities are to be located as riverfront amenities, there will be no significant impacts to travel patterns, accessibility, community facilities, economic vitality, established business districts, or public safety. Traffic may be re-routed temporarily due to construction along the existing right-of-way on both North 6th Street and Burnett Street. Traffic may be altered temporarily due to the movement of construction vehicles in and out of the boat launch and marina/transient dock sites.

Social and Cultural Loss to the Community by Displacements

There are no social and/or cultural losses expected due to there being no displacements resulting from the proposed projects. The proposed boat launch and marina/transient dock facilities are to be located as riverfront amenities.

Impacts on Economic Vitality in Project Area and Established Business Districts

Paducah, Kentucky has various shopping and restaurants within the downtown area. The downtown shopping opportunities include: antiques, collectibles, art galleries, books, clothing & accessories, coffee & sweets, fabric & quilt shops, florists & special event accessories, food & beverage markets, general services, gifts, home décor, jewelry, lawn & garden, nature & health food, outdoor, photography, hobby, and music. Neither of the proposed projects will negatively impact shopping, restaurant opportunities, or other businesses in the downtown area of the city. Increased use of the riverfront amenities will most likely have a positive effect on the economic viability of downtown Paducah with this effect being one of the driving forces behind the redevelopment of the riverfront area.

Cumulative & Indirect Impacts

The boat launch and marina/transient dock projects will have positive impacts on the downtown Paducah community. In the process, the existing boat ramp facility located at the northeastern end of Broadway Street will be relocated which will allow the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point along the Ohio River. The marina/transient dock facility will bring an economic stimulus to the downtown area through visitors that are traversing up and down the Ohio. Overall, the proposed projects will increase the economic vitality of downtown Paducah.

Displacements & Relocations

The selected alternatives will not cause any displacements or relocations.

Farmland

Baseline Conditions in Project Areas

The Farmland Protection Policy Act (FPPA) of 1981 is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. "Prime farmland", as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency. The proposed boat launch project involves construction within an area comprised of upland woods, one agricultural field, a narrow wooded strip of Ohio River bank, and an open field. The proposed marina/transient dock facility project involves construction within the undeveloped riverbank which currently consists of riprap and limited vegetation, Schultz Park, and surface waters of the Ohio River. There are no agricultural opportunities within the marina/transient dock facility area.

Impacts to Farmland

Through the review of soils data from the National Resource Conservation Service under the direction of the U.S. Department of Agriculture (USDA) in McCracken County, it has been determined that the proposed boat launch project area would involve lands protected under the Farmland Protection Policy Act (FPPA). The project area contains six soil types of which four are designated as prime farmland soils. The prime farmland soils are Huntington-Combs complex (Hm), Huntington-nolin silty clay loams (Hn), Newark-Lindsay complex (Ne), and Okaw silt loam (OhA). The entire project is located within these four soils with the exception of the riverbank (Water-W), the tree line paralleling the northern property boundary (Yeager fine sandy loam-Ye), the levee (Levee), and Burnett Street south of the earthen levee (Urban land-Udorthents complex-UtA). These soils are not designated as prime farmland, unique farmland, or statewide soils. The marina/transient dock facility contains three soil type designations (Udorthents-urban land complex-UdC, Urban land-Udorthents complex-UrA, and Water-W) of which none are designated as prime farmland, unique farmland, or statewide soils. A USDA Farmland Conversion Impact Rating (Form AD-1006) has been completed for the boat launch project. The form provides an evaluation and scoring system with criteria for evaluating adverse effects of projects on the protection of farmland. Sites receiving the highest combined scores up to a maximum of 260 are considered most suitable for protection while those with lowest scores are considered least suitable. According to the FPPA, sites receiving total scores of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated. The total score computed for the proposed boat launch area was 158, assuming a "relative value of farmland" score of 99 and a "site assessment score" of 59. The USDA Farmland Conversion Impact Rating (Form AD-1006) for the boat launch project is included as Figure 13.

Feasible Alternative to Avoid Farmland Impacts if Impact Rating > 160 points

According to the Farmland Protection Policy Act (FPPA), sites receiving total scores of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated. The total score computed for the proposed boat launch area was 158, assuming a “relative value of farmland” score of 99 and a “site assessment score” of 59.

Cumulative & Indirect Impacts

Since the farmland impact rating for the proposed boat launch area is less than 160, no alternatives need to be investigated and no protection of the area is warranted. This is based on the premise that no cumulative impact is expected from the conversion of farmed wetlands to non-farmed acreage within the development, i.e. the overall impact to the available agricultural property in McCracken County will not be significant. The loss of the farmed wetlands as a result of the boat launch project will have no impact on future farming opportunities in the county.

Prime Farmland within the Project Areas

The boat launch project area contains six soil types of which four are designated as prime farmland soils. The prime farmland soils are Huntington-Combs complex (Hm), Huntington-nolin silty clay loams (Hn), Newark-Lindsay complex (Ne), and Okaw silt loam (OhA). A soils map for the subject project is detailed in Figure 14. There are no prime farmland soils within the proposed marina/transient dock project area.

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 11-15-07			
Name Of Project LOTH + BURKETT BOAT LAUNCH		Federal Agency Involved FHWA			
Proposed Land Use BOAT RAMP, PARKING, ACCESS RD		County And State MCCRACKEN CO., KY			
PART II (To be completed by NRCS)		Date Request Received By NRCS			
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 0	Average Farm Size 126
Major Crop(s) Corn / Soybeans	Farmable Land In Govt. Jurisdiction Acres: 149,545 % 90.5	Amount Of Farmland As Defined in FPPA Acres: 102,390 % 64		Date Land Evaluation Returned By NRCS 11-26-07	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System				
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		7.0			
B. Total Acres To Be Converted Indirectly		48.7			
C. Total Acres In Site		0.0 21.5	0.0	0.0	0.0
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		22.2			
B. Total Acres Statewide And Local Important Farmland		0			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		106			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		14			
PART V (To be completed by NRCS) Land Evaluation Criterion					
Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		0	99	0	0
PART VI (To be completed by Federal Agency)					
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points				
1. Area In Nonurban Use	15	11			
2. Perimeter In Nonurban Use	10	7			
3. Percent Of Site Being Farmed	20	4			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	5			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	0			
8. Creation Of Nonfarmable Farmland	10	10			
9. Availability Of Farm Support Services	5	2			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	0			
TOTAL SITE ASSESSMENT POINTS	160	59	0	0	0
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100	99	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	59	0	0	0
TOTAL POINTS (Total of above 2 lines)	260	158	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:					

(See Instructions on reverse side)

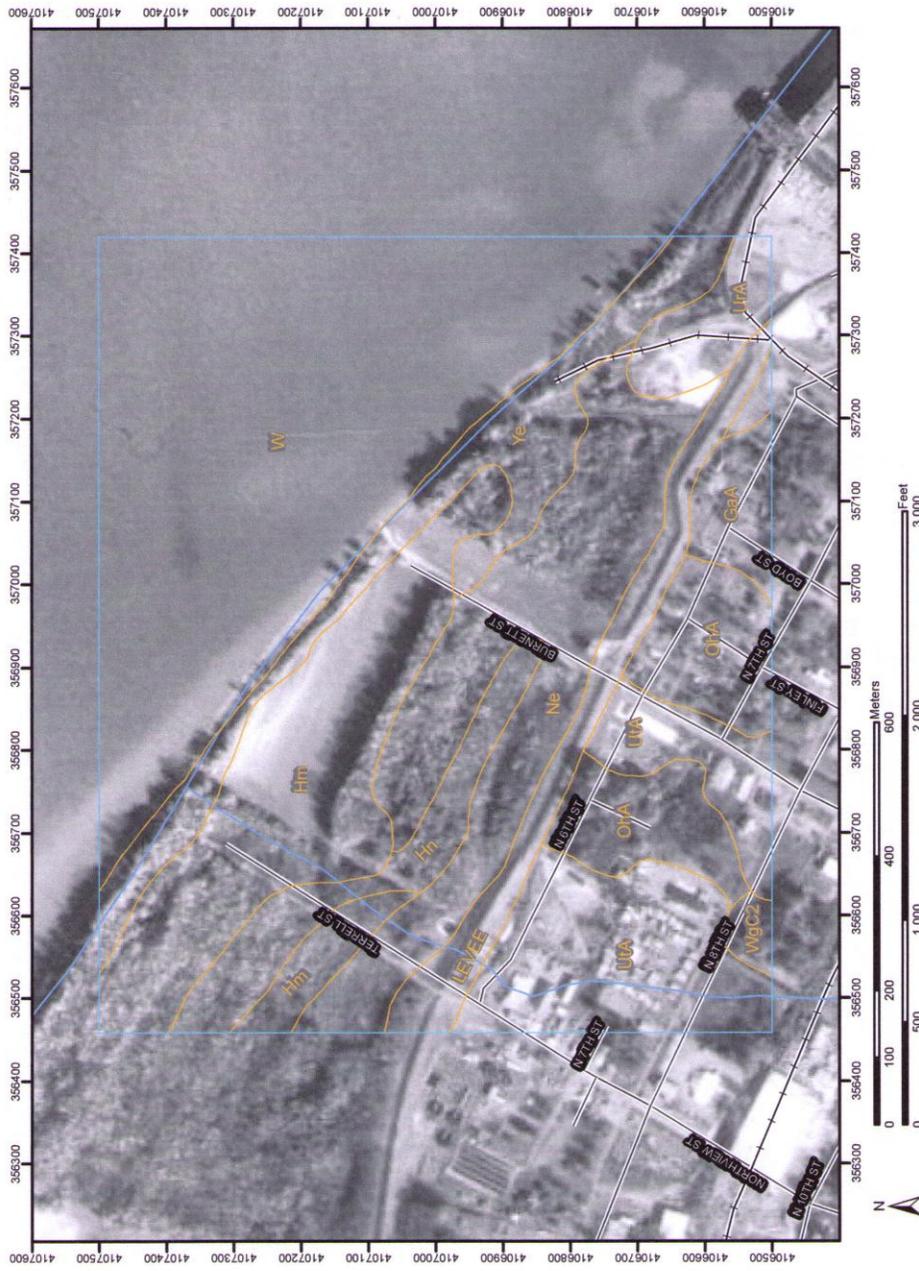
This form was electronically produced by National Production Services Staff

Form AD-1006 (10-83)

Figure 13

Paducah Boat Launch & Marina/Transient Dock FONSI

Soil Map—Ballard and McCracken Counties, Kentucky
(Boat Launch)



11/14/2007
Page 1 of 3

Web Soil Survey 2.0
National Cooperative Soil Survey

USDA
Natural Resources
Conservation Service

Figure 14

Paducah Boat Launch & Marina/Transient Dock FONS

Environmental Justice

The selected alternatives will have no environmental justice impacts.

Pedestrian & Bicycle Facilities

Opportunities for Providing Pedestrian and Bicycle Facilities

The proposed marina/transient dock facility has incorporated the consideration of bicyclists and pedestrians in the design process. As part of the marina/transient dock facility, Schultz Park will be redeveloped to establish it as the gateway to the Paducah riverfront. The redevelopment of the park is to include:

- the use of Monroe Street as a pedestrian link between town and the waterfront
- an interpretive waterfront experience including a levee trail/garden/open space
- reconfiguration of roadway alignment to provide landscape buffer for pedestrians
- the creation of a pedestrian promenade
- clear delineation of all paths and trails with appropriate signs/markers
- established spatial & visual separation of vehicles, pedestrians, and bicyclists
- multiple destinations along paths and trails
- provide ADA accessibility
- include amenities such as benches, trash/recycling receptacles, & bike racks
- provide pedestrian lighting where applicable

The transient boat dock will provide a gangway system connecting the park with the dock. Also proposed is a walking path and public access along the gangway and dock facility. The marina portion of the site will share a gangway entrance with the transient boat dock with a secure entrance. The proposed boat launch site has been designed to serve private boat owners and will be limited in the opportunity for pedestrians and bicyclists due to the commitment to preserve surrounding acreage as part of the compensatory mitigation plan for impacts to wetlands on the site; however, bicyclists and pedestrians will be allowed to utilize the premises.

Cumulative & Indirect Impacts

The marina/transient dock will provide new opportunities for both bicyclists and pedestrians through the design of specific park amenities. The boat launch does not have specific amenities designed for these opportunities; however, the development will allow bicyclists and pedestrians to utilize the site within the local regulations. There are no negative cumulative or indirect impacts expected with either of the two proposed projects.

Underground Storage Tanks/Hazardous Materials/Wastes

The selected alternatives will have no impacts on underground storage tanks, hazardous materials, or hazardous wastes.

Visual Impacts

Description of Visual Impacts of and from the Facilities

The boat launch facility will be located on the Ohio River. The facility will be accessed by a roadway extending from North 6th Street. Sight lines of the boat launch facility will be obscured by the wooded acreage and the earthen flood wall between the Ohio River and 6th Street. The approximate elevations of the proposed boat launch and the boat launch parking area are 310 and 320 feet above Mean Sea Level (MSL), respectively. The earthen floodwall elevation near the intersection of Burnett Street and North 6th Street is approximately 350 feet above MSL. Based on the elevations and the wooded area, no negative visual impact of the facility is expected. Views from the boat launch facility will be of the Ohio River to the immediate north, east, and west and wooded acreage to the south as it exists presently. No negative visual impact from the facility is expected. The marina/transient dock facility will extend from the floodwall at the end of Jefferson Street westward for approximately 2,200 linear feet while extending approximately 550 linear feet at its maximum (transient dock portion) into the Ohio River. The sight lines of the marina/transient dock facility will be obscured by the concrete floodwall paralleling the river. The proposed marina/transient dock will have a “floating” gangway deck system with a maximum elevation of 347 feet above MSL based on the maximum historic flood level. The elevation at the top of the flood wall at Harrison Street, Madison Street, and Monroe Street is approximately 349 feet above MSL; therefore, the gangway deck system, the marina, and the transient dock will not have any visual impacts on downtown Paducah. The marina/transient dock will have three individual sets of four pipe piles that will support the “floating” gangway deck system. The top of the pipe piles will be at an approximate elevation of 351 feet above MSL and positioned 390, 470, and 560 linear feet on the river side of the floodwall. The elevation at the top of the floodwall in this area is approximately 349 feet above MSL; therefore, the tops of the pipe piles will be above the floodwall. Vertical axis wind turbines will be placed at the top of each of the twelve pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. According to literature, the turbines are relatively “soundless” (53 dB @ 10-12 feet) and have non-reflecting surfaces to eliminate shadow strobing effects. The Kentucky Transportation Cabinet-Division of Environmental Analysis (KYTC) submitted a visual impact analysis to the Kentucky Heritage Council on March 19, 2012. The Kentucky Heritage Council concluded on April 19, 2012 that no historic properties will be affected by the wind turbines if it is also verified that noise levels are not significantly impacted. KYTC submitted noise impact documentation to the Kentucky Heritage Cabinet on May 10, 2012. The Kentucky Heritage Council concluded on May 11, 2012 that the cumulative effect of the wind turbines will not pose an adverse effect to historic resources.

Cumulative & Indirect Impacts

There are no negative cumulative or indirect visual impacts expected as a result of the boat launch and marina/transient dock projects.

Impacts of Construction Activities

Potential Adverse Impacts

Noise impacts associated with the proposed boat launch and marina/transient dock will occur during construction of the facilities; however, construction is conditionally exempt from the City Noise Ordinance. It is concluded that noise levels associated with construction will not exceed the criteria detailed in the City Noise Ordinance. The noise control ordinance exempts construction operations from 7:00 a.m. to 6:00 p.m. on weekdays for which building permits have been issued or construction operations not requiring permits due to ownership of the project by an agency of government; providing all equipment is operated in accordance with all standard equipment, manufacturers' mufflers, and noise reducing equipment in use and in properly operating condition. Construction of the proposed boat launch and marina/transient dock facilities is not expected to cause traffic congestion due to the fact that main construction will be on the riverfront and not within the existing vehicle traffic patterns of downtown Paducah. It is expected that occasional traffic re-routing will be necessary for precautionary measures when construction equipment is entering and/or exiting the project sites and during the enhancement along 6th and Burnett Streets.

Waste and Borrow Sites

The boat launch and marina/transient dock project areas will not be used as waste and/or borrow sites during construction. Fill material for both sites will be obtained from off-site.

Mitigation Commitments

The boat launch site has been designed to reduce environmental impacts by utilizing an existing roadway corridor and existing agricultural field for the entrance roadway and parking area. Other designs for this site would result in significantly greater impacts to higher quality wooded wetlands. Although the proposed site design results in the impacts to approximately 9.7 acres of wetlands, only about 0.7 acres of wooded wetlands will be impacted. These impacts are limited to fringe areas and will not fragment the existing forest. No viable alternative boat launch site exists within the immediate vicinity of downtown Paducah. The selected site minimizes ecological impacts while still meeting the river access needs of the community. A mitigation plan was developed by Redwing Ecological Services, Inc. (Redwing) for the boat launch project to provide compensation for unavoidable impacts to approximately 9.7 acres of waters/wetlands by construction. The impacts and committed mitigation for the boat launch project is as follows with measurements in acres unless otherwise stated:

Feature	Size	Impacted	Mitigation Ratio	Mitigation Required	Type	Size	Ratio	Credit
Wooded	37.0	0.7	3:1	2.1	Preservation	34.4	10:1	3.4
Wooded	37.0	0.7	3:1	2.1	Restoration	7.3	1:1	7.3
Farmed	16.0	8.3	1:1	8.3	-----	-----	-----	-----
Open Field	1.0	0.2	2:1	0.4	-----	-----	-----	-----
Up. Forest	-----	0.0	-----	-----	Preservation	3.4	10:1	0.3
Ohio River	-----	0.5 (250')	2:1	1.0 (500')	Restoration	765'	1:1	765'
TOTAL	54.0	9.7 (250')		10.8 (500')		45.1		11.0*

* Includes 765' of riparian buffer restoration

These mitigation requirements will be met with on-site wetland preservation and restoration. The 11.0 acres of proposed mitigation more than compensates for impacts to wetlands (10.8 acres of required mitigation) by the proposed boat launch facility. The major components of the mitigation plan include wetland preservation, wetland restoration, and upland buffer preservation. Approximately 34.4 acres of existing high quality forested wetland will be permanently preserved under a conservation easement/deed restriction within a designated conservation area. Approximately 7.3 acres of existing farmed wetland will be restored to forested wetland through planting of native wetland tree species. Approximately 3.4 acres of existing forested upland buffer will be permanently preserved under a conservation easement/deed restriction. Approximately 765 linear feet of wooded riparian buffer will be restored along the Ohio River through planting of native trees.

According to the U.S. Fish & Wildlife Service (USFWS), an endangered *Myotis sodalis* (Indiana bat) record has been documented within five miles of the proposed boat launch project site. Based on this information, USFWS believes that (1) forested areas in the vicinity of or on the project area may provide potentially suitable summer roosting and foraging habitat, and (2) caves, rock shelters, and abandoned underground mines in the vicinity of or on the project area may provide potentially suitable winter hibernation habitat for the endangered species. The removal of trees onsite will be coordinated with the US Fish and Wildlife Service (USFWS) through the execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction.

The proposed marina/transient dock facility project involves construction within the undeveloped riverbank which currently consists of riprap and limited vegetation, the existing Schultz Park, and surface waters of the Ohio River. There are no jurisdictional waters within the project area with the exception of the river. It is anticipated that there will be no mitigation requirements for the marina/transient dock due to the relatively limited nature of the marina/transient dock impacts in relation to the overall Ohio River system.

A mussel survey was conducted by Redwing Ecological Services, Inc. (Redwing) with the assistance of Copperhead Environmental Consulting, Inc. and Gannett Fleming Engineers & Architects, P.C., for the boat launch and marina/transient dock areas from August 5-8, 2008. The Mussel Survey Report was submitted to the USFWS on September 25, 2008. After review of the Mussel Survey Report, the USFWS identified a state and federally listed endangered mussel species, *Potamilus capax* (Fat Pocketbook), at the boat launch location. A Biological Assessment (BA) document that estimates potential impacts to Ohio River mussels was completed and submitted to USFWS on December 19, 2008 for concurrence. The results of the BA indicated that the proposed boat launch project is not likely to adversely affect three federally protected species: *Potamilus capax* (Fat Pocketbook), *Lampsilis abrupta* (Pink Mucket), and *Plethobasus cooperianus* (Orangefoot Pimpleback). A Biological Opinion (BO) was issued on July 6, 2010 and revised on December 21, 2010 by the USFWS for impacts to the three species. The BO concluded that the boat launch project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. Since the completion of the initial Biological Assessment (BA) and Biological Opinion (BO), the U.S. Fish & Wildlife Service (USFWS) has determined that additional mussel species are proposed for listing under the Endangered Species Act of 1973 (the Act). As a result of this proposal, the Federal Highway Administration (FHWA) requested a formal conference opinion from the USFWS on March 4, 2011 for three species likely to be listed prior to the completion of the boat launch project. The conference was requested to take into account the effects on *Quadrula cylindrica* (Rabbitsfoot), *Cumberlandia monodonta* (Spectaclecase) and *Plethobasus cyphus* (Sheepnose). The US Fish and Wildlife Service (USFWS) completed the formal conference opinion on July 13, 2011. USFWS concurred that the project will likely adversely affect the Rabbitsfoot and Sheepnose and will not likely adversely affect the Spectaclecase. A new Biological Assessment (BA) was completed by Redwing on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch project area. Reasonable and prudent measures; terms & conditions; implementation and monitoring; and/or discretionary conservation measures will be attached to the Biological Opinion (BO). The USFWS completed the Biological Opinion (BO) and submitted the report to FHWA on June 6, 2012. In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, FHWA and the City of Paducah must comply with the following terms and conditions of the Biological Opinion (BO):

- Implement proposed actions in the Biological Assessment (BA) and mussel conservation measures listed in the Biological Opinion (BO),
- Develop a Mussel Relocation Plan and obtain USFWS written approval prior to the initiation of the relocation efforts,
- Contribute \$20,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for monitoring the Schultz Park expansion area and the site relocated mussels will be placed,
- Contribute \$71,706 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for the preservation, creation, enhancement, and/or protection of federally listed mussel habitat in the lower Ohio River,
- Contribute \$37,000 to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used in the recovery efforts for the four federally listed mussels addressed in the Biological Opinion (BO), thereby minimizing the take expected to occur on the project,

- Notify the USFWS office in Louisville, KY upon locating a dead, injured, or sick individual of an endangered or threatened species followed by contacting the USFWS office in Frankfort, KY.

Indirect & Cumulative Impacts

Indirect Impacts

The indirect impact analysis for the proposed boat launch and marina/transient dock projects concluded that there are no reasonably foreseeable indirect impacts associated with the redevelopment of the riverfront in the two separate areas. There is low potential for future development within the project areas due to both being situated in the Conservancy Zone (C-1). According to the City of Paducah Zoning Ordinance, the Conservancy Zone is intended to establish a zone to meet the needs of the Ohio and Tennessee Rivers and their tributaries in times of flood and to prevent the undue loss of life and property by not allowing encroachment into the zone of uses which will either be damaged by flood or will increase floodwater heights. The principal permitted uses include: (1) open type uses such as loading and unloading areas, parking lots and gardens auxiliary to uses permitted in any adjoining district, (2) storage yards for equipment and material not subject to major flood damage, (3) water-port facilities, and (4) open-type public and private recreation facilities such as public parks. Conditionally permitted uses are special exceptions and require written approval of the Board of Adjustment as long as the requested use is determined to be of the same general character as the principal permitted uses. Therefore, it is not reasonably foreseeable that the boat launch and marina/transient dock projects will induce growth to the existing area. There are no reasonably foreseeable negative indirect impacts associated with the two projects. Increased use of the riverfront amenities will most likely have a positive effect on the economic viability of downtown Paducah with this effect being one of the driving forces behind the redevelopment of the riverfront area.

Cumulative Impacts

The proposed boat launch project will directly impact jurisdictional wetlands, prime farmland, floodplains, and the Ohio River. The direct impact of jurisdictional wetlands will be compensated through preservation and restoration of the balance of the surrounding wetlands available on the project site; therefore, the overall impacts to jurisdictional wetlands will not show a net loss of wetlands. The direct impact to prime farmland acreage has been evaluated utilizing a scoring system developed by the U.S. Department of Agriculture. Since the farmland impact rating for the proposed boat launch area is less than 160, no alternatives need to be investigated and no protection of the area is warranted. This is based on the premise that no cumulative impact is expected from the conversion of farmed wetlands to non-farmed acreage within the development, i.e. the overall impact to the available agricultural property in McCracken County will not be significant. The loss of the farmed wetlands as a result of the boat launch project will have no impact on future farming opportunities in the County. The proposed boat launch project has been developed in accordance with Executive Order 11988 (Floodplain Management) and 23 CFR 650A (Location and Hydraulic Design of Encroachments on Flood Plains). Though the project is within the 100-year floodplain, the project is not expected to be a "significant encroachment" as defined in 23 CFR 650A nor is it expected to have an appreciable environmental impact on the base floodplain. The level of risk analogous with the probable areas of flooding and its consequences attributed to this encroachment is not expected to be any greater than that associated with the present conditions of the project area. The project is not expected to have any increased cumulative potential for property loss and

hazard to life. Without environmental commitments, the proposed boat launch may directly impact endangered/threatened bat species. Mitigation commitments have been established to reduce impacts to the Indiana bat. The removal of trees onsite will be coordinated with the USFWS through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. A new Biological Assessment (BA) was completed by Redwing Ecological Services, Inc. (Redwing) on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch project area. Reasonable and prudent measures; terms & conditions; implementation and monitoring; and/or discretionary conservation measures have been attached to the Biological Opinion (BO) that the USFWS submitted to FHWA on June 6, 2012.

The proposed marina/transient dock project will directly impact floodplains, the Ohio River, and a Section 4 (f) site, Schultz Park. The proposed project has been developed in accordance with Executive Order 11988 (Floodplain Management) and 23 CFR 650A (Location and Hydraulic Design of Encroachments on Flood Plains). Though the project is within the 100-year floodplain, the project is not expected to be a "significant encroachment" as defined in 23 CFR 650A nor is it expected to have an appreciable environmental impact on the base floodplain. The level of risk analogous with the probable areas of flooding and its consequences attributed to this encroachment is not expected to be any greater than that associated with the present conditions of the project area. The project is not expected to have any increased cumulative potential for property loss and hazard to life. The existing Schultz Park area in which the marina/transient dock facility will be constructed is a Section 4 (f) resource. Impacts to the resource will consist of redevelopment of the park, construction of a marina, and construction of the transient dock. Though the resource will be impacted, alterations to the area will not change its use. Schultz Park will remain as a park and recreation area. Since (1) the proposed marina/transient dock project will not adversely affect the activities, features, and attributes of the park/recreation area but will add amenities to the area and (2) the mayor of the City of Paducah concurs with the fact that no adverse affect to the existing Schultz Park will occur as a result of the proposed project, requirements under Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, Section 6009, can be satisfied utilizing the *de minimis* impact classification. The riverfront redevelopment plan is to increase the opportunity for access to the river through boating opportunities, pedestrian and bicyclist amenities, as well as enhanced picnic areas. Without environmental commitments, the proposed marina/transient dock project may directly impact endangered/threatened mussel species. A new Biological Assessment (BA) was completed by Redwing on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the new marina/transient dock project area. Reasonable and prudent measures; terms & conditions; implementation and monitoring; and/or discretionary conservation measures have been attached to the Biological Opinion (BO) submitted to FHWA on June 6, 2012.

In conclusion, since the proposed boat launch and marina/transient dock projects are not likely to induce growth to the area, there are no reasonably foreseeable indirect impacts to the surrounding environment. In addition, the cumulative impacts associated with the proposed projects have been minimized or negated when assuming all other past, present, and reasonably foreseeable impacts to jurisdictional wetlands, prime farmland acreage, floodplains, the Ohio River, Section 4 (f) resources, and threatened/endangered species.

PLANNING & PUBLIC INVOLVEMENT

Planning & Public Involvement Activities

The following is a timeline of activities and events conducted for stakeholder involvement:

- The City of Paducah and JJR meet with the U.S. Corps of Engineers to coordinate and discuss Paducah's general intent for riverfront improvements (January 2006)
- Separate project meetings involving City Staff, Executive Committee, Stakeholders, and the public are conducted over a two day period to review the overall project scope, planning boundaries, and schedule (March 8-9, 2006)
- A group bus tour to the riverfront cities of Chattanooga, Tennessee, and Evansville, Indiana, is conducted to allow key members of the Paducah Riverfront Redevelopment Plan to observe two communities possessing successful redeveloped riverfronts (March 23-24, 2006)
- A City staff meeting followed by a public hearing is held to present riverfront conditions analysis and perceived riverfront opportunities/alternatives (May 17-18, 2006)
- A preliminary consensus Riverfront Redevelopment Plan is developed and submitted to the City of Paducah (June 23, 2006)
- The City holds a series of meetings with riverfront property owners with land influencing the Riverfront Redevelopment Plan (June and July 2006)
- Based on new information, meetings, and input, a new Riverfront Redevelopment Plan is created shifting the proposed activities downstream (August and September 2006)
- U.S. Army Corps of Engineers, U.S. Coast Guard, Crouse Corporation, James Marine, City of Paducah, and the consultant team meet and discuss the new Plan (August 2006)
- Prominent display of informational boards in and around Schultz Park depicting a brief narrative, conceptual plan, and artistic renderings of a number of aspects associated with the proposed marina/transient dock facility (May 2008)
- Advertisement for consulting parties under Section 106 for available public meeting (January 2010) (There was no response to this advertisement)
- Public meeting to discuss the environmental assessment of the projects (March 2010)
- Public hearing to discuss the environmental assessment of the projects (May 2012)

During the planning process, input has been provided at public meetings, stakeholder meetings, and at presentations to museum boards. An understanding of current efforts as well as future plans of these entities was important in order to coordinate the interface with the cultural institutions and their efforts to link to the river. Some of these meetings included input from representatives from the Mural Walls, River Heritage Museum, Carson Four Rivers Center, and the historic railroad group.

Public Hearings

A public notice was published on January 24, 2010 for any persons wishing to participate as "consulting parties" in the decision-making process for historic and archaeological issues under the National Historic Preservation Act of 1966. There were no requests from persons to participate as "consulting parties". No separate public hearing was required under the Act.

A public notice was published on February 17, 2010 to allow interested persons to review the approved Environmental Assessment (EA) as well as prepare to attend a public meeting held on March 10, 2010. A total of 28 persons signed the attendance sheet for the public meeting concerning the approved EA. Three attendees submitted written comments as a result of the public meeting. The written comments are summarized as follows:

- “Future marina operators should be required to annually evaluate the impact of their goods and products as possible waste sources in the environment”
- “Consider coating the roof of the new marina with the polyurethane spray foam technology to reduce the heating load on the facility thereby reducing energy consumption”
- “Modify or spec the exterior lighting so that light emissions in the horizontal plane are limited to reduce the volume of insects attracted to the facilities thereby reducing the volume of pesticides and/or labor needed in the cleaning process”
- “Utilize signage to discourage feeding of wildlife, especially birds, near the riverfront to reduce the number of birds and associated diseases”
- “Place the closing of the foot of the Broadway ramp on the ballot for a vote”
- “Most of the citizens do not want the current boat ramp moved to Burnett Street”
- “Construct a pier into the river lined with seated benches along the side of the pier and outfitted with flower boxes, lighted lampposts, bushes, and small trees”

Public notices were published on April 25, 2012 and May 16, 2012 to allow interested persons to review the revised and approved Environmental Assessment (EA) as well as prepare to attend a public hearing held on May 30, 2012. A total of 32 persons signed the attendance sheet for the public meeting concerning the approved EA. No attendees submitted written comments during the public meeting. Two persons made public comments at the hearing. These comments were made part of the public hearing record through video. The public hearing video is included in this document in Appendix C. Two persons submitted written comments to the City Engineer within the allotted review period. The written comments are summarized as follows:

- “The proposed boat launch ramp should be considered a back-up ramp to the existing boat ramp at the end of Broadway. Both ramps should remain open to see which one is used the most”
- “I support the efforts in Phase I to expand Schultz Park but the expanded area should include an outdoor pavilion with any additional funds used to create a park suitable for the many festivals we host in Paducah. Only after the successful land based improvements, should a marina and transient dock be built adjacent to the land expansion”

Public Issues, Concerns, and Responses

No new issues, reasonable alternatives, or mitigation measures have been suggested as a result of the public hearing in May 2012 and/or the received comments; therefore, it is not required that the Environmental Assessment (EA) be rewritten. The written comment to “not remove the existing boat ramp from the end of Broadway Street but to use both the proposed and existing ramps” does not agree with the purpose and need of the boat launch project. The purpose of the boat launch project is to relocate the existing boat launch ramp facility located at the northeastern end of Broadway Street allowing for the end of Broadway Street to be

converted back to its original use as a riverboat landing and community focal point along the Ohio River. The relocation of the boat launch facility will reduce congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats. The comment to “construct a marina and transient dock only after an outdoor pavilion and creation of a park suitable for festivals are completed” is in agreement with the purpose and need of the marina/transient dock project.

Changes as a Result of Public Hearings

No new issues, reasonable alternatives, or mitigation measures have been suggested; therefore, it is not required that the approved Environmental Assessment (EA) be rewritten. Any comments from interested parties as a result of public hearings have been addressed, if relative to the purpose and need of the projects, and have been incorporated into this Finding of No Significant Impact (FONSI) document. The public hearing for the approved Environmental Assessment (EA) held on May 30, 2012 was documented by video for the record. A copy of the public hearing video can be found in Appendix C of this Finding of No Significant Impact (FONSI).

PROJECT EVENTS

Events and/or Project Influences concurrent with/since the approval of the EA

The Environmental Assessment (EA) was approved by the Kentucky Transportation Cabinet-Division of Environmental Analysis and the Federal Highway Administration on April 9, 2012. The following events took place either concurrently with or after the EA was approved:

- Redwing Ecological Services, Inc. submitted a Section 404 permit application to the US Corps of Engineers for the marina/transient dock on March 14, 2012
- Redwing Ecological Services, Inc. submitted a Section 401 permit application to Kentucky Division of Water for the marina/transient dock on March 26, 2012
- US Corps of Engineers publishes public notice for the Section 404 permit for the marina/transient dock on June 19, 2012
- Kentucky Division of Water publishes public notice for the Section 401 permit for the marina/transient dock on June 19, 2012
- The Kentucky Transportation Cabinet-Division of Environmental Analysis submitted a visual impact analysis to the Kentucky Heritage Council on March 19, 2012 for the proposed wind turbines to be used at the marina/transient dock
- The Kentucky Heritage Council determines on April 19, 2012 that no historic properties will be visually affected by the wind turbines if it is verified that noise levels are not significantly impacted
- The Kentucky Transportation Cabinet-Division of Environmental Analysis submitted information to the Kentucky Heritage Council on May 10, 2012 concerning noise impacts from the wind turbines to be used at the marina/transient dock
- The Kentucky Heritage Council determines that the cumulative effect of the wind turbines will not pose an adverse effect to historic resources on May 11, 2012
- The City of Paducah received a Stream Construction Permit from the Kentucky Division of Water on May 1, 2012 for the marina/transient dock
- Redwing Ecological Services, Inc. submitted *Effects Analysis and Request for Indiana Bat Memorandum of Agreement (MOA)* to the US Fish and Wildlife Service on May 17, 2012 for the boat launch project
- A public hearing concerning the approved Environmental Assessment (EA) was held on May 30, 2012
- The US Fish and Wildlife Service issued a Biological Opinion (BO) to the Federal Highway Administration concerning project impacts on freshwater mussels on June 6, 2012
- The US Corps of Engineers issued a public notice for the marina/transient dock Section 10 and 404 permits on June 19, 2012

FONSI Availability

This Finding of No Significant Impact (FONSI) document for the proposed boat launch and marina/transient dock facilities will be available for public review after approval by the Division of Environmental Analysis of the Kentucky Transportation Cabinet and the Federal Highway Administration (FHWA). The approved FONSI will be available for review at the following locations:

- City of Paducah
Engineering-Public Works Department
City Hall, 2nd Floor
300 South 5th Street
Paducah, KY 42002-2267
270-444-8511
- Kentucky Transportation Cabinet
Department of Highways, District One
5501 Kentucky Dam Road
Paducah, KY 42003
270-898-2431
- Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero Street
Frankfort, KY 40622
502-564-7250

SECTION 4(f) and SECTION 6(F) EVALUATIONS

Background

Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, Section 6009, requires federal-aid projects to include special efforts to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Approval of projects that have the potential to impact any of these resources can be made only if the following conditions are met:

- I. There is no feasible or prudent alternative to the use of land from the property; and
- II. The action includes all possible planning to minimize harm to the property resulting from use.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended the existing Transportation Act legislation with Section 6009(a) in order to simplify the Section 4(f) process and approval of projects having a *de minimis* impact on a historic or recreational resource. With respect to parks, recreation areas, or wildlife or waterfowl refuges, the USDOT Secretary may make a finding of *de minimis* impact only if the following conditions are met:

- I. The Secretary has determined after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- II. The finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.

Section 4(f) Resources

The property in which the proposed boat launch facility will be constructed is owned by the City of Paducah; therefore, the property is designated as “publicly owned.” The subject property does not fall under the three basic resource categories of parks & recreation areas, refuges, or cultural resources.

Existing Raymond Schultz Riverfront Park (Schultz Park) will be utilized for the proposed marina/transient dock facility. The marina/transient dock will extend from the floodwall at the end of Jefferson Street westward for approximately 2,200 linear feet while extending approximately 550 linear feet at its maximum (transient dock portion) into the Ohio River. Schultz Park is owned by the City of Paducah and is considered a “publicly owned park”. According to the City of Paducah’s *Parks and Recreation Facilities Inventory*, Schultz Park is located on the Ohio River between Harrison Street and Route 45 and is 7.8 acres in size. The park has an outdoor theater (Wilson Stage), two boat launch ramps, an asphalt parking lot, benches, sidewalks, and a moveable floating dock. Schultz Park is home to the annual Paducah Summer Festival in July and the annual Bar-B-Que on the River celebration in September. Since the park will be impacted as part of this proposed project, the area is protected as a Section 4(f) property. The park is publicly owned, open to the public, and serves as a recreation area. The existing area is considered significant by the local authorities when compared to the other similar areas included in the community. However, since (1) the proposed marina/transient dock project will not

adversely affect the activities, features, and attributes of the park/recreation area but will add amenities to the area and (2) the mayor of the City of Paducah concurs with the fact that no adverse affect to the existing Schultz Park will occur as a result of the proposed project, requirements under Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, Section 6009, can be satisfied utilizing the *de minimis* impact classification.

The boat launch and marina/transient dock facility will be located in the Ohio River which does not fall under any of the categories of Section 4(f). Because portions of the two projects will impact the Ohio River and associated riverbank, coordination with the U.S. Corps of Engineers and the Kentucky Department for Environmental Protection will be required.

Identify and Discuss any 6(f) Impacts

Section 6 (f) of the Land and Water Conservation Fund Act (the Act) concerns transportation projects that propose impacts, or the permanent conversion, of outdoor recreation property that was acquired or developed with grant assistance from the Land and Water Conservation Fund. Passed by Congress in 1965, the Act established a matching assistance program that provides grants which pay half the acquisition and development cost of outdoor recreation sites and facilities. Section 6 (f) of the Act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of Interior's National Park Service. The boat launch property was acquired by the City of Paducah (the City) in September of 1991. The marina/transient dock property was acquired by the City in October of 1985. Since neither property will be converted to a "non-recreational purpose", Section 6 (f) regulations do not apply to these proposed projects.

Furthermore, a literature search was conducted of the Land and Water Conservation Fund listings for McCracken County, Kentucky compiled by the National Park Service. Neither Schultz Park nor the proposed boat launch properties is listed; therefore, Section 6(f) is not applicable.

COMMUNICATING ALL PROMISES (CAP)

Environmental Commitments

The proposed boat launch and marina/transient dock facilities will require commitments to minimize any potential impacts that may occur to the human and natural environments. The following is a list of the environmental commitments required for the construction of the two projects:

1. According to the U.S. Fish & Wildlife Service (USFWS), an endangered *Myotis sodalis* (Indiana bat) record has been documented within five miles of the proposed boat launch project site. Based on this information, the Service believes that (1) forested areas in the vicinity of or on the project area may provide potentially suitable summer roosting and foraging habitat, and (2) caves, rock shelters, and abandoned underground mines in the vicinity of or on the project area may provide potentially suitable winter hibernation habitat for the endangered species. The removal of trees onsite will be coordinated with the USFWS through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction. Redwing Ecological Services, Inc. indicated that there are no caves, rock shelters, or abandoned underground mines that could provide suitable winter hibernation habitat.
2. According to the U.S. Fish & Wildlife Service (USFWS), the proposed boat launch and marina/transient dock projects are in close proximity to several federally protected mussel records known to occur within the Ohio River. A Biological Assessment (BA) was completed for the boat launch and new marina/transient dock project site by Redwing on January 3, 2012. FHWA submitted their request for formal consultation to USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch and new marina/transient dock project areas. Reasonable and prudent measures; terms & conditions; implementation and monitoring; and/or discretionary conservation measures have been attached to the Biological Opinion (BO) forwarded to FHWA on June 6, 2012.
3. According to the Kentucky State Nature Preserves Commission (KSNPC), *Myotis austroriparius* (Southeastern myotis, federal species of management concern, KSNPC endangered) and *Myotis sodalis* (Indiana myotis, federally listed endangered, KSNPC endangered) are known to occur in the bottomland hardwood forest adjacent to the boat launch project area and near the marina/transient dock site. In order to avoid impacts to potentially suitable summer roosting and foraging habitat of these species, the removal of trees onsite will be coordinated with the USFWS through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction.
4. According to the Kentucky State Nature Preserves Commission (KSNPC), many of the fishes and mussels listed are believed to be extirpated or are known only from historic records; however, some are still extant in the area. These species are sensitive to increased turbidity, sediment, and other adverse influences on water quality. KSNPC data are not sufficient to guarantee absence of endangered, threatened or sensitive species from the sites of proposed construction disturbance. Mussel surveys were conducted by Redwing Ecological Services, Inc., (Redwing) with the assistance of Copperhead Environmental Consulting, Inc. and Gannett Fleming Engineers & Architects, P.C., for both the boat launch and marina/transient dock facility areas in

August 2008, and in conjunction with Ecological Specialists, Inc. in October 2010 and October 2011. A new Biological Assessment (BA) was completed by Redwing on January 3, 2012. FHWA requested formal consultation with USFWS on January 19, 2012 for a Biological Opinion (BO) on impacts to ten freshwater mussel species in the boat launch and new marina/transient dock project areas. Reasonable and prudent measures; terms & conditions; implementation and monitoring; and/or discretionary conservation measures have been attached to the Biological Opinion (BO) forwarded to FHWA on June 6, 2012.

5. According to the Kentucky State Nature Preserves Commission (KSNPC), *Tyto alba* (Barn owl, KSNPC special concern) can be found in hollow trees, old buildings, barns, silos, and other abandoned structures. If Barn owl habitat will be disturbed, the KSNPC will be consulted prior to commencement.
6. The proposed boat launch project will result in impacts to 9.7 acres of jurisdictional wetlands, including 0.5 acres of the Ohio River, 8.3 acres of farmed wetland, 0.7 acres of wooded wetland, and 0.2 acres of open field wetland. Mitigation for these impacts will include: (1) preservation of approximately 34.4 acres of existing forested wetlands, (2) preservation of approximately 3.4 acres of upland forest, (3) restoration of approximately 7.3 acres of forested wetlands, and (4) restoration of approximately 765 linear feet of riparian buffer along the Ohio River.
7. Redwing Ecological Services, Inc. (Redwing) applied for and received the following permits for the proposed boat launch: Section 401 Water Quality Certification #2008-0029-1 (Kentucky Department for Environmental Protection, Division of Water), Stream Construction Permit #16689 (Kentucky Department for Environmental Protection, Division of Water), and Section 404 Permit #LRL-2007-811-GJD (U.S. Corps of Engineers). Redwing has submitted applications to the U.S. Army Corps of Engineers and the Kentucky Department for Environmental Protection, Division of Water, for a Section 401 Water Quality Certification, Section 10 Navigable Waters Permit, and a Section 404 Permit for the proposed marina/transient dock. Individual Section 402 (KPDES Stormwater) Permits will also be obtained for both projects. A Stream Construction Permit (Floodplain Permit) has been acquired by the City of Paducah on May 1, 2012 for the marina/transient dock. It is anticipated that no mitigation will be required for water resource impacts due to the limited nature of the impacts in relation to the overall Ohio River system. As a condition of the Stream Construction Permit acquired from the Kentucky Division of Water, an Engineering "No Impact" Certification which certifies that the marina/transient dock will not impact the 100-year flood elevations, floodway elevations, and floodway widths on the Ohio River is required. Any required permits will be obtained before construction commences.
8. To minimize possible noise impacts, construction activities, to the extent possible, will be confined to normal working hours, and noise controlled equipment will be utilized.
9. To minimize possible impacts to water quality, the contractor/contractors will be required to implement erosion prevention and sediment control best management practices, reflecting policies contained in 40 CFR Part 122 and promulgated by the Kentucky Department of Environmental Protection, Division of Water.

10. The projects will be constructed utilizing reasonable precautions to prevent particulate matter from becoming airborne as directed under Kentucky Division for Air Quality Regulation *401 KAR 63:010 Fugitive Emissions*. Such reasonable precautions will include but not be limited to (1) use, where possible, of water or chemicals for control of dust during demolition and/or construction operations, (2) the covering of open bodied trucks operating outside the work area transporting materials likely to become airborne, and (3) the prompt removal of earth or other material from a paved street which earth or other material has been transported by trucking or earth moving equipment or erosion by water.
11. The projects will be constructed without open burning as directed under Kentucky Division for Air Quality Regulation *401 KAR 63:005 Open Burning*, except for the purposes listed in Section 4, Allowable Open Burning and Section 5, Restrictions to Open Burning, of the regulation.
12. There are no relocations or displacements of residences or businesses expected as a result of the proposed boat launch and marina/transient dock projects. No neighborhood or community impacts are expected that would sever groups or access to and from communities. The projects are not expected to cause advantages/disadvantages to one or more communities over other communities. Since the boat launch and marina/transient dock will be city/county-owned, the facilities will be available to all. No commitments are made toward socioeconomic issues.
13. The boat launch and marina/transient dock facilities will not have a negative impact on future farming (agricultural) opportunities in McCracken County; therefore, no commitments are made regarding preservation of farmlands.
14. The marina/transient dock will have three individual sets of four pipe piles that will support the "floating" gangway deck system. The top of the pipe piles will be at an approximate elevation of 351 feet above MSL and positioned 390, 470, and 560 linear feet on the river side of the floodwall. The elevation at the top of the floodwall in this area is approximately 349 feet above MSL; therefore, the tops of the pipe piles will be above the floodwall. Vertical axis wind turbines will be placed at the top of each of the twelve pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. According to literature, the turbines are relatively "soundless" (53 dB @ 10-12 feet) and have non-reflecting surfaces to eliminate shadow strobing effects. The Kentucky Transportation Cabinet-Division of Environmental Analysis (KYTC) submitted a visual impact analysis to the Kentucky Heritage Council on March 19, 2012. The Kentucky Heritage Council concluded on April 19, 2012 that no historic properties will be affected by the wind turbines if it is also verified that noise levels are not significantly impacted. KYTC submitted noise impact documentation to the Kentucky Heritage Cabinet on May 10, 2012. The Kentucky Heritage Council concluded on May 11, 2012 that the cumulative effect of the wind turbines will not pose an adverse effect to historic resources.

Environmental Statement

Environmental commitments have been made that will eliminate significant environmental impacts associated with the proposed boat launch and marina/transient dock projects. Therefore, if the environmental commitments detailed above are complied with, the 6th Street & Burnett Street Boat Launch and the Marina/Transient Dock will not significantly affect any social, ecological, or cultural resources as defined under the National Environmental Policy Act (NEPA) of 1969.

CONCLUDING STATEMENT

The projects are needed to provide improvements to the Paducah riverfront through the following objectives:

- Relocation of the existing boat ramp facility located at the northeastern end of Broadway Street while at the same time allowing for the northeastern end of Broadway Street to be converted back to its original use as a riverboat landing and community focal point along the Ohio River
- Reduction of congestion and vehicle parking associated with recreational fishing activities such as launching and the parking of fishing boats
- Providing accommodations for transient boaters and local recreational boat owners near downtown Paducah
- Providing loading/unloading facilities for transient boats and to provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown Paducah
- Providing opportunities for boaters to refuel, dine, purchase supplies, etc. near downtown Paducah.

The Kentucky Transportation Cabinet (KYTC) and the Federal Highway Administration (FHWA) have determined that there has been proper consideration of avoidance alternatives to environmentally-sensitive areas. Where avoidance is not practical, proper mitigation has been provided for impacts resulting from the Selected Alternatives.

APPENDIX A



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

July 3, 2012

Mr. Rick Murphy
City Engineer
City of Paducah
300 South 5th Street
Paducah, Kentucky 42002

Re: FWS 2007-B-1117; Indiana Bat Conservation MOA for the City of Paducah in association with the proposed Paducah Riverfront Boat Launch in McCracken County, Kentucky

Dear Mr. Murphy:

Please find the attached Indiana Bat Conservation Memorandum of Agreement (MOA) between the U.S. Fish & Wildlife Service (Service) and the City of Paducah accounting for adverse effects to the Indiana bat in association with the subject project. Please review for any questions or changes. If you do not have any, please have the responsible party sign, date, and return to our office via fax, email, or mail.

Execution of the attached MOA and the Indiana Bat Conservation Fund (IBCF) contribution that it requires will allow the City of Paducah to be in compliance with the Endangered Species Act relative to the Indiana bat. If necessary to fulfill requirements of the U.S. Army Corps of Engineers and/or other federal nexus agencies obligations per section 7 of the ESA, please provide them with a copy of this letter, fully executed Conservation MOA, and proof of payment for their records.

In order to complete payment per the Conservation MOA (Section 6.4 of the MOA) please:

- 1) Make check or money order payable to **Kentucky Natural Lands Trust**,
- 2) Reference **City of Paducah, FWS 2007-B-1117- IBCF** in the memo line,
- 3) Remit payment to:
Kentucky Natural Lands Trust
c/o Hugh Archer, Executive Director
433 Chestnut Street
Berea, Kentucky 40403
- 4) Provide proof of payment (copy of the check or receipt) to our office via fax, email, or mail.

If you have any questions regarding the information that we have provided, please contact Phil DeGarmo of my office at (502) 695-0468 extension 110.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

Attachment

**INDIANA BAT CONSERVATION
MEMORANDUM OF AGREEMENT
BETWEEN THE
U.S. FISH AND WILDLIFE SERVICE
AND
CITY OF PADUCAH**

This Memorandum of Agreement (MOA) is entered into by the United States Department of the Interior, U.S. Fish and Wildlife Service (Service) and the City of Paducah to promote the survival and recovery of the Indiana bat (*Myotis sodalis*), a federally listed endangered species. Together, the Service and the City of Paducah are referred to as "Cooperators."

Section 1: PURPOSE AND OBJECTIVES

The Indiana bat is a federally listed endangered species native to a large portion of the eastern United States and the Commonwealth of Kentucky. This MOA will implement recovery-focused conservation measures that will be undertaken by the Cooperators and afford a measurable conservation benefit for the Indiana bat as set forth in the Service's Indiana Bat Mitigation Guidance as modified January 3, 2011 and hereby incorporated by reference. These measures will be implemented in association with the proposed project as detailed in section 4 of this MOA. All measures will be implemented according to the terms of this MOA. The Cooperators understand and intend that the benefits resulting from this MOA may also provide conservation benefits for other federal protected species and native fish and wildlife.

Section 2: AUTHORITY

This MOA is hereby entered into under the authorities of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) (ESA), Fish and Wildlife Act of 1956 (16 U.S.C. 742a. *et seq.*), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*). Section 5 of the ESA provides that, "The Secretary...shall establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species..." and "shall utilize land acquisition and other authority under the Fish and Wildlife Act, as amended, and the Migratory Bird Conservation Act, as appropriate". Section 7(a) (1) of the ESA further directs Federal agencies to "utilize their authorities in furtherance of the purposes of this Act [ESA] by carrying out programs for the conservation of endangered species and threatened species." The Fish and Wildlife Act of 1956 provides that the Secretary shall "...take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources...." Finally, the Fish and Wildlife Coordination Act states that the Secretary is authorized "to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat..."

The authorization for any incidental take of the Indiana bat, as defined in section 9 of the ESA, and resulting from impacts that may be associated with the qualified project(s), as defined in section 4 of this MOA, is provided through the Service's incidental take statement and January 3, 2011 intra-Service biological opinion, which is incorporated herein by this reference. This biological opinion covers the Service's development of conservation agreements for the Indiana bat, which includes this MOA, that are based on implementation of the Indiana Bat Mitigation Guidance and provides incidental take of Indiana bats in the form of up to 2,500 acres of forested Indiana bat habitat per year through 2016.

Section 3: STATEMENT OF MUTUAL INTEREST

The mission of the Service is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The Service's major responsibilities are for endangered species, threatened species, migratory birds, marine mammals, and freshwater and anadromous fish. The Service recognizes the ability and interest of City of Paducah to contribute to the conservation and recovery of the Indiana bat, and recognizes City of Paducah as a partner in the recovery and habitat conservation of the species. City of Paducah recognizes the Service's mission and its interest in developing partnerships to protect, restore, and manage important habitats on private and public lands for federal listed species. The Cooperators understand the collaboration for this MOA is voluntary.

Section 4: PROJECT DESCRIPTION

As part of the comprehensive Paducah Riverfront Redevelopment Plan, the project proponent proposed to construct a public boat launch facility providing access to the Ohio River. The project site is located on the north side of Paducah, McCracken County, Kentucky. The following information was derived and calculated from the project proponent's agent, Redwing Ecological Services, Inc, June 28, 2012 correspondence and attachments.

The proposed project would result in the direct loss of 0.99 acres of forested habitat from one (1) Indiana bat habitat type as depicted in Table 1 below.

Table 1

Habitat Type	Forested Acreage Removed
Known Maternity Summer Habitat	0.99 acres

These Indiana bat habitat impacts are the impacts that are covered by this agreement and that were analyzed by the Service to assess the direct, indirect, and cumulative effects of the proposed project on Indiana bats.

Section 5: EFFECTIVE DATE AND TERMS OF AGREEMENT

This MOA is valid for the City of Paducah's consideration for 90 days from the date of the Service's signature below, shall be deemed effective on the last date signed below, and shall remain in effect until all terms of the agreement have been fulfilled, except as modified in Section 8 hereof.

The City of Paducah has determined that removal of all Indiana bat habitat will likely occur during the timeframe when maternal Indiana bats are anticipated to be present (i.e., occupied), which is between the dates of April 1 – August 15. However, the City of Paducah may also choose to conduct tree clearing during the timeframe when maternal Indiana bats are not anticipated to be present (i.e.; unoccupied), which is between the dates of August 16 – March 31. As a project specific minimization measure, tree clearing within the maternity home range portion of the project would not take place between the dates of June 1 - July 31. This specific minimization measure addresses a specific adverse effect described in the Indiana Bat Mitigation Guidance and is intended to further minimize the effect of take on maternal bats and their young. The Indiana Bat Conservation Fund contribution amount that is identified in section 6.4 of the MOA is based on the assumption that all tree removal associated with the project will be conducted during the occupied timeframe. If additional forested areas not considered in Section 4 of this agreement are to be removed, then City of Paducah must coordinate with the Service to determine if additional modification of this agreement is necessary, and, if found necessary, City of Paducah will seek such modification.

Section 6: SPECIFIC OBLIGATIONS OF THE COOPERATORS

The City of Paducah and the Service agree to fulfill the following conditions to minimize the potential level of take of the Indiana bat, compensate for adverse effects on the Indiana bat that may result from construction of the project, and promote future conservation and recovery of the Indiana bat:

6.1 The Service will take the necessary steps to ensure that the project covered under this MOA meets federal requirements for compliance with the National Environmental Policy Act (NEPA) and ESA. If the City of Paducah has NEPA requirements beyond the scope of this MOA, the City of Paducah or other Federal action agency are responsible for those additional requirements.

With regard to the ESA, the Biological Opinion authorizes incidental take of Indiana bats associated with forested habitat removal. As such, paragraphs 6.3 and 6.4 of the MOA are incorporated to ensure compliance with the Reasonable and Prudent Measures and Terms and Conditions of the biological opinion. The City of Paducah acknowledges that any divergence from these measures and conditions may result in a violation of Section 9 of the ESA.

6.2 The City of Paducah will take the necessary steps to ensure that the project covered under this MOA meets federal requirements for compliance with the National Historic Preservation Act (NHPA).

6.3 The project proposed by the City of Paducah, as described in Section 4, will result in the incidental take of Indiana bats in the form of habitat loss totaling not more than 0.99 acres of known maternity summer habitat. The City of Paducah may remove this habitat during the occupied and/or unoccupied timeframes as stated in Section 5. Forested habitat associated with the proposed project, but not considered in this MOA, shall not be removed without further coordination with the Service.

6.4 The City of Paducah shall contribute \$5,742.00 to the Indiana Bat Conservation Fund (IBCF) administered by the Kentucky Natural Lands Trust (KNLT). This contribution is based on 0.99 acres of known maternity summer habitat using the process identified in the Indiana Bat Mitigation Guidance. Funds shall be provided to KNLT within thirty (30) days of the last signature to this MOA. The City of Paducah shall provide the Service with a copy of the check or transaction receipt within seven (7) business days of payment that shows the date and amount of the deposit.

In summary, this MOA provides recovery based conservation benefits for the Indiana bat in form of contributions to the IBCF which, in turn, will fund Indiana bat habitat protection, conservation, restoration and/or priority monitoring and research projects for the Indiana bat.

Section 7: COOPERATION

Both the Service and City of Paducah acknowledge that it is their desire to facilitate the processes set forth in this MOA by open communication and cooperation. Both parties agree to exercise their rights and obligations under this MOA in good faith. If at any time the City of Paducah has questions regarding this MOA or the Guidance, the Service agrees to make itself available for consultation in a timely fashion.

Section 8: MODIFICATION OR TERMINATION

Modifications to this MOA may be proposed by either party in writing and will become effective upon being reduced to a written instrument and being signed by duly authorized representatives of the Cooperators.

The City of Paducah or the Service may terminate this MOA at any time within or prior to thirty (30) days of the last signature to this MOA upon written notification from the other signatory party. Failure to fulfill the provisions, as specified, within paragraph 6.4 will result in automatic termination of this MOA.

Section 9: OTHER PROVISIONS

9.1 The Cooperators hereto agree that they shall be liable for the negligent or wrongful acts or omissions of their employees, agents, and assigns only to the extent liable under applicable law. Nothing in this MOA shall be interpreted or construed as constituting a waiver by any party of sovereign immunity or statutory limitation on liability.

9.2 Each provision of this MOA shall be interpreted in such a manner as to be effective and valid under applicable law, but if any provision of the MOA shall be prohibited or invalid under application law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this MOA.

9.3 No provision of this MOA shall be interpreted as or constitute a commitment or requirement that either party take actions in contravention of applicable laws, either substantive or procedural.

9.4 Nothing in the MOA shall be interpreted as or constitute a commitment or requirement that the Service obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. §1341, or any other law or regulation.

9.5 Third Parties Not to Benefit: This MOA does not grant rights or benefits of any nature to any party not named or identified in this MOA.

9.6 Merger: This MOA contains the sole and entire MOA of the parties. No oral representations of any nature form the basis of or may amend this MOA. This MOA may be extended, renewed, or amended only when agreed to in writing by the parties.

9.7 Waiver: Failure to enforce any provision of this agreement by either party shall not constitute waiver of that provision, nor a waiver of a claim for subsequent breach of the same type, nor a waiver of any other term of this agreement. The waiver of any provision must be express and evidenced in writing.

9.8 Assignment: No part of this agreement shall be assigned to any other party.

Section 10: NOTICES AND AUTHORIZED REPRESENTATIVES

Notices shall be made in writing to the persons at the addresses listed below and may be given by personal delivery, mail or by telecopy (FAX) to the duly authorized representatives listed below. If there are changes in a party's representative, each party shall notify the other party, in writing, within thirty (30) days of the change in their representative.

U.S. Fish and Wildlife Service
Virgil Lee Andrews, Jr.
Field Office Supervisor
330 West Broadway, Room 265
Frankfort, Kentucky 40601
502/695-0468 (telephone)
502/695-1024 (fax)

City of Paducah
Mr. Rick Murphy
City Engineer
300 South 5th Street
Paducah, Kentucky 42002

Each party hereby indicates its acceptance of the terms of the MOA as outlined herein by its signature below. The parties hereto have executed this MOA as of the last written date below:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

CITY OF PADUCAH

BY:  _____

BY: _____

TITLE: ^{for} Field Supervisor _____

TITLE: _____

DATE: 3 July 2012 _____

DATE: _____



FILE COPY

1139 South Fourth Street • Louisville, KY 40203 • Phone 502.625.3009 • Fax 502.625.3077

May 17, 2012

Mr. Phil DeGarmo
U.S. Fish and Wildlife Service
JC Watts Federal Building – Room 265
330 West Broadway
Frankfort, KY 40601

**Subject: Effects Analysis and Request for Indiana Bat Conservation MOA
Paducah Riverfront Boat Launch
McCracken County, Kentucky
Redwing Project 06-090 - 01
USACE ID No. LRL-2007-811-gjd
FWS Project # 2007-B-1117 (Initial Consultation)
FWS Project # 2010-B-0327 (Mussel BO)**

Dear Mr. DeGarmo:

On behalf of the City of Paducah (City), and in conjunction with Florence & Hutcheson, Inc. (F&H), Redwing Ecological Services, Inc. (Redwing) is pleased to submit this Effects Analysis and Request for Indiana Bat Conservation Memorandum of Agreement (MOA) to the U.S. Fish and Wildlife Service (USFWS) for the proposed Paducah Riverfront Boat Launch project. The format of this submittal follows the USFWS document *Revised Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky* (effective January 3, 2011).

The purpose of the MOA is to provide for the clearing of Indiana bat (*Myotis sodalis*) habitat designated as "maternity/sensitive" at any time during the year, without a presence/absence survey. This submittal provides background for the proposed project, presents an effects analysis of federally-listed species which may potentially be affected by the project, and outlines proposed tree clearing and related fee payment for incorporation into the MOA.

PROJECT BACKGROUND

As part of the comprehensive Paducah Riverfront Redevelopment Plan, the City proposes the construction of a public boat launch facility to provide needed boat access to the Ohio River in the vicinity of Paducah. The site is located on the north side of Paducah, McCracken County, Kentucky, immediately north of North 6th Street/Burnett Street Intersection and approximately one mile southeast of the Irvin S. Cobb Bridge (Figures 1 and 2).

Based on maps provided by the USFWS, the entire project site is located within a "maternity/sensitive" habitat zone for the Indiana bat (Figure 3). No winter habitat (caves or underground mines) for this species was found within the project area. Summer habitat is present on the site, a small portion of which is proposed for clearing in the next two years.

Coordination history for this project includes:

12/12/07 – USFWS letter to U.S. Army Corp of Engineers (USACE) responding to public notice for the boat launch 404 permit. Based on information available at the time, the USFWS agreed with a “not likely to adversely affect” determination for the Indiana bat, given the proposed seasonal clearing of summer habitat. The USFWS also agreed to a “not likely to adversely affect” determination for mussel species, with the condition that the City/Redwing consult with them regarding final project design.

11/3/09 – Biological Assessment (BA) submitted by Redwing to USFWS regarding endangered fat pocketbook (*Potamilus capax*) mussels identified at the Boat Launch and Transient Dock portions of the riverfront development project.

7/6/10 – Biological Opinion (BO) issued by USFWS, allowing the take of endangered mussels at the transient dock site. However, the analysis concluded that: “In the Burnett Street Boat Ramp portion of the action area, we do not believe fat pocketbooks will be affected by the proposed action”. Similar statements were made for pink mucket (*Lampsilis abrupta*) and orangefoot pimpleback (*Plethobasus cooperianus*). Note: The BO was formally reissued on December 21, 2010 to clarify the interrelated federal actions. The affect determination was not changed.

1/3/12 – BA prepared by Redwing, which was formally submitted to the USFWS by the Federal Highway Administration for formal consultation on January 20, 2012. This BA addressed design changes for the downtown Transient Dock to reduce impacts to the fat pocketbook. There were no changes regarding threatened/endangered species impacts for the Boat Launch site from the original BA and BO.

EFFECTS ANALYSIS

An analysis of effects that the project will have upon federally threatened/endangered species listed under Section 7 of the Endangered Species Act is discussed below. The following table summarizes the status of all federally threatened/endangered species in the USFWS database for McCracken County.

Species	Common Name	Status	Habitat Present?	Species Present?
Mammals				
<i>Myotis sodalis</i>	Indiana Bat	E	Yes	Known
Mussels				
<i>Cumberlandia monodonta</i>	Spectaclecase	E	Yes	No *
<i>Cyprogenia stegaria</i>	Fanshell	E	Yes	No *
<i>Lampsilis abrupta</i>	Pink Mucket	E	Yes	Potential **
<i>Obovaria retusa</i>	Ring Pink	E	Yes	No *
<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback	E	Yes	Potential **
<i>Plethobasus cyphus</i>	Sheepnose	E	Yes	No*
<i>Pleurobema clava</i>	Clubshell	E	Yes	No *
<i>Pleurobema plenum</i>	Rough Pigtoe	E	Yes	No *
<i>Potamilus capax</i>	Fat Pocketbook	E	Yes	Yes *
Birds				
<i>Sterna antillarum</i>	Interior Least Tern	E	No	Unknown

E = Federally Endangered Species

* = per August 2008 mussel survey; ** = per USFWS

The species listed in the preceding table are discussed in detail below.

Indiana Bat: This federally-endangered species requires distinct habitat types during the summer and winter months. Summer foraging habitat includes areas of woodlands and edge habitat along fields often in close proximity to bodies of water. Summer roosting habitat includes live or dead trees with exfoliating bark, cracks, crevices, or cavities located either on upland slopes, bottomlands, or along streams. Current USFWS maps indicate that this project site is located within a known "maternity/sensitive" habitat zone (Figure 3). Winter hibernacula habitat consists of limestone caves with pools, rock shelters, and abandoned mine portals. As no caves, rock shelters, or mine portals are present, no Indiana bat winter habitat is present on site. Potential summer foraging and roosting habitat for the Indiana bat is present in the wooded areas of the site which are depicted in Figure 2 and include: one large mixed-age forested block over the southern two-thirds of the site and extending into the northwest corner; a narrow riparian corridor of young [6 to 18-inch diameter-breast-height (dbh)] cottonwood (*Populus deltoides*) and red maple (*Acer rubrum*) along the bank of the Ohio River; and one lone cottonwood at the eastern end of the existing farm field. The lone cottonwood is a potential prime maternity roost tree. It is approximately four feet dbh; contains two large dead limbs with abundant cracks, crevices and exfoliating bark; and is located with an open exposure.

Effects and Minimization: The City is requesting to enter into an MOA with the USFWS to allow tree clearing in 0.44 acre of potential Indiana bat summer habitat, as depicted on the Tree Clearing Plan (attached in Appendix) at any time during the year. Only approximately 1% of total on-site summer habitat is proposed for clearing and approximately 99% of the existing habitat will remain, with the majority of it being permanently protected. No prime maternity roosts will be cleared between June 1 and July 31.

Mussels: A mussel survey in August of 2008 identified six fat pocketbook mussels well outside the construction area, but in the vicinity, of the proposed boat launch facility. The USFWS also concluded that pink mucket and orangefoot pimpleback mussels are potentially present although they were not found during the survey. The survey was reported in a November 3, 2009 BA submitted by Redwing on behalf of the City. The ensuing formal consultation process resulted in the issuance of a BO by the USFWS on July 6, 2010, which was re-issued on December 21, 2010. A second BA was submitted to the USFWS on January 20, 2012 to address design changes to significantly reduce impacts to fat pocketbook at the downtown Transient Dock site. This second BA provided no change in information regarding this Boat Launch site.

Effects of Minimization: The BO concluded that the Burnett Street Boat Ramp would not affect fat pocketbook, pink mucket, or orangefoot pimpleback mussels. In addition, an erosion and sediment control plan will be implemented to help ensure that sediment is not transferred off the site during construction or operation of the facility. The BO did allow the take of the species at the Transient Dock portion of the project area and included associated conservation measures. Based on coordination with the USFWS, it is anticipated that the conclusions in the forthcoming 2012 BO will be consistent with those in the original BO regarding the Boat Launch site.

Interior Least Tern: The preferred summer habitat for this bird is sandbars within large river systems that are free of vegetation. The Interior Least Tern spends winter along the Gulf Coast. No such habitat exists on the project site.

Effects and Minimization: No preferred habitat for this species occurs on site; thus, it is not likely that this project will adversely affect this federally-endangered species or its critical habitat.

PROPOSED TREE CLEARING

Proposed tree clearing activities may occur at any time of the year and will not exceed 0.44 acre of Indiana bat habitat. The required MOA fee is **\$2,552** as outlined in the table below. The fee is based on a land cost of \$2,900 per acre at a 2.0 multiplier to cover clearing at any time of year, including the most restrictive period for known maternity habitat between April 1 and August 15. The one prime maternity roost tree will not be cleared between June 1 and July 31.

Habitat Zone	Impacts	Unit Cost	Multiplier	Cost
Maternity/ Sensitive	0.44 acre	\$2,900/acre	2.0	\$2,552

CONCLUSION

The City proposes the contribution of \$2,552 to the Indiana Bat Conservation Fund (IBCF), in order to allow tree clearing activities at any time of the year. The one prime maternity roost will not be cleared between June 1 and July 31. Payment will be made within 30 days following MOA execution and prior to any clearing of potential habitat trees.

The City of Paducah contact information is as follows:

Mr. Rick Murphy, City Engineer
City of Paducah
300 South 5th Street
Paducah, KY 42002

We appreciate the opportunity to work with you on this project and look forward to completing an MOA acceptable to both parties in the near future. If you have any questions regarding this letter or the overall project, please feel free to contact Brian O'Neill or Ron Thomas of Redwing at (502) 625-3009 or Jason Petersen of Florence & Hutcheson at (270) 444-9691.

Sincerely,



Brian J. O'Neill
Project Aquatic Biologist



Ronald L. Thomas
Principal
Senior Ecologist

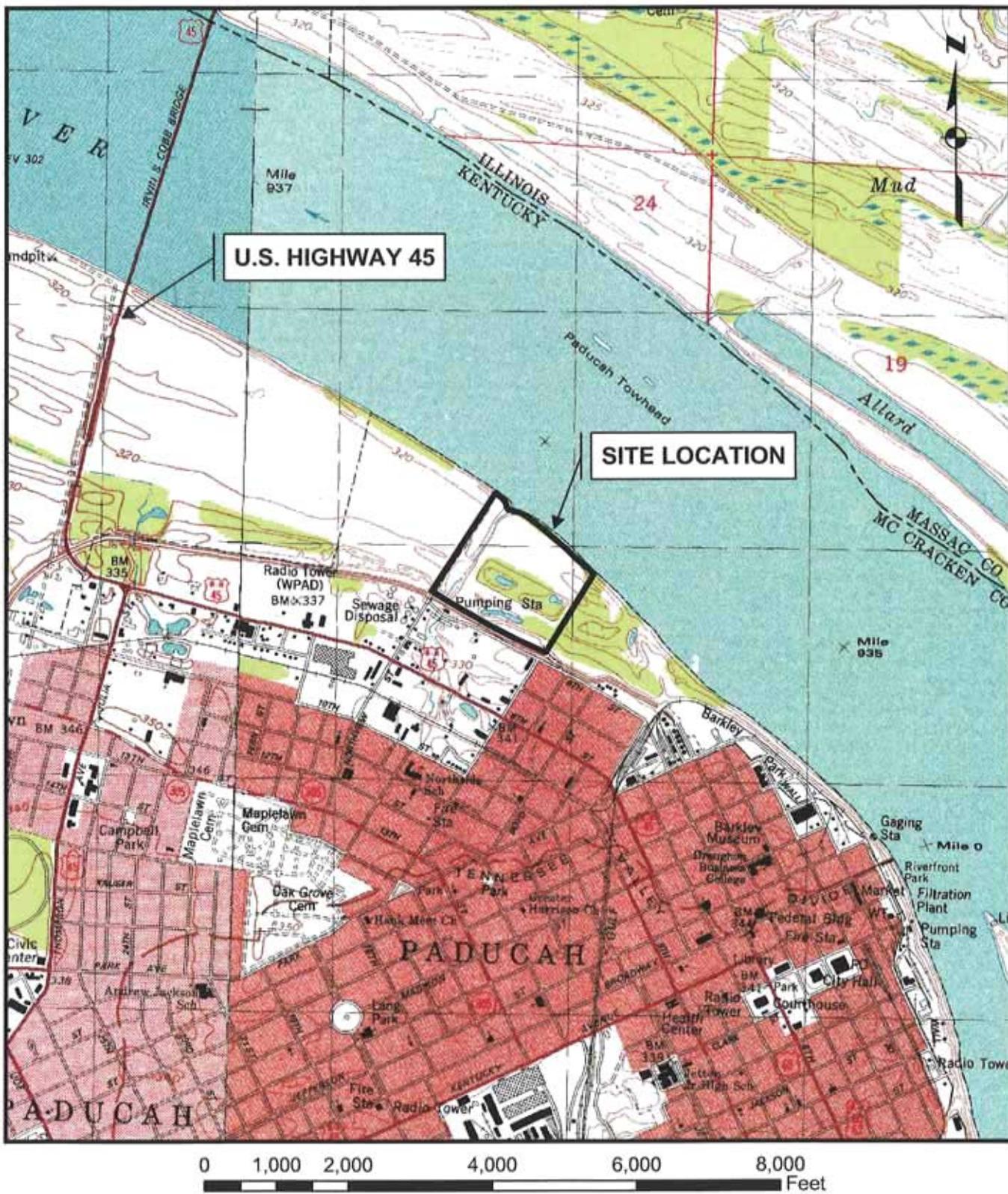
File: 06-090/Reports/Boat Launch Docx/BatHabitat-MOA/Conservation MOA - PaducahBoatLaunch

cc: Mr. Rick Murphy – City of Paducah
Mr. Jason Petersen – Florence & Hutcheson, Inc.

Attachments: Figures
Photographs
Appendix – Tree Clearing Plan

FIGURES

Source: USGS 7.5-minute Topographic Quadrangle; McCracken County, Kentucky



PADUCAH RIVERFRONT BOAT LAUNCH
McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090/Figures/Boat Launch/Site Location
REDWING PROJECT 06-090
REVISION DATE 12/17/10 DRAWN BY LMB



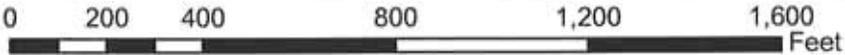
SITE LOCATION MAP

FIGURE 1



Legend

- Site Location
- Potential Indiana Bat Summer Habitat
- Potential Indiana Bat Prime Maternity Roost Tree



PADUCAH RIVERFRONT BOAT LAUNCH
McCRACKEN COUNTY, KENTUCKY

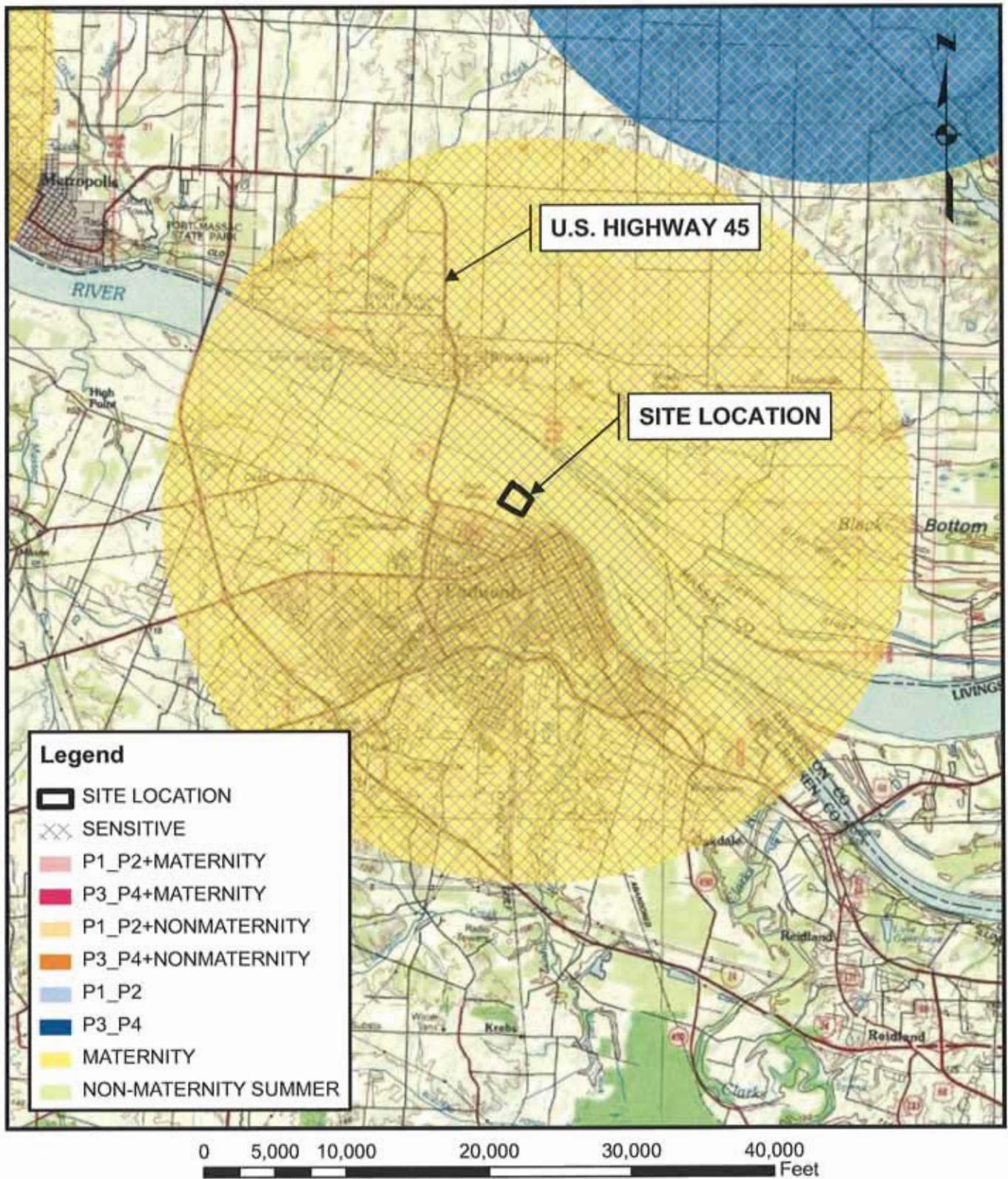
FILE: Redwing/06-090/Figures/Boat Launch/HabitatMap
REDWING PROJECT 06-090
REVISION DATE 05.04.12 DRAWN BY LMB\EDB



HABITAT MAP

FIGURE 2

Source: USGS 7.5-minute Topographic Quadrangle; McCracken County, Kentucky



PADUCAH RIVERFRONT BOAT LAUNCH
McCRACKEN COUNTY, KENTUCKY



INDIANA BAT
OCCURRENCE MAP

FILE: Redwing/06-090/06-090-01/Figures/Batcircles
REDWING PROJECT 06-090-01
REVISION DATE 02-20-12 DRAWN BY EDB

FIGURE 3

PHOTOGRAPHS



Photograph 1: Facing north along the proposed new access road, from the southeast property corner on the floodwall. A total of 0.17 acre of wooded habitat will be cleared to the left of the existing path along the very edge of the existing tree line. Paducah Riverfront Boat Launch. April 2, 2007.



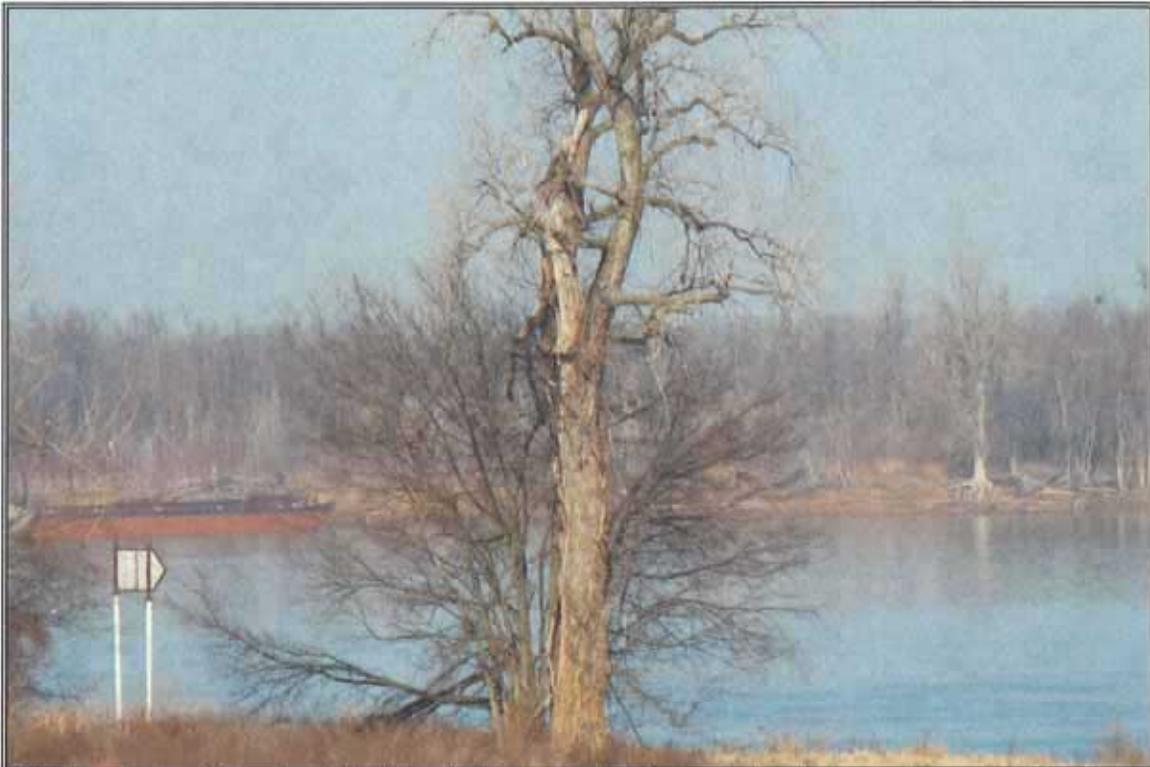
Photograph 2: Facing northeast from the eastern portion of farm field. The narrow tree line in the center and left of the photo is part of the 0.26 acre of trees to be cleared along the Ohio River to accommodate boat ramp construction. Paducah Riverfront Boat Launch. April 2, 2007.



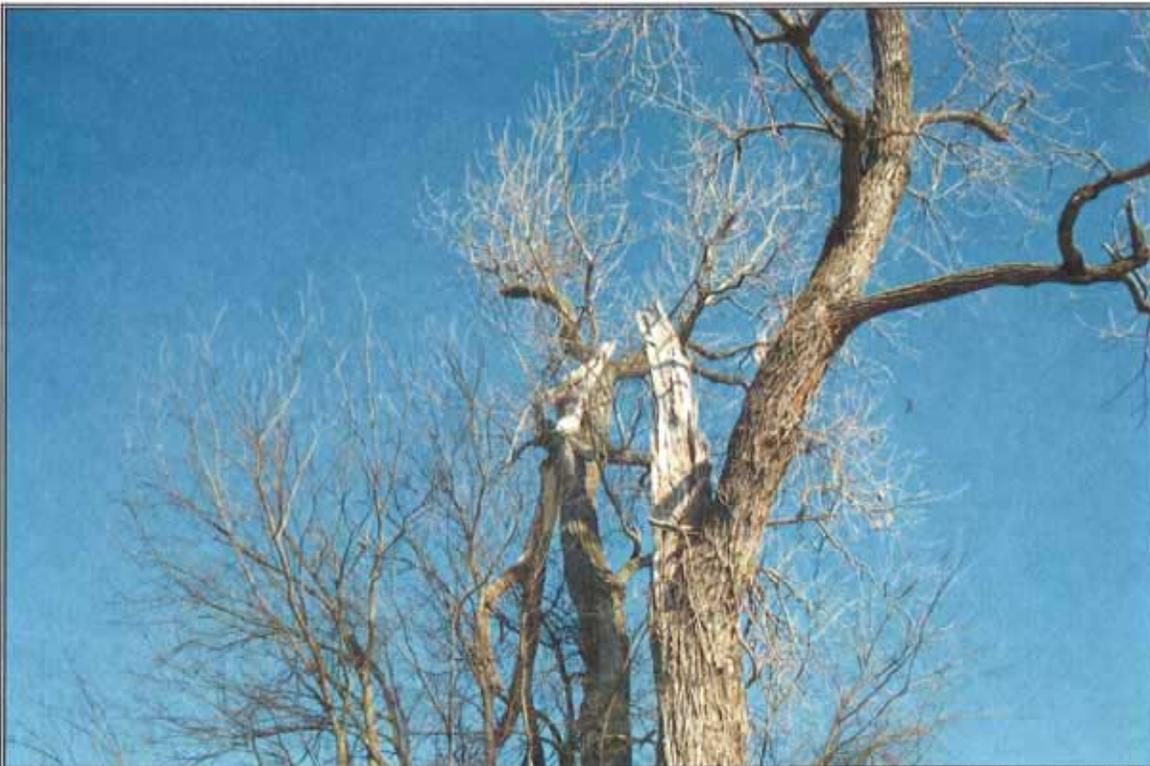
Photograph 3: Tree line along the Ohio River proposed for clearing, facing southeast from near boat ramp location. The narrow corridor is dominated by small (6 to 18-inch dbh) cottonwood and red maple trees. Paducah Riverfront Boat Launch. April 2, 2007.



Photograph 4: Wooded summer Indiana bat habitat in the central portion of the site. Common trees included red maple, silver maple, green ash, sugarberry, cottonwood, and honey locust. Only a small portion (0.17 acre out of a total of approximately 37 acres) along the very eastern edge of this wooded area will be cleared for access road construction. The remainder will be permanently preserved. Paducah Riverfront Boat Launch. April 2, 2007.



Photograph 5: One potential Indiana bat prime maternity roost tree is present on site. The large cottonwood is located near the Ohio river at the eastern edge of an existing farm field . Paducah Riverfront Boat Launch. January 28, 2011.



Photograph 6: The large cottonwood which constitutes a potential Indiana bat prime maternity roost tree is approximately 4 feet dbh, has dead limbs with extensive cracking and exfoliating bark, and is located with an open exposure. Paducah Riverfront Boat Launch. January 28, 2011.

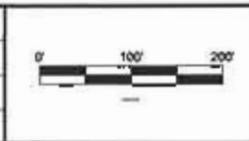
APPENDIX

Tree Clearing Plan 6th and Burnett Boat Launch



ISSUE	DATE	DESCRIPTION
0	12/20/10	ISSUE FOR INDIANA BAT MOA

FAH JOB NO.:	0603102
DESIGNED BY:	JEP
DRAWN BY:	JEP
CHECKED BY:	-



300 SOUTH FIFTH STREET
 P.O. BOX 2287
 PADUCAH, KY 42002

Florence & Hutcheson
 CONSULTING ENGINEERS

2550 IRVIN COBB DRIVE
 PADUCAH, KY 42003
 (270) 444-9601

PROJECT	6th & BURNETT BOAT LAUNCH
DRAWING	TREE CLEARING PLAN

DRAWING NO. **1**



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

December 8, 2011

Mr. Rick Murphy
City of Paducah
300 South 5th Street
Paducah, KY 42002

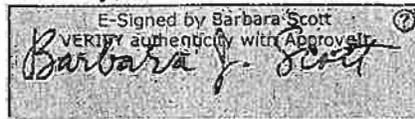
Re: Water Quality Certification #2008-0029-1-
Renewal (3)
Paducah Riverfront Redevelopment Project
Burnett Street Boat Ramp
USACE Public Notice No.: 2007-0811-GJD
AI No.: 96535, Activity ID: APE20090002
Ohio River and Adjacent Wetlands
McCracken County, Kentucky

Dear Mr. Murphy:

Pursuant to Section 401 of the Clean Water Act (CWA), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under 33 CFR part 330, and the attached conditions are met.

All future correspondence on this project must reference AI No. 96535. The attached document is your official Water Quality Certification; please read it carefully. If you should have any questions concerning the conditions of this water quality certification, please contact Mr. Alan Grant of my staff by calling (502) 564-3410.

Sincerely,



Barbara Scott, Supervisor
Water Quality Certification Section
Kentucky Division of Water

BS: AG

Attachment

cc: George DeLancey, USACE: Newburgh Regional Office
Matt Blake: Redwing Ecological Services, Inc. (agent), 1139 S 4th St., Louisville, KY 40203-3155
Jason Petersen: Florence & Hutcheson, Inc., 2550 Irvin Cobb Drive, Paducah, KY 42003
Lee Andrews, USFWS: Frankfort

Water Quality Certification
Paducah Riverfront Redevelopment Project
Facility Requirements
Permit Number: 2008-0029-1-R(3)
Activity ID No.: APE20090002

Page 1 of 2

ACTV0000000001 (Boat Dock) Burnett Street Boat Ramp -- 9.2 acres of wetland impact:

Submittal/Action Requirements:

- | Condition No. | Condition |
|---------------|--|
| S-1 | The City of Paducah shall submit a progress/monitoring report on the wetland restoration project: Due annually, by the 31st of December for a period of at least five years. The first monitoring report is due after the first full growing season of planted vegetation. The Kentucky Division of Water reserves the right to extend the monitoring period until such time as the stated success criteria have been obtained. Any deficiencies noted within the monitoring period shall be addressed in the annual monitoring report for that year and, after approval from the USACE and KDOW, corrective action shall be taken within the next year of monitoring. If the project is deemed unsuccessful after a monitoring period of eight years, the City of Paducah shall pay a fee-in-lieu of mitigation to the Kentucky Department for Fish and Wildlife Resources Stream Restoration Fund, the amount of which will be determined by the Corps of Engineers. [Clean Water Act] |
| S-2 | The City of Paducah shall submit written notification: Due prior to any construction activity. The draft Kentucky Division of Water conservation easement model with applicant's suggested changes shall be submitted to the Water Quality Certification Section before construction may begin. [Clean Water Act] |
| S-3 | The City of Paducah shall submit written notification: Due within 60 days. The conservation easement shall be recorded and a copy of the recorded easement submitted to the KDOW within 60 days of written approval by KDOW and USACE. [Clean Water Act] |

Narrative Requirements:

- | Condition No. | Condition |
|---------------|---|
| T-1 | The work approved by this certification shall be limited to: <ul style="list-style-type: none">- Impacts to 0.7 acre wooded wetland, 8.3 acres farmed wetlands, and 0.2 acre open field wetland resulting in total impacts of 9.2 acres of wetland.- The construction of a boat ramp resulting in impacts to 250 feet of Ohio River riparian area.- Mitigation shall consist of 7.3 acres wooded wetland restoration, 3.4 acres wooded wetland preservation, 3.4 acres upland forest preservation and 765 feet riparian buffer restoration. [Clean Water Act] |
| T-2 | All work performed under this certification shall adhere to the design and specifications set forth in the USACE Public Notice 2007-0811-GJD, the Joint Application for Section 404 Individual Permit, Section 10 Navigable Waters Permit and Section 401 Water Quality Certification dated May 30, 2007, and subsequent addendums to the 404/401 Permit Application dated February 25, 2008, and March 28, 2008. [Clean Water Act] |
| T-3 | The applicant is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sedimentation control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. [Clean Water Act] |

ACTV0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-4	The Division of Water reserves the right to modify or revoke this certification should it be determined that the activity is in noncompliance with any condition set forth in this certification. [Clean Water Act]
T-5	If construction does not commence within one year of the date of this letter, this certification will become void. A letter requesting a renewal should be submitted. [Clean Water Act]
T-6	Other permits may be required from the Division of Water for this project. If this project takes place within the floodplain, a permit may be required from the Water Resources Branch. The contact person is Barry Elmore. If this project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a KPDES stormwater permit shall be required from the KPDES Branch. The contact person is Allen Ingram. Both can be reached at 502/564-3410. [Clean Water Act]



STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

November 29, 2011

City of Paducah
300 S 5th St
Paducah, KY 42002

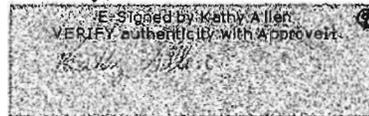
RE: Stream Construction Permit #16689 construction of a multi-lane boat launch facility, parking area, and access road in the left descending floodplain of Ohio River at about stream mile 45.6, with coordinates 37.098611, - 88.611667, in McCracken County. AI: 96535

Dear City of Paducah:

We have received your request for an extension of Stream Construction Permit #16689. Since there are no changes in the original plans or circumstances involved, we are extending the expiration date to November 29, 2012. Please note that all restrictions and requirements on the previous permit are still applicable.

If you have any questions, please call Ms. Kathy Allen at (502) 564-3410.

Sincerely,



By:

Jory Becker, P.E., Manager
Surface Water Permit Branch

JB/KA/kec

pc: Paducah Regional Office
Rick Murphy – Paducah
Jason Petersen, PE – Florence & Hutcheson



Fax To JJR
F!H
KY, Fish & Wildlife

ERNE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

TERESA J. HILL
SECRETARY

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.water.ky.gov

RECEIVED

SEP 13 2007

ENGINEERING
DEPARTMENT

STREAM CONSTRUCTION PERMIT

For Construction In Or Along A Stream

Issued to: **City of Paducah**
Address: **300 South 5th St**
Paducah, KY 42002

Permit expires on
September 7, 2008

Permit No. **16689**

In accordance with KRS 151.250 and KRS 151.260, the Environmental and Public Protection Cabinet approves the application dated May 31, 2007 for construction of a multi-lane boat launch facility, parking area, and access road in the left descending floodplain of Ohio River at about stream mile 45.6 (935.8 miles below Pittsburgh), with coordinates 37.098611, -88.611667, in McCracken County.

There shall be no deviation from the plans and specifications submitted and hereby approved unless the proposed change shall first have been submitted to and approved in writing by the Cabinet. This approval is subject to the attached limitations.

This permit is nontransferable and is not valid unless actual construction of this authorized work is begun prior to the expiration date noted above. Any violation of the Water Resources Act of 1966 as amended is subject to penalties as set forth in KRS 151.990.

If you have any questions regarding this permit, please call Mr. Jim Oerther at (502) 564-3410.

Issued September 7, 2007.

By:

Art Clay, P.E., Manager
Water Resources Branch

AC/JO/da

- pc: - Paducah Regional Office
- Rick Murphy - Paducah
- File

JJR

F!H

KY Fish & Wildlife

Stream Construction Permit
 Paducah Riverfront Redevelopment Project
 Facility Requirements
 Permit Number: 16689
 Activity ID No.: AFE20070001

STRC1 (boat dock) construction of a multi-lane boat launch facility, parking area, and access road:

Submittal/Action Requirements:

Condition No.	Condition
S-1	City of Paducah must submit final construction report: Due within 90 days after completion of construction City of Paducah must notify in writing that the project has been completed in accordance with the approved plans and specifications. A Final Construction Report Form is enclosed. [401 KAR 4:060 Section 3(2)]

Narrative Requirements:

Condition No.	Condition
T-1	This permit is issued from the standpoint of stream obstruction only and does not constitute certification of any other aspect of the proposed construction. The applicant is liable for any damage resulting from the construction, operation, or maintenance of this project. This permit has been issued under the provisions of KRS Chapter 151.250 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. [KRS 151.250]
T-2	A copy of this permit must be available at the construction site. [KRS 151.250]
T-3	This permit holder must obtain a permit from the U.S. Army Corps of Engineers, Louisville District, pursuant to Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act, as may be required. [Clean Water Act Section 404 and River & Harbor Act of 1899]
T-4	Any work performed by or for City of Paducah that does not fully conform to the submitted application or drawings and the limitations set forth in this permit, is subject to partial or total removal and enforcement actions pursuant to KRS 151.280 as directed by the Kentucky Department for Environmental Protection. [KRS 151.280]
T-5	Any design changes or amendments to the approved plans must be submitted to the Division of Water and approved in writing prior to implementation. [KRS 151.250]
T-6	Since City of Paducah participates in the National Flood Insurance Program, a local floodplain permit must be obtained prior to beginning of construction. Upon completion of construction City of Paducah must contact the local permitting agency for final approval of the construction for compliance with the requirements of the local floodplain ordinance. [401 KAR 4:060 Section 1(16)]
T-7	The permittee must obtain a Water Quality Certification through the Division of Water, Water Quality Branch before beginning construction. Contact the Water Quality Certification Supervisor at (502) 564-3410. [KRS 224.16-050 & Clean Water Act Section 401]

Stream Construction Permit
Paducah Riverfront Redevelopment Project
 Facility Requirements
 Permit Number: 16689
 Activity ID No.: APE20070001

STRCI (continued):

Narrative Requirements:

Condition No.	Condition
T-8	Fill slopes shall be no steeper than 2:1 (horizontal: vertical). Steeper slopes shall require a stability analysis. [401 KAR 4:060 Section 3(1)]
T-9	City of Paducah must use standard silt control practices in such quantity to prevent siltation of the Ohio River. Silt fences, rock check dams and/or straw-bales are acceptable. [KRS 224.70-110]
T-10	To avoid secondary adverse impacts, all materials used shall be stable and inert, free from pollutants and floatable objects, and shall meet all appropriate engineering standards. (Inert here means materials that are not chemically reactive and that will not rot or decompose, such as soil, rock, broken concrete or similar materials.) [401 KAR 4:060 Section 7]
T-11	All debris and excess material shall be removed for disposal outside of the base floodplain. [401 KAR 4:060]
T-12	Upon completion of construction all disturbed areas shall be seeded and mulched or otherwise stabilized to prevent erosion. [401 KAR 4:060]
T-13	The entry of mobile equipment into the stream channel shall be limited as much as reasonably possible to minimize degradation of the waters of the Commonwealth. [401 KAR 4:060]
T-14	Measures shall be taken to prevent possible spills of fuels and lubricants from entering the stream. [KRS 224.70-110]
T-15	Construction other than as authorized by this permit shall require written approval from the Division of Water. [401 KAR 4:060]
T-16	This permit is not valid until the City of Paducah obtains ownership or easement rights for all property on which the project will be located. [401 KAR 4:060]



COPY

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
REGULATORY BRANCH, WEST SECTION
P.O. Box 489
NEWBURGH, INDIANA 47629-0489
FAX: (812) 858-2678
<http://www.lrl.usace.army.mil>

RECEIVED

NOV 28 2011

ENGINEERING
DEPARTMENT

November 22, 2011

Operations Division
Regulatory Branch (West)
ID No. LRL-2007-811-GJD

City of Paducah
Mr. Rick Murphy, City Engineer
300 South 5th Street
Paducah, Kentucky 42002

Dear Mr. Murphy:

This is in regards to a letter dated, November 3, 2011, which requested an extension of Department of the Army permit LRL-2007-811. Enclosed, in duplicate, is an unsigned Department of the Army permit relating to your request with a new completion date of December 31, 2012 to construct a public boat launch facility. The project would result in the construction of a boat ramp, approximately 260' x 100', a paved parking/trailing area, and an access road extension from Burnett Street. There would also be a gang way and courtesy dock constructed at the ramp. The gangway/ramp structure would be approximately 200' x 8'. The boat ramp would be constructed of a compacted sub grade, 12" minimum of compacted aggregate, and a 6" minimum concrete grooved cap. The boat ramp would extend approximately 105' riverward at normal pool. The gangway/courtesy dock would extend 35' riverward at normal pool. The Ordinary Highwater Mark is 310.3' Ohio River Datum (ORD) and the Normal Pool elevation is 302' ORD. The project would result in the Permanent loss of 8.3 acres Farmed Wetlands (FW), 0.7 of Palustrine Forested Wetlands (PFO), and 0.2 acres of Palustrine Emergent Wetlands (PEM).

The project is located in Paducah, McCracken County, Kentucky, as described in your application. This extension will not be valid until properly signed by you and the issuing officer. The date the permit is validated by the District Engineer, or his representative, will be the new completion date of the permit.

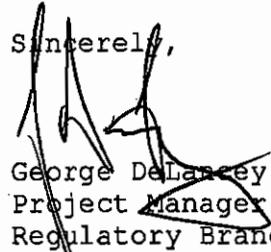
Upon acceptance of the terms and conditions of the permit, both copies of the permit form should be signed and dated on the lines provided for "Permittee" signature and "Date" on the last page and returned to us at the following address:

U.S. Army Corps of Engineers
CELRL-OP-FW
Attn: George DeLancey
P.O. Box 489
Newburgh, Indiana 47629-0489

Upon receipt of the signed permit forms, the District Engineer or his representative will validate the permit and return the original form to you.

If you have any questions concerning this matter, please contact this office at the above address, ATTN: CELRL-OP-FW or call me at (812) 842-2807.

Sincerely,



George DeLancey
Project Manager
Regulatory Branch

Enclosures

Barron/OP-FW

DEPARTMENT OF THE ARMY PERMIT

Permittee: City of Paducah – Mr. Rick Murphy, City Engineer

Permit Number: LRL-2007-811-GJD

Issuing Office: U.S. Army Engineer District, Louisville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The project would result in the construction of a boat ramp, approximately 260' x 100', a paved parking/trailing area, approximately 750' x 325', and an access road extension from Burnett Street. There would also be a gang way and courtesy dock constructed at the ramp. The gangway/ramp structure would be approximately 200' x 8'. The boat ramp would be constructed of a compacted sub grade, 12" minimum of compacted aggregate, and a 6" minimum concrete grooved cap. The boat ramp would extend approximately 105' riverward at normal pool. The gangway/courtesy dock would extend 35' riverward at normal pool. The Ordinary Highwater Mark is 310.3' Ohio River Datum (ORD) and the Normal Pool elevation is 302' ORD.

The project would result in the permanent loss of 8.3 acres Farmed Wetlands (FW), 0.7 of Palustrine Forested Wetlands (PFO), and 0.2 acres of Palustrine Emergent Wetlands (PEM).

Project Location: On the left bank of the Ohio River, Mile 935.8, and adjacent wetlands, located in Paducah, McCracken County, Kentucky.

Latitude: 37-05-59

Longitude: 88-36-39

7.5 Minute Quad: Paducah East, KY

Permit Conditions:

General Conditions:

1. The time limit for completing the authorized activity has been extended and will now end on December 31, 2012. If you find that you need more time to complete the authorized activity, you will need to contact this office to determine if a new application will need to be submitted.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

Special Conditions:

- a. The permittee shall adhere to the wetland mitigation plans as outlined in "Addendum to 404/401 Permit Application Paducah Riverfront Boat Launch" revised February 25, 2008, and supplemental amendments dated March 28, 2008 and April 28, 2008, of the DA application package. Upon completion of the mitigation construction, as-built plans documenting the final post-mining conditions of the streams and wetlands shall be submitted to this office for review and approval. Any modification to these conditions would be required to be demonstrated on amended plans and submitted to this office for prior approval.
- b. Prior to but no later than 60 days after the mitigation site has been determined to be successful, the applicant shall place a perpetual conservation easement or a deed restriction on the site guarding it from future development. A proposed copy of the protective easement shall be submitted to the Corps for review and approval prior to recording with the deed.
- c. During monitoring, and until Corps release of the proposed mitigation, the applicant shall maintain the site to remove all volunteer and invasive tree species.
- d. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
- e. The permittee shall abide by all nine special conditions and nine general conditions in the Kentucky Division of Water's 401 Water Quality Certification, issued on April 8, 2008.
- f. In order to inform all necessary interests (Notice to Navigation Interests) in a timely manner, you must furnish the Corps of Engineers, P.O. Box 59, Louisville, KY 40201-0059, ATTN: CEORL-OP-WN, (Rick Lewis, 502-315-6699) a written notice two weeks prior to commencement of any work. This written notice should include the following information: name, type and number of equipment, duration of project, hours of operation, location of equipment during non-work hours, any marine radios available, contact person and phone number, and any other pertinent data.
- g. The permittee's responsibility to complete the required compensatory mitigation proposal in Special Conditions a - c shall not be considered fulfilled until mitigation success has been demonstrated and written verification is received from the U. S. Army Corps of Engineers.

Further Information:

1. Congressional Authorities. You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

- a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

**US Army Corps of Engineers
Regulatory Operations
P.O. Box 489
Newburgh, Indiana 47629-0489**

**US Army Corps of Engineers
Regulatory Operations
P.O. Box 489
Newburgh, Indiana 47629-0489**

**ATTN: Tfe BARROD
LRL-2007-811**

APPENDIX B



STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

STREAM CONSTRUCTION PERMIT

For Construction In Or Along A Stream

Issued to: **City of Paducah**
Address: **300 S 5th St**
Paducah, KY 42002

Permit expires on **May 1, 2013**

Permit No. **17643-Revision**

In accordance with KRS 151.250 and KRS 151.260, the Energy and Environment Cabinet approves the application dated **January 31, 2012** for **construction of a new marina and dock facility with electricity, potable water, fuel & retail shopping in the left descending floodplain of Ohio River at about stream mile 46.6 (934.8 miles below Pittsburgh), with coordinates 37.092222, -88.596389, in McCracken County. AI: 102251**

There shall be no deviation from the plans and specifications submitted and hereby approved unless the proposed change shall first have been submitted to and approved in writing by the Cabinet. This approval is subject to the attached limitations. **Please read these limitations carefully!** If you are unable to adhere to these limitations for any reason, please contact this office prior to construction.

This permit is valid from the standpoint of stream obstruction only. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. Specifically if the project involves work in a stream, such as bank stabilization, dredging, relocation, or in designated wetlands, a 401 Water Quality Certification from the Division of Water will be required.

This permit is nontransferable and is not valid unless actual construction of this authorized work is begun prior to the expiration date noted above. Any violation of the Water Resources Act of 1966 as amended is subject to penalties as set forth in KRS 151.990.

If you have any questions regarding this permit, please call Kourosh Namin at (502) 564-3410.

Issued May 1, 2012.

Todd Powers, P.E., Supervisor
Floodplain Management Section
Surface Water Permit Branch

TAP/KN/dg

pc: Paducah Regional Office
Rick Murphy – City of Paducah Floodplain Coordinator
File

Stream Construction Permit Modification

City of Paducah Property
Facility Requirements
Permit Number:17643-Revision
Activity ID No.: APE20120001

Page 1 of 3

STRC0000000001 (commercial) construction of a new marina and dock facility with electricity, potable water, fuel & retail shopping:

Submittal/Action Requirements:

Condition No.	Condition
S-1	Jason Peterson, P.E. must submit final construction report: Due within 90 days after completion of construction Jason Peterson, P.E. must notify in writing that the project has been completed in accordance with the approved plans and specifications. A Final Construction Report Form is enclosed. [401 KAR 4:060 Section 3(2)]
S-2	The completed constructions must either (1) have the finished lowest floor elevation at or above 340.00 feet MSL, which is the Base Flood Elevation (BFE), or (2) must be floodproofed to at least the BFE (forms attached). The applicant must submit an elevation certificate or a floodproofing certificate form: Due within 90 days after completion of construction The permit holder must have the appropriate form completed by a registered professional engineer or architect. Submit a completed copy to the Division of Water, Water Resources Branch. Local agencies may require elevation or floodproofing levels higher than those provided here. (Note: for insurance rating purposes, the building's floodproofed design elevation must be at least one foot above the BFE to receive rating credit. If the building is floodproofed only to the BFE, then the building's insurance rating will result in a higher premium.). [401 KAR 4:060 Section 6(2)(b)1, 401 KAR 4:060 Section 6(2)(b)2, 401 KAR 4:060 Section 6(2)(c)]

Narrative Requirements:

Condition No.	Condition
T-1	This permit is issued from the standpoint of stream obstruction only and does not constitute certification of any other aspect of the proposed construction. The applicant is liable for any damage resulting from the construction, operation, or maintenance of this project. This permit has been issued under the provisions of KRS Chapter 151.250 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. [KRS 151.250]
T-2	A copy of this permit must be available at the construction site. [KRS 151.250]
T-3	This permit holder must obtain a permit from the U.S. Army Corps of Engineers, (District Louisville), pursuant to Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act, as may be required. [Clean Water Act Section 404 and River & Harbor Act of 1899]
T-4	Any work performed by or for City of Paducah that does not fully conform to the submitted application or drawings and the limitations set forth in this permit, is subject to partial or total removal and enforcement actions pursuant to KRS 151.280 as directed by the Kentucky Department for Environmental Protection. [KRS 151.280]

Stream Construction Permit Modification

City of Paducah Property
Facility Requirements
Permit Number:17643-Revision
Activity ID No.: APE20120001

Page 2 of 3

STRC0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-5	Any design changes or amendments to the approved plans must be submitted to the Division of Water and approved in writing prior to implementation. [KRS 151.250]
T-6	Since McCracken County participates in the National Flood Insurance Program, a local floodplain permit must be obtained prior to beginning of construction. Upon completion of construction City of Paducah must contact the local permitting agency for final approval of the construction for compliance with the requirements of the local floodplain ordinance. [401 KAR 4:060 Section 1(16)]
T-7	At no point below the base flood elevation 340.00 feet MSL shall the use of construction materials or the permanent storage of materials subject to flood damage be allowed. [401 KAR 4:060]
T-8	The foundation walls, if any, must be vented below the base flood elevation to allow the free flow of floodwater in and out. Total vent area must equal or exceed one square inch of opening to one square foot of floor space with the location of vents placed with bottom of vent no greater than one foot above adjacent finished grade. [401 KAR 4:060]
T-9	Manufactured structures shall be placed on a properly engineered foundation, and shall be securely anchored to resist flotation, lateral movement, or collapse from the impacts of flood waters. [KRS 151.250, 401 KAR 4:060]
T-10	The permittee must obtain a Water Quality Certification (or a determination that none is required) through the Division of Water, Water Quality Branch before beginning construction. Contact the Water Quality Certification Supervisor at (502) 564-3410. [KRS 224.16-050 & Clean Water Act Section 401]
T-11	Any electrical components should be elevated above the base flood elevation of 340.00 feet MSL or provided with ground fault breakers. [KRS 151.250]
T-12	To avoid secondary adverse impacts, all materials used shall be stable and inert, free from pollutants and floatable objects, and shall meet all appropriate engineering standards. (Inert here means materials that are not chemically reactive and that will not rot or decompose, such as soil, rock, broken concrete or similar materials.). [401 KAR 4:060 Section 7]
T-13	Stream bank restoration and stabilization shall be limited to that necessary to restore the stream bank as closely as possible to its original location and configuration, and shall be completed without compromising the conveyance capacity of the stream at any time. [401 KAR 4:060]
T-14	All debris and excess material shall be removed for disposal outside of the base floodplain. [401 KAR 4:060]
T-15	Upon completion of construction all disturbed areas shall be seeded and mulched or otherwise stabilized to prevent erosion. [401 KAR 4:060]

Stream Construction Permit Modification

City of Paducah Property
Facility Requirements
Permit Number:17643-Revision
Activity ID No.: APE20120001

STRC0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-16	The entry of mobile equipment into the stream channel shall be limited as much as reasonably possible to minimize degradation of the waters of the Commonwealth. [401 KAR 4:060]
T-17	Construction other than as authorized by this permit shall require written approval from the Division of Water. [401 KAR 4:060]
T-18	No human habitation shall be allowed in these structures. [401 KAR 4:060 Section 3]

Petersen, Jason

From: Powers, Todd (EEC) <todd.powers@ky.gov>
Sent: Tuesday, January 31, 2012 9:22 AM
To: Petersen, Jason
Subject: RE: Paducah Riverfront Permit Modification Permit # 17643

Regulatory time frame is 20 business days. Typically these are a little faster than that however.

From: Petersen, Jason [<mailto:jpetersen@flohut.com>]
Sent: Tuesday, January 31, 2012 10:16 AM
To: Powers, Todd (EEC)
Subject: RE: Paducah Riverfront Permit Modification Permit # 17643

That's great! If you need anything else just let me know. Can you estimate when we may receive a revision letter? No hurry, I'd just like to provide an update to the project team on our bi-weekly conference call.

Jason Petersen, P.E., Manager
Industrial/Site Development Division

From: Powers, Todd (EEC) [<mailto:todd.powers@ky.gov>]
Sent: Tuesday, January 31, 2012 8:56 AM
To: Petersen, Jason
Subject: RE: Paducah Riverfront Permit Modification Permit # 17643

Jason – I believe your email is sufficient to consider a revision to Permit 17643.

Thanks,

Todd Powers, P.E., Supervisor
Floodplain Management Section
Surface Water Permits Branch
Division of Water
502-564-3410

From: Petersen, Jason [<mailto:jpetersen@flohut.com>]
Sent: Friday, January 27, 2012 3:10 PM
To: Powers, Todd (EEC)
Subject: Paducah Riverfront Permit Modification Permit # 17643

Mr. Powers,

F&H performed a hydraulic analysis for the proposed Paducah Riverfront Redevelopment project and received a floodplain permit from your office, a copy of which is attached. This permit was subsequently extended through July 21, 2011. Since that time, the proposed project location has been moved approximately 500 feet downstream. The fundamental aspects of the project have remained unchanged from the originally permitted concept with only minor modifications in surface grading in the parking areas. A sketch of the proposed footprint in relation to the originally permitted location is attached for general information. This relocation has been arrived at through negotiations to minimize impacts to a dense mussel bed depicted on the sketch as concentric contours immediately upstream of the proposed location.

F&H is preparing to update the original hydraulic model and report to reflect the new location. We do not anticipate that the results of the analysis will be affected because the riverward projection will be virtually

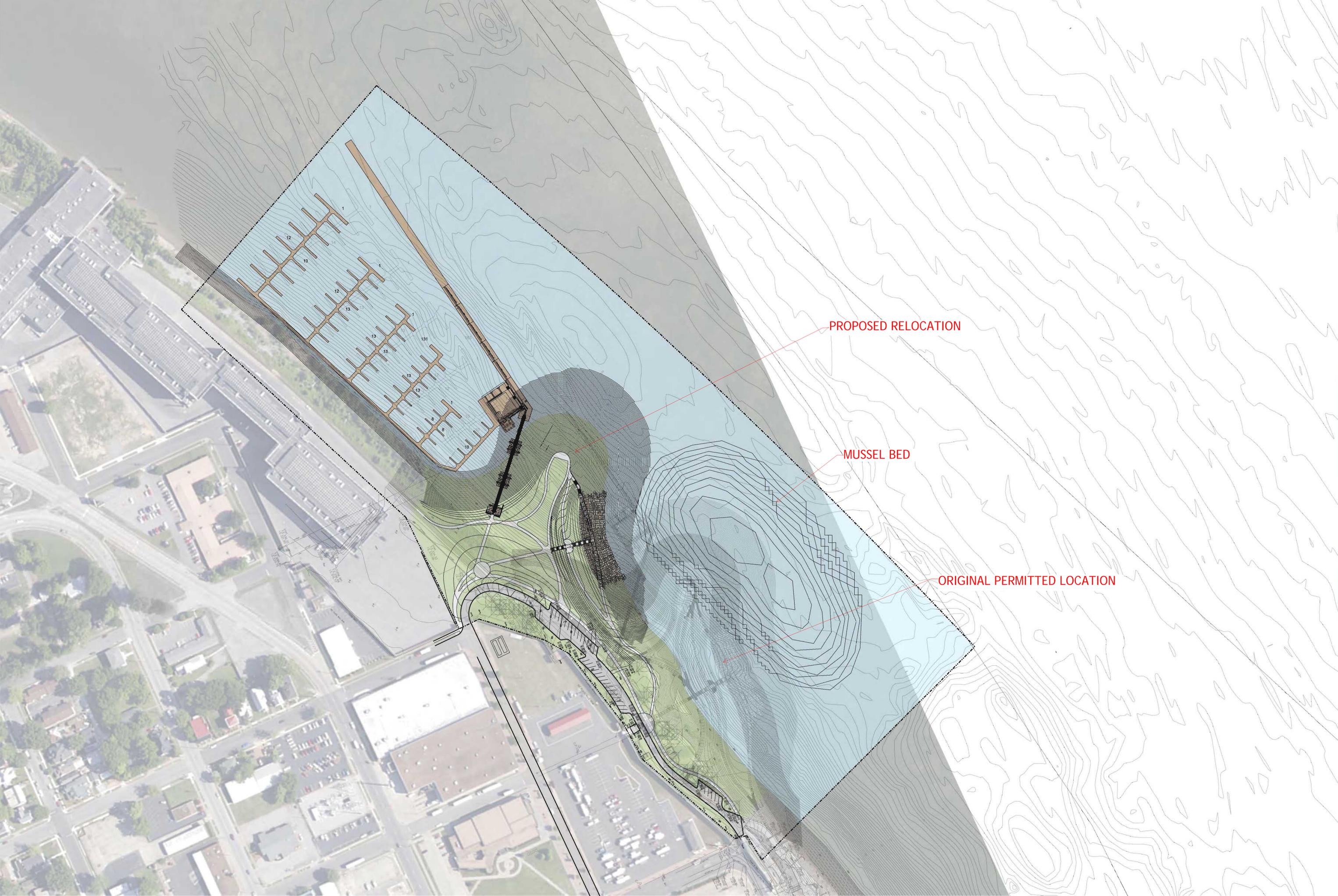
identical to the originally permitted concept. With this email, we wish to confirm the deliverable that your office will require in order to consider a modification of the existing permit for this project.

Please feel free to contact me if you wish to discuss in more detail.

Thanks.

Jason Petersen, P.E., Manager
Industrial/Site Development Division
Florence & Hutcheson - Consulting Engineers
2550 Irvin Cobb Drive
Paducah, KY 42003
jpetersen@flohut.com
ph: 270-444-9691
fax: 270-443-3943
mobile: 270-564-1920
www.flohut.com

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PROPOSED RELOCATION

MUSSEL BED

ORIGINAL PERMITTED LOCATION



STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

July 21, 2010

City of Paducah
300 S 5th St
Paducah, KY 42002

RE: Stream Construction Permit #17643-ET **construction of a new marina and dock facility with electricity, potable water, fuel & retail shopping in the left descending floodplain of Ohio River at about stream mile 46.6, with coordinates 37.092222, -88.596389, in McCracken County. AI: 102251**

Dear City of Paducah:

We have received your request for an extension of Stream Construction Permit #17643. Since there are no changes in the original plans or circumstances involved, we are extending the expiration date to **July 21, 2011**. Please note that all restrictions and requirements on the previous permit are still applicable.

If you have any questions, please call **Ms. Kate Carigan** at (502) 564-3410.

Sincerely,

A handwritten signature in black ink that reads "Kate Carigan".

By:

Jory Becker, P.E., Manager
Surface Water Permit Branch

JB/KC/kec

pc: **Paducah Regional Office**
Randall Boggess – McCracken County Floodplain Coordinator
Rick Murphy – Paducah Floodplain Coordinator
Jason Petersen, PE (by email)



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

RECEIVED

FEB 11 2009

ENGINEERING
DEPARTMENT

STREAM CONSTRUCTION PERMIT

For Construction In Or Along A Stream

Issued to: City of Paducah
Address: 300 S 5th St
Paducah, KY 42002

Permit expires on
February 4, 2010

Permit No. 17643

In accordance with KRS 151.250 and KRS 151.260, the Environmental and Public Protection Cabinet approves the application dated October 6, 2008 for construction of a new marina and dock facility with electricity, potable water, fuel & retail shopping in the left descending floodplain of Ohio River at about stream mile 46.6, with coordinates 37.092222, -88.596389, in McCracken County.

There shall be no deviation from the plans and specifications submitted and hereby approved unless the proposed change shall first have been submitted to and approved in writing by the Cabinet. This approval is subject to the attached limitations. Please read these limitations carefully! If you are unable to adhere to these limitations for any reason, please contact this office prior to construction.

This permit is valid from the standpoint of stream obstruction only. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. Specifically if the project involves work in a stream, such as bank stabilization, dredging, relocation, or in designated wetlands, a 401 Water Quality Certification from the Division of Water will be required.

This permit is nontransferable and is not valid unless actual construction of this authorized work is begun prior to the expiration date noted above. Any violation of the Water Resources Act of 1966 as amended is subject to penalties as set forth in KRS 151.990.

If you have any questions regarding this permit, please call Kouros Namin at (502) 564-3410.

Issued February 4, 2009.

By:

Ron Dutta, P.E., Acting Manager
Water Resources Branch

RD/KN/kla

pc: Paducah Regional Office
Rick Murphy – McCracken County
File



Stream Construction Permit

City of Paducah Property
Facility Requirements
Permit Number: 17643
Activity ID No.: APE20080001

Page 2 of 3

STRC0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-5	Any design changes or amendments to the approved plans must be submitted to the Division of Water and approved in writing prior to implementation. [KRS 151.250]
T-6	Since McCracken County participates in the National Flood Insurance Program, a local floodplain permit must be obtained prior to beginning of construction. Upon completion of construction City of Paducah must contact the local permitting agency for final approval of the construction for compliance with the requirements of the local floodplain ordinance. [401 KAR 4:060 Section 1(16)]
T-7	At no point below the base flood elevation 338.00 feet MSL shall the use of construction materials or the permanent storage of materials subject to flood damage be allowed. [401 KAR 4:060]
T-8	The foundation walls, if any, must be vented below the base flood elevation to allow the free flow of floodwater in and out. Total vent area must equal or exceed one square inch of opening to one square foot of floor space with the location of vents placed with bottom of vent no greater than one foot above adjacent finished grade. [401 KAR 4:060]
T-9	The manufactured home shall be placed on a properly engineered foundation, and shall be securely anchored to resist flotation, lateral movement, or collapse from the impacts of flood waters. [KRS 151.250]
T-10	The permittee may obtain a Water Quality Certification through the Division of Water. Water Quality Branch before beginning construction. Contact John Dovak at (502) 564-3410, extension 485. [KRS 224.16-050 & Clean Water Act Section 401]
T-11	Any electrical components should be elevated above the base flood elevation of 338.00 feet MSL or provided with ground fault breakers. [KRS 151.250]
T-12	To avoid secondary adverse impacts, all materials used shall be stable and inert, free from pollutants and floatable objects, and shall meet all appropriate engineering standards. (Inert here means materials that are not chemically reactive and that will not rot or decompose, such as soil, rock, broken concrete or similar materials). [401 KAR 4:060 Section 7]
T-13	Stream bank restoration and stabilization shall be limited to that necessary to restore the stream bank as closely as possible to its original location and configuration, and shall be completed without compromising the conveyance capacity of the stream at any time. [401 KAR 4:060]
T-14	All debris and excess material shall be removed for disposal outside of the base floodplain. [401 KAR 4:060]
T-15	Upon completion of construction all disturbed areas shall be seeded and mulched or otherwise stabilized to prevent erosion. [401 KAR 4:060]

Stream Construction Permit

City of Paducah Property

Facility Requirements

Permit Number: 17643

Activity ID No.: APE20080001

STRC000000001 (commercial) construction of a new marina and dock facility with electricity, potable water, fuel & retail shopping:

Submittal/Action Requirements:

Condition No.	Condition
S-1	Jason Peterson, P.E. must submit final construction report: Due within 90 days after completion of construction Jason Peterson, P.E. must notify in writing that the project has been completed in accordance with the approved plans and specifications. A Final Construction Report Form is enclosed. [401 KAR 4:060 Section 3(2)]
S-2	The completed constructions must either (1) have the finished lowest floor elevation at or above 338.00 feet MSL, which is the Base Flood Elevation (BFE), or (2) must be floodproofed to at least the BFE (forms attached). The applicant must submit an elevation certificate or a floodproofing certificate form: Due within 90 days after completion of construction The permit holder must have the appropriate form completed by a registered professional engineer or architect. Submit a completed copy to the Division of Water, Water Resources Branch. Local agencies may require elevation or floodproofing levels higher than those provided here. (Note: for insurance rating purposes, the building's floodproofed design elevation must be at least one foot above the BFE to receive rating credit. If the building is floodproofed only to the BFE, then the building's insurance rating will result in a higher premium.). [401 KAR 4:060 Section 6(2)(b)1, 401 KAR 4:060 Section 6(2)(b)2, 401 KAR 4:060 Section 6(2)(c)]

Narrative Requirements:

Condition No.	Condition
T-1	This permit is issued from the standpoint of stream obstruction only and does not constitute certification of any other aspect of the proposed construction. The applicant is liable for any damage resulting from the construction, operation, or maintenance of this project. This permit has been issued under the provisions of KRS Chapter 151.250 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies. [KRS 151.250]
T-2	A copy of this permit must be available at the construction site. [KRS 151.250]
T-3	This permit holder must obtain a permit from the U.S. Army Corps of Engineers, (District Louisville), pursuant to Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act, as may be required. [Clean Water Act Section 404 and River & Harbor Act of 1899]
T-4	Any work performed by or for City of Paducah that does not fully conform to the submitted application or drawings and the limitations set forth in this permit, is subject to partial or total removal and enforcement actions pursuant to KRS 151.280 as directed by the Kentucky Department for Environmental Protection. [KRS 151.280]

Stream Construction Permit

City of Paducah Property

Facility Requirements

Permit Number: 17643

Activity ID No.: APE20080001

STRC0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-16	The entry of mobile equipment into the stream channel shall be limited as much as reasonably possible to minimize degradation of the waters of the Commonwealth. [401 KAR 4:060]
T-17	Construction other than as authorized by this permit shall require written approval from the Division of Water. [401 KAR 4:060]
T-18	No human habitation shall be allowed in these structures. [401 KAR 4:060 Section 3]



KY Department for Environmental Protection

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City of Paducah Property		
Agency ID:	102251	Regulatory Status: Active
AI Type:	GOVT- City Agency/Organization (92)	Physical Address
County:	McCracken	Schultz Park Paducah, KY 42002

Activities with Downloadable Documents

	Program	Activity Type	Current Milestone	Milestone Date	Issued Date
<input type="checkbox"/>	Water Quality	WQ 401 Certifications	Public Notice #1 Issued	6/19/2012	

List of available documents:

Document Name	Document Date	Click Image to Download File
2012_Paducah_FinalBO.pdf	6/19/2012	
Revised WQC Application PDF.pdf	6/19/2012	
April 2012 Water Quality Sampling results.pdf	6/14/2012	
March 2012 Environmental Assessment	6/14/2012	
PaducahRiverfront-USACE PN-Posted061212.pdf	6/14/2012	
Revised Design Drawings for New WQC Application	6/14/2012	
Revised WQC Application	6/14/2012	

Licensed Operator(s)

No Licensed operators found

Alternate/Historic AI Identifiers

Alt ID	Alternate Name	ID Type	Start Date	End Date
18920A	City of Paducah	DOWWRB- Floodplain Management	10/1/2008 12:00:00 AM	
17643-REV	City of Paducah	DOWWRB- Floodplain Management	5/1/2012 12:00:00 AM	
20664A	City of Paducah	DOWWRB- Floodplain Management	7/21/2010 12:00:00 AM	
17643-ET	City of Paducah	DOWWRB- Floodplain Management	7/21/2010 12:00:00 AM	

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March 26, 2012

Mr. Alan Grant
Water Quality Certification Section
Kentucky Division of Water
200 Fair Oaks Lane – 4th Floor
Frankfort, Kentucky 40601

Subject: **Application for Section 401 Water Quality Certification
Paducah Riverfront Development Phase 1/Transient Dock
McCracken County, Kentucky
Redwing Project 06-090-01**

Dear Mr. Grant:

Redwing Ecological Services, Inc. (Redwing), on behalf of the City of Paducah, is pleased to submit this Application for Section 401 Water Quality Certification for the proposed Paducah Riverfront Development Phase 1/Transient Dock project in Paducah, McCracken County, Kentucky. The proposed development will result in unavoidable impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 feet of the Ohio River, including 0.79 acres of riverbank and 5.85 acres of open water. This application report presents project information and additional supplemental information, including project purpose and need, project alternatives, project impacts, project design, threatened/endangered species surveys, and archaeological surveys.

We appreciate the opportunity to work with you on this project. Please contact Ron Thomas or Brian O'Neill at (502) 625-3009 with any questions you have during your review.

Sincerely,

Brian J. O'Neill
Project Aquatic Biologist

Ronald L. Thomas
Principal
Senior Ecologist

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cc: Rick Murphy – City of Paducah
Jason Petersen – Florence & Hutcheson, Inc.



**APPLICATION FOR
SECTION 401 WATER QUALITY CERTIFICATION**

**PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCracken County, Kentucky**

Prepared for:

KENTUCKY DIVISION OF WATER

March 2012

**APPLICATION FOR
SECTION 401 WATER QUALITY CERTIFICATION**

**PADUCAH RIVERFRONT DEVELOPMENT PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY**

Submitted to:

KENTUCKY DIVISION OF WATER

Submitted by:

**CITY OF PADUCAH, KENTUCKY
McCracken County, Kentucky**

Prepared by:

**REDWING ECOLOGICAL SERVICES, INC.
Louisville, Kentucky**



**Brian J. O'Neill
Project Aquatic Biologist**



**Ronald L. Thomas
Principal
Senior Ecologist**

March 26, 2012

EXECUTIVE SUMMARY

The City of Paducah is proposing the development of a public marina/transient dock facility in downtown Paducah, McCracken County, Kentucky. The purpose of the development is to provide needed public connections to, and boat facilities on, the Ohio River in the vicinity of downtown Paducah. The proposed development includes a floating dock with approximately 150 boat slips, a fuel dock, marina administration buildings, a gangway system, public access for walking and fishing, potable water and electrical pedestals, and enhancements of Schultz Park.

The project is a major component of Paducah's overall master plan for the Ohio River waterfront. The purpose of the proposed project is to provide public connections to the riverfront and provide needed docking and amenities to both transient boats and recreational boat owners. These facilities include loading/unloading for transient boats, docking, refueling and related amenities.

No practicable alternative sites exist in the vicinity of downtown that can accommodate the needed marina and transient dock facilities. The associated ecological/environmental impacts, access issues, and acquisition costs make other sites unacceptable. The proposed design provides the needed docking and marina amenities to serve downtown Paducah while minimizing impacts to jurisdictional waters, aquatic resources, and the overall environment. Thus, the proposed Paducah Riverfront Development Phase 1/Transient Dock site represents the least environmentally damaging practicable alternative for meeting the needs of the project.

The proposed development will result in unavoidable impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 feet of the Ohio River. Impacts include 0.79 acre of riverbank and 5.85 acres of open water for expansion of Schultz Park, providing public access to the river, and anchoring of floating docks. The development has minimized and avoided jurisdictional water impacts to as great an extent possible by limiting impacts to the Ohio River and high quality aquatic habitat to the minimum necessary to meet the need for public marina and dock facilities. Mitigation for riverbank and open water impacts are proposed in the form of: a contribution to the Kentucky Aquatic Resource Fund (KARF) for riparian/riverbed habitat protection; re-establishment of riverbed and shoreline on site; and enhancing the educational and recreational functions of the river.

Based on threatened/endangered species surveys of the site, and contingent upon completion of formal consultation with the USFWS, the proposed project is not likely to jeopardize the continued existence of federally threatened/endangered species, or adversely affect their critical habitat. No winter or summer habitat for the federally-endangered Indiana bat (*Myotis sodalis*) exists within the site. Mussel surveys of the project site were conducted in August 2008, October 2010 and October 2011. The federally-endangered fat pocketbook (*Potamilus capax*) was identified within the project area during all three surveys. Under KAR 10:031 Section 8, the reach of the Ohio River from Ohio River Mile (ORM) 933 to 937 has been designated as an Outstanding State Resource Water (OSRW) due to the confirmed presence of the fat pocketbook. Based on the Biological Assessment (BA) issued by Redwing on January 3, 2012, and refined project design drawings, the proposed project will result in a take of 76 fat pocketbook. Proposed conservation measures include support for endangered mussel recovery efforts and compensation for substrate habitat loss through contributions to KARF. Formal consultation with the USFWS was initiated on January 27, 2012, which will result in issuance of a Biological Opinion (BO) on or before June 10, 2012. Preliminary coordination with the USFWS has indicated that they may designate a minimal take of the endangered orangefoot pimpleback (*Plethobasus cooperianus*), pink mucket (*Lampsilis abrupta*), and sheepsnose (*Plethobasus cyphyus*) even though none of these species were identified during extensive surveys of the area. The USFWS has also preliminarily indicated that some level of mussel relocation effort in the project footprint will be required. A significant population of fat pocketbook (>340 individuals), as well as a diverse assemblage of unionid mussels, will remain unharmed within this OSRW after completion of the proposed project.

Based on a completed Phase 1 survey, no archaeological sites were identified within the project area. It was also concluded that no intact archaeological deposits are likely to be present due to the disturbed nature of the site. Thus, the proposed project is not likely to have an adverse impact on

significant archaeological sites or historic properties that are listed, or eligible for listing, on the National Register of Historic Places. These findings were confirmed by the State Historic Preservation Office in letters dated September 30, 2008 and January 11, 2012.

An Environmental Assessment (EA) is being conducted as required by 23 CFR 771.115(c) and the National Environmental Policy Act of 1969 concurrent with this application to determine the proposed project's impact to the social, ecological and cultural environments. The EA document is currently under review by the Kentucky Transportation Cabinet and the Federal Highway Administration and a final document was submitted in March 2012. As documented in the EA process, the proposed project is not expected to result in any cumulative and/or indirect adverse impacts to air quality, noise, water quality, floodplains, land use/zoning, community facilities, residential/commercial/industrial development, hazardous materials, visual amenities, or navigation.

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1.0 INTRODUCTION

The City of Paducah respectfully submits this application for Water Quality Certification under Section 401 of the Clean Water Act for jurisdictional/navigable water impacts associated with the proposed development of the Paducah Riverfront Development Phase 1/Transient Dock facility on the Ohio River in Paducah, McCracken County, Kentucky. The objectives of this report are to describe:

- the proposed project in terms of purpose and need, alternatives, and proposed development plans
- the existing conditions at the site in terms of natural habitats, and water/wetland functions and values
- potential project impacts related to waters, threatened/endangered species and cultural resources
- proposed mitigation plans

A completed Application for Water Quality Certification form is provided as Appendix A. Project Design Drawings are provided as Appendix B.

An Environmental Assessment (EA) is being conducted as required by 23 CFR 771.115(c) and the National Environmental Policy Act (NEPA) of 1969 concurrent with this application to determine the proposed project's impact to the social, ecological and cultural environments. The EA document has been submitted and is currently under review by the Kentucky Transportation Cabinet and the Federal Highway Administration, and should be ready for public involvement in April 2012.

2.0 PROJECT DESCRIPTION

As part of their overall riverfront development initiative, the City of Paducah is proposing the construction of a marina/transient dock facility on city-owned property in Paducah, McCracken County, Kentucky (Figures 1 and 2). The project site is located on the Ohio River, extending from the floodwall at the end of Jefferson Street westward to the floodwall opening at 4th Street. The proposed landform extends approximately 400 feet from the shore and the transient dock extends approximately 650 feet at the greatest extent into the river from the ordinary high water mark (Figure 3). The project site is comprised of the Ohio River and undeveloped river corridor above normal pool, including the existing Schultz Park. The following project description is based on the EA document prepared for the overall waterfront development and includes a discussion of project purpose and need, project alternatives, and proposed development.

2.1 PROJECT PURPOSE AND NEED

Although Paducah has historically had close ties to the Ohio and Tennessee Rivers, it has not fully capitalized on potential recreational, cultural and historical connections with the river due to the lack of waterfront access and facilities. A downtown redevelopment plan, initiated in 1992, has gained a national reputation for downtown renewal; however, Paducah still lacked a major public link to the riverfront. This need has resulted in a long-term commitment for physical renovation of the riverfront with the goals of attracting new tourism, providing recreation and economic development opportunities, and reconnecting people with the river.

The City of Paducah has completed a master plan for the redevelopment and revitalization of the Paducah riverfront to capitalize on growing opportunities. It includes a comprehensive analysis of existing conditions, and recommendations to further enhance Paducah's cultural, historical, recreation, tourism and economic development potential. Currently proposed waterfront projects include a boat launch facility and the marina/transient dock facility, both of which are fully described in the EA document prepared for the Kentucky Transportation Cabinet and the Federal Highway Administration.

The purpose of the proposed project is to provide accommodations for transient boaters and local recreational boaters in the vicinity of downtown Paducah, and to provide public connections to the riverfront. The need for the marina/transient dock is to meet the demand for loading/unloading facilities for transient boats and to provide a marina, with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown Paducah, providing opportunities to refuel, dine, and purchase supplies. Currently available facilities include

unprotected docking on the riverbank near downtown Paducah and an on-water refueling/marina facility located 33 miles upstream at Golconda, Illinois.

2.2 PROJECT ALTERNATIVES

An evaluation of potential alternatives for the proposed Paducah Riverfront Development Phase 1/Transient Dock, following Section 404(b)(1) guidelines, identified the proposed project as the least environmentally damaging practicable alternative for meeting the identified Ohio River access needs of the community. The City has evaluated alternatives for the proposed marina/transient dock through the consideration of alternative site locations as well as alternative project designs in the process of developing the currently proposed "build" alternatives. This evaluation was documented in the EA and is summarized below in terms of the no-build alternative, alternative site locations, and alternative project designs.

2.2.1 No-Build Alternative

The No-Build Alternative for the marina/transient dock project was evaluated for purposes of comparison, but is not a practicable option because it does not address the identified need to: reconnect the public to the river; provide loading/unloading facilities for transient boats; and provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. The no-build alternative would require continued use of the inadequate existing facilities that include docking along the riverbank with no related amenities and utilizing refueling and marina facilities over 30 miles away. It will not allow the City to fully capitalize on its recreational, cultural, and historical ties with the river, and the economic opportunities that these present. Not building the marina/transient dock facility will inhibit new tourism, recreation, and economic development opportunities for the City.

2.2.2 Alternative Sites

The proposed site for the marina/transient dock facility was selected based on a number of locational factors including:

- proximity to downtown Paducah
- land owned by Paducah/McCracken County
- level of existing development on the properties in question
- ease of access for the public via major streets or highways

- degree of potential impact to cultural, social and environmental resources

Because the river and river-related activities are an integral part of Paducah's downtown environment, it is important to provide a marina and transient dock facility near downtown Paducah. Very few sites that can accommodate a sufficiently-sized marina/dock are available along the riverfront in the vicinity of downtown. In general, alternative sites that could accommodate such improvements are heavily wooded, have relatively poor access, and would likely entail significant ecological/environmental impacts. In addition, these alternative sites are all privately owned and acquisition costs could be substantial, if the sites are available at all.

Potential project sites were narrowed to four locations which are described in more detail in the EA, summarized below, and depicted in Figure 4. Location alternatives #1 and #2 consisted of separate marina and dock components. Each of these alternatives included portions of the project not located on City-owned land. For location alternative #1, the marina was proposed to be located along the Ohio River on Executive Inn (presently removed) property owned by the Paducah/McCracken Visitors Bureau. The floating dock was proposed on the Ohio River at the end of Broadway Street on City-owned property. The marina and floating dock were separated by approximately 3,500 feet in location alternative #1. After consideration, location alternative #1 was not chosen because it does not meet the purpose and need since the marina is approximately 0.7 miles from the downtown area and the breakwater to protect the marina is not feasible to construct due to the depth of the river and the distance from the existing river bank.

For Location alternative #2, the marina was proposed to be located on both City-owned and Crouse Corporation property north of the Carson Four Rivers Center at the confluence of the Ohio and Tennessee Rivers. The large dock (cruise dock) was proposed to be located on city-owned property at the end of Broadway Street approximately 900 feet downstream of the marina. After consideration, location alternative #2 was not chosen for the following reasons:

- The facility position decreases the available navigation channel of the river.
- The facility position increases the potential for interference with existing and future planned river operations.
- The marina is not positioned entirely on city-owned property.

Location alternative #3 for the marina/transient dock facility was comprised of a combination of an excursion dock and a protected marina/transient dock facility. This facility was to be located along the Ohio River between Martin Luther King, Jr. Drive (extended) and Jefferson Street on city-owned property. A Biological Assessment completed for location alternative #3 identified the presence of a federally-endangered mussel and a dense and diverse mussel bed located within the footprint of the proposed park expansion. A Biological Opinion (BO) issued by the U.S. Fish

and Wildlife Service (USFWS) estimated that the proposed location would likely adversely affect three federally protected mussel species including the take of up to 546 fat pocketbooks (*Potamilus capax*), 18 orangefoot pimpleback (*Plethobasus cooperianus*), and nine pink mucket (*Lampsilis abrupta*). The BO concluded that the marina/transient dock project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. However, after consideration of the potential impacts to freshwater mussels, location alternative #3 was not chosen and an alternative location was sought.

Similar to location alternative #3, location alternative #4 for the marina/transient dock facility is comprised of a combination of an excursion dock and a protected marina/transient dock. Location alternative #4 is positioned 500 linear feet downstream (northwest) of location alternative #3 on city/county-owned property. This shift is a result of additional mussel surveys conducted in October 2010 and October 2011 which revealed varying mussel bed densities along the Ohio River shoreline. The surveys found the presence of an abundant and diverse mussel bed upstream and riverward of location alternative #3. Downstream of location alternative #3, the reach was characteristically siltier with a mussel assemblage that was less dense and less species-rich. Based on this information, the proposed marina/transient dock project was shifted downstream to the less-dense mussel bed area. Location alternative #4 is considered the "consensus location" for the proposed facility based on the review of location alternatives #1 and #2 and the potential freshwater mussel impacts of location alternative #3. The "consensus" marina/transient dock facility location has been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah.

2.2.3 Design Alternatives

The following design alternative discussion was borrowed from the EA. The design for the marina/transient dock facility commenced with the approved *Riverfront Redevelopment Plan*, continued through context design, and culminated with a "consensus" design alternative after the consideration of a number of design alternatives. The context design and consensus design alternative were documented and further refined in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* in December 2007. In addition to addressing the fundamental purpose and need for the project, the *Riverfront Redevelopment Plan* and the *MOU* both address the goal to enhance existing amenities in order to "recapture" the riverfront. This includes creating an interface and area of public gathering for not only transient boaters, but also for local public use and enjoyment. To that end, the *MOU* outlined a number of basic context elements that were established to be fundamental to the success and goals of the project. The salient context elements presented in the *MOU* can be summarized as follows:

- Locate the marina and dock facilities strategically to avoid impacts to river traffic.

- Construct the transient dock parallel with the river's direction of flow to limit current forces and to serve as a wave attenuator for the marina.
- Provide a debris deflector upstream of the marina to protect against floating debris, ice and break-away barges from both the Ohio and Tennessee Rivers for all river stages

- Accommodate river stage fluctuations from elevation 299 to 341.8 (100-yr WSE).
- Enhance existing amenities at Schultz Park.
- Utilize the existing opening at Monroe Street as the pedestrian access point through the floodwall to connect the riverfront to the downtown area.
- Maximize public accessibility to the river up to elevation 322.
- Preserve and enhance existing viewsheds.
- Utilize the existing floodwall in its existing condition without modification.
- Maintain vehicular access through Schultz Park.
- Provide a marina with boat slips that includes:
 - Fuel, electricity, potable water and sanitary pump out facilities.
 - Store and administration building

The development of alternatives documented in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* focused primarily on three separate concepts that are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. The *MOU* does not include the documentation of two other marina/transient dock design alternatives that were evaluated and eliminated early in the design development process, namely, sheet pile retaining walls and floating barrier. The *Riverfront Redevelopment Plan* and the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* are included in the EA as Appendix N and Appendix O, respectively.

A brief summary of mass fill (alternative #1), sheet pile retaining walls (alternative #2), and the floating barrier (alternative #3) is provided below.

Design Alternative #1- Mass Fill

Three concepts were evaluated for design alternative #1 (mass fill) for the marina/transient dock facility. Each of the concepts would serve the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Each of the concepts would enhance Schultz Park and would have landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities in common. The three concepts each consist of the construction of a landform expansion of Schultz

Park through the placement of clean fill material within the Ohio River to form a peninsula and construction of a floating dock and marina on the downstream side of the peninsula. Fill material is placed by truck or barge on an approximate 3H:1V slope to create the peninsula to an elevation 338 feet (near the 100-year river elevation). This landform provides passive protection of the marina and transient dock from floating debris, ice and barge impact for all river stages. Access to the floating dock is provided by elevated walkway/gangways. The land-based improvements of Schultz Park include reconstruction of parking, slope protection walkways and enhanced vegetation. The amount of fill material used to create the landform has been limited to construct a suitable deflector for debris. The three concepts are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. Concept #1 includes an observation tower, bioengineered slope protection, a park overlook, a lawn and sculpture park, pedestrian link to downtown via Monroe Street, an interpretive levee trail, the marina, and the transient dock. Concept #2 includes the amenities provided in Concept #1 with the addition of terraced seating and terraced lawn & gardens. Concept #3 includes the amenities provided in Concept #2 with the addition of a marina/transient dock building, steps leading down to the Ohio River, a connection to the existing amenities to the immediate east, and the adaptive use of existing structures and interpretive landmarks. Concept #3 does not include an observation tower. Each of the three design concepts will require that fill be placed in the Ohio River in order to provide landform and shore protection. Concept #3 requires the most fill impact to the Ohio River while Concept #1 requires the least. Table 1 summarizes the amenities and features of the three concepts as well as the preferred concept (Consensus). The Consensus is a combination of specific amenities/features taken from the three mass fill alternative concepts and requires the same amount of fill as Concept #3. The anticipated capital construction cost for the Consensus is \$13.0M.

The key elements of the three concepts are summarized in the following table.

Amenities and/or Features	Concepts			
	Concept #1	Concept #2	Concept #3	Consensus
Observation Tower	X	X	----	----
Bioengineered Slope Protection	X	X	X	X
Park Overlook	X	X	X	X
Lawn/Sculpture Park	X	X	X	X
Interpretive Levee Trail	X	X	X	X
Marina	X	X	X	X
Transient Dock	X	X	X	X
Promenade/Pedestrian Link to Downtown	X	X	X	X
Terraced Seating		X	X	X
Terraced Lawn & Garden		X	X	X
Marina/Transient Dock Building			X	X
Steps to the Ohio River			X	----
Connectivity to Existing Amenities			X	X
Adaptive Use of Existing Landmarks			X	X
Rock Outcropping to the River				X
Vertical axis wind turbines				X
Estimated Fill (cubic yards)	160,000	220,000	265,000	265,000
Estimated Construction Cost	\$ 11.1M	\$ 12.2M	\$ 12.7M	\$ 13.0M

Design Alternative #2- Sheet Pile Retaining Wall

Design alternative #2 is similar to design alternative #1 (mass fill) except that the mass fill material is placed within a vertical sheet pile wall up to an elevation of approximately 302 feet above MSL. This alternative also provides protection for the marina against floating debris. Access to the floating dock is provided by elevated walkway/gangways; however, the river's edge will not be accessible. The land-based improvements to Schultz Park include reconstruction of parking and enhanced vegetation.

This alternative addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. However, with this alternative, access to the river for non-boaters is limited and there is minimum enhancement to the useable area in Schultz Park. Based on preliminary soil boring data, it was anticipated that sheet piling lengths on the order of 60 feet would be required as well as the potential for pre-drilling and

significant tie-backs and dewatering. When compared with alternative #1 (\$11 to 13M), the anticipated capital construction cost for such sheet piling (\$17.4M) is much greater and the life expectancy is much less than with mass fill. Contrary to design alternative #1, this alternative would isolate pedestrians from interacting with the river at the river's edge due to the necessary hand-railing protections required to provide adequate safety. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #2 was eliminated.

Design Alternative #3- Floating Barrier

Design alternative #3 consists of a floating barrier structure that would provide debris/barge protection for the marina, wave attenuation, and access to the dock/marina. This alternative represents the Consensus Plan presented in the approved *Riverfront Redevelopment Plan* of March 2007. This floating barrier consists of a series of precast concrete barges linked together to form one continuous, articulated floating dock string. This articulated dock string is attached to multiple piers constructed at intervals along the dock to provide anchorage. Access to the dock would be provided through an elevated walkway/gangway from the existing Schultz Park riverbank. With this alternative, the only fill material placed in the river is associated with construction of the anchor piers for the floating dock and the anchorage for the marina. The land-based improvements of Schultz Park would include reconstruction of parking, slope protection, walkways and enhanced vegetation.

Design alternative #3 addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Although design alternative #3 minimizes the amount of fill material placed in the river when compared with design alternatives #1 and #2, the alternative poses significant challenges associated with the design and construction of a suitable structure that can accommodate the river current, debris load, ice load and significant range of river fluctuations (elevation 299 to 338 feet above MSL). Because the barrier would be subject to very significant lateral loading, it is estimated that the piers would be constructed of concrete caissons on the order of 8 to 10 feet diameter, and/or sheet pile cells on the order of 20 feet diameter, each with significant foundations. It has been estimated that each pier would likely extend approximately 60 feet above normal pool elevation directly in front of Schultz Park, thus significantly obstructing the viewshed from the park and surrounding areas. The floating barrier would be anchored using a guide rail system to each cell and would rise and fall with the river elevation. This guide rail system poses a significant maintenance obligation, and in the event of a failure or binding, portions of the dock would become submerged. This would result in an unacceptable risk to public safety as well as damage to the floating infrastructure.

Furthermore, the floating barrier would be susceptible to major structural damage and potential loss of life in the event of impact from a break-away barge. When compared with alternative #1 (\$11 to 13M), the anticipated capital construction cost for the floating barrier (\$15.7M) is greater. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #3 was eliminated.

2.2.4 Alternatives Summary

The proposed transient dock represents the least environmentally damaging alternative in terms of location and design. Location alternative #4 is considered the "consensus" location (preferred location alternative) for the proposed facility based on the limitations of location alternatives #1, #2 and #3, which include locations on land owned by the City (#1 and #2), separation from downtown/public access (#1), unfeasibility of construction (#1), interference with navigation and inland waterways industry operations (#2), and high level of impact to endangered mussel species (#3). Location alternative #4 for the marina/transient dock facility is on city/county-owned property a distance of 500 linear feet downstream (northwest) of location alternative #3 to lessen the potential impacts to freshwater mussels. The "consensus" marina/transient dock facility location has been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah, and meet the needs of the public access and boating needs of the project.

The preferred design alternative (consensus) is based on design alternative #1 (mass fill). It has been determined that the mass fill alternative is the best and only feasible approach to provide long-term stability and protection of the City's infrastructure (marina and dock assets), address the purpose and need for the project, and enhance the Schultz Park and the riverfront interface with the public. Design alternative #2 (sheet pile retaining wall) was rejected due to its inability to meet public river access needs, limited life expectancy, and higher costs. Design alternative #3 (floating barrier) was not practicable due to construction/stability challenges, potential risks to public safety, adverse impacts to river access and viewsheds, and higher cost.

In the consensus design alternative (Mass Fill- Concept #3), the size of the mass fill is expanded slightly in order to increase the usable area of Schultz Park for additional amenities including a pedestrian promenade and terraced seating at the river's edge. The preferred design alternative will enhance Schultz Park and include landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities. Specifically, the preferred design includes: bioengineered slope protection, a river overlook, lawn & sculpture park, pedestrian link to downtown via Monroe Street, terraced seating, terraced lawn & gardens, an interpretive levee trail, a marina/transient dock building, rock outcropping leading down to the Ohio River, the adaptive

use of existing structures and interpretive landmarks, a connection to the existing amenities to the immediate east, the marina, and the transient dock. The marina/transient dock will have three individual sets of four pipe piles that will support the "floating" gangway deck system. The most elevated portion of this support system will be vertical axis wind turbines at the top of each of the pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. Lighting within the marina/transient dock facility will consist of pole-mounted pedestrian lights, pathway lighting along the transient dock, mounted gangway lights, and submersible inset lights for the stairways.

No viable alternatives to the preferred marina/transient dock exist within the immediate vicinity of downtown Paducah that meet project needs. The selected site minimizes ecological/environmental impacts and avoids disruption to navigation and inland waterways operations, while still meeting the riverfront access and boat docking needs of the Paducah area. The proposed design also represents the design alternative which provides the required amenities, while limiting impacts to the Ohio River. The no-build alternative is not viable as it does not meet the designated need for a public connection to the riverfront or for protected dock and marina facilities. Thus, the proposed project represents the least environmentally damaging practicable alternative for providing the needed marina and boat docking on the Ohio River in Paducah, Kentucky.

2.3 PROPOSED DEVELOPMENT

The proposed site development plan is shown on Figure 3 and is comprised of marina and transient dock components. The detailed design drawings are provided in Appendix B. The major components of the marina include:

- floating dock system
- 150 boat slips, with a portion reserved for transient boats
- fuel dock and two above-ground fuel storage tanks
- marina administration building with showers and retail
- utilities (fuel, potable water, electricity, and sanitary pump out)
- gangway entrance (secured)

The major components of the transient dock include:

- floating dock system (designed as wave attenuator)
- dockage for transient vessels on both sides of dock
- gangway system comprised of gangway sections
- walking path and public access along gangway and dock
- fishing opportunities

3.0 EXISTING SITE CONDITIONS

The project site consists of the Ohio River and undeveloped riverbank, which includes the existing Schultz Park. It is located at the confluence of the Tennessee and Ohio Rivers in downtown Paducah. The Ohio River is approximately 0.6-mile wide at the project site. The 6.64 acres of jurisdictional waters of the U.S. at the present site include 0.79 acre of riverbank between the ordinary high water mark (OHWM) (310 feet) and normal pool (302 feet) and 5.85 acres of open water located below the normal pool. The riverbank consists primarily of a riprap slope with a few scattered saplings. The open water area is approximately 40 feet deep at its deepest point at normal pool, and the area exhibits riverbed substrate which consists primarily of silt, sand, and gravel. The project site supports a mussel assemblage with scattered individuals of the federally-endangered fat pocketbook. However, a dense, diverse mussel bed is located upstream and riverward and has been avoided by the project. A more detailed discussion of river habitat and mussel surveys will be included in the completed BO by the USFWS.

The non-jurisdictional river corridor, including the area between the OHWM of the river and the flood wall, consists of Schultz Park and a steeply sloped riprap riverbank. Scattered vegetation along the bank includes black willow (*Salix nigra*), silver maple (*Acer saccharinum*), crown vetch (*Coronilla varia*), hop clover (*Trifolium campestre*), and indigo bush (*Amorpha fruticosa*).

Schultz Park consists of open lawn with scattered trees and park benches/tables. Tree species present include sycamore (*Platanus occidentalis*), sugar maple (*Acer saccharum*), weeping willow (*Salix babylonica*), and pin oak (*Quercus palustris*). Common herbaceous species include bluegrass (*Trifolium pratense*), red clover (*Trifolium pratense*), dandelion (*Taraxacum officinale*), and narrow-leaved plantain (*Plantago lanceolata*).

No wetlands or jurisdictional waters of the U.S., other than the Ohio River, are present within the project area.

4.0 POTENTIAL PROJECT IMPACTS

Potential project impacts were evaluated through field assessments of jurisdictional waters/wetlands, threatened/endangered species or their critical habitat, cultural resources, and other environmental factors.

4.1 WATERS/WETLANDS

Construction of the proposed project will result in impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 feet of Ohio River, including 0.79 acre of riverbank (between OHWM elevation 310' and normal pool elevation 302') and 5.85 acres of open water (fill below normal pool elevation). No additional impacts to wetlands or other waters of the U.S. will result from the project. Mitigation provisions for impacts to aquatic habitat are being proposed and are described in detail in Section 5.0. The project site is located within the 100-year floodplain (Figure 5). The highly developed nature of the landward side of the project is illustrated by the mapping of urban-complex soils (Figure 6).

4.2 PROTECTED SPECIES

Impacts of the project on federally-listed threatened/endangered species are addressed in terms of the federal Endangered Species Act and state Water Quality Standards.

4.2.1 Endangered Species Act

A protected species survey of the project area, conducted as part of the overall site assessment, concluded that the proposed project is likely to have an adverse impact on the federally-endangered fat pocketbook. The project is not likely to have an adverse impact on any other federally threatened/endangered species, or their critical habitat. Potential impacts to mussels are being resolved through formal consultation with the USFWS. A summary of federally-protected species potentially occurring in McCracken County, Kentucky, based on existing USFWS county lists and survey records, and their potential for occurrence at the project site is presented in the table below.

Scientific Name	Common Name	Status*	Habitat	Habitat Present	Species Observed
MAMMALS					
<i>Myotis sodalis</i>	Indiana Bat	E	Caves in winter; nursery colonies and roosting under the loose bark of trees from late March to mid October.	No	No
BIRDS					
<i>Sterna antillarum</i>	Least Tern	E	Alluvial islands and sandbars.	No	No
MUSSELS					
<i>Cyprogenia stegaria</i>	Fanshell	E	Medium to large rivers with moderate current in gravel.	Yes	No **
<i>Cumberlandia monodonta</i>	Spectaclecase	E	Large rivers sheltered from main force of river current in mud to boulders.	Yes	No **
<i>Lampsilis abrupta</i>	Pink Mucket	E	Large rivers with swift current in sand, gravel, and cobble.	Yes	No **
<i>Obovaria retusa</i>	Ring Pink	E	Large rivers in sand or gravel.	Yes	No **
<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback	E	Medium to large rivers with swift current in sand and gravel.	Yes	No **
<i>Plethobasus cyphus</i>	Sheepnose	E	Medium to large rivers in mud, sand, or gravel.	Yes	No **
<i>Pleurobema clava</i>	Clubshell	E	Medium to small rivers in coarse sand and gravel.	Yes	No **
<i>Pleurobema plenum</i>	Rough Pigtoe	E	Medium to large rivers with sand, gravel, and cobble substrates.	Yes	No **
<i>Potamilus capax</i>	Fat Pocketbook	E	Large rivers in slow-flowing water in mud to gravel.	Yes	Yes **
<i>Quadrula cylindrica</i>	Rabbitsfoot	C	Small to large rivers in a mixture of sand and gravel.	Yes	No **

*E=endangered, C = candidate

**mussel surveys conducted August 2008, October 2010, and October 2011

The project site contains no potential habitat for the federally-endangered Indiana bat (*Myotis sodalis*) or least tern (*Sterna antillarum*). The few scattered trees in Schultz Park do not represent potential summer roosting/maternity habitat for the Indiana bat and no caves, rock houses or mine portals are present.

Results of three mussel surveys completed from 2008 through 2011 indicate the presence of a mussel bed upstream and riverward of the proposed Schultz Park expansion, as well as confirmed presence of the federally-endangered fat pocketbook. Detailed reports of the mussel surveys completed on site are presented in the *Biological Assessment Report* dated January 3, 2012. Figure 10 presents a summary of mussel survey data collected for the proposed project. Based on the density/diversity of the mussel bed upstream and riverward of the project and the results of surveys in the vicinity, the USFWS assumes that spectaclecase (*Cumberlandia monodonta*), pink mucket, orangefoot pimpleback, sheepnose (*Plethobasus cyphus*), and rabbitsfoot (*Quadrula cylindrica cylindrica*) may also be present in the vicinity. Formal consultation with the USFWS regarding potential impacts to mussel resources was initiated on January 27, 2012, and will be completed no later than June 10, 2012.

4.2.2 Water Quality Standards

Under KAR 10:031 Section 8, the reach of the Ohio River from Ohio River Mile (ORM) 933 to 937 has been designated as an Outstanding State Resource Water (OSRW) due to the confirmed presence of the federally-endangered fat pocketbook. The proposed project is located at approximately ORM 935. This designation as a Special Use Water requires that the existing water quality and habitat be "maintained and protected" unless modifications "will not have a harmful effect on the threatened or endangered species that the water supports." Because this reach of the Ohio River is an OSRW as a result of the confirmed presence of the endangered fat pocketbook, a discussion of mussel surveys completed within the reach is provided below to characterize the potential effect of the proposed project on this species.

Mussel Surveys

Surveys for unionid mussels were conducted within the vicinity of the Schultz Park Expansion area to determine potential impacts of the proposed project on federally protected mussel species and/or significant mussel resources in the Ohio River (Figure 7). Mussel data for the Schultz Park Expansion area were collected during three visits including August 2008, October 2010, and October 2011. Semi-quantitative survey methods included transects, subdivided into 10-meter segments (each segment searched for five minutes), and qualitative search effort including timed spot-dives ranging from 5 to 20 minutes each. Transects and spot dives were completed in October 2011 specifically in response to changes in the proposed location of the Schultz Park Expansion. Survey effort upstream of the proposed project was completed in October 2010 to assess mussel distribution and habitat within the overall river reach in the vicinity of the proposed project. Over 28 hours of diver search effort, including transects and spot dives covering over one acre of river substrate, has been completed within the vicinity of the Schultz Park Expansion project. The results presented below represent a synthesis of the 2008, 2010, and 2011 survey collection efforts.

Schultz Park Transects

A total of 830 live Unionidae mussels, representing 23 species, were collected from the ten semi-quantitative transects at the Schultz Park Expansion area in 2008 and 2011 (see table below). The two most abundant species comprised 60% of the total assemblage and included ebonyshell (*Fusconaia ebena* [48.6%]) and mapleleaf (*Quadrula quadrula* [11.8%]). Sixteen fat pocketbook (1.9%) were encountered during the semi-quantitative transect survey at the Schultz Park Expansion area.

Schultz Park Expansion Semi-Quantitative Mussel Survey Results

Scientific Name	Common Name	Total #	% Composition
<i>Amblema plicata</i>	Threeridge	45	5.4
<i>Ellipsaria lineolata</i>	Butterfly	16	1.9
<i>Elliptio crassidens</i>	Elephant's Ear	1	0.1
<i>Fusconaia ebena</i>	Ebonysshell	403	48.6
<i>Fusconaia flava</i>	Wabash Pigtoe	1	0.1
<i>Lampsilis cardium</i>	Plain Pocketbook	3	0.4
<i>Lasmigona complanata</i>	White Heelsplitter	1	0.1
<i>Lampsilis teres</i>	Yellow Sandshell	2	0.2
<i>Leptodea fragilis</i>	Fragile Papershell	6	0.7
<i>Ligumia recta</i>	Black Sandshell	6	0.7
<i>Megalonaias nervosa</i>	Washboard	10	1.2
<i>Obliquaria reflexa</i>	Threehorn Wartyback	44	5.3
<i>Obovaria olivaria</i>	Hickorynut	38	4.6
<i>Pleurobema sintoxia</i>	Round Pigtoe	2	0.2
<i>Potamilus alatus</i>	Pink Heelsplitter	40	4.8
<i>Potamilus capax</i>	Fat Pocketbook	16	1.9
<i>Potamilus ohioensis</i>	Pink Papershell	6	0.7
<i>Quadrula apiculata</i>	Southern Mapleleaf	1	0.1
<i>Quadrula metanerva</i>	Monkeyface	29	3.5
<i>Quadrula nodulata</i>	Wartyback	23	2.8
<i>Quadrula pustulosa</i>	Pimpleback	38	4.6
<i>Quadrula quadrula</i>	Mapleleaf	98	11.8
<i>Truncilla truncata</i>	Deertoe	1	0.1
		830	100

Survey results are shown on Figure 8 in terms of the total number of mussels collected per transect as well as the number of mussels collected per segment. Sixteen live fat pocketbook were collected from these ten transects - two at S2, one at S3, five at S5, one at T1, one at S6, and six at S8. The greatest density of mussels at the Schultz Park Expansion survey area occurred across transects S2 (3.3 mussels/ m²), S3 (3.7 mussels/m²), T1 (1.8 mussels/m²), and S5 (1.75 mussels/m²).

The majority of mussels (71%) from transect surveys at the Schultz Park Expansion area were located in the upstream portion of the survey area (upstream of transect S5) and >80m from shore in relatively deep water (>10m). Based on survey data, a dense and diverse assemblage of mussels, or mussel bed, is estimated to occur upstream of the proposed Schultz Park landform, particularly between transects S2 and S5 (Figure 9). Species richness across these transects ranged from 14 to 16 species with densities as high as 3.7 mussels/m². Based on survey data, the densest portion of the bed was found in relatively deep water (8 to 12m), with relatively coarse

substrate (sand and gravel), and approximately 40 to 160m from shore. There is also a dense (up to 1.8 mussels/ m²) assemblage (likely an extension of the mussel bed) at transect T1 between 140m and 180m from shore, which includes one confirmed fat pocketbook. The extent of the mussel bed was estimated using an inverse-distance weighting technique (ArcGIS 10 Spatial Analyst) that interpolated the mussel survey transect data. The dense mussel bed, defined in this study as having >0.75 mussels/ m², was estimated to cover approximately 3.14 acres upstream of the proposed fill, and 0.68 acres riverward of the proposed fill, as depicted in Figure 9. The proposed redesigned project footprint avoids this mussel bed.

Qualitative Search Effort

In addition to the semi-quantitative transects, over 8 hours of qualitative diver search effort was expended throughout the approximately 2,300m reach of Ohio and Tennessee Rivers within the vicinity of the Schultz Park Expansion (Figure 7). Qualitative searches, or spot dives, entailed a diver searching the riverbed for mussels for a defined time interval. A total of 259 live mussels were encountered during 19 spot dives (15-minutes each) interspersed between the Schultz Park transects downstream of transect S1 (Figure 10). Three fat pocketbook were observed during three separate 15-minute dives within the Schultz Park Expansion area; none of these are located within the proposed project footprint. A total of 595 live mussels were encountered during 26 spot dives upstream of transect S1 including: one 20-minute dive; six 15-minute dives; one 13-minute dive; and 18, 5-minute dives (Figure 10). Five fat pocketbook were observed during five separate 15-minute spot dives upstream of transect S1.

Mussel Survey Summary

The survey dataset for the Schultz Park survey reach represents over 28 diver hours of search effort covering over one acre of riverbed, resulting in a total of 1,886 live mussels observed, representing 28 species. Results of the Schultz Park surveys revealed the presence of an abundant and diverse mussel bed upstream and riverward of the proposed Schultz Park expansion footprint (Figure 9). The mussel bed, delineated as mussel densities >0.75 mussels/m², was estimated to cover 3.82 acres and was located primarily ≥80m from shore, in deep water (>10m), in a substrate consisting primarily of sand, gravel and cobble. The downstream portion of the study area (including the entire transient dock facility and a significant portion of the park expansion footprint) was characteristically siltier with a mussel assemblage that was generally less dense and not as species-rich. A total of 25 fat pocketbook were observed within the Schultz Park expansion area; 18 (72%) located either riverward or upstream of the proposed project impacts. In general, an abundance of unionid mussels was found at the confluence of the Ohio and Tennessee Rivers continuing upstream into the Tennessee River near Owen Island.

Based on the BA completed for the proposed project, along with refined design drawings, it is conservatively estimated that 76 fat pocketbook may be adversely affected by the proposed project. Using the same assumptions to calculate potential mussel impacts, it is estimated that the approximately 3.82-acre unimpacted mussel bed located upstream and riverward of the proposed project could contain 16,850 unionid mussels including 340 fat pocketbook. When considering substrate characteristics and qualitative search data, it is likely that the mussel bed extends further upstream than the available transect data can predict. Based on this likelihood the number of mussels, including fat pocketbook, that will remain unharmed after completion of the proposed project will be much larger. Therefore, a significant population of fat pocketbook as well as a diverse assemblage of unionid mussels will continue to exist within this OSRW after completion of the proposed project.

Thus, based on the documented presence of fat pocketbook and suitable habitat throughout this reach of the Ohio River, and the significant number of fat pocketbook that will not be affected by the proposed project, it appears that the impacts resulting from this project will not have a harmful effect on the threatened/endangered species that this OSRW supports.

4.3 CULTURAL RESOURCES

As recommended by the Kentucky Heritage Council, a Phase I Archaeological Survey of the project site was conducted to determine if the proposed project will impact historic or prehistoric archaeological sites that are eligible for or listed in the National Register of Historic Places. The Phase I survey identified no archaeological sites within the project area, and stated that the presence of significant historic or prehistoric archaeological deposits was unlikely due to highly disturbed conditions and the predominance of artificially created land. The SHPO concurred with these findings in letters dated September 30, 2008 and January 11, 2012 as provided in the EA.

4.4 OTHER ENVIRONMENTAL FACTORS

As documented in the EA, no cumulative and/or indirect adverse impacts to air quality, noise, water quality, floodplains, land use/zoning, community facilities, residential/commercial/industrial development, hazardous materials, visual amenities, or navigation are expected as a result of the proposed marina/dock facility.

Air Quality: The proposed project will be consistent with the Kentucky State Implementation Plan regarding the attainment of the national Ambient Air Quality Standards.

Noise: Noise impacts during construction are exempt from the City Noise Ordinance; however, commitment to minimize noise impacts have been made. Noise during operation of the marina/dock will be attenuated by the adjacent floodwall, vegetation and distance from receptors, and is well within the City Noise Ordinance requirements.

Water Quality: Temporary erosion/sedimentation impacts to the Ohio River are possible during construction; however, they will be minimized through best management practices. The project is not expected to have any long term impact on the water quality of the Ohio River or the water treatment process for the Paducah system due to the current intake being upstream of the project.

Floodplains: The project is located within the floodway of the Ohio River. A detailed HEC-RAS hydraulic analysis has been performed and a "No Net Rise" certification has been submitted along with completed permit application to the Kentucky Division of Water – Floodplain Management Section. A KDOW floodplain permit has been issued and a modification of the permit to reflect the relocation of the project 500 feet downstream is currently under review.

Land Use / Zoning: The proposed project is compatible with current land uses and will conform to the current zoning and the principal permitted uses that include loading/unloading, water port facilities, and open-type public recreation facilities such as public parks.

Community Facilities: The proposed project will result in no significant impacts to travel patterns, accessibility, community facilities, economic vitality, established business districts or public safety. Minor temporary traffic alteration may be necessary during construction.

Displacements: The proposed project will result in no relocations or displacements of businesses or residences as none are present within the project area.

Hazardous Materials: The proposed project will result in no impacts to hazardous materials/waste sites or underground storage tanks, as none are known to be present within the project area.

Visual Impacts: The project will result in no negative visual impacts due to the separation of the project area from the nearest populated areas by distance and the existing flood wall.

Navigation: Representatives from the local inland waterways industry and the U.S. Coast Guard have participated in the planning stages of the project. A 300-foot buffer will be maintained between the project and the "sail line" as depicted in Figure 2 and Navigation Chart 11 for the Ohio River. In addition, a single white light having a range of one nautical mile is proposed on the end of the transient dock (river side) to aid navigation.

5.0 MITIGATION PLAN

The City of Paducah believes that it has adequately minimized and avoided impacts to jurisdictional waters of the U.S., and proposed mitigation that adequately compensates for the aquatic resources being impacted. In evaluating the functions and values provided by the impacted portion of the Ohio River, it appears that substrate, aquatic habitat, and flow characteristics are of primary concern. These items are discussed below in terms of minimization/avoidance, hydraulic modeling, and compensatory mitigation.

5.1 MINIMIZATION AND AVOIDANCE

Impacts to the Ohio River resulting from the proposed Transient Dock facility have been minimized and avoided to as great an extent possible, while still meeting the project needs of providing enhanced public access to the river. Minimization/avoidance factors include:

- The minimum size landform necessary to adequately protect the dock and marina was designed.
- Although a total of 5.85 acres of fill is proposed below normal pool, only 2.9 acres of open water will be eliminated due to the broad side-slope of the landform. Thus, approximately 50% of the fill will continue to provide open water and river substrate habitat.
- There will be a net gain in shoreline along the project site, increasing from approximately 772 feet at present to approximately 1,149 feet following construction.
- Impacts to the mussel bed have been avoided completely.

Therefore, impacts to the river ecosystem have been minimized and significant aquatic habitat, including shoreline, open water, and substrate (including mussel habitat) will remain after project completion.

5.2 HYDRAULIC MODELING

The City of Paducah, through subcontracts with design engineer JJR and Florence & Hutcheson, Inc. (F&H), has conducted modeling of the Ohio River to assess any impact the proposed project may have on existing flow patterns. The results of the modeling were included in a report titled *Paducah Transient Mooring Facility: Hydraulic Impact Analysis – Draft Final Report* (HCCL, November 2007), which concluded that the project may have a small local influence on the water levels and velocities in its immediate vicinity, with increased velocities at the edge of the “headland” feature and marginal increases in water levels just upstream of the structure. However, it concludes: “The model results

suggest that the influence is not widespread, with negligible change in water levels at all other points of interest..." And "Given the small size of the proposed works in contrast to the cross section of the Ohio River at Paducah, it is concluded that, in general, impacts to flood levels are expected to be negligible." This was further confirmed by F&H through a detailed hydraulic analysis using HEC-RAS and subsequent issuance of a No-Net Rise Certification. A modification of this model completed for the Biological Assessment (BA) related projected flow velocity to potential transport of variable sized substrate particles. Relative to mussel habitat, the model results indicated no significant substrate scour impacts and that deposition of fine-grained particles may occur immediately downstream in the area of the dock facility. These results were used to estimate impacts to mussels in the BA. The hydraulic studies are available upon request.

5.3 COMPENSATORY MITIGATION

Compensatory mitigation for impacts to jurisdictional waters of the U.S. will be provided through a combination of restoration, enhancement, and protection components that focus on off-setting impacts to aquatic habitats and functions of the lower Ohio River.

Restoration: Restoration will be provided through re-establishment of a natural river substrate and vegetated shoreline with the construction of the proposed Schultz Park expansion landform. The coarse natural materials used to construct the landform will provide a stable substrate with increased surface area over the existing silt, sand, and gravel substrate. Over two acres of river substrate will be re-established as a result of the proposed landform. The coarse substrate of the landform will provide increased aquatic habitat for wildlife such as fish and macroinvertebrates as well as promote the biological and chemical processes necessary to maintain the river's water quality functional capacity. There will also be a net gain of approximately 377 linear feet of shoreline as a result of the proposed project. The proposed shoreline design will utilize a combination of native grasses, trees and shrubs to the greatest extent possible which will provide habitat for wildlife as well as a stable buffer from stormwater runoff.

Enhancement: Enhancement of habitat functions will be provided through increased terrestrial/aquatic habitat quality and complexity as well as through increased cultural, educational and recreational opportunities. The existing river corridor consists of a relatively steep, riprap riverbank and a river substrate consisting primarily of silt, sand and gravel. The proposed project will increase habitat quality and complexity through: diversifying terrestrial vegetation; increasing the length/complexity of the shoreline; and coarsening of the river substrate. Enhancements to the river corridor will also serve to protect the near shore habitats from barges that currently regularly beach along the bank. Other enhancements to this portion of the Ohio River will be realized through

increased cultural, educational, and recreational opportunities. The proposed project will significantly increase the riverfront's accessibility and reconnect the City and its neighbors to its heritage with the Ohio River. Interaction with the riverfront will promote a greater appreciation for, and awareness of, the Ohio River and its rich resources. The City will install interpretive stations throughout the proposed park to educate the public and increase the awareness the Ohio River ecosystem, terrestrial and aquatic wildlife (particularly the area's diverse mussel assemblage), and water quality issues in the river. Proposed recreational opportunities in the form of a multi-use trail, increased park acreage, and boating will also increase the social benefits of the river. These amenities will be connected to various parts of the city via a greenway trail.

Protection: Protection of aquatic habitat (particularly river substrate) will be provided via an in-lieu fee payment to the Kentucky Aquatic Resources Fund (KARF). This contribution shall be designated for preservation, creation, enhancement and/or protection of aquatic habitat in the lower Ohio River through implementation of protections to high quality mussel beds or other aquatic habitat, and the permanent preservation of adjacent riparian land. The City proposes to contribute \$71,706 to KARF, based on impacts to 6.29 acres of impacted mussel habitat at a 4:1 ratio and a per acre land value of \$2,850.

Even though not directly required under section 401 mitigation, impacts to mussels within the project area will be further minimized and/or avoided, through a mussel relocation effort through assistance with endangered mussel recovery efforts. The extent and specifics of the relocation effort will be determined through a work plan developed in conjunction with USFWS, with the goal to relocate as many live mussels as reasonable prior to construction. Recovery efforts support will be provided through payment of \$19,000 to KARF for take of federally-endangered mussel species, in addition to any payment for aquatic habitat. This payment shall be designated for recovery efforts for the impacted endangered species. Payment is based on mussel density and current status of recovery efforts.

6.0 CONCLUSION

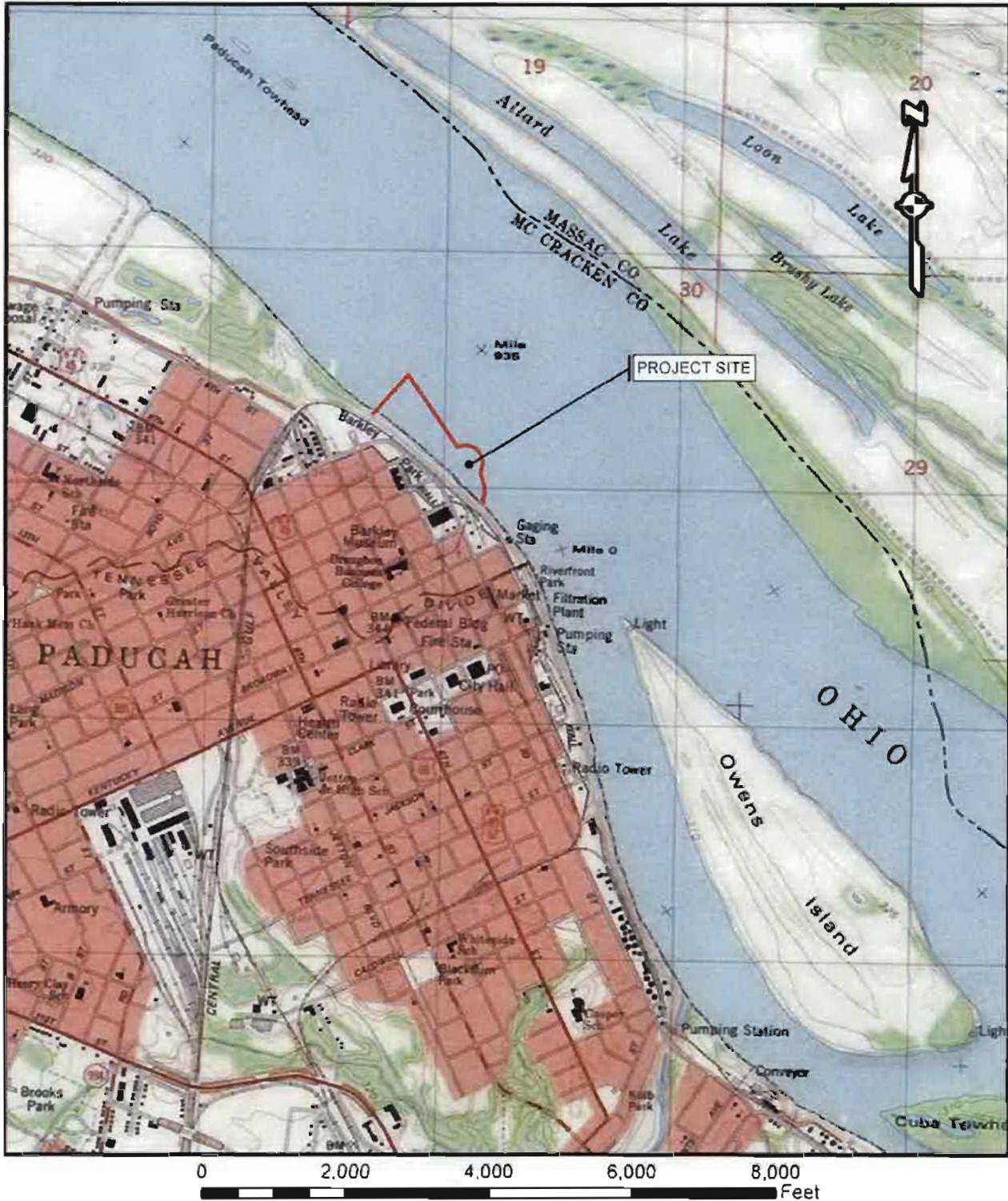
This application for Section 401 Water Quality Certification has been prepared on behalf of the City of Paducah for the proposed development of a marina/transient dock facility on the Ohio River in McCracken County, Kentucky. The project will help meet the overall need for public connection to the Ohio River as well as docking and marina amenities that help preserve the historic integrity of the downtown riverfront. The proposed location and design represent the least environmentally damaging alternative for meeting these needs.

The proposed development will result in unavoidable impacts to a total 6.64 acres of jurisdictional/navigable waters (Ohio River). Based on extensive mussel surveys and project redesign efforts, the proposed project will not jeopardize the continued existence of federally-listed threatened/endangered species. A significant population of fat pocketbook, as well as a diverse mussel assemblage, will be avoided by the proposed project and will continue to exist within this OSRW. The site contains no archaeological (historic or prehistoric) features. No other significant environmental impacts are anticipated.

Impacts to Ohio River habitat have been avoided and minimized to as great an extent possible while still meeting the purpose and need of the project. Compensatory mitigation for impacts to jurisdictional waters of the U.S. will include: re-establishment of a natural river substrate and shoreline; enhancement of habitat quality and complexity; increased cultural, educational and recreational opportunities; contributions to KARF for habitat protection/restoration in the lower Ohio River; relocation of mussels within the proposed footprint prior to construction; and contributions to KARF for endangered mussel recovery efforts. The proposed project will improve the functional capacity of this portion of the river as well as promote public awareness and appreciation for the ecosystem, providing benefits to the watershed as a whole.

FIGURES

Source: USGS 7.5' Topographic Maps: © 2011 National Geographic Society, i-cubed



PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY



SITE LOCATION MAP

FILE: Redwing/06-090-01/Figures/404&401/Location
 REDWING PROJECT 06-090-01
 REVISED DATE 3.13.2012 DRAWN BY BJO

FIGURE 1



Maximum Riverward Projection
Sailing Line

0 300 600 900 1,200 Feet

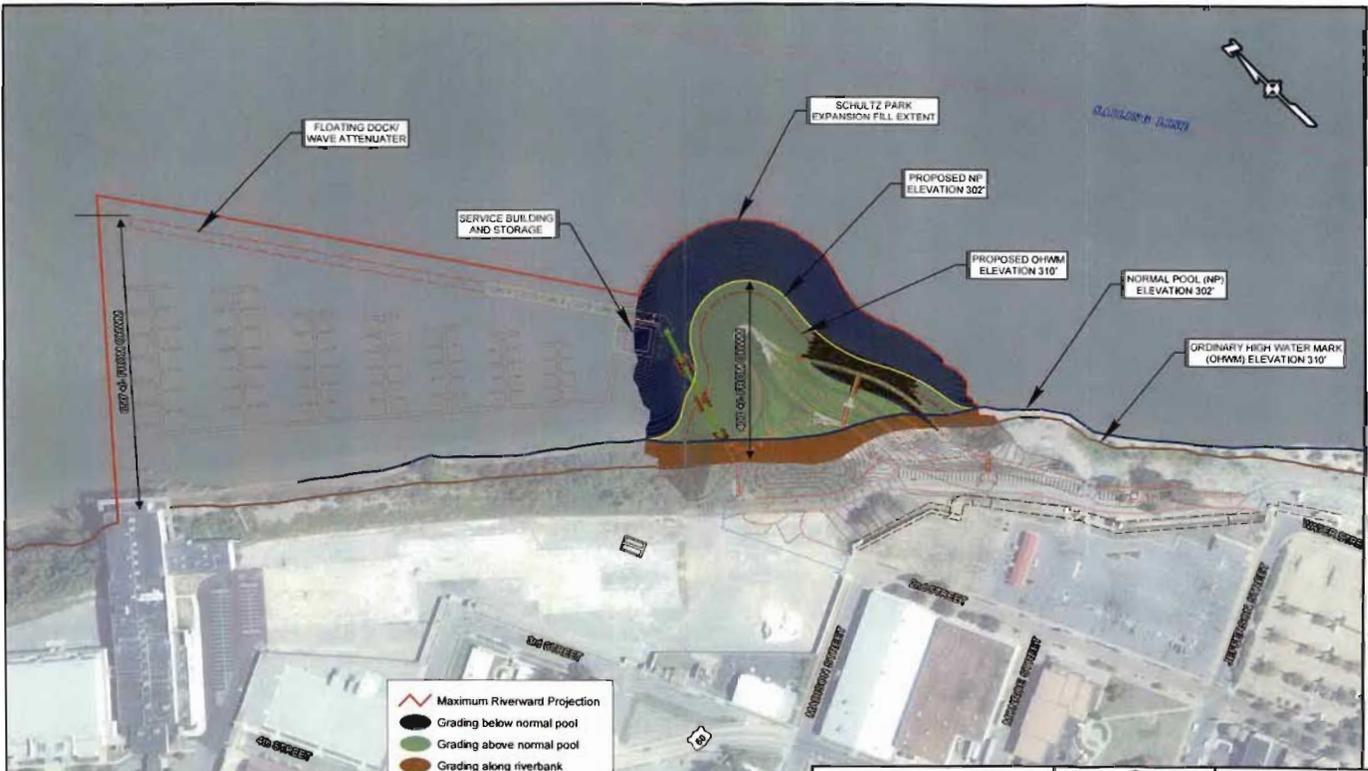
PADUCAH RIVERFRONT DEVELOPMENT
PHASE I/TRANSIENT DOCK
MCCRACKEN COUNTY, KENTUCKY

FILE # 2010-010217 (GENERAL CONTRACT)
REDWING PROJECT 06-000-01
REVISED DATE: 3.13.2012 DRAWN BY: BLD



AERIAL PHOTOGRAPH

FIGURE 2



- Maximum Riverward Projection
- Grading below normal pool
- Grading above normal pool
- Grading along riverbank

0 200 400 600 800 Feet

PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY

FILE #	Redwing-2012-014 (paducah)Development
REVISION PROJECT NO.	2012-014
REVISED DATE	3/13/2012
DRAWN BY	BUC



SITE
DEVELOPMENT PLAN

FIGURE 3



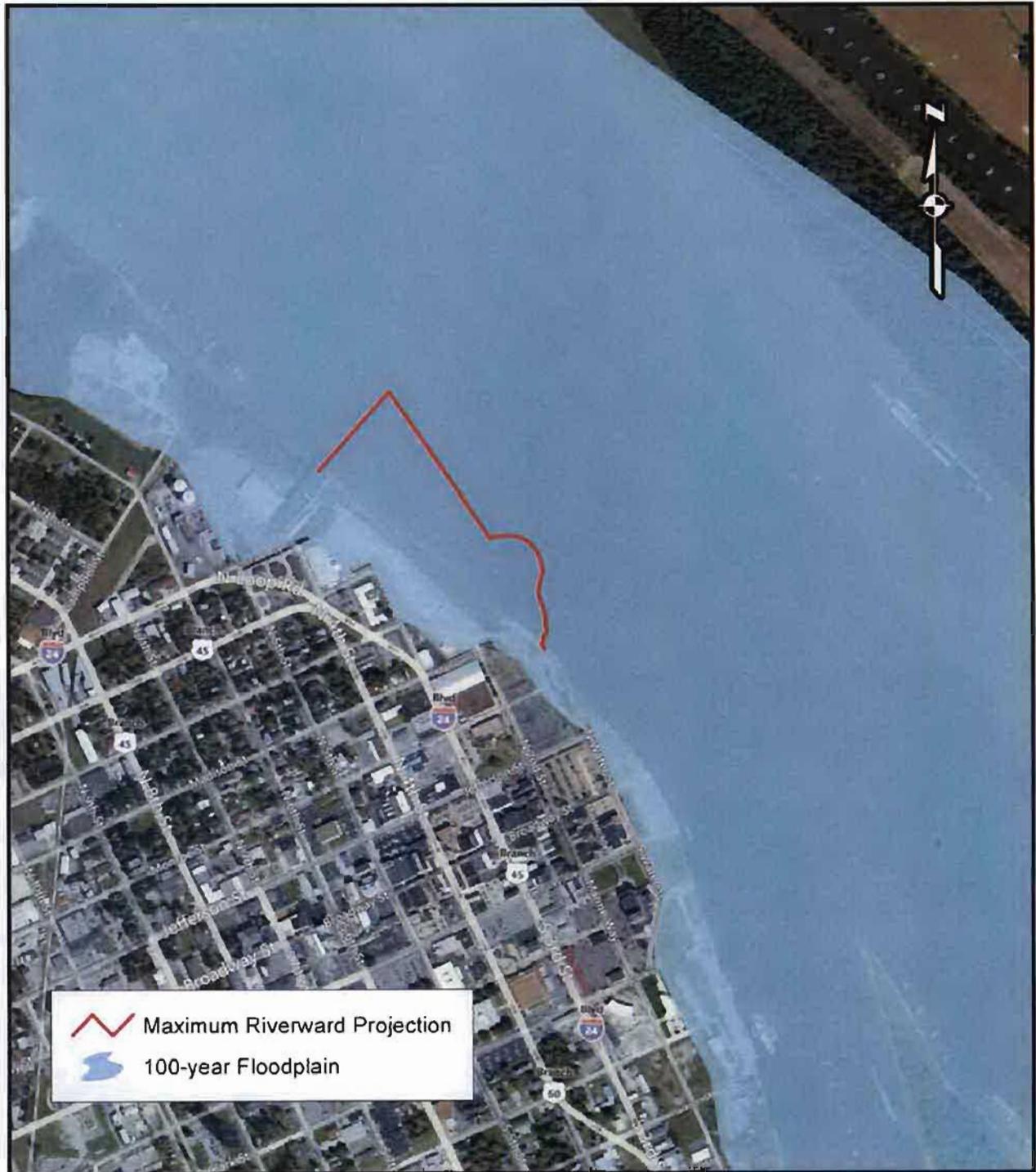
0 600 1,200 1,800 2,400
Feet

PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY
FILE: Redwing\20120215\g:\m\44441\alternatives
REDWING PROJECT: 09-000-01
REVISED DATE: 3/13/2012 DRAWN BY: SJD



LOCATION
ALTERNATIVES
FIGURE 4

Source: FEMA Q3 Digital Flood Data 1998; Bing Maps Hybrid ©2010 Microsoft Corporation and its data suppliers



0 1,000 2,000 3,000 4,000 Feet

PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090-01/Figures/404&401/FEMA

REDWING PROJECT 06-090-01

REVISED DATE 3.13.2012

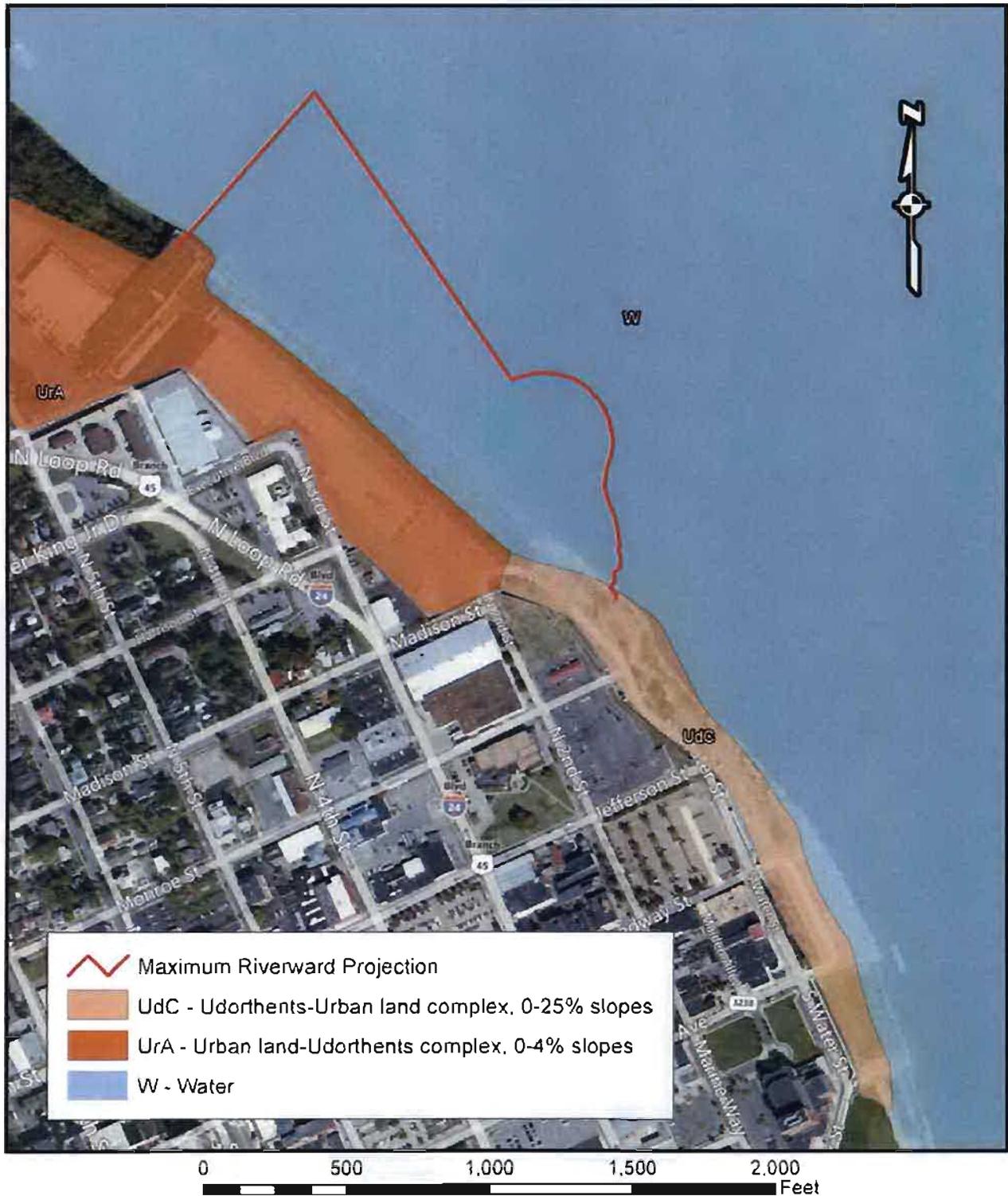
DRAWN BY BJO



FEMA
FLOODPLAIN MAP

FIGURE 5

Source: SSURGO for Ballard and McCracken Counties, Kentucky 2007; Bing Maps Hybrid ©2010 Microsoft Corporation and its data suppliers



PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCracken County, Kentucky



SOIL
 SURVEY MAP

FILE: Redwing/06-090-01/Figures/404&401/Soil
 REDWING PROJECT 06-090-01
 REVISED DATE 3 13.2012 DRAWN BY BJO

FIGURE 6



0 600 1,200 1,800 2,400 Feet

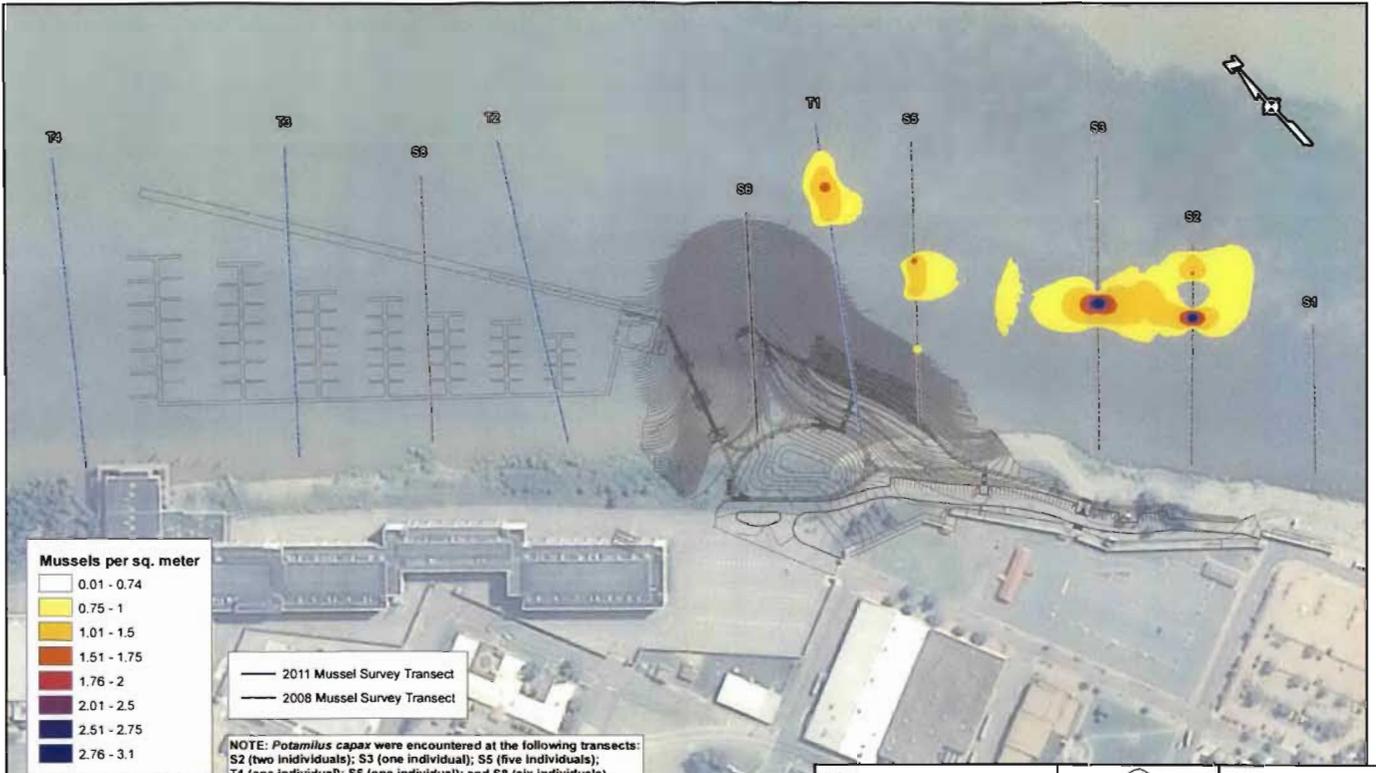
PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY

FILE: Redwing\GIS\Projects\KIN\KIN_Schultz_Survey
REDWING PROJECT 06-200-01
REVISED DATE: 5.13.2012 DRAWN BY: SJG



SCHULTZ PARK
EXPANSION MUSSEL
SURVEY SAMPLE LOCATIONS

FIGURE 7



Mussels per sq. meter

- 0.01 - 0.74
- 0.75 - 1
- 1.01 - 1.5
- 1.51 - 1.75
- 1.76 - 2
- 2.01 - 2.5
- 2.51 - 2.75
- 2.76 - 3.1

— 2011 Mussel Survey Transect
 - - - 2008 Mussel Survey Transect

NOTE: *Potamilius capax* were encountered at the following transects:
 S2 (two individuals); S3 (one individual); S5 (five individuals);
 T1 (one individual); S6 (one individual); and S8 (six individuals)

0 200 400 600 800 Feet

PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY



SCHULTZ PARK
 EXPANSION AREA
 MUSSEL BED EXTENT

FIGURE 9



0 600 1,200 1,800 2,400 Feet

PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY

FILE: Redwing\01-0001\GIS\04-04-07\Mussel_A01.pdf
 REDWING PROJECT: 06-06-01
 REVISED DATE: 3/13/2012 DRAWN BY: GJO



MUSSEL SURVEY SUMMARY

FIGURE 10

PHOTOGRAPHS



Photograph 1: Western portion of site proposed for park expansion, facing downstream (west) from riverbank. There will be no disturbance to the riverbank in this area and river impacts will be limited to dock anchors. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 2: Facing upstream from the proposed expansion of Schultz Park. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 3: Facing upstream in the area of the proposed Schultz Park expansion. The existing Schultz Park is located above the riprap bank to the right. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



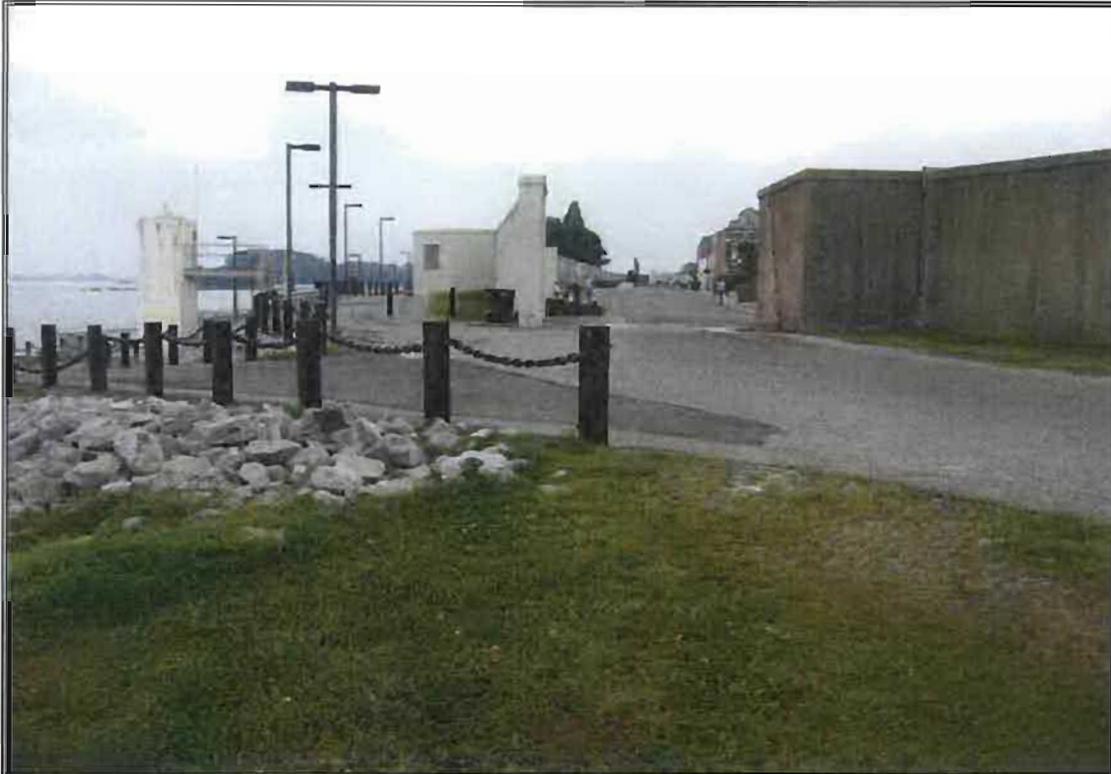
Photograph 4: The majority of the existing riverbank throughout the project area consists of riprap with scattered vegetation. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



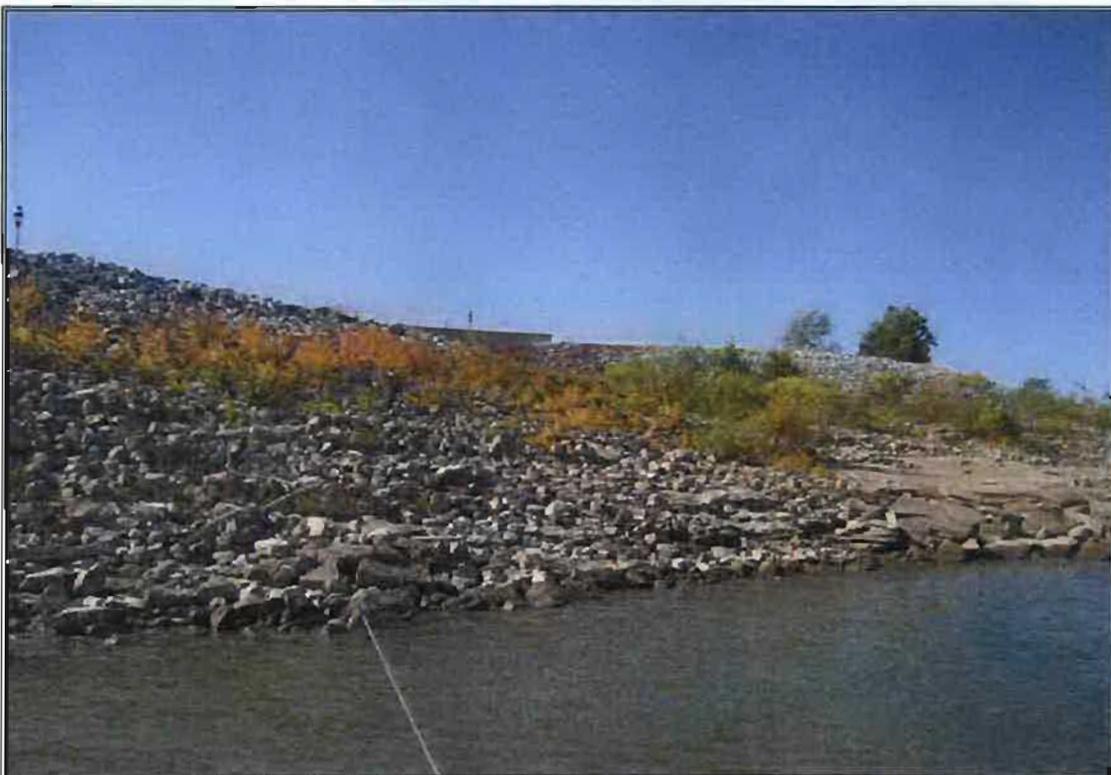
Photograph 5: The western portion of Schultz Park, facing east. The park provides limited public viewing and passive recreation opportunities. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 6: The central portion of Schultz Park, facing east. The park is dominated by common old field/lawn species with scattered trees. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 7: The eastern end of the project area, facing east toward the intersection of Jefferson and Water Streets (just past the flood wall). Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 8: The Schultz Park expansion is proposed in the foreground through placement of approximately 6.64 acres of fill into the riverbank and open water portion of the Ohio River. Paducah Riverfront Development Phase 1 / Transient Dock. October 31, 2011.

APPENDIX A

WATER QUALITY CERTIFICATION STREAM CONSTRUCTION PERMIT APPLICATION FORM

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES & ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER

APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM
AND / OR WATER QUALITY CERTIFICATION

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. *If the project involves work in a stream, such as bank stabilization, dredging or relocation, you will also need to obtain a 401 Water Quality Certification (WQC) from the Division of Water.* This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact John Dovak at 502/564-3410.

If the project will disturb more than 1 acre of soil, you will also need to complete the attached Notice of Intent for Storm Water Discharges, and return both forms to the Floodplain Management Section of the KDOW. This general permit will require you to create and implement an erosion control plan for the project.

1. OWNER: City of Paducah; c/o Rick Murphy, P.E., City Engineer
Give name of person(s), company, governmental unit, or other owner of proposed project.

MAILING ADDRESS: 300 South 5th Street
Paducah, Kentucky 42002

TELEPHONE #: (270) 444-8511 EMAIL: rmurphy@ci.paducah.ky.us

2. AGENT: Redwing Ecological Services, Inc. - Ron Thomas
Give name of person(s) submitting application, if other than owner.

ADDRESS: 1139 South Fourth Street, Louisville, KY 40203

TELEPHONE #: (502) 625-3009 EMAIL: rthomas@redwing.win.net

3. ENGINEER: _____ P. E. NUMBER: _____
Contact Division of Water if waiver can be granted.

TELEPHONE #: _____ EMAIL: _____

4. DESCRIPTION OF CONSTRUCTION: _____
Describe the type and purpose of construction and describe stream impact.

The proposed project is part of the overall Paducah Riverfront Redevelopment Plan, a master plan for the entire Ohio River waterfront at Paducah. This project involves the construction of a new marina and transient dock facility in downtown Paducah. The proposed development will include: a floating dock with 150 boat slips and gangway system; amenities including electricity, potable water, fuel and retail shopping; and public access through trails and enhancement of Schultz Park. The project is part of an executed agreement between the Kentucky Department of Fish and Wildlife Resources and the City of Paducah. The development will impact 6.64 acres of jurisdictional waters along 772 feet of the Ohio River, including 0.79 acre of riverbank and 5.85 acres of open water.

5. COUNTY: McCracken NEAREST COMMUNITY: Paducah

6. USGS QUAD NAME: Paducah East LATITUDE/LONGITUDE: N 37° 5' 28" W 88° 35' 46"

7. STREAM NAME: Ohio River
WATERSHED SIZE (in acres): NA

8. LINEAR FEET OF STREAM IMPACTED: 772 linear feet

9. DIRECTIONS TO SITE:
From the Western KY Parkway, take I-24 west to Exit 16. Right on Rt 68, Left on Rt 62, Right on Rt 60, Right on Broadway. Left on 2nd Street. Right on Jefferson Street. follow through floodwall to Schultz Park. Located in downtown Paducah between the Ohio River and the floodwall, between Jefferson Street on the east and Park Avenue on the west.

10. IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE? NO If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. **DATE:** _____

11. ESTIMATED BEGIN CONSTRUCTION DATE: June 2013

12. ESTIMATED END CONSTRUCTION DATE: June 2015

13. HAS A PERMIT BEEN RECEIVED FROM THE US ARMY, CORPS OF ENGINEERS? Yes No If yes, attach a copy of that permit. Application submitted concurrently with this WQC.

14. THE APPLICANT **MUST** ADDRESS PUBLIC NOTICE:
(a) PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:
_____ Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)
_____ Adjacent property owner(s) affidavits (Contact Division of Water for requirements)

(b) X I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE:
Public notice will be provided through the US Army Corps of Engineers Individual Permit process (30-day notice given to all adjoining land owners and other interested parties, the public at large, and regulatory/resource agencies).
Public notice will be provided through the public review portion of the Environmental Assessment (EA) process under KYTC.

15. I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:
Rick Murphy, P.E., City Engineer, Paducah, Kentucky
(Give name and title of person(s) contacted and provide copy of any approval city or county may have issued).

16. LIST OF ATTACHMENTS: See application package for site drawings.
List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.

17. I, RBM (owner) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILL OCCUR (including, for dams, the area that would be impounded during the design flood).

18. REMARKS:
The City is in active negotiations to acquire a minor parcel associated with this project. Proof of property acquisition and ownership will be provided at a later date.

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents. To the best of my knowledge, all of the information provided is true and correct.

SIGNATURE: *Rick Murphy*
(Owner or Agent sign here. If signed by an Agent, a Power of Attorney should be attached.)

DATE: 3/23/12

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR: *Rick Murphy*
Permit application will be returned to applicant if not properly endorsed by the local floodplain coordinator.

DATE: 3/23/12

SUBMIT APPLICATION AND ATTACHMENTS TO:

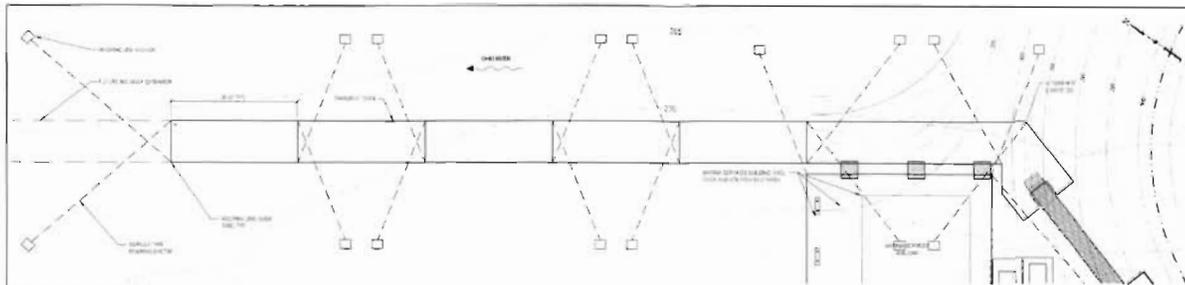
Floodplain Management Section
Division of Water
14 Reilly Road
Frankfort, Kentucky 40601

APPENDIX B

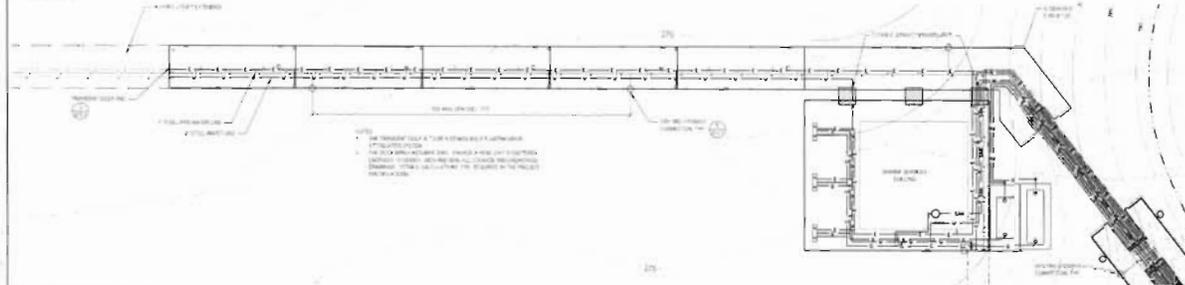
PROJECT DESIGN DRAWINGS

SELECT SHEETS

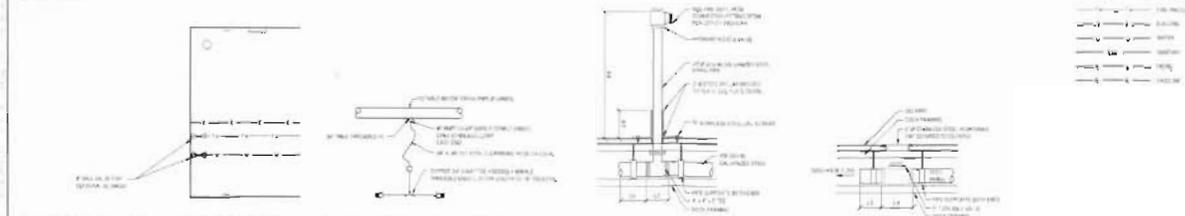
[COMPLETE DRAWING SET ATTACHED AS CD]



TRANSIENT DOCKWAVE ATTENUATOR LAYOUT
SCALE: 1" = 10'



TRANSIENT DOCKWAVE ATTENUATOR UTILITY LAYOUT
SCALE: 1" = 10'



TRANSIENT DOCKWAVE ATTENUATOR UTILITY ENDING
SCALE: 1" = 10'



WATER SUPPLY TO POWER PEDESTAL
SCALE: 1" = 10'



DRY FIRE HYDRANT
SCALE: 1" = 10'

SCHULTZ PARK AND TRANSIENT DOCK
CITY OF PADUCAH

JJR
JAMES J. RYAN, P.E.
100 WILLIAMSON STREET
ANDERSON, INDIANA 46011
317.427.1111
317.427.1111
jrr@jjr.com

NO.	DATE	DESCRIPTION
1	08/05/2014	ISSUED FOR PERMIT
2		
3		
4		
5		
6		
7		
8		
9		
10		

NOT FOR CONSTRUCTION

TRANSIENT DOCK



SCALE: 1" = 10'

DATE: 24.11.2014
PROJECT: TRANSIENT DOCK
DRAWING: D-1.1

SCHULTZ PARK AND TRANSIENT DOCK

City of Paducah

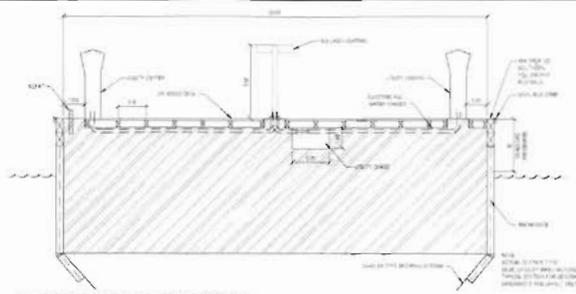
JJR
 JAMES J. RYAN & ASSOCIATES, INC.
 1000 W. MAIN STREET
 PADUCAH, MISSOURI 62050
 505.527.1111
 www.jjr.com

DATE:	02/12/2014
PROJECT:	SCHULTZ PARK
SCALE:	AS SHOWN
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	

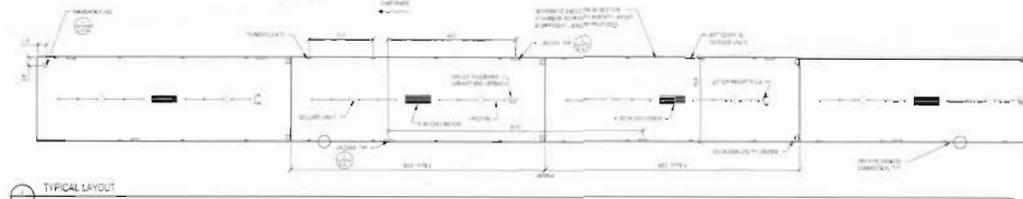
NOT FOR CONSTRUCTION

TRANSIENT DOCK DETAILS

DATE: 2/12/2014
 PROJECT: SCHULTZ PARK
 SCALE: AS SHOWN
D-2.1



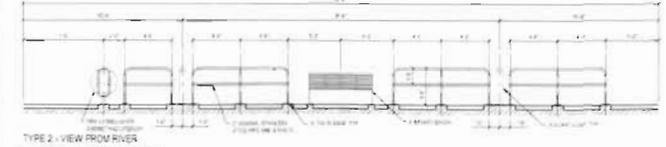
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 SCALE: 1/4" = 1'-0"



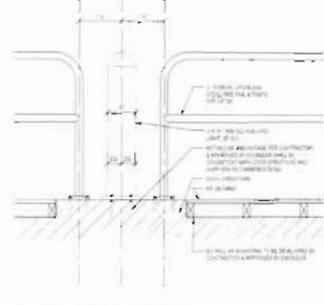
TYPICAL LAYOUT
 SCALE: 1/4" = 1'-0"



TYPE 1 - VIEW FROM RIVER



TYPE 2 - VIEW FROM RIVER
 TRANSIENT DOCK ELEVATION
 SCALE: 1/4" = 1'-0"



BOLLARD AND RAILING ELEVATION
 SCALE: 1/4" = 1'-0"



RAILING ELEVATION
 SCALE: 1/4" = 1'-0"



LADDER
 SCALE: 1/4" = 1'-0"

**SCHULTZ PARK
AND TRANSIENT
DOCK**

CITY OF PADUCAH

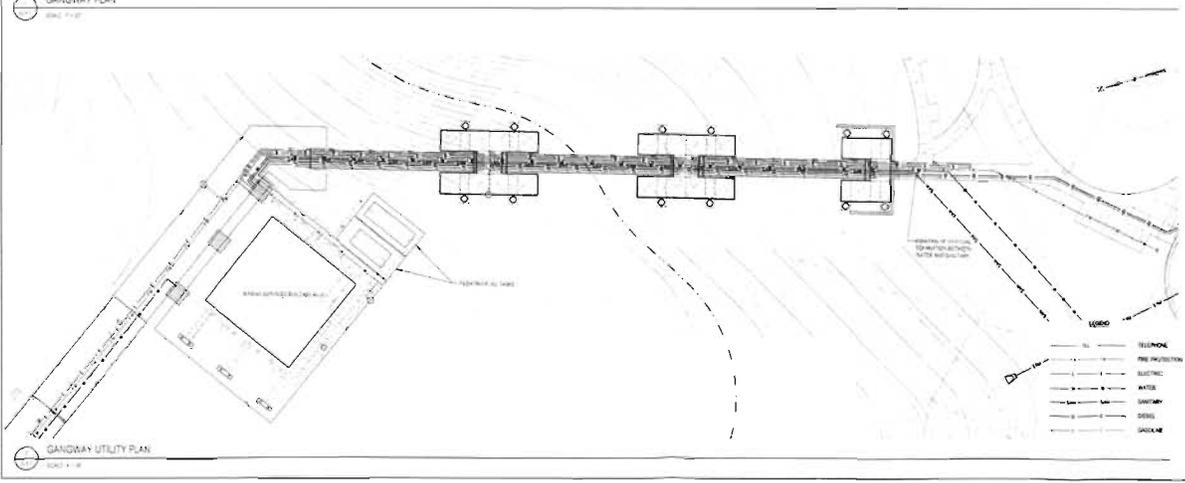
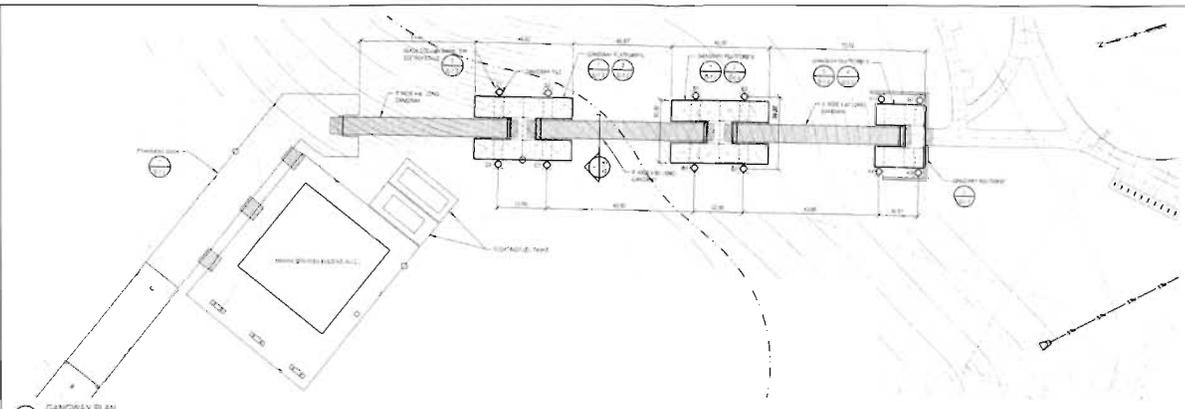
JJR
 JAMES J. RYAN, INC.
 1000 W. BROADWAY
 SUITE 1000
 PADUCAH, KY 40301
 (502) 838-1111
 www.jjr.com

DATE	NO. 001
BY	JJR/001
REVISION	
DATE	
BY	
REVISION	
DATE	
BY	
REVISION	

NOT FOR CONSTRUCTION

GANGWAY & UTILITY PLAN

SCALE: 1" = 10'
 DATE: 04/15/2008
 SHEET: G-1.1



SCHULTZ PARK
AND TRANSIENT
DOCK

CITY OF PADUCAH

JJR

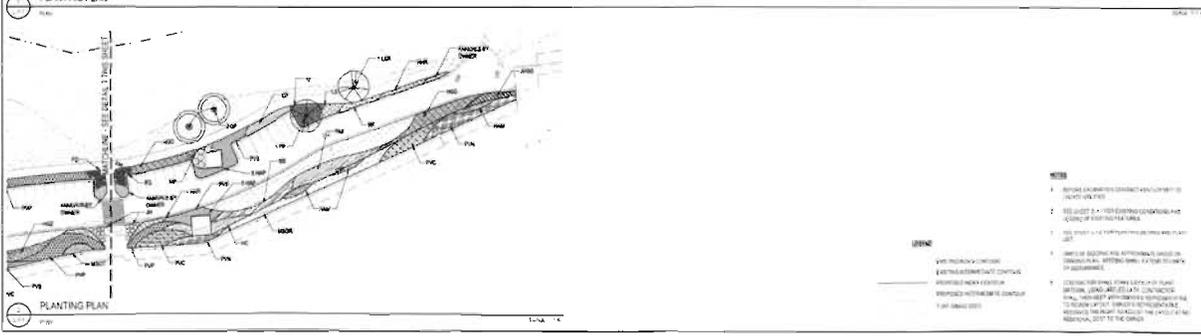
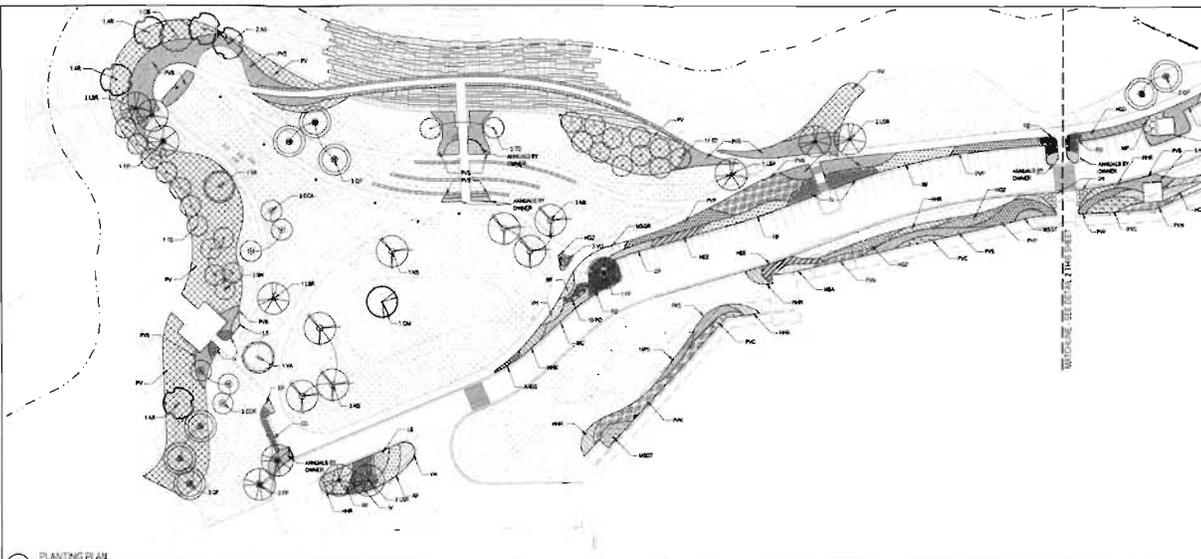
JJR
1001 W. MAIN STREET
PADUCAH, KENTUCKY 40301
502.241.1377
www.jjr.com

NO.	DATE	DESCRIPTION

NOT FOR CONSTRUCTION

PLANTING PLAN

DATE: 2/17/2020
SCALE: L-1.1



- NOTES**
1. REFER TO ALL OTHER CONTRACT DOCUMENTS FOR ALL NOTES.
 2. SEE PLANT SPECIFICATIONS FOR ALL PLANTINGS AND SPECIFICATIONS FOR ALL MATERIALS.
 3. SEE PLANT SPECIFICATIONS FOR ALL PLANTINGS.
 4. PLANTINGS TO BE INSTALLED AS SHOWN ON THIS PLAN UNLESS OTHERWISE NOTED ON CONTRACT DOCUMENTS.
 5. CONTRACTOR SHALL VERIFY ALL PLANTINGS ARE HEALTHY AND GROWN TO THE SPECIFICATIONS AND TO THE SCHEDULED PLANTING DATE. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLANTING OF ANY PLANTINGS THAT DO NOT MEET THE SPECIFICATIONS.

- LEGEND**
- EXISTING PLANTING
 - PROPOSED PLANTING
 - PROPOSED PLANTING
 - 1" = 100'

SCHULTZ PARK
AND TRANSIENT
DOCK

CITY OF PADUCAH

JJR
JAMES J. RYAN, INC.
215 W. HARRISON STREET
PADUCAH, KY 40301-1001
606.251.1111
www.jjr.com

NO.	DESCRIPTION	QTY	UNIT
1	PLANT SCHEDULE	1	SET
2	PLANT SCHEDULE	1	SET
3	PLANT SCHEDULE	1	SET
4	PLANT SCHEDULE	1	SET
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NOT FOR CONSTRUCTION

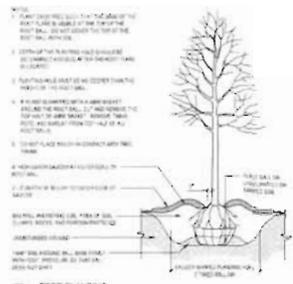
PLANT SCHEDULE AND
DETAILS

DATE: 2/17/2010

L-1.2

PLANT LIST

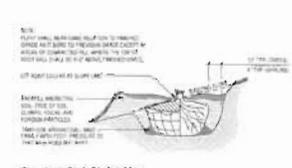
SYM.	SCIENTIFIC NAME	COMMON NAME	SIZE	ROOT	QUANT.	COMMENTS
CANOPY DECIDUOUS TREES						
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02	Acer rubrum	Red Maple	12" H, 1" DBH	Ball	5	1st Spec. Group
03	Fraxinus americana	White Ash	12" H, 1" DBH	Ball	5	1st Spec. Group
04	Quercus alba	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
05	Quercus prinus	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
06	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
07	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
08	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
09	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
10	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
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78	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
79	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
80	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
81	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
82	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
83	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
84	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
85	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
86	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
87	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
88	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
89	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
90	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
91	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
92	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
93	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
94	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
95	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
96	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
97	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
98	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
99	Quercus sp.	Pin Oak	12" H, 1" DBH	Ball	5	1st Spec. Group
100	Quercus sp.	White Oak	12" H, 1" DBH	Ball	5	1st Spec. Group



TREE PLANTING
SCALE: 1/4" = 1'-0"



TREE PRUNING
SCALE: 1/4" = 1'-0"





US Army Corps
of Engineers
Louisville District ®

Public Notice

Public Notice No.
LRL-2008-1267-A-sew

Open Date:
19 June 2012

Close Date:
19 July 2012

Please address all comments and inquiries to:
U.S. Army Corps of Engineers, Louisville District
ATTN: Sam Werner, CELRL-OP-FW,
P.O. Box 489
Newburgh, Indiana 47629-0489

Phone: (812)842-2768

This notice announces an application submitted for a Department of the Army (DA) Permit, subject to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act:

APPLICANT: City of Paducah
P.O. Box 2267
Paducah, Kentucky 42002

AGENT: Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, Kentucky 40203

LOCATION: The proposed project is located on the left bank
of the Ohio River, Mile 934.8-935.1, at Paducah,
McCracken County, Kentucky.

Latitude: 37.0926° North
Longitude: 88.5987° West
7.5 Minute Quad: Paducah East

PURPOSE: To construct a land mass and marina/transient
dock with wave attenuator including a floating
dock with 150 boat slips, an overlook, and a
gangway system with amenities including on dock
fueling, water and electricity.

DESCRIPTION OF WORK: The work would include the placement 165,000 cubic yards of clean granular fill material below the Ordinary High Water (OHW) elevation of 310 feet Ohio River Datum (ORD), to provide a mass land fill and river overlook which would protect the marina and provide access and observation opportunities to the public. The fill would be placed in a peninsular shape with maximum elevation at approximately 338 feet above mean seal level (MSL). It would also extend riverward a maximum of 403 feet at normal pool elevation of 302.0 feet ORD. Additionally, a marina with a series of 150 boat slips and a floating dock/wave attenuator would be constructed immediately downstream of the mass fill. The docks and 50 eight foot concrete deadmen weight cubes would project a maximum of 655 feet at normal pool elevation of 302.0 feet ORD. A gangway system would be constructed from top of bank to the base of the floating dock/wave

Operations Division
Regulatory Branch (west)
Public Notice No. LRL-2008-1267-sew

attenuator where the service and storage building as well as the fueling system would be located. The docks would also include a handrail and lighting system.

AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES: Other alternatives investigated by the applicant would have required more fill material into "waters of the United States." The preferred alternative reduced the quantities of fill into the Ohio River to the minimum amount necessary to protect the dock and marina. By utilizing the existing Schultz Park, avoidance of other aquatic resources was attainable. The mass fill portion of the project would provide an additional 377 linear feet of shoreline as well as increased aquatic habitat quality and complexity through the use of coarse stable natural materials used for the construction.

REVIEW PROCEDURES: A DA Permit cannot be issued if any legally required Federal, State, or local authorization or certification is denied. A DA permit, if otherwise warranted, will not be issued until a State of Kentucky Water Quality Certification or waiver is on file at this office. In order to comply with Section 401 of the Clean Water Act, the applicant, by this notice, hereby applies for State certification from the Kentucky Natural Resources and Environmental Protection Cabinet Division of Water (KDOW).

Copies of this notice are sent to the appropriate Federal and State Fish and Wildlife Agencies. Their views and comments are solicited in accordance with the Fish and Wildlife Coordination Act of 1956. Through previous mussel surveys, it has been determined that the Federally endangered fat pocketbook (*Potamilus capax*) is present within the proposed project area. Additionally, based on density/diversity of the mussel bed upstream and riverward of the proposed project, the U.S. Fish and Wildlife Service (USFWS) assumes presence of the spectaclecase (*Cumberlandia monodonta*), pink mucket (*Lampsilis abrupt*), orangefoot pimpleback (*Plethobasus cooperianus*), sheepsnose (*Plethobasus cyphus*), and the rabbitsfoot (*Quadrula cylindrica cylindrical*) species as well. Formal consultation with the USFWS was initiated on January 27, 2012.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. A request for a public hearing must state the specific interest which might be damaged by issuance of the DA Permit.

The National Register of Historic Places has been examined, and it has been determined that there are no properties currently listed on the Register which would be directly affected by the proposed work. If we are made aware, as a result of comments received in response to this notice, or by other means, of specific archaeological, scientific, prehistorical, or historical sites or structures which might be

Operations Division
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affected by the proposed work, the District Engineer will immediately take the appropriate action necessary pursuant to the National Historic Preservation Act of 1966 - Public Law 89-665 as amended (including Public Law 96-515).

The decision whether to issue a permit will be based on an evaluation of the probable impact 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; among those are conservation, economics, aesthetic values, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production, and in general, the needs and welfare of the public. In addition, the evaluation of the impact of the activity on the public interest will include application of the guidelines (40 CFR Part 230) promulgated by the Administrator, United States Environmental Protection Agency, under authority of Section 404(b) of the CWA.

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 a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Written statements received in this office on or before the closing date will become a part of the official record and will be considered in the determination on this permit request. Any objections which are received during this period will be forwarded to the applicant for possible resolution before the determination is made whether to issue or deny the requested DA Permit. A permit will be granted unless its issuance is found to be contrary to the public interest.

Information pertaining to this application is available for public examination during normal business hours upon prior request. Drawings are available on Louisville District's Internet site at <http://www.lrl.usace.army.mil/orf/listnotices.asp>. All comments regarding this proposal should be addressed to Sam Werner; CELRL-OP-FW

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at the address noted above and should refer to the Public Notice
Number LRL-2008-1267-sew.

If you desire to submit your comments by email, you must comply with
the following:

a) In the subject line of your email, type in **ONLY** the Public
Notice ID No. LRL-2008-1267-A-sew.

Example:

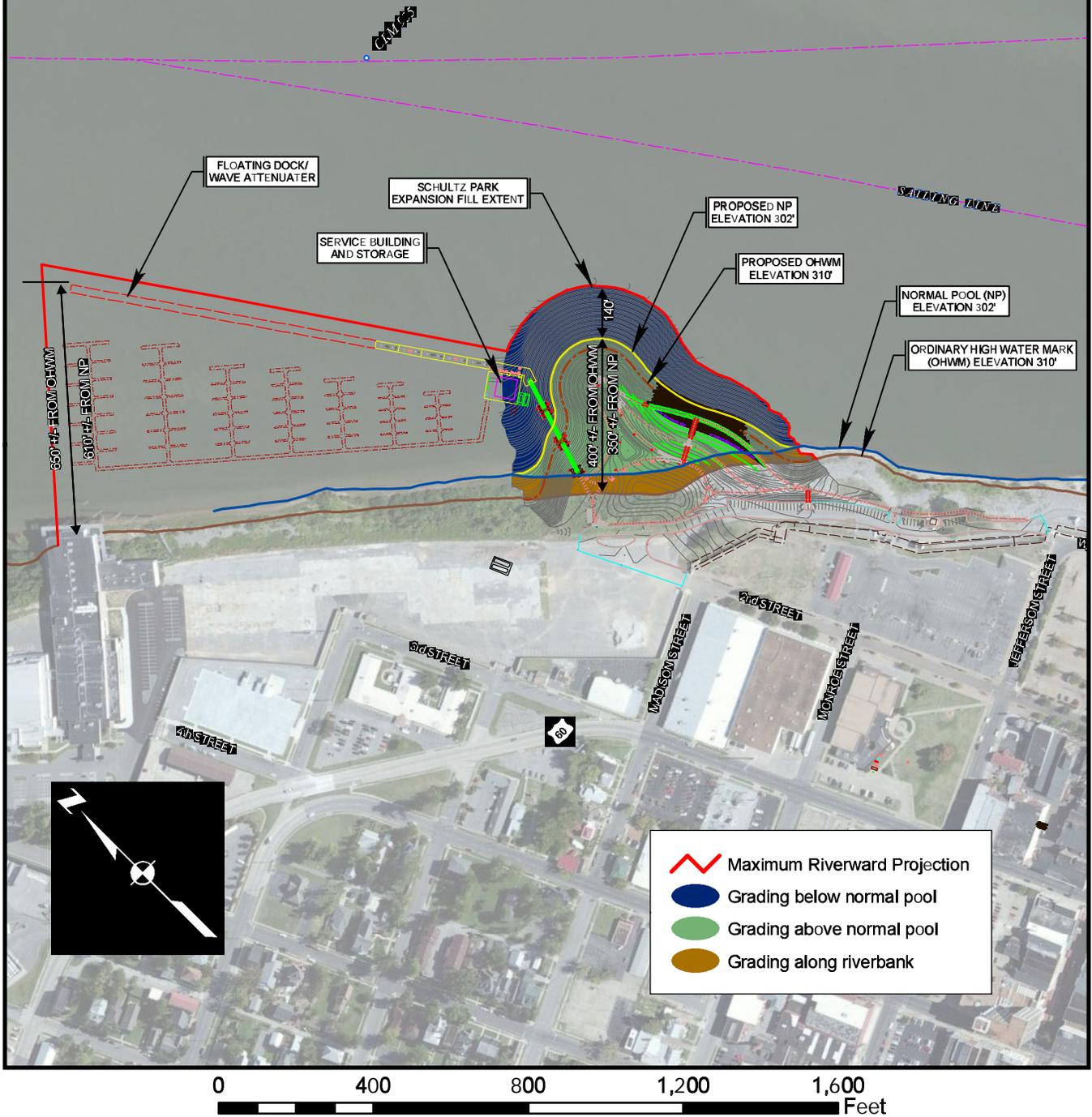
Subject: LRL-2008-1267-sew

b) Provide your physical mailing address and telephone number.

c) Send your email to: lrl.regulatorypubliccomment@usace.army.mil

d) If you are sending attachments greater than 1 Mb in size with
your email, you must send a hard copy (CD or paper) to the Corps'
physical address as well.

Maximum riverward projection of the land mass from normal pool elevation to the toe of slope = 490 feet



**PADUCAH RIVERFRONT
REDEVELOPMENT PROJECT
McCRACKEN COUNTY, KENTUCKY**

FILE: Redwing/06-090-01/Figures/FIGURE3_8x11

REDWING PROJECT 06-090-01

REVISED DATE 4.26.2012

DRAWN BY BJO



City of Paducah
Paducah Riverfront Project
Plan View Map
Sheet 2 of 8



**APPLICATION FOR
SECTION 404 INDIVIDUAL PERMIT
and
SECTION 10 NAVIGABLE WATER PERMIT**

**PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCracken County, Kentucky**

Prepared for:

**U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT**

March 2012



REDWING
ECOLOGICAL SERVICES, INC.

1139 South Fourth Street • Louisville, KY 40203 • Phone 502.625.3009 • Fax 502.625.3077

March 14, 2012

Mr. Michael Ricketts
Chief, Newburgh Regulatory Section
U.S. Army Corps of Engineers – Louisville District
6855 State Road 66
Newburgh, IN 47630

Subject: **Application for Section 404 Individual Permit and
Section 10 Navigable Waters Permit
Paducah Riverfront Development Phase 1/Transient Dock
McCracken County, Kentucky
Redwing Project 06-090-01**

Dear Mr. Ricketts:

Redwing Ecological Services, Inc. (Redwing), on behalf of the City of Paducah, is pleased to submit this Joint Application for a Section 404 Individual Permit and a Section 10 Navigable Waters Permit for the proposed Paducah Riverfront Development Phase 1/Transient Dock project in Paducah, McCracken County, Kentucky. The proposed development will result in unavoidable impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 linear feet of the Ohio River, including 0.79 acre of riverbank and 5.85 acres of open water. This application report presents required project information and additional supplemental information, including project purpose and need, project alternatives, project impacts, project design, threatened/endangered species surveys, and archaeological surveys.

We appreciate the opportunity to work with you on this project. Please contact Ron Thomas or Brian O'Neill at (502) 625-3009 with any questions you have during your review.

Sincerely,

Brian J. O'Neill
Project Aquatic Biologist

Ronald L. Thomas
Principal
Senior Ecologist

File 06-090-01/Reports/404/PaducahTransientDock-IP

cc: Rick Murphy – City of Paducah
Jason Petersen – Florence & Hutcheson, Inc.

**APPLICATION FOR
SECTION 404 INDIVIDUAL PERMIT
AND
SECTION 10 NAVIGABLE WATERS PERMIT**

**PADUCAH RIVERFRONT DEVELOPMENT PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY**

Submitted to:

**U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT**

Submitted by:

CITY OF PADUCAH, KENTUCKY

Prepared by:

**REDWING ECOLOGICAL SERVICES, INC.
Louisville, Kentucky**



**Brian J. O'Neill
Project Aquatic Biologist**



**Ronald L. Thomas
Principal
Senior Ecologist**

March 14, 2012

EXECUTIVE SUMMARY

The City of Paducah is proposing the development of a public marina/transient dock facility in downtown Paducah, McCracken County, Kentucky. The purpose of the development is to provide needed public connections to, and boat facilities on, the Ohio River in the vicinity of downtown Paducah. The proposed development includes a floating dock with approximately 150 boat slips, a fuel dock, marina administration buildings, a gangway system, public access for walking and fishing, potable water and electrical pedestals, and enhancements of Schultz Park.

The project is a major component of Paducah's overall master plan for the entire Ohio River waterfront. The purpose of the proposed project is to provide public connections to the riverfront and provide needed docking and amenities to both transient boats and recreational boat owners. These facilities include loading/unloading for transient boats, docking, refueling and related amenities.

No practicable alternative sites exist in the vicinity of downtown that can accommodate the needed marina and transient dock facilities. The associated ecological/environmental impacts, access issues, and acquisition costs make other sites unacceptable. The project design provides the needed docking and marina amenities to serve downtown Paducah while minimizing impacts to jurisdictional waters, aquatic resources, and the overall environment. Thus, the proposed Paducah Riverfront Development Phase 1/Transient Dock site represents the least environmentally damaging practicable alternative for meeting the needs of the project.

The proposed development will result in unavoidable impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 feet of the Ohio River. Impacts include 0.79 acres of riverbank and 5.85 acres of open water for expansion of Schultz Park, providing public access to the river, and anchoring of floating docks. The development has minimized and avoided jurisdictional water impacts to as great an extent possible by limiting impacts to the Ohio River and high quality aquatic habitat to the minimum necessary to meet the need for public marina and dock facilities. Mitigation for riverbank and open water impacts are proposed in the form of: a contribution to the Kentucky Aquatic Resource Fund (for riparian/riverbed habitat protection); re-establishment of riverbed and shoreline on site; and enhancing the educational and recreational functions of the river.

Based on threatened/endangered species surveys of the site, and contingent upon completion of formal consultation with the USFWS, the proposed project is not likely to jeopardize the continued existence of federally threatened/endangered species, or adversely affect their critical habitat. No winter or summer habitat for the federally-endangered Indiana bat (*Myotis sodalis*) exists within the site. Mussel surveys of the project site were conducted in August 2008, October 2010 and October 2011. The federally-endangered fat pocketbook (*Potamilus capax*) was identified within the project area. Based on the Biological Assessment (BA) issued by Redwing on January 3, 2012, and refined design drawings, the proposed project will result in a take of 75 fat pocketbook. Proposed conservation measures include support for endangered mussel propagation efforts and compensation for substrate habitat loss through contributions to the Kentucky Aquatic Resources Fund. Formal consultation with the USFWS was initiated on January 27, 2012, which will result in issuance of a Biological Opinion (BO) on or before June 10, 2012. Preliminary coordination with the USFWS has indicated that they may designate a minimal take of the endangered orangefoot pimpleback (*Plethobasus cooperianus*) and pink mucket (*Lampsilis abrupta*) even though neither of these species were identified during extensive surveys of the area. The USFWS has also preliminarily indicated that some level of mussel relocation effort in the project footprint will likely be required.

Based on a completed Phase 1 survey, no archaeological sites were identified within the project area. It was also concluded that no intact archaeological deposits are likely to be present due to the disturbed nature of the site. Thus, the proposed project is not likely to have an adverse impact on significant archaeological sites or historic properties that are listed, or eligible for listing, on the National Register of Historic Places. These findings were confirmed by the State Historic Preservation Office (SHPO) in letters dated September 30, 2008 and January 11, 2012.

An Environmental Assessment (EA) is being conducted as required by 23 CFR 771.115(c) and the National Environmental Policy Act (NEPA) of 1969 concurrent with this application to determine the proposed project's impact to the social, ecological and cultural environments. The EA document is currently under review by the Kentucky Transportation Cabinet and the Federal Highway Administration and a final document should be submitted in April 2012. As documented in the EA process, the proposed project is not expected to result in any cumulative and/or indirect adverse impacts to air quality, noise, water quality, floodplains, land use/zoning, community facilities, residential/commercial/industrial development, hazardous materials, visual amenities, or navigation.

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Photograph

1. Western portion of site proposed for park expansion, facing downstream (west) from riverbank. The proposed mass fill will be placed in the foreground and extend riverward. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
2. Facing upstream from the proposed expansion of Schultz Park. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
3. Facing upstream from the area of the proposed Schultz Park expansion. The existing Schultz Park is located above the riprap bank to the right. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
4. The majority of the existing riverbank throughout the project area consists of riprap with scattered vegetation. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
5. The western portion of Schultz Park, facing east. The park provides limited public viewing and passive recreation opportunities. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
6. The central portion of Schultz Park, facing east. The park is dominated by common old field/lawn species with scattered trees. Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
7. The eastern end of the project area, facing east toward the intersection of Jefferson and Water Streets (just past the flood wall). Paducah Riverfront Development Phase 1/Transient Dock. May 14, 2008.
8. The Schultz Park expansion is proposed in the foreground through placement of approximately 6.64 acres of fill into the riverbank and open water portion of the Ohio River. Paducah Riverfront Development Phase 1/Transient Dock. October 31, 2011.

1.0 INTRODUCTION

The City of Paducah respectfully submits this joint application for an Individual Permit under Section 404 of the Clean Water Act and a Navigable Waters permit under Section 10 of the Rivers and Harbors Act for jurisdictional/navigable water impacts associated with the proposed development of the Paducah Riverfront Development Phase 1/Transient Dock facility on the Ohio River in Paducah, McCracken County, Kentucky. The objectives of this report are to describe:

- the proposed project in terms of purpose and need, alternatives, and proposed development plans
- the existing conditions at the site in terms of natural habitats, and water/wetland functions and values
- potential project impacts related to waters, threatened/endangered species and cultural resources
- proposed mitigation plans

A completed Application for Department of the Army Permit is provided as Appendix A. The required list of adjacent property owners is provided as Appendix B.

An Environmental Assessment (EA) is being conducted as required by 23 CFR 771.115(c) and the National Environmental Policy Act (NEPA) of 1969 concurrent with this application to determine the proposed project's impact to the social, ecological and cultural environments. The EA document has been submitted and is currently under review by the Kentucky Transportation Cabinet and the Federal Highway Administration, and should be finalized and ready for public involvement in April 2012.

2.0 PROJECT DESCRIPTION

As part of their overall riverfront development initiative, the City of Paducah is proposing the construction of a marina/transient dock facility on city-owned property in Paducah, McCracken County, Kentucky (Figures 1 and 2). The project site is located on the Ohio River, extending from the floodwall at the end of Jefferson Street westward to the floodwall opening at 4th Street. The proposed landform extends approximately 400 feet from the shore and the transient dock extends approximately 650 feet at the greatest extent into the river from the ordinary high water mark (Figure 3). The site is comprised of the Ohio River and undeveloped river corridor above normal pool, including the existing Schultz Park. The following project description is based on the EA document prepared for the overall waterfront development and includes a discussion of project purpose and need, project alternatives, and proposed development.

2.1 PROJECT PURPOSE AND NEED

Although Paducah has historically had close ties to the Ohio and Tennessee Rivers, it has not fully capitalized on potential recreational, cultural and historical connections with the river due to the lack of waterfront access and facilities. A downtown redevelopment plan, initiated in 1992, has gained a national reputation for downtown renewal; however, Paducah still lacked a major public link to the riverfront. This need has resulted in a long-term commitment for physical renovation of the riverfront with the goals of attracting new tourism, providing recreation and economic development opportunities, and reconnecting people with the river.

The City of Paducah has completed a master plan for the redevelopment and revitalization of the Paducah riverfront to capitalize on growing opportunities. It includes a comprehensive analysis of existing conditions, and recommendations to further enhance Paducah's cultural, historical, recreation, tourism and economic development potential. Currently proposed waterfront projects include a boat launch facility and the marina/transient dock facility, both of which are fully described in the EA document prepared for the Kentucky Transportation Cabinet and the Federal Highway Administration.

The purpose of the proposed project is to provide accommodations for transient boaters and local recreational boaters in the vicinity of downtown Paducah, and to provide public connections to the riverfront. The need for the marina/transient dock is to meet the demand for loading/unloading facilities for transient boats and to provide a marina, with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown Paducah, providing opportunities to refuel, dine, and purchase supplies. Currently available facilities include

unprotected docking on the riverbank near downtown Paducah and an on-water refueling/marina facility located 33 miles upstream at Golconda, Illinois.

2.2 PROJECT ALTERNATIVES

An evaluation of potential alternatives for the proposed Paducah Riverfront Development Phase 1/Transient Dock, following Section 404(b)(1) guidelines, identified the proposed project as the least environmentally damaging practicable alternative for meeting the identified Ohio River access needs of the community. The City has evaluated alternatives for the proposed marina/transient dock through the consideration of alternative site locations as well as alternative project designs in the process of developing the currently proposed “build” alternatives. This evaluation was documented in the EA and is summarized below in terms of the no-build alternative, alternative site locations, and alternative project designs.

2.2.1 No-Build Alternative

The No-Build Alternative for the marina/transient dock project was evaluated for purposes of comparison, but is not a practicable option because it does not address the identified need to: reconnect the public to the river; provide loading/unloading facilities for transient boats; and provide a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. The no-build alternative would require continued use of the inadequate existing facilities that include docking along the riverbank with no related amenities and utilizing refueling and marina facilities over 30 miles away. It will not allow the City to fully capitalize on its recreational, cultural, and historical ties with the river, and the economic opportunities that these present. Not building the marina/transient dock facility will inhibit new tourism, recreation, and economic development opportunities for the City.

2.2.2 Alternative Sites

The proposed site for the marina/transient dock facility was selected based on a number of locational factors including:

- proximity to downtown Paducah
- land owned by Paducah/McCracken County
- level of existing development on the properties in question
- ease of access for the public via major streets or highways
- degree of potential impact to cultural, social and environmental resources

Because the river and river-related activities are an integral part of Paducah's downtown environment, it is important to provide a marina and transient dock facility near downtown Paducah. Very few sites that can accommodate a sufficiently-sized marina/dock are available along the riverfront in the vicinity of downtown. In general, alternative sites that could accommodate such improvements are heavily wooded, have relatively poor access, and would likely entail significant ecological/environmental impacts. In addition, these alternative sites are all privately owned and acquisition costs could be substantial, if the sites are available at all.

Potential project sites were narrowed to four locations which are described in more detail in the EA, summarized below, and depicted in Figure 4. Location alternatives #1 and #2 consisted of separate marina and dock components. Each of these alternatives included portions of the project not located on City-owned land. For location alternative #1, the marina was proposed to be located along the Ohio River on Executive Inn (presently removed) property owned by the Paducah/McCracken Visitors Bureau. The floating dock was proposed on the Ohio River at the end of Broadway Street on City-owned property. The marina and floating dock were separated by approximately 3,500 feet in location alternative #1. After consideration, location alternative #1 was not chosen because it does not meet the purpose and need since the marina is approximately 0.7 miles from the downtown area and the breakwater to protect the marina is not feasible to construct due to the depth of the river and the distance from the existing river bank.

For Location alternative #2, the marina was proposed to be located on both City-owned and Crouse Corporation property north of the Carson Four Rivers Center at the confluence of the Ohio and Tennessee Rivers. The large dock (cruise dock) was proposed to be located on city-owned property at the end of Broadway Street approximately 900 feet downstream of the marina. After consideration, location alternative #2 was not chosen for the following reasons:

- The facility position decreases the available navigation channel of the river.
- The facility position increases the potential for interference with existing and future planned river operations.
- The marina is not positioned entirely on city-owned property.

Location alternative #3 for the marina/transient dock facility was comprised of a combination of an excursion dock and a protected marina/transient dock facility. This facility was to be located along the Ohio River between Martin Luther King, Jr. Drive (extended) and Jefferson Street on city-owned property. A Biological Assessment completed for location alternative #3 identified the presence of a federally-endangered mussel and a dense and diverse mussel bed located within the footprint of the proposed park expansion. A Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (USFWS) estimated that the proposed location would likely adversely affect three federally protected mussel species including the take of up to 546 fat pocketbooks (*Potamilus*

capax), 18 orangefoot pimpleback (*Plethobasus cooperianus*), and nine pink mucket (*Lampsilis abrupta*). The BO concluded that the marina/transient dock project is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. However, after consideration of the potential impacts to freshwater mussels, location alternative #3 was not chosen and an alternative location was sought.

Similar to location alternative #3, location alternative #4 for the marina/transient dock facility is comprised of a combination of an excursion dock and a protected marina/transient dock. Location alternative #4 is positioned 500 linear feet downstream (northwest) of location alternative #3 on city/county-owned property. This shift is a result of additional mussel surveys conducted in October 2010 and October 2011 which revealed varying mussel bed densities along the Ohio River shoreline. The surveys found the presence of an abundant and diverse mussel bed upstream and riverward of location alternative #3. Downstream of location alternative #3, the reach was characteristically siltier with a mussel assemblage that was less dense and less species-rich. Based on this information, the proposed marina/transient dock project was shifted downstream to the less-dense mussel bed area. Location alternative #4 is considered the “consensus location” for the proposed facility based on the review of location alternatives #1 and #2 and the potential freshwater mussel impacts of location alternative #3. The “consensus” marina/transient dock facility location has been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah.

2.2.3 Design Alternatives

The following design alternative discussion was borrowed from the EA. The design for the marina/transient dock facility commenced with the approved *Riverfront Redevelopment Plan*, continued through context design, and culminated with a “consensus” design alternative after the consideration of a number of design alternatives. The context design and consensus design alternative were documented and further refined in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* in December 2007. In addition to addressing the fundamental purpose and need for the project, the *Riverfront Redevelopment Plan* and the *MOU* both address the goal to enhance existing amenities in order to “recapture” the riverfront. This includes creating an interface and area of public gathering for not only transient boaters, but also for local public use and enjoyment. To that end, the *MOU* outlined a number of basic context elements that were established to be fundamental to the success and goals of the project. The salient context elements presented in the *MOU* can be summarized as follows:

- Locate the marina and dock facilities strategically to avoid impacts to river traffic.
- Construct the transient dock parallel with the river’s direction of flow to limit current forces and to serve as a wave attenuator for the marina.

- Provide a debris deflector upstream of the marina to protect against floating debris, ice and break-away barges from both the Ohio and Tennessee Rivers for all river stages
- Accommodate river stage fluctuations from elevation 299 to 341.8 (100-yr WSE).
- Enhance existing amenities at Schultz Park.
- Utilize the existing opening at Monroe Street as the pedestrian access point through the floodwall to connect the riverfront to the downtown area.
- Maximize public accessibility to the river up to elevation 322.
- Preserve and enhance existing viewsheds.
- Utilize the existing floodwall in its existing condition without modification.
- Maintain vehicular access through Schultz Park.
- Provide a marina with boat slips that includes:
 - Fuel, electricity, potable water and sanitary pump out facilities.
 - Store and administration building

The development of alternatives documented in the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* focused primarily on three separate concepts that are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. The *MOU* does not include the documentation of two other marina/transient dock design alternatives that were evaluated and eliminated early in the design development process, namely, sheet pile retaining walls and floating barrier. The *Riverfront Redevelopment Plan* and the *Transient Dock and Schultz Park Memorandum of Understanding (MOU)* are included in the EA as Appendix N and Appendix O, respectively.

A brief summary of mass fill (alternative #1), sheet pile retaining walls (alternative #2), and the floating barrier (alternative #3) is provided below.

Design Alternative #1- Mass Fill

Three concepts were evaluated for design alternative #1 (mass fill) for the marina/transient dock facility. Each of the concepts would serve the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Each of the concepts would enhance Schultz Park and would have landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities in common. The three concepts each consist of the construction of a landform expansion of Schultz Park through the placement of clean fill material within the Ohio River to form a peninsula and construction of a floating dock and marina on the downstream side of the peninsula. Fill material is placed by truck or barge on an approximate 3H:1V slope to create the peninsula to an elevation 338 feet (near the 100-year river elevation). This landform provides passive protection of the marina and transient dock from floating debris, ice and barge impact for all river stages. Access to the floating dock is provided by elevated walkway/gangways. The land-

based improvements of Schultz Park include reconstruction of parking, slope protection walkways and enhanced vegetation. The amount of fill material used to create the landform has been limited to construct a suitable deflector for debris. The three concepts are variations of placing fill in the river to provide protection for the marina and to enhance Schultz Park. Each concept is similar in design and varies slightly based on size and amenities. Concept #1 includes an observation tower, bioengineered slope protection, a park overlook, a lawn and sculpture park, pedestrian link to downtown via Monroe Street, an interpretive levee trail, the marina, and the transient dock. Concept #2 includes the amenities provided in Concept #1 with the addition of terraced seating and terraced lawn & gardens. Concept #3 includes the amenities provided in Concept #2 with the addition of a marina/transient dock building, steps leading down to the Ohio River, a connection to the existing amenities to the immediate east, and the adaptive use of existing structures and interpretive landmarks. Concept #3 does not include an observation tower. Each of the three design concepts will require that fill be placed in the Ohio River in order to provide landform and shore protection. Concept #3 requires the most fill impact to the Ohio River while Concept #1 requires the least. Table 1 summarizes the amenities and features of the three concepts as well as the preferred concept (Consensus). The Consensus is a combination of specific amenities/features taken from the three mass fill alternative concepts and requires the same amount of fill as Concept #3. The anticipated capital construction cost for the Consensus is \$13.0M.

The key elements of the three concepts are summarized in the following figure.

Amenities and/or Features	Concepts			
	Concept #1	Concept #2	Concept #3	Consensus
Observation Tower	X	X	----	----
Bioengineered Slope Protection	X	X	X	X
Park Overlook	X	X	X	X
Lawn/Sculpture Park	X	X	X	X
Interpretive Levee Trail	X	X	X	X
Marina	X	X	X	X
Transient Dock	X	X	X	X
Promenade/Pedestrian Link to Downtown	X	X	X	X
Terraced Seating		X	X	X
Terraced Lawn & Garden		X	X	X
Marina/Transient Dock Building			X	X
Steps to the Ohio River			X	----
Connectivity to Existing Amenities			X	X
Adaptive Use of Existing Landmarks			X	X
Rock Outcropping to the River				X
Vertical axis wind turbines				X
Estimated Fill (cubic yards)	160,000	220,000	265,000	265,000
Estimated Construction Cost	\$ 11.1M	\$ 12.2M	\$ 12.7M	\$ 13.0M

Design Alternative #2- Sheet Pile Retaining Wall

Design alternative #2 is similar to design alternative #1 (mass fill) except that the mass fill material is placed within a vertical sheet pile wall up to an elevation of approximately 302 feet above MSL. This alternative also provides protection for the marina against floating debris. Access to the floating dock is provided by elevated walkway/gangways; however, the river's edge will not be accessible. The land-based improvements to Schultz Park include reconstruction of parking and enhanced vegetation.

This alternative addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. However, with this alternative, access to the river for non-boaters is limited and there is minimum enhancement to the

useable area in Schultz Park. Based on preliminary soil boring data, it was anticipated that sheet piling lengths on the order of 60 feet would be required as well as the potential for pre-drilling and significant tie-backs and dewatering. When compared with alternative #1 (\$11 to 13M), the anticipated capital construction cost for such sheet piling (\$17.4M) is much greater and the life expectancy is much less than with mass fill. Contrary to design alternative #1, this alternative would isolate pedestrians from interacting with the river at the river's edge due to the necessary hand-railing protections required to provide adequate safety. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #2 was eliminated.

Design Alternative #3- Floating Barrier

Design alternative #3 consists of a floating barrier structure that would provide debris/barge protection for the marina, wave attenuation, and access to the dock/marina. This alternative represents the Consensus Plan presented in the approved *Riverfront Redevelopment Plan* of March 2007. This floating barrier consists of a series of precast concrete barges linked together to form one continuous, articulated floating dock string. This articulated dock string is attached to multiple piers constructed at intervals along the dock to provide anchorage. Access to the dock would be provided through an elevated walkway/gangway from the existing Schultz Park riverbank. With this alternative, the only fill material placed in the river is associated with construction of the anchor piers for the floating dock and the anchorage for the marina. The land-based improvements of Schultz Park would include reconstruction of parking, slope protection, walkways and enhanced vegetation.

Design alternative #3 addresses the purpose and need by: (1) providing loading/unloading facilities for transient boats, and (2) providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown. Although design alternative #3 minimizes the amount of fill material placed in the river when compared with design alternatives #1 and #2, the alternative poses significant challenges associated with the design and construction of a suitable structure that can accommodate the river current, debris load, ice load and significant range of river fluctuations (elevation 299 to 338 feet above MSL). Because the barrier would be subject to very significant lateral loading, it is estimated that the piers would be constructed of concrete caissons on the order of 8 to 10 feet diameter, and/or sheet pile cells on the order of 20 feet diameter, each with significant foundations. It has been estimated that each pier would likely extend approximately 60 feet above normal pool elevation directly in front of Schultz Park, thus significantly obstructing the viewshed from the park and surrounding areas. The floating barrier would be anchored using a guide rail system to each cell and would rise and fall with the river elevation. This guide rail system poses a significant maintenance obligation, and in

the event of a failure or binding, portions of the dock would become submerged. This would result in an unacceptable risk to public safety as well as damage to the floating infrastructure. Furthermore, the floating barrier would be susceptible to major structural damage and potential loss of life in the event of impact from a break-away barge. When compared with alternative #1 (\$11-13M), the anticipated capital construction cost for the floating barrier (\$15.7M) is greater. In addition, this alternative will not provide the amenities as will alternative #1 (mass fill). For these reasons, design alternative #3 was eliminated.

2.2.4 Alternatives Summary

The proposed transient dock represents the least environmentally damaging alternative in terms of location and design. Location alternative #4 is considered the “consensus” location (preferred location alternative) for the proposed facility based on the limitations of location alternatives #1, #2 and #3, which include locations on land owned by the City (#1 and #2), separation from downtown/public access (#1), unfeasibility of construction (#1), interference with navigation and inland waterways industry operations (#2), and high level of impact to endangered mussel species (#3). Location alternative #4 for the marina/transient dock facility is on city/county-owned property a distance of 500 linear feet downstream (northwest) of location alternative #3 to lessen the potential impacts to freshwater mussels. The “consensus” marina/transient dock facility location has been selected to minimize cost and environmental impact, while maintaining close proximity to downtown Paducah, and meet the needs of the public access and boating needs of the project.

The preferred design alternative (consensus) is based on design alternative #1 (mass fill). It has been determined that the mass fill alternative is the best and only feasible approach to provide long-term stability and protection of the City’s infrastructure (marina and dock assets), address the purpose and need for the project, and enhance the Schultz Park and the riverfront interface with the public. Design alternative #2 (sheet pile retaining wall) was rejected due to its inability to meet public river access needs, limited life expectancy, and higher costs. Design alternative #3 (floating barrier) was not practicable due to construction/stability challenges, potential risks to public safety, adverse impacts to river access and viewsheds, and higher cost.

In the consensus design alternative (Mass Fill- Concept #3), the size of the mass fill is expanded slightly in order to increase the usable area of Schultz Park for additional amenities including a pedestrian promenade and terraced seating at the river’s edge. The preferred design alternative will enhance Schultz Park and include landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities. Specifically, the preferred design includes: bioengineered slope protection, a river overlook, lawn & sculpture park, pedestrian

link to downtown via Monroe Street, terraced seating, terraced lawn & gardens, an interpretive levee trail, a marina/transient dock building, rock outcropping leading down to the Ohio River, the adaptive use of existing structures and interpretive landmarks, a connection to the existing amenities to the immediate east, the marina, and the transient dock. The marina/transient dock will have three individual sets of four pipe piles that will support the “floating” gangway deck system. The most elevated portion of this support system will be vertical axis wind turbines at the top of each of the pipe piles. The vertical axis wind turbines are proposed as an environmentally-friendly electricity generator to power a portion of the lighting of the marina/transient dock facility. Lighting within the marina/transient dock facility will consist of pole-mounted pedestrian lights, pathway lighting along the transient dock, mounted gangway lights, and submersible inset lights for the stairways.

No viable alternatives to the preferred marina/transient dock exist within the immediate vicinity of downtown Paducah that meet project needs. The selected site minimizes ecological/environmental impacts and avoids disruption to navigation and inland waterways operations, while still meeting the riverfront access and boat docking needs of the Paducah area. The proposed design also represents the design alternative which provides the required amenities, while limiting impacts to the Ohio River. The no-build alternative is not viable as it does not meet the designated need for a public connection to the riverfront or for protected dock and marina facilities. Thus, the proposed project represents the least environmentally damaging practicable alternative for providing the needed marina and boat docking on the Ohio River in Paducah, Kentucky.

2.3 PROPOSED DEVELOPMENT

The proposed site development plan is shown on Figure 3 and is comprised of marina and transient dock components. The detailed design drawings are provided in Appendix C. The major components of the marina include:

- floating dock system
- 150 boat slips, with a portion reserved for transient boats
- fuel dock and two above-ground fuel storage tanks
- marina administration building with showers and retail
- utilities (fuel, potable water, electricity, and sanitary pump out)
- gangway entrance (secured)

The major components of the transient dock include:

- floating dock system (designed as wave attenuator)

- dockage for transient vessels on both sides of dock
- gangway system comprised of gangway sections
- walking path and public access along gangway and dock
- fishing opportunities
- fixed ladders
- potable water and electrical pedestals
- lighting and handrail with benches on center of dock
- enhancement of existing Schultz Park

Development of the proposed project will result in impacts to 6.64 acres of jurisdictional/navigable waters of the U.S along 772 feet of Ohio River, including approximately 0.79 acre of riverbank and 5.85 acres of open water. Impacts include 50 eight-foot deadman anchors (0.07 acre) to support the floating dock. The overall project site includes surface water and riverbed substrate of the Ohio River, undeveloped riverbank currently comprised of rip rap with scattered vegetation, and the existing Schultz Park between the floodwall and riverbank in the eastern portion of the site. The project is described in more detail in the following sections in terms of existing site conditions and potential project impacts.

3.0 EXISTING SITE CONDITIONS

The project site consists of the Ohio River and undeveloped riverbank, which includes the existing Schultz Park. It is located at the confluence of the Tennessee and Ohio Rivers in downtown Paducah. The Ohio River is approximately 0.6-mile wide at the project site. The 6.64 acres of jurisdictional waters of the U.S. at the present site include 0.79 acre of riverbank below the ordinary high water mark (OHWM) (310 feet) and above the normal pool (302 feet) and 5.85 acres of open water located below the normal pool. The riverbank consists primarily of rip-rapped slope with a few scattered saplings. The open water area exhibits riverbed substrate which consists primarily of silt, sand, and gravel, and is up to approximately 40 feet deep at normal pool. The project site supports a mussel assemblage with scattered individuals of the federally-endangered fat pocketbook. However, a dense, diverse mussel bed located upstream and riverward has been avoided by the project. A more detailed discussion of river habitat and mussel surveys will be included in the completed BO by the USFWS.

The non-jurisdictional river corridor, including the area between the OHWM of the river and the flood wall, consists of Schultz Park and a steeply sloped riprap riverbank. Scattered vegetation along the bank includes black willow (*Salix nigra*), silver maple (*Acer saccharinum*), crown vetch (*Coronilla varia*), hop clover (*Trifolium campestre*), and indigo bush (*Amorpha fruticosa*).

Schultz Park consists of open lawn with scattered trees and park benches/tables. Tree species present include sycamore (*Platanus occidentalis*), sugar maple (*Acer saccharum*), weeping willow (*Salix babylonica*), and pin oak (*Quercus palustris*). Common herbaceous species include bluegrass (*Trifolium pratense*), red clover (*Trifolium pratense*), dandelion (*Taraxacum officinale*), and narrow-leaved plantain (*Plantago lanceolata*).

No wetlands or jurisdictional waters of the U.S., other than the Ohio River, are present within the project area.

4.0 POTENTIAL PROJECT IMPACTS

Potential project impacts were evaluated through field assessment of jurisdictional waters/wetlands, threatened/endangered species or their critical habitat, cultural resources, and other environmental factors.

4.1 WATERS/WETLANDS

Construction of the proposed project will result in impacts to 6.64 acres of jurisdictional/navigable waters of the U.S. along 772 feet of Ohio River, including 0.79 acre of riverbank (between OHWM elevation 310' and normal pool elevation 302') and 5.85 acres of open water (fill below normal pool elevation). No additional impacts to wetlands or other waters of the U.S. will result from the project. Mitigation provisions for impacts to aquatic habitat are being proposed and are described in detail in Section 5.0. The project site is located within the 100-year floodplain (Figure 5). The highly developed nature of the landward side of the project is illustrated by the mapping of urban-complex soils (Figure 6).

4.2 PROTECTED SPECIES

A protected species survey of the project area, conducted as part of the overall site assessment, concluded that the proposed project is likely to have an adverse impact on the federally-endangered fat pocketbook. The project is not likely to have an adverse impact on any other federally threatened/endangered species, or their critical habitat. Potential impacts to mussels are being resolved through formal consultation with the USFWS. A summary of federally-protected species potentially occurring in McCracken County, Kentucky, based on existing USFWS county lists and survey records, and their potential for occurrence at the project site is presented in the table below.

Scientific Name	Common Name	Status*	Habitat	Habitat Present	Species Observed
MAMMALS					
<i>Myotis sodalis</i>	Indiana Bat	E	Caves in winter; nursery colonies and roosting under the loose bark of trees from late March to mid October.	No	No
BIRDS					
<i>Sterna antillarum</i>	Least Tern	E	Alluvial islands and sandbars.	No	No
MUSSELS					
<i>Cyprogenia stegaria</i>	Fanshell	E	Medium to large rivers with moderate current in gravel.	Yes	No **
<i>Cumberlandia monodonta</i>	Spectaclecase	E	Large rivers sheltered from main force of river current in mud to boulders.	Yes	No **
<i>Lampsilis abrupta</i>	Pink Mucket	E	Large rivers with swift current in sand, gravel, and cobble.	Yes	No **
<i>Obovaria retusa</i>	Ring Pink	E	Large rivers in sand or gravel.	Yes	No **
<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback	E	Medium to large rivers with swift current in sand and gravel.	Yes	No **
<i>Plethobasus cyphus</i>	Sheepnose	E	Medium to large rivers in mud, sand, or gravel.	Yes	No **
<i>Pleurobema clava</i>	Clubshell	E	Medium to small rivers in coarse sand and gravel.	Yes	No **
<i>Pleurobema plenum</i>	Rough Pigtoe	E	Medium to large rivers with sand, gravel, and cobble substrates.	Yes	No **
<i>Potamilus capax</i>	Fat Pocketbook	E	Large rivers in slow-flowing water in mud to gravel.	Yes	Yes **
<i>Quadrula cylindrica</i>	Rabbitsfoot	C	Small to large rivers in a mixture of sand and gravel.	Yes	No **

*E=endangered, C = candidate

**mussel surveys conducted August 2008, October 2010, and October 2011

The project site contains no potential habitat for the federally-endangered Indiana bat (*Myotis sodalis*) or least tern (*Sterna antillarum*). The few scattered trees in Schultz Park do not represent potential summer roosting/maternity habitat for the Indiana bat and no caves, rock houses or mine portals are present.

Results of three mussel surveys completed from 2008 through 2011 indicate the presence of a mussel bed upstream and riverward of the proposed Schultz Park expansion, as well as confirmed presence of the federally-endangered fat pocketbook. Detailed reports of the mussel surveys completed on site are presented in the *Biological Assessment Report* dated January 3, 2012. Copies are available upon request. Figure 7 presents a summary of mussel survey data collected for the proposed project. Based on the density/diversity of the mussel bed upstream and riverward of the project and the results of surveys in the vicinity, the USFWS assumes that spectaclecase (*Cumberlandia monodonta*), pink mucket, orangefoot pimpleback, and sheepnose (*Plethobasus cyphus*), and rabbitsfoot (*Quadrula cylindrica cylindrica*) may also be present in the vicinity. Formal consultation with the USFWS regarding potential impacts to mussel resources was initiated on January 27, 2012, and will be completed no later than June 10, 2012.

Based on the limited available terrestrial habitat on site, avoidance of the mussel bed, and expected completion of formal consultation with the USFWS, the proposed project will not jeopardize the continued existence of federally threatened or endangered species.

4.3 CULTURAL RESOURCES

As recommended by the Kentucky Heritage Council, a Phase I Archaeological Survey of the project site was conducted to determine if the proposed project will impact historic or prehistoric archaeological sites that are eligible for or listed in the National Register of Historic Places. The Phase I survey identified no archaeological sites within the project area, and stated that the presence of significant historic or prehistoric archaeological deposits was unlikely due to highly disturbed conditions and the predominance of artificially created land. The SHPO concurred with these findings in letters dated September 30, 2008 and January 11, 2012 (Appendix D).

4.4 OTHER ENVIRONMENTAL FACTORS

As documented in the EA, no cumulative and/or indirect adverse impacts to air quality, noise, water quality, floodplains, land use/zoning, community facilities, residential/commercial/industrial development, hazardous materials, visual amenities, or navigation are expected as a result of the proposed marina/dock facility.

Air Quality: The proposed project will be consistent with the Kentucky State Implementation Plan regarding the attainment of the national Ambient Air Quality Standards.

Noise: Noise impacts during construction are exempt from the City Noise Ordinance; however, commitment to minimize noise impacts have been made. Noise during operation of the marina/dock will be attenuated by the adjacent floodwall, vegetation and distance from receptors, and is well within the City Noise Ordinance requirements.

Water Quality: Temporary erosion/sedimentation impacts to the Ohio River are possible during construction; however, they will be minimized through best management practices. The project is not expected to have any long term impact on the water quality of the Ohio River or the water treatment process for the Paducah system due to the current intake being upstream of the project.

Floodplains: The project is located within the floodway of the Ohio River. A detailed HEC-RAS hydraulic analysis has been performed and a "No Net Rise" certification has been submitted along with completed permit application to the Kentucky Division of Water – Floodplain Management

Section. A KDOW floodplain permit has been issued and a modification of the permit to reflect the relocation of the project 500 feet downstream is currently under review.

Land Use / Zoning: The proposed project is compatible with current land uses and will conform to the current zoning and the principal permitted uses that include loading/unloading, water port facilities, and open-type public recreation facilities such as public parks.

Community Facilities: The proposed project will result in no significant impacts to travel patterns, accessibility, community facilities, economic vitality, established business districts or public safety. Minor temporary traffic alteration may be necessary during construction.

Displacements: The proposed project will result in no relocations or displacements of businesses or residences as none are present within the project area.

Hazardous Materials: The proposed project will result in no impacts to hazardous materials/waste sites or underground storage tanks, as none are known to be present within the project area.

Visual Impacts: The project will result in no negative visual impacts due to the separation of the project area from the nearest populated areas by distance and the existing flood wall.

Navigation: Representatives from the local inland waterways industry and the U.S. Coast Guard have participated in the planning stages of the project. A 300-foot buffer will be maintained between the project and the "sail line" as depicted in Figure 2 and Navigation Chart 11 for the Ohio River. In addition, a single white light having a range of one nautical mile is proposed on the end of the transient dock (river side) to aid navigation.

5.0 MITIGATION PLAN

The City of Paducah believes that it has adequately minimized and avoided impacts to jurisdictional waters of the U.S., and proposed mitigation that adequately compensates for the aquatic resources being unavoidably impacted. In evaluating the functions and values provided by the impacted portion of the Ohio River, it appears that substrate, aquatic habitat, and flow characteristics are of primary concern. These items are discussed below in terms of minimization/avoidance, hydraulic modeling, and compensatory mitigation.

5.1 MINIMIZATION AND AVOIDANCE

Impacts to the Ohio River resulting from the proposed Transient Dock facility have been minimized and avoided to as great an extent possible, while still meeting the project needs of providing enhanced public access to the river. Minimization/avoidance factors include:

- The minimum size landform necessary to adequately protect the dock and marina was designed.
- Although a total of 5.85 acres of fill is proposed below normal pool, only 2.9 acres of open water will be eliminated due to the broad side-slope of the landform. Thus, over three acres of the fill will continue to provide open water and river substrate habitat.
- There will be a net gain in shoreline along the project site, increasing from approximately 772 feet at present to approximately 1,149 feet following construction.
- Impacts to the mussel bed have been avoided completely.

Therefore, impacts to the river ecosystem have been minimized and significant aquatic habitat, including shoreline, open water, and substrate (including mussel habitat) will remain after project completion.

5.2 HYDRAULIC MODELING

The City of Paducah, through subcontracts with design engineer JJR and Florence & Hutcheson, Inc. (F&H), has conducted modeling of the Ohio River to assess any impact the proposed project may have on existing flow patterns. The results of the modeling were included in a report titled *Paducah Transient Mooring Facility: Hydraulic Impact Analysis – Draft Final Report* (HCCL, November 2007), which concluded that the project may have a small local influence on the water levels and velocities in its immediate vicinity, with increased velocities at the edge of the “headland” feature and marginal increases in water levels just upstream of the structure. However, it concludes: “The model results suggest that the influence is not widespread, with negligible change in water levels at all other points of interest...” And “Given the small size of the proposed works in contrast to the cross section of the

Ohio River at Paducah, it is concluded that, in general, impacts to flood levels are expected to be negligible.” This was further confirmed by F&H through a detailed hydraulic analysis using HEC-RAS and subsequent issuance of a No-Net Rise Certification. A modification of this model completed for the Biological Assessment (BA) related projected flow velocity to potential transport of variable sized substrate particles. Relative to mussel habitat, the model results indicated no significant substrate scour impacts and that deposition of fine-grained particles may occur immediately downstream in the area of the dock facility. These results were used to estimate impacts to mussels in the BA. The hydraulic studies are available upon request.

5.3 COMPENSATORY MITIGATION

Compensatory mitigation for impacts to jurisdictional waters of the U.S. will be provided through a combination of restoration, enhancement, and protection components that focus on off-setting impacts to aquatic habitats and functions of the lower Ohio River.

Restoration: Restoration will be provided through re-establishment of a natural river substrate and vegetated shoreline with the construction of the proposed Schultz Park expansion landform. The coarse natural materials used to construct the landform will provide a stable substrate with increased surface area compared to the existing substrate which consists primarily of silt, sand, and gravel. Over three acres of river substrate will be re-established as a result of the proposed six-acre landform footprint. The coarse substrate of the landform will provide increased aquatic habitat for wildlife such as fish and macroinvertebrates as well as promote the biological and chemical processes to maintain the river’s water quality functional capacity. There will also be a net gain of approximately 377 linear feet of shoreline as a result of the proposed project. The proposed shoreline design will utilize a combination of native grasses, trees and shrubs to the greatest extent possible which will provide habitat for wildlife as well as a stable buffer from stormwater runoff.

Enhancement: Enhancement of habitat functions will be provided through increased terrestrial/aquatic habitat quality and complexity as well as through increased cultural, educational and recreational opportunities. The existing river corridor consists of a relatively steep, rip-rap riverbank and a river substrate consisting primarily of silt, sand and gravel. The proposed project will increase habitat quality and complexity through: diversifying terrestrial vegetation; increasing the acreage of riverbank; increasing the length/complexity of the shoreline; and coarsening of the river substrate. Enhancements to the river corridor will also serve to protect the near shore habitats from barges that regularly beach along the bank. Other enhancements to this portion of the Ohio River will be realized through increased cultural, educational, and recreational opportunities. The proposed project will significantly increase the riverfront’s accessibility and reconnect the City and its neighbors to their heritage with the Ohio River. Interaction with the riverfront will promote a greater appreciation

for, and awareness of, the Ohio River and its rich resources. The City will install interpretive stations throughout the proposed park to educate the public and increase awareness of the Ohio River ecosystem, terrestrial and aquatic wildlife (particularly the area's diverse mussel assemblage), and water quality issues in the river. Proposed recreational opportunities in the form of a multi-use trail, increased park acreage, and boating will also increase the social benefits of the river. These amenities will be connected to various parts of the city via a greenway trail.

Protection: Protection of aquatic habitat (particularly river substrate) will be provided via an in-lieu fee payment to the Kentucky Aquatic Resources Fund (KARF). This contribution shall be designated for preservation, creation, enhancement and/or protection of aquatic habitat in the lower Ohio River through implementation of protections to high quality mussel beds or other aquatic habitat, and the permanent preservation of adjacent riparian land. The City proposes to contribute \$71,706 to KARF, based on impacts to 6.29 acres of low to moderate quality substrate at a 4:1 ratio and a per acre land value of \$2,850.

Even though not directly required under section 404 mitigation, impacts to mussels within the project area will be further minimized and/or avoided, through a mussel relocation effort to be completed prior to construction and through assistance with endangered mussel propagation efforts. The extent of the relocation effort will be determined in conjunction with USFWS formal consultation, but its goal will be to relocate as many live mussels as reasonable prior to construction. Recovery efforts support will be provided through payment of \$18,750 to KARF for take of federally-endangered mussel species, in addition to any payment for aquatic habitat. It shall be designated for recovery efforts for the impacted endangered species. Payment will be based on mussel density, current status of recovery efforts, and will be determined by the USFWS through the formal consultation process.

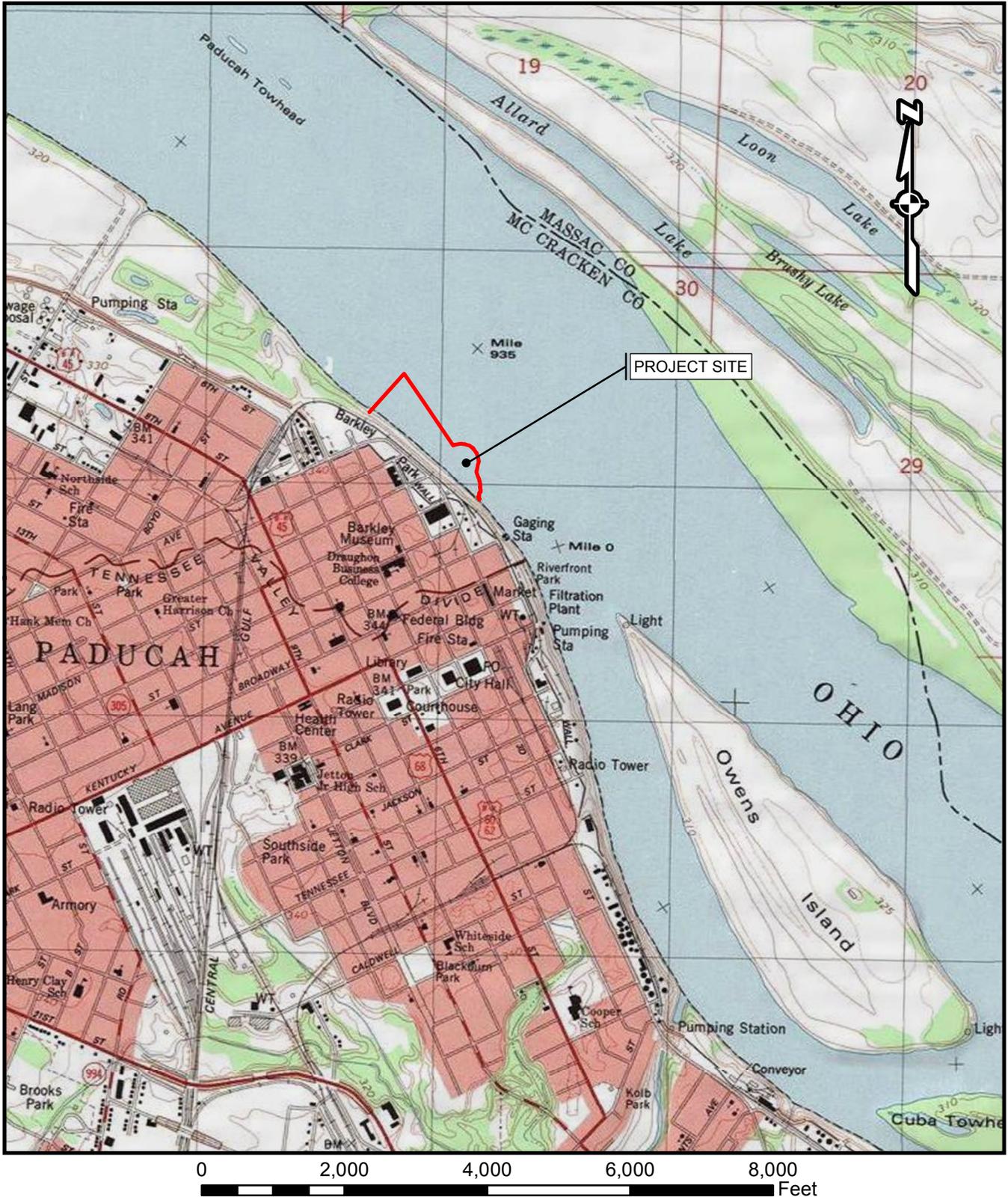
6.0 CONCLUSION

This joint application for a Section 404 Individual Permit and a Section 10 Navigable Water permit, has been prepared on behalf of the City of Paducah for the proposed development of a marina/transient dock facility on the Ohio River in McCracken County, Kentucky. The project will help meet the overall need for public connection to the Ohio River as well as docking and marina amenities that help preserve the historic integrity of the downtown riverfront. The proposed location and design represent the least environmentally damaging alternative for meeting these needs.

The proposed development will result in unavoidable impacts to a total 6.64 acres of jurisdictional/navigable waters (Ohio River). Contingent upon formal USFWS consultation regarding mussel resources, the proposed project will not jeopardize the continued existence of federally-listed threatened/endangered species. The site contains no archaeological (historic or prehistoric) features. No other significant environmental impacts are anticipated.

Impacts to Ohio River habitat have been avoided and minimized to as great an extent possible while still meeting the purpose and need of the project. Compensatory mitigation for impacts to jurisdictional waters of the U.S. will include: re-establishment of a natural river substrate and shoreline; enhancement of habitat quality and complexity; increased cultural, educational and recreational opportunities; and contributions to KARF for habitat protection/restoration in the lower Ohio River. The proposed project will improve the functional capacity of this portion of the river as well as promote public awareness and appreciation for the ecosystem providing benefits to the watershed as a whole.

FIGURES



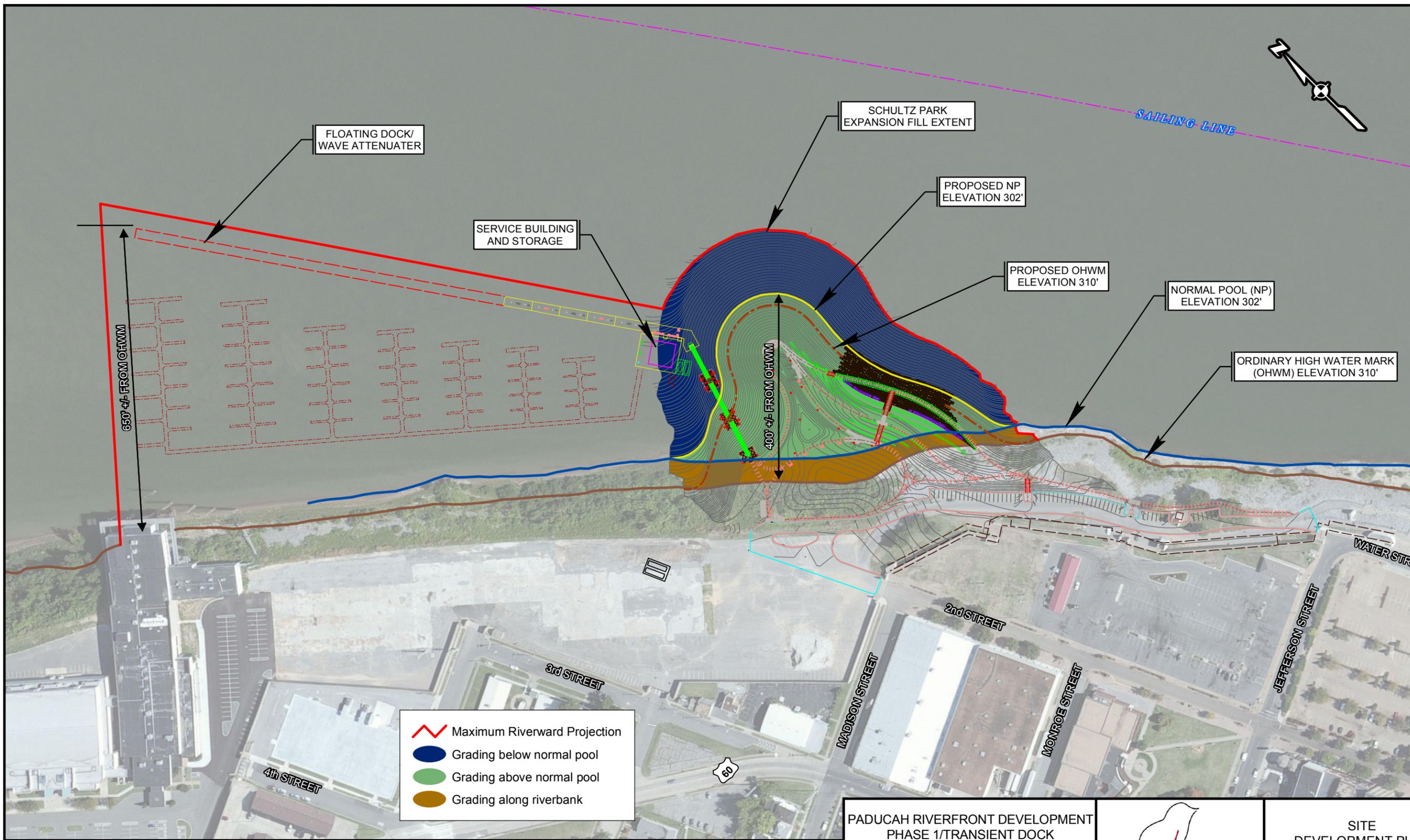
PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090-01/Figures/404&401/Location
 REDWING PROJECT 06-090-01
 REVISED DATE 3.13.2012 | DRAWN BY BJO



SITE LOCATION MAP

FIGURE 1



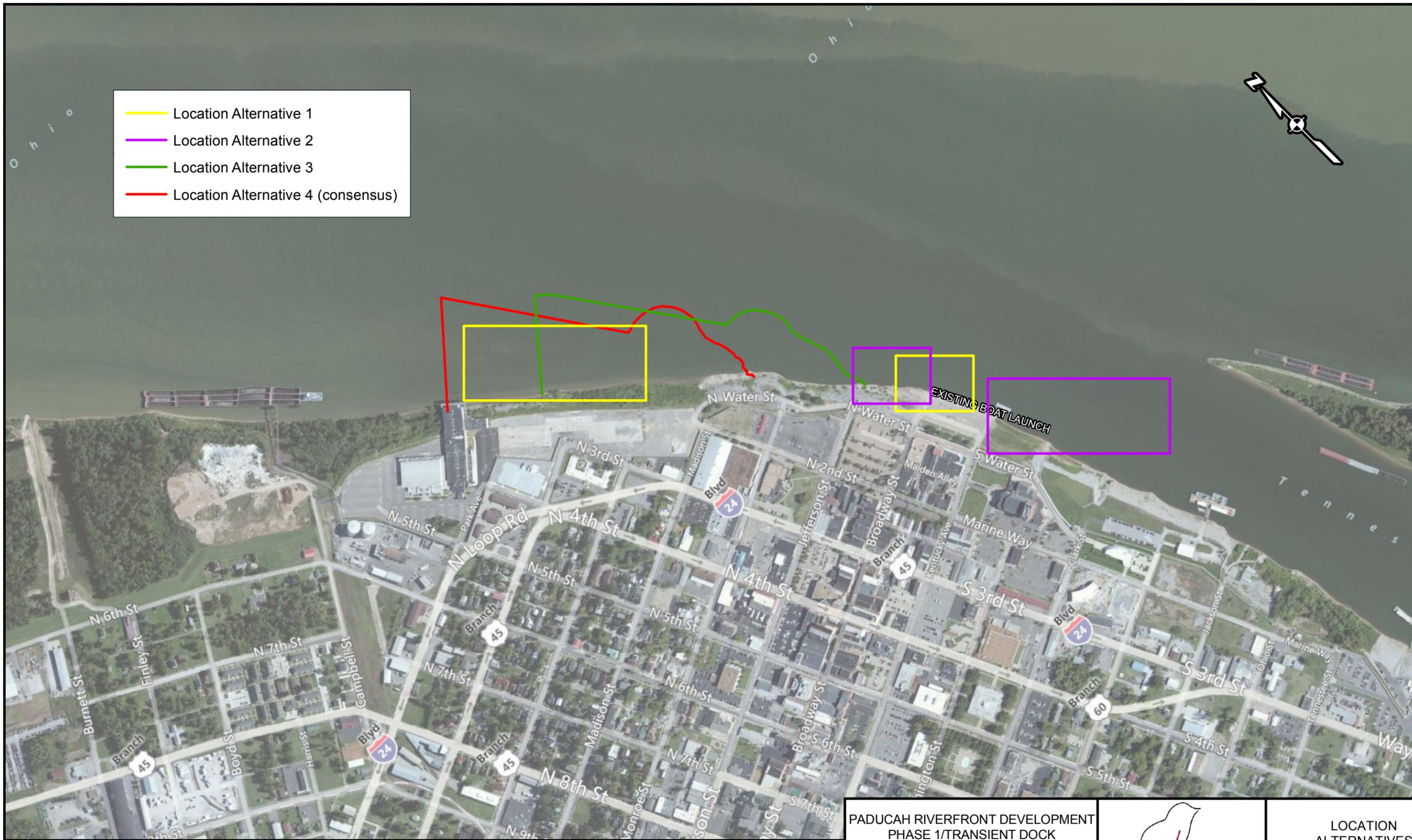
PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090-01/Figures/404&401/Development
 REDWING PROJECT 06-090-01
 REVISED DATE: 3.13.2012 DRAWN BY BJO



SITE
 DEVELOPMENT PLAN

FIGURE 3



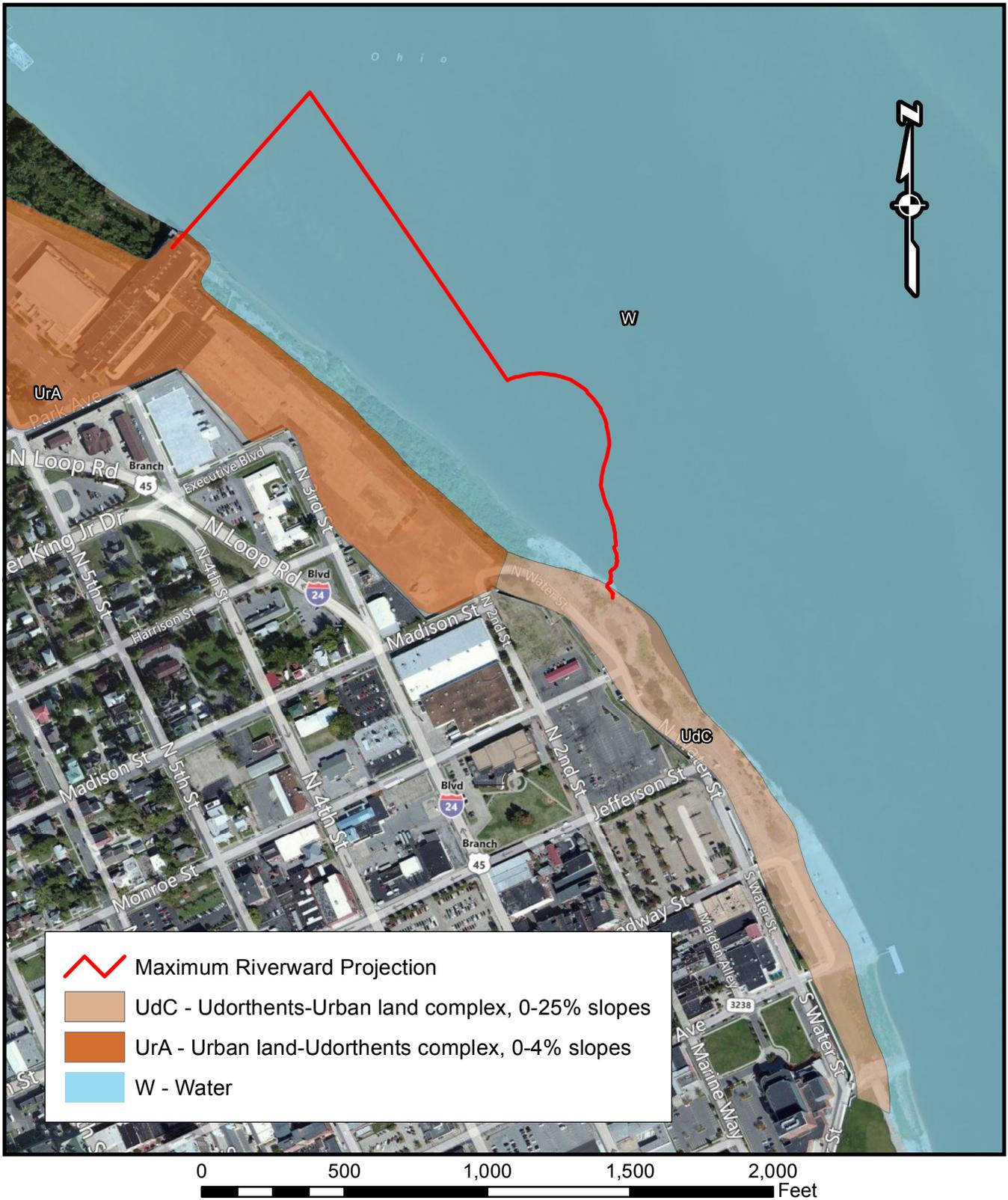
PADUCAH RIVERFRONT DEVELOPMENT
PHASE 1/TRANSIENT DOCK
McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090-01/Figures/404&401/Alternatives
REDWING PROJECT 06-090-01
REVISED DATE: 3.13.2012 DRAWN BY BJO



LOCATION ALTERNATIVES

FIGURE 4



PADUCAH RIVERFRONT DEVELOPMENT
 PHASE 1/TRANSIENT DOCK
 McCracken County, Kentucky

FILE: Redwing/06-090-01/Figures/404&401/Soil

REDWING PROJECT 06-090-01

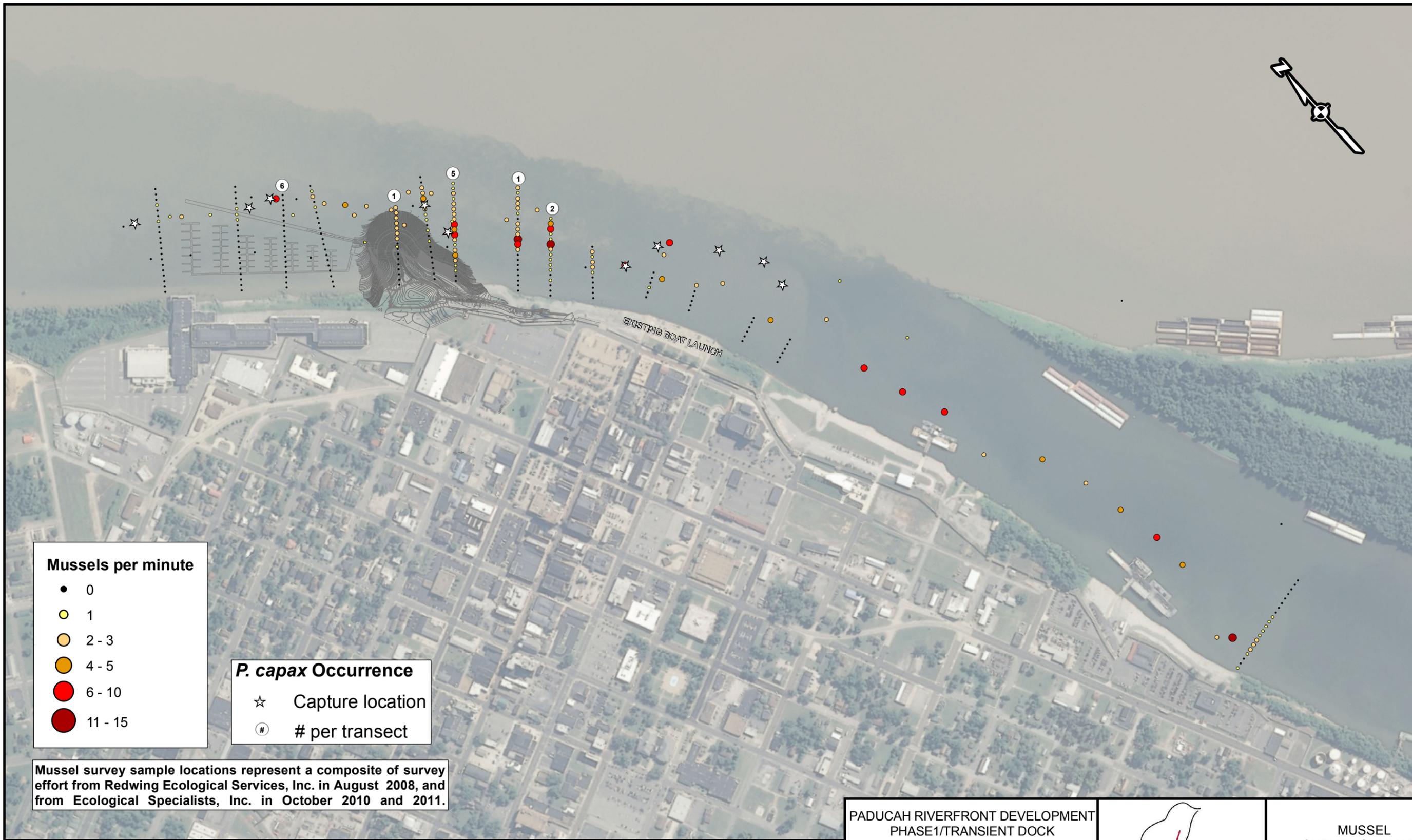
REVISED DATE 3.13.2012

DRAWN BY BJO



SOIL
 SURVEY MAP

FIGURE 6



Mussels per minute

- 0
- 1
- 2 - 3
- 4 - 5
- 6 - 10
- 11 - 15

***P. capax* Occurrence**

- ☆ Capture location
- ⊕ # per transect

Mussel survey sample locations represent a composite of survey effort from Redwing Ecological Services, Inc. in August 2008, and from Ecological Specialists, Inc. in October 2010 and 2011.



PADUCAH RIVERFRONT DEVELOPMENT
 PHASE1/TRANSIENT DOCK
 McCRACKEN COUNTY, KENTUCKY

FILE: Redwing/06-090/Figures/404&401/Mussels_404.pdf
 REDWING PROJECT 06-090-01
 REVISED DATE: 3.12.2012 DRAWN BY BJO



MUSSEL
 SURVEY SUMMARY

FIGURE 7

PHOTOGRAPHS



Photograph 1: Western portion of site proposed for park expansion, facing downstream (west) from riverbank. There will be no disturbance to the riverbank in this area and river impacts will be limited to dock anchors. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 2: Facing upstream from the proposed expansion of Schultz Park. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 3: Facing upstream in the area of the proposed Schultz Park expansion. The existing Schultz Park is located above the riprap bank to the right. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 4: The majority of the existing riverbank throughout the project area consists of riprap with scattered vegetation. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 5: The western portion of Schultz Park, facing east. The park provides limited public viewing and passive recreation opportunities. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 6: The central portion of Schultz Park, facing east. The park is dominated by common old field/lawn species with scattered trees. Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 7: The eastern end of the project area, facing east toward the intersection of Jefferson and Water Streets (just past the flood wall). Paducah Riverfront Development Phase 1 / Transient Dock. May 14, 2008.



Photograph 8: The Schultz Park expansion is proposed in the foreground through placement of approximately 6.64 acres of fill into the riverbank and open water portion of the Ohio River. Paducah Riverfront Development Phase 1 / Transient Dock. October 31, 2011.

APPENDIX A

DEPARTMENT OF THE ARMY PERMIT APPLICATION FORM

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

OMB APPROVAL NO. 0710-003

(33 CFR 325)

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0033), Washington, DC 20503. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10: 1413, Section 404. Principal Purpose: These laws require authorizing activities in, or affecting, navigable waters of the United States, the discharge or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine Uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

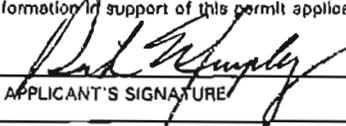
1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
--------------------	----------------------	------------------	-------------------------------

BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME City of Paducah - Rick Murphy, P.E., City Engineer	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required) Redwing Ecological Services, Inc. - Ron Thomas
6. APPLICANT'S ADDRESS P.O. Box 2267, Paducah, KY 42002	9. AGENT'S ADDRESS 1139 South Fourth Street, Louisville, KY 40203
7. APPLICANT'S PHONE NOs. W/AREA CODE a. Residence b. Business 270-444-8511	10. AGENT'S PHONE NOs. W/AREA CODE a. Residence b. Business 502-625-3009

11. STATEMENT OF AUTHORIZATION

I hereby authorize, Redwing Ecological Services, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.


APPLICANT'S SIGNATURE

3/14/12
DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) Paducah Riverfront Development Phase 1/Transient Dock	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Ohio River - Mile Point 934.8 to 935.1	14. PROJECT STREET ADDRESS (if applicable) n/a
15. LOCATION OF PROJECT McCracken COUNTY KY STATE	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Section, Township, Range, Lat/Lon, and/or Accession's Parcel Number, for example. Downtown Paducah on the river-side of the floodwall between Jefferson Street and the former Executive Inn.	
17. DIRECTIONS TO THE SITE From I-24 Exit 4, take U.S. 60 east to downtown Paducah. Turn left onto Madison Street and drive to the river.	

18. Nature of Activity (Description of project, include all features)

The proposed project will include construction of a floating dock with 150 boat slips and gangway system, amenities including electricity, potable water, fuel, retail shopping and public access through trails and enhancement of Shultz Park.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The proposed project is part of the overall Paducah Riverfront Redevelopment Plan, a master plan for the entire waterfront at Paducah. The purpose of the project is to provide docking for transient and recreational boaters along with needed marina facilities in the vicinity of downtown Paducah and to help reconnect the community to the riverfront.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Create a land-mass deflector (and park expansion) associated with the proposed marina and docking facilities and enhance the accessible area.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Approximately 285,000 c.y. of total fill. Approximately 165,000 c.y. of clean granular fill will be placed below OHW Elev = 310.3.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Total of 6.64 acres of jurisdictional/navigable waters along approximately 772 linear feet the Ohio River, including 0.79 acre of riverbank and 5.85 acres of open water.

23. Is Any Portion of the Work Already Complete? Yes ___ No x IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessors, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See Appendix B of the 404 Permit Application Package

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
KDOW	401/WOC	n/a	Concurrent		
KDOW	Floodplain	n/a	n/a		
KDOW	402/Stormwater	n/a	n/a		

* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.


SIGNATURE OF APPLICANT

3/14/12
DATE


SIGNATURE OF AGENT

3/14/12
DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguise a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

APPENDIX B

LIST OF ADJOINING PROPERTY OWNERS

**PADUCAH MARINA/TRANSIENT DOCK
MCCRACKEN COUNTY, KENTUCKY**

ADJACENT PROPERTY OWNERS

ITEM	LAST NAME	FIRST NAME	ADDRESS	CITY	STATE	ZIP
1	City of Paducah	n/a	P.O. Box 2267	Paducah	KY	42002
2	Paducah-McCracken County Convention Center Corporation		P.O. Box 2267	Paducah	KY	42002
3	Jim Smith Contracting, Inc.	n/a	1108 Dover Road	Grand Rivers	KY	42045
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

APPENDIX C

PROJECT DESIGN DRAWINGS

SELECT SHEETS

[COMPLETE DRAWING SET ATTACHED AS CD]

SCHULTZ PARK AND TRANSIENT DOCK

Owner:
CITY OF PADUCAH

JJR landscape architecture
planning
urban design
civil engineering
environmental science
JJR, LLC
625 WILLIAMSON STREET,
MADISON, WISCONSIN 53703
608.251.1177 T
608.251.6147 F
www.jjr-us.com

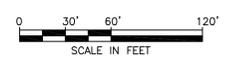
ISSUED FOR	REV	DATE
Issued for Review		03/02/2012

SEALS AND SIGNATURES

NOT FOR CONSTRUCTION

KEY PLAN

DRAWING TITLE
GRADING PLAN - OVERALL SITE

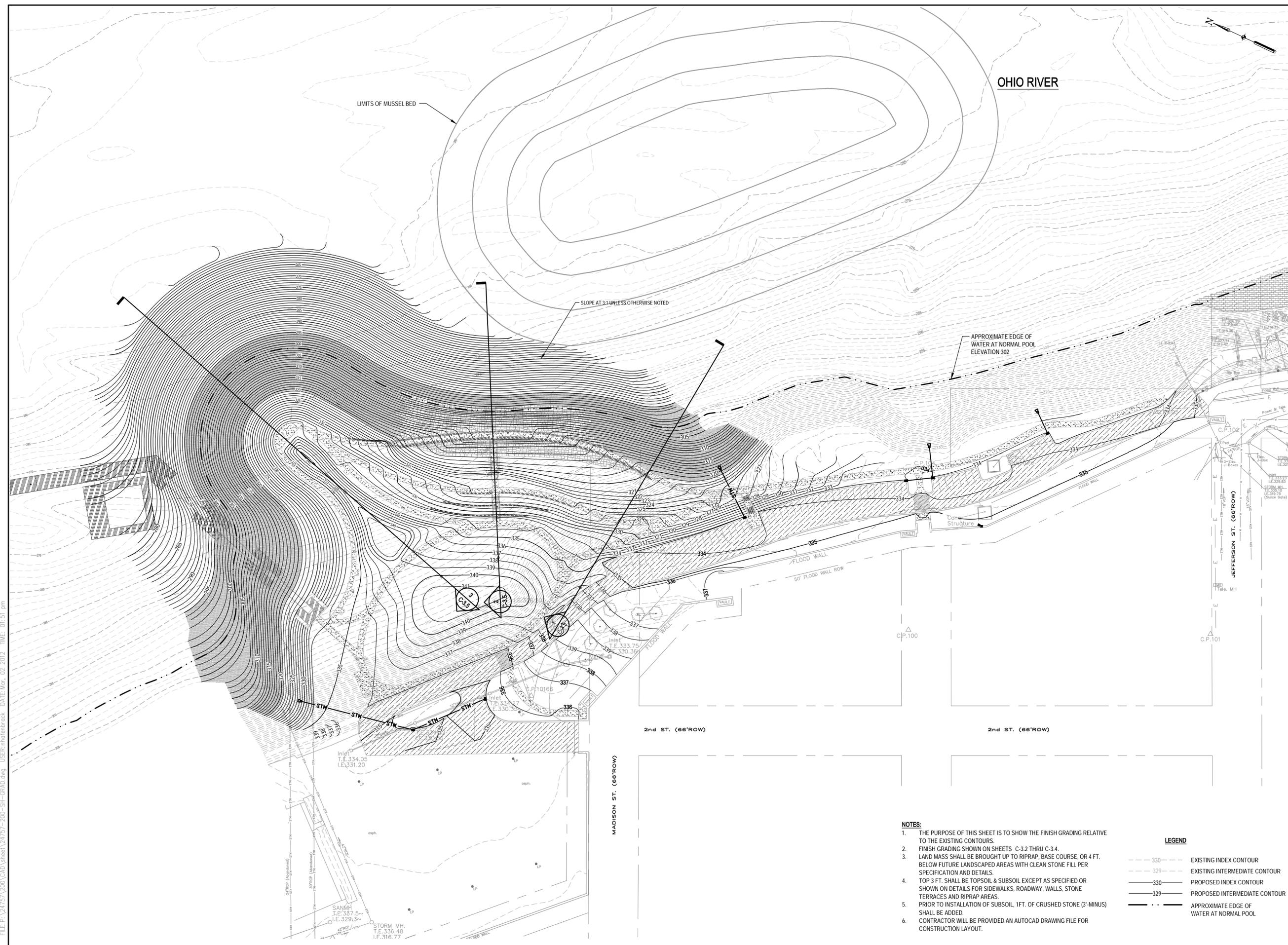


SCALE 24757.200

PROJECT NUMBER

C-3.1

DRAWING NUMBER



- NOTES:**
1. THE PURPOSE OF THIS SHEET IS TO SHOW THE FINISH GRADING RELATIVE TO THE EXISTING CONTOURS.
 2. FINISH GRADING SHOWN ON SHEETS C-3.2 THRU C-3.4.
 3. LAND MASS SHALL BE BROUGHT UP TO RIPRAP, BASE COURSE, OR 4 FT. BELOW FUTURE LANDSCAPED AREAS WITH CLEAN STONE FILL PER SPECIFICATION AND DETAILS.
 4. TOP 3 FT. SHALL BE TOPSOIL & SUBSOIL EXCEPT AS SPECIFIED OR SHOWN ON DETAILS FOR SIDEWALKS, ROADWAY, WALLS, STONE TERRACES AND RIPRAP AREAS.
 5. PRIOR TO INSTALLATION OF SUBSOIL, 1FT. OF CRUSHED STONE (3"-MINUS) SHALL BE ADDED.
 6. CONTRACTOR WILL BE PROVIDED AN AUTOCAD DRAWING FILE FOR CONSTRUCTION LAYOUT.

LEGEND

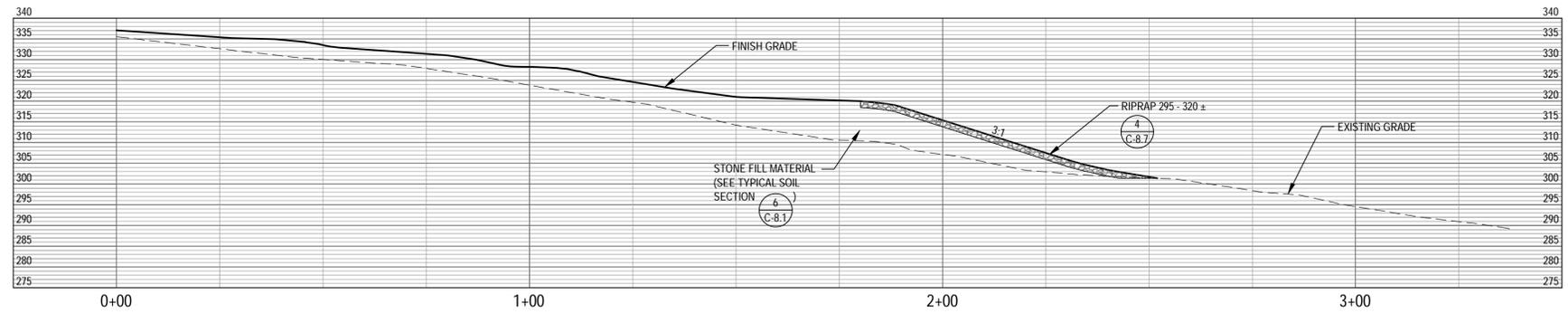
---	330	EXISTING INDEX CONTOUR
---	329	EXISTING INTERMEDIATE CONTOUR
---	330	PROPOSED INDEX CONTOUR
---	329	PROPOSED INTERMEDIATE CONTOUR
- - -		APPROXIMATE EDGE OF WATER AT NORMAL POOL

FILE: P:\24757\200\CAD\sheet\24757-200-SH-GR10.dwg USER: rhr@rhr.com DATE: Mar. 02. 2012 TIME: 01:51 pm

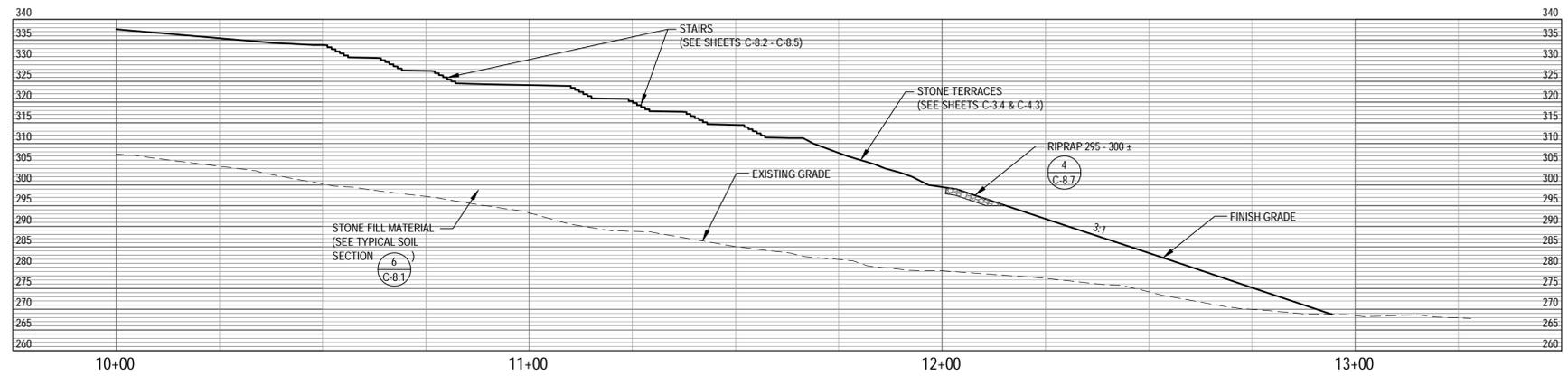
SCHULTZ PARK AND TRANSIENT DOCK

Owner:
CITY OF PADUCAH

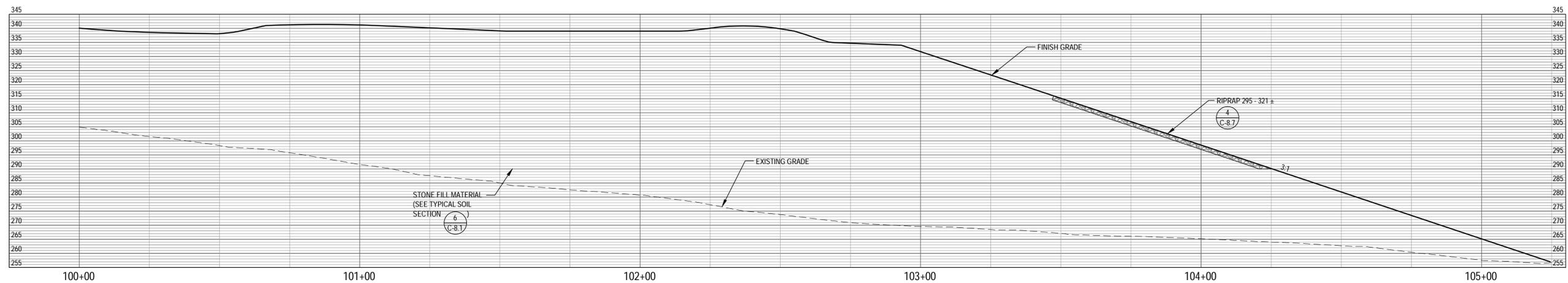
JJR landscape architecture
planning
urban design
civil engineering
environmental science
JJR, LLC
625 WILLIAMSON STREET,
MADISON, WISCONSIN 53703
608.251.1177 T
608.251.6147 F
www.jjr-us.com



1 SECTION 1
C-3.5 SCALE: 1" = 20'



2 SECTION 2
C-3.5 SCALE: 1" = 20'



3 SECTION 3
C-3.5 SCALE: 1" = 20'

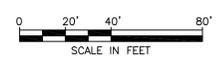
ISSUED FOR	REV	DATE
Issued for Review		03/02/2012

SEALS AND SIGNATURES

NOT FOR CONSTRUCTION

KEY PLAN

DRAWING TITLE
GRADING SECTIONS



SCALE: 24757.200

PROJECT NUMBER
C-3.5

DRAWING NUMBER

FILE: P:\24757\200\CAD\sheet\24757-200-SH-SECTIONS.dwg USER: mofenbrack DATE: Mar-02-2012 TIME: 01:52 pm

APPENDIX D

SHPO CORRESPONDENCE



COMMERCE CABINET
KENTUCKY HERITAGE COUNCIL

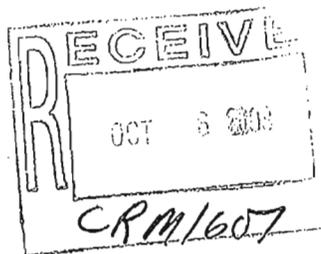
Steven L. Beshear
Governor

The State Historic Preservation Office
300 Washington Street
Frankfort, Kentucky 40601
Phone (502) 564-7005
Fax (502) 564-5820
www.kentucky.gov

Marcheta Sparrow
Secretary

September 30, 2008

Jason Peterson
Florence and Hutcheson, Inc
PO Box 7267
Paducah, Kentucky 42002



Re: Phase I Archaeological Survey for the Proposed Development of the Paducah Riverfront Boat Launch and Improvements to Schultz Park, McCracken County, Kentucky by Kevin Lomas and Michael McNerney

Dear Mr. Peterson:

This office has received the above mentioned report for review. The survey found no new evidence of prehistoric or early historic occupation in the project area. I concur with the author's findings. In accordance with 36CFR Part 800.4(d) of the Advisory Council's revised regulations our finding is that there are No Historic Properties Present within the undertaking's area of potential impact. Therefore, we have no further comments and responsibility to consult with the Kentucky State Historic Preservation Officer under the Section 106 review process for archaeology on this portion of the project is fulfilled.

If you have any questions, please do not hesitate to contact Lori Stahlgren of my staff at (502) 564-7005 ext 151.

Sincerely,

Mark Dennen, Acting Executive Director
Kentucky Heritage Council and
State Historic Preservation Officer

Cc. George Crothers
Steve Titus



STEVEN L. BESHEAR
GOVERNOR

**TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL**

MARCHETA SPARROW
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

LINDY CASEBIER
ACTING EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

January 11, 2012

Mr. John L. Farmer, P. E.,
Florence & Hutcheson
410 New Salem Hwy
Suite 109
Murfreesboro, TN 37129

Re: Paducah Riverfront Development Project Proposed Updates, Paducah, McCracken County, Kentucky

Mr. Farmer,

Thank you for your correspondence concerning the above referenced project. Based on the information provided, I concur with your recommendation that the proposed updates to the Boat Launch and the Marina/Transient Dock will have no impact to historic properties within the Area of Potential Effect. However, if the project design or boundaries change again in the future then this office should be consulted to determine the nature and extent of additional documentation that may be needed.

If you have any questions, please do not hesitate to contact Phillip Johnson of my staff at (502) 564-7005 ext 122.

Sincerely,

Lindy Casebier, Acting Executive Director
Kentucky Heritage Council and
State Historic Preservation Officer

LC:prj

Cc: David Waldner (KYTC-DEA)
Michael Jones (KYTC-OLP)
James Lee Hixon (KYTC-DEA)

APPENDIX C

0280 **BUSINESS FOR SALE**
TIME to retire! Profitable, convenience store. Interested inquiries only call 270-210-3647 after 2pm.

PETS

0320 **CATS/DOGS/PETS**
MINI Bichon Frise pups, CKC, 7 wks., very cute, non-shedding, non-allergenic, 1st shots/wormed. \$500-\$850. No Sunday calls please. 270-968-0765.

CKC Teacup Yorkie male 6 wks., \$500
CKC Bichon Frise puppies, hypo allergenic, non shed, small, 6 wks, 3 M: \$450ea., 1 F: \$500, vet checked. 731-627-2311.

COCKER Spaniel pups, \$120. No Sun calls. 270-623-6095.

YORKIES & Yorkie Poo pups Reg., Pad training. 270-376-2121, 705-9772.

FARM

0420 **YOUR PICK**
STRAWBERRIES Ready for pick-up or pre-pick. Picking hrs. 8-8 daily, containers avail. Blueberry Hill Farm, Cobden, IL. 618-939-2397.

0430 **FEED/FERTILIZER**

STRAW FOR SALE \$3.50 bale 270-293-6989

0450 **LIVESTOCK**

ALFALFA HAY 270-752-0227

ANGUS Bulls, calving ease & growth yearlings. Bremer Bros. 618-524-5396.

HEREFORD BULLS 12-24 months old with EPD's & performance records. Young's Polled Herefords, Kuttawa. Phone 270-963-0309

MERCHANDISE

0503 **AUCTION SALES**
Col. Paul Wilkerson & Sons Real Estate/Auction. Lowes, KY. 674-5659, 674-5523

0506 **ANTIQUES/ART**
NEW Antique Store opening! 216 Broadway, Courtyard East.

0509 **HOUSEHOLD GOODS**
GUARANTEED Used Appliances 1600 Irvin Cobb Dr. 443-1115

WASHER/Dryer, 1 yr old. \$300. 554-0609.

0521 **LAWN & GARDEN EQUIPMENT**
2011 HUSQVARNA Lawn tractor 46" cut. 21hp Kohler eng, w/ hydrostatic trans. Used 4 times, \$1100. 270-816-4115.

0554 **WANTED TO RENT/BUY/TRADE**
JUNKED Cars, \$400 & up. 270-933-8698

NOW BUYING JUNK CARS Top Dollar Paid 270-408-1200

RUNNING, fixable, junk cars-trucks-vans-trailers-farm/big equip., tools. CASH. 270-804-8333.

0563 **MISC. ITEMS FOR SALE**
THIS NEWSPAPER COULD BE YOURS EVERY DAY! What better gift to give yourself or a friend, Call The Paducah Sun Customer Service Department for details. 575-8800 or 1-800-599-1771.

REAL ESTATE FOR RENT

0605 **REAL ESTATE FOR RENT**
HUD PUBLISHERS NOTICE
All real estate advertised herein is subject to the Federal Fair Housing Act which makes it illegal to advertise any preference, limitations, or discrimination based on race, color, religion, sex, handicap, familial status or national origin, or intent to make any such preferences, limitations or discrimination. State laws forbid discrimination in the sale, rental or advertising of real estate based on factors in addition to those protected under federal law. We will not knowingly accept any advertising for real estate which is in violation of the law. All persons are hereby informed that all dwellings advertised are available on an equal opportunity basis.

0610 **UNFURNISHED APARTMENTS**

1BR townhome newly dec., cent. h.v.a, w/d con., appls., no pets. \$720 mo. 559-5569

2 BR, 1.5 B, 3216 Jack Gray Dr., off N. 32nd near mall, \$600 442-777, 556-9695.

228 S 17th St., \$400, lg. 1BR, appls., water pd. 618-363-1246

HEATH AREA 2 BR, 1B, \$500+ dep. 270-210-3324.

LONE OAK, 1BR, W/D, refs., no pets. \$450. 554-8374.

WEST END LTD 2BR, 1B Townhome W/D hookup in kit. 2BR, 1B flat, private storage, W/D hookup in basement. 270-442-9258 Hours: 9-10 a.m. Mon-Fri.

1 BR, \$525 incl. gas, heat & water, all electric. 554-8155

BEAUTIFUL 2 BR APT. overlooking Tenn. River, \$825/mo. 501-454-9564.

Cardinal Point 2 BR, 1 B, 2 laundry rooms, West End area. 444-7334. Hrs: 10-12. Mon-Fri.

F & F Leasing Spacious 2 BR, Lone Oak, central heat/air, all electric. 554-8155

NICE Lg. Efficiency all utils. paid, 2142 Jefferson. 443-3090

REIDLAND, 2 BR, \$425, LEASE NO PETS. 898-2256

Soungate Manor 1 BR. 270-442-6621

WHITTIER APTS. 1 BR, Sec 8 Senior & Disabled 270-443-9809. EHO

WILLOW OAKS 1, 2, & 3 BR APTS. All electric, laundry room on property 270-443-4200 Hours: 10:00-4:30 Mon-Fri.

0615 **FURNISHED APARTMENTS**

1 & 2 BR exc. location, includes W/D, pet friendly. No pets. \$550 & 700/mo. 443-7103.

0620 **HOUSES FOR RENT**

QUILTERS 3 BR, 3 bath Historic Victorian home located 3 minutes from downtown Paducah. Sleeps 4 comfortably. \$450 per night. Call 615-785-1534.

1010 BRONSON, nice 3BR. 442-1276.

2 BR, 2001 S. 28th St. \$525. 556-0149.

3 BR, West Paducah, Ogden Landing Rd., \$750 + \$750 dep. No indoor pets. 442-6601, 415-2474

4 BR, 1 yard, fenced back yard, 945 N. 32nd near mall. \$675 442-7877, 556-9895.

NEW 3BR 2B, central heat/air, 2 car attached garage, appliances, trash, & lawn care provided. No. Graves Co., 15 mi. from KY Oaks mall, \$950/month + dep. 270-705-3824.

WILLOW OAKS 4 BR/3 B/2.5 BA. The Choice is Yours.

0620 **HOUSES FOR RENT**

4BR 3B brick home, great rm., basement, carport, central heat/air, gas FP, water, sewer, yard care, & trash provided. Melber area, No. Graves Co., 15 mi. from KY Oaks mall, quiet country setting, \$1100/month + dep. 270-705-3824.

LONE OAK, 950 Lov. Flo. St. Rd., 4BR, 2B, 2500 sq. ft., carport, 30x30 det. gar., 20x40 shop, 3 acres, \$1300. 217-1238.

REIDLAND Unique 2BR 1B pets by appr. 270-933-2998

2BR \$585/mo + dep., no pets. 559-0689.

0630 **DUPLEXES FOR RENT**

3 BR, 2 B, Reidland under a lease, \$950 mo. 270-703-0240.

0670 **BUSINESS PLACES/OFFICES**

7,000+ SQ. FT., 8 bays, 3 phase electric, lobby w/office on Park Ave. 331-2283.

BUSINESS property for lease in front of Southside Walmart, 3240 Irvin Cobb Dr. \$4500 mo. triple net lease. 270-331-2288 or 270-564-6273.

SHOP with overhead doors. 217-3909.

2320 BROADWAY 540 - 6000 sq. ft. suite. 442-6685.

0675 **MOBILE HOMES FOR RENT**

2BR 1B, Freemont, 554-9612.

0676 **MOBILE HOME LOTS FOR RENT**

Lg. lots, Locust Valley, Lone Oak 3 BR, 2.5 Bath. 210-5524.

REAL ESTATE FOR SALE

0710 **HOUSES FOR SALE**

MUST Sell 3BR 1B, Fully remodeled. 220 S 19th St. \$62,000. Appraised, \$76K. 270-559-7191

SEEING IS BELIEVING. Don't buy property based on pictures or representations. For free information about avoiding time-share and real estate scams, write the Federal Trade Commission at Washington, DC 20580 or call the National Fraud Information Center, 1-800-876-7060.

SHARPE community, Marshall Co. school district, 3 BR, 2.5 B, lg. bonus rm., great rm., two 2-car garages (attached & detached). lg. lot. \$100 SF. \$250,000. 270-832-4508, 832-1389.

COUNTRY Club of Paducah township, 3BR, 3.5 B, 2650 sq. ft. Granite & hardwood, 20 ft. ceilings, 7 yrs. old. \$530,000. 270-368-3700.

0728 **LAKE/RIVER/RESORT**

LAKEFRONT Log home, on 2 building lots, 3BR 2B, main lake view, \$195,000. 270-924-0200

0734 **LOTS & ACREAGE**

LAND: No. Calloway County, 229 acres hunting/limber, Fred Jones Rd./Goodwin Dr. \$1,400/acre. 270-217-5524

SHADY 1 acre lot, Whispering Oaks, \$15,900. 217-0039.

0741 **MOBILE HOMES FOR SALE**

BANK REPO 2005 28x48, 3BR 2B, \$1000 down & low monthly payments. See at Today's Homes! 270-527-5545

0754 **COMMERCIAL/OFFICE**

For Sale or rent. Commercial bldg. Benton, KY. Reasonable offer considered. 270-227-6154.

0760 **BUSINESS PROPERTIES**

BAR for sale, full bar & key operation w/land, equip., & liquor license, all for \$165,000. 703-9086.

2002 HD Wide Glide 1 owner, lots of extras. 14k mi. \$9,900 OBO. 270-627-0144.

0786 **WANTED TO BUY REAL ESTATE**

I WILL BUY YOUR house, farm, or estate commercial property, or mobile home. CEB@myhomes.com. 270-247-2981. Pay cash/close quickly.

Are you an early riser?

we want you!

Make some money in the early morning hours by becoming a Paducah Sun carrier in the following areas:

PRINCETON, FULTON, PADUCAH (CITY, OLD MAYFIELD ROAD, MALL AREA), SYMSONIA/HARDMONEY

- Earn \$600 - \$1,800 per month!
- Routes available in your area.
- Call to find out more!

270.575.8792

The Paducah Sun

nothing available in YOUR AREA?
CALL today and sign up for our CARRIER waiting List!

Call Today To Be Put On Our Bundle Hauler Waiting List!



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Buy @ Sell @ Trade @ Rent @ Hire

CLASSIFIEDS ONLINE

Check'em out BEFORE they're not off the press!

www.paducahsun.com



LOWERTOWN CHARMER
515 N. 8th, newly constructed in 2009. 4 BR, 2 B, 2100 sq. ft. living area includes porch, 1600 sq. ft. under super energy efficient HVAC. Hardwoods, ventless gas FP and wine fridge. 1BR has private entrance for use as commercial office or Artist space. \$178,400. Call for showing! Buyers Agent Welcome. (270)366-1389

Beautiful home in a great neighborhood!!!
2816 Juniper Ln., Metropolis, IL

Home features 3 BR, 2.5 BA, living room, dining room, & full basement, attached & detached garage. Kitchen has breakfast nook with a large sunroom!! Gorgeous gas fireplace in LR & kitchen. Lots of large closets for storage. Nice fenced-in yard!! All appliances stay as well as pool table & sofa in basement. \$176,310. Take virtual tour at: <http://vimeo.com/28389921>
618-324-3099 or 618-645-9135

DRASTICALLY REDUCED TO \$175,000!!
Designer Renovation on Jefferson Street!
In-ground Pool w/State, Col Pond, Granite, Marble & Hardwood Master Suite, Guest Room, Dressing Room/3BR & 2 Baths. Basement and Garage-Flatcreens and surround sound. 270-933-0243

0804 **BOATS FOR SALE**

2005 SUNTRACKER pontoon, 18' BW Bass Buggy, Signatur Model, 50 h.p. Mercury, low hrs., exc. cond., \$7,900. 270-898-3104.

0820 **COACHMEN** Spirit of America, 24', \$7,000. 564-6075.

2006 COACHMEN travel trailer, 22 ft., 1 slide. 554-3574.

0832 **MOTORCYCLES**

'08 KAWASAKI Vulcan 900 Classic LT, 13K, garage kept, \$5,600. 703-4636.

'03 HONDA SABRE 1100, Cobra pipes & foot boards, \$3,500. 270-564-0711

'08 GOLDWING w/ 2011 Hannigan trike kit. Nav., abs, Alumina trailer to match, \$32,500. after 5pm, 554-0836.

'08 HD V-Rod Limited Edition, 6,500 miles, \$12,000. 564-6075.

2002 HD Wide Glide 1 owner, lots of extras. 14k mi. \$9,900 OBO. 270-627-0144.

0860 **VANS FOR SALE**

'01 DODGE Grand Caravan. Entervan, handcap conversion, 270-748-5447

0864 **PICKUP TRUCKS FOR SALE**

'69 Chevy Fleet-side, cherry red, frame off. Firm \$9,950. 554-9938.

2004 FORD crew cab Lariat, \$11,000. 270-252-6352.

0868 **CARS FOR SALE**

2000 VOLVO S80, 104k mi. Dg km w/ tan leather, heated seats. 270-442-0531.

MOST VEHICLES UNDER \$5,000
JIM NELSON USED CARS
4030 Clark River Rd

JUST OUT! 2011 Mustang GT 5.0 Premium call the Elliott Circuit Court Clerk about this case (#11-CJ-00069).

you take no action within the next 50 days, a Court judgment may be entered in the case.

LEGAL NOTICE OF A PUBLIC HEARING Paducah Waterfront Development Project Phase 1 Paducah, McCracken County, Kentucky

KYTC Six Year Plan Project No. 01-122 The Kentucky Transportation Cabinet (KYTC) has scheduled a Public Hearing on the above referenced project to be held Wednesday, May 30, 2012 from 5:00 PM to 7:00 PM.

The hearing will be held in the City Commission chambers on

0910 **BUSINESS OPPORTUNITIES**

Government Wildlife Jobs! Great Pay and Benefits! No Experience Necessary. The ticket to a dream job might really be a scam. To protect yourself, call the Federal Trade Commission toll-free, 1-877-FTC-HELP, or visit www.ftc.gov. A public service message from The Paducah Sun and the FTC.

0910 **BUSINESS OPPORTUNITIES**

SOME ads in this classification are not necessarily for "help wanted" but for employment information booklets.

0910 **LEGALS**

ON June 20, 2011, a Petition for Dissolution of Marriage was filed in the Elliott Co. Family Court by Gerald McGowan against Vickie McGowan, I, Patrick Trent, have been appointed as a "Warning Order Attorney" to publish this notice. To learn more call the Elliott Circuit Court Clerk about this case (#11-CJ-00069).

you take no action within the next 50 days, a Court judgment may be entered in the case.

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The Federal Highway Administration (FHWA) and the Kentucky Transportation Cabinet (KYTC) approved the Environmental Assessment (EA) on April 9, 2012. Project drawings and the EA are available for public review at the City of Paducah, 300 South 5th Street, Paducah, KY 40301-2267

Recycle this newspaper!

BE A 4-H VOLUNTEER

4-H OFFICE 554-9520

0955 **LEGALS**

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BE A 4-H VOLUNTEER

4-H OFFICE 554-9520

0955 **LEGALS**

This request does not have to be in writing. Please call (270) 444-8511 or mail the request to the address listed below. Please address any questions or comments regarding this hearing, or project information, to: Rick Murphy, PE City Engineer/Public Works Director City Hall, 300 South 5th Street, PO Box 2267 Paducah, KY 40301-2267

WE WANT IT BACK!

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4-H OFFICE 554-9520

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We are your primary source for real estate information

47% of area shoppers rely on *The Paducah Sun*®

Sell Your Home Today!

Individuals: 478-8296 Realtors: 478-8290

REAL ESTATE FOR RENT

0605

UNFURNISHED APARTMENTS

WILLOW OAKS
1, 2 & 3 BR APTS. All electric, laundry room on property
270-443-4200
Hours: 1:30-4:30 Mon-Fri.

REAL ESTATE FOR RENT

0610

FURNISHED APARTMENTS

1 & 2 BR exc. location, includes W/D, off st. parking. No pets. \$550 & \$700/mo. 443-7103.

1 BR apt., incl. utility, cable/WiFi, no pets. \$650. Reidland, no lease. 270-808-7146.

1BR furnished apt., 575-3743, 556-6488.

\$475/month, 1BR, no pets. 559-0688.

REAL ESTATE FOR RENT

0620

UNFURNISHED APARTMENTS

1 BR house, 1713 Broad St., \$400 + deposit. 442-5529.

1104 PARK Ave., nice 2 BR. 442-1276.

3 BR, 2 B, nice. 564-3500, 564-6265.

REAL ESTATE FOR RENT

0630

DUPLEXES FOR RENT

NICE 3BR, 2B, 1850 sq. ft. w/ large backyard area. \$950/mo. 270-703-0240.

3+2 BR, 3 B, very lg., gar. \$950. 554-2287.

REAL ESTATE FOR RENT

0635

ROOMS FOR RENT

890 WEEKLY, 1712 Bloom Av. 443-8007.

0670 BUSINESS PLACES/OFFICES

BEAUTY Salon, furnished, 3 station, util. incl., \$650 monthly. 270-994-3126.

PRIME Retail/Office 564-5000, 443-9911.

SHOP with overhead doors, 217-3800.

2320 BROADWAY 540-6000 sq. ft. suite. 442-6685.

REAL ESTATE FOR RENT

0676

MOBILE HOME LOTS FOR RENT

LG. lots, Locust Valley, Lone Oak, 3 wood, 20 ft. ceilings.

REAL ESTATE FOR SALE

0710 HOMES FOR SALE

2430 JEFFERSON, 3BR, 2B, 2 car garage, 1 block from WBH \$129,000. 270-534-5864.

2BR 1.5B, 1.5 acres, leaving almost everything. MUST SELL! \$25,000. 366-5337, call between 7a-7p.

COUNTRY Club of Paducah townhome, 3BR, 3.5 B, 2650 sq. ft. Granite & hardwood floors, 20 ft. ceilings, 7 yrs. old. \$380,000. 270-366-3700.

COUNTRY Home on 1.4 acres, 11970 Ogden Lindg Rd., Kevl, 1400 sq ft + carport. 2BR, 2B, 2000 sq ft metal build w/ concrete floor \$102,000. Call 270-556-0856.

GREAT LO location, BRICK 3 BR, 2 B w/ upgrades & extra storage. No realtors. \$157,300. 210-9095.

PATIO HOME West Park Village, 3 car garage, 2 BR, 2 B. 270-217-0897.

REAL ESTATE FOR RENT

0610

UNFURNISHED APARTMENTS

2 BR, 1.5 B, 3216 Jack Gray Dr., off N. 32nd, \$575 mo. 442-7877, 556-9895.

2 EFF. Apts., Reidland area, \$275/mo. 270-559-3252.

270-217-3272

2804 KY Ave., \$450; 22B S. 17th, \$400. Lg., 1 BR, water pd. apps. all elec. 618-38-1113.

CUTE & convenient, 2728 Clark, new efficiency apt., all util. included. \$400/month. 442-6696.

EFFICIENCY, utils. incl., \$475/mo near WBH. 519-8636.

LARGE 1 BR upstairs apt. \$475 + dep. 270-559-6943.

LONE OAK, 1BR, W/D, refs., no pets. \$450. 554-8374.

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ADRIAN JONES AUTO SALES
Ledbetter, KY • (270) 898-4350

All Vehicles Marked Down All Prices Firm

CARS

- '07 Suzuki Forenza 4 dr. Auto, 4 cy, 117K, silver \$4,900
- '06 Nissan Altima 2.5S 4cy, 4 dr, local trade \$6,900
- '06 Chevy HHR 4 dr, 4 cy, automatic 80K, silver \$7,900
- '06 Chrysler PT Cruiser 5 speed, 4dr, blue, 95K \$4,900
- '05 Chevy Aveo LS 4 dr, auto, 100K, silver fin \$4,900
- '04 Chevy Malibu LT V6, sunroof, spoiler, leather \$15,900
- '03 Chrysler Concord 4 dr, v6, leather, hooded, gold fin \$4,900
- '03 Hyundai Tiburon 2 dr GT, v6, auto, red fin, 85K \$4,900
- '03 Ford Focus 4 dr hatchback, 4cy automatic, silver, 85K \$4,900
- '02 Pontiac Grand Am 4 dr, 4 cy, gold finish, spoiler \$3,900
- '01 Merc. Grand Marquis 6.5, 4 dr, cloth, blue \$2,900
- '01 Merc. Sable 4 dr, leather, v6, gold finish \$3,900
- '00 Ford Mustang v6, automatic, red fin, cheap \$4,900
- '99 Olds Cutlass 4 dr, 6 cy, auto, trans good \$1,000
- '97 Lincoln Towncar leather, signature, like new \$3,900
- '95 Chev Camaro v6, auto, 1 tops, spoiler \$2,900
- '90 Mazda Miata Convertible, red/black top, 5 speed, v6, like new \$3,900

TRUCKS, VANS & SUVs

- '05 Ford Ranger 4cy, 5.9, red, 133K, nice \$4,900
- '05 Kia Sedona van, 76K miles, red, extras \$5,900
- '04 Pontiac Montana van, v6, auto, extra mile, 84K \$4,900
- '03 Hyundai Santa Fe 4dr, v6, auto, burgundy, local trade \$4,900
- '03 Mitsubishi Outlander SUV 6 cy, 4 dr, white \$4,900
- '02 Dodge Durango 4dr, auto, air, 159K, 4dr, nice \$3,900
- '00 Ford Windstar van, 7pass, 4 dr, hooded, 98K mi \$2,900
- '99 Chev Tahoe 4dr, 6.6, auto, v6, chrome cap \$5,900
- '99 Dodge Ram 1500 pickup, v8, auto, ext. cab, 6dr, nice \$3,900
- '98 Ford F150 4dr, V8, 4dr, auto, white fin \$3,900
- '96 Nissan Quest minivan, 4 dr, v6, maroon, v6 \$2,900
- '95 Ford F150 ext cab, v8, auto, air, maroon fin \$2,900
- '94 Ford Ranger 4 cy, 5 speed, ext. cab, white \$2,900
- '91 Jeep Cherokee 4 dr, 6.0, auto, v6, ext. cab \$1,995
- '90 Dodge Ram 1500 ext cab, v8, auto, air \$1,900
- '90 Ford Custom van, raised roof, v8, trans good \$1,000

0710 HOMES FOR SALE

RENT with option to purchase, newly renovated, Jefferson St., 2 BR, 2 B, sun room, dining room, office, garage, gas fireplace, small down payment will be applied to purchase price. \$139,500. 270-994-7757

SEEING is believing. Don't buy property based on pictures or representations. For free information about avoiding time share and real estate scams, write the Federal Trade Commission at Washington, DC 20580 or call the National Fraud Information Center, 1-800-876-7060.

0820 CAMPERS/TRAILERS

06 42' HY-LINE park model, at Moors Resort, great main lake view, never floods, 1BR, updated furn., 3 slides, 30' deck & awning. \$344,900. 812-435-5555

0832 MOTORCYCLES

'07 YAMAHA V-Star Classic 1100 8.900 mi., windshield, sissy bar, saddle bags, chrome pipes, black w/ghost flames, garage kept, \$5,500. 270-978-3723

0734 LOTS & ACREAGE

4.625 ACRES in Benton city limits, \$37,500 OBO. 270-205-0188.

0741 MOBILE HOMES FOR SALE

11 CLAYTON 16x80, 3BR, 2B, vinyl, like new. 270-489-2525.

1994 MOBILE home on 1/2 acre lot N. of Metropolis, IL in exc. cond., 2 1/2 det. garage, 16x16 deck, 25x15 carport, nice shaded back yard fenced in. Serious inquiries only \$49,500. 618-524-8061.

0856 SPORT UTILITY VEHICLES

'11 TAHOE, 2wd, silver W/ black int. 17K mi. \$32,000 OBO Super Sharp! Call 270-564-1823

2007 NISSAN Murano SL AWD, black, All Options!!! 82K. \$16,500. 254-0476. 270-217-3272.

0860 VANS FOR SALE

'03 PONTIAC Montana Van, \$2,500. Call Mon-Fri., 10:30-4:30. 444-8859.

0868 CARS FOR SALE

2004 CHEVY Blazer 4x4 \$6700 OBO, great cond., 76K mi., everything works. 270-898-1676.

0786 WANTED TO BUY REAL ESTATE

I WILL BUY your house, farm, estate, commercial property, or mobile home. CEbuysHomes.com. 270-247-2988. Pay cash/close quickly.

TRANSPORTATION

2005 CHRYSLER Crossfire Ltd., loaded, showroom, 1 year only 8800 mi., priced to sell. 270-559-5533, 554-1991.

2005 TOYOTA Camry LE \$6500. Beige, 150km, mechanically exc., great cond. dependable. 270-519-1519.

0804 BOATS FOR SALE

14 FT. Larson watercraft, 6hp Evinrude, \$600. 270-562-1035.

2006 SUNTRACKER 25' pontoon, inboard 20 ft. ceilings, 135 h.p., 4 cyl., w/trailer, \$13,500. 270-210-2647.

2010 YAMAHA VX Cruiser jet ski, 13hp, galv. trailer, \$7,100. 618-638-5862

G3 18' alum. bass boat, w/trailer, 50hp power, 110 motor, depth finder, trolling motor, \$9200. 270-217-0043

0820 CAMPERS/TRAILERS

1994 28' 5TH wheel camper, \$4,500. 270-804-0618.

2007 C6 Corvette, Z51 package, targa top, white w/black leather, nav., Bose, polished wheels, 31K mi. Exc. cond., adult driver, \$34,900. 270-320-2815.

2007 MERCURY Montgo Premier, 1 owner, garage kept, loaded, leather, low miles, immaculate, \$11,800. 217-2972

2008 CORVETTE Indy Pace Car, 6,000 mi., black/gray top, conv. top, \$44,500. 270-210-2647.

Congratulations CLASS OF 2012

Parents, Grandparents, Friends & Relatives...

Now's the time to reserve a space for your special high school or college graduate's picture in our special salute to the "Class of 2012," to be inserted in The Paducah Sun on Saturday, June 2.

HURRY! DEADLINE IS TUESDAY, MAY 22!

Choose from one of these three options:

OPTION 1\$15
With Full Color ...\$25
Includes Photo, Graduate's Name, School and Your Name

OPTION 2\$30
With Full Color ...\$40
Includes Photo, Graduate's Name, School, Your Name and a Personalized Message

OPTION 3\$45
With Full Color ...\$55
Includes Two Photos, Graduate's Name, School, Your Name and a Personalized Message

Remember when selecting a photo to find a "close-up" shot to ensure the quality of your picture when it's printed.

The Class of 2012

(Please Print)

GRADUATE'S NAME _____

SCHOOL NAME _____

SON/DAUGHTER OF (OR OTHER RELATIONSHIP TO): _____

DAYTIME PHONE _____

ADDRESS _____

CITY _____ STATE _____

Bring the graduate's photograph, name, school name, your name, payment and self-addressed, stamped envelope for return of original photo during office hours 4:00 Kentucky Avenue in Paducah, or mail to: The Paducah Sun, Attn: Classifieds 408 Kentucky Avenue, Paducah, KY 42003

OPTION 1 black & white full color

OPTION 2 black & white full color

OPTION 3 black & white full color

0868 CARS FOR SALE

2008 HONDA Ridge-line, burgundy, moon roof, towing, 48K, warranty, \$18,750. 270-338-0778.

2008 TOYOTA Prius, great cond., white, 61K miles, \$14,500. 270-217-3272.

0910 BUSINESS OPPORTUNITIES

SOME ads in this classification are not necessarily for "help wanted" but for employment information booklets.

0955 LEGALS

0955 LEGALS

PUBLIC ANNOUNCEMENT OF TRUSTEE

OF THE

The Concord Fire Protection District

UNDER SECTIONS 2509.01 and 2509.02 of the Kentucky Constitution, there is an opening on the Board of Trustees. This position is a Property Owner and who resides in the Concord Fire Protection District. Any interested persons should please contact the Fire Chief at 270-559-2366, 442-2436 or e-mail cf401@vci.net. Detailed qualification and a nomination form are available from the Fire District. (FHWA) and the Kentucky Transportation Cabinet Project No. 10aM Mon. 5/21/12 and join the dedicated men and women of the Concord Fire District.

LEGAL NOTICE OF A PUBLIC HEARING

Paducah Waterfront Development Project

- Phase 1 - Paducah, McCracken County, Kentucky

KYTC Six Year Plan Project No. 01-122

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0880 OFF-ROAD VEHICLES

'03 HONDA RECON, 2500 good condition \$18,800 cash. 270-354-6402.

FINANCIAL

0910 BUSINESS OPPORTUNITIES

CANDLE BUSINESS

Liquidating all equip & supplies, including 150 lb wax meter, wax fragrances, wicks, containers, etc. \$1,200 OBO. For detailed inventory email: candle1@newwaxcom.net

Government Willingness to Pay and Benefits. No Experience Necessary. The ticket to a dream job might really be your scam. To protect yourself from the Federal Trade Commission toll-free, 1-877-FTC-HELP, or visit www.ftc.gov. A public service message from The Paducah Sun and will be held in the City Com-

0955 LEGALS

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0955 LEGALS

formation made available, for a period of fifteen (15) days after the hearing at the address below. All comments from this meeting will become part of the official hearing record. Once compiled, the meeting record will be available for review and copy only after an Open Records Request must be submitted to the Kentucky Transportation Cabinet, Office of Legal Services, 200 Maro Street, Frankfort, Kentucky 40622. In accordance with the Americans with Disabilities Act (ADA), if anyone has a disability and will require assistance, please notify the City Engineer/Public Works Department of the necessary requirements no later than May 23, 2012. This request does not have to be in writing. Please call (270) 444-8511 or mail the request to the address listed below. Please address any questions or comments regarding this hearing, or project information, to: Rick Murphy, PE City Engineer/Public Works Director City Hall, 300 South 5th Street PO Box 2267 Paducah, KY 42002-2267

ANNOUNCING HAPPY ADS BIRTHDAYS ANNIVERSARIES SPECIAL OCCASIONS Share Your Happiness CALL 270-575-8700 And Ask For Classified.

CLASSIFIED CAN DO IT!

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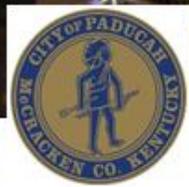
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8 A.M. UNTIL 4:30 P.M.

The Paducah Sun

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Government Agency
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Stephanie Morrow Reynolds commented on Sarah Stewart Holand's status: "WOW! That does not seem possible..."
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Kelly Layne Hendrickson can't see The Quilt Store in Paris Saturday night with July Cox Hendrickson...

- Brian Odor
Claudia Hutchison Meeks
Holly Huff
Janice Riley Comstock
John Comstock
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City of Paducah, Kentucky shared a link. 45 minutes ago

To learn more about the Riverfront Project a public hearing will be held May 30, 5-7pm at City Hall.

http://paducahky.gov/paducah/events/riverfront-project-public-hearing

Riverfront Project Public Hearing | Paducahky.gov
The Kentucky Transportation Cabinet (KYTC) has scheduled a Public Hearing on the above referenced project to be held Wednesday, May 30, 2012 from 5:00 PM to 7:00 PM. The hearing will be held in the City Commission chambers on the 2nd floor of City Hall, 300 South 5th Street, Paducah, Kentucky. The C...

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- Employment
- Financial Presentation
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- Library of Paducah
- Departmental Hazard Study
- Lease/Tenure/Lease Program
- Maps (MAPS)
- McCracken County
- News Releases
- Outreach Committee
- Plans and Special Programs
- Public Safety
- Public Safety
- Request for Bids

Riverfront Project Public Hearing

Time:
May 30, 2012 - 5:00pm - 7:00pm

LEGAL NOTICE OF A PUBLIC HEARING

Paducah Waterfront Development Project - Phase I
Paducah, McCracken County, Kentucky
KYTC Six Year Plan Project No. 01-02

The Kentucky Transportation Cabinet (KYTC) has scheduled a Public Hearing on the above referenced project to be held Wednesday, May 30, 2012 from 5:00 PM to 7:00 PM. The hearing will be held in the City Commission chambers on the 2nd floor of City Hall, 300 South 5th Street, Paducah, Kentucky. The City of Paducah proposes to construct a boat launch facility and a marina/transit dock on the Ohio River as part of a waterfront development effort. This hearing has been scheduled to afford all interested persons an opportunity to become better informed and to express their views concerning the proposed project. The format of the hearing will consist of: (1) public review of project displays, (2) formal presentation of the project and the approved Environmental Assessment (EA) document, (3) a public question and answer session, and (4) the opportunity to record oral and written comments.

The Federal Highway Administration (FHWA) and the Kentucky Transportation Cabinet (KYTC) approved the Environmental Assessment (EA) on April 9, 2012. Project drawings and the EA are available for public review at the City Engineer/Public Works Director office on the 2nd floor of City Hall, 300 South 5th Street, Paducah, Kentucky from 8:00 AM to 4:30 PM Monday through Friday until June 14, 2012 and will also be made available at the hearing. Oral and written statements will be accepted during the hearing. Written statements will be accepted, and information made available, for a period of fifteen (15) days after the hearing at the address below.

All comments from this meeting will become part of the official hearing record. Once compiled, the meeting record will be available for review and copy only after an Open Records Request has been received and approved. All Open Records Requests must be submitted to the Kentucky Transportation Cabinet, Office of Legal Services, 200 Mars Street, Frankfort, Kentucky 40622.

In accordance with the Americans with Disabilities Act (ADA), if anyone has a disability and will require assistance, please notify the City Engineer/Public Works Department of the necessary requirements no later than May 23, 2012. This request does not have to be in writing. Please call (270) 444-8511 or mail the request to the address listed below.

Please address any questions or comments regarding this hearing, or project information, to:

Rick Murphy, PE

City Engineer/Public Works Director

City Hall, 300 South 5th Street
PO Box 2267
Paducah, KY 42003-2267



PADUCAH WATERFRONT DEVELOPMENT PROJECT PHASE 1

ENVIRONMENTAL ASSESSMENT



May 30, 2012
5:00 p.m. to 7:00 p.m.

Paducah City Hall
Commission Chambers – 2nd Floor
300 South 5th Street
Paducah, Kentucky 42001

McCracken County, Kentucky



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WELCOME!

Thank you for attending the Public Meeting for the proposed Paducah Waterfront Development Project – Phase 1. This handout provides an overview of the purpose and format of tonight's public hearing and agenda.

Funding for this project has been provided through a combination of local, state and federal funds which includes the Kentucky Transportation Cabinet (KYTC), Kentucky Department of Fish and Wildlife Resources (KDFWR), Federal Highway Administration (FHWA) and Housing and Urban Development (HUD). As a requirement of federal funding, an Environmental Assessment (EA) has been conducted as part of the National Environmental Policy Act (NEPA) of 1969 in accordance with 23 CFR 771.115(c). Public involvement is a required element of the NEPA process and a fundamental part of the development of this project. Tonight's Public Hearing is intended to provide the public with information regarding the project, present the EA and receive comments for review and consideration by the KYTC and FHWA.

As you enter the room, you will notice displays of the proposed project, project drawings and copies of the EA for review. Key project personnel are available to discuss the project with you and to answer any questions that you may have concerning the project. You will also notice a designated location where you may provide written comments that will become part of the final record for the hearing. Following the presentation of the EA document, you will be given an opportunity to provide comments publicly at the podium.

The agenda is provided below:

5:00 p.m. to 5:30 p.m.

Sign in, review displays and project documents. Informal one-on-one question/answer and discussion with project personnel.

5:30 p.m. to 6:00 p.m.

Formal presentation of the Environmental Assessment document

6:00 p.m. to 7:00 p.m.

Formal public comment period. If you wish to make a comment during this time, please place your name on the Speakers List located at the welcome table just outside the door by 6:00 p.m.. First opportunity will be given to speakers whose name appears on this list, then additional comments will be welcomed from the general audience only as time allows. If you wish to comment, please step to the podium and speak into the microphone. Please state your name, address and city of residence. Comments should be limited to 3 minutes each.

All comments received in written form or issued publicly from the podium will become part of the official record of the public hearing along with a copy of the audio/video

recording. General comments provided to or by the project personnel cannot be entered into the official record and are intended only as general information. In addition, only comments will be received during the formal public comment portion of the hearing and there will be no question/answer exchange with project personnel.

If you do not wish to provide a comment at this time or simply wish to comment at a later date, you may submit a written comment via standard mail until June 14, 2012 to the address below.

Mail comments to: Office of the City Engineer
City Hall
P.O. Box 2267
Paducah, Kentucky 42002-2267
Attn: EA Public Comment

Thank you for interest and participation in the development of this project.

PADUCAH WATERFRONT DEVELOPMENT PROJECT (PHASE 1)

Environmental Assessment Public Hearing

Wednesday, May 30, 2012 - 5:00 to 7:00 CST
Commission Chambers, City Hall, Paducah, Kentucky

SIGN-IN SHEET

	NAME	CITY/STATE	TELEPHONE
1	Mary Hammond	Paducah, Ky	274-443-8783
2	ROGER MELUWIN	W. PADUCAH	270-744-3838
3	GONOR BEVELL	Lone Oak	502-240-1731
4	Sue Therp	Paducah, Ky	270-442-4554
5	Cell-Rhodes	Paducah	270 443-7700
6	Debi & Richard Glasscock	Paducah	442-3098
7	B. Chambliss		
8	A. CHAMBLISS		
9	TOM PADGETT	PADUCAH	519-2444
10	MAURIE MCGARVEY	Paducah	519-0427
11	Elaine Spalding	Chamber	443-1746
12	Sonny Smith	Pad Ky	443-6511
13	STEVE DODDLETT	PADUCAH, KY	444-
14	Jeff Paskin	" "	" 8503
15	Jimmy Duckoella	Paducah KY	564-8175
16	Rain Spencer	Paducah, Ky	444-8669
17	Alan Reed, Paducah Sun	Paducah	575-8858
18	Lisa Thompson	Paducah	444-8649
19	Meredith Chisler	Paducah	898-7903
20	Bill Schrad	Paducah	898-3402
21	STROE ERWIN	Paducah	559-0383
22	Pat Murphy	City of Paducah	444-8511
23	PATRICK PERRY	PAD. Ky	270-217-1674
24	Sandra Wilson	Pad. Ky	559-0389
25	Mark Warren	Pad/Ky	994-6649
26	Spring Hawk		

PADUCAH WATERFRONT DEVELOPMENT PROJECT (PHASE 1)

Environmental Assessment Public Hearing

Wednesday, May 30, 2012 - 5:00 to 7:00 CST
Commission Chambers, City Hall, Paducah, Kentucky

SIGN-IN SHEET

	NAME	CITY/STATE	TELEPHONE
27	Carol C. GAULT	Paducah Ky	
28	Patrick Downs	Paducah, Ky	
29	James Young	Paducah, Ky	
30	Jerry Stewart	Paducah Ky	
31	Jammy White	Paducah Ky	
32	Kevin Boyd	Paducah Ky	
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PADUCAH WATERFRONT DEVELOPMENT PROJECT - PHASE 1

Environmental Assessment Public Hearing

PUBLIC COMMENT LIST OF SPEAKERS

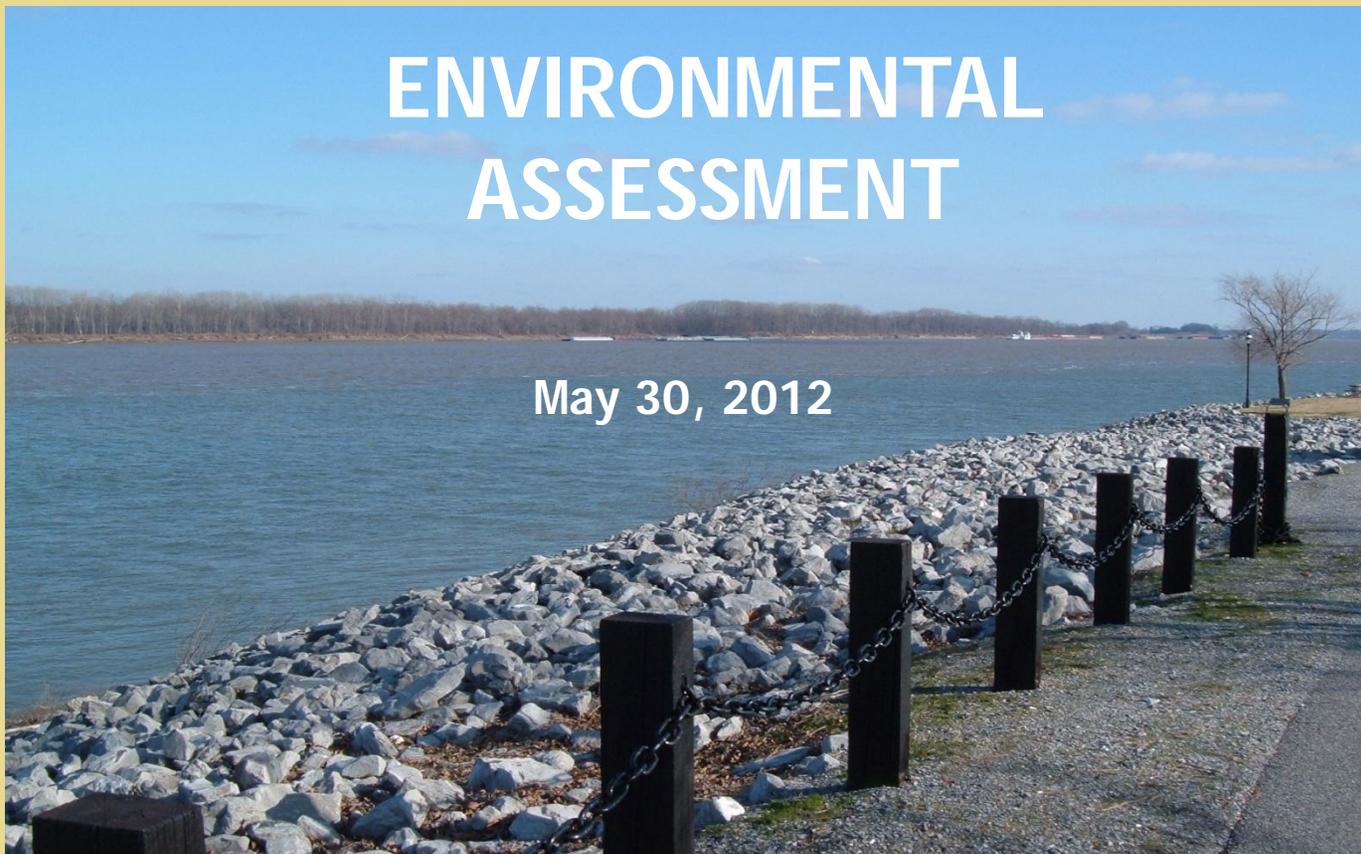
	NAME	CITY/STATE	TELEPHONE
1	<i>B. Bennett Chambers</i>	(BENNETT CHAMBERS)	
2	ROGER MELUCCINI		
3	NICK WARDEN	Pad Ky	714-6649
4			
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Paducah Waterfront Development Project (Phase I)

KYTC Six Year Plan Project No. 01-122

ENVIRONMENTAL ASSESSMENT

May 30, 2012



Why Are We Here?

- The National Environmental Policy Act (NEPA) of 1969 established a mandate for Federal agencies to consider impacts to the ecological, social, and cultural environments.
- Project is being funded through state and federal grants:
 - Kentucky Department of Fish & Wildlife Resources
 - Federal Highway Administration (administered through the Kentucky Transportation Cabinet)
 - US Fish & Wildlife Service
 - US Department of Housing and Urban Development

Why Are We Here? (cont.)

- As part of the requirements under NEPA regulations, an “assessment” of the impacts to the environment is documented either in an Environmental Assessment (EA) or an Environmental Impact Statement (EIS)
- The EA must, at a minimum, address:
 - Purpose and Need
 - Alternatives Analysis (Location & Design)
 - Environmental Impacts
 - Planning and Public Involvement
- Present the EA document and receive public comment

Background

- City of Paducah identified a need for a comprehensive plan to enhance its existing riverfront facilities
- JJR prepared a Riverfront Redevelopment Plan and the Plan was adopted by the City in April, 2007
- The Plan includes a comprehensive approach to planning, development, implementation and enhancement concepts along the riverfront
- The **Boat Launch** and **Marina/Transient Dock** projects were identified and funded as Phase I of the Plan.

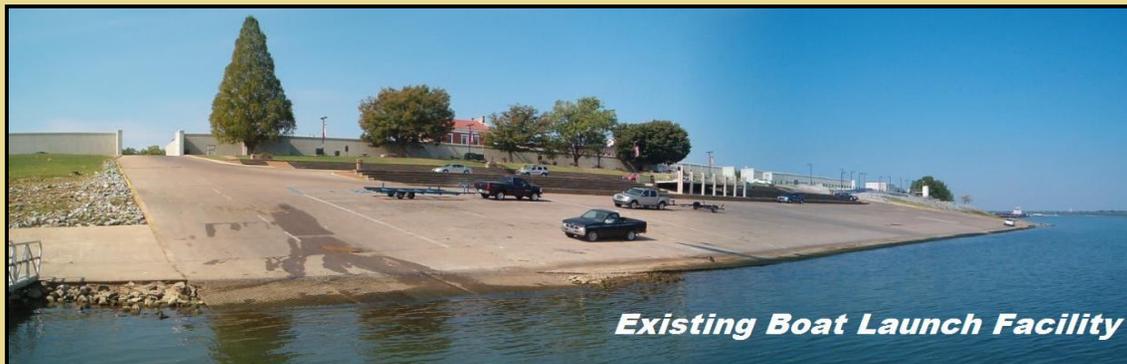
Purpose & Need

Purpose

- Boat Launch: Relocate the existing boat ramp facility from Broadway Street
- Marina/Transient Dock: Provide accommodations for transient boaters and local recreational boat owners

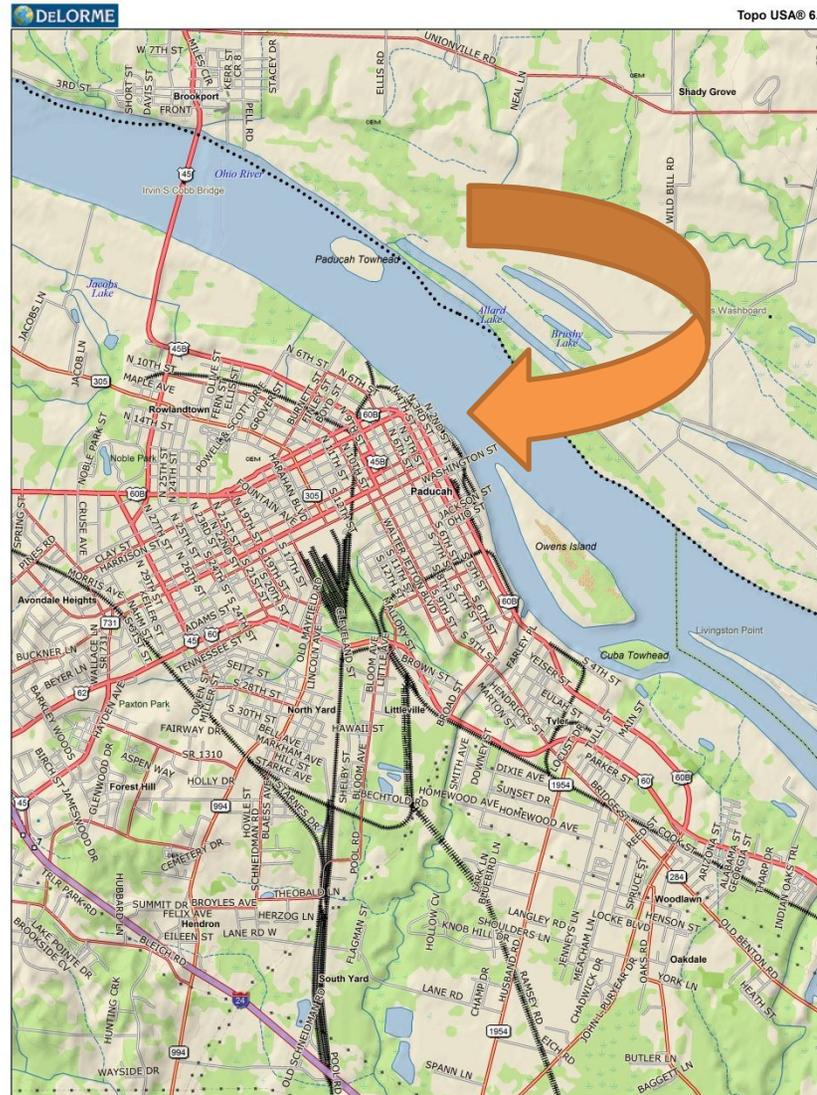
Need

- Boat Launch: Reduce congestion and vehicle parking associated with recreational fishing activities at the end of Broadway Street
- Marina/Transient Dock: Provide loading/unloading facilities for transient boats and a protected marina with associated facilities



Existing Boat Launch Facility

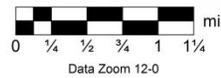
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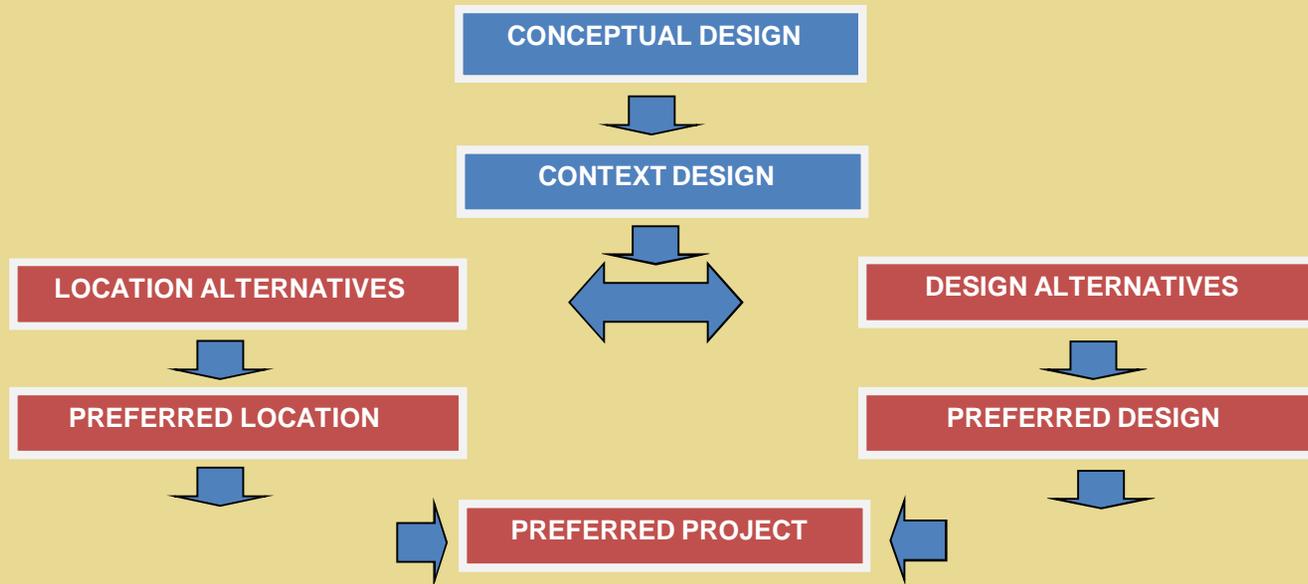


Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122



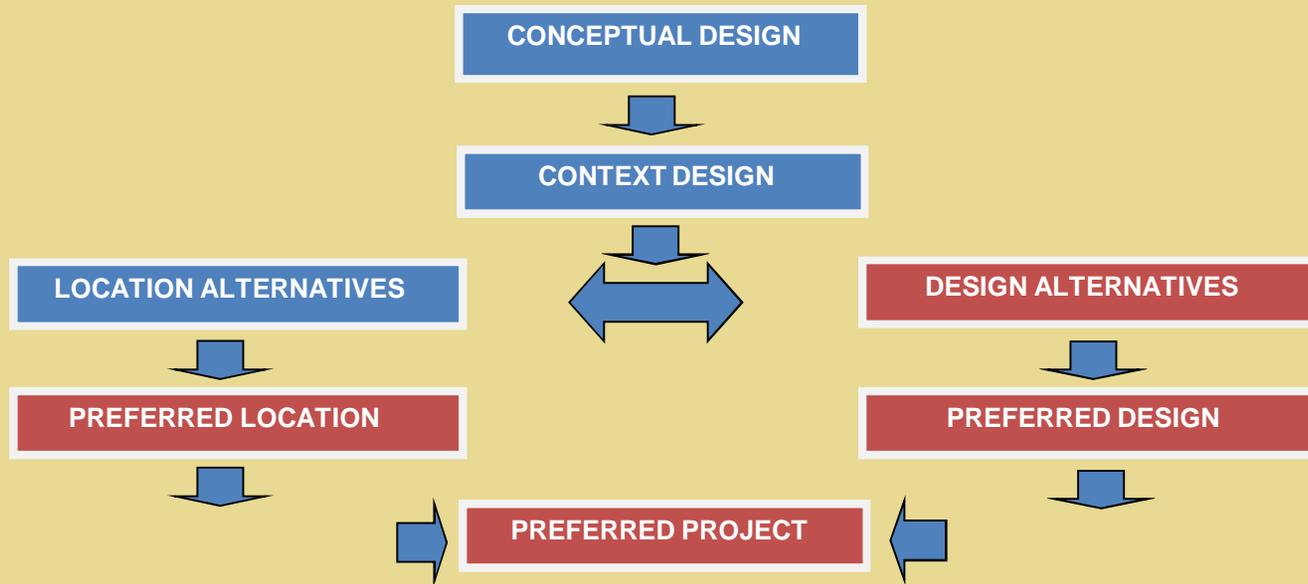
Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives



Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives



Location Alternatives

- Location alternatives were considered and eliminated utilizing a hierarchy of constraints.
 - Distance from downtown
 - Publicly (city/county) owned properties
 - Level of existing development on the properties in question
 - Level of probable impact to cultural, social and environmental resources.
- Sites were selected to minimize development cost and environmental impact, while **maintaining close proximity to downtown Paducah.**

Location Alternatives - Boat Launch

- Location Alternative #1
 - SE and contiguous to the Midwest Gas Terminal Barge access off of North 6th St/Campbell St intersection; city/county owned.
 - Rejected- Inadequate room for ingress, egress, parking & inappropriate zoning
- Location Alternative #2
 - Undeveloped property 0.6 miles downstream of Alternative #1 on city-owned property and downstream of the Paducah City Water intakes
 - Rejected- Combined sewer outfall for wastewater treatment plant in vicinity
- Location Alternative #3
 - Undeveloped property 400 feet upstream of Alternative #2 and city-owned
 - Considered the “consensus location” for the boat launch facility

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

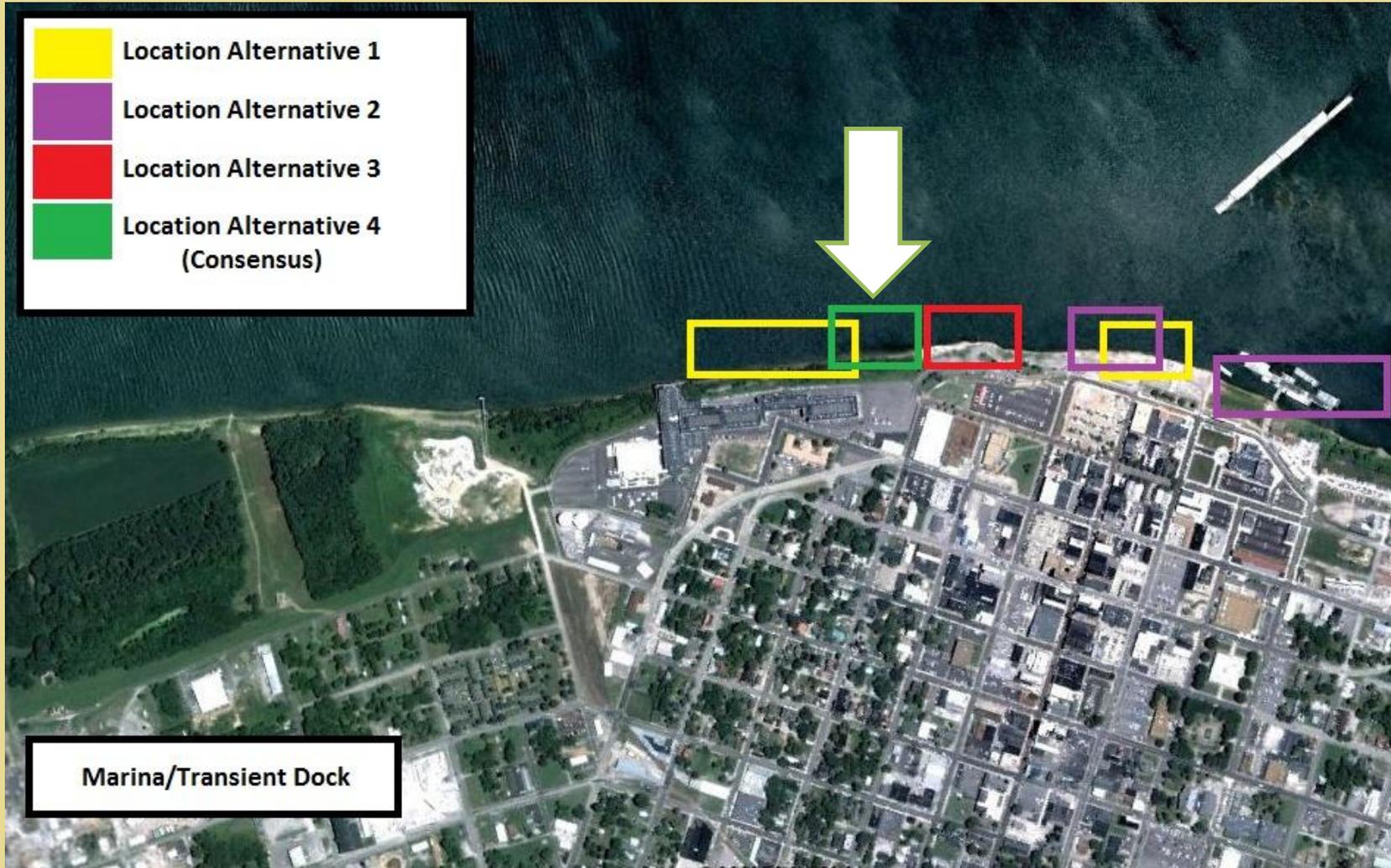


Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location Alternatives - Marina/Transient Dock

- Location Alternative #1
 - Marina- Executive Inn property and city/county-owned; Transient Dock- end of Broadway St. and city-owned.
 - Rejected-Marina 0.7 miles from “downtown” and separate
- Location Alternative #2
 - Marina- Both Crouse and city-owned property north of the Carson Four Rivers Center; Transient Dock- end of Broadway St. and city-owned.
 - Rejected-Marina may impede navigation/development and separate
- Location Alternative #3
 - Facilities combined on river between MLK Dr. and Jefferson St.
 - Rejected-Impacts to freshwater mussels
- Location Alternative #4
 - Shifted 500 feet downstream of Alternative #3 to lessen mussel impact
 - Considered “consensus location” for the marina/transient dock

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122



Existing Facilities at Preferred Location

Boat Launch

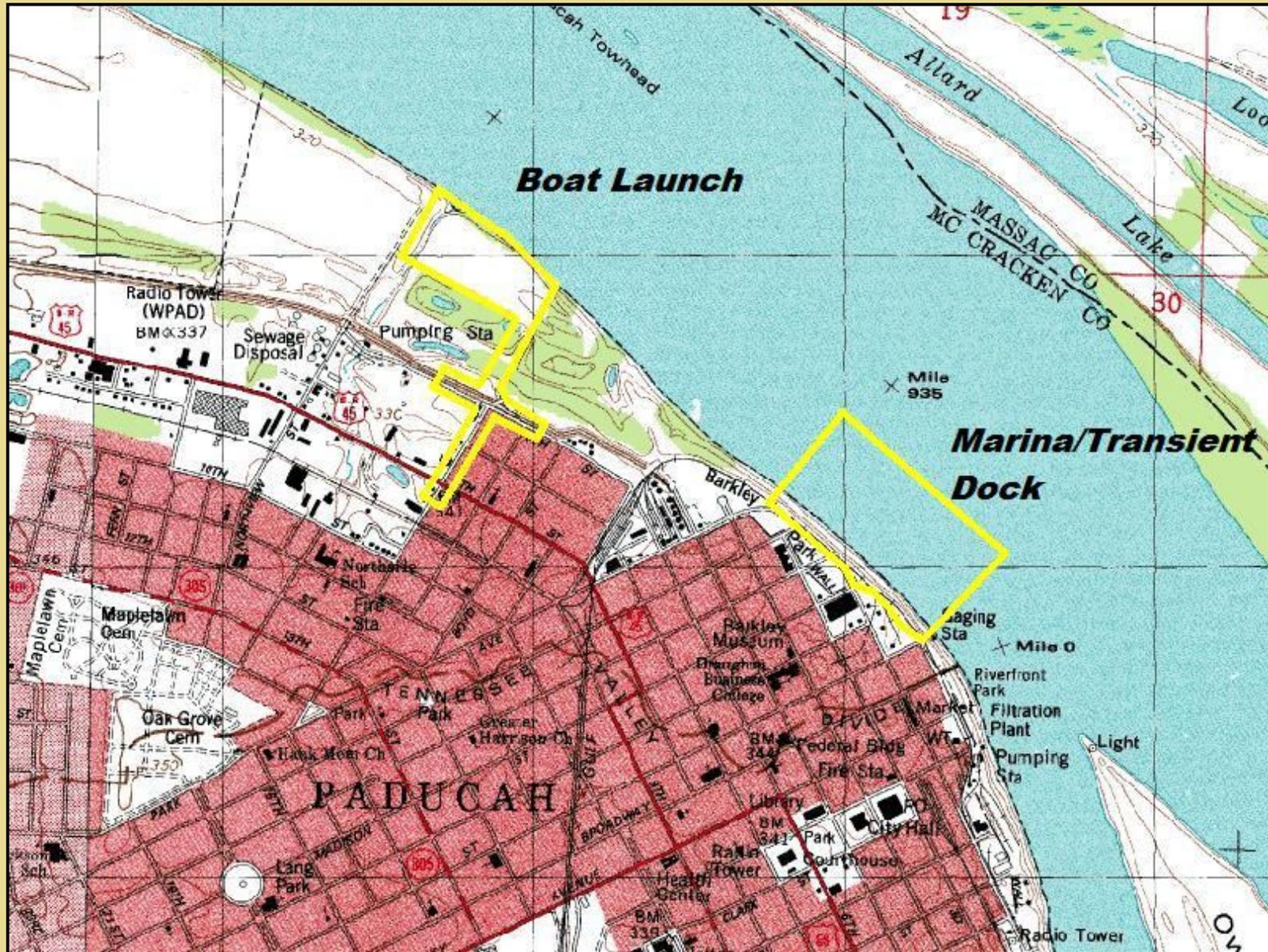
- Existing undeveloped agricultural field and woodland between the levee and Ohio River near 6th and Burnett Street.
- Existing Burnett Street between 8th and 6th Streets.

Marina/Transient Dock

- Existing Schultz Park and riverbank between the floodwall and Ohio River westward from the end of Jefferson Street.



Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122



Paducah Waterfront Development Project (Phase I) KYTC Six Year Plan Project No. 01-122



Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Proposed Facilities (Conceptual Design)

Boat Launch

- 5-lane boat ramp w/courtesy dock
- 100± parking spaces
- Reconstruction of Burnett Street from 6th to 8th Street
- Access road up and over floodwall to ramp facility



Marina/Transient Dock

- Floating dock system
- 150-slip marina
- Refueling facilities
- Store/office building
- Schultz Park enhancements
- Parking enhancements

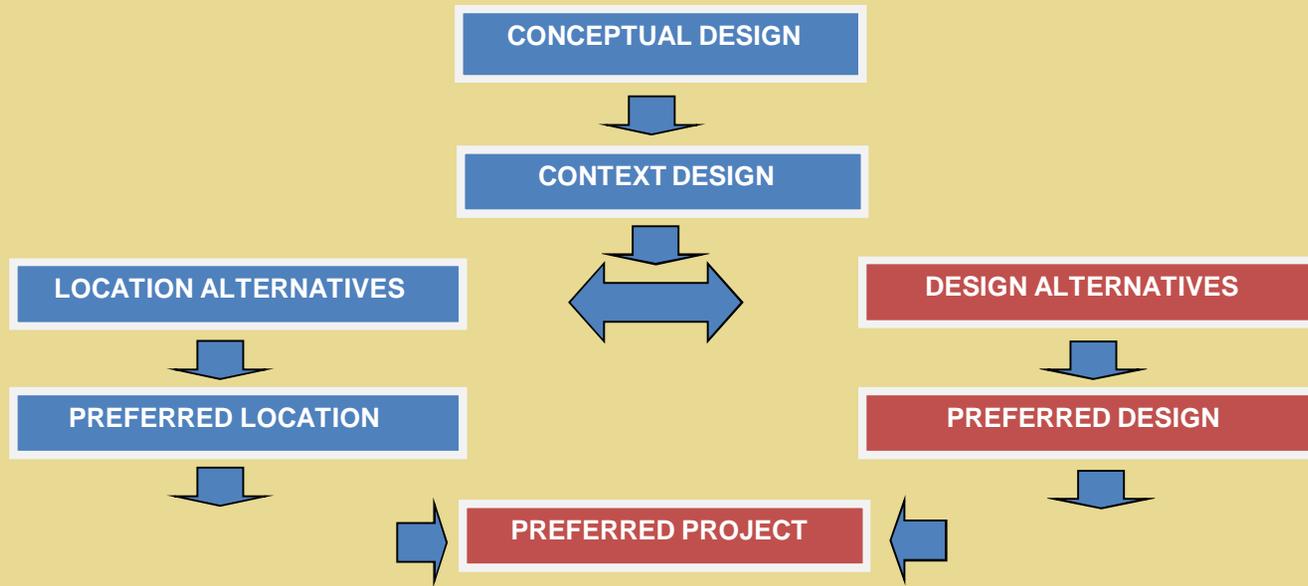


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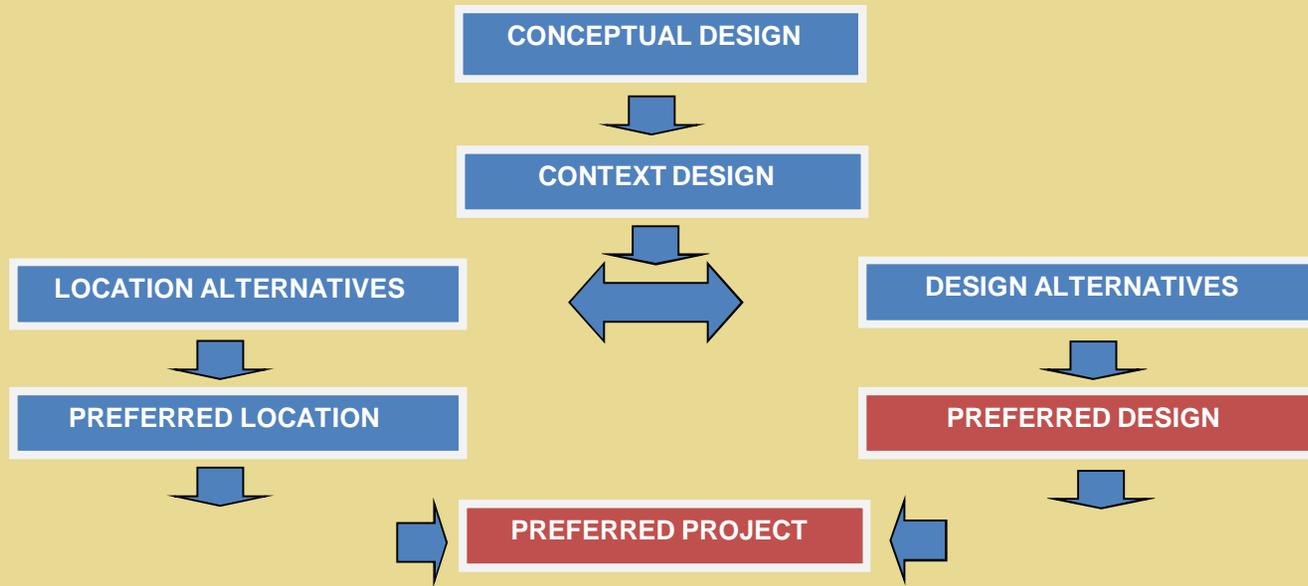
Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives



Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives

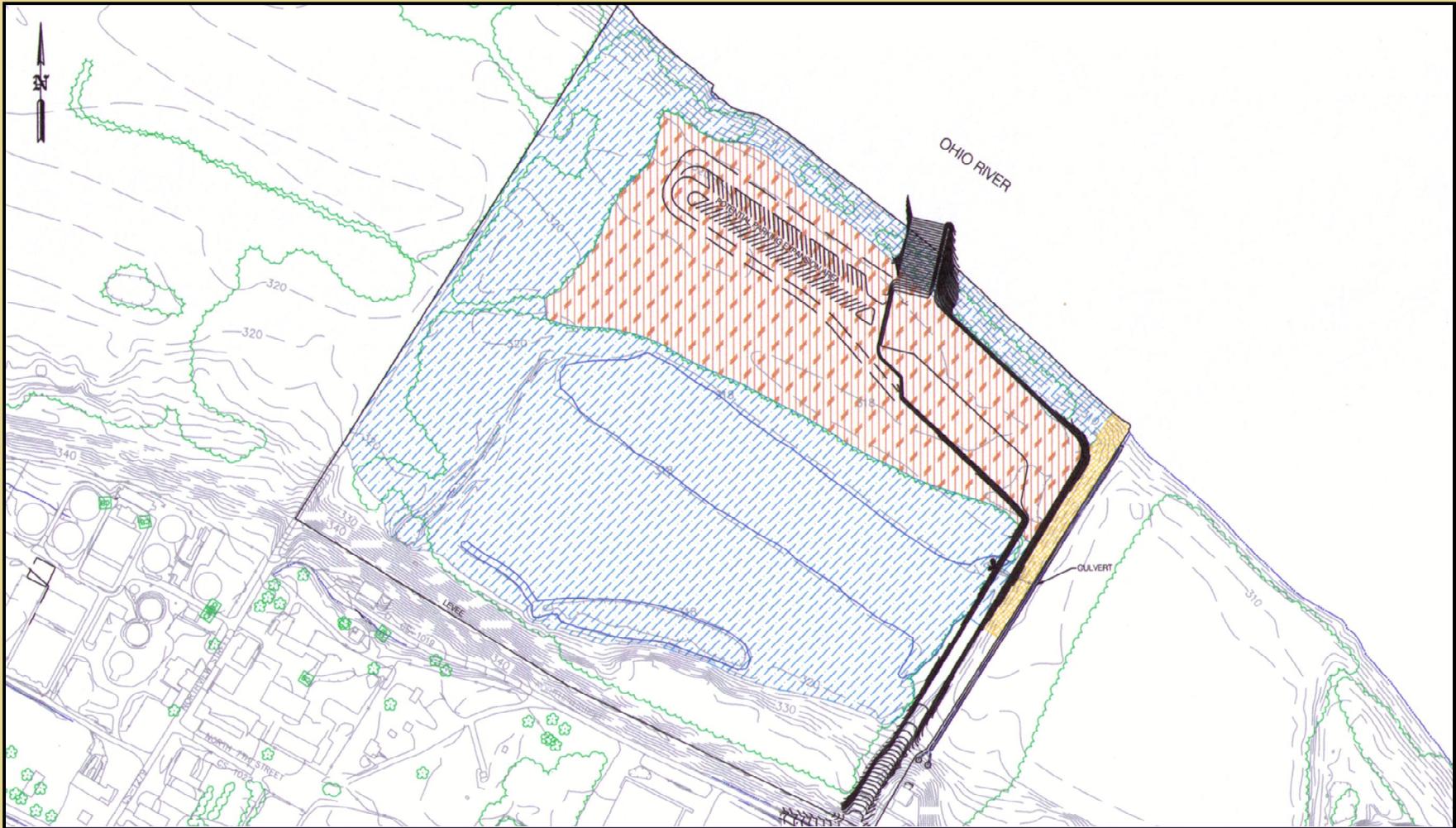


Design Alternatives - Boat Launch

- Two design alternatives were evaluated requiring fill in the river
- Alternative #1 includes:
 - Five (5) lane boat ramp w/courtesy dock
 - Paved parking and trailering area for 100 parking places
 - An access road to the site as an extension of Burnett Street and constructed in the location of an existing gravel/dirt access road along the eastern boundary of the site.
- Alternative #2 includes:
 - The amenities provided in Alternative #1 with the addition of 4.3 acres of future parking area.
 - Alternative #2 is the “consensus” design alternative

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Preferred Design Alternative (Consensus)- Boat Launch



Design Alternatives - Marina/Transient Dock

- Three design alternatives were evaluated:
 - Alternative #1 - Mass Fill to provide landform and shore protection
 - ✓ Concept #1
 - ✓ Concept #2
 - ✓ Concept #3
 - Alternative #2 - Sheet Pile Retaining Walls
 - Alternative #3 - Floating Barrier
- Each alternative would serve the purpose and need by:
 - Providing loading/unloading facilities for transient boats
 - Providing a marina with associated facilities that will allow transient and local recreational boaters to dock in a protected marina near downtown.
- Each of the alternatives would enhance Schultz Park.

Design Alternatives - Marina/Transient Dock

Alternative #2 - Sheet Pile Retaining Walls

- Mass fill material is placed within a vertical sheet pile wall.
- This alternative provides protection of the marina/transient dock from floating debris, ice, and barge impact.
- Access to the floating dock is provided by elevated walkway/gangway; however, the river's edge will not be accessible
- Land-based improvements to Shultz Park limited to reconstruction of parking and enhanced vegetation

Rejected because:

- Access to the river for non-boaters is limited
- Minimum enhancement to Shultz Park
- Few amenities
- High capital construction costs

Design Alternatives - Marina/Transient Dock

Alternative #3 - Floating Barrier

- Consists of a series of pre-cast concrete barges linked together to form one continuous, articulated floating dock string
- Attached to multiple piers constructed at intervals along the dock
- This alternative provides (1) protection of the marina/transient dock from floating debris, (2) wave attenuation, and (3) access to the dock/marina.
- Land-based improvements to Shultz Park limited to reconstruction of parking, slope protection, walkways, and enhanced vegetation

Rejected because:

- Piers would obstruct viewshed from the park and surrounding areas
- Significant maintenance obligation of floating guide rail system
- Unacceptable risk to public in the event of barge impact
- High capital construction costs

Design Alternatives - Marina/Transient Dock

Alternative #1 - Mass Fill

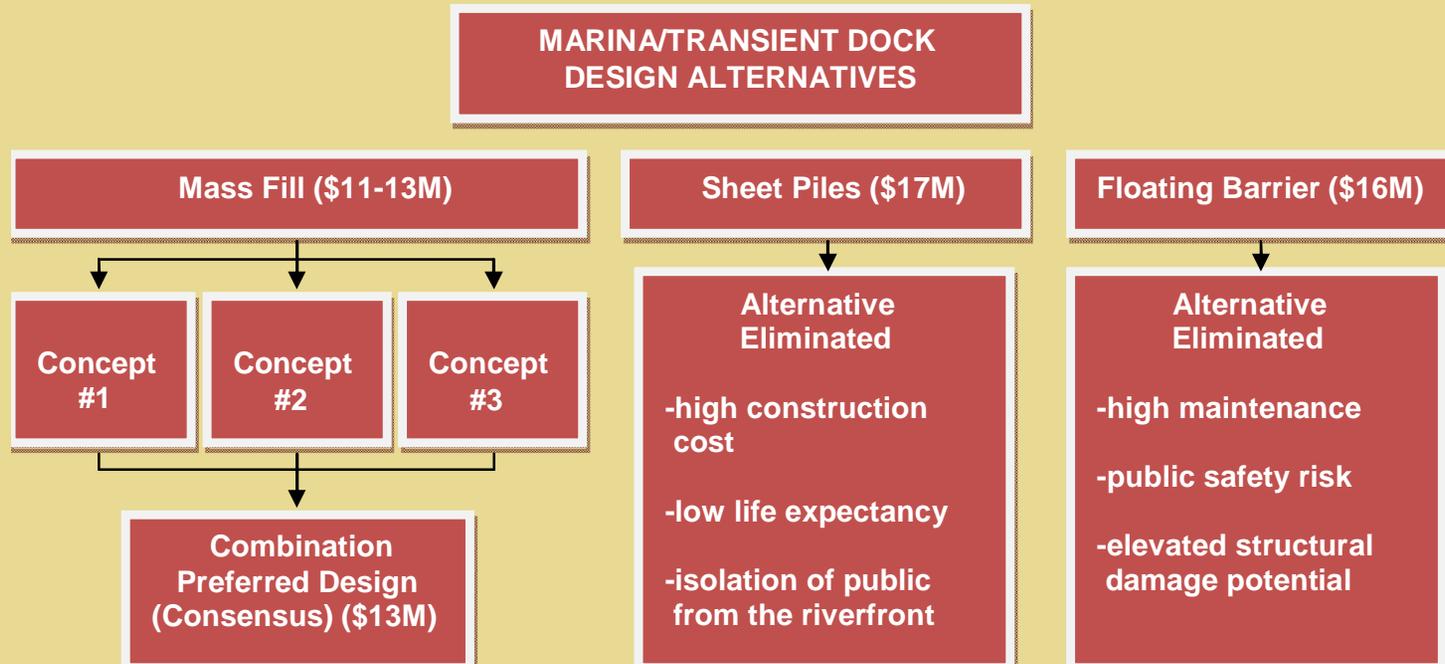
- Three concepts would enhance Shultz Park and would have landform and shore protection, roadways and paths, an overlook, a gangway/ramp system, a transient dock, a marina, and park amenities in common
- The landform provides protection of the marina/transient dock from floating debris, ice, and barge impact for all river stages
- Each concept is similar in design but varies in size and amenities
- Concept #1 - fewest amenities; 160,000 cubic yards of fill
- Concept #2 - added amenities; 220,000 cubic yards of fill
- Concept #3 - most amenities; 265,000 cubic yards of fill
- The “consensus” design alternative is Concept #3 with the addition of rock outcropping and vertical axis wind turbines.

Paducah Waterfront Development Project (Phase I)
 KYTC Six Year Plan Project No. 01-122

Marina/Transient Dock - Design Alternative #1

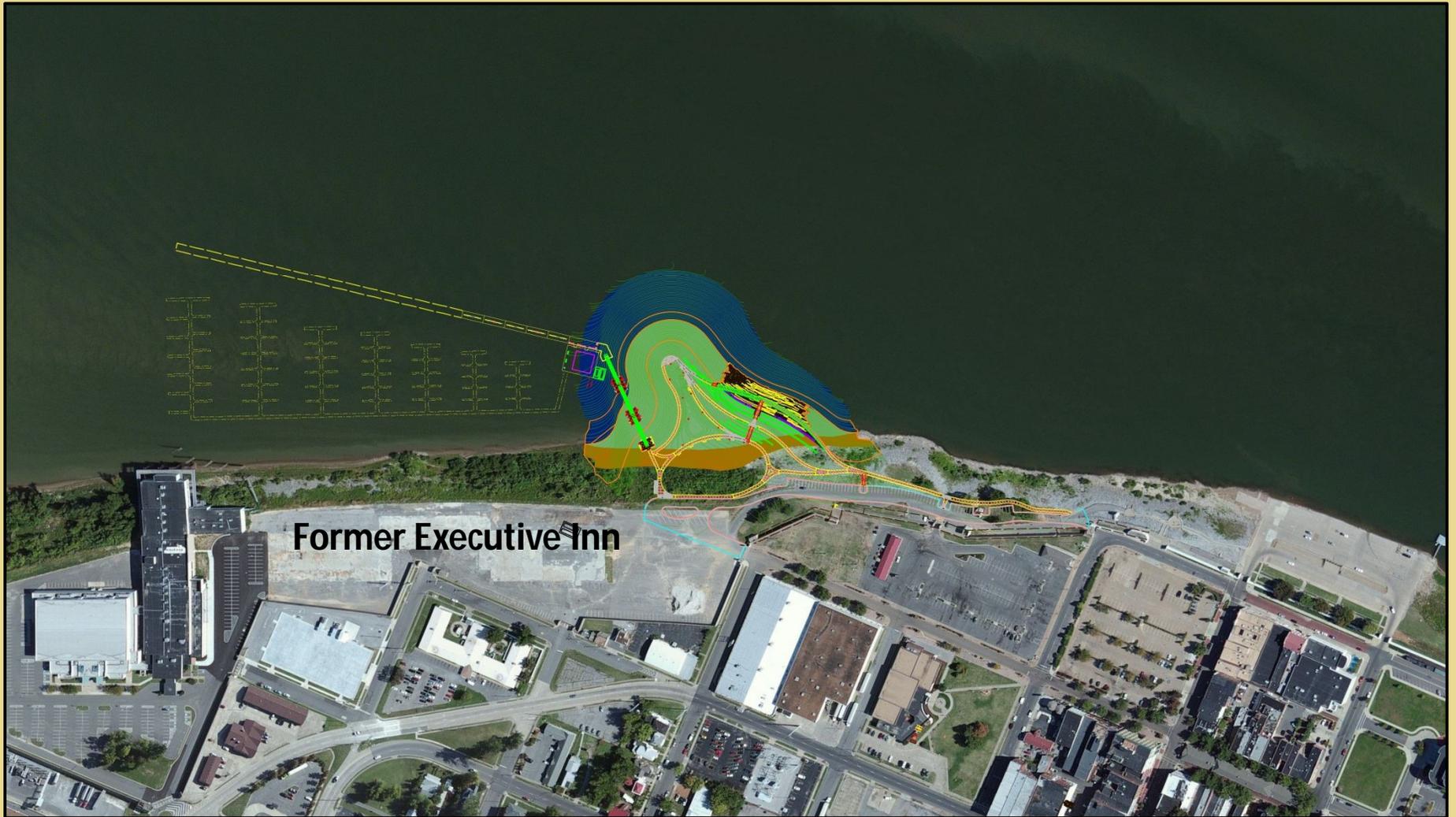
Amenities and/or Features	Concepts			
	Concept #1	Concept #2	Concept #3	Consensus
Observation Tower	X	X	----	----
Bioengineered Slope Protection	X	X	X	X
Park Overlook	X	X	X	X
Lawn/Sculpture Park	X	X	X	X
Interpretive Levee Trail	X	X	X	X
Marina	X	X	X	X
Transient Dock	X	X	X	X
Promenade/Pedestrian Link to Downtown	X	X	X	X
Terraced Seating		X	X	X
Terraced Lawn & Garden		X	X	X
Marina/Transient Dock Building			X	X
Steps to the Ohio River			X	----
Connectivity to Existing Amenities			X	X
Adaptive Use of Existing Landmarks			X	X
Rock Outcropping to the River				X
Vertical axis wind turbines				X

Design Alternatives - Marina/Transient Dock



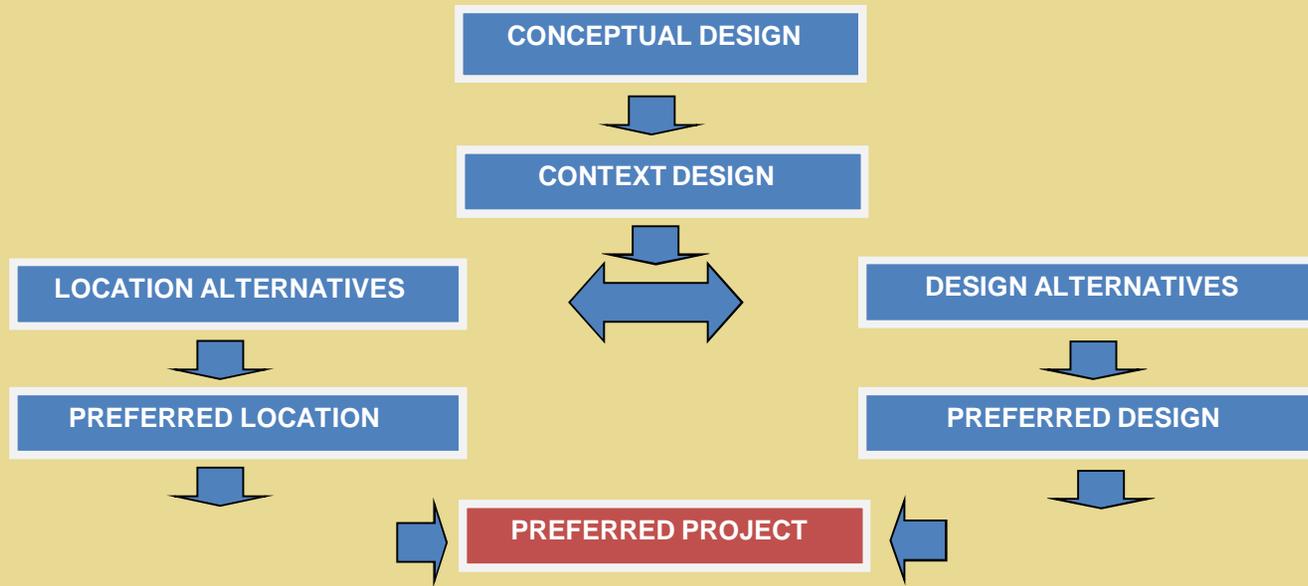
Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Preferred Design (Consensus) - Marina/Transient Dock



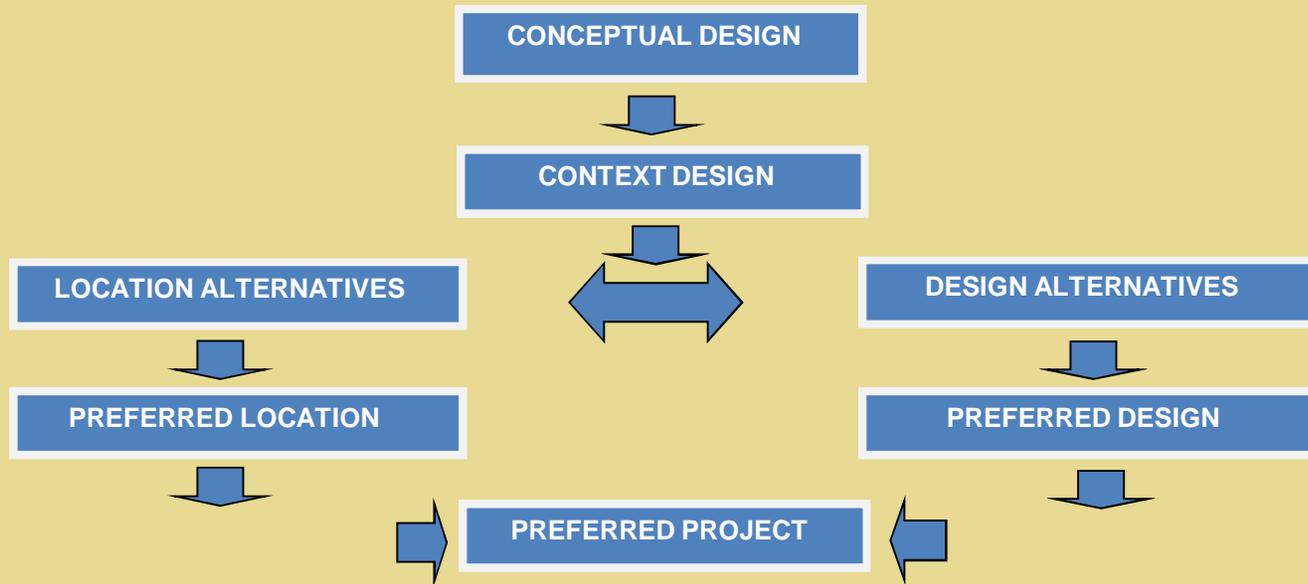
Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives



Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Location & Design Alternatives



Environmental Impacts

- The National Environmental Policy Act (NEPA) of 1969 established a mandate for Federal agencies to consider impacts to the ecological, social, and cultural environments.
- Environmental Assessment (EA) documents the project purpose and need, location alternatives, design alternatives, and **environmental impacts associated with the proposed project.**



Environmental Impacts

- Technical studies conducted for both the boat launch and marina/transient dock sites include:
 - ✓ Floodplains, streams, wetlands
 - ✓ Threatened/endangered species
 - ✓ Archaeological sites
 - ✓ Historic sites/structures
 - ✓ Hazardous materials/wastes
- Additional impact analyses completed include:
 - ✓ Noise Impacts
 - ✓ Air Quality
 - ✓ Visual impacts
 - ✓ Farmland
 - ✓ Environmental Justice
 - ✓ Displacements/Relocations

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Environmental Impacts Summary

Impact Category	Impacts		
		Boat Launch	Marina/Transient Dock
Air Quality		None	None
Noise		None	None
Water Quality & Streams		0.5 acres (Mitigated)	6.2 acres
Floodplains		Yes	Yes
Wetlands		9.2 acres (Mitigated)	None
Wild & Scenic Rivers		None	None
Federal Threatened/Endangered Species		Mitigated	Mitigated
State Threatened/Endangered Species		Mitigated	Mitigated
Historic Structures or Districts		None	None
Archaeological Sites		None	None
Surface Water/Land Use		Ohio River	Ohio River
Community Impacts		None	None
Displacements & Relocations		None	None
Farmland		Minimal	None
Environmental Justice		None	None
Pedestrian & Bicycle Facilities		None	None
UST/Hazardous Materials		None	None
Visual Impacts		None	Minimal
Construction Activities		Minimal	Minimal
Section 4(f) and/or 6(f)		None	Schultz Park
Section 9 Bridge Permit		None	None
Federal Permits		Sections 404 & 10	Sections 404 & 10
State Permits		401, 402, Floodplain	401, 402, Floodplain

Environmental Commitments

- Removal of trees for the boat launch will be coordinated with the US Fish & Wildlife Service (USFWS) through execution of an Indiana Bat Conservation Memorandum of Agreement (MOA) prior to initiation of construction.
- Consultation with US Fish & Wildlife Service (USFWS) regarding potential impacts to freshwater mussel species at the boat launch and marina/transient dock will be completed prior to the approval of the Finding of No Significant Impact (FONSI).
- Kentucky State Nature Preserves Commission (KSNPC) will be consulted prior to disturbance of suitable habitat for the state protected Barn Owl.
- Mitigate for boat launch impacts to 9.2 acres of wetlands through 34.4 acres of forested wetland preservation, preservation of 3.4 acres of upland forest, and 7.3 acres of forested wetland restoration.

Environmental Commitments

- Local, State and Federal environmental permits (Section 10/404/401/402) will be obtained prior to construction.
- Construction noise impacts will be limited by working during normal business hours and noise-controlled equipment will be utilized.
- Contractors will be required to install, inspect, and maintain erosion prevention and sediment control (EPSC) best management practices during construction.
- Minimize airborne particles during construction through the use of water/chemicals for dust suppression, the covering of open-bodied trucks, and the prompt removal of earth or other material from paved streets.
- Conduct any open burning in accordance with local regulations.
- Consultation with the Kentucky Heritage Council on any visual impacts from the marina/transient dock pipe pile structures will be completed prior to the completion of the Finding of No Significant Impact (FONSI).

Environmental Statement

- “Environmental commitments have been made that will eliminate significant environmental impacts associated with the proposed boat launch and marina/transient dock projects. Therefore, if the environmental commitments are complied with, the 6th Street & Burnett Street Boat Launch and the Marina/Transient Dock will not significantly affect any social, ecological or cultural resources as defined under the National Environmental Policy Act (NEPA) of 1969.”

NEPA Process

- The EA must, at a minimum, address:
 - ✓ Purpose and Need
 - ✓ Alternatives Analysis (Location & Design)
 - ✓ Environmental Impacts

Planning and Public Involvement
- **Present the EA document and receive public comment**

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Planning and Public Outreach to Date

- Meeting with US Corps of Engineers (January 2006)
- Project scoping meetings with City Staff, Executive Committee, Stakeholders and the public (March 2006)
- Bus tour of Chattanooga and Evansville riverfronts (March 2006)
- Public meeting to present riverfront opportunities (May 2006)
- Submission of Preliminary Riverfront Plan (June 2006)
- Meetings with riverfront property owners (July 2006)
- Meetings with regulatory and river industries (August 2006)
- Revised Preliminary Riverfront Plan (Sept 2006)
- Public informational display at Schultz Park (May 2008)
- Meetings with various regulatory agencies (2006-2012)
- Advertisement for Section 106 consulting parties (January 2010)
- Public Meeting to discuss Environmental Assessment (March 2010)
- Public Hearing (May 2012)

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Project Status

- Environmental Assessment (EA) has been prepared and approved by the KYTC and the FHWA (April 2012)
- Environmental permitting is ongoing
- Biological Opinion (BO) from US Fish & Wildlife Service on impacts to freshwater mussels at boat launch and marina/transient dock is ongoing
- Finding of No Significant Impact (FONSI) document development
- Project design is approximately 90% complete
- Construction anticipated to begin Summer 2013

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

Project Funding

FHWA ISTEAA Grant	\$2.3 million	Ohio River Boat Launch
FHWA Grant (source pending)	\$4.3 million	Riverfront Phase I
HUD Grant	\$3.0 million	Riverfront Phase I
USFWS - BIG Grant	\$ 910,000	Riverfront Phase I
KDFWR Grant	\$ 175,000	Ohio River Boat Launch
<hr/>		
Total	\$10.685 million	
Estimated Total Project Cost	\$17.3 million	

Format for Comments

- Step to the podium
- Speak clearly into the microphone so all can hear
- Please provide name, address, and city of residence
- Comments will be limited to 3 minutes
- Environmental Assessment (EA) document available for review until June 14, 2012 at Public Works/Engineering
- Written comments accepted until June 14, 2012

Paducah Waterfront Development Project (Phase I)
KYTC Six Year Plan Project No. 01-122

COMMENTS?



City Commission Phase One Boat Ramp

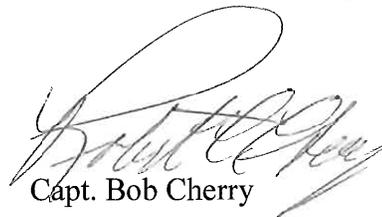
This letter is concerning the purposed launch ramp to be built near Burnett St. This ramp Is a good idea for a back-up ramp to handle any overflow from the downtown ramp on Broadway but the new ramp in no way can replace the Broadway ramp which is the best boat launch in the state of Kentucky. I use the Broadway ramp all of the time and have only seen it crowded on special occasions. The City of Paducah wants to shut down the only thing that works for free in downtown Paducah. We should keep both ramps open and see which one gets used the most.

I have heard about the 2 riverboats which may stop in Paducah for a total of 10 days a year. Why not let them use the multi-million dollar facility that Mayor Montgomery built? This facility has everything in place for riverboats except for a flat barge with a cover like the one in Nashville, Tenn. The city does backflips for out of town boats at the expense of our local citizens. More than 95% of our citizens have not and will not ever set foot onboard a \$1,000 dollar a night per cabin boat like the American Queen. Passenger boats should pay at least \$5,000 per day to dock at Paducah and cause congestion, pollution and use city services for fuel ,water and trash removal.

As for moving the fishermen from the banks of the river-front area good luck. There are fish near the sewer plant discharge at the Burnett St site but they taste different . As for knowing what is best for Paducah just look at old Barkley Park, they paved paradise and put up a parking lot. We now have an unusable and very costly Convention Center. A defunct hotel and an

inflatable blunder dome. Now they want to tear out the boat ramps on Broadway that work well and send the boaters to the sewer plant location. The fish at this location aren't the only thing in Paducah that are full of crap!

Boaters and concerned citizens of Paducah need to attend the Phase 1 meeting at City Hall May 30th 5-7 p.m. and let them know how you feel.

A handwritten signature in black ink, appearing to read "Bob Cherry", written in a cursive style.

Capt. Bob Cherry

Boater and candidate

For City Commissioner

(270) 559-2450

201 Hilldale Rd. Paducah Ky.

RECEIVED

JUN 14 2012

ENGINEERING
DEPARTMENT

PADUCAH WATERFRONT DEVELOPMENT PROJECT
PHASE 1

PUBLIC COMMENT FORM

The City of Paducah welcomes public comments regarding the proposed Waterfront Development Project – Phase 1. Please provide clear and concise written comments using this form.

Upon completion, this form may be placed in the designated area at the office of the City Engineer, submitted at the public meeting scheduled for Wednesday, May 30, 2012, or mailed to the address provided below. All comments must be received by the end of business on June 14, 2012 to receive consideration.

Mail comments to: Office of the City Engineer
City Hall
P.O. Box 2267
Paducah, Kentucky 42002-2267
Attn: Public Comment

Please provide contact information and comments below:

Name: Lisa Mullins Thompson

Address: P.O. Box 27

Paducah, KY 42002

Phone: 270-444-8649

Comment: See attached 2 pages.

RECEIVED

JUN 14 2012

ENGINEERING
DEPARTMENT

PADUCAH Waterfront Development Project, Phase I

Public Comment Form

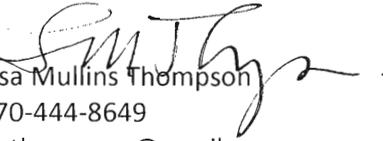
June 14, 2012

Paducah's riverfront is critical to the growing success of our historic downtown, Lower Town arts district and our community. For 20 plus years, City leaders have strongly supported restoration of downtown, and the arts and design has been a cornerstone to its achievements. Today, Paducah has the opportunity to create much needed open space along the Ohio River. A new riverfront park will be enjoyed by all residents and visitors, and help re-establish historic downtown as a destination for shopping, dining, culture, entertainment, leisure and more.

I support the efforts in Phase I to expand Schultz Park by adding fill material into the Ohio River. However, my support ends there. I strongly believe that the expanded area should include an outdoor pavilion with the Ohio River at its back (for concerts) and that any additional funds should be used to improve the former site of the Executive Inn to create a park suitable for the many festivals we host in Paducah. Additionally, the new open space should be linked to the bike trails.

Only after the successful completion of land based improvements, where good design is essential, should a marina and transient dock be built adjacent to the land expansion. The goal of the project should be to reconnect Paducahans to historic Paducah and the Ohio River who haven't visited in awhile, to increase historic Paducah's top-of-mind status with shoppers and diners, to increase both local visitors and tourists who support our businesses and cultural district amenities, to recruit and retain talent in our community, to create consumer interest, and to attract new businesses who want to locate in downtown or Lower Town.

Thank you for your consideration.


Lisa Mullins Thompson
270-444-8649
lmthompson@ymail.com

Drawing Attached, June 14, 2012

Lisa M. Thompson
270-444-8649
lmtompson@gmail.com

PUBLIC COMMENT
PADUCAH Waterfront
Phase 1.
JUNE 14, 2012



RECEIVED

JUN 14 2012

ENGINEERING
DEPARTMENT

Farmer, John

From: Houser, Jackalyn
Sent: Thursday, May 31, 2012 2:46 PM
To: Farmer, John
Cc: Petersen, Jason
Subject: Emailing: article-Marina-location-revealed.htm



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May 31, 2012

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Marina location revealed

May 31, 2012 | 113 views | 0 | 4 | |



ALAN REED | The Sun John Farmer (left), an engineer from the firm of Florence and Hutchison, announced the locations of two new recreational facilities that will see construction begin next summer. A boat ramp into the Ohio River will be built near Sixth St. and Burnett, meanwhile a new transient boat dock and marina will be built at Schultz Park, running into the river parallel to the site of the old Executive Inn. Rick Murphy (right) said the first phase of the project will require builders to pour fill into the river to build a landmass. The fill must settle for nine to 15 months before additional construction can proceed.



ALAN REED | The Sun John Farmer (left), an engineer from the firm of Florence and Hutchison, announced the locations of two new recreational facilities that will see construction begin next summer. A boat ramp into the Ohio River will be built near Sixth and Burnett streets, while a new transient boat dock and marina will be built at Schultz Park, running into the river parallel to the site of the old Executive Inn. City engineer Rick Murphy (right) said the first phase of the project will require builders to pour fill into the river to build a landmass. The fill must settle for nine to 15 months before additional construction can proceed.

After a public hearing at Paducah's City Hall on Wednesday, construction on the city's Waterfront Development Project could begin next summer. John Farmer, an engineer from Florence & Hutchison, said the hearing was the final preliminary step needed before filing a report of no significant impact. The report is required by the National Environmental Policy Act of 1969, which necessitates that such development projects consider economic, social, cultural and environmental factors. Noise, historical and anthropological studies are also made of the area. The hearing was the step needed to finalize the environmental assessment.

The first phase of the plan includes a new boat ramp and a combination of a marina and transient boat dock. Farmer said the plan will reduce traffic and parking at the foot of Broadway, provide services like fuel and groceries for transient boats, and provide a protective marina for resident boaters on the Ohio River.

Farmer said the boat launch ramp will be near Sixth and Burnett streets while the marina and transient boat dock will begin around the current site of Schultz Park, running into the river alongside the property where the Executive Inn stood. Criteria for site selection included proximity to downtown, municipal ownership of the property and the level of existing development. Planners also considered the effect of construction on the community and environment.

Paducah city engineer Rick Murphy said the project has \$10.68 million in funding and is expected to cost \$17.3 million total.

“We’ll build parts of the project as we are able and look for additional funding opportunities in the future,” Murphy said. Murphy said the project’s first construction would come in the form of pouring fill to create a landmass in the river. The fill must settle for nine to 15 months before any work can begin on the dock or marina. Other than the settling period, Murphy estimated work would be finished in two construction seasons. The marina will protect boats in a flood stage of about 54 feet. Murphy added a 55-foot water level constituted a 300-year flood. The marina would close during floods. While settling, erosion is not a problem Murphy anticipates, even during flooding. During public comments, residents said they were concerned with river currents in the area and asked planners to consider improvements to land-based recreation. Call Alan Reed, a Paducah Sun staff writer, at 270-575-8658.

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APPENDIX D



**United States Department of the Interior
FISH AND WILDLIFE SERVICE**

Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

June 6, 2012

Mr. John Ballantyne
U.S. Department of Transportation
Federal Highway Administration
330 West Broadway
Frankfort, Kentucky 40601

Subject: FWS #2010-B-0327; Final Biological Opinion on the Paducah Riverfront
Development Project, McCracken County, Kentucky, and its effects on federally
listed mussels

Dear Mr. Ballantyne:

This document supercedes the July 6, 2010 U.S. Fish and Wildlife Service's (Service) biological opinion and the July 13, 2011 conference opinion on the previously proposed Paducah Riverfront Development Project. This biological opinion is based on our review of the relocated Paducah Riverfront Development Project at approximately Ohio River Miles 934.7 to 935.8 in McCracken County, Kentucky, and its effects on federally listed mussels under section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The Federal Highway Administration's (FHWA) letter requesting formal consultation was received on January 19, 2011 and formal consultation was initiated on January 27, 2011, in a letter from the Service to the FHWA. This document also includes the U.S. Army Corps of Engineers (Louisville District) and the Service as cooperating agencies due to their involvement in the project as permitting and funding agencies, respectively.

This biological opinion is based on information provided in a January 12, 2012 Biological Assessment (BA) prepared by Redwing Ecological Services, Inc. (Redwing), a modification to the BA provided by Redwing on March 21, 2012, meetings (see consultation history), available literature, communications with experts on the federally listed species considered in this biological opinion, and other sources of information available to us and/or in our files. A complete administrative record of this consultation is on file at the Service's Kentucky Field Office in Frankfort, Kentucky (see address above).

The Service believes this project may affect and is likely to adversely affect the fat pocketbook, *Potamilus capax*; pink mucket, *Lampsilis abrupta*; orangefoot pimpleback, *Plethobasus cooperianus*; and sheepsnose, *Plethobasus cyphus*. The fat pocketbook is known to occur at the project site and the other three species are considered likely to occur at the project site.

Species not considered in this biological opinion that were included in the Biological Assessment include the spectaclecase, *Cumberlandia monodonta*; fanshell, *Cyprogenia stegaria*; ring pink, *Obovaria retusa*; clubshell, *Pleurobema clava*; rough pigtoe, *Pleurobema plenum*; and rabbitsfoot, *Quadrula cylindrica cylindrica*. The Service does not consider that these six species are likely to occur at the project site based on a lack of recent occurrences for these species in the project area, a lack of suitable habitat for several of the species, and recent mussel survey results that were provided in the BA; therefore, it is the Service's determination that this project is not likely to adversely affect those six species.

Consultation History

Although considered as 'new' project in this Biological Opinion, this riverfront development project is essentially a continuance of a previous project, but it has been moved approximately 500 feet downstream. A biological opinion and conference opinion were completed on the previous project; however, the project was moved downstream, which necessitated a new review of the project. The consultation history for the previous project was summarized in the July 6, 2010 biological opinion and the July 13, 2011 conference opinion.

22 November 2011 – Redwing met with Service to discuss preliminary results of additional surveys and the preparation of a Biological Assessment Redwing was preparing based on moving the Shultz Park portion of the Paducah Riverfront project downstream approximately 500 feet.

19 January 2012 – Letter from Mr. John Ballantyne (Federal Highway Administration) regarding the transmittal of a Biological Assessment dated January 9, 2012 and a request for formal consultation with the Service.

27 January 2012 – Service letter to Mr. John Ballantyne of the Federal Highway Administration replying that the Service believed the BA was adequate for initiating formal consultation, and indicating that the Service's biological opinion would focus on four mussel species – the fat pocketbook, *Potamilus capax*; orangefoot pimpleback, *Plethobasus cooperianus*; pink mucket, *Lampsilis abrupta*; and sheepnose, *Plethobasus cyphyus*.

20 March 2012 – Service met with Redwing to discuss modifications to the BA dealing with mussel habitat and Mussel Conservation Measures.

29 May 2012 – A draft final version of the biological opinion was provided to the FHWA, KYTC, and U.S. Army Corps of Engineers – Louisville District (COE), and comments on the draft final biological opinion were solicited from those agencies.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Paducah Riverfront Redevelopment Project is a proactive revitalization effort, resulting from the collaborative effort of a diverse group of constituents including stakeholders, city staff, the general public and state and federal agencies that began in 2006. The Paducah Riverfront Redevelopment Plan has been in the design and planning phase since 1992. The plan's goal is to reconnect residents and neighbors with the City of Paducah's downtown riverfront as well as provide new tourism, recreation, and economic development opportunities for the city. Improvements to the riverfront outlined in the redevelopment plan include a terraced riverbank with overlooks, a performance plaza, recreational areas along a new greenway trail, landscaping, renovation of public infrastructure, public education and outreach through interpretative activities, and a five-lane boat launch. The plan's components will link public amenities, recreational facilities, public spaces, and Paducah's downtown to the Ohio River. Due to its long range goals and magnitude of the plan, it will be implemented using a phased approach, spanning several years. More information regarding the Paducah Riverfront Redevelopment Plan can be found on their website: riverfrontpaducah.com. The BA focused on the first phase of the plan which includes the Burnett Street Boat Ramp and the Schultz Park Expansion marina/transient dock. These two components of the plan involve the only proposed direct impacts to the Ohio River (Figure 1).

Numerous alternative designs have been developed and presented to city staff, the USACE, U.S. Coast Guard, marine industry representatives, the public, and riverfront property owners. Based on a detailed alternatives analysis, the current location was ultimately chosen. Feasibility was determined based on availability of riverfront properties, avoidance of the Ohio River navigational channel, the least potential to interfere with future river operations, and avoidance of existing mussel resources. The two components of the proposed project assessed as part of the BA include the Burnett Street Boat Ramp and the Schultz Park Expansion and are described in more detail below. Each of these components also involves other interrelated federal actions. More specifically, the construction of the Burnett Street Boat Ramp would involve a federal boating access grant from the Service to the Kentucky Department of Fish and Wildlife Resources (KDFWR). KDFWR would then use this funding to pay for the City of Paducah's construction costs for the Burnett Street Boat Ramp. The project also includes a Boating Infrastructure Grant from the Service to KDFWR. KDFWR would then use this funding to pay for the City of Paducah's construction costs associated with the Schultz Park Expansion marina. While the granting of these federal funds do not result in direct impacts to federally listed species (i.e., they are administrative in nature), the use of these federal grant funds will lead to adverse effects on listed freshwater mussels as described below and in the "Effects of the Action" section of this biological opinion.

This biological opinion also is intended to address the interrelated federal actions and pending permits under sections 10, 401, and 404 of the Clean Water Act (CWA) that are necessary for construction of the proposed project.

Source: USGS 7.5' Topographic Maps: © 2011 National Geographic Society, i-cubed



<p>PADUCAH RIVERFRONT REDEVELOPMENT PROJECT McCRACKEN COUNTY, KENTUCKY</p>	 <p>REDWING ECOLOGICAL SERVICES, INC.</p>	<p>PROPOSED ACTIONS MAP</p>
<p>FILE: Redwing-06-090-01/Figures/PrpAction</p>		<p>FIGURE 1</p>
<p>REDWING PROJECT 06-090-01 REVISED DATE 4.16.2012 DRAWN BY BJO</p>		

Burnett Street Boat Ramp

The Burnett Street Boat Ramp project will relocate the existing main boat ramp along the downtown riverfront to a currently undeveloped piece of property approximately one mile downstream so that the existing downtown riverfront can be converted back to its original use as a riverboat landing and community focal point.

The proposed ramp is located at approximately Ohio River Mile 935.8. This component of the redevelopment plan is being undertaken as a partnership with KDFWR through a USFWS Boating Access Grant. The proposed boat launch site is located on currently undeveloped property owned by the City of Paducah and will contain five launch lanes with parking for 100 vehicles and trailers (Figure 1) with 24-hour access to the river. The property can accommodate an additional 100 parking spaces in the future as needed. The proposed boat launch will be connected to the downtown Riverfront Park via a planned pedestrian and bicycle greenway trail along the river.

Construction of the Burnett Street Boat Ramp, its access route, and all of the associated parking will result in permanent impacts to jurisdictional wetlands. Mitigation for these impacts will be provided on site in accordance with the conditions of the approved Section 404 and 401 permits through a combination of preservation and restoration activities. Mitigation includes permanent preservation of approximately 34.4 acres of high quality forested wetland, restoration of 7.3 acres of forested wetland, preservation of 3.4 acres of forested riparian buffer, and restoration of 765 linear feet of riparian buffer along the Ohio River. These mitigation measures have been designed to ensure the functional components of the impacted wetlands will be maintained on site as well as enhance the quality of the Ohio River riparian corridor. These mitigation components will be monitored for five years to ensure long-term success. In addition, permanent preservation of these components through a conservation easement or deed restriction will ensure long-term indirect benefits through reduced streambank erosion and nonpoint source runoff into the Ohio River.

Impacts to the Ohio River associated with the construction of the boat ramp will consist of placing a subgrade base and precast concrete ramp faces. The ramp's footprint will cover approximately 0.3 acre of riverbank and extend no greater than 35 meters riverward from normal pool. It is estimated that an additional 0.3 acre area will receive indirect effects from the construction of the boat ramp, for a total of 0.60 acres of affected river substrate (Table 1).

Table 1: Effects Summary for River Substrate and Mussel Habitat

Impact Type	Schultz Park	Burnett Street Boat Ramp
Direct (fill)	3.49 acres	0.30 acre
Direct (fill non-mussel habitat)	2.29 acres	0 acre
Direct (mooring)	0.07 acres	NA
Indirect (sedimentation non-mussel habitat)	4.97 acres	0.30 acre
Indirect (sedimentation mussel habitat)	2.73 acres	0 acre
Total Ohio River Substrate Impacts	13.55 acres	0.60 acre
Total Mussel Habitat Effects	6.29 acres	0.30 acre

The compacted subgrade base material and concrete ramp face will be installed from shore and best management practices will be used to ensure erosion and sedimentation is minimized to the greatest extent possible. As required under the 404/401 permits, an erosion and sediment control plan will be designed, implemented, and maintained in effective operating condition at all times during construction to prevent degradation of waters of the Commonwealth. All fill material will consist of less than 5% fines, and silt fences and bank stabilization will be used where necessary and as appropriate to minimize the potential for bank erosion and sedimentation during construction. The proposed boat ramp orientation (i.e., angle in relation to river flow and ramp face slope) was designed to have minimal impact on the prevailing hydraulic conditions of the Ohio River. The slope of the ramp will largely follow the existing contours of the riverbank. The pre-cast ramp faces will be installed over a compacted coarse-granular foundation with a minimum slope of 7:1.

Modeling hydrodynamic processes specifically related to the proposed Burnett Street Boat Ramp was cost-prohibitive due to the relatively small proposed encroachment into the river and the data-intensive model input requirements. Therefore, the modeling results for the Schultz Park Expansion site (see EFFECTS OF THE ACTION – Analysis for Effects of the Action, below in this BO) were used as an estimate for relative hydrodynamic changes at the proposed Burnett Street Boat Ramp location.

Schultz Park Expansion

The Schultz Park Expansion represents Paducah's continuing efforts to revitalize its riverfront and will serve as a catalyst for additional riverfront and downtown improvements as outlined in the Riverfront Redevelopment Plan. The proposed Schultz Park Expansion area is accessed via three existing openings in the floodwall and proposed expansion activities will extend from approximately Ohio River Mile 934.8 to 935.1 (Figure 2). Proposed park expansion activities include improvements to the adjacent Schultz Park, construction of a marina/transient dock, associated parking and infrastructure, and connection of park amenities with existing roads, and infrastructure. This component of the redevelopment plan is being undertaken as a partnership with KDFWR through a USFWS Boating Infrastructure Grant.

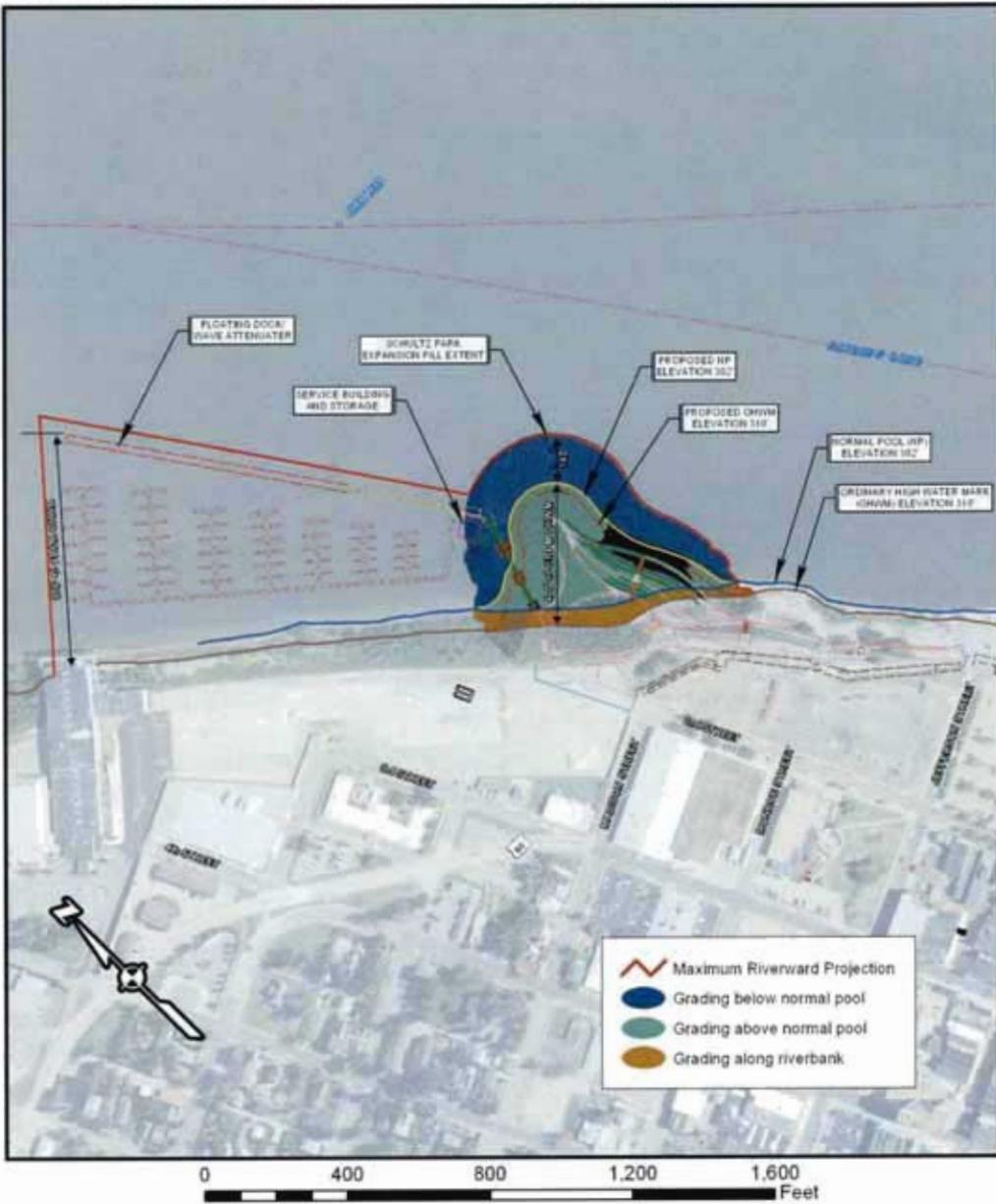
Development of the Schultz Park Expansion will be accomplished in several phases. The first phase includes riverward expansion of the existing Schultz Park and construction of a transient dock. Construction will begin by placing appropriately-sized coarse fill material below the Ohio River Normal Pool elevation of 302 feet to create a new peninsular landform with a footprint of approximately 5.78 acres. An additional area of sedimentation impact is estimated on 7.7 acres of additional Ohio River bottom, and there will be an estimated 0.07 acres of area covered by marina anchors. Therefore, the total acreage of potential and actual mussel habitat that will be impacted at the Schultz Park Expansion portion of the project is 13.55 acres (Table 1). The coarse fill material will meet KDOW Division of Environmental Protection water quality requirements and will not exceed 5% fines. Placement of the fill material may occur from land-side via truck or from river-side via barges depending on the location of source fill material,

feasibility, and efficiency (i.e., The contract for doing this work likely will not limit contractor installation methods.). However, if material is transported and unloaded from barges, special conditions will be required to avoid disturbance of the existing mussel bed from potential barge anchoring or stray debris. The newly constructed landform foundation may be left to settle for approximately one year to stabilize prior to final grading and construction of the transient dock, marina, and other amenities. Once the foundation has settled, the remaining landform will be constructed using no steeper than a 3:1 slope. The landform will be protected by a combination of revetment techniques using coarse aggregate material and other naturalized components where applicable. Bioengineered slope stabilization will supplement stone revetment where applicable and native vegetation will be used extensively throughout the site.

Construction of the transient dock on the downstream side of the Schultz Park landform, which will be accessed via a floating gangway system, will begin once the landform has settled and stabilized. The floating gangway system will provide for approximately 150 boat slips. Currently, boaters are required to dock on the riverbank. The closest alternative on-water refueling/marina facilities for recreational boaters are located 33 miles upstream at Golconda, Illinois. The transient dock will serve as a continuation of the river walk for the public as well as a mooring dock for transient vessels. The transient dock will not provide dockage for excursion vessels such as the 'Delta Queen' steamboat or paddleboats. Impacts to the riverbed associated with the transient dock will be limited to placement of a maximum of 50 eight-foot deadman weight cubes for anchoring the floating dock and marina. The project will maintain a 300-foot buffer from the USACE Navigation Channel.

The second phase of the Schultz Park Expansion includes installation of park amenities. Planned park amenities include public open spaces and scenic overlooks, benches and picnic tables, additional parking, pedestrian/bicycle trails, educational/interpretive resources, and other landscape features. Marina accommodations include associated utility systems (e.g. fuel, water, electric, and sanitary) that will provide restrooms, showers, and a sundries store. While no specific details are yet available for these facilities, all fuel and wastewater systems must be designed to Kentucky state standards. A spill prevention plan will be required and developed and maintained by the marina operator. The spill prevention plan will comply with state codes and approved by the appropriate agency prior to marina operation.

Source: Bing Maps ©2010 Microsoft Corporation and its data suppliers; Basemap provided by JJR & Florence & Hutcheson



PADUCAH RIVERFRONT
REDEVELOPMENT PROJECT
McCRACKEN COUNTY, KENTUCKY

FILE: Redwing\06-090-01\Figures\Development_Bx11
REDWING PROJECT 06-090-01
REVISED DATE 4.16.2012 DRAWN BY BJO



SITE
DEVELOPMENT PLAN

FIGURE 2

ACTION AREA

The Service considers the action area to include the lower Ohio River between J.T. Myers Lock and Dam at Ohio River Mile 846.0 downstream to the mouth of the Ohio River at ORM 981.0. This action area also includes the Cumberland River downstream of Barkley Dam and the Tennessee River downstream of Kentucky Dam. The action area is designated in this way because (a) it contains the entirety of the Burnett Street Boat Ramp and Schultz Park Expansion portions of the proposed action and (b) it contains the areas upstream and downstream of the proposed project where the indirect and cumulative effects of the proposed action are likely to occur. Regarding these upstream and downstream areas, the Service believes that the proposed action is likely to result in (a) hydrologic effects on the listed freshwater mussels addressed in this biological opinion and their habitats within and downstream of areas impacted by the Burnett Street Boat Ramp and Schultz Park Expansion portions of the proposed action, (b) localized population reductions of these freshwater mussels that will have corresponding effects on their populations within the described action area, and (c) a reduced likelihood that fish hosts for these freshwater mussel species will provide the same level of pre-project genetic flow throughout the described action area due to the anticipated population reductions of these species within the action area.

In the action area, the proposed boat ramp and park expansion and marina/transient dock is located at approximately Ohio River Mile 934.8 to 935.1, immediately downstream of an existing downtown boat launch, and consists of a relatively developed shoreline with armored riverbanks and a narrow park setting on the river side of the floodwall. The Ohio River within the vicinity of the City of Paducah experiences a high volume of boat and barge traffic due to its proximity to the existing downtown boat ramp and the nearby lower Ohio River navigation lock system. The City of Paducah is a major hub for commercial barge activity. Barges frequently use the shoreline in the proposed marina/transient dock area for staging purposes because of the high volume of barge traffic through the nearby locks. Barge staging often consists of beaching the nose of the barge onto the shore at an angle sufficient to maintain position in the river while waiting for lock traffic to clear. Many recreational boaters also use the area for fishing, water skiing, cruising, and other activities. There is a considerable volume of foot traffic along the existing riverfront park along the floodwall for fishing, sight-seeing, etc.

Table 1 provides a summary of the expected acreage of impact on the river substrate and mussel habitat. The extent of direct and indirect effects were determined based on the extent of the proposed fill required to construct the park expansion landform, the anticipated extent of hydrodynamic modifications caused by the proposed landform, and the anchor system for securing the transient dock and marina.

Based on mussel surveys conducted for this project, the project's impact area is greater than the area of occupied mussel habitat because mussels do not occur everywhere within the project site (e.g., near shore). Direct effects of the expansion of Schultz Park include the placement of fill material over a footprint covering approximately 3.56 acres that lies below the normal pool elevation and extending approximately 480 feet riverward. Direct effects also include placement of mooring anchors, totaling approximately 0.07 acre, to secure the transient dock and marina.

Therefore a total of 5.85 acres of “fill” will occur as a result of the proposed project. An additional affected area of 7.7 acres of river substrate, which includes 4.97 acres of unoccupied mussel substrate and 2.73 acres of mussel habitat, will be indirectly affected by anticipated hydrodynamic modifications and sedimentation. The proposed park’s shoreline at the maximum extent will be approximately 350 feet riverward from its current location. The location of the proposed expansion, as well as the orientation of the proposed landform, was designed to infringe as little as possible on river hydraulics as well as the commercial traffic in the river’s navigation channel. However, changes in river flow and, therefore, sediment transport patterns will likely change locally. The results of the hydrodynamic modeling performed by HCCL provide an estimation of these potential changes in deposition and entrainment patterns of sediment particles as a result of the proposed Schultz Park landform. The model predicts that under existing conditions, sediment entrainment potential (mobility index > 1) is limited to particle sizes less than 5 mm (fine gravel) occurring at river stages between 304 and 320 feet. After construction of the proposed landform, the model predicts entrainment potential for particles up to 5mm in size on the surface of the landform fill slope at a river stage of 320 feet. Because the fill slope will be constructed with coarse aggregate significantly greater in size than 5 mm, the effects discussion will be limited to sediment transport potential of particles less than 5 mm at river stages 304, 310, and 320 feet.

Results of the model show potential entrainment of 1mm particles, at river stage 304 feet, is likely to occur at the furthest riverward extent of the proposed landform. Other changes to the existing sediment transport dynamics of the river include potential deposition of 0.1 mm, 1 mm, and 2 mm particles primarily downstream and shoreward of the proposed landform.

Potential sedimentation or scour from boating activity within the transient dock marina is not likely to occur due to river depth and the slow speed required to effectively maneuver boats within the dock area. In addition, a wave attenuator was integrated into the transient dock design to buffer the boat harbor and shoreline from wave action generated from vessels navigating within the main river channel.

Mussel Conservation Measures

Proposed mussel conservation measures that were included in the Biological Assessment are as follows:

Conservation measures proposed to minimize take of protected mussel species and to minimize impacts to mussel habitat as a result of the proposed project will consist of contributions to an appropriate resource conservation entity to support enhancement and/or protection of mussel habitat, and for mussel recovery efforts in the lower Ohio River. The proposed conservation measures are summarized below:

- **Habitat:** The City of Paducah will contribute a total of \$71,706 for the preservation, creation, enhancement, and/or protection of mussel habitat in the lower Ohio River. This contribution will be provided to minimize impacts to mussel habitat expected to occur on

this project. The contribution amount was derived using the average 2009 agricultural land value in Kentucky (Trimble 2009) of \$2,850 per acre and then applying a ratio of 4:1 for impacts to a total of 6.29 acres.

- **Propagation:** The City of Paducah will contribute \$19,000 for recovery efforts related to protected mussel species in the lower Ohio River. This contribution will be provided to minimize take expected to occur on this project. The contribution amount was an estimate based on take of 76 *P. capax* and a per mussel compensatory amount of \$250 per *P. capax* (This amount was utilized by the USFWS in the previous BO.). It is proposed that the contribution be applied to propagation efforts for *P. cooperianus*; however, it may be used for *P. capax* or other federally-listed mussel species in the lower Ohio River.

The Service recognizes that, individually and/or cumulatively, these mussel conservation measures that are included in the BA contribute to the avoidance and minimization of adverse effects to these listed mussels, but that these measures do not necessarily eliminate all adverse effects that may result from the proposed action.

These conservation measures are included with more detail, along with additional minimization actions, in the Reasonable and Prudent Measures and Terms and Conditions portion of this Biological Opinion.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

This biological opinion covers the fat pocketbook, *Potamilus capax*; pink mucket, *Lampsilis abrupta*; orangefoot pimpleback, *Plethobasus cooperianus*, and sheepnose, *Plethobasus cyphus*. All four species are federally listed as an endangered.

Fat pocketbook mussel

The fat pocketbook was first listed as endangered in 1976, and a recovery plan was written in 1985 and then revised in 1989 (USFWS 1985a, USFWS 1998). This species is currently undergoing a 5-year review to determine its current status by the Service's Mississippi Field Office. Critical habitat for this species has not been designated.

The following taxonomic information is gleaned from the recovery plan for this species (USFWS 1989). The fat pocketbook was described twice in 1832 by two authors giving it different names. It was first described by J. Green as *Unio capax* and by I. Lea as *Symphnota globosa*. A few name changes have occurred since 1832, and the current accepted name, which includes the author who first described it, is *Potamilus capax* (Green 1832).

The type locality is the upper Mississippi River at the Falls of St. Anthony in Minnesota. The fat pocketbook has a round to oblong shell that is greatly inflated and has a strong s-shaped hinge

line. The beak cavity is very deep (NatureServe 2007, Cummings and Mayer 1992). The shell is thin to moderately thick and the periostracum varies in color from light brown, yellow, or olive, and becoming dark brown in older individuals. The shell is typically rayless, smooth, and very shiny. Both anterior and posterior ends of the shell are rounded. Young fat pocketbook shells may have a few faint ridges on the umbo as well as have a small posterior wing present, but these characteristics are not necessarily visible in older individuals. The umbos are greatly inflated, elevated above the hinge line, and turned inward. The fat pocketbook is known to grow to a length of 5 inches. Internal morphology includes two pseudocardinal teeth in each valve, and both are thin, compressed, and elevated. There are two lateral teeth in the left valve and one in the right valve. Lateral teeth are thin and greatly curved in both valves. The nacre is bluish white and often iridescent; however, it may include some pink or salmon color in some specimens (Cummings and Mayer 1992).

Pink mucket

The pink mucket (*Lampsilis abrupta*) was listed as an endangered species on June 14, 1976 (Code of Federal Regulations 1976). No critical habitat has been designated for this species.

The pink mucket is a medium-sized mussel, growing to a length of approximately 4.5-5in. The shells are subquadrate or circular in shape and become thick and heavy in mature individuals. Anterior edges of the shells are rounded, with slightly curved dorsal and ventral margins. The posterior margins of the shells in females are slightly rounded to straight; shells of the males are rounded or bluntly pointed. A well-defined posterior ridge is present in the males. Color of the outer shell surface (periostracum) varies from light yellow or yellowish-brown to dark brown, occasionally marked with broken fine to fairly wide dark green rays. The color of the inner shell surface (nacre) varies from white to pink to salmon in color, with the posterior margin being iridescent (Parmalee and Bogan 1998).

Orangefoot pimpleback

The orangefoot pimpleback (*Plethobasus cooperianus*) is an Ohioan species (i.e., Interior Basin) species. Records are only known from the Ohio River basin. It was officially listed as an endangered species on July 14, 1976 (Code of Federal Regulations 1976). No critical habitat has been designated for this species.

The orangefoot pimpleback is a medium-sized mussel, growing to a length of approximately 3.5 inches. The shell is circular or sub-triangular in shape, with prominent beaks that are directed anteriorly. The periostracum is brown to reddish-brown and the surface of the shell is marked by concentric growth lines. The posterior two-thirds of the shell are covered with numerous raised, irregular pustules (Parmalee and Bogan 1998). Nacre color varies from white to pink inside the pallial line, being more intense toward the hinge-teeth (Bogan and Parmalee 1983).

Sheepnose

The sheepnose is a recently federally listed species (Federal Register 2012). Critical habitat for this species has not yet been designated but will be determined within a year after the final listing rule.

The following taxonomic and descriptive information is summarized from the status review of this species (Butler, 2003). The sheepsnose was described by Constantine Rafinesque in 1820. The type locality is the Falls of the Ohio River near Louisville, Kentucky and adjacent Indiana.

The following description is generally summarized from and Parmalee and Bogan (1998). This medium sized mussel reaches nearly 5.5 inches in length, and the shape of the shell is elongate ovate, moderately inflated, with the valves thick and solid. The anterior end of the shell is rounded and the posterior is truncate to bluntly pointed. The posterior ridge is gently rounded and flattened ventrally, and there is generally a row of large, broad tubercular swelling on the center of the shell extending from the beak to the ventral margin. A shallow sulcus lies between the posterior ridge and central swellings. Beaks are high and located near the anterior margin. In young individuals the periostracum is often light yellow to yellowish brown, becoming darker with age. The beak cavity is shallow to moderately deep and generally white in color. The right valve contains a large triangular pseudocardinal tooth and the lateral teeth are heavy, long and slightly curved.

Life History

Fat pocketbook

The fat pocketbook is a filter-feeding species from the Unionidea family. The fat pocketbook occurs primarily in sand and mud substrates, although the species has been found in fine gravel and hard clay occasionally (Parmalee 1967, Bates and Dennis 1983, Clarke 1985). The species occurs at water depths that range from a few inches to several feet (Parmalee 1967). The life cycle of the fat pocketbook is similar to that of other freshwater mussels, in which the glochidia (larvae) require a fish host to transform to the juvenile stage. Larval mussels must attach to a host (usually on a fish gill) where they metamorphose into free-living individuals called juveniles. The fat pocketbook is a long-term brooder, with females becoming gravid in the fall, retaining glochidia over winter, and releasing the progeny during spring and summer. The freshwater drum is the primary host fish for the species (Barnhart 1997, Watters 2007).

The fat pocketbook is a large-river species that is typically found in slow-flowing water with a mud (silt/clay), sand, or gravel substrate, at depths of a few inches to eight or more feet (USFWS 1997, Cummings and Mayer 1992, USFWS 1989, EA 2007, Parmalee 1967). In the St. Francis River in Arkansas and lower Wabash River, fat pocketbooks have been found to utilize sand, mud and fine gravel substrates (Bates and Dennis 1983, Clarke 1985). The fat pocketbook is known to exist in 200 miles of the St. Francis River watershed, which includes man-made ditches, bayous, and sloughs. These habitat types are characterized as depositional areas with slow-moving water, and surveys of the St. Francis River watershed indicate that the fat pocketbook is surviving and reproducing in these conditions (Miller and Payne 2005). The reproductive strategy of the fat pocketbook is not known, but it is suspected to be a long-term brooder (bradyctictic), which holds glochidia through the winter and releases them in the spring of the year (USFWS 1989). Several unpublished studies since the species Recovery Plan have reported that fat pocketbook glochidia successfully transformed on the freshwater drum (*Aplodinotus grunniens*) (Watters 1994, Barnhart 1996, Barnhart and Roberts 1996, Barnhart and

Riusech 1997). Barnhart (1997) found that fat pocketbook transformed only on freshwater drum among 29 fish species tested.

Pink mucket

The pink mucket inhabits areas in large rivers with swift currents, depths of 1.6 ft to 26.2 ft, and mixed sand/gravel/cobble substrate. Notwithstanding this, the pink mucket appears to have adapted to reservoir-type conditions in the upper reaches of some impoundments. This species is a long term brooder with a life span greater than 20 years. Females become gravid by age three and brood glochidia from August through June of the following year (Hubbs 2010b).

Reproduction is likely similar to other freshwater mussels. Males release sperm into the water column; the sperm are taken in by females during normal siphoning activity. Fertilized eggs are retained in specially modified gills (marsupia) until the larvae (glochidia) are fully developed. Once released, the glochidia must attach to the gills or fins of an appropriate fish host. They encyst and metamorphose into juvenile mussels. Fully developed juveniles drop from the fish host and settle to the river bottom. The glochidia are undescribed. Freshwater mussels feed by siphoning food items that drift in the water column. The pink mucket likely feeds on items similar to other mussel species including algae, zooplankton, diatoms, and detritus.

Host fishes identified through laboratory induced infections include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), and walleye (*Sander vitreus*) (Barnhart et al. 1997) as well as white crappie (*Pomoxis annularis*) and sauger (*Sander canadense*) (J.B. Layzer and L.M. Madison, USGS, from pers. comm., in Williams et al. 2008). The use of large piscivorous fishes for hosts is consistent with the presence of a fish-like mantle lure in the pink mucket (Barnhart et al. 1997). Freshwater drum (*Aplodinotus grunniens*) was erroneously cited as being a host by Fuller (1974).

The pink mucket often inhabits regulated rivers, particularly those navigational waters modified by locks and dams. Although not reservoir tolerant *per se*, it is found in tailwaters having good riverine-quality habitat (generally rocky substrates swept free of excessive fine sediment deposits by adequate currents). Reservoir conditions (characterized by slackwater, low oxygen, and heavy silt deposition) are not conducive for its survival and population sustainability. However, its host fishes are more habitat generalists, being commonly found in reservoir, tailwater, and riverine habitats.

The mobility of its hosts and/or host fish tolerance for habitats unsuitable for the pink mucket may partially account for sometimes seemingly disjunct records of the mussel in streams like the Paint Rock River in Alabama, the Bourbeuse River in Missouri, and Bear Creek in Mississippi. It is possible that these highly sporadic occurrences in otherwise well-sampled streams do not actually represent populations but are merely occurrences of low-probability events (e.g., having a highly mobile host fish carry juveniles spawned from a nearby source population shed post-metamorphosed pink mucket into suitable habitat). Without a readily accessible source population (Tennessee River, Guntersville Dam tailwaters for Paint Rock River; Tennessee River, Wilson Dam tailwaters for Bear Creek; and Meramec River for Bourbeuse and Big Rivers), the pink mucket could possibly not exist in these streams.

Using the growth ring method, qualitative age estimations from external shell growth-rest ring counts (Neves and Moyer 1988) from 36 individuals collected from Osage River, Missouri suggests that the pink mucket has a lifespan of at least 36 years (Ecological Services Inc. 2003). It is probable the species lives several years longer considering that the growth ring method typically underestimates age compared to quantitative age determinations (thin sectioning shells) and that the older the specimen the greater the underestimate of age (Neves and Moyer 1988). Unfortunately, no empirical age data exists from thin sectioning pink mucket shells.

An experimental pond propagation study took place in early 2006 using pink mucket stock from Pickwick Landing Dam tailwater in the Tennessee River, Tennessee, and sheds light on aspects of its early life history (Don Hubbs 2009). Host fish (largemouth bass) were infested with mature glochidia teased out of a gravid female pink mucket and contained in a small pond enclosure. By late summer 2006, six juvenile individuals that had survived post-metamorphosis were released into an enclosure in their parent tailwaters to monitor survival, growth, and sexual activity. After approximately 20 months, they had all survived and grown from approximately 0.9 in length at the time of translocation to a range of 2.2-2.7 in, and were beginning to develop sexual dimorphic shell characters (apparently four females and two males). A reassessment of the grow-out experiment in March 2009 when the mussels were approaching age 3 found 100% survival and that there were indeed four females and two males. The females all had charged gills (whether with eggs or glochidia was unknown) and had grown to a length range of 2.4-2.8 in, while the males were larger at 3.1 and 3.2 in (Bob Butler 2010). From this age and growth data, it appears that at least female pink mucket reach sexual maturity at age 2+. Growth is rapid for the first few years, especially in males. In general, mussel growth slows considerably after the first few years, presumably when individuals become fully mature, with energy instead going towards gamete production and development (Baird 2000).

Orangefoot pimpleback

The orangefoot pimpleback is found in medium to large rivers with sand and gravel substrates (USFWS 1984). The reproductive cycle of the orangefoot pimpleback is likely similar to that of other native freshwater mussels. Males release sperm into the water column; the sperm are then taken in by the females through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The mussel glochidia are released into the water, and within a few days they must attach to the appropriate species of fish, which they parasitize for a short time while they develop into juvenile mussels. The orangefoot pimpleback is likely a short term brooder with spawning occurring in the spring and release of glochidia during summer months (USFWS 1984). Wilson and Clark (1914) collected two gravid females in early June. Utterback (1915) reported the orangefoot pimpleback to be a summer breeder and Yokley (1972a) observed one specimen with gills charged in August.

The glochidia of the orangefoot pimpleback have not been described, but the sexual glands and soft parts are usually pinkish in color and also grayish or brown (USFWS 1984). The glochidia have been observed to be pale orange in June (Hubbs 2010b). It is probable that the glochidia are semi-oval, and hookless, similar to those in the closely related species, sheepsnose (*Plethobasus cyphus*) (Ortmann 1912, 1919).

Specific glochidial hosts for this species are unknown; however, the sauger (*Stizostedion canadense*) is reported by Surber (1913) and Wilson (1916) to be the fish host for the orangefoot pimpleback. The Kentucky Department of Fish and Wildlife Resources, under the direction of Dr. Monte McGregor is planning studies to identify the species' fish host(s) and other life history aspects, and is maintaining captive individuals at their Center for Mollusk Conservation in Frankfort, Kentucky.

Sheepnose

The life history information is summarized from the status review of this species (Butler 2003). Thick shelled, larger river mussels such as the sheepnose are thought to live longer than other species. The life span of the sheepnose is thought to be about 21 to 25 years. The reproductive cycle of the sheepnose is likely similar to that of other native freshwater mussels. As with most mussel species the sheepnose has separate sexes. Age at sexual maturity is unknown but is estimated at about 3 years. Female sheepnose utilize only the outer pair of gills as marsupium for its glochidia, and is considered to be a short-term brooder with most reproduction taking place in early summer (Parmalee and Bogan 1998). Glochidia are released in the form of conglomerates, which are narrow and lanceolate in outline, solid and red in color, and discharged in unbroken form (Oesch 1984). Several score to a few hundred glochidia probably occur in each conglomerate. Total fecundity per female sheepnose is probably in the tens of thousands.

Glochidia must come into contact with a specific host fish(es) to survive and develop further. Little is known regarding the host fish for the sheepnose but one known host is the sauger, *Stizostediaon canadense*. It is possible that other fish species may also serve as a suitable host. Newly metamorphosed juveniles drop off the host and begin a free living existence on the stream bottom.

The following habitat requirements of the sheepnose are summarized from Oesch (1984) and Parmalee and Bogan (1998). The sheepnose is primarily a larger stream species, usually occurring in shallow shoal habitats with moderate to swift currents over coarse sand and gravel. Habitats also may have mud, cobble, and boulders, and it may occur in deep runs.

Historical and current distribution information on the sheepnose is summarized from Butler (2003). The sheepnose historically occurred throughout much of the Mississippi River system with the exception of the upper Missouri River system and most lowland tributaries in the lower Mississippi River system. This species is known from the Mississippi, Ohio, Cumberland, Tennessee River main stems, and scores of tributary streams rangewide. It historically occurred in at least 77 streams in 15 states. The current distribution includes 26 streams in 14 states. The sheepnose has been eliminated from about two-thirds of the total number of streams from which it was historically known (26 streams currently compared to 77 streams historically), and has been eliminated from long reaches in streams in which it currently occurs. The sheepnose was historically known from 28 streams in the Ohio River system. Currently, only 11 streams are thought to have extant populations. The sheepnose was historically documented from the entire length of the Ohio River. The sheepnose has been recently recorded from the main stem Ohio River downstream of Paducah, and in several locations in the Tennessee River downstream of Kentucky Dam.

Population dynamics

Population size - fat pocketbook

Little is known on the population dynamics of the fat pocketbook; however, relatively dense populations do occur in portions of the St. Francis River drainage in Arkansas and Missouri, and sporadically elsewhere, but extensive surveys have not been conducted. Surveys conducted within the last 5-10 years in the lower Ohio River that have recorded this species, are usually targeted at specific projects (e.g., fleeting areas, loading/unloading facilities, Corps dredging needs, and sand and gravel dredging operations), or records have been obtained from commercial mussel fishermen working that portion of the lower Ohio River near Paducah, Kentucky, and Metropolis, Illinois. Based on these more recent records, it appears the fat pocketbook may be somewhat more common than previously believed in this reach of river, but no quantitative assessment is available. Many of these records are of young individuals (i.e., <5 years), so it is apparent the species has been able to successfully recruit in recent years.

Population size - pink mucket

Despite its wide range in historical times, the pink mucket has apparently always been an uncommon species (Ortmann 1919, Johnson 1980, USFWS 1985b). Most literature records report very low population numbers. In addition, only 11 of 232 Ohio State University Museum of Zoology (OSUM) pink mucket records rangewide, over several decades, contained more than 10 specimens. All 11 of these OSUM lots represented collections made ca. 1980 from commercial sheller's cull piles in lower Tennessee and middle Cumberland Rivers, meaning the records represented protracted spatial and temporal collections from harvesting along several mile river reaches over extended collecting periods (L.M. Koch 2009).

Pink muckets collected during surveys tend to be large, old adult animals. Smaller juveniles or subadults are rarely if ever found in the vast majority of populations, despite recent quantitative quadrat sampling in several streams. If the species' rate of recruitment is characteristically very low (which there is no empirical data to support), this would at least partially explain the typical lack of evidence for recruitment that most populations exhibit. It is entirely possible that many of the populations now considered extant have recruitment rates that are below population maintenance levels if they don't suffer from outright recruitment failure. Below population maintenance levels indicate that a population is below the threshold of sustainability and that the population is in decline. Unless this downward population trend is arrested or reversed, the ultimate result will be extirpation. Considering the advanced age the pink mucket attains (36+ years), non-recruiting populations may take decades to become extirpated. Therefore, it may not be known whether most populations are viable or not for many years to come (Bob Butler 2010).

The tendency of pink muckets to inhabit larger streams and oftentimes deeper water habitats may partially account for apparent rareness, since most collectors historically were unable to sample these habitats effectively. But recruitment rates may play a significant role in dictating relative population size. Current pink mucket recruitment rates would appear to be very low given the scant evidence we have for the presence of juveniles in many populations and despite considerable effort expended conducting quantitative sampling. Considering the species

longevity and the fact that it has always appeared to be an uncommon species, it is possible that recruitment rates are naturally low for pink mucket. If true, having a low rate of recruitment would make populations inherently more susceptible to extirpation when factors act in concert to further compromise the already low recruitment level (Bob Butler 2010).

A contributing factor to the pink mucket being a rare species, is the fact that its inhabited range is a fraction of what it was historically (over a 100 years ago), having lost several thousand miles of large river habitat to habitat degradation. Considering the huge loss of range, it is likely the current total population size of pink mucket represents a small proportion of its historical numbers. Unfortunately, very little quantifiable information is available for estimating population size for this species either historically or currently (Bob Butler 2010).

Population size - orangefoot pimpleback

Historical records for the orangefoot pimpleback indicate this species is strictly an Ohioan or Interior Basin species (i.e., Ohio, Cumberland and Tennessee river drainages) (Ortmann, 1919). Populations of the orangefoot pimpleback continue to occur in the lower Ohio River and in the Tennessee River, while the best remaining population of the species occurs in the lower, free-flowing reach of the Ohio River, and in the riverine portion of Kentucky Lake downstream of Pickwick Landing Dam in Tennessee.

Hubbs (2010b) recently collected two individuals from the Pickwick Landing Dam tailwater that were approximately seven years in age, demonstrating recruitment in this Tennessee River population of the orangefoot pimpleback. It is not known if any genetic interchange is occurring between the two populations in the Ohio and Tennessee Rivers. The Cumberland River does not currently contain a known viable population of the species, but individuals may still exist there in low numbers (Widlak 2010).

No new populations of orangefoot pimpleback have been discovered and populations have not yet been reestablished in historic habitat. The lower French Broad River and lower Holston River have, however, been recently designated for establishment of nonessential experimental populations of the species. When the orangefoot pimpleback is collected during surveys, older, often eroded, adult specimens of this species are sampled (Widlak 2010).

Population size – sheepnose

The information below is summarized from the status review of this species by Butler (2003). The sheepnose, although widespread in many Mississippi River system streams was rarely very common. Archaeological evidence on relative abundance indicates that it has been an uncommon or even rare species in many streams for centuries. Museum collections of this species, with few exceptions, are almost always small. Fair numbers were recorded historically from the upper Muskingum River system in Ohio, and the lower Wabash River. Cummings and Mayer (1992) considered it 'rare throughout its range'. The sheepnose has experienced a significant reduction in range and most of its populations are disjunct, isolated, and appear to be declining rangewide. The extirpation of the sheepnose from over 50 streams within its historical range indicates substantial population losses have occurred. In the vast majority of streams with extant populations, it appears to be uncommon at best. Small population size and/or restricted

stream reaches of current occurrences are currently the norm. No new populations of sheepsnose have been discovered and populations have not yet been reestablished in historic habitat.

Population variability - fat pocketbook

Little is known on the population variability of the fat pocketbook; however, in recent years in the lower Ohio River, young individuals may comprise the majority of a population. Densities are often so low that only a few individuals of various age groups comprise the population.

Population variability - pink mucket

Little is known on the population variability of the pink mucket. Few individuals are observed during survey efforts, making it difficult to accurately assess populations. Densities are often so low that only a few individuals may comprise a population.

Population variability - orangefoot pimpleback

This species is considered extremely rare wherever it is found. Little is known on the population variability of the orangefoot pimpleback. Few individuals are observed during survey efforts, making it difficult to accurately assess populations. In the Tennessee River, the Pickwick Landing Dam tailwater supports the only known population in which recent recruitment has been observed. The Tennessee Wildlife Resources Agency collected a seven year old individual at TRM 170 in the vicinity of Swallow Bluff Island in 2009. Finding mussels of this early age indicates that some level of recruitment is occurring in this reach of the Tennessee River (Don Hubbs 2010a). During a June 17-21, 2008 pre-project survey at TRM 160.7, one orangefoot pimpleback was collected and comprised <0.001 percent of the total species composition (11,090 native mussels, representing 17 species) (Shaw 2010).

Population variability - sheepsnose

This species is considered extremely rare wherever it is found. Little is known on the population variability of the sheepsnose. Few individuals are observed during survey efforts, making it difficult to accurately assess populations

Population stability - fat pocketbook

The stability of fat pocketbook populations is not well known; however, there have been examples of this species recolonizing areas that have been dredged in ditches in Arkansas. In most locations, the presence of fat pocketbooks is evident from occasional individuals or a few individuals recorded. In the Ohio River, the low numbers typically encountered during mussel surveys, is of little value other than indicating the species may be existing in a certain area over a relatively long period of time.

Population stability – pink mucket

The stability of pink mucket populations is not well known. In most locations where this species appears to be present, the presence of pink muckets is evident from occasional individuals or only a few individuals recorded. In the Ohio River, the low numbers typically encountered during mussel surveys, is of little value other than indicating the species may be existing in a certain area over a relatively long period of time.

Population stability – orangefoot pimpleback

The stability of orangefoot pimpleback populations is not well known. In most locations where this species appears to be present, the presence of orangefoot pimplebacks is evident from occasional individuals or only a few individuals recorded. In the Ohio River, the low numbers typically encountered during mussel surveys, is of little value other than indicating the species may be existing in a certain area over a relatively long period of time.

Population stability – sheepnose

The stability of sheepnose populations is not well known. In most locations where this species appears to be present, the presence of sheepnose is evident from occasional individuals or only a few individuals recorded. In the lower Ohio River and lower Tennessee River downstream of Kentucky Dam, the low numbers typically encountered during mussel surveys is of little value other than indicating the species may exist in a certain area over a relatively long period of time.

Status and distribution

Reasons for listing - fat pocketbook

The primary causes for the decline of the fat pocketbook in its historic range are from navigation (e.g., maintenance dredging) and flood control activities on the rivers where it was once found (USFWS 1989). Channel dredging is a direct impact that physically removes fat pocketbooks from their habitat. Dredging activities can affect aquatic systems both physically (e.g., accelerated erosion, decreased habitat diversity, increased bedload, and increased habitat instability) and biologically (e.g., altered behavior of host fish from changing flow patterns, decreased biomass, and altered species composition and abundance) (USEPA 2007). Construction of impoundments for flood control in the river basins in which fat pocketbook had been collected has caused a loss of fat pocketbook habitat from inundation, changes in flow distributions, and sedimentation. Reductions in water quality (metals, pesticides, and other pollutants) from point source discharges also have likely affected mussel populations. However, with the implementation of the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System in 1972, industrial discharges have been regulated, and point source pollutants have significantly declined in the large river systems, in which the fat pocketbook is reported. Non-point source pollution (stormwater runoff that includes complex mixtures of pesticides, fecal coliform bacteria, metals, suspended solids, and pharmaceuticals) may also have had a negative impact on mussel populations downstream of agricultural and urban areas, although the possible effects have not been adequately researched. Other causative factors in the decline of the fat pocketbook include competition of food and habitat resources with the invasive zebra mussel (*Dreissena polymorpha*) in some portions of their range (NPS 2006, Hunter et al. 1996, Scholessner et al. 1996). Zebra mussels were found to be a contributing factor in the decline of unionids located downstream of the Belleville Locks and Dam (EA 2005).

Reasons for listing – pink mucket

The recovery plan for the pink mucket provides reasons for listing this species including: impoundments, siltation, and pollution (USFWS 1985b). Impoundments alter flow, temperature regimes, and water quality and habitat conditions creating conditions unsuitable for riverine

mussels and/or their host fish. Siltation can increase turbidity which irritates or clogs the gills of mussels and can even physically smother the animal. Mussel life cycles can be affected indirectly from siltation by impacting host fish populations (e.g., smothering fish eggs or larvae, reducing food availability, etc.). Various forms of pollution from municipal, agricultural, and industrial sources can impact mussels in a variety of ways. Currently, the vast majority of the pink mucket's historical range has been altered and no longer offers suitable habitat (approximately an 80% loss). Despite the relatively large number of extant populations for a federally listed mussel, the total population size for pink mucket, although undetermined, appears to be relatively small based on significant loss of total range, infrequent occurrence in otherwise suitable habitat, very low relative abundance compared to other mussels, and overall rarity of the species). With few exceptions, its 29 extant populations are: 1) invariably small (rarely are more than one or two individuals found per sample and a third of its populations are known from only one or two animals collected over the past 25 years), 2) characteristically rare (having low relative abundance), 3) sporadically or occasionally distributed (despite the extent of seemingly suitable habitat it is very patchy in distribution and occurrence), 4) generally limited in linear extent (most less than 30 RMs), and typically lacking evidence for recent recruitment (despite considerable quantitative sampling efforts). With many disjunct populations and its overall scarcity, the species is highly susceptible to localized extirpations from the genetic implications of extremely low population size and because of threats that are extremely difficult if not impossible to control. Stochastic events are a real concern for all populations, particularly reach-limited ones and those associated with navigation channels and other major transportation arteries (Bob Butler 2010).

Reasons for listing - orangefoot pimpleback

The recovery plan for the orangefoot pimpleback provides reasons for listing this species including: impoundments, siltation, and pollution. Impoundments alter flow, temperature regimes, and water quality and habitat conditions creating conditions unsuitable for riverine mussels and/or their host fish. Siltation can increase turbidity which irritates or clogs the gills of mussels and can even physically smother the animal. Mussel life cycles can be affected indirectly from siltation by impacting host fish populations (e.g., smothering fish eggs or larvae, reducing food availability, etc.). Various forms of pollution from municipal, agricultural, and industrial sources can impact mussels in a variety of ways. The orangefoot pimpleback is an extremely rare mussel. Generally, only one or two individuals are collected, if any, in suitable habitat supporting an abundance of other mussel species. Historically, it had a relatively restricted distribution in that the species was only reported from the Ohio, Tennessee and Cumberland rivers and their larger tributary streams (USFWS 1984). Alteration and destruction of habitat, due to creation of impoundments for flood control, navigation, hydroelectric power production and recreation, and activities resulting in siltation which affected substrate quality (e.g., navigation traffic, sand and gravel mining), led to the listing of the orangefoot pimpleback; these impacts continue to affect the species' habitat (USFWS 1984; James Widlak 2010). The orangefoot pimpleback is not a species that is collected for commercial purposes; however, commercial mussel harvest may have contributed to some decline in populations due to the species being unintentionally collected along with commercially valuable species. However, these impacts are believed to be minor in regards to declining population levels (Widlak 2010).

Reasons for listing – sheepsnose

The following summary is primarily from Butler (2003). The sheepsnose has experienced a significant reduction in range and most of its populations are disjunct, isolated, and appear to be declining rangewide. The extirpation of the sheepsnose from over 50 streams within its historical range indicates substantial population losses have occurred. The decline of the sheepsnose is primarily the result of habitat loss and degradation from impoundments, sedimentation, and pollution. Chief among the causes of decline are impoundments, channelization, chemical contaminants, mining, and sedimentation. Impoundments result in the modification of riffle and shoal habitats and the resulting loss of mussel resources, especially in larger rivers. Dams interrupt most of a river's ecological processes by modifying flood pulses; controlling impounded water elevations; altering water flow, sediments, nutrients, and energy inputs and outputs; increasing depth; decreasing habitat heterogeneity; decreasing stability due to subsequent sedimentation; blocking host fish passage; and isolating mussel populations from fish hosts. Even small low-head dams can have some of these effects on mussels. In addition, dams can alter downstream water quality and habitat. Population losses due to impoundments have probably contributed more to the decline and imperilment of the sheepsnose than any other single factor. Channelization and dredging activities have also altered riverine habitats nationwide. Gravel mining activities may be a localized threat in some streams with extant sheepsnose populations. Chemical contaminants contained in point and non-point discharges can degrade water and substrate quality impacting mussel populations and may be most profound on juvenile mussels. Various forms of pollution from municipal, agricultural, and industrial sources can impact mussels in a variety of ways. Siltation can increase turbidity which irritates or clogs the gills of mussels and can even physically smother the animal. Mussel life cycles can be affected indirectly from siltation by impacting host fish populations (e.g., smothering fish eggs or larvae, reducing food availability, etc.). Currently, the vast majority of the historical range of the sheepsnose has been altered and no longer offers suitable habitat. With few exceptions, extant populations are: 1) invariably small (rarely are more than one or two individuals found per sample), 2) characteristically rare (having low relative abundance), 3) sporadically or occasionally distributed (despite the extent of seemingly suitable habitat it is very patchy in distribution and occurrence), and 4) generally limited in linear extent, and typically lacking evidence for recent recruitment. With many disjunct populations and its overall scarcity, the species is highly susceptible to localized extirpations from the genetic implications of extremely low population size and because of threats that are extremely difficult if not impossible to control. Stochastic events are a real concern for all populations, particularly reach-limited populations and those associated with navigation channels and other major transportation arteries. Other threats include exotic species, such as Asian clams, zebra mussels, and Asian carp.

Rangewide trend – fat pocketbook

Although the fat pocketbook was historically widespread within much of its original range, populations of this species and its range have declined in the last 50 years. The main reason for decline of the species is channelization, impoundment and dredging of rivers, but contributing factors include siltation and pollution, and possibly range reductions of fish hosts (USFWS 1989, 1997). More recently, infestations of the exotic invasive zebra mussel are contributing to the decline of all native Unionid mussels (Layzer et. al. 1996, Ricciardi et. al. 1998). Because of the severe reduction in range of the species, the fat pocketbook was listed as an endangered species

on June 14, 1976. No estimate of the total population was included in the 1985 recovery plan (USFWS 1985a).

The historic range of the species includes the upper Mississippi River above St. Louis; the Ohio River; the Wabash and White Rivers in Indiana; the St. Francis, White, and Black Rivers in Arkansas; the Spoon and Illinois Rivers in Illinois; the Des Moines and Iowa Rivers in Iowa; the Cumberland River in Kentucky; and the Neosho River in Kansas. It was also reported in the Des Moines River (Missouri) and the Illinois River. Since 1970, it has been collected from the St. Francis River and Right Hand Chute Little River and drainage ditches associated with these streams in Arkansas and Missouri, the lower Wabash and White Rivers in Indiana, the lower Ohio River, lower Tennessee River and lower Cumberland River in Kentucky, and the upper Mississippi River. Live and fresh-dead fat pocketbook specimens have been found at various locations in the Mississippi River from the mouth of the St. Francis (MRM 669), above Helena, Arkansas, downstream to just below Vicksburg, Mississippi (MRM 427). Additionally, they have been found in abandoned channels within batture lands as far south as Natchez, Mississippi (MRM 385), however, there have been no main channel searches for the species below MRM 427 (Paul Hartfield, 2008). The species is present in low densities at appropriate sites in at least 300 miles of the Lower Mississippi River between Natchez, Mississippi, and Memphis, Tennessee (Paul Hartfield, 2008). A single fat pocketbook was collected in 2003 from the White River in Arkansas near river mile 11, the first collection in that river since the 1960's (Harris and Christian 2003). The largest viable population currently exists in the St. Francis River system (Arkansas); however, other viable populations likely exist in the Wabash, Ohio, or Cumberland Rivers (USFWS 1989, 1997). In 1987, during a survey of the unionid fauna of the Wabash River drainage, nine live fat pocketbooks were found in the lower part of the river. Subsequent surveys of the Wabash River detected populations of various sizes at sample sites from the confluence with the Ohio River upstream to Knox County, Indiana (Cummings et al. 1990). Based on the results of these surveys, the population of fat pocketbooks in the lower Wabash River appears to be viable and large relative to other sympatric mussels. Fresh dead specimens (e.g., surveyors collected shells from mussels that had recently died) have been found occasionally in the lower Ohio River (e.g., Ohio River miles 848 and 938) since the late 1980s. The fat pocketbook is currently known to occur in several locations in the lower Ohio River from J.T. Myers Lock and Dam (ORM 846) downstream to the mouth of the Ohio River (ORM 981), a reach of approximately 135 miles. However, in 2008 the fat pocketbook was recorded from the Ohio River near the mouth of the Green River, approximately 65 upstream of the J.T. Myers Lock and Dam. This 2008 record at Ohio River Mile 784 indicates the fat pocketbook also occurs in the J.T. Myers pool. It is not known to what extent this species is distributed in the J.T. Myers pool.

Rangewide trend – pink mucket

The pink mucket is an Ohioan species with possibly the widest range known for a listed mussel. It is a rare larger-stream mussel that was widely distributed historically in at least 48 large rivers in 12 states. Presently, known populations occur in the Barren River, Big River, Black River, Clinch River, Cumberland River, Current River, Gasconade River, Green River, Kanawha River, Little Black River, Meramec River, Ohio River, Osage River, Paint Rock River, and Tennessee River (USFWS 1985; Parmalee and Bogan 1998). Of these extant populations, only a few have shown recent evidence of recruitment. Some taxonomists have recently postulated that the reproducing populations west of the Mississippi River are not *Lampsilis abrupta*, but rather are

more closely related to another endangered species, the Higgins eye pearly mussel (*Lampsilis higginsii*). If this is true, then there are fewer known reproducing populations of *L. abrupta* than originally thought. Although it has a relatively wide distribution and is apparently more tolerant of reservoir-type habitat conditions than other listed mussel species, the pink mucket is reported to occur in low numbers where it occurs.

Currently, 29 populations are considered extant. With few exceptions, the 29 extant populations are extremely small and occur in relatively short river reaches despite the extent of seemingly suitable habitat in many streams. Further, over one-third of its populations deemed extant are very sporadic in occurrence and known from only one or two individuals collected over approximately the past 25 years (e.g., Licking, French Broad, Clinch, Paint Rock, Sac, Bourbeuse, St. Francis, Current, Eleven Point Rivers; Bear Creek). A majority of populations are essentially limited to discrete reaches making the species in these streams highly susceptible to elimination from catastrophic stochastic events (Bob Butler 2010).

Rangewide trend – orangefoot pimpleback

The orangefoot pimpleback was historically known from the Ohio River (from western Pennsylvania to southern Indiana), the Wabash River (below Mt. Carmel, Illinois), the Cumberland River (from Cumberland County, Kentucky to near Nashville, Tennessee), the lower Clinch River (Anderson County, Tennessee) and the Tennessee River (near Knoxville to Benton County, Tennessee) and has also been reported from the Caney Fork, Holston, and French Broad Rivers in Tennessee, and the Green and Rough Rivers in Kentucky (NatureServe 2003). The largest known populations remain in the lower, free-flowing reach of the Ohio River downriver from the confluence of the Tennessee River at Paducah, and a short reach of the Tennessee River below Pickwick Landing Dam (USFWS 1984, Miller et al. 1986). The Cumberland River may continue to support individuals of the species, but none have been collected from that system in recent decades. The Service (Code of Federal Regulations 2007) is currently planning future releases of the orangefoot pimpleback into the lower French Broad and lower Holston Rivers Experimental Population Area, under a Nonessential Experimental Population designation to further the recovery and conservation of the species.

Live orangefoot pimplebacks have recently been recovered from commercial mussel harvesters in the vicinity of the lower Ohio River near Lock and Dam 52. Several of these individuals are currently being held by the KDFWR to be used for propagation and reintroduction purposes in the near future. Surveys of mussel beds in the lower Ohio River from July through October 2007 yielded 24 orangefoot pimplebacks (Widlak 2010). The TWRA collected a seven year old individual at TRM 170 in the vicinity of Swallow Bluff Island in 2009 and have collected several seven and eight year old orangefoot pimpleback mussels in the Pickwick Landing Dam tailwater in recent years, indicating that some level of recruitment is occurring in this reach of the Tennessee River. The orangefoot pimpleback also continues to be found in the lower Tennessee River downstream of Kentucky Dam, but no recruitment of the species has been recently noted in Kentucky waters (Lewis 2008). This individual, 3.1 inches in length, was discovered on June 18, 2008 during a pre-project survey of the proposed project area.

Rangewide trend – sheepnose

The sheepnose has experienced a significant reduction in range and most of its population are disjunct, isolated, and appear to be declining rangewide. It is extirpated from over 50 streams in its historical range. In the majority of streams with extant populations, the sheepnose appears to be uncommon at best. Several extant populations are thought to exhibit some level of population viability; however, given its current distribution, abundance, and trend information, the sheepnose appears to exhibit a high level of imperilment.

New threats

The zebra mussel, an exotic species that colonizes the shells of native mussels, is a relatively new threat to mussels including the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose. It is present in the Ohio River and has been observed attached to native mussels, including these three species, and can restrict the ability of a mussel to move, feed, respire, and reproduce, especially if large numbers are present on the shell of the native mussel.

An additional new potential threat to both the rabbitsfoot and sheepnose is a molluscivore (mollusk predator) fish, the black carp, *Mylopharyngodon piceus*. It has recently been recorded in the Mississippi River near the mouth of the Ohio River.

Analysis of the species/critical habitat likely to be affected

The fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose mussels are federally listed species likely to be adversely affected in the action area of this project. No critical habitat has been designated for these mussel species; therefore, none will be affected.

ENVIRONMENTAL BASELINE

Status of the species within the action area

A reconnaissance mussel survey was performed during August 5 – 8, 2008 in two portions of the river from near Ohio River Mile (ORM) 935.7 (Burnett Street Boat Ramp) and 934.7 (Schultz Park Expansion).

Fat pocketbook

The reconnaissance survey recorded a total of 21 live fat pocketbook mussels, six from the Burnett Street Boat Ramp area and 15 from the Schultz Park Expansion area. This species has also been recorded from other survey efforts within two to three miles both upstream and downstream of the action area. In the Ohio River, fat pocketbooks are known to occur primarily from the mouth of the Wabash River (ORM 848) downstream to the mouth of the Ohio River (ORM 981), a reach of approximately 133 miles; however, recent mussel surveys have extended the known distribution of this species in the Ohio River approximately 64 miles upstream of the mouth of the Wabash River to ORM 784 (Chad Lewis, 2008, personal communication). Throughout this portion of the Ohio River, the fat pocketbook is not evenly distributed and is likely to be found only in sites containing suitable habitat conditions. It is not known how much

suitable fat pocketbook habitat exists in the lower Ohio River. Mussel surveys that have been conducted in recent years in this 135-mile reach of river occasionally record the fat pocketbook; however, these surveys do not give a complete assessment of the available habitat or the status of the species. Surveys conducted within the last 5-10 years that have recorded this species are usually targeted at specific projects (e.g., fleeting areas, loading/unloading facilities, Corps dredging needs, and sand and gravel dredging operations), or records have been obtained from commercial mussel fishermen working that portion of the lower Ohio River near Paducah, Kentucky, and Metropolis, Illinois. Considering the widespread distribution of fat pocketbooks in the Mississippi River and certain tributaries to the Mississippi River, the Ohio River distribution is in itself a small subset of the overall range of this species.

Pink mucket

A reconnaissance mussel survey, such as was performed for the project, is not specifically intended or designed to detect extremely rare mussels such as the pink mucket, but it will usually provide sufficient information on the overall mussel assemblage and habitat that a determination can be made as to the likelihood such rare species could occur at the survey site. The reconnaissance mussel survey did not record any pink muckets; however, it is likely that the pink mucket occurs in the action area. The pink mucket has been recorded in the Ohio River within two to three miles of the action area, the mussel species assemblage in the action area is one in which the pink mucket is often associated, and portions of the action area contain suitable habitat.

Orangefoot pimpleback

A reconnaissance mussel survey, such as was performed for the project, is not specifically intended or designed to detect extremely rare mussels such as the orangefoot pimpleback, but it will usually provide sufficient information on the overall mussel assemblage and habitat that a determination can be made as to the likelihood such rare species could occur at the survey site. The reconnaissance mussel survey did not record any orangefoot pimpleback mussels; however, it is likely that this species occurs in the action area. The orangefoot pimpleback has been recorded in the Ohio River within two to three miles of the action area, the mussel species assemblage in the action area is one in which this species is often associated, and portions of the action area contain suitable habitat.

Sheepnose

A reconnaissance mussel survey, such as was performed for the project, is not specifically intended or designed to detect extremely rare mussels such as the sheepnose, but it will usually provide sufficient information on the overall mussel assemblage and habitat that a determination can be made as to the likelihood such rare species could occur at the survey site. The reconnaissance mussel survey did not record any sheepnose mussels; however, it is likely that this species occurs in the action area. The sheepnose has been recorded in the Ohio River downstream of the project site and occurs in the Tennessee River upstream of the project site within the action area as defined in this conference opinion.

Factors affecting species environment within the action area

The habitat conditions within the action area consist primarily of sand, soft silt over sand, and small areas of gravel and/ or clay. Other factors possibly affecting the species environment in the action area include runoff from agriculture activities which can increase turbidity and add sediment, including possible contaminants from urban runoff, dams which can affect host fish movement and habitat conditions, sewer outfalls, and industrial complexes located upstream in the Ohio, Cumberland, and Tennessee Rivers. Barge traffic will continue to operate in the river channel riverward of the project footprint; however, barge groundings or 'parking' on the shoreline is expected to cease once the project is constructed.

Previous Incidental Take Authorizations

Fat pocketbook

Sixteen prior formal consultations involving the fat pocketbook have involved the United States Army Corps of Engineers (USACE), Federal Highway Administration (FHWA) and United States Forest Service (USFS). However, the formal consultation with the USFS did not authorize any incidental take of fat pocketbooks. Of the fifteen biological opinions issued by the Service authorizing incidental take of fat pocketbooks, ten were issued to the USACE primarily for maintenance dredging activities, barge fleeting/loading/unloading facilities, for bank stabilization, levee setback and bridge construction activities. Five biological opinions authorizing incidental take were issued to the FHWA for bridge replacement and construction and for scour repair. These biological opinions were issued between 1999 and 2010. A summary of these formal consultations is discussed below and provided in Appendix A.

The fifteen incidental take statements have authorized the loss of about 1,148 individuals, an indeterminate number of small individuals, the relocation of more than 3,257 individuals, and the placement of nine gravid female fat pocketbooks into a propagation facility. Eight of the biological opinions authorized take of fat pocketbook from relocation. The largest relocation authorized by these biological opinions allowed the relocation of up to 3,000 individuals prior to the start of maintenance activities on Stateline Outlet Ditch in Arkansas. The actual relocation was performed in 2002 and involved the relocation of 2,042 fat pocketbooks. Results from a 2005 post-relocation survey of this reach found the area re-populated with fat pocketbooks and at densities higher than those found during the pre-impact survey.

Service programmatic biological opinions in Regions 3 and 4 regarding section 10(a)(1)(A) permits for mussel species, including fat pocketbook, anticipate the incidental take of five individuals per year, per permit. There have been two reports of incidental take in the form of injury or death reported by two permittees in Kentucky in recent years; both were for less than five individuals.

The amount of actual take of fat pocketbook associated with these biological opinions is difficult to determine for several reasons:

1. Young mussels are small and may be difficult to detect.

2. Quantitative assessments of the number of mussels in a dredge pile are time-consuming and costly and are, therefore, not routinely recommended.
3. Mussels are long-lived and have a complex life-cycle making assessment of indirect effects difficult (e.g. effects of water quality changes, long-term relocation effects, impacts to host species, etc.).

Despite the inherent difficulties associated with assessing the actual amount of take associated with projects impacting mussels and the uncertainties associated with the long-term impacts, the fat pocketbook appears to be doing well range-wide and within impacted reaches such as Arkansas' Stateline Outlet Ditch. This coupled with the recent discoveries of previously undocumented populations of fat pocketbook and the Service's internal analysis, the Service concludes that the aggregate effects of the activities and incidental take covered in previous biological opinions on the fat pocketbook have not degraded the overall conservation status (i.e., environmental baseline) of the fat pocketbook.

Pink mucket

Thirty-six prior formal consultations involving the pink mucket have involved the United States Army Corps of Engineers (USACE), Federal Highway Administration (FHWA), Federal Energy Regulatory Commission (FERC), U. S. Fish and Wildlife Service (USFWS), Tennessee Valley Authority (TVA), Nuclear Regulatory Commission (NRC), and Natural Resources Conservation Service (NRCS). A summary of these formal consultations is discussed below and provided in Appendix B.

The incidental take statements from the above mentioned consultations have authorized the loss of about 44.5 acres of habitat, 255 individuals, an indeterminate number of individuals from several consultations indicating all individuals will be taken within a project area, and the relocation of five individuals. The amount of actual take of pink muckets associated with these biological opinions is difficult to determine for several reasons:

1. Young mussels are small and may be difficult to detect.
2. Quantitative assessments of the number of mussels taken were not always given.
3. Mussels are long-lived and have a complex life-cycle making assessment of indirect effects difficult (e.g. effects of water quality changes, long-term relocation effects, impacts to host species, etc.).

Despite the inherent difficulties associated with assessing the actual amount of take associated with projects impacting mussels and the uncertainties associated with the long-term impacts, the pink mucket appears to be persisting range-wide. The Service concludes that the aggregate effects of the activities and incidental take covered in previous biological opinions on the pink mucket have not degraded the overall conservation status (i.e., environmental baseline) of the pink mucket.

Orangefoot pimpleback

Twenty prior formal consultations involving the orangefoot pimpleback have involved the United States Army Corps of Engineers (USACE), Federal Highway Administration (FHWA),

U. S. Fish and Wildlife Service (USFWS), and Tennessee Valley Authority (TVA). A summary of these formal consultations is discussed below and provided in Appendix C.

The incidental take statements from the above mentioned consultations have authorized the loss of about 14.5 acres of habitat, 76 individuals, and an indeterminate number of individuals from several consultations indicating an unknown number of individuals will be taken within a project area. The amount of actual take of orangefoot pimpleback mussels associated with these biological opinions is difficult to determine for several reasons:

1. Young mussels are small and may be difficult to detect.
2. Quantitative assessments of the number of mussels taken was not always given.
3. Mussels are long-lived and have a complex life-cycle making assessment of indirect effects difficult (e.g. effects of water quality changes, long-term relocation effects, impacts to host species, etc.).

Despite the inherent difficulties associated with assessing the actual amount of take associated with projects impacting mussels and the uncertainties associated with the long-term impacts, the orangefoot pimpleback mussel appears to be persisting in the lower Ohio River and selected portions of the Tennessee River in Kentucky and Tennessee. The Service concludes that the aggregate effects of the activities and incidental take covered in previous biological opinions on the orangefoot pimpleback have not degraded the overall conservation status (i.e., environmental baseline) of the orangefoot pimpleback.

Sheepnose

We are not aware of any incidental take authorizations for this species other than a Conference Opinion on the Paducah Riverfront Development Project, McCracken County, Kentucky and its effects on rabbitsfoot and sheepnose mussels, in a letter from the Service to Mr. John Ballantyne, U.S. Dept. of Transportation dated July 13 2011, that is on file at the Kentucky Ecological Services Field Office in Frankfort, Kentucky. In that Conference Opinion take was provided for 7.5 acres of habitat and 5 sheepnose mussels.

EFFECTS OF THE ACTION

Factors to be considered

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities. While analyzing direct and indirect effects of the proposed action, the Service considered the following factors:

- Proximity of the action – We describe known species locations and designated critical habitat in relation to the action area and proposed action;
- Distribution – We describe where the proposed action will occur and the likely impacts of the activities;
- Timing – We describe the likely effects in relation to sensitive periods of the species' lifecycle;
- Nature of the effects – We describe how the effects of the action may be manifested in elements of a species' lifecycle, population size or variability, or distribution, and how individual animals may be affected;
- Duration – We describe whether the effects are short-term, long-term, or permanent;
- Disturbance frequency – We describe how the proposed action will be implemented in terms of the number of events per unit of time;
- Disturbance intensity – We describe the effect of the disturbance on a population or species; and
- Disturbance severity – We describe how long we expect the adverse effects to persist and how long it would take a population to recover.

Proximity of the action:

The proposed action will occur upstream of Lock and Dam 52 on the Kentucky side of the river near approximately Ohio River Mile 934.7 to 935.8, extending from the Kentucky shore out to the navigation channel. The proposed action area is known to contain fat pocketbooks and likely to contain pink muckets, sheepsnose, and orangefoot pimplebacks. Fat pocketbooks are known to be present in the project footprint portion of this reach in which a mussel survey was conducted. The pink mucket, orangefoot pimpleback, and sheepsnose likely occur within the project footprint and/or larger action area, because of their close proximity to the site, the occurrence of suitable habitat, and the associated mussel assemblage present in the action area.

Distribution:

Direct impacts to the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose mussels and their habitats will most likely occur within the project footprint and in other portions of the action area downstream and riverward of the project footprint. It is expected that the greatest impacts will be from the new fill to provide the terrestrial area at the Schultz Park Expansion site. Other potential impacts will be from changes to the surrounding riverine habitat from flow changes due to the fill, the presence and operation of the marina, and boat traffic activity at and near the project sites.

Timing:

The proposed action can be divided into essentially two periods, a construction phase and an operation phase. Depending on when the actual construction occurs, the construction may impact the fat pocketbook, pink mucket, sheepsnose, and orangefoot pimpleback mussels during sensitive periods of their life cycle.

The fat pocketbook and pink mucket are thought to become gravid in the late summer or fall and brood glochidia over the winter (long-term brooders), and then release them in the spring. Sensitive periods (late summer-fall) for adults include the release of sperm into the water column and, for females, the fertilization of eggs and brooding of larvae as they transform into glochidia. Another sensitive period for female mussels is the time of release of glochidia and their attachment onto the fish host (spring-early summer). Sensitive periods for the juveniles include their attachment to excystment from the fish host as they drop to the riverbed and establish themselves in the substrate (spring-early summer). All these sensitive periods of the fat pocketbook and pink mucket will certainly occur during the post-construction or operation period and into the foreseeable future. In addition, both the fat pocketbook and pink mucket may be impacted if fish host behavior and presence are affected by the construction and operation phases of the proposed action.

The orangefoot pimpleback and sheepsnose mussels are thought to become gravid during spring and/or summer, brood glochidia for a short period of time and release larvae in the late summer (short-term brooder). Sensitive periods in late spring-summer for adults, include the release of sperm into the water column and the fertilization of eggs and brooding of larvae. Another sensitive period for female mussels is the time of release of partially developed larvae or glochidia, and their attachment onto the fish host (summer). Sensitive periods for the juveniles include their attachment to the host fish and excystment from the host fish as they drop to the riverbed and establish themselves in the substrate (summer). All these sensitive periods of the orangefoot pimpleback will certainly occur during the post-construction or operation period and into the foreseeable future. In addition, the orangefoot pimpleback may be impacted if fish host behavior and presence are affected by the construction and operation phases of the proposed action. The fish host for the orangefoot pimpleback is not known.

Nature of the effect:

It is likely that the proposed action will have a variety of effects on the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose mussels. Any of the periods of these species life cycle can potentially be disturbed or disrupted by construction and/or operation activities; however, the construction phase of fill deposition and concomitant flow changes will likely be the greatest effect. For instance, any listed mussels remaining within the filled peninsula area will be killed. The operation phase of this project is likely to result in the (a) direct and/or indirect mortality of individual adults and juveniles from boat activity, (b) dislodgement of adults and/or juveniles due to flow alterations and/or navigation activity, (c) reduction or other modification in the availability of fish hosts that is caused by degradation/alteration of habitat and that may harm and/or harass individuals through interference with respiration, feeding, and reproduction, and (d) creation of turbidity and/or deposition of sediment that may directly and/or indirectly affect adults and/or juveniles by harm and/or harassment. In addition, these species

may be impacted if fish host behavior and presence is negatively affected by flow alterations, turbidity, or changes in sediment deposition.

Duration:

During the construction phase, potential impacts to the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose will be direct and indirect, and remain for the duration of the construction. The effects of the operation phase are indeterminable, but any effects will likely be of a long-term duration. It is possible that the post-construction or operational phase will also result in changes to flows and other habitat conditions; however, the effects of these changes will not be known until sufficient monitoring reveals the extent and magnitude of the changes. The loss of habitat within the filled peninsula area will be permanent.

Disturbance frequency:

The construction phase disturbance will only occur once, but will result in a following unknown period of change. Any disturbances to the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose produced during the operation phase are expected to occur on a regular basis with on-going boating activity. These disturbances (i.e., flow changes, increased turbidity, movement of sediment, etc.) are expected to occur over an unknown period of time as new flow conditions alter the makeup of the river's flow characteristics, sediment removal, and/or sediment transport/deposition patterns.

Disturbance intensity:

The disturbance intensity will likely be dissimilar throughout the action area and is expected to occasionally create habitat conditions that are unfavorable for the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose.

Disturbance severity:

The disturbance severity of the fill portion of the construction phase is expected to be severe and permanent. The post-construction or operation phase is expected to primarily impact fat pocketbooks, pink muckets, orangefoot pimplebacks, and sheepnose nearest the fill portion of the project, along the perimeter of the fill area, and in shallow water due to sedimentation. The recovery rate to these mussel species in this part of the action area is unknown. Taken as a whole, the overall disturbance severity is expected to be minor to the population of fat pocketbooks in the lower Ohio River and range-wide; minor to the pink mucket in the lower Ohio River and range-wide; and of unknown severity to the orangefoot pimpleback and sheepnose in the lower Ohio River and range-wide.

Analyses for effects of the action

Beneficial effects:

No wholly beneficial effects have been identified or are expected to occur. The proposed action is expected to result in adverse effects on the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose populations within the Shultz Park Expansion action area.

Direct effects:

Direct effects of the proposed action on the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepnose include harassment, harm, and mortality from construction of the fill area, flow alterations resulting from the fill area, construction of the marina, and resultant boating activities within the Shultz Park Expansion action area. In the Shultz Park Expansion action area, a total of approximately 6.29 acres of mussel habitat will be directly impacted. This includes 3.49 acres of direct fill, 2.73 acres of potential sedimentation area, and 0.07 acres of anchor sites for the marina (Table 1). A portion of the project area at the Shultz Park Expansion area is known to be occupied by numerous mussel species including the fat pocketbook; and, it is likely the pink mucket, orangefoot pimpleback and sheepnose occur also in this area. Table 1 shows the anticipated acreages affecting actual known mussel habitat based on mussel surveys conducted for this project. Table 1 also indicates that there are portions of the area of fill that will not likely impact federally listed mussels because no mussels are known to occur there.

It is estimated that a total of approximately 6.29 acres of habitat, 76 fat pocketbook, 2 pink mucket, 2 orangefoot pimpleback, and 2 sheepnose mussels will be impacted by these activities.

Since the pink mucket, orangefoot pimpleback and sheepnose mussel were not recorded in the survey at this site, the number of individuals provided above is considered, at best, an estimated number based on other mussel surveys conducted in the Tennessee River downstream of Kentucky Lock and Dam and in the lower Ohio River. Some of these surveys recorded the species, while others did not record these species (See section below titled: **Species' response to proposed action**).

Hydrodynamic processes were modeled for existing and proposed conditions by HCCL River Engineering (HCCL) to estimate the potential change in deposition and entrainment patterns of sediment particles as a result of the proposed Schultz Park Expansion landform. The *Hydrotechnical Considerations: Technical Brief*, prepared by HCCL, details the methodology and results of the model and is provided in the BA. The model was built using the original design for the Schultz Park Expansion which was located approximately 500 feet upstream of its currently proposed location. Due to the overall scale of the model/processes and the relatively minor changes to the overall park design, the results of the model are likely still applicable to the new location for the purposes of this biological opinion. Sediment transport potential (i.e., deposition and entrainment), presented as a mobility index, was estimated from bed shear values modeled over a range of river stage elevations for a range of sediment particle sizes. Mobility index values greater than 1.0 indicate potential particle entrainment whereas mobility index values of less than 1.0 indicate potential particle deposition. Because a wide range of hydrodynamic conditions were modeled, only the subset of results pertaining to potential mussel impacts was included in the BA. River stages and particle sizes considered relevant to potential effects on mussels encompass a typical annual hydrograph range (based on hydrograph data from 1990 to 2011) and particle sizes corresponding to suitable mussel habitat. These include river stages 304, 310, and 320 and for particle sizes of 0.1 millimeter (mm) (very fine sand), 1 mm (very coarse sand), 2 mm (very fine gravel), and 5 mm (fine gravel). Particle sizes greater than 5 mm, although representative of suitable mussel substrate, are not included in the results discussion because they were not mobile within the project area for existing or proposed conditions according to the model. A river stage of 304 feet is slightly greater than the normal

pool elevation of 302 feet whereas a river stage of 320 feet corresponds with an approximately 10% exceedance probability. The City of Paducah Action Stage is 318 feet and Flood Stage is 325 feet. It should be noted that river stage elevations and actual local reach conditions are complicated by the effects of the Smithland Lock and Dam, Lock and Dam 52 and the Kentucky Lake Dam controlling flows and water levels.

Other direct effects to the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose include, but are not limited to, habitat modifications such as changes in flow and dissolved oxygen concentrations due to increased turbidity, and sediment deposition which could bury mussels, especially juveniles, and cause injury and/or mortality. These effects could also restrict mussel respiration (e.g., suffocation due to inability to purge sediment from gills), limit feeding (e.g., starvation due to inability to eliminate sediment), and interfere with reproduction (e.g., abortion from stress, host fish absence during critical reproductive periods). Direct effects of mussel relocation include harm, harassment and possible mortality due to the stress of being handled, processed, and relocated. These effects can result in premature release of sperm or aborted glochidia negatively impacting reproductive success. A trained biologist that holds a collection permit from either the Service or the Kentucky Department of Fish and Wildlife Resources, and who will accomplish any relocation work, will minimize some of these effects. In summary, the following direct effects are anticipated:

1. Mortality that is the result of a constructed fill area in occupied habitat. This action could damage, bury or crush fat pocketbook, pink mucket, sheepsnose, and orangefoot pimpleback mussels.
2. Harm resulting from the constructed fill area, marina construction and operation, and boating activities in occupied habitat may result in mussel dislodgement, increased turbidity, flow alterations, sediment removal, sediment deposition, and decreased dissolved oxygen levels. This may affect the ability of these mussel species to respire, reproduce, and feed. Direct physical harm (e.g., damaged shell or bruised animal) could result in the death of mussels.
3. Harassment in the form of induced stress including, but not limited to, displacement of mussels during construction activities, potential degradation of remaining/adjacent habitat, and handling of mussels during relocation. This harassment could result in decreased ability of these species to respire, reproduce, and feed.

All of these direct effects can lead to reduced population levels for these mussel species in this portion of the Ohio River, which, in turn, can reduce their reproductive capacity.

Interrelated and interdependent actions:

Interdependent and interrelated activities occur because of, or associated with, the proposed project activities. These activities would include potential harm from substrate disturbance from propeller wash, bank erosion from wave action, spills/debris as a result of increased boating traffic, and sediment disturbance from launching and extracting boats from the river.

Due to the depth of the river (>3m) where these activities will take place and the relatively small watercraft that will be using the ramp, the effects of propeller wash are not likely to occur. If sediment disturbance were to occur, the suspended sediment would be deposited downstream and riverward of the boat ramp. Because the majority of mussels were located upstream and further from shore than the proposed boat ramp, any potential interdependent and interrelated effects from substrate disturbance are not likely to adversely affect the existing mussel assemblage.

Increased wave action on riverbanks and spills/debris at the proposed facilities could occur due to the anticipated increase in boating activity associated with the proposed boat ramp. While the anticipated wave action would likely cause riverbank erosion and sedimentation, riverbank stabilization measures are proposed to combat these effects. Mitigation measures to specifically address riverbank stabilization as approved in the 404/401 permits include 765 linear feet of riparian buffer restoration and preservation of the riparian restoration area through a permanent deed restriction. The proposed boat ramp property will be maintained and monitored by the City of Paducah. Maintenance activities will include regularly scheduled trash/debris cleanup, garbage collection, and general facility maintenance to prevent degradation of the property, facilities, and the Ohio River. Based on the proposed mitigation activities for riparian impacts and the anticipated maintenance and monitoring schedule for the proposed facilities, interrelated and interdependent effects from wave action and spills/debris are not likely to occur.

Indirect effects:

Indirect effects of this project on the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose include changes in fish host behavior and/or presence that could impact the ability of glochidia to attach to the fish at the proper time when released from the female mussel, and changes in flow regimes and sediment transport in the action area. In summary, the following indirect effects are anticipated:

1. Mortality of adult and juvenile mussels that results from changes in the flow regime around the constructed fill area and marina, redistributing sediments that smother mussels due to new deposition, and/or that result in sediment loss creating instability and loss of habitat.
2. Harm in the form of decreased ability to respire, reproduce, and feed as a result of the redistribution of sediments resulting from changes in flow regimes and/or boating activities in occupied habitat. These activities may affect turbidity, flows, dissolved oxygen levels, and the presence of host fish during the future reproductive seasons of these mussel species.
3. Harassment in the form of induced stress including, but not limited to, potential degradation of habitat from changes in flow regimes, and handling of mussels during survey and monitoring activity. This harassment could result in the mussels decreased ability to respire, reproduce, and feed.

Species' response to a proposed action

Numbers of individuals/populations in the action area affected:

Fat pocketbook

Based on the mussel assemblage and habitat conditions recorded during the survey, it is likely fat pocketbooks occur in suitable habitat throughout the action area; however, they are not expected to be evenly distributed in the action area.

In the Burnett Street Boat Ramp portion of the action area we do not believe fat pocketbooks will be affected by the proposed action. In the Schultz Park Expansion portion of the action area, we estimate that about 76 fat pocketbook mussels are present. Fat pocketbook mussels occur in the densities of approximately 12 per acre within the Schultz Park Expansion portion footprint. The exact number of fat pocketbook mussels in the action area is unknown. However, the total number of fat pocketbooks estimated to occur in the Burnett Street Boat Ramp and Schultz Park Expansion portions of the action area is 76. This estimate was derived from the data collected in the mussel survey. We expect the proposed action to appreciably affect the overall fat pocketbook population in the Schultz Park Expansion portion of the action area, since 6.29 acres within the 13.55 acres of covered fill and sediment impacted area, is expected to be directly impacted. We expect the aforementioned indirect impacts to adversely affect a portion of the fat pocketbooks in the Schultz Park Expansion action area to an unknown extent; however, it is not possible to accurately determine (or quantify) the indirect effects to fat pocketbooks in this area.

Pink mucket, Orangefoot Pimpleback, and Sheepnose

Based on the mussel assemblage and habitat conditions recorded during the survey, it is likely the pink mucket, orangefoot pimpleback, and sheepnose occur in suitable habitat throughout the Burnett Street Boat Ramp and Schultz Park Expansion portions of the action area; however, they are not expected to be evenly distributed within this area. Since the mussel survey did not record any of these three species, the exact number of these mussels in this portion of the action area is currently unknown. We base our estimates below on other mussel surveys that have recently been performed in close proximity to this proposed action.

The total number of pink mucket, orangefoot pimpleback, and sheepnose estimated to occur in the Burnett Street Boat Ramp and Schultz Park Expansion portions of the action area is not possible to accurately determine. We do not expect the proposed action to affect these species in the Burnett Street Boat Ramp portion of the action area. We do expect the proposed action to affect the overall population of these three species in the Schultz Park Expansion portion of the action area. The covered fill area is estimated at 13.55 acres, of which 6.29 acres consists of likely mussel habitat where these three species may occur. We expect the aforementioned indirect impacts to adversely affect these three species in the Schultz Park Expansion portion of the action area to an unknown extent; however, it is not possible to accurately determine (or quantify) the indirect effects to these species in this area.

Sensitivity to change:

The degree to which the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose are prone to change when disturbed is unknown. These four species are thought to be relatively sedentary within the substrate. As a result, they are likely unable to respond to change by moving great distances; however, it is possible they could move several meters. When disturbed, mussels, in general, tend to close their valves for a period of time; however, this response will vary depending on the disturbance. Mussels exposed to disturbance events will likely close their valves when disturbed and remain closed if continued to be disturbed. They are not likely to move out of the area of disturbance on their own because of their inability to move great distances in a short period of time and because their valves will likely remain closed.

Resilience:

Resilience relates to the characteristics of populations or a species that allow them to recover from different magnitudes of disturbance. Assuming that the flow characteristics and habitat conditions in the action area are not appreciably changed, the magnitude of disturbance is expected to be low and resilience is not expected to change from its current level. However, this can only be determined through monitoring of the population and habitat over time.

Recovery rate:

In this biological opinion, the recovery rate relates to the time required for a fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose individual or population to return to equilibrium after exposure to a disturbance. Mussel populations are expected to continue to spawn and recruit new individuals into the population; however, the level of successful recruitment to the adult stage is unknown, especially in areas that may be subjected to repeated degradation (i.e., the shallow, near-shore areas). The recovery rate for these four mussel species is likely to vary within the action area.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future, State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Private actions in the vicinity of the action area are primarily urban and agriculture-related activities. We are reasonably certain these actions will continue and do not expect these activities to change appreciably in the future from current conditions. Effects from urban and agricultural activities on fat pocketbooks, pink muckets, orangefoot pimplebacks, and sheepsnose could include increased sediment deposition, turbidity, and herbicide/pesticide levels in localized portions of the Ohio River. However, these effects, if they are occurring, are indeterminable. Private boating and commercial navigation activities also occur in the Ohio River and are

expected to continue, but they are not expected to result in additional adverse effects even though they could potentially result in increased turbidity, physical disruption of habitat, and spills of petroleum products. Essentially, we cannot predict that these specific types of adverse effects will occur.

We are not aware of any other State, tribal or local actions to include under Cumulative effects.

CONCLUSION

After reviewing the current status of the fat pocketbook, pink mucket, orangefoot pimpleback, and sheepsnose, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of these species, and is not likely to destroy or adversely modify designated critical habitat. At this time no critical habitat has been designated for these species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA, Corps, and Service, so that they become binding conditions of any grant, permits or contracts, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA, Corps, and Service have a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHWA, Corps, and/or Service (1) fails to assume and implement the terms and conditions or (2) fails to require the Permittee to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the grant, permit or contract, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA, Corps, and Service must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement [50 CFR § 402.14 (1)(3)].

AMOUNT OF TAKE EXPECTED

The Service expects that 6.29 acres of mussel habitat could be taken as a result of this proposed action. The 6.29 acres of habitat estimated to be taken includes 3.49 acres from direct fill, 2.73 acres of mussel habitat impacted by sedimentation, and 0.07 acres of habitat covered by marina anchors. Indirect impacts include marina construction and operation, potential long-term sedimentation, and habitat disturbance.

The Service expects that 76 fat pocketbook mussels, 2 pink mucket mussels, 2 orangefoot pimpleback mussels, and 2 sheepsnose will be taken as a result of this proposed action. The take provided for the pink mucket, orangefoot pimpleback, and sheepsnose is set low because these species were not recorded from the project footprint area; however, the Service believes it is likely that some or all of these species could occur in the project footprint area. If so, the take provided will likely account for any of these species taken due to this projects activity.

In the "Analyses for effects of the action" section above, the Service determined that the proposed action would result in incidental take through (a) direct mortality as a result of the Schultz Park expansion fill area and relocation of any fat pocketbook, pink mucket, sheepsnose, and orangefoot pimpleback mussels; (b) harm from construction activities that will likely result in (1) physical harm (i.e., cracked shell, bruising) to mussels that were not included in the relocation, (2) negative effects of sedimentation that could entomb, starve, and/or suffocate individuals, (3) loss and/or degradation of habitat, (4) relocation efforts, and (5) disruption of host fish availability at key times during the reproductive cycle; and (c) harassment as a result of disruption in reproductive capabilities by, but not limited to, the spontaneous abortion of glochidia during relocation and/or monitoring efforts, individuals being dislodged downriver into unsuitable habitat, and potentially low dissolved oxygen levels.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of expected take is not likely to result in jeopardy to the species or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize take of fat pocketbooks.

1. The FHWA, Corps, and Service must ensure that the proposed action will occur as designed, planned, and documented in the BA, all supporting information provided by the City of Paducah, and this biological opinion.
2. The FHWA, Corps, and Service must ensure that the City of Paducah has a plan to replace fat pocketbooks, pink muckets, sheepsnose, and orangefoot pimplebacks likely to be taken by the proposed action.

3. The FHWA, Corps, and Service must ensure that the City of Paducah implements measures to minimize or eliminate impacts of the Burnett Boat Ramp and Schultz Park Expansion sites to fat pocketbooks, pink muckets, sheepnose, and orangefoot pimplebacks.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Act, the FHWA and City of Paducah must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The FHWA, Corps, Service and/or City of Paducah must agree to implement the proposed action as described in the BA, including mussel conservation measures listed in this biological opinion that are referred to in the BA, the BA's supporting documentation, and this biological opinion (see "Mussel Conservation Measures" section above). **This Term and Condition supports RPM 1 and 3.**
2. The FHWA, Corps, Service and/or City of Paducah shall develop a Mussel Relocation Plan and obtain the Service's prior written approval of the plan, prior to relocating fat pocketbook, pink mucket, orangefoot pimpleback mussels, sheepnose, and other mussel species, before any new construction activity occurs at or below the ordinary high water level. This plan will include a mussel relocation effort from within an area approximately 6.29 acres in size at the Schultz Park Expansion action area. We estimate that about 4,000 mussels occur in this 6.29 acre area. Relocation emphasis will be in the 3.49 area of impact by fill. An estimated 2,200 mussels occur in the 3.49 acre area direct fill portion. An estimated 1,800 mussels occur in the 2.8 acres of indirect and anchor locations. It is not expected that all mussels in the entire area will likely be relocated; however, the Service believes that if approximately 50 percent of mussels in this area are relocated that will be an adequate level of relocation effort. This effort should be targeted at the four federally listed species addressed in this BO and other species that are similar in appearance to the federally listed species. This Mussel Relocation Plan will also include a baseline 'monitoring' component. Future monitoring efforts are addressed in Terms and Conditions #3 below. All federally listed mussels will be tagged and either relocated to a nearby area of suitable habitat that is protected from navigation and fleeting activity, as indicated in the Mussel Relocation Plan, or as directed by the Service, to the KDFWR to be used in propagation and culture activities at the KDFWR Center for Mollusk Conservation in Frankfort, Kentucky. **This Term and Condition supports RPM 1.**
3. The FHWA, Corps, Service and/or City of Paducah shall contribute **\$20,000** to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) to be used for monitoring at the Schultz Park Expansion area, and the site relocated mussels will be placed. Monitoring will be done two years and five years after the baseline

monitoring described in Terms and Condition #1 is completed. The total contribution of \$20,000 shall be made using certified funds and should be made out to – “Kentucky Waterways Alliance” – with KARF and any other appropriate details in the memo section. The contribution shall be mailed to: Attention: Judith Petersen, Executive Director, Kentucky Waterways Alliance, 120 Webster Street, Suite 217, Louisville, Kentucky 40206. The Kentucky Waterways Alliance’s office telephone number is 270-524-1774. Contact Ms. Petersen if the contribution will be made by direct deposit or a wire transfer. **This Term and Condition supports RPM 1.**

4. The FHWA, Corps, Service and/or City of Paducah shall contribute a total of **\$71,706** to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) following issuance of this biological opinion and prior to initiating any construction below the ordinary high water level. This contribution amount was derived using the 2009 agricultural land value of \$2,850 per acre with a ratio of 4:1 for impacts to a total of 6.29 acres. This contribution will provide mussel habitat impact minimization and includes both direct and indirect impact to habitat. These funds will be used for the preservation, creation, enhancement, and/or protection of federally listed mussel habitat in the lower Ohio River. The total contribution of **\$71,706** shall be made using certified funds and should be made out to – “Kentucky Waterways Alliance” – with KARF and any other appropriate details in the memo section. The contribution shall be mailed to: Attention: Judith Petersen, Executive Director, Kentucky Waterways Alliance, 120 Webster Street, Suite 217, Louisville, Kentucky 40206. The Kentucky Waterways Alliance’s office telephone number is 270-524-1774. Contact Ms. Petersen if the contribution will be made by direct deposit or a wire transfer. **This Term and Condition supports RPM 3.**
5. The FHWA, Corps, Service and/or City of Paducah shall contribute **\$37,000** to the Kentucky Waterways Alliance (KWA) Kentucky Aquatic Resources Fund (KARF) following issuance of this biological opinion and prior to any construction below the ordinary high water level. These funds will be used in recovery efforts for the four federally listed mussels addressed in this biological opinion, thereby minimizing the take expected to occur on this project. To derive the figure of \$37,000, we estimated an amount that could be applied towards an approximately three year effort to replace the mussels estimated to be taken. These funds will be used to collect adult mussels and fish hosts, care for adult mussels and fish, propagate and culture juvenile mussels, and to monitor recovery efforts. **Fat pocketbook:** For the 76 fat pocketbooks taken we estimate \$19,000. This funding will provide additional funding to an already ongoing project to propagate and culture this species. Some considerations for the fat pocketbook effort include costs such as facilities and staff to work on the species, the species is sensitive to handling, has a known host fish that is a challenge to keep alive in captivity, has a relatively short life span, and food requirements are not well understood. We expect a relatively low cost to locate adults to use for propagation and culture. **Pink mucket:** For the 2 pink muckets taken, we estimate \$1,000. Considerations involved in deriving this amount include: (a) there would be a relatively high cost of obtaining adults to work with, (b) the fish host is already known and easily obtained, and (c) the species has previously been successfully propagated and cultured. **Orangefoot pimpleback:** For

the 2 orangefoot pimpleback taken, we estimated \$16,000. Considerations involved in deriving this amount include: (a) there is an anticipated very high cost to locate adults, (b) the fish host is unknown, (c) the species is a short term brooder and has never been propagated or cultured, (d) the species easily aborts larvae when handled, and (e) little is known regarding how this species will respond to captivity.

Sheepnose: For the 2 sheepnose taken, we estimated \$8,000. Considerations involved in deriving this amount include: (a) there is an anticipated high cost to locate adults, (b) the species is a short term brooder and easily aborts larvae when handled, (c) there has been previous success on fish host identification with this species, (d) there has been previous success on propagation and culture with this species, and (e) little is known regarding how this species will respond to captivity. We expect the contribution shall be made using certified funds and should be made out to – “Kentucky Waterways Alliance” – with KARF and any other appropriate details in the memo section. The contribution shall be mailed to: Attention: Judith Petersen, Executive Director, Kentucky Waterways Alliance, 120 Webster Street, Suite 217, Louisville, Kentucky 40206. The Kentucky Waterways Alliance’s office telephone number is 270-524-1774. Contact Ms. Petersen if the contribution will be made by direct deposit or a wire transfer. The contribution shall be made within 15 weekdays of the completion of the relocation effort. **This Term and Condition supports RPM 2.**

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Fish and Wildlife Service Law Enforcement Office at 601 W. Broadway, Suite 115A, Gene Snyder Courthouse, Louisville, Kentucky 40202 (phone 502/582-5989 extension 21). Additional notification must be made to the Fish and Wildlife Service Ecological Services Field Office at 330 West Broadway, Room 265, Frankfort, Kentucky 40601 (phone 502/695-0468). Care should be taken in handling sick or injured mussels. All federally listed mussels that are moribund or have died recently are to be preserved according to standard museum practices (preferably kept frozen and/or preserved in 95% ethyl alcohol and then frozen), properly identified or indexed (date of collection, complete scientific and common name, latitude and longitude of collection site, description of collection site), and submitted to the Kentucky Ecological Services Field Office in Frankfort, or to another location if instructed by the KYFO.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service believes that no more than **76 fat pocketbooks, 2 pink muckets, 2 orangefoot pimplebacks, 2 sheepnose**, and **6.59 acres** of occupied federally listed mussel habitat will be incidentally taken. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring re-initiation of consultation and review of the reasonable and prudent measures provided. In addition, if any other federally listed mussels are recorded during the mussel relocation activities, re-initiation of consultation and review of the reasonable and prudent measures provided is required. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATION

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

The FHWA, Corps, and Service should consider implementing the following conservation recommendation:

Provide financial assistance to the Kentucky Department of Fish and Wildlife Resources Center for Mollusk Conservation to support programs that work to restore federally listed mussels and other native mussels in the lower Ohio River. Such assistance could take the form of protecting or enhancing similar habitat and/or providing funding to the CMC facility to propagate federally listed mussels and other native mussels.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, please provide notification to the Service's Kentucky Field Office of the implementation of any conservation recommendations.

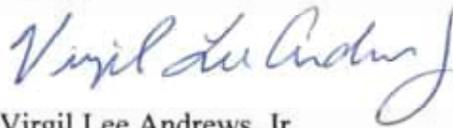
REINITIATION NOTICE

This concludes formal consultation on the action outlined in the FHWA request. As written in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary FHWA, Corps, and Service involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the FHWA, Corps, and Service actions that may affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; (3) the FHWA, Corps, and Service action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease until re-initiation.

For this biological opinion, the incidental take would be exceeded, when the take exceeds 76 fat pocketbooks, 2 pink muckets, 2 orangefoot pimplebacks, and 2 sheepnose which is what has been exempted from the prohibitions of section 9 by this biological opinion. The Service

appreciates the cooperation of the FHWA and Corps during this consultation. We would like to continue working with you and your staff regarding this project. For further coordination, please contact me or Leroy Koch of this office at 502/695-0468.

Sincerely,

A handwritten signature in blue ink that reads "Virgil Lee Andrews, Jr." The signature is written in a cursive style with a large, sweeping "J" at the end.

Virgil Lee Andrews, Jr.
Field Supervisor

cc: Doug Dawson, KDFWR, Frankfort, KY
Matthew Mangan, USFWS, Marion, IL
Michael Ricketts, USACE, Louisville District, IN
Barbara Scott, KDOW, Frankfort, KY

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APPENDIX A

Fat pocketbook biological opinions including amount and form of incidental take exempted.

PROJECTS	SERVICE OFFICE AND DATE BO ISSUED	INCIDENTAL TAKE (IT) FORM	TAKE EXEMPTED OR SURROGATE MEASURE TO MONITOR
Effects of scour repair at Arkansas Highway 77 crossings of Right Hand Chute on the endangered fat pocketbook mussel (<i>Potamilus capax</i>)	Arkansas ES Office April 27, 1999	Harm, harass or kill	Up to 50 mussels relocated and up to 5 mussels killed due to relocation. Indeterminate amount of small mussels not relocated and buried.
Potential impacts of ditch maintenance activities within Stateline Outlet Ditch, Mississippi County, Arkansas on the fat pocketbook mussel (<i>Potamilus capax</i>)	Arkansas ES Office October 3, 2001	Harm, harass or kill	Up to 3,000 individuals relocation and up to 5 killed during the relocation. Up to 30 dead individuals in dredge disposal pile.
Bridge replacement over the St. Francis River	Arkansas ES Office November 8, 2001		2 individuals
Potential impacts of three scour repair areas in the St. Francis Floodway on the fat pocketbook mussel (<i>Potamilus capax</i>)	Arkansas ES Office April 2002	Harm, harass or kill	Up to 200 individuals relocation and up to 2 killed during the relocation. Indeterminate amount of small mussels not relocated and buried.
Proposed maintenance dredging of the Ohio River navigation channel at Wabash Island located in Posey County, Indiana, Gallatin County, Illinois and Henderson County, Kentucky and its effects on the fat pocketbook pearly mussel (<i>Potamilus capax</i>)	Bloomington, IN ES Office September 2002	Harm, harass, collect or kill	Undefined but discovery of more than 3 live mussels in dredged material from a single event indicates take has been exceeded
Arkansas Highway 14 bridge replacement over Ditch 10 near the city of Harrisburg, AK	Arkansas ES Office October 31, 2002		1 individual

Emergency consultation for a sewage lagoon embankment stabilization near the city of Madison, Arkansas	Arkansas ES Office June 10, 2003		6 individuals relocated, 9 gravid females taken to propagation facility
Potential effects of the construction of a Union Pacific Railroad Bridge across the St. Francis floodway on the fat pocketbook (<i>Potamilus capax</i>)	Arkansas ES Office October 29, 2003		3 individuals
Potential impacts of ditch maintenance activities within Ditch 10 on the fat pocketbook mussel (<i>Potamilus capax</i>)	Arkansas ES Office April 28, 2004		10 individuals
Potential impacts of constructing a pre-cast concrete bridge across Ditch 61 on the federally endangered fat pocketbook mussel (<i>Potamilus capax</i>)	Arkansas ES Office September 2, 2007	Harm, harass or kill	3 individuals: 1 relocated and 2 killed
Potential effects of the removal and replacement of the Route 15 bridge over the Wabash River at Mount Caramel, Indiana on the fat pocketbook (<i>Potamilus capax</i>)	Bloomington, IN ES Office October 22, 2007	Injury or direct mortality	4 individuals: 2 during relocation, 2 during construction.
Potential impacts of the proposed setback of Elk Chute Levee in Dunklin County, Missouri on the federally endangered fat pocketbook (<i>Potamilus capax</i>)	Missouri ES Office January 10, 2008	Death or injury	5 individuals
Biological Opinion on the USDA Forest Service Application Of Fire Retardants On National Forest System Lands	Washington DC February 2008	No take provided	No take provided
Biological Opinion on the Construction of Smithland Hydroelectric Project, Livingston County, KY	Kentucky ES Office January 9, 2009	Mortality, harm or harassment	486 individuals and 40 acres of habitat
Biological Opinion on fleeting and loading facilities for the River View Coal Company, Union County, KY	Kentucky ES Office September 11, 2009	Harm, harass, or kill	61 individuals and 12.2 acres of habitat

Biological Opinion on Paducah Riverfront Project, McCracken County, KY	Kentucky ES Office December 21, 2010	Mortality, harm or harassment	546 individuals and 7.5 acres of habitat
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APPENDIX B

Pink mucket (*Lampsilis abrupta*) biological opinions including amount and form of take exempted.

PROJECTS	SERVICE OFFICE AND DATE BO ISSUED	INCIDENTAL TAKE (IT) FORM	TAKE EXEMPTED or SURROGATE MEASURE TO MONITOR
USACE – Biological Opinion on the Issuance of Permits for Dixie Cement Co. Barge Terminal Construction and Access Channel Dredging in Tennessee River	May 21, 1982 ES Field Office Asheville, NC	Harm, harass, or kill	All individuals within proposed project area and an undetermined number downstream and adjacent to project area
USACE – Final Biological Opinion on the Effects on Threatened and Endangered Species on the Lower Ohio River Navigation Feasibility Study	June 13, 1985 ES Field Office Asheville, NC	N/A	No take authorized
FERC - Biological Opinion on the Effects of Threatened and Endangered Species from the Construction and Operation of a Hydroelectric Facility at Lock and Dam #5 on the Green River in Warren and Butler counties, KY	June 25, 1985 ES Field Office Asheville, NC	N/A	No take authorized
USFWS – Biological Opinion on the Effects of Conducting Taxonomic Studies	September 3, 1987 SE Regional Office Atlanta, GA	Collect and kill	Ten individuals (Five each from two divergent populations) NO INCIDENTAL TAKE
FERC – Biological Opinion on the FEIS for Hydropower Development in the Upper Ohio River Basin	January 13, 1989 Pennsylvania Field Office State College, PA	Harm, harass or kill	Can not be determined. Level of authorized take measured by community structure.
TVA – Biological Opinion on the Proposed Wood Chipping and Barge-Loading Facilities on the Tennessee River	December 2, 1992 SE Regional Office Atlanta, GA	N/A	No take authorized
USACE – Biological Opinion on the Effects of Work on a Coal Loading Facility on the Kanawha River RM 90.4, Fayette County, WV	July 7, 1993 ES Field Office Elkins, WV	Harm or Harass	Can not be determined

USACE - Biological Opinion for Proposed Channel Maintenance Dredging of the Cumberland River (CRM 304.0 to 307.0) Smith County, TN	October 1993 ES Field Office Cookeville, TN	Harm or harass	All individuals within the project area
USACE – Biological Opinion for the Proposed City of Florence Municipal Treated Sewage Outfall, Tennessee River, Lauderdale County, AL	October 1994 ES Field Office Cookeville, TN	Harm or harass	All individuals within the project area
FHWA - Biological Opinion for the Construction of the Patton Island Bridge	November 23, 1994 ES Field Office Daphne, AL	Harm or harass	One individual
TVA & NRC - Biological Opinion for the Proposed Operation of the Watts Bar Nuclear Plant, Rhea County, TN	March 1995 ES Field Office Cookeville, TN	N/A	No take authorized
Biological Opinion for Endangered Species Permit Approval for the Rescue of Critically Endangered Mussels in KY, AL and TN	October 1996 ES Field Office Cookeville, TN	Collection of live individuals	Up to 30 live individuals, not more than ten individual per population
USACE – Biological Opinion on the Effects of the Joe S. Towing Co., Inc. Barge Fleeting Facility, Wood County, WV	March 18, 1997 ES Field Office Elkins, WV	Harm or harass	Can not be determined. Take has been exceed if there is a decline of up to 25% of the mussel bed density or decline of up to 25% in the live-to-dead ratio or decline of up to 25% in the total number of species encountered
USACE & TVA – Biological Opinion For The Proposed City of Florence Municipal Treated Sewage Outfall Tennessee River Lauderdale County, AL	1998 ES Field Office Daphne, AL	Harm, harass or kill	Can not be determined
FHWA – Biological Opinion for the Proposed Keller Bridge Demolition Project in Limestone and Morgan Counties, AL	June 8, 1998 ES Field Office Daphne, AL	Harm, harass, or kill	One individual within impact area, all individuals within study area

USFWS – Programmatic Biological Opinion Addressing Effects of Section 10(a)(1)(A) Permitting on Freshwater Mussels in Region 4	August 1, 1998 SE Regional Office Atlanta, GA	Harm or kill	Up to five adult mussels per year
USACE – Biological Opinion for Proposed Maintenance Dredging in the Tennessee River at Diamond Island, Hardin County, TN	July 1999 ES Field Office Cookeville, TN	Harm or harass	Approximately seven acres of habitat loss
USACE – Supplement to the 1991 Biological Opinion For The Proposed Bridges and Alignments Modification to the Kentucky Lock Addition Project Livingston and Marshall Counties, Kentucky	January 2000 ES Field Office Cookeville, TN	Harm or kill	All individuals within the 0.04 acre of habitat impacted by drilling and construction activities
FHWA – Biological Opinion for the Proposed US 231 Bridge Replacement Over the Tennessee River in Madison and Morgan Counties, AL	February 18, 2000 ES Field Office Daphne, AL	Harm, harass or kill	17 individuals
FHWA & USACE – Biological Opinion on the Proposed Replacement of the State Route 2 Bridge over the Tennessee River, Loudon County, TN	February 2001 ES Field Office Cookeville, TN	Harm, harass or kill	All individuals within the project corridor
FHWA and TVA – Amended Biological Opinion for the Proposed Replacement of the State Route 2 Bridge Over the Tennessee River, Loudon County, Tennessee	February 2002 ES Field Office Cookeville, TN	Harm or harass	All individuals within the project corridor
USACE – Chickamauga Lock Project Hamilton County, Tennessee	February 2002 ES Field Office Cookeville, TN	Habitat loss and/or degradation	All within disturbed area
USACE – Biological Opinion on the Effects of Navigational Dredging on the White River in Arkansas	March 1, 2002 ES Field Office Conway, AR	Kill	Five individuals per year

USACE – Mussel relocation Experiment on Tennessee River Near Diamond Island, Hardin County, TN	September 9, 2002 ES Field Office Cookeville, TN	Harm or harass	One individual
TVA – Proposed Public Marina Expansion at Ditto Landing on the Tennessee River, Madison County, AL	November 22, 2002 ES Field Office Daphne, AL	Harm, harass or kill	One individual
USACE – Olmsted Lock and Dam Construction Replaces the 1993 BO	July 16, 2003 ES Field Office Cookeville, TN	N/A	No incidental take authorized
FHWA – Biological Opinion on the Construction of the Rockport Bridge Across the Ouachita River	July 29, 2003 ES Field Office Conway, AR	Harm or harass	Can not be determined
USACE – Tennessee River, Pickwick Landing Dam Mussel Relocation Study, Hardin County, Tennessee	November 13, 2003 ES Field Office Cookeville, TN	Harm, harass, or collect	One individual
TVA _ Proposed Wilson Hydro Plan Modernization of Hydroturbine Project, Lauderdale and Colbert counties, AL	2004 ES Field Office Daphne, AL	Harm, harass or kill	20 individuals
TVA – Biological Opinion on the proposed Reservoir Operations Study in the Tennessee River Valley of AL, GA, KY, MS, NC, TN, and VA	February 9, 2004 ES Field Office Cookeville, TN	Harm or harass	Can not be determined. 30 miles of habitat altered or degraded
FHWA – Biological Opinion on the Proposed Construction of the Highway 46 Bridge Across The Saline River Grant County, AR	July 7, 2004 ES Field Office Conway, AR	Harm, harass or kill	Five through relocation and no more than one killed
USFWS – Amendment to Programmatic Section 7 Biological Opinion Addressing Effects of Section 10(a)(1)(A) Permitting on Freshwater Mussels in Region 4	July 16, 2004 ES Field Office Conway, AR	N/A	No change

FHWA – Biological Opinion on the Proposed Construction of the Highway 167 Bridge, Dallas and Grant counties, AR	January 30, 2006 ES Field Office Conway, AR	Harm, harass or kill	No more than two individuals
NRCS - Programmatic Biological Opinion for the Arkansas Healthy Forest Reserve Program	September 25, 2006 ES Field Office Conway, AR	Harm	Can not be determined. Any take would be associated with a return to baseline conditions and would not involve individuals associated with pre- or post-baseline riparian conditions.
TVA – Biological Opinion on the Routine Operation and Maintenance of TVA Dams in AL, GA, KY, MS, NC, TN, and VA	October 17, 2006 ES Field Office Cookeville, TN	Harm or harass	Can not be determined. All in two mile reaches of the river below Douglas, Cherokee, Fort Loudoun, Watts Bar, Nickajack, Guntersville, Wheeler, Wilson, Pickwick Landing, and Kentucky dams
TVA – Biological Opinion on the Dike stabilization at Johnsonville Fossil Plant Ash disposal Area No. 2 (Johnsonville Island) between Tennessee River Mile 99 – 100, Humphreys Co., TN	February 1, 2010 ES Field Office Cookeville, TN	Harass	151 individuals
Biological Opinion on Paducah Riverfront Project, McCracken County, KY	Kentucky ES Office December 21, 2010	Mortality, harm or harassment	Nine individuals and 7.5 acres of habitat

APPENDIX C

Orangefoot pimpleback (*Plethobasus cooperanius*) biological opinions including amount and form of take exempted.

PROJECTS	SERVICE OFFICE AND DATE BO ISSUED	INCIDENTAL TAKE (IT) FORM	TAKE EXEMPTED or SURROGATE MEASURE TO MONITOR
USACE – Biological Opinion on the Consolidated Grain and Barge Co. Proposed Cargo Fleeting Area on the Ohio River. Pulaski County, IL	April 3, 1985 MW Regional Office Ft. Snelling, MN	N/A	Jeopardy Opinion – No take authorized
USACE – Final Biological Opinion on the Effects on Threatened and Endangered Species on the Lower Ohio River Navigation Feasibility Study	June 13, 1985 ES Field Office Asheville, NC	N/A	No take authorized
TVA – Biological Opinion on the Proposed Wood Chipping and Barge-Loading Facilities on the Tennessee River	December 2, 1992 SE Regional Office Atlanta, GA	N/A	No take authorized
USACE – Biological Opinion on the Construction of the Olmstead Lock and Dam Facility Supplemental to 1985 BO	January 15, 1993 ES Field Office Cookeville, TN	Habitat loss	No take authorized
USACE – Biological Opinion for the Proposed Construction of Barge Fleeting Facilities on the Ohio River, Ballard County, KY	September 1993 SE Regional Office Atlanta, GA	N/A	No take authorized
FHWA - Biological Opinion for the Construction of the Patton Island Bridge	November 23, 1994 ES Field Office Daphne, AL	Harm or harass	One individual
USFWS – Rescue of Critically Endangered Mussels in TN, KY and northern AL	October 1996 ES Field Office Cookeville, TN	Collection of live individuals	Up to 30 live individuals, not more than 10 individual per population

USFWS – Programmatic Biological Opinion Addressing Effects of Section 10(a)(1)(A) Permitting on Freshwater Mussels	August 1, 1998 SE Regional Office Atlanta, GA	Harm or kill	Up to five adult mussels per year
USACE – Biological Opinion for Proposed Maintenance Dredging in the Tennessee River at Diamond Island, Hardin County, TN	July 1999 ES Field Office Cookeville, TN	Harm or harass	Approximately seven acres of habitat loss
Supplement to the 1991 Biological Opinion For The Proposed Bridges and Alignments Modification to the Kentucky Lock Addition Project Livingston and Marshall Counties, Kentucky	January 2000 ES Field Office Cookeville, TN	Harm or kill	All individuals within the 0.04 acre of habitat impacted by drilling and construction activities
FHWA & USACE – Biological Opinion on the Proposed Replacement of the State Route 2 Bridge over the Tennessee River, Loudon County, TN	February 2001 ES Field Office Cookeville, TN	Harm, harass or kill	All individuals within the Project corridor
FHWA and TVA – Amended Biological Opinion for the Proposed Replacement of the State Route 2 Bridge Over the Tennessee River, Loudon County, TN	February 2002 ES Field Office Cookeville, TN	Harm or harass	All individuals within the project corridor
USACE – Chickamauga Lock Project Hamilton County, Tennessee	February 2002 ES Field Office Cookeville, TN	Habitat loss and/or degradation	All within disturbed area
USACE – Mussel relocation Experiment on Tennessee River Near Diamond Island, Hardin County, TN	September 9, 2002 ES Field Office Cookeville, TN	Harm or harass	One individual
USACE – Olmsted Lock and Dam Construction Replaces the 1993 BO	July 16, 2003 ES Field Office Cookeville, TN	N/A	No incidental take authorized

USACE – Tennessee River, Pickwick Landing Dam Mussel Relocation Study, Hardin County, Tennessee	November 13, 2003 ES Field Office Cookeville, TN	Harm, harass, collect	One individual
TVA – Proposed Wilson Hydro Plan Modernization of Hydroturbine Project, Lauderdale and Colbert counties, AL	2004 ES Field Office Daphne, AL	Harm, harass or kill	20 individuals
USFWS- Amendment to the 1998 Programmatic Section 7 Biological Opinion Addressing Effects of Section 10(a)(1)(A) Permitting on Freshwater Mussels in Region 4	July 16, 2004 ES Field Office Conway, AR	Harm or mortality	Five individuals per 100 handled
TVA – Biological Opinion on the Routine Operation and Maintenance of TVA Dams in AL, GA, KY, MS, NC, TN, and VA	October 17, 2006 Cookeville, TN ES Field Office	Harm, harass	Can not be determined. All in 2 mile reaches of the TN River below Fort Loudoun, Watts Bar, Gunterville, Pickwick Landing and Kentucky dams.
Biological Opinion on Paducah Riverfront Project, McCracken County, KY	Kentucky ES Office December 21, 2010	Mortality, harm or harassment	18 individuals and 7.5 acres of habitat

APPENDIX E

TECHNICAL STUDY SUMMARY

Date	Type	Jurisdiction	Location	Conducted	Outcome
April 2007	T&E Species Streams Wetlands	Endangered Species Act of 1973 (Section 7) Clean Water Act	Boat Launch	Redwing Ecological	Probable Indiana bat habitat; Impacted wetlands
May 2008	T&E Species Streams Wetlands	Endangered Species Act of 1973 (Section 7) Clean Water Act	Marina/Transient	Redwing Ecological	No impacts
Aug 2008 Oct 2010 Oct 2011	Mussel Surveys	Endangered Species Act of 1973 (Section 7)	Boat Launch	Redwing Copperhead Gannett Fleming	Biological Assessments (BA) submitted to USFWS
Aug 2008 Oct 2010 Oct 2011	Mussel Surveys	Endangered Species Act of 1973 (Section 7)	Marina/Transient	Redwing Copperhead Gannett Fleming	Biological Assessments (BA) submitted to USFWS
May 2008	Archaeological Survey	Section 106 National Historic Preservation Act of 1966	Boat Launch	American Resources Group	Cultural Resource Survey Report – no impacts
May 2008	Archaeological Survey	Section 106 National Historic Preservation Act of 1966	Marina/Transient	American Resources Group	Cultural Resource Survey Report – no impacts
May 2008	Architectural Survey	Section 106 National Historic Preservation Act of 1966	Boat Launch	American Resources Group	Architectural Resource Report – no impacts
July 2009	Architectural Survey	Section 106 National Historic Preservation Act of 1966	Marina/Transient	American Resources Group	No structures in Area of Potential Effect – no impacts
Mar 2012	Visual Impact Analysis (wind turbines)	Section 106 National Historic Preservation Act of 1966	Marina/Transient	Florence & Hutcheson	No visual impacts to historic resources from wind turbines
May 2012	Noise Impact Document (wind turbines)	Section 106 National Historic Preservation Act of 1966	Marina/Transient	Florence & Hutcheson	No noise impacts to historic areas from wind turbines

APPENDIX F

(The approved Environmental Assessment is on file)