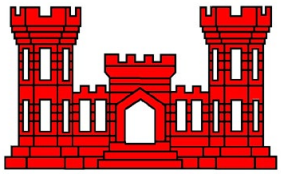
DRAFT

ENVIRONMENTAL ASSESSMENT

Island No. 18/Dyer County Little Levee Emergency Repairs
Mississippi River
Dyer County, Tennessee



U.S. Army Corps of Engineers
Mississippi Valley Division
Regional Planning and Environmental Division South

TABLE OF CONTENTS

FIGURES

APPENDICES

DRAFT
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Mississippi River
Dyer County, Tennessee

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) has prepared this draft environmental assessment (EA) to evaluate impacts associated with emergency repairs within the Island No. 18 complex to include the top left descending bank (LDB) of the Mississippi River, the closure structure at the upstream mouth of Everett Lake, and the toe of the Dyer County Little Levee (DCLL)/LDB of Everett Lake. This EA details the items that were constructed in 2 phases between January 2019 and May 2019, referred to hereafter as Phase 1 and Phase 2. The Island No. 18 complex begins at approximately River Mile (RM) 837 and includes a dike field, Island No. 18, Everett Lake, and Dyer County Little Levee (Figure 1). Over the past several years, flooding has caused high velocity water to damage the LDB of the main channel of the Mississippi River at RM 837. This damage includes the breaches of the LDB and the sand closure dike at the mouth of Everett Lake, and the dislocation of Dike #2 from the LDB of the Mississippi River. These breaches caused significant scour along the LDB bank of Everett Lake and damaged the toe of the DCLL (Figure 2). Everett Lake existed as an isolated slough (Killgore, et al. 1991) on the Mississippi River located between RMs 837 and 832 prior to the breach. The DCLL is a non-Federal levee, but is considered part of the MRL system though the PL84-99 program, and is located in Dyer County, Tennessee, between the mainline Mississippi River Levee, the Mississippi River and the Obion River (RM 820 to 840).

This draft EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, U.S. Army Corps of Engineers, Memphis District, to make an informed decision on the appropriateness of an environmental impact statement (EIS) or a Finding of No Significant Impact (FONSI) for the Phase 1 and Phase 2 Island No. 18/DCLL emergency repair measures. This document has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2.

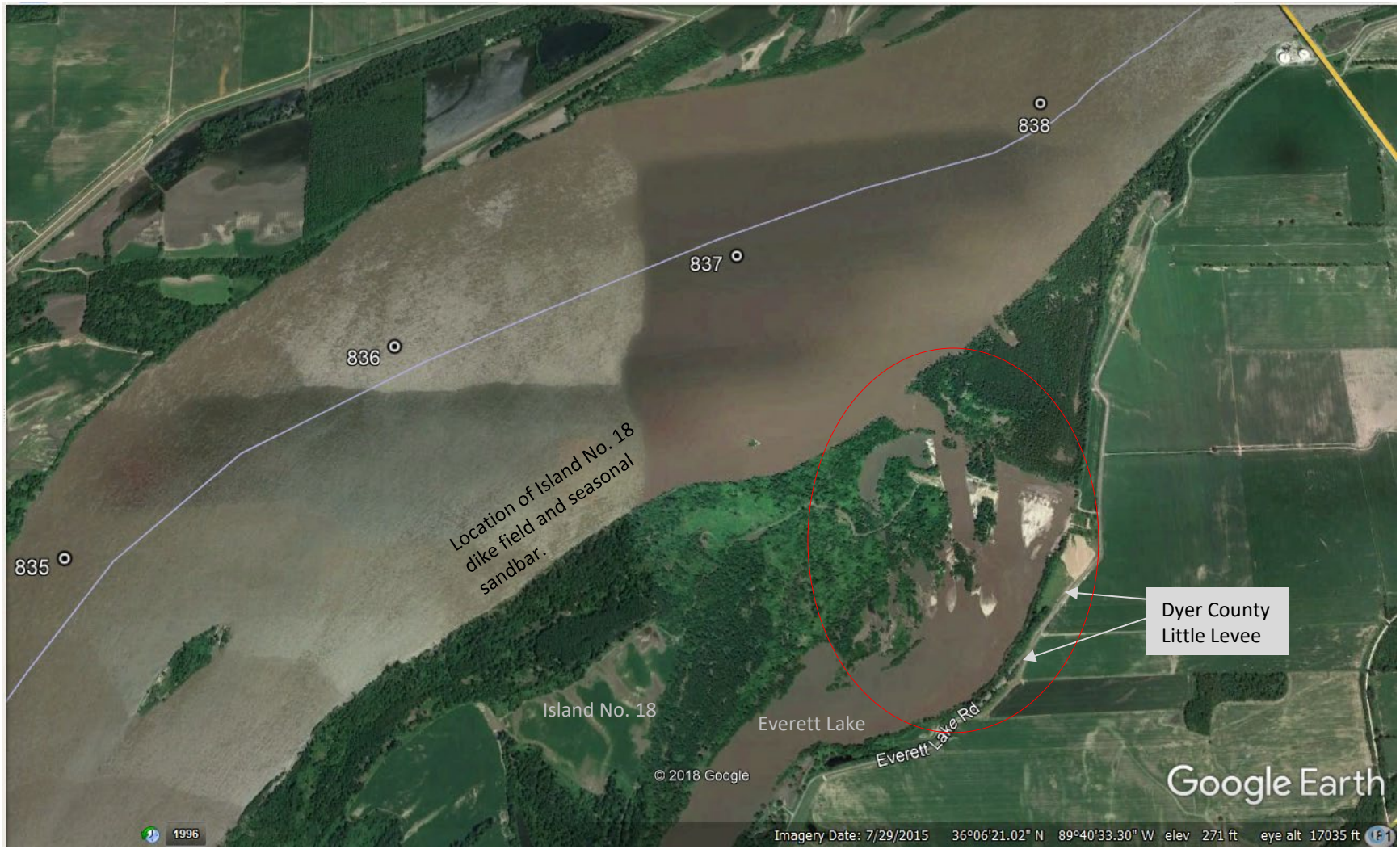

Figure 1. Vicinity map of the Island No. 18/Dyer County Little Levee Emergency Repair project located in Dyer County, Tennessee.

Figure 2. Photographs of the active scour that prompted the emergency repairs at the Dyer County Little Project Area, in Northwestern Tennessee.

1.1 Description of Action**.** Due to the high priority nature of the work described herein, the U.S. Army Corps of Engineers, Memphis District (MVM), completed Phase 1 of the emergency repairs on 2 February 2019. Phase 1 included the immediate riprap bank protection of the DCLL toe and the top bank of Everett Lake to prevent likely failure of the DCLL, and the restoration of the top LDB of the main channel of the Mississippi River. The Phase 1 repairs were required to restore the riverbank to correct flow, and to reduce the water velocity and amount of water entering Everett Lake as substantial damage to the DCLL/Everett Lake Road was occurring. Approximately 65,600 tons of Class A riprap was placed at a thickness of up to 25 feet to restore approximately 1,275 feet of the LDB of the main channel. The crown width of the restored LDB totals approximately 14 feet with up- and downstream slopes of approximately 1-foot horizontal to 2.5-feet vertical (1H:2.5V). A 55-foot wide stone apron consisting of 27,200 tons of class C riprap was placed directly behind the restored top bank for the entire length of the structure at approximately 4 feet thick to prevent scour behind the repair. The Phase 1 repairs (Figures 3 and 4) also included placement of approximately 28,800 tons of class C riprap along approximately 900 feet of the DCLL (LDB of Everett Lake) to repair the immediate damage and prevent likely failure of the DCLL. The riprap was placed along the bank from the toe of the DCLL riverward for approximately 150 feet at a typical slope of 1H:1.5V. This levee protects approximately 12,000 acres of land including residences, other important community assets, and the Mainline Mississippi River Levee/Highway 181. Riprap was delivered by barge, and the work was performed by floating plant using barge mounted draglines or hydraulic excavators.

Construction on Phase 2 began on 15 April and is expected to be complete on 18 May 2019. This work includes the Everett Lake Closure Structure replacement which replaces the structure that was constructed of sand in the 1960's as well as the remainder of the required riprap bank protection. High water is still actively eroding the bank upstream of the completed Phase 1-DCLL riprap protection (Figure 5). The Everett Lake Closure Structure replacement provides immediate protection for the DCLL/Everett Road. The structure was moved downstream by approximately 900 feet to avoid constructing in the scour hole. The sand structure was breached and no longer functioning. Construction of the Everett Lake Closure Structure required approximately 32,000 tons of class A riprap and 56,000 tons of class C riprap across approximately 1,500 feet of the upstream end of Everett Lake. The closure structure was constructed with an upstream slope of 1V:1.25H and a downstream slope of 1V:1.5H with an approximate 14-foot crown. Riprap was also be placed along the LDB of Everett Lake/toe of the DCLL to restore the pre-flood section and grade to prevent further degradation and to stabilize the bank (Figure 5). The bank protection adjacent to the structure on the LDB of Everett Lake now extends from approximately 200 feet upstream of the structure to the existing bank protection on DCLL placed during Phase 1. The bank protection adjacent to the structure on the right descending bank (RDB) extends from approximately 100 feet upstream to approximately 300 feet downstream of the closure. Detailed plans and cross-sections of all work areas are shown in Appendix A.

1.2 Purpose and Need for the Described Action**.** As a result of flooding over the past several years, significant damage has occurred at RM 837 in several areas, as described above. An emergency declaration was released on 11 January 2019 to allow for the high priority work to be completed in an expedited manner. The top LDB of the Mississippi River failed and was

becoming more unstable within the Island No. 18 complex. In addition, prior to the Phase 1 repairs, the likelihood of DCLL failure was very high due to the observed progression of bank failures. Subsequent to the Phase 1 repairs, the likelihood of the DCLL failure was reduced for the immediate future; however, an emergency situation remained due to continuing flood conditions forecast throughout the Spring of 2019. Therefore Phase 2 was also completed to complete the protection of the Island 18 complex and the area protected by the DCLL. The DCLL supports a public road, protects approximately 12,000 acres of agriculturally developed land, 30 homes, 1 business, a church and 41 farm buildings. The total value of the structures is estimated at $2,935,000. It is also estimated that approximately 80 people reside within the area. With the levee in its current condition, this prolonged high water event is likely to cause the continued erosion of the levee if action is not taken. The sandbar on the riverside of Island No. 18, which is utilized by the federally endangered interior least tern during their reproductive season, was also being damaged because of the changes to flow patterns.

1.3 Authority**.** USACE has authority under Public Law 84-99 (PL 84-99), Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities, including rehabilitation of flood control works threatened or destroyed by flood. The constructed and proposed work along the toe of the DCLL is authorized as part of PL 84-99. The purpose of the repairs is to reconstruct the levee toe to the pre-flood section and grade and stabilize the active scour using stone protection.

The work to restore the top bank of the Mississippi River, additional paving and repairs on existing Dike #2, and restoration of the Island No. 18 Closure Dike is authorized by the MR&T Channel Improvement Authority as authorized under the 1928 Flood Control Act.

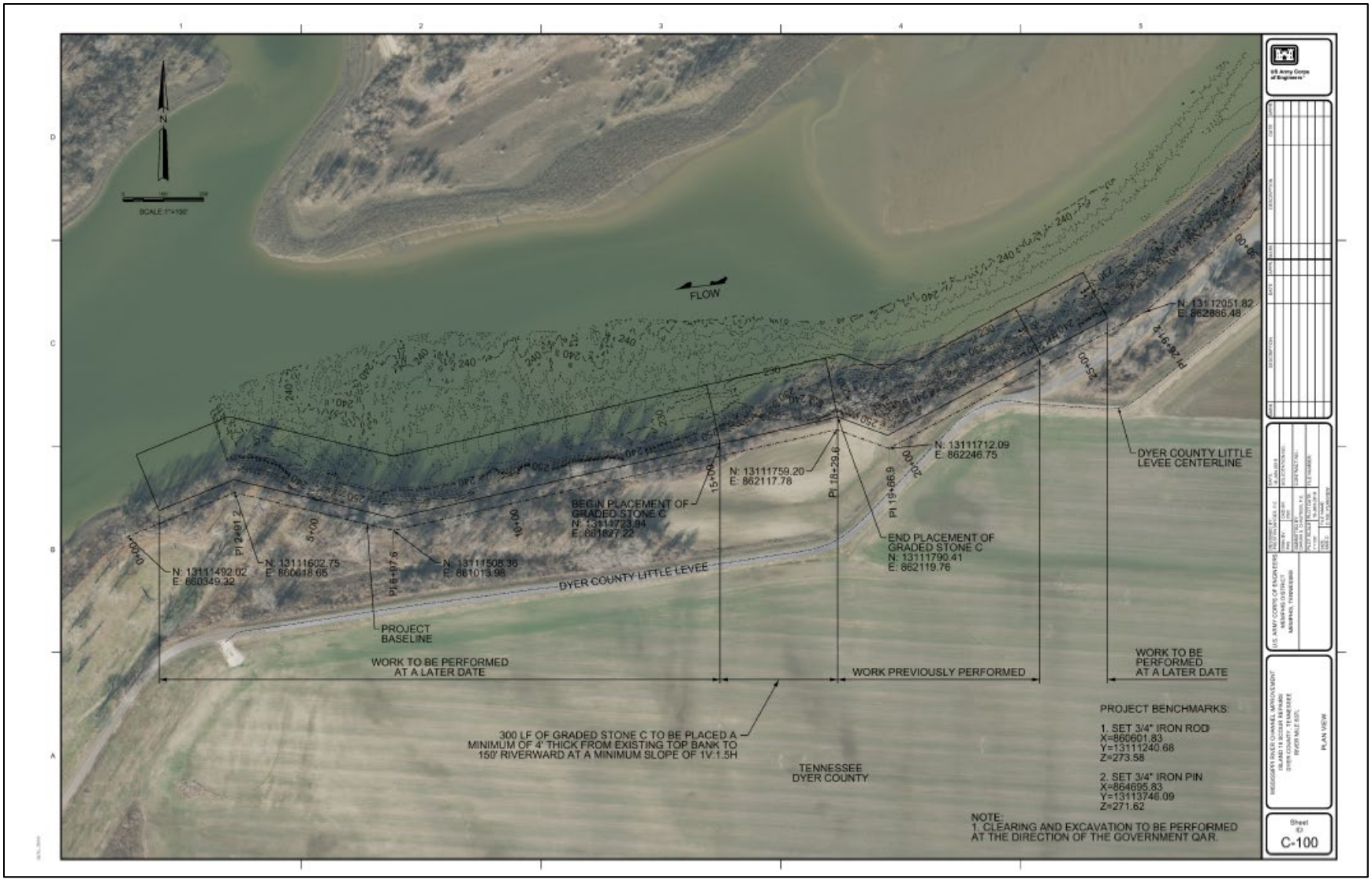

Figure 3. Location of the Phase 1-Dyer County Little Levee emergency scour repairs, Dyer County, Tennessee.

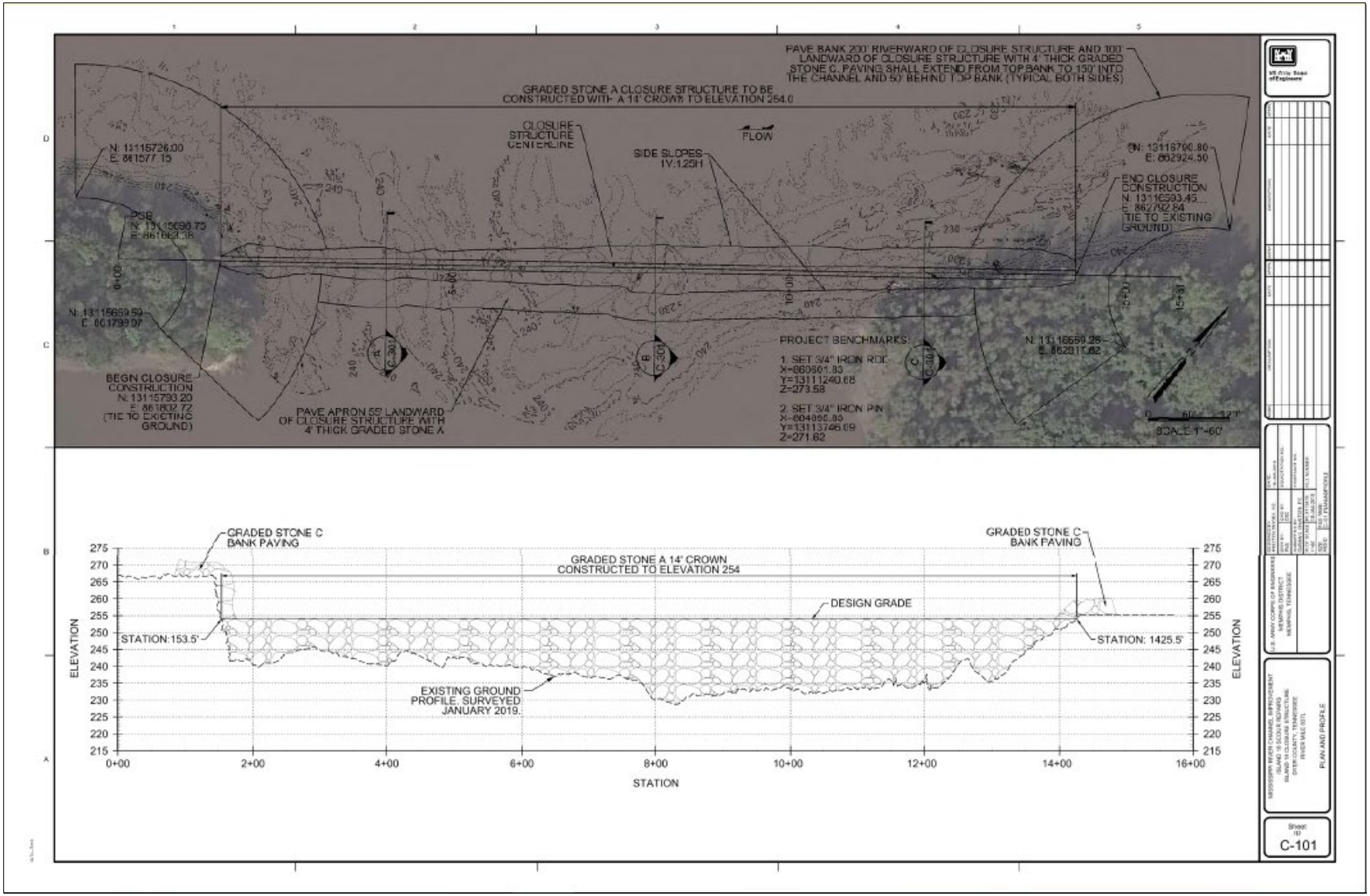

Figure 4. Location of the Phase 1-Island No. 18 Top left descending bank restoration emergency repairs, Dyer County, Tennessee.

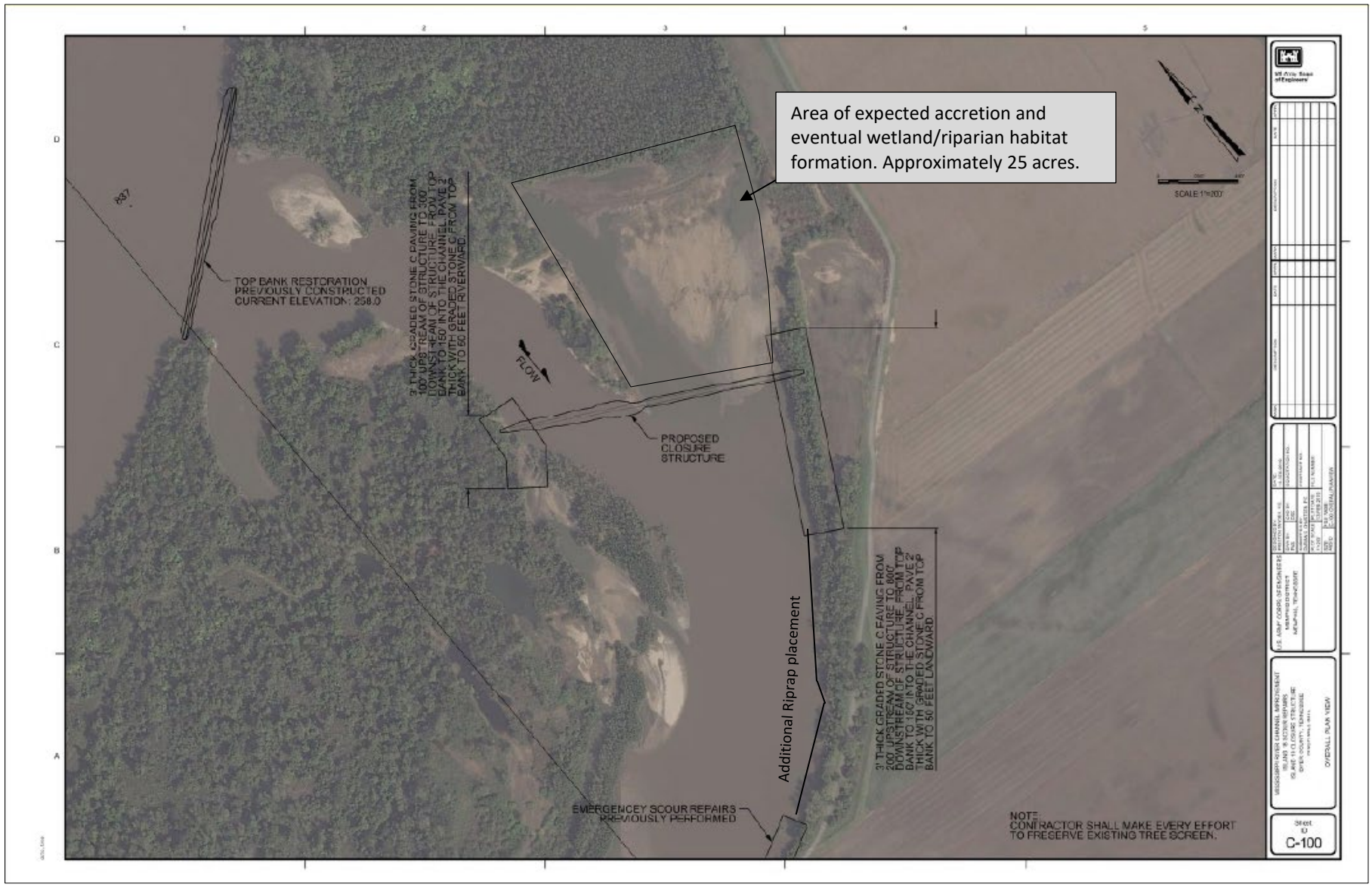

Figure 5. Location of the Phase 2-Everitt Lake Closure Structure replacement and completion of repairs, Dyer County, Tennessee.

2.0 ALTERNATIVES TO THE PROPOSED ACTION

Three alternatives were considered for the prior to completion of the preferred alternative. These alternatives were: (1) No-action; (2) reconstruction of Everett Lake Closure Structure, downstream location; (3) reconstruction of Everett Lake Closure Structure, in place, and (4) levee setback. Due to the high priority nature of this action, Phase 1 has been constructed and Phase 2 is 90% complete, as of May 9, 2019.

2.1 Alternative 1 – No Action. This alternative consisted of providing no further emergency repairs under PL84-99 or MR&T Channel Improvement authority. Under this alternative, the likelihood of DCLL failure occurring was high due to the projected flood season of 2019. The Everett Lake closure dike was breached allowing high flows to scour the DCLL. The DCLL has height sufficient to provide protection from a 4 percent chance of exceedance flood (25-year level of protection) without freeboard. If the scour had been allowed to continue, a levee breach was likely, and water would enter the area at an uncontrolled rate with no way to accurately predict where the breach may occur. A levee breech would have resulted in damage to agricultural land, property loss, displacement of residents, and could potentially cause human injuries and/or loss of life. Due to the significant negative consequences of the "No Action" alternative, it was deemed unacceptable.

2.2 Alternative 2. The selected alternative consists of constructing Phases 1 and 2 as described in Section 1.1- Description of Action, above, at a cost of approximately $7,000,000. Phase 1 included the immediate riprap bank protection of the DCLL toe and the top bank of Everett Lake to prevent likely failure of the DCLL, and the restoration of the top LDB of the main channel of the Mississippi River. The Phase 1 repairs were required to restore the riverbank to correct flow, and to reduce the water velocity and amount of water entering Everett Lake as substantial damage to the DCLL/Everett Lake Road was occurring. Approximately 65,600 tons of Class A riprap was placed at a thickness of up to 25 feet to restore approximately 1,275 feet of the LDB of the main channel. The crown width of the restored LDB totals approximately 14 feet with up- and downstream slopes of approximately 1-foot horizontal to 2.5-feet vertical (1H:2.5V). A 55-foot wide stone apron consisting of 27,200 tons of class C riprap was placed directly behind the restored top bank for the entire length of the structure at approximately 4 feet thick to prevent scour behind the repair. The Phase 1 repairs (Figures 3 and 4) also included placement of approximately 28,800 tons of class C riprap along approximately 900 feet of the DCLL (LDB of Everett Lake) to repair the immediate damage and prevent likely failure of the DCLL. The riprap was placed along the bank from the toe of the DCLL riverward for approximately 150 feet at a typical slope of 1H:1.5V. This levee protects approximately 12,000 acres of land including residences, other important community assets, and the Mainline Mississippi River Levee/Highway 181. Riprap was delivered by barge, and the work was performed by floating plant using barge mounted draglines or hydraulic excavators.

Phase 2 work includes the Everett Lake Closure Structure replacement which replaces the structure that was constructed of sand in the 1960's as well as the remainder of the required riprap bank protection. High water is still actively eroding the bank upstream of the Phase 1-

DCLL riprap protection, and will be corrected when Phase 2 is complete (Figure 5). The Everett Lake Closure Structure replacement provides immediate protection for the DCLL/Everett Road. The structure was moved downstream by approximately 900 feet to avoid constructing in the scour hole. Construction of the Everett Lake Closure Structure required approximately 32,000 tons of class A riprap and 56,000 tons of class C riprap across approximately 1,500 feet of the upstream end of Everett Lake. The closure structure was constructed with an upstream slope of 1V:1.25H and a downstream slope of 1V:1.5H with an approximate 14-foot crown. Riprap is also being placed along the LDB of Everett Lake/toe of the DCLL to restore the pre-flood section and grade to prevent further degradation and to stabilize the bank (Figure 5). The bank protection adjacent to the structure on the LDB of Everett Lake will extend from approximately 200 feet upstream of the structure to the existing bank protection on DCLL placed during Phase 1. The bank protection adjacent to the structure on the right descending bank (RDB) will extend from approximately 100 feet upstream to approximately 300 feet downstream of the closure. Detailed plans and cross-sections of all work areas are shown in Appendix A.

This alternative re-stabilizes the Island No. 18 complex, protects approximately 60 acres of riparian habitat, and is expected to cause accretion upstream of the Everett Lake Closure Structure on the landside (Figure 5) eventually resulting in approximately 25 acres of wetland/riparian habitat. The Phase 2 Everett Lake Closure Structure was constructed at an average elevation of 260 feet NAVD88, which is approximately 12-13 feet lower than the original structure. This, at least partially, meets an objective of the Lower Mississippi River Conservation Committee's 'Restoring America's Greatest River Initiative' (Appendix B) by improving aquatic connectivity in Everett Lake. Overbank flow will enter Everett Lake more frequently, and for a longer duration than pre-breach. This repair also contributes to stability within the Island No. 18 complex as high-water will flow over an armored site first, rather than causing additional scour in unidentified or unprotected areas. Also, USACE is actively engaged in recommending the planting of tree screens as a conservation measure to landowners in the area.

2.3 Alternative 3. This alternative consisted of reconstructing the closure dike along the original alignment. Approximately 250,000 tons of stone would be required to rebuild the structure with an estimated cost of approximately $6,250,000, which was not feasible from a cost standpoint. The structure would have required reconstruction to its original elevation of approximately 272 NAVD88 to tie back into the existing top banks and dimensions with stone, preventing any increased flow through Everett Lake. Hydrologic analysis showed the structure, if constructed in this manner, would not reliably protect the DCLL from future scour. In addition, the environmental benefits identified in Alternative 2 could not be realized. Therefore, Alternative 3 was eliminated from further consideration.

2.4 Alternative 4. This alternative consisted of setting the levee back by a distance of approximately 150 feet. The levee would be constructed to the same dimensions (approximate 20-ft crown width and 1V:3H side slopes). Approximately 162,800 cubic yards of borrow material would have come from the existing levee, and an additional 40,000 cubic yards of borrow would have been needed from an unidentified borrow area. It is assumed that this borrow area would be located in prior-converted cropland between the mainline Mississippi

River Levee and the DCLL. The levee crown would be covered with approximately 3,000 tons of aggregate surfacing to allow for transportation. This alternative would have requires more than one construction season and could not be started until the flood hazards are greatly reduced in summer and early fall. This delay increased the risk of a breech due to delay which would endanger life, property, farmland, and businesses. The construction of a setback would also impact a significant amount of prime farmland. The cost would likely exceed costs associated with other alternatives.

The no action alternative was determined to be unacceptable because of the risks to public safety and property, and the extent of projected flood damages (including $1,047,000 annually for crops and $178,000 for farm property other than crops). Alternative 3 was determined to be unacceptable as this alternative would be more expensive, less reliable for protection of the DCLL, and would not provide equivocal environmental benefits compared with Alternative 2. Alternative 4 would require more than one construction season, could not be started until the flood hazards are greatly reduced in summer and early fall, and would result in the loss of prime farmland. With the levee in its current condition, a prolonged high water event is likely to cause the continued erosion of the levee and increased risks of a levee breach this flood season.

Alternative 2 was selected and constructed for the following reasons: it will be completed during this spring flood season, is the most effective and least costly structural alternative, and it provides environmental benefits.

3.0 AFFECTED ENVIRONMENT

3.0.1 Environmental Setting

Everett Lake was created in the 1960's by the construction of a sand closure structure and has existed as an isolated slough (Killgore, et al. 1991) of the Mississippi River located between River Miles 837 and 832 since that time. It is approximately 3.8 miles in length and ranges in width from approximately 700 to 900 feet. The damage to the top bank of the Mississippi River and breach of the closure structure allowed uncontrolled flow to enter Everett Lake causing the banks to erode and causing serious damage to the Dyer County Little Levee, as described above. Substrate in the channel of the chute likely consisted of silt/sand/clay mixture, and now consists nearly entirely of sands with large woody debris. Near the Phase 1 top bank repairs, the overstory mostly consisted of cottonwood, black willow, and sugarberry trees.

The DCLL scour consisted of approximately 2,500 linear feet of an actively caving bank along which nearly all riparian habitat had been washed into Everett Lake. Approximately 900 feet of the scour has been repaired as described above. The remaining scour damage is currently being repaired, and depends on water levels for completion. The top bank breach was, similarly, an area that had been scoured with significant riparian vegetation being lost into the channel/Everett Lake. The substrate consists of recent alluvium (mostly sands). The remaining trees along the DCLL consisted mostly of cottonwood trees. Very little understory was present, but is likely to be dominated by poison ivy, greenbrier, and trumpet vine.

3.0.2 Description of the Watershed

The 8-digit hydrologic unit code for the area riverside of the DCLL is the Mississippi River (08010100) and consists mainly of the Mississippi River channel and adjacent floodplain. The predominant land use is open water (Mississippi River), and the floodplain is a mixture of woody wetlands (vegetated islands and riparian vegetation) and agricultural row-crop production.

The Conservation Plan for the Interior Least Tern, Pallid Sturgeon, and Fat Pocketbook Mussel in the Lower Mississippi River describes the watershed as follows. The Mississippi River is one of the world's largest alluvial river systems, having a drainage basin of 1,245,000 square miles, encompassing 41 percent of the contiguous United States and parts of two Canadian provinces. The Lower Mississippi River (LMR) extends 953.5 miles from the confluence of the Ohio River to the Head of Passes where the river subdivides into several distributaries to the Gulf of Mexico. In response to the 1927 flood, the Mississippi River and Tributaries (MR&T) project was initiated by the USACE. The project consists of levees, revetments, flood storage reservoirs, and floodways to reduce flood risk, as well as dikes, and other river training structures in the channel to facilitate low-water navigation by towboats. While the development of the Mississippi River for year-round navigation and flood protection has provided enormous economic benefit to the United States, it has also resulted in a general decrease of channel habitat complexity in the LMR (e.g., Williams & Clouse 2003). The construction of the Mississippi River levee system altered natural patterns of surface water drainage within the region and reduced the floodplain by over 80% (Baker et al. 1991). Channel engineering for navigation over the past 30 years has resulted in a gradual but significant loss of secondary channels and associated seasonally flooded in-channel habitats in the LMR. About 23 secondary channels and roughly 14,000 acres of associated higher elevation habitats have been lost in the LMR since the 1960's due to natural realignments and/or channel modifications, including closure dikes, conducted under the MR&T Project (Williams & Clouse 2003). Dikes constructed along the main channel have resulted in sediment accretion and loss of aquatic surface area during low water periods.

Despite river engineering activities over the past century, the LMR has not experienced any known extirpations or extinctions of channel species, such as have occurred in other large rivers of the United States. There are several reasons for this: 1) the LMR remains unimpounded, experiencing a natural flood cycle hydrograph; 2) although size and quantity of sediment input to the system has been significantly reduced through bank protection and construction of multiple impoundments of all major LMR tributaries, large quantities of stored sediment are available in its large channel that are continuously reworked during flood cycles; 3) implementation of the Clean Water Act throughout the drainage basin has significantly improved water quality in the LMR; and 4) the proactive nature of USACE, specifically Mississippi Valley Division, in carrying out its continuing responsibilities under the Endangered Species Act. These factors all contribute to maintain the LMR channel as a highly functional and valuable fluvial ecosystem.

3.0.3 Climate

The average annual temperature for Dyer County is 61 degrees Fahrenheit. The average daily maximum temperature for the area is 70 degrees Fahrenheit with 2 years in every 10 having temperatures greater than 100 degrees Fahrenheit occurring in July. The average daily minimum temperature is 51 degrees Fahrenheit with 2 years in every 10 having temperatures less than 2 degrees Fahrenheit occurring in January. Yearly precipitation averages 51 inches. Rainfall will average less than 35 inches and greater than 58 inches 2 out of every 10 years. The month receiving the most rainfall is December with an average of 5.2 inches, and the month receiving the least is September with an average of 2.9 inches. Most precipitation falls in the form of rain; however snow may fall in the months of November through March.

3.0.4 Geology

The proposed project area is located within the Mississippi Alluvial Valley, which formed by glacial melt waters carrying large amounts of water, silt, sand, and gravel from the country's interior down to the Gulf Coast. The alluvial valley is bordered on the east by bluffs and on the west by merging valleys of the principal tributaries and ranges in width from approximately 30 to 90 miles (Saucier 1994). Quaternary deposits within the alluvial valley consist of various abandoned channels and point bar deposits of historic Mississippi River meander belts. The fluvial-geomorphic history determines the individual soil types at specific locations. The majority of the soils within the immediate project footprint is sand alluvium.

3.1 RELEVANT RESOURCES

This section contains a description of relevant resources that could be impacted by the project. The important resources (Table 1) described in this section are those recognized by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. The following resources have been examined and found to not be affected by the alternatives under consideration: freshwater marshes, freshwater lakes, state-designated scenic streams, fisheries, municipal facilities, municipal utilities, roadways, recreation, and aesthetics.

Table 1: Relevant Resources			
Resource	**Institutionally Important**	**Technically Important**	**Publicly Important**
Agricultural Lands	Food Security Act of 1985, as amended; the Farmland Protection Policy Act of 1981	The habitat provided for the provision or potential provision of human and livestock food products.	The present economic value or potential for future economic value.
Wetlands/ Bottomland Hardwoods	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., EO 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.
Aquatic Resources/ Fisheries	Fish and Wildlife Coordination Act of 1958, as amended.	They are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of the various freshwater and marine habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened and Endangered Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, USFWS, NMFS, NRCS, USEPA, TWRA, and TDEC cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.
Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979	State and Federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Socio-Economic Resources	River and Harbor Flood Control Act of 1970 (PL 91-611).	The social and economic welfare of the nation may be positively or adversely impacted by the proposed action.	Social concerns and items affecting area economy are of significant interest to community.

Table 1: Relevant Resources			
Resource	**Institutionally Important**	**Technically Important**	**Publicly Important**
Environmental Justice	Executive Order 12898 and the Department of Defense's Strategy on Environmental Justice of 1995,	The social and economic welfare of minority and low-income populations may be positively or disproportionately impacted by the tentatively selected plans.	Public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of federal laws, regulations, policies, and actions.
Air Quality	Clean Air Act of 1963.	State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Water Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act,	USACE, USFWS, NMFS, NRCS, USEPA, and TDEC and TWRA recognize value of fisheries and good water quality. the national and state standards established to assess water quality	Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water.
Navigation	Section 10 of the Rivers and Harbors Act	Inland navigation is a key element in economic development and job creation efforts and is essential in maintaining interstate commerce, economic competitiveness and national security.	The public places importance on the facilitation of safe, reliable, and economically efficient movement of vessels for interstate and foreign commerce.

3.1.1 AGRICULTURAL LANDS, PRIME AND UNIQUE FARMLANDS

Existing Conditions: The predominant land use on the protected side of the DCLL is agriculture totaling approximately 12,000 acres. Much of this area is eligible for classification as prime farmland. The four primary crops grown are corn, cotton, soybeans, and wheat.

3.1.2 WETLANDS/BOTTOMLAND HARDWOODS

Existing Conditions: The riparian vegetation adjacent to the riverside toe of the DCLL is comprised largely of cottonwood and sugarberry trees; however, none of the area within the project footprint is identified as wetlands on the National Wetlands Inventory (https://www.fws.gov/wetlands/Data/Mapper.html). The riparian vegetation in the Phase 1 construction areas was actively being lost into the channel due to streambank erosion. While the LDB of Mississippi River was stabilized by the Phase 1 construction, there are still areas of instability along the top bank of Everett Lake and the DCLL. Within the proposed Phase 2 repair area, most of the riparian vegetation along the top bank has been impacted by the erosion described above.

3.1.3 AQUATIC RESOURCES/FISHERIES

Existing Conditions: While many species of fish utilize the lower Mississippi River and could be found within Everett Lake throughout the year, the dominant fish species likely include

catfishes, freshwater drum, shads, gars, and numerous minnow and suckers. A closure dike existed which prevented flow through Everett Lake during much of the year. The upstream mouth of the chute disconnected during stages lower than 272 feet NAVD and is now connected until approximately 260 feet NAVD due to the lowering of the closure during the restoration of the top bank of Phase 1. The fish community assemblage likely changes from those species adapted to swift-current habitats to those adapted to backwater habitats depending on seasons and associated river stages (Baker et al. 1991). Due to the frequency of high velocities, the actively caving banks, and the shifting sand substrate, few or no mussels are likely to be within close proximity of the project footprint. There is the potential for low densities of freshwater mussels and aquatic insects to be present in limited portions of Everett Lake, such as areas protected from high flows with stable substrates. It is unlikely that benthic species and/or aquatic insects exist within the active scour areas.

3.1.4 WILDLIFE

Existing Conditions: The project vicinity consists of the Island No. 18 complex and includes a variety of habitats. A forested island, (previously) isolated slough, sandbar/dike field, small amount of batture land, and agricultural land comprise the area. The area landside of the DCLL has been largely cleared and drained for the purposes of agricultural production. Island No. 18 is predominantly forested and capable of supporting wildlife. Wildlife expected to utilize the shorelines and adjacent lands include raccoon, opossum, mink, bobcat, coyotes, deer, wild turkey, muskrat, river otter, beaver, turtles, snakes, frogs, toads, hawks, vultures, Mississippi kite, bald eagle, kingfishers, and various songbirds and woodpeckers. Herons, egrets, pelicans, cormorants, killdeer, gulls, terns, bald eagle, osprey, and various shorebirds would be bird species commonly observed utilizing the Mississippi River channel and sandbar near the project area.

3.1.5 THREATENED AND ENDANGERED SPECIES

Existing Conditions: Five federally listed species may occur in the vicinity of the proposed project areas: the endangered interior least tern (*Sterna antillarum athalassos*), endangered pallid sturgeon (*Scaphirhynchus albus*), endangered fat pocketbook mussel (*Potamilus capax*), endangered Indiana bat (*Myotis sodalis*), and threatened northern long-eared bat (*Myotis septentrionalis*).

Interior Least Terns

The federally endangered interior least tern is the smallest North America tern. In the lower Mississippi River (LMR), interior least terns typically nest on large isolated sandbars from late May to August, depending on timing and duration of low river stages. A nesting colony of interior least terns is seasonally present within the dike field on the riverside (main channel side) of Island No. 18 near the project area.

Pallid sturgeon

The federally endangered pallid sturgeon is part of an ancient group of fishes that inhabit benthic habitats of large, turbid rivers of the central United States, such as the Mississippi and Missouri

Rivers and several of their major tributaries (and distributaries). Captures of pallid sturgeon in the Mississippi River have been associated with a variety of habitats including: the main channel, island tips, channel borders, sandbars, gravel bars, dikes, and secondary channels.
Recent data has shown that pallid sturgeon positively selected island tips, natural banks, and to a lesser degree, revetted banks, over other habitat features in the LMR (Herrala et al. 2014). Extensive sampling in the Mississippi River is currently underway so that a better understanding of population size, population density, habitat preference, extent of range, and impacts on the population can be quantified. The closest pallid sturgeon detections to the proposed project area are approximately 17 miles upstream near River Mile 854 AHP (J. Killgore, USACE, pers. communication 2009).

Fat pocketbook mussel
The federally endangered fat pocketbook mussel is a relatively large species of freshwater mussel reaching approximately 5 inches in length and native to the Ohio River system and Mississippi River drainage. Fat pocketbook mussels typically inhabit sand and silt depositional areas of slow moving rivers. The largest population is currently found within the St. Francis River Basin in Arkansas, a tributary downstream of the project area. Low densities of fat pocketbook mussels may be found sporadically in the LMR typically within relatively stable secondary channels and side channels (USFWS 2012). The closest fat pocketbook mussel observed near the proposed project area was a dead shell found approximately 28 miles downstream near River Mile 800 AHP (B. Posey, AGFC, pers. communication 2012).

Indiana bat (Myotis sodalis)
Indiana bats are found over most of the eastern United States. They hibernate in large numbers in relatively few caves and are thus, vulnerable to disturbances. During summer, they roost under the peeling bark of dead and dying trees and often forage on flying insects along rivers or lakes and in upland forests. Threats contributing to their decline include the disease white-nose syndrome, commercialization of caves, loss of summer habitat, pesticides and other contaminants. The entire state of Tennessee is within the species range.

Northern Long Eared Bat (Myotis septentrionalis)
The northern long-eared bat is one of the bat species impacted by the white-nose syndrome. It was listed as threatened with a finalized 4(d) rule in 2016. The northern long-eared bat hibernates in caves but during summer, it roosts and forages along forested areas and along rivers and lakes. Their summer roosting habitat is similar to that of the Indiana bat. The species range includes the entire state of Tennessee.

3.1.6 CULTURAL RESOURCES

Existing Conditions: There are eight historic properties listed on the National Register of Historic Places in Dyer County, Tennessee. None of these properties fall within the area of potential effect of the proposed project. Previously unrecorded archaeological sites may be present in alluvial landforms such as natural levees in the surrounding area. The area of potential effect for the proposed project is an actively caving riverbank. There are no known cultural resources within the project area.

3.1.7 SOCIO-ECONOMIC RESOURCES

Existing Conditions: The DCLL protects approximately 12,000 acres of agriculturally developed land, with agriculture being the major industry within the area. Along with the farmland, 30 homes, 2 businesses, a church and 41 farm buildings are located within the area protected by the levee. The total value of the structures is estimated at $2,935,000. It is also estimated that approximately 80 people reside within the area.

3.1.8 ENVIRONMENTAL JUSTICE

Existing Conditions: The Department of Defense's Strategy on Environmental Justice of 1995, directs Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population.

According to the 2014 U.S. Census Bureau, 19.7% of the residents of Dyer County are minorities. The percentage of people living below the poverty level in 2014 was 19.6% (http://www.census.gov/quickfacts/table/PST045215/00,47045).

3.1.9 AIR QUALITY

Existing Conditions: Dyer County is in attainment with national ambient air quality standards.

3.1.10 WATER QUALITY

Existing Conditions: According to the Tennessee Department of Environment and Conservation (TDEC), the Mississippi River in this area does not support recreational, fish and wildlife water quality standards; however, they do support domestic, irrigation, and livestock use water quality standards. The entire main stem of the Mississippi River in the State of Tennessee is listed as impaired on the final 2014 303(d) list because it was not fully supporting designated use classifications due to elevated levels of chlordane, dioxins, and polychlorinated biphenyls (PCBs) in fish tissue samples and for physical substrate habitat alterations (TDEC 2014). There were also some elevated levels of mercury in fish tissue samples near the City of Memphis in Shelby County. Total Maximum Daily Loads for chlordane, dioxins, and PCBs in the Mississippi River were approved by EPA on 25 July 2008 (TDEC 2008).

3.1.11 NAVIGATION

Existing Conditions: The Memphis District maintains a commercial navigation channel along 355 miles of the Mississippi River from Cairo, Illinois, near River Mile 954, to the mouth of the White River at Rosedale, Mississippi, River Mile 599. Over 250 million tons of goods pass through the Memphis District boundaries annually. The major commodities include petroleum

and petroleum products, crude materials, food and farm products, chemicals and related products, primary manufactured goods, and coal. There is no commercial navigation through Everett Lake. The purpose of the Island No. 18 dike field is to maintain the navigation channel at low water stages (Figure 1).

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 AGRICULTURAL LANDS, PRIME AND UNIQUE FARMLANDS

Future Conditions with No Action: As stated previously, the Dyer County Levee provides protection up to a 4 percent chance of exceedance flood. With no action, a levee breach was expected to occur with the current prolonged high water event. Without the project, approximately 6,168 acres of cropland, most of which is considered prime farmland, would be flooded annually. Flood damages would also occur to non-crop items (i.e., farm property other than crops). These include damages to farm supplies, farm roads, drainage ditches, fences; irrigation systems, and landforming and leveling of fields. Without implementation of the action, the damaged DCLL would allow low to moderate flooding from the Mississippi River to inundate part or all of the protected area behind the levee causing significant damage to agriculture.

Future Conditions with the Proposed and Completed Actions: With the bank stabilization and restoration of the breached structures, the DCLL will continue to provide protection up to a 4 percent chance of exceedance flood. Thus, only 493 acres of cropland are expected to be flooded annually yielding protection to 5,675 acres annually compared to the no action alternative. One approximately 3-acre agricultural field on the riverside of the DCLL was directly protected by the Phase 1 repairs. Another approximately 20-acre field is be protected by the additional riprap placed for Phase 2.

4.2 WETLANDS/BOTTOMLAND HARDWOODS

Future Conditions with No Action: Without implementation of the activity, scour would continue to encroach into the remaining riparian vegetation riverside of the DCLL, adjacent to top bank, and within the Island No. 18 complex, in general. Approximately 15 acres of natural bank habitat loss was caused by the breach and subsequent erosion, and it is estimated that approximately 60 additional acres of riparian/wetland habitat would have been impacted, or lost, if the repair was not completed. Without implementation of the proposed action, the damaged DCLL would allow low to moderate flooding from the Mississippi River to inundate part or all of the protected area behind the levee potentially causing scour, aggradation, or other damage to wetlands or BLH.

Future Conditions with the Proposed and Completed Actions: With the bank stabilization activities, vegetative clearing would be the minimum necessary to key the rock into the bank. Based on the sandy soils and extent of the scour that was occurring at these locations, more habitat would likely have been lost if no action was taken. Every effort is being made to preserve all trees not interfering with construction. This project is expected to prevent the loss of

approximately 60 acres of riparian/wetland habitat, as well as eventually establishing approximately 25 acres of wetland due to accretion behind the replacement closure structure.

4.3 AQUATIC RESOURCES/FISHERIES

Future Conditions with No Action: Without implementation of the action, the aquatic resources and fisheries would have continued to be impacted by the scour. Stable habitat suitable for aquatic species would not exist within the area impacted by the scour for the foreseeable future. It is unlikely that fish or macroinvertebrate communities would utilize the area.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, minimal adverse impacts to aquatic resources are expected. During construction, fish are expected to temporarily migrate upstream or downstream; no permanent impacts to any fish species are expected. Due to the high velocities, actively caving banks, and sandy substrate, few or no mussels are likely to inhabit the project footprint or be affected by construction. The substrate of Everett Lake is expected to shift to fine silts and sands overtime and would likely support mayflies, chironomids, amphipods, and oligochaetes. The macroinvertebrate community composition over the riprap closure structures would likely shift to high densities of hydropsychid caddisflies.

4.4 WILDLIFE

Future Conditions with No Action: Without implementation of the action, wildlife near the project area would continue to be impacted by habitat loss as noted in section 4.2. The Island No. 18 complex would continue to experience scour leading to land loss. This action prevented the loss of approximately 60 acres of riparian habitat. Without implementation of the action, the damaged DCLL would allow low to moderate flooding from the Mississippi River to inundate part or all of the protected area behind the levee potentially causing damage to some wildlife populations.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, some wildlife in the immediate area of construction may be temporarily displaced due to construction. However, since all work would be done from barges floating in the river, any disturbance would be minimal and short-lived. Overall, habitat will be preserved with bank stabilization and will be established once the area behind the Phase 2 Closure Structure starts to accrete and becomes a wetland/riparian area.

4.5 THREATENED AND ENDANGERED SPECIES

Future Conditions with No Action: Without implementation of the action, it is possible that the Island No. 18 complex would have continued to unravel, impacting the sandbar utilized by interior least terns for reproduction during the summer as well as any remaining suitable habitat for bats. Stable habitat suitable for aquatic species would not exist within the area impacted by the scour for the foreseeable future; therefore it is unlikely that mussels would utilize the area.

Future Conditions with the Proposed and Completed Actions: The sandbar adjacent to the Island No. 18 Dike Field utilized by least terns during the low water nesting season is near the proposed activities; however, no impacts to the species are expected since the sandbar is inundated with water, and least terns would not be present until later in the summer. Work is expected to be complete prior to the arrival of the least terns.

Pallid sturgeon could utilize any areas connected to the main channel of the Mississippi River during portions of the year. Pallid sturgeon spawning sites have not yet been documented on the lower Mississippi River, but spawning is suspected to occur on gravel bars. No gravel bars are present within this project area; therefore, no significant adverse impacts to pallid sturgeon are expected due to the proposed actions.

Based on the current velocities, unstable substrate, and rate of bank caving at the proposed location of rock deposition, no fat pocketbook mussels are expected to occur within the vicinity of the project. No significant adverse impacts to the fat pocketbook mussel are expected due to the proposed actions.

Every effort is being made to leave all trees not interfering with construction; however, some vegetation within 2 feet from top bank may be removed in areas of vertical banks for construction equipment to key the rock into the bank. This vegetation would be lost due to the ongoing erosion should no action be taken. The majority of the repairs were completed prior to the arrival of Indiana bats and northern long-eared bats; however, construction is dependent on river stages. No suitable habitat was observed during a site visit to the project area; therefore, no adverse impacts to the Indiana bat or northern long-eared bat are expected. Without implementation of the action, additional riparian/forested habitat would have been impacted further reducing any suitable habitat within the Island No. 18 complex.

Pursuant to Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service concurred with the USACE not likely to adversely affect determination for federally listed species and critical habitat.

4.6 CULTURAL RESOURCES

Future Conditions with No Action: Without implementation of the proposed action, no significant cultural resources would be directly impacted. However, the 12,000-acre area protected by the DCLL may contain previously unrecorded sites that could be damaged or eroded with the next flood event if the DCLL is breached.

Future Conditions with the Proposed and Completed Actions: Pursuant to 36 CFR 800.3(a)(1), the District Archaeologist has determined that this project has no potential to cause effects to historic properties eligible for the National Register of Historic Places. Thus, no further Section 106 National Historic Preservation Act consultation is required. However, if prehistoric or historic artifacts, human bones, or other archaeological materials subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are found during construction, all activities are to cease immediately in that area and the Memphis District Archaeologist, shall be contacted.

State Historic Preservation Officer and tribal NAGPRA representatives, the local sheriff, etc., will be contacted as required by state and federal law.

4.7 SOCIO-ECONOMIC RESOURCES

Future Conditions with No Action: Without implementation of the proposed action, the damaged DCLL increased the probability that a breach would occur, which would allow low to moderate flooding from the Mississippi River to inundate part or all of the protected area behind the levee causing significant economic loss. This levee protects approximately 12,000 acres of agriculturally developed land, 30 homes, 2 businesses, a church, and 41 farm buildings. The total value of the structures is estimated at $2,935,000. It is also estimated that approximately eighty people reside within the area. Flooding displaces residents and businesses; increases mental and physical stress of those displaced, and generally diminishes the quality of life and economy of the residents and local communities. If the levee is not repaired, damages are expected to agricultural lands and residential dwellings with a levee breach from the next prolonged high water event.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, quality of life for the residents and businesses protected by the DCLL will not change significantly from current conditions.

4.8 ENVIRONMENTAL JUSTICE

Future Conditions with No Action: Without implementation of the proposed action, no adverse impacts to low-income communities are expected**.** The study area was not identified as a low-income community. If the proposed project features are not constructed, there will be no direct disproportionately high or adverse human health or environmental effects on any minority and/or low-income populations as per E.O. 12898.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, no adverse impacts to low-income communities are expected**.** The study area was not identified as a low-income community. If the proposed project features are constructed, there will be no direct disproportionately high or adverse human health or environmental effects on any minority and/or low-income populations as per E.O. 12898.

4.9 AIR QUALITY

Future Conditions with No Action: Without implementation of the proposed action, air quality in the area would not change.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, the project-related construction equipment will produce small amounts of engine exhaust during construction activities. The temporary, minor impacts to air quality will be localized to the project area and will not affect area residents. Tennessee's State Implementation Plan is not expected to be impacted. The various types of conventional

construction equipment that would be used for construction with implementation of the proposed action are classified as mobile sources. No permits are required for air emissions from mobile sources within attainment areas. Best management practices would be used throughout the construction to minimize air pollution. No adverse impacts to air quality are expected.

4.10 WATER QUALITY

Future Conditions with No Action: Without implementation of the proposed action, no significant changes to water quality would likely occur due to current regulatory mechanisms and the existing management of the river. Continued bank erosion near the project area during higher river stages would add to the sediment load of the river; however, these increases would be minor compared to the natural sediment load of the Mississippi River.

Future Conditions with the Proposed and Completed Actions: With implementation of the proposed action, some sediments (mostly sands) are stirred up when the stone is deposited onto the riverbank and when the closure structures were restored. This minimal increase in turbidity would be transitory and not detectable from the surface. Material graded along the bank during bank preparation consists of alluvium deposits (mostly sands) which is the same material that has recently fallen into the river due to bank caving and similar to what is located on the channel bottom. Minor increases in sediment load are expected with grading activities; however, any increases in turbidity would be transitory and minor compared to the natural sediment load of the river, especially during high river stages. Also, the increase in turbidity with no action is likely greater than the turbidity increase with the proposed and completed actions. A Section 404(b)(1) evaluation was prepared for the Phase 1 and 2, and is included in Appendix E. Section 401 water quality certification has been received from the State of Tennessee.

4.11 NAVIGATION

Future Conditions with No Action: Without implementation of the proposed action, navigation conditions on the Mississippi River could be impacted as scour would continue to impact the Island No. 18 complex and dike field. The purpose of the Island No. 18 dike field is to maintain the navigation channel during low water stages. If scour continues to impact the area as a whole, impacts to the maintained navigation channel could be incurred.

Future Conditions with the Proposed and Completed Actions: No adverse impacts to navigation are expected.

4.12 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

The USACE is obligated under Engineer Regulation (ER) 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all hazardous, toxic, and radioactive waste (HTRW) contamination within the vicinity of proposed actions. ER 1165-2-132 identifies that HTRW policy is to avoid the use of project funds for HTRW removal and remediation activities. A record search has been conducted of the Environmental Protection Agency's (EPA) EnviroMapper Web Page (http://maps.epa.gov). The EPA search engine was checked for any

superfund sites, toxic releases, or hazardous waste sites within the vicinity of the proposed project. Site inspection of the proposed project area was conducted by USACE personnel in January 2019. An Environmental records search and the site survey conducted did not identify the presence of any hazardous or suspected hazardous wastes in the project area. As a result of these assessments, it was concluded that the probability of encountering HTRW is low. If a recognized environmental condition is identified in relation to the project site, the USACE, Memphis District, will take the necessary measures to avoid the recognized environmental condition so that the probability of encountering or disturbing HTRW will continue to be low. If any HTRW is encountered during construction activities, the proper handling and disposal of these materials will be coordinated with the TDEC.

4.13 CUMULATIVE IMPACTS

The Council on Environmental Quality's regulations (40 CFR 1500-1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.) define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)". Cumulative Effects can result from individually minor but collectively significant actions taking place over a period of time."

The DCLL is a non-Federal levee system constructed in the 1930s, except in the reach along the Obion River, which was added in the early 1970s. Five set back levees have been constructed during the life of the project. The construction of the projects were completed in 1968, 1975, 1988, 1989 and 2015. Additional repair measures to the system include emergency bank protection in 1983, 1985 and 1991, extensive rehab in 1973, an emergency raise in 1997 and a culvert replacement currently under construction. The levee is 20 miles in length and ranges from 6 to 12 feet in height. The DCLL is exposed to overbank flows along 20 miles of the Mississippi River. Based on the gage at Caruthersville, Missouri, stages of 30 feet or more begin to impact the levee. Flood stage at Caruthersville is 32 feet. The levee system provides flood risk reduction to a 0.04 (25-year frequency) chance exceedance flood or a Caruthersville Gage stage reading of 44 feet. The DCLL reduces the risk for approximately 12,000 acres, 30 homes, 1 business, a church, and 41 farm buildings. The levee runs from high ground to high ground and is considered a completely integrated system. The system includes 4 gravity drains for interior drainage and approximately 4,300 linear feet of bank protection. In 2015, USACE repaired 3 segments of the DCLL under the PL 84-99 Program, and one in 2016. These projects are discussed in the Environmental Assessment for the Dyer County Little Levee Rehabilitation (USACE, 2013) and the Environmental Assessment for the Dyer County Little Levee Scour PL 84-99 Project within Chute of Island No. 21 – Mississippi River (USACE, 2016).

On the riverside of the Island No. 18 complex, three dikes have been constructed in the Mississippi River as part of the Channel Improvement Program of the Mississippi River and Tributaries (MR&T) Project. Maintenance of these structures has occurred periodically since their construction. The dike field currently requires repair by restoring Dike #2 to its previously constructed conditions, reconnecting the dike to the LDB, and armoring the bank with riprap

from approximately 200 feet downstream of the tie-in to the Phase 1 LDB restoration structure. In the 1960's, a closure dike was constructed in the upstream portion of the slough to restrict flow through the chute which was adversely affecting the navigation channel. The primary environmental effects of the overall MR&T project and channel improvement activities include the physical loss of channel habitat quantity, a growing disconnect with the relict floodplain during low to moderate river stages, and a general loss of riverine habitat complexity (USACE 2013). Efforts to maintain, restore, and improve habitat values in the LMR have increased in recent years. In 2012 and 2013, ten thousand acres of batture, an area of active floodplain riverward of the levees, were placed under easement and reforested to increase the contiguous forested wetlands along the LMR (IEC 2014). Over 873,000 acres of wetlands have been restored as part of the Wetland Reserve Program in the LMR corridor encompassing lands both within and outside of the levee system (IEC 2014). A programmatic conservation plan was developed in 2013 detailing the actions and mechanisms by which the Channel Improvement Program of the MR&T project implements conservation measures to maintain and improve habitat values within the LMR (USACE 2013). The number and condition of secondary channels are monitored on the LMR and opportunities to maintain and restore connectivity are discussed and implemented annually (USACE 2013, USFWS 2013).

In conjunction with Phase 1, the preferred alternative would reduce the risk of failure of the DCLL and accomplish flood risk reduction objectives, which are of great importance in the Lower Mississippi Valley. The proposed activities would result in no net loss to wetlands, wildlife habitat or fisheries; therefore, no significant adverse cumulative impacts are expected due to the repair items. Overall, the project, in comparison to past, present, and reasonably foreseeable future actions, will not contribute significant impacts to the general project area.

5.0 COORDINATION

Comments are being solicited 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 the proposed activity. Any comments received will be considered by USACE to determine whether to modify the project.

6.0 MITIGATION

The Council on Environmental Quality's regulations (40 CFR 1508.20) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.) define "mitigation" as including a) avoiding the impact altogether by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and e) compensating for the impact by replacing or providing substitute resources or environments.

The constructed alternative re-stabilizes the Island No. 18 complex, protects approximately 60 acres of riparian habitat, and is expected to cause accretion upstream of the Everett Lake Closure

Structure (Figure 5) eventually resulting in the creation of approximately 25 acres of wetland/riparian habitat. The Phase 2 Everett Lake Closure Structure was constructed at an average elevation of 260 feet NAVD88, which is approximately 12-13 feet lower than the original structure. This, at least partially, meets an objective of the Lower Mississippi River Conservation Committee's 'Restoring America's Greatest River Initiative' by improving aquatic connectivity in Everett Lake. Overbank flow will enter Everett Lake more frequently, and for a longer duration than the pre-breach condition. This repair also contributes to stability within the Island No. 18 complex as high-water will flow over an armored site first, rather than causing additional scour in unidentified or unprotected areas.

No adverse impacts requiring compensatory mitigation have been identified.

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the proposed action would be achieved upon: coordination of this EA and draft Finding of No Significant Impact (FONSI) with appropriate agencies, organizations, and individuals for their review and comments; USFWS has confirmed that the proposed action would not be likely to adversely affect any endangered or threatened species; Water Quality Certification from the State of Tennessee has been received; public review of the Section 404(b)(1) Public Notice, and signature of the Section 404(b)(1) Evaluation. The FONSI will not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

Pursuant to Section 7 of the Endangered Species Act, U.S. Fish and Wildlife Service concurred with the USACE not likely to adversely affect determination for federally listed species and critical habitat on January 28, 2019.

Investigations into HTRW activities near the project area revealed that no known HTRW sites would be impacted by the proposed project.

Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, a public notice and Section 404(b)(1) Evaluation were completed. The Tennessee Department of Environment and Conservation (TDEC) was informed by email dated January 11, 2019, that the Memphis District was implementing emergency repair procedures on the levee and within the channel. This notification was necessary due to imminent risks to life and property associated with the potential failure of the levee. The emergency declaration allows the repairs to be made prior to the receipt of an official water quality certification. Water Quality Certifications for the Phase 1 and Phase 2 activities were received on February 28 and on April 15, 2019, respectively.

Pursuant to 36 CFR 800.3(a)(1), the District Archaeologist determined that this project has no potential to cause effects to historic properties eligible for the National Register of Historic Places. Thus, no further Section 106 National Historic Preservation Act consultation is required.

8.0 CONCLUSION

This office has assessed the environmental impacts of various project alternatives. No significant impacts to agricultural lands, wetlands, aquatic resources, fisheries, wildlife, threatened and endangered species, cultural resources, socio-economic resources, environmental justice, air quality, water quality, navigation, and HTRW are expected. There are no foreseen cumulative impacts that would have a significant negative impact on human health or the environment. Therefore, an environmental impact statement is not warranted. Pending the results of the public review of this document, a final finding of no significant impact (FONSI) would be prepared.

9.0 PREPARED BY

This draft EA and the associated draft FONSI were prepared by Andrea Carpenter, biologist, with cultural resources input provided by Pam Lieb, archaeologist. The address of the preparer is: U.S. Army Corps of Engineers, Memphis District, Environmental Compliance Branch, Regional Planning and Environmental Division South, Attn: Andrea Carpenter, 167 North Main St., B202, Memphis, TN 38103-1894.

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APPENDICES

Appendix A– Declaration of Emergency

Appendix B– Agency Coordination/Water Quality Certification

Appendix C– Detailed Plans and Cross-Sections for Completed/Proposed Actions– Alternative 2

Appendix D– 404(b)(1) Evaluation

Appendix A– Declaration of Emergency

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TENNESSEE 38103-1894

CEMVM-OD-RCO

11 January 2019

MEMORANDUM FOR CEMVD-RCO

SUBJECT: Declaration of Emergency, Memphis District, MVM 2019 January Scour at Dyer County Little Levee

1. In accordance with ER 500-1-1, a Declaration of Emergency has been declared to exist in the Memphis District as of 11 January 2019.

2. The Emergency Operations Center is activated to Level II (Partial). There is an urgent need to make emergency repairs to the existing Island 18 Dikes, top bank/overbank in the immediate vicinity of the dike field and adjacent to the Dyer County Little Levee (DCLL). The existing Island 18 dike closure structure was overtopped, failed, and is actively scouring and eroding the structure, top bank upstream in the main channel, and actively scouring the existing toe and riverside slopes of the DCLL. In addition, the existing Island 18 Dike 2 has been flanked and the existing top bank is actively caving up and downstream of the existing dike. The active scour along the bank is rapidly approaching the levee toe (within 45 feet of the levee centerline in the critical area, and within 15 feet of the levee toe at the worst point). The consequences of channel loss are high due to adverse impacts to navigation, increased dredging, and economic damages resulting from a river closure.

3. Expenses incurred as a result of this emergency will be those involved with the emergency operation activities. All electronics, supplies, and other equipment purchased for the event will be procured in accordance with EP 500-1-1 for the betterment of the District's response to emergencies and are not procured for personal use.

4. Paid overtime is authorized under the following criteria:

a. All personnel, regardless of grade, engaged in flood emergency operations, will be paid overtime for work hours in excess of normal tour of duty hours.

b. Earning of GS employees exempt from FLSA are subject to limitation contained in 5 USC 6547. Earnings under the provision of FLSA are not subject to the aforementioned limitation.

ELLICOTT.MICHAEL.ALIN.JR.1047643526

Digitally signed by ELLICOTT.MICHAEL.ALIN.JR.1047643526
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=ELLICOTT.MICHAEL.ALIN.JR.1047643526
Date: 2019.01.11 21:55:33 -06'00'

MICHAEL A. ELLICOTT
COL, EN
Commanding

Appendix B– Agency Coordination/Water Quality Certification

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

January 28, 2019

U.S. Army Corps of Engineers
Environmental Compliance Branch
Attn: Edward P. Lambert
167 North Main Street, RM B-202
Memphis, TN 3810-18943

Subject: §401 Water Quality Certification
Application NRS19.010
Emergency Levee and Dike Field Repairs, Island 18 Mississippi River Mile 837
Dyer County

Dear Mr. Lambert:

We have reviewed and approved your application to conduct emergency levee repairs on the Dyer County Little Levee of Island 18 on the Mississippi River along Everett Lake Road; specifically, addition of new rip rap to 2,900 linear feet of Mississippi River bank pursuant to the conditions outlined in your Aquatic Resource Alteration Permit application NRS19.010. Based on the information you provided, the Commissioner has determined that, pursuant to rule 0400-04-070.04, and emergency situation exists and this permit for remedial action is hereby issued without full prior public notice and participation. This emergency permit shall be advertised by public notice, however, no later than twenty (20) days after issuance.

Authorized waterbody impacts include placement of approximately 28,800 tons of Class C rip rap for a distance of 900 linear feet along the toe and side of the levee, and approximately 65,600 tons of Class A rip rap and 27,200 tons of Class C rip rap along approximately 2,000 feet of the upper bank of the Mississippi River. The Division and applicant will place this action on Public Notice within 20 days of the date of this letter, which will include a determination of the need for mitigation, if any, to offset any appreciable loss of water resource values.

The planned activity was reviewed and the Division has reasonable assurance that the activity as proposed in accordance with all permit conditions herein will not violate applicable water quality standards and has issued the enclosed permit. This permit may also serve as a §401 water quality certification pursuant to 40 C.F.R. §121.2.

The state of Tennessee may modify, suspend or revoke this authorization should the state determine that the activity results in more than an insignificant violation of applicable water quality standards or violation of the Tennessee Water Quality Control Act. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

It is the responsibility of the permittee to read and understand all permit conditions before the project begins. Thank you for your attention to these details. If you need any additional information or clarification, please contact me at 615-532-0358 or by e-mail at scott.hall@tn.gov.

Sincerely,

Scott Hall,
Natural Resources Unit

Enclosure: §401 Water Quality Certification

ec/cc: TDEC EFO Jackson (Amy Fritz)
U.S. Army Corps of Engineers Memphis District (Tim Flinn)
Mike Thron and Andrea Carpenter (Corps of Engineers, Memphis)
US Fish and Wildlife Service (Robbie Sykes)

§401 WATER QUALITY CERTIFICATION

Aquatic Resource Alteration Permit NRS 19.010 Emergency Permit

Pursuant to §401 of *The Federal Clean Water Act* (33 U.S.C. 1341), any applicant for a federal license or permit to conduct any activity which may result in any discharge into the waters of the U.S. shall provide the federal licensing or permitting agency a certification from the state in which the discharge originates or will originate. Accordingly, the Division of Water Resources requires reasonable assurance that the activity will not violate provisions of *The Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) or provisions of §§301, 302, 303, 306 or 307 of *The Clean Water Act.*

Subject to conformance with accepted plans, specifications, and other information submitted in support of the application, pursuant to 33 U.S.C. 1341 and T.C.A. §69-3-101 et seq., the State of Tennessee hereby certifies and authorizes the activity described below.

PERMITTEE: U.S. Army Corps of Engineers
Environmental Compliance Branch
167 North Main Street, RM B-202
Memphis, TN 3810-18943

AUTHORIZED WORK: Repairs on Dyer County Little Levee and Dike Field of Island 18 at Mississippi River Mile 837, adding new rip rap to 2,900 linear feet of Mississippi River bank as follows: approximately 28,800 tons of Class C rip rap for a distance of 900 linear feet along Everett Lake Road at the toe and side of the levee, approximately 65,600 tons of Class A rip rap (approximately 5,000 pound) at dike closure structure and 27,200 tons of Class C rip rap along approximately 2,000 feet of the upper bank of the Mississippi River. The Commissioner has determined that, pursuant to rule 0400-04-070.04, and emergency situation exists and this permit for remedial action is hereby issued without full prior public notice and participation. This emergency permit shall be advertised by public notice, however, no later than twenty (20) days after issuance.

LOCATION: Dyer County Little Levee and Dike Field of Island 18
Latitude 36.08551, Longitude -89.63115

EFFECTIVE DATE: January 23, 2019
EXPIRATION DATE: January 22, 2024

FOR

Jennifer Dodd
Director, Division of Water Resources

RDA 2970 MAJOR

Table of Contents

Part I Page 3

Part II Page 4

Part III Page 4

PART I

Authorized Work:

Due to erosion of the toe and side-walls of the Dyer County Little Levee along Everett Lake Road, loss of road base (stone toe) has begun and will continue, causing further loss of the structural integrity of the road base, if remedial action is not taken. The levee protects approximately 12,000 acres of land, including residences and other important community assets, the Mainline Mississippi River Levee/Highway 181, and prevents further degradation along the banks of the Mississippi River. Immediate levee repairs are necessary to protect these resources.

Special Conditions:

a. Any proposed in-stream equipment shall be free of noticeable leaks of fluids and oils; e.g., hydraulic, transmission, crankcase, and engine coolant, fluids, and oils.

b. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the state, including groundwater, should a spill occur.

c. The use of monofilament-type erosion control netting or blanket is prohibited.

d. Best Management Practices (BMPs) shall be stringently implemented throughout the construction period to prevent sediments, oils, or other project-related pollutants from being discharged into waters of the state.

e. If it is determined that appreciable permanent loss of resource value has occurred as a result of the permitted impacts, mitigation must be conducted in-system (HUC 8) to reduce degradation to the level of *de minimis*. A mitigation proposal and time schedule for mitigation completion shall be provided to the Division for review within ninety (90) days of permit issuance if mitigation is determined to be necessary. As-built specifications for representative photographs of the completed project must be submitted to TDEC following project completion. Send the report to TDEC Division of Water Resources, Attn. Scott Hall, 312 Rosa L. Parks Avenue – 11th Floor, Nashville, TN 37243 or at scott.hall@tn.gov.

General Conditions:

a. It is the responsibility of the applicant to convey all terms and conditions of this permit to all contractors. A copy of this permit, approved plans and any other documentation pertinent to the activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

b. Work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. The applicant is responsible for obtaining these permits.

c. The work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of application NRS 19.010 and the limitations, requirements

and conditions set forth herein.

d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 0400-40-03-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated by Rule 0400-40-4. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.

e. Impacts to waters of the state other than those specifically addressed in the plans and this permit are prohibited. All streams, springs and wetlands shall be fully protected prior, during and after construction until the area is stabilized. Any questions, problems or concerns that arise regarding any stream, spring or wetland either before or during construction, shall be addressed to the Division of Water Resources Jackson Field Office (731-512-1300) or the permit coordinator (Scott Hall) in the Division's Natural Resources Section (615-532-0358).

f. Adverse impact to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.

g. This permit does not authorize adverse impacts to cultural, historical or archeological features or sites.

h. Temporary or permanent soil stabilization shall be accomplished within 15 days after final grading or other earth work. Permanent stabilization with perennial vegetation or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

i. All permanent plantings are to be of native or non-exotic-invasive species. Note that native grasses take longer to germinate and mature than invasive exotics such as tall fescue. A temporary cover crop such as annual winter wheat or rye shall be sown to quickly establish and maintain cover until native grasses can establish themselves. A list of native species may be found at:
Landscaping with Natives; http://www.tnepp c.org/pages/landscaping#native_plants or
Tennessee Erosion & Sediment Control Handbook; http://www.tneps c.org/handbook.asp.

PART II

Monitoring Requirements and Procedures

1. This permit has been issued in response to an emergency, and any mitigation required to off-set appreciable loss of water resources will be determined and reviewed after permit issuance. If needed, mitigation compliance will require the generation or purchase of sufficient stream mitigation credits in accordance with the 2004 Stream Mitigation Guidelines for the State of Tennessee. Mitigation and a time schedule for completion shall be proposed pursuant to Tenn. Comp. R. & Regs. 0400-40-07.04 (7(a) and provided to the Division for review **within 90 days of permit issuance**. All mitigation shall be performed properly and in a timely manner. All mitigation shall be adequately maintained.

2. Any required mitigation shall be in-system in order to offset degradation to the level of *de minimis*.

3. After Division approval of mitigation plans, this permit may be modified to include approved mitigation

plans and outlines, approved monitoring requirements, and schedule for mitigation activities.

4. Compensatory mitigation activities shall be carried out utilizing best professional efforts to comply with the approved plans and conditions of this permit. Mitigation activities shall be determined complete when the Division determines that the permitted impact on aquatic resources has been adequately addressed through successful achievement of the compensatory mitigation activities, and a no further action letter has been provided to the permitee.

5. The goal of this permit and its mitigation success criteria is to ensure no net loss of resource value due to the impact of the permitted activity. In accordance with adaptive management, the Division incorporates safety factors into compensatory mitigation requirements. Therefore, once successful mitigation has been achieved, the Division reserves the right to revise performance standards and mitigation criteria to account for an changes documented in the compensatory mitigation project. While final mitigation activities may not result in a net loss of resource value, they may be revised to reflect approved changes from the original mitigation proposal and the success criteria in the permit. Upon acceptance of project closure, the Division shall record any such revisions of the mitigation plan or success criteria through formal modification of the permit condition with public notice.

Submission of Monitoring Results

If required, additional monitoring shall be conducted in accordance with the accepted mitigation plan.

Records Retention

All records and information resulting from the monitoring activities (if applicable) required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation, shall be retained for a minimum of five (5) years, or longer, if requested by the Division of Water Resources.

Falsifying Results and/or Reports

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

PART III

Duty to Reapply

If any portion of the permitted activities, including the authorized impacts to water resources, compensatory mitigation requirements, or post-project monitoring is not completed before the expiration date of this permit the applicant must apply for permit re-issuance. The permittee shall submit such information and forms as are required to the director of the Division of Water Resources at least ninety (90) days prior to its expiration date. Such applications must be properly signed and certified.

Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

Other Information

If the permittee becomes aware that he/she failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, then he/she shall promptly submit such facts or information.

Transfer/Change of Ownership

a. This permit may be transferred to another party, provided there are no activity or project modifications, no pending enforcement actions, or any other changes which might affect the permit conditions contained in the permit, by the permittee if:
b. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;
c. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and contractual liability between them; and the Director does not notify the current permittee and the new permittee, within 30 days, of her intent to modify, revoke, reissue, or terminate the permit, or require that a new application be filed rather than agreeing to the transfer of the permit.
d. The permittee must provide the following information to the Division in their formal notice of intent to transfer ownership
    a. permit number of the subject permit;
    b. the effective date of the proposed transfer;
    c. the name and address of the transferor;
    d. the name and address of the transferee;
    e. the names of the responsible parties for both the transferor and transferee;
    f. a statement that the transferee assumes responsibility for the subject permit;
    g. a statement that the transferor relinquishes responsibility for the subject permit;
    h. the signatures of the responsible parties for both the transferor and transferee, and;
    i. a statement regarding any proposed modifications to the permitted activities or project, its operations, or any other changes which might affect the permit conditions contained in the permit.

Change of Mailing Address

The permittee shall promptly provide to the Director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

Noncompliance

Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

Reporting of Noncompliance

24-Hour Reporting

a. In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response personnel).
b. A written submission must be provided within five (5) days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the Director on a case-by-case basis. The permittee shall provide the Director with the following information:

a. A description of the discharge and cause of noncompliance;
b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
c. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

c. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph a. above, the permittee shall report the noncompliance by contacting the permit coordinator, and provide all information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

Adverse Impact

The permittee shall take all reasonable steps to mm1m1ze any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including but not limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Liabilities

Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of pollutants to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its discharge activities in a manner such that public or private nuisances or health hazards will not be created.

Liability under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

This permit does not preclude requirements of other federal, state or local laws. This permit also serves as a State of Tennessee Aquatic Resource Alteration Permit (ARAP) pursuant to the Tennessee Water Quality Control Act of 1977 (T.C.A. §69-3-101 et seq.).

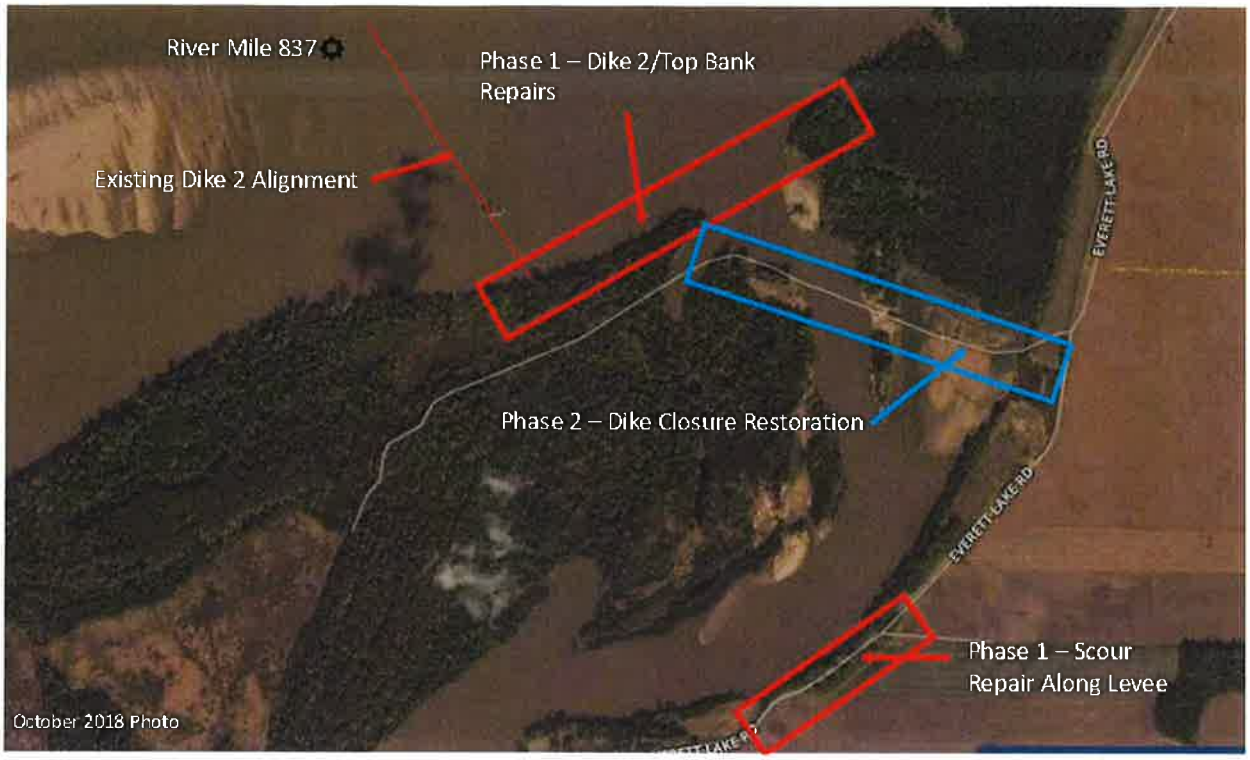
The State of Tennessee may modify, suspend or revoke this permit or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water quality standards or violation of the act. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

An appeal of this action may be made as provided in T.C.A. §69-3-105(i) and Rule 0400-40-03-.12 by submitting a petition for appeal. This petition must be filed within THIRTY (30) DAYS after public notice of the issuance of the permit. The petition must specify what provisions are being appealed and the basis for the appeal. It should be addressed to the technical secretary of the Tennessee Board of Water Quality, Oil and Gas at the following address: Jennifer Dodd, Director, Division of Water Resources, 11th

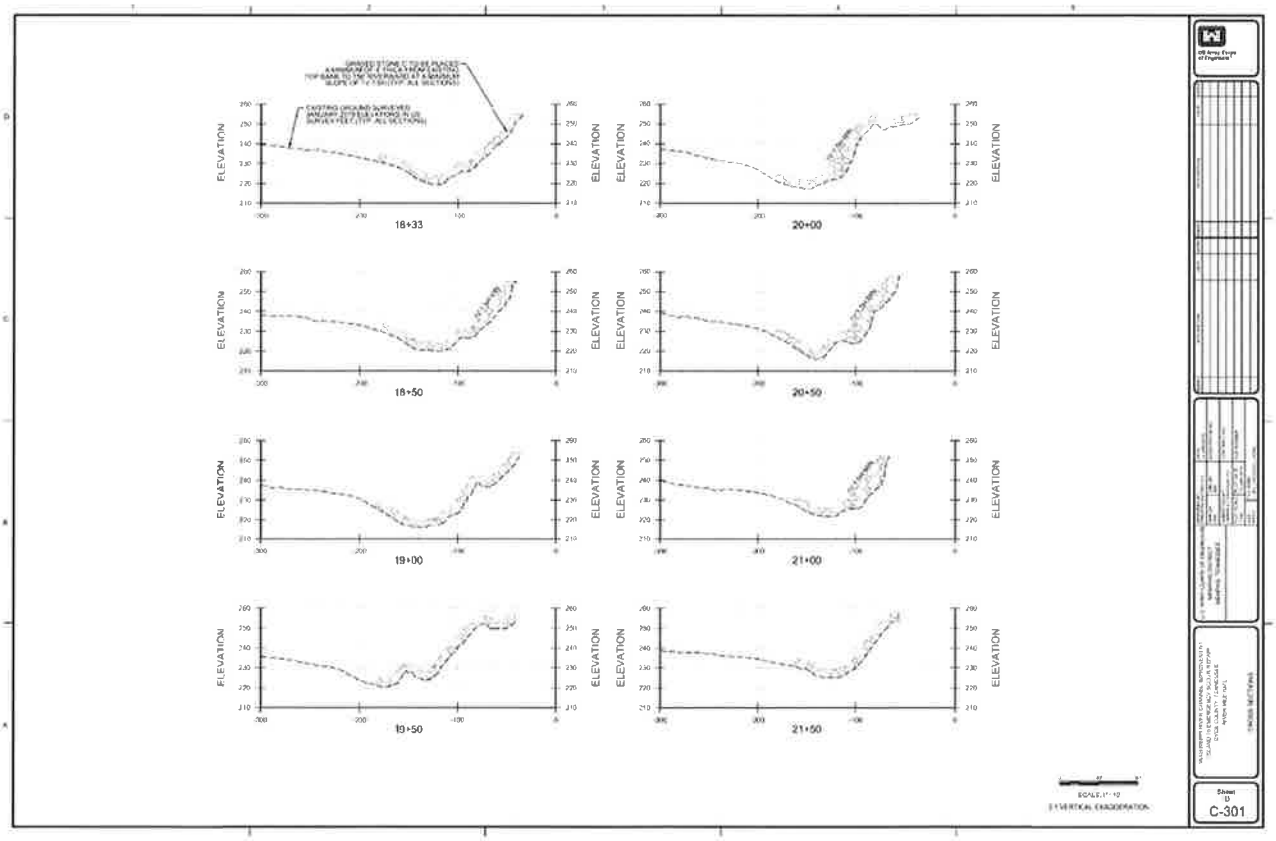
Floor William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, Nashville, Tennessee 37243. Any hearing would be in accordance with T.C.A. §§69-3-110 and 4-5-301 et seq.

Appendix I – Topographic Map and Representative Permit Sketches

Proposed work indicated as Phase 1
RDA 2970 MAJOR


River Mile 837
Phase 1 – Dike 2/Top Bank Repairs
Existing Dike 2 Alignment
Phase 2 – Dike Closure Restoration
Phase 1 – Scour Repair Along Levee
EVERETT LAKE RD
EVERETT LAKE RD
October 2018 Photo


FLOW
PROJECT BASELINE
OVER COUNT LITTLE LEVEE CENTERLINE
OVER COUNT LITTLE LEVEE
C-100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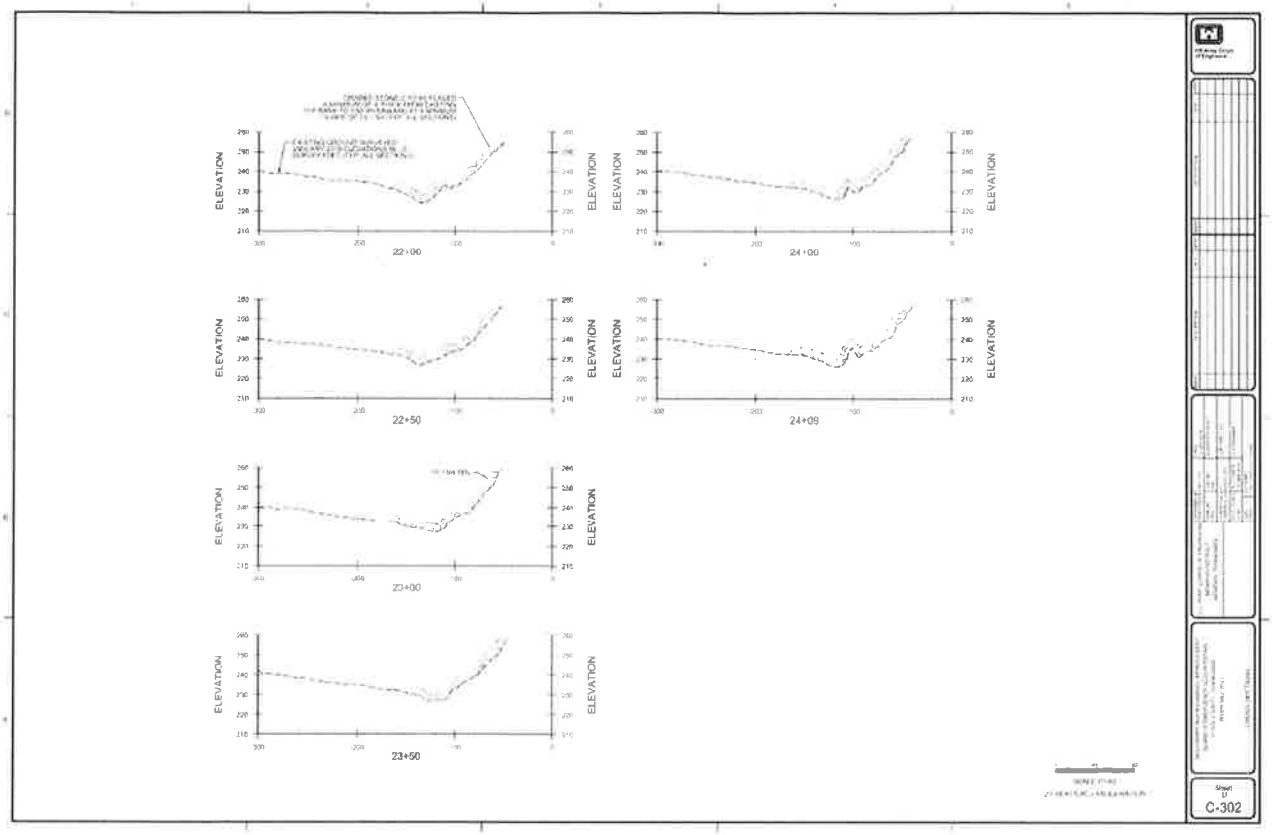
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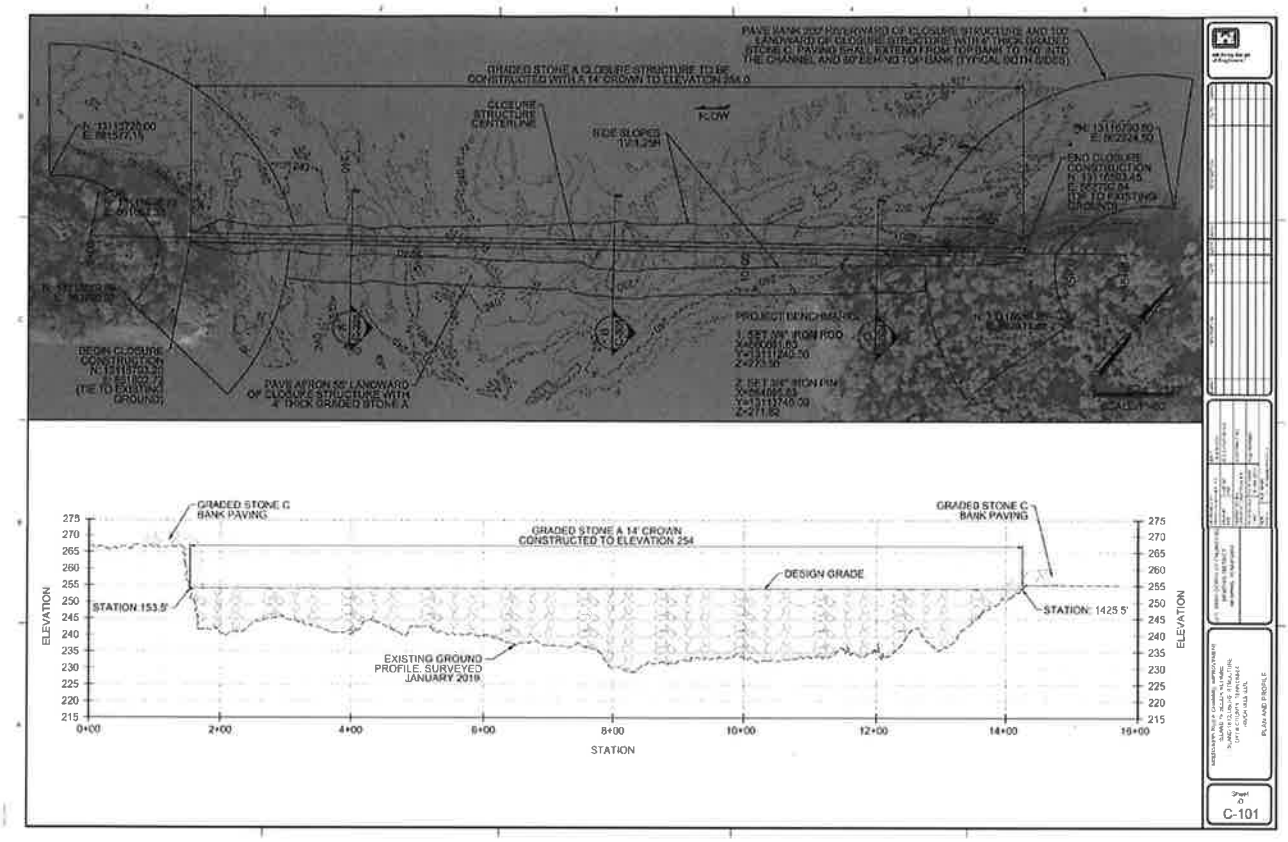
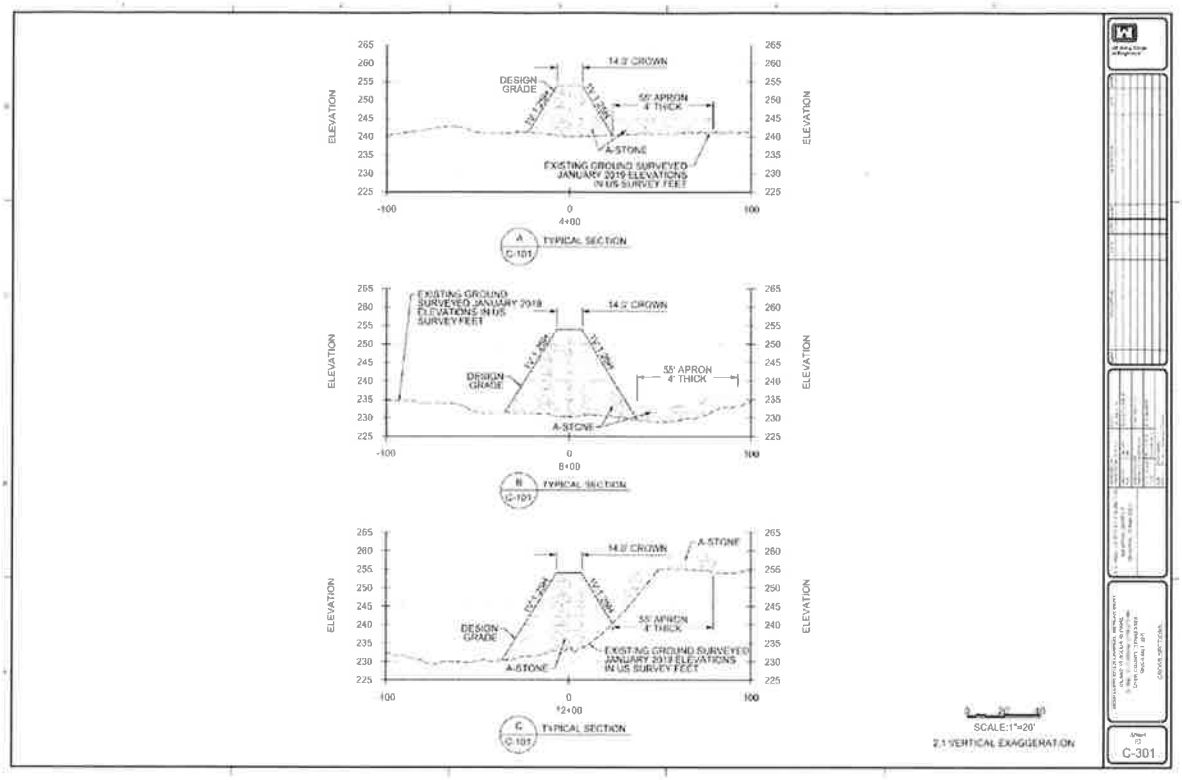
24+09
23+00
23+50
C-302

Closure Structure




14.0' CROWN
DESIGN GRADE
55' APRON 4' THICK
A-STONE
EXISTING GROUND SURVEYED JANUARY 2019 ELEVATIONS IN US SURVEY FEET
ELEVATION
4+00
A C-101 TYPICAL SECTION
EXISTING GROUND SURVEYED JANUARY 2019 ELEVATIONS IN US SURVEY FEET
8+00
B C-101 TYPICAL SECTION
12+00
C C-101 TYPICAL SECTION
SCALE:1"=20'
2:1 VERTICAL EXAGGERATION
C-301

§401 WATER QUALITY CERTIFICATION

Aquatic Resource Alteration Permit NRS 19.010MOD Emergency Permit

Pursuant to §401 of *The Federal Clean Water Act* (33 U.S.C. 1341), any applicant for a federal license or permit to conduct any activity which may result in any discharge into the waters of the U.S. shall provide the federal licensing or permitting agency a certification from the state in which the discharge originates or will originate. Accordingly, the Division of Water Resources requires reasonable assurance that the activity will not violate provisions of *The Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) or provisions of §§301, 302, 303, 306 or 307 of *The Clean Water Act.*

Subject to conformance with accepted plans, specifications, and other information submitted in support of the application, pursuant to 33 U.S.C. 1341 and T.C.A. §69-3-101 et seq., the State of Tennessee hereby certifies and authorizes the activity described below.

PERMITTEE: U.S. Army Corps of Engineers
Environmental Compliance Branch
167 North Main Street, RM B-202
Memphis, TN 3810-18943

AUTHORIZED WORK: Repairs on Dyer County Little Levee and Dike Field of Island 18 at Mississippi River Mile 837, adding new rip rap to 3,900 linear feet of Mississippi River bank and dike closure structure of the upper bank of the Mississippi River as follows: top bank restoration 400 feet, levee stabilization 2,100 feet (Phase 1 and Phase 2 total), Everett Lake closure structure 1,400 feet. The Commissioner has determined that, pursuant to rule 0400-04-070.04, and emergency situation exists and this permit for remedial action is hereby issued without full prior public notice and participation. This emergency permit shall be advertised by public notice, however, no later than twenty (20) days after issuance.

LOCATION: Dyer County Little Levee and Dike Field of Island 18
Latitude 36.08551, Longitude -89.63115

EFFECTIVE DATE: January 23, 2019
MODIFICATION DATE: April 10, 2019
EXPIRATION DATE: January 22, 2024

For:
Jennifer Dodd
Director, Division of Water Resources

RDA 2970 MAJOR

Table of Contents

Part I Page 3

Part II Page 4

Part III Page 4

PART I

Authorized Work:

Due to erosion of the toe and side-walls of the Dyer County Little Levee along Everett Lake Road, loss of road base (stone toe) has begun and will continue, causing further loss of the structural integrity of the road base, if remedial action is not taken. The levee protects approximately 12,000 acres of land, including residences and other important community assets, the Mainline Mississippi River Levee/Highway 181, and prevents further degradation along the banks of the Mississippi River. Immediate levee repairs are necessary to protect these resources.

Special Conditions:

a. Top bank rip rap will be installed to an average of 10 feet lower elevation than historically installed, rip rap on the closure structure will be installed to average elevation of 260 feet (12 to 13 feet lower than historically installed).

b. A notch will be placed in the Island 18 dike sufficient to allow flow around the least tern nesting colony adjacent to the site, re-establish approximately 25 acres of wetland, and ensure better flow and oxygenation of Everett Lake. Rip rap associated with this project is expected to protect approximately 60 acres of riparian habitat.

c. Any proposed in-stream equipment shall be free of noticeable leaks of fluids and oils; e.g., hydraulic, transmission, crankcase, and engine coolant, fluids, and oils.

d. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the state, including groundwater, should a spill occur.

e. The use of monofilament-type erosion control netting or blanket is prohibited.

f. Best Management Practices (BMPs) shall be stringently implemented throughout the construction period to prevent sediments, oils, or other project-related pollutants from being discharged into waters of the state.

g. If it is determined that appreciable permanent loss of resource value has occurred as a result of the permitted impacts, mitigation must be conducted in-system (HUC 8) to reduce degradation to the level of *de minimis*. A mitigation proposal and time schedule for mitigation completion shall be provided to the Division for review within ninety (90) days of permit issuance if mitigation is determined to be necessary. As-built specifications for representative photographs of the completed project must be submitted to TDEC following project completion. Send the report to TDEC Division of Water Resources, Attn. Scott Hall, 312 Rosa L. Parks Avenue – 11th Floor, Nashville, TN 37243 or at scott.hall@tn.gov.

General Conditions:

a. It is the responsibility of the applicant to convey all terms and conditions of this permit to all contractors. A copy of this permit, approved plans and any other documentation pertinent to the activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

b. Work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. The applicant is responsible for obtaining these permits.

c. The work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of application NRS 19.010 and the limitations, requirements and conditions set forth herein.

d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 0400-40-03-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated by Rule 0400-40-4. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.

e. Impacts to waters of the state other than those specifically addressed in the plans and this permit are prohibited. All streams, springs and wetlands shall be fully protected prior, during and after construction until the area is stabilized. Any questions, problems or concerns that arise regarding any stream, spring or wetland either before or during construction, shall be addressed to the Division of Water Resources Jackson Field Office (731-512-1300) or the permit coordinator (Scott Hall) in the Division's Natural Resources Section (615-532-0358).

f. Adverse impact to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.

g. This permit does not authorize adverse impacts to cultural, historical or archeological features or sites.

h. Temporary or permanent soil stabilization shall be accomplished within 15 days after final grading or other earth work. Permanent stabilization with perennial vegetation or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

i. All permanent plantings are to be of native or non-exotic-invasive species. Note that native grasses take longer to germinate and mature than invasive exotics such as tall fescue. A temporary cover crop such as annual winter wheat or rye shall be sown to quickly establish and maintain cover until native grasses can establish themselves. A list of native species may be found at:

Landscaping with Natives; http://www.tnepp c.org/pages/landscaping#native_plants or
Tennessee Erosion & Sediment Control Handbook; http://www.tneps c.org/handbook.asp.

PART II

Monitoring Requirements and Procedures

1. This permit has been issued in response to an emergency, and any mitigation required to off-set appreciable loss of water resources will be determined and reviewed after permit issuance. If needed, mitigation compliance will require the generation or purchase of sufficient stream mitigation credits in accordance with the 2004 Stream Mitigation Guidelines for the State of Tennessee. Mitigation and a time schedule for completion shall be proposed pursuant to Tenn. Comp. R. & Regs. 0400-40-07.04 (7(a) and provided to the Division for review **within 90 days of permit issuance**. All mitigation shall be performed properly and in a timely manner. All mitigation shall be adequately maintained.

2. After Division approval of submitted plans, this permit may be modified to include approved mitigation plans and outlines, approved monitoring requirements, and schedule for mitigation activities.

3. Compensatory mitigation activities, if applicable, shall be carried out utilizing best professional efforts to comply with the approved plans and conditions of this permit. Mitigation activities shall be determined complete when the Division determines that the permitted impact on aquatic resources has been adequately addressed through successful achievement of the compensatory mitigation activities, and a no further action letter has been provided to the permitee.

4. The goal of this permit is to ensure no net loss of resource value due to the impact of the permitted activity. In accordance with adaptive management, the Division incorporates safety factors into compensatory mitigation requirements. Therefore, once successful mitigation has been achieved (if required), the Division reserves the right to revise performance standards and mitigation criteria to account for any changes documented in the compensatory mitigation project. While final mitigation activities may not result in a net loss of resource value, they may be revised to reflect approved changes from the original mitigation proposal and the success criteria in the permit. Upon acceptance of project closure, the Division shall record any such revisions of the mitigation plan or success criteria through formal modification of the permit condition with public notice.

5. Monitoring requirements for this permit are:

    a. Notification of TDEC permit writer (scott.hall@tn.gov) upon initiation of construction activities.
    b. Within 30 days of project completion, submittal of post-project as-built construction diagrams, and photographs of areas expected to recover as wetlands, riparian areas protected by the installed rip rap, and least tern habitat that will be further protected as a result of these activities.
    c. Three years after project completion, submission of a brief letter-style report of the results in terms of protection of least-tern habitat, establishment of wetlands, and whether protection of riparian areas was successful. Include photographs of the same areas photographed in response to monitoring requirement 5 a.

Submission of Monitoring Results

If required, additional monitoring shall be conducted in accordance with the accepted mitigation plan.

Records Retention

All records and information resulting from the monitoring activities (if applicable) required by this permit, including all records of analyses performed and calibration and maintenance of

instrumentation, shall be retained for a minimum of five (5) years, or longer, if requested by the Division of Water Resources.

Falsifying Results and/or Reports

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

PART III

Duty to Reapply

If any portion of the permitted activities, including the authorized impacts to water resources, compensatory mitigation requirements, or post-project monitoring is not completed before the expiration date of this permit the applicant must apply for permit re-issuance. The permittee shall submit such information and forms as are required to the director of the Division of Water Resources at least ninety (90) days prior to its expiration date. Such applications must be properly signed and certified.

Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

Other Information

If the permittee becomes aware that he/she failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, then he/she shall promptly submit such facts or information.

Transfer/Change of Ownership

a. This permit may be transferred to another party, provided there are no activity or project modifications, no pending enforcement actions, or any other changes which might affect the permit conditions contained in the permit, by the permittee if:
b. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;
c. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and contractual liability between them; and the Director does not notify the current permittee and the new permittee, within 30 days, of her intent to modify, revoke, reissue, or terminate the permit, or require that a new application be filed rather than agreeing to the transfer of the permit.
d. The permittee must provide the following information to the Division in their formal notice of intent to transfer ownership
    a. permit number of the subject permit;
    b. the effective date of the proposed transfer;
    c. the name and address of the transferor;
    d. the name and address of the transferee;
    e. the names of the responsible parties for both the transferor and transferee;
    f. a statement that the transferee assumes responsibility for the subject permit;
    g. a statement that the transferor relinquishes responsibility for the subject permit;
    h. the signatures of the responsible parties for both the transferor and transferee, and;

i. a statement regarding any proposed modifications to the permitted activities or project, its operations, or any other changes which might affect the permit conditions contained in the permit.

Change of Mailing Address

The permittee shall promptly provide to the Director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

Noncompliance

Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

Reporting of Noncompliance

24-Hour Reporting

a. In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response personnel).

b. A written submission must be provided within five (5) days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the Director on a case-by-case basis. The permittee shall provide the Director with the following information:
    a. A description of the discharge and cause of noncompliance;
    b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
    c. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

c. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph a. above, the permittee shall report the noncompliance by contacting the permit coordinator, and provide all information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

Adverse Impact

The permittee shall take all reasonable steps to mm1m1ze any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including but not limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Liabilities

Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties

for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of pollutants to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its discharge activities in a manner such that public or private nuisances or health hazards will not be created.

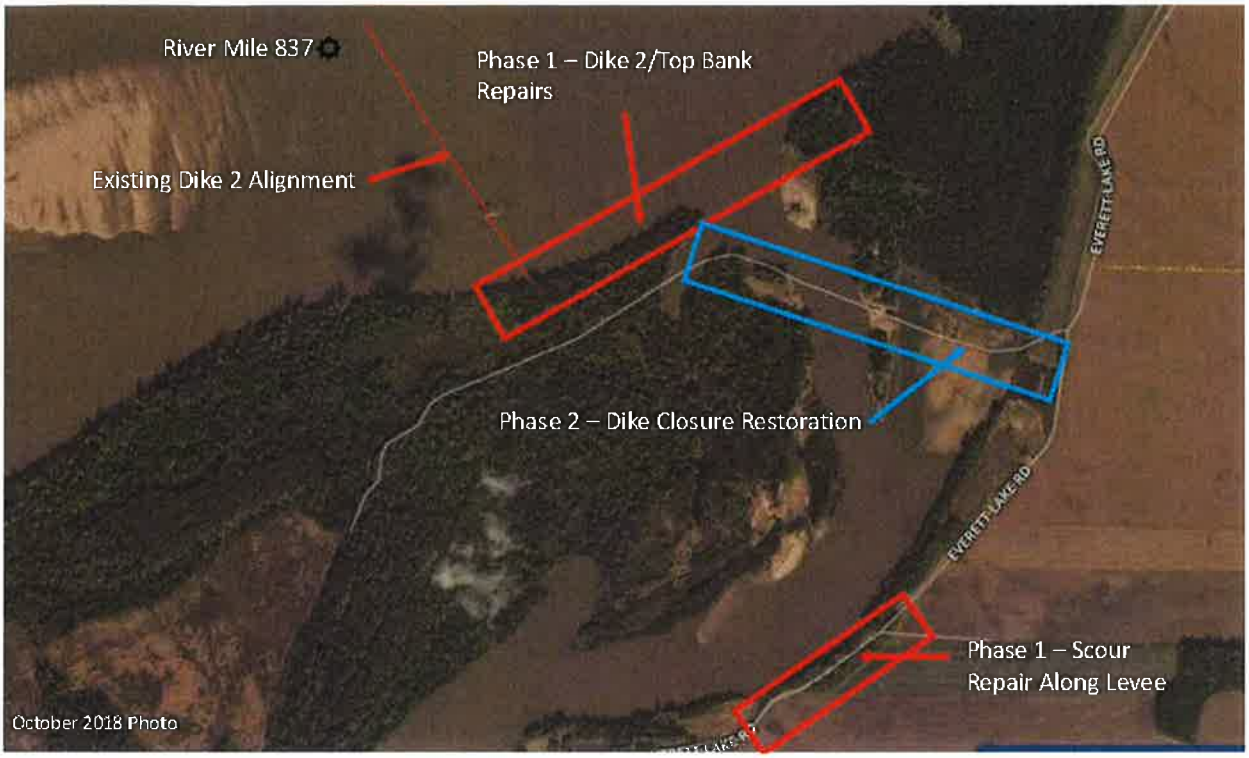
Liability under State Law
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

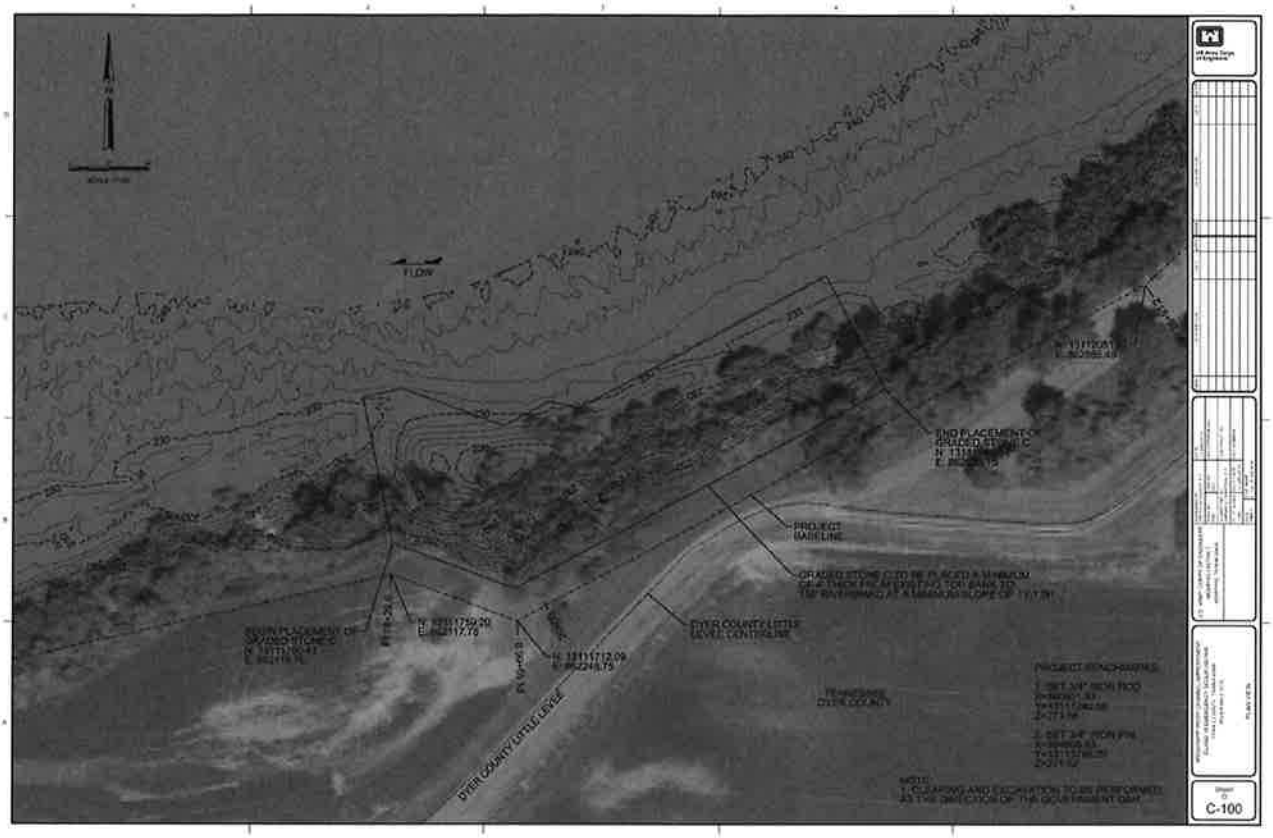
This permit does not preclude requirements of other federal, state or local laws. This permit also serves as a State of Tennessee Aquatic Resource Alteration Permit (ARAP) pursuant to the Tennessee Water Quality Control Act of 1977 (T.C.A. §69-3-101 et seq.).

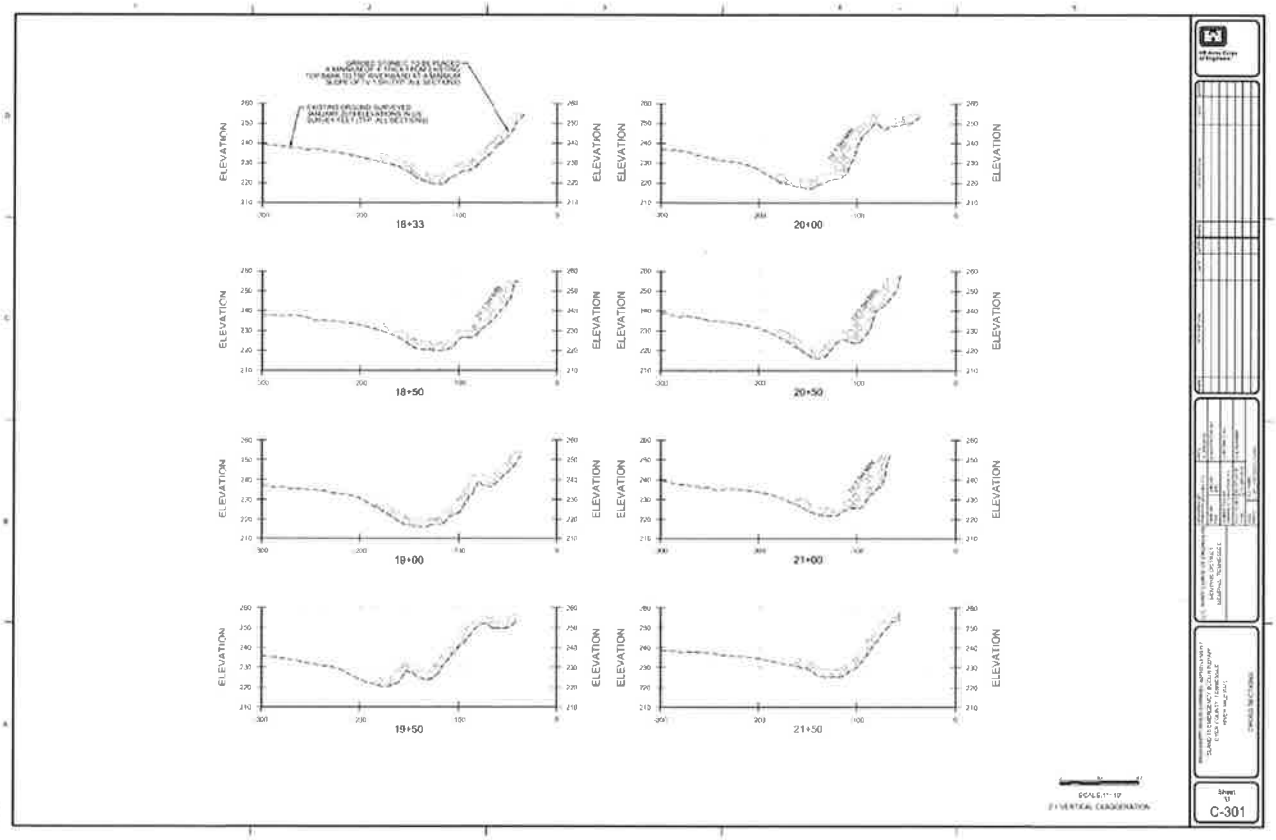
The State of Tennessee may modify, suspend or revoke this permit or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water quality standards or violation of the act. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

An appeal of this action may be made as provided in T.C.A. §69-3-105(i) and Rule 0400-40-03-.12 by submitting a petition for appeal. This petition must be filed within THIRTY (30) DAYS after public notice of the issuance of the permit. The petition must specify what provisions are being appealed and the basis for the appeal. It should be addressed to the technical secretary of the Tennessee Board of Water Quality, Oil and Gas at the following address: Jennifer Dodd, Director, Division of Water Resources, 11th Floor William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, Nashville, Tennessee 37243. Any hearing would be in accordance with T.C.A. §§69-3-110 and 4-5-301 et seq.

Appendix I – Topographic Map and Representative Permit Sketches


River Mile 837
Phase 1 – Dike 2/Top Bank Repairs
Existing Dike 2 Alignment
EVERETT LAKE RD
Phase 2 – Dike Closure Restoration
EVERETT LAKE RD
Phase 1 – Scour Repair Along Levee
October 2018 Photo


FLOW
PROJECT BASELINE
DYER COUNTY LITTLE LEVEE
C-100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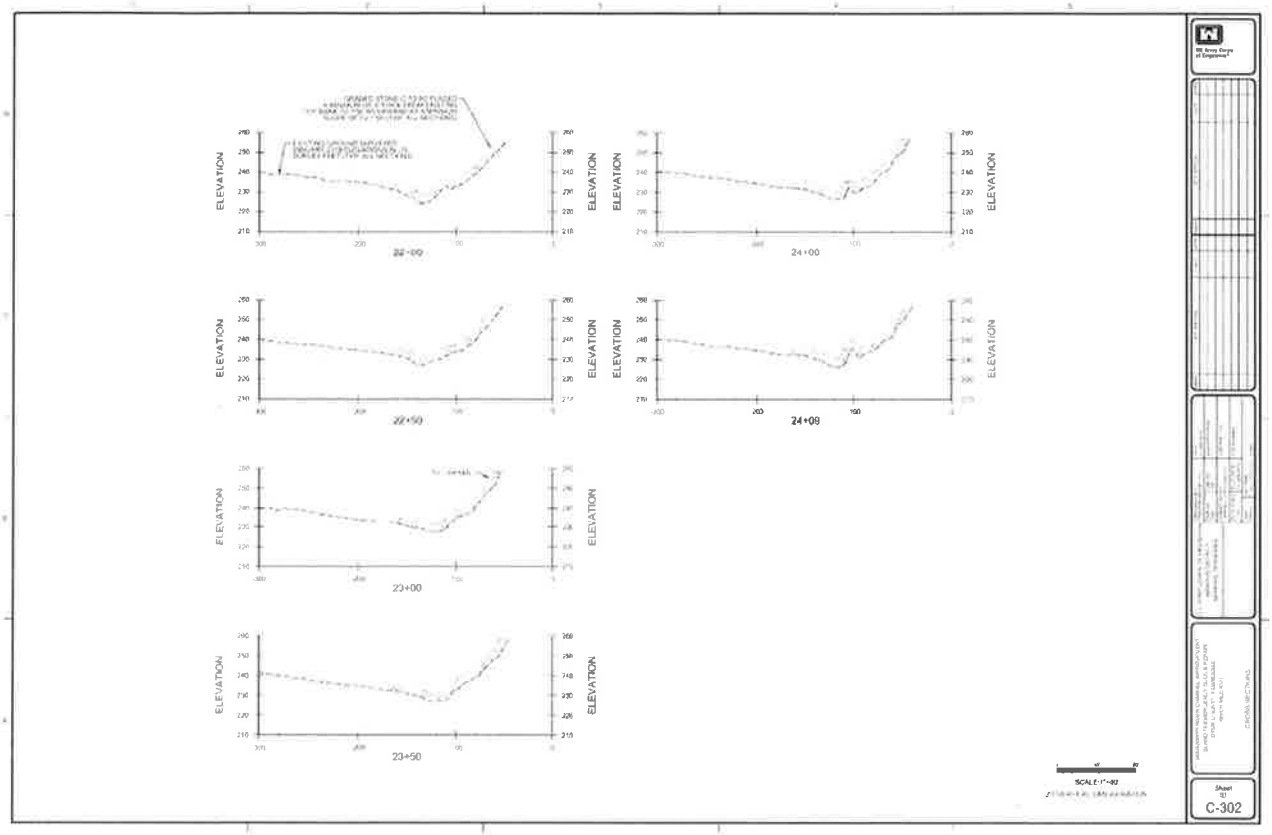
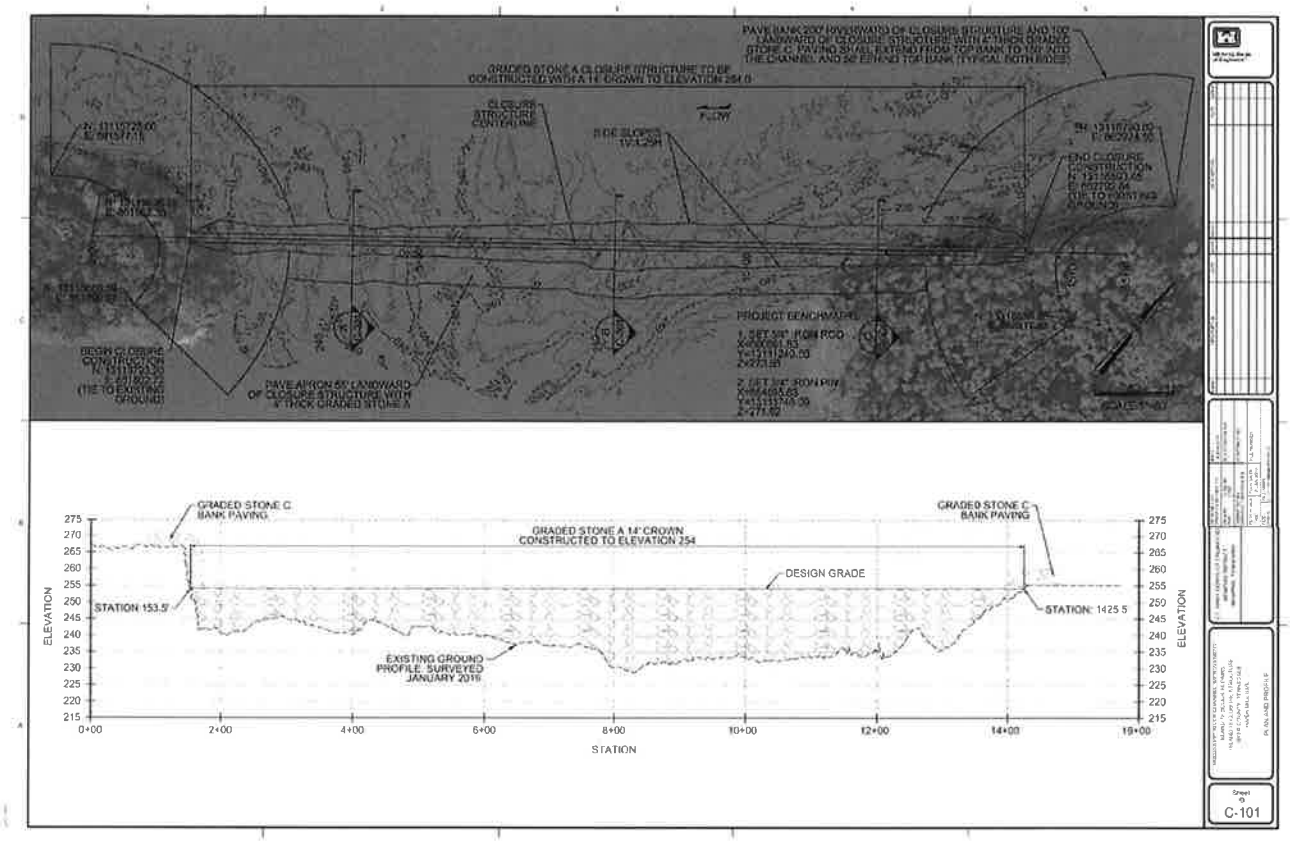
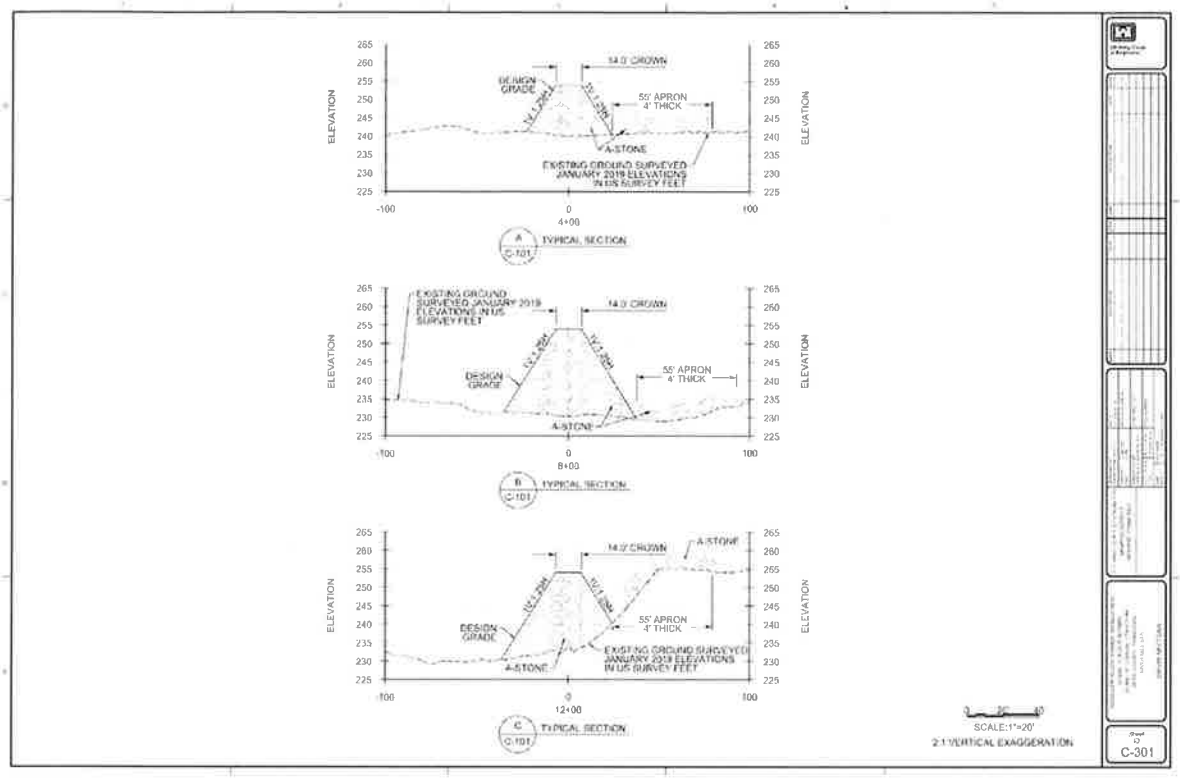
18+33
20+00
18+50
20+50
19+00
21+00
19+50
21+50
C-301


ELEVATION
22+00
24+00
22+50
24+09
23+00
23+50
SCALE: 1"=40'
C-302

Closure Structure




14.0' CROWN
DESIGN GRADE
55' APRON 4' THICK
A-STONE
EXISTING GROUND SURVEYED JANUARY 2019 ELEVATIONS IN US SURVEY FEET
ELEVATION
4+00
TYPICAL SECTION
EXISTING GROUND SURVEYED JANUARY 2019 ELEVATIONS IN US SURVEY FEET
8+00
12+00
SCALE:1"=20'
2:1 VERTICAL EXAGGERATION
C-301

Hey Andrea,
Thank you for the below information and attachments. This was helpful to give me a better understanding of the project.

Based on the information received, it appears as though the proposed closure structure and the top bank restoration (as shown in the Everett's Lake Closure Structure.pdf) are both repairs of previously existing structures, but with lower elevations than the original construction. As you know, the LMRCC worked at the Island 18 dike field in 2012, notching Dikes 1, 2, and 3. We appreciate MVM's efforts to restore the notch in Dike 2.

Another project in this area that is part of the LMRCC's Restoring America's Greatest River plan, TN06-Robert E. Everett Lake, is to augment aquatic connectivity within the floodplain. Everett Lake has the potential for providing good habitat for paddlefish (and other species), therefore any enhanced connectivity between the river and lake would be beneficial. Certainly a lower elevation of the closure structure is preferable over a higher elevation, as it will provide greater connectivity for fish and other aquatic organisms. After these emergency repairs are completed and the area has time to recover and reset, the LMRCC would be interested in discussing the possibility of any additional connectivity options, such as notching the closure structure or other opportunities. We always appreciate discussions with MVM on these such issues.

If you have any questions or would like additional information, do not hesitate to let me know. Thank you for checking in with LMRCC. We appreciate the continued partnership with MVM.

Thanks,
Angie

Andrea:

The Tennessee Wildlife Resources Agency has reviewed the information that you provided regarding the proposed emergency repairs to Island 18/Dyer County Little Levee and we do not anticipate adverse impacts to state listed species under our authority due to the proposed project as proposed. Thank you for the opportunity to review and comment on this project. If I may be of further assistance, please contact me.

Robert Todd
Fish & Wildlife Environmentalist
Tennessee Wildlife Resources Agency
Ellington Agricultural Center
P.O. Box 40747
Nashville, TN 37204
Office: 615-781-6572
Cell: 931-881-8240
Fax: 615-781-6667
Email: rob.todd@tn.gov

-----Original Message-----
From: Carpenter Crowther, Andrea L CIV USARMY CEMVN (US)
[mailto:Andrea.L.Carpenter@usace.army.mil]
Sent: Thursday, January 24, 2019 4:28 PM
To: Rob Todd
Subject: Emergency repairs to Island 18/Dyer County Little Levee

Hi Rob,

The Dyer County Little Levee (DCLL) is a non-Federal levee located in Dyer County, Tennessee, between the mainline Mississippi River Levee, the Mississippi River and the Obion River. The DCLL begins at the Mississippi River Mainline Levee (MRL) east of Boothspoint and extends to the Obion River, between river miles 820 and 840. Island 18 lies adjacent to a dike field that aids in maintaining navigational safety. The top bank of the Mississippi River at approximately River Mile 837 has been breached by flooding and high water velocity. This breach has allowed high flows into the Lake Everett and caused scour along the riverside toe of the DCLL. Everett Lake is a secondary channel in the Mississippi River located between River Miles 837 and 832.

Due to the high priority nature of the work described herein, the U.S. Army Corps of Engineers, Memphis District (MVM), has placed approximately 28,800 tons of Class C rip rap along approximately 900 feet of the Dyer County Little Levee adjacent to Island 18/Everett Lake, of the Mississippi River at River Mile 837. The stone was placed from the toe of the levee riverward for approximately 150 feet at a typical slope of 1-foot vertical to 1.5 feet horizontal (1H:1.5V). Additionally, near the same location, approximately 65,600 tons of Class A rip rap at a thickness of up to 25 feet has been placed along

approximately 1,275 feet to restore Mississippi River top bank. The crown of the closure structure would total approximately 14 feet with up- and downstream slopes of approximately 1V:2.5V. A 55-foot wide stone apron consisting of 27,200 tons of Class C stone at approximately 4 feet thick has been placed directly behind top bank for the entire length of the restoration. The repairs were required to reduce the amount of water and water velocity to prevent further damage to the Dyer County Little Levee/Everett Lake Road which protects approximately 12,000 acres of land including residences, other important community assets, and the Mainline Mississippi River Levee/Highway 181, as well as preventing further degradation along the banks of the Mississippi River. Stone would be delivered by barge, and the work would be performed by floating plant using barge mounted draglines or hydraulic excavators.

The ranges of the Indiana and northern long-eared bat, pallid sturgeon, fat pocket-book mussel, and interior least tern are known to fall within the project area; however, this action is not likely to adversely affect any of these species. Less than 0.5 acre of tree clearing was required, and less than 0.5 acre of additional tree clearing may be required to complete repairs. None of the listed bat species are present within the project area at this time, but I will be doing a habitat survey tomorrow. Pallid sturgeon may be present within Everett Lake; however, no reproduction activities are occurring and they have the ability to temporarily relocate. Interior least terns are not present during this time of year. Timing of repairs to the dike field are not known, but will not interfere with the breeding season per the Lower Mississippi River Conservation Plan. Existing notching of dikes will be restored to allow flow to continue as intended and maintain isolation of the sandbar. Due to active scour and heavy erosion, the fat pocket-book mussel is unlikely to have been present within the project footprint. Due to circumstances beyond their control, the U.S. Fish and Wildlife Service is not currently able to respond requests for comments or concurrence at this time.

Additional repairs are anticipated including placement of approximately 2,000 feet of stone along the DCLL, as well as the secondary closure structure to protect Everett Lake, and repair of the Island 18 Dike Field in the main channel of the Mississippi River.

We are currently working to draft NEPA documentation for the completed work and the anticipated work. I have attached the rough drawing of the phases of construction as well the emergency declaration from our Colonel. Phase 1 is currently underway, with the scour along the DCLL already being completed. The Phase 1 Top bank repair is underway. I will attach the engineering plans and photos in subsequent emails (too large for everything to fit).

Let me know if you have any additional questions or concerns.

Thanks,
Andrea

Andrea L. Carpenter
Biologist
USACE, Regional Planning and Environment Division South
167 N. Main St., Rm. B-202
Memphis, TN 38103
Phone: 901-544-0817
Fax: 901-544-3955
Email: Andrea.L.Carpenter@usace.army.mil

Appendix C– Detailed Plans and Cross-Sections for Completed/Proposed Actions - Alternative 2

US Army Corps
of Engineers®
Memphis District

MISSISSIPPI RIVER CHANNEL IMPROVEMENT

ISLAND 18 SCOUR REPAIRS

DYER COUNTY, TENNESSEE

RIVER MILE 837L

JANUARY 2019

US Army Corps
of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.		DATE: 16-JAN-2019	
DWN BY: PAS	CKD BY: DSC	SOLICITATION NO.:	
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.		CONTRACT NO.:	
PLOT SCALE: NTS	PLOT DATE: 16-JAN-2019	FILE NUMBER:	
SIZE: ANSI D	FILE NAME: G-001 COVERSHEET		

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
DYER COUNTY, TENNESSEE
RIVER MILE 837L

COVER SHEET

Sheet ID
G-001

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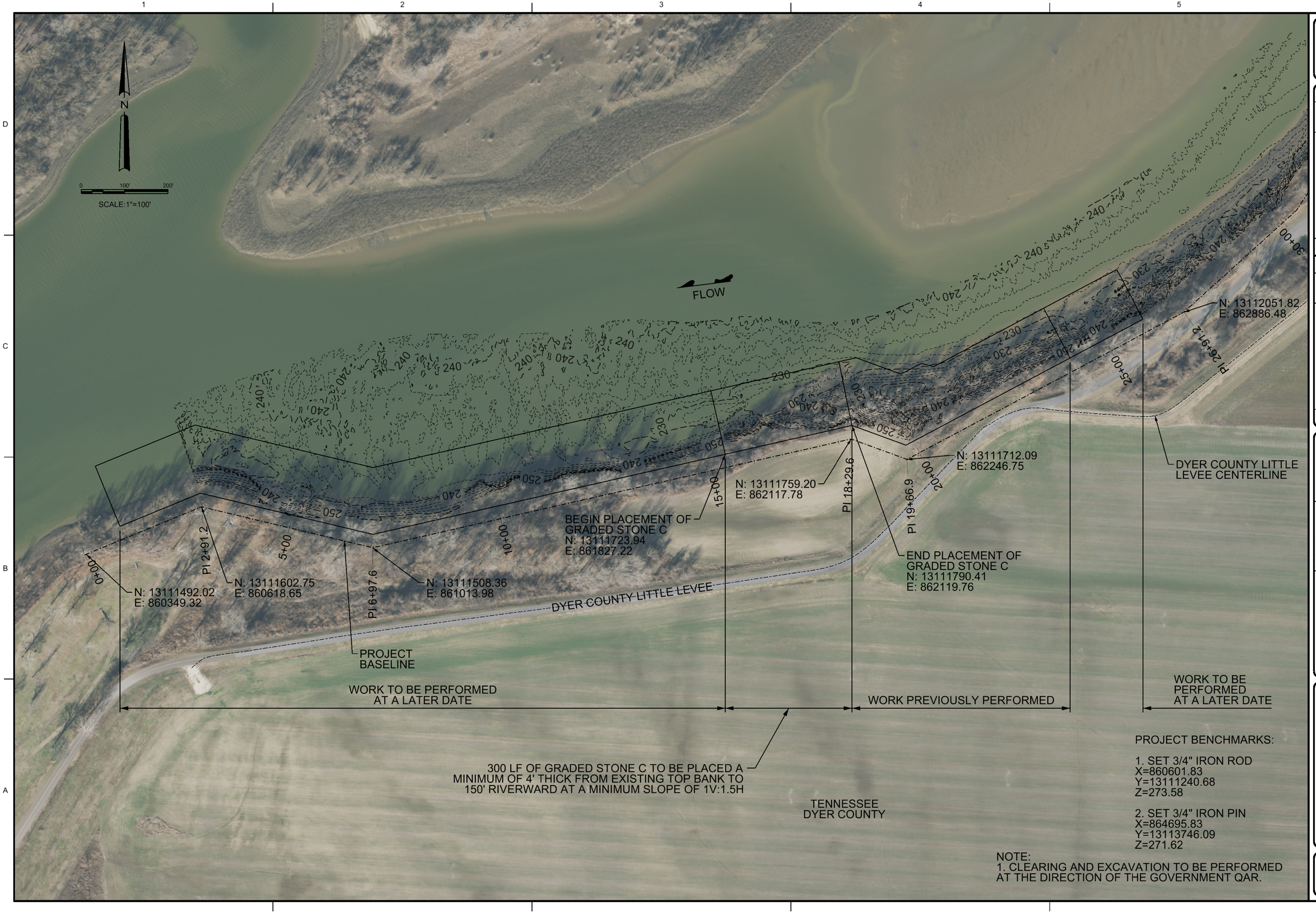

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MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
PLOT SCALE: 1"=100'
PLOT DATE: 16-JAN-2019
SIZE: ANSI D
FILE NAME: C-100 PLANVIEW
DATE: 16-JAN-2019
SOLICITATION NO.
CONTRACT NO.:
FILE NUMBER:

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
DYER COUNTY, TENNESSEE
RIVER MILE 837L

PLAN VIEW

Sheet ID
C-100

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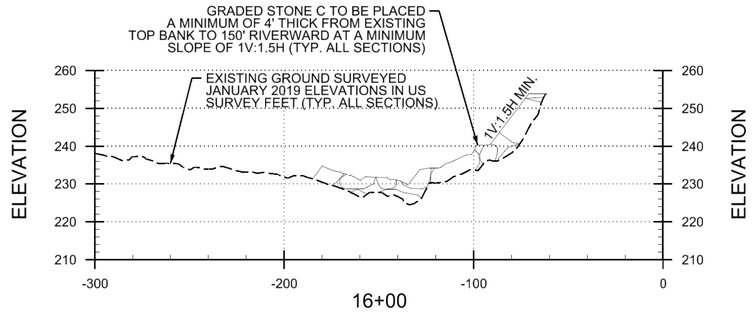

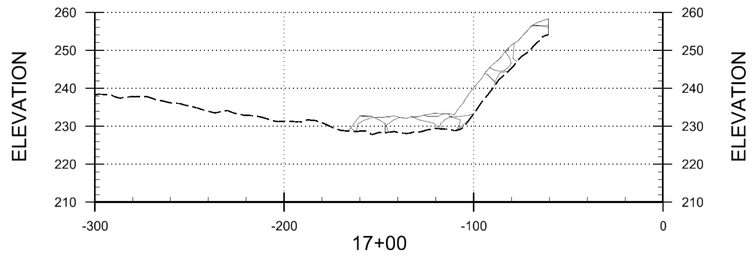

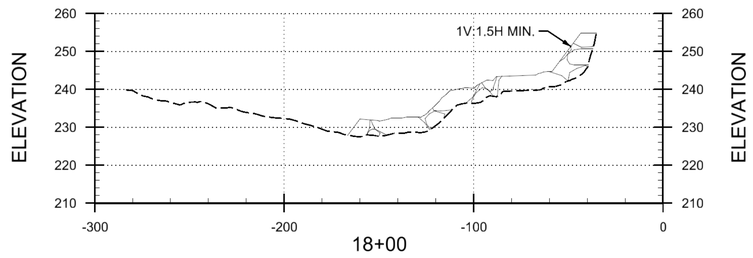

0 40' 80'

SCALE:1"=40'

2:1 VERTICAL EXAGGERATION

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
PLOT SCALE: As noted
SIZE: ANSI D
DATE: 16-JAN-2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
PLOT DATE: 16-JAN-2019
FILE NAME: C-301 CROSSSECTIONS

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
DYER COUNTY, TENNESSEE
RIVER MILE 837L

CROSS SECTIONS

Sheet ID
C-301

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Memphis District

MISSISSIPPI RIVER CHANNEL IMPROVEMENT

ISLAND 18 SCOUR REPAIRS AND CLOSURE STRUCTURE

DYER COUNTY, TENNESSEE

RIVER MILE 837L

JANUARY 2019

US Army Corps
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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.		DATE: 18-JAN-2019	
DWN BY: PAS	CKD BY: DSC	SOLICITATION NO.:	
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.		CONTRACT NO.:	
PLOT SCALE: NTS	PLOT DATE: 18-JAN-2019	FILE NUMBER:	
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MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

COVER SHEET

Sheet ID
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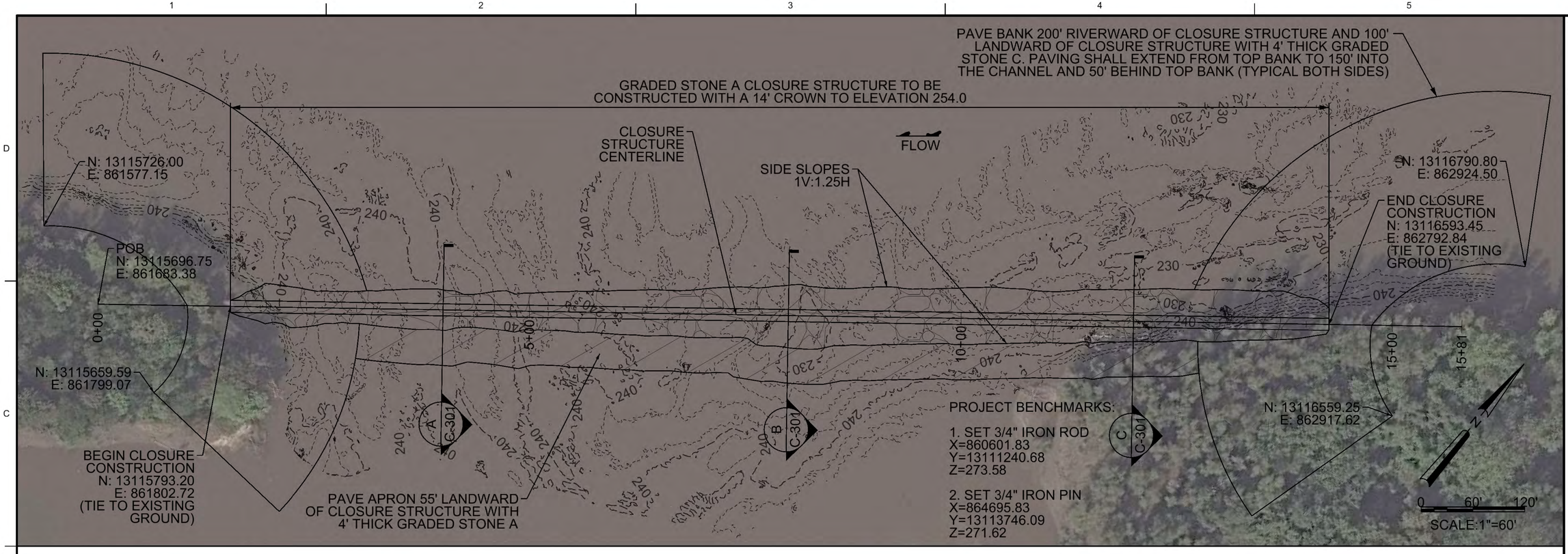

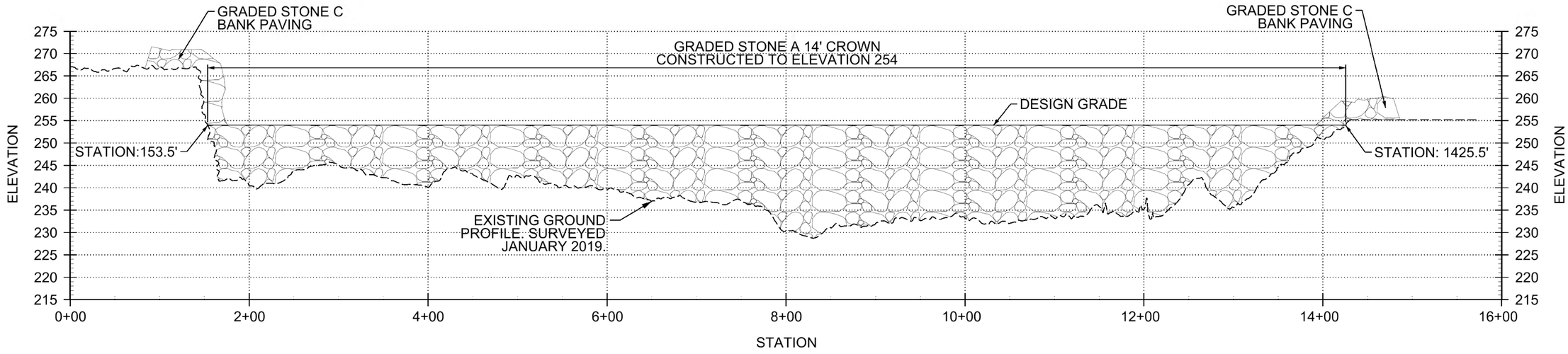

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
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PLOT DATE: 14-JAN-2019
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DATE: 18-JAN-2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

PLAN AND PROFILE

Sheet ID
C-101

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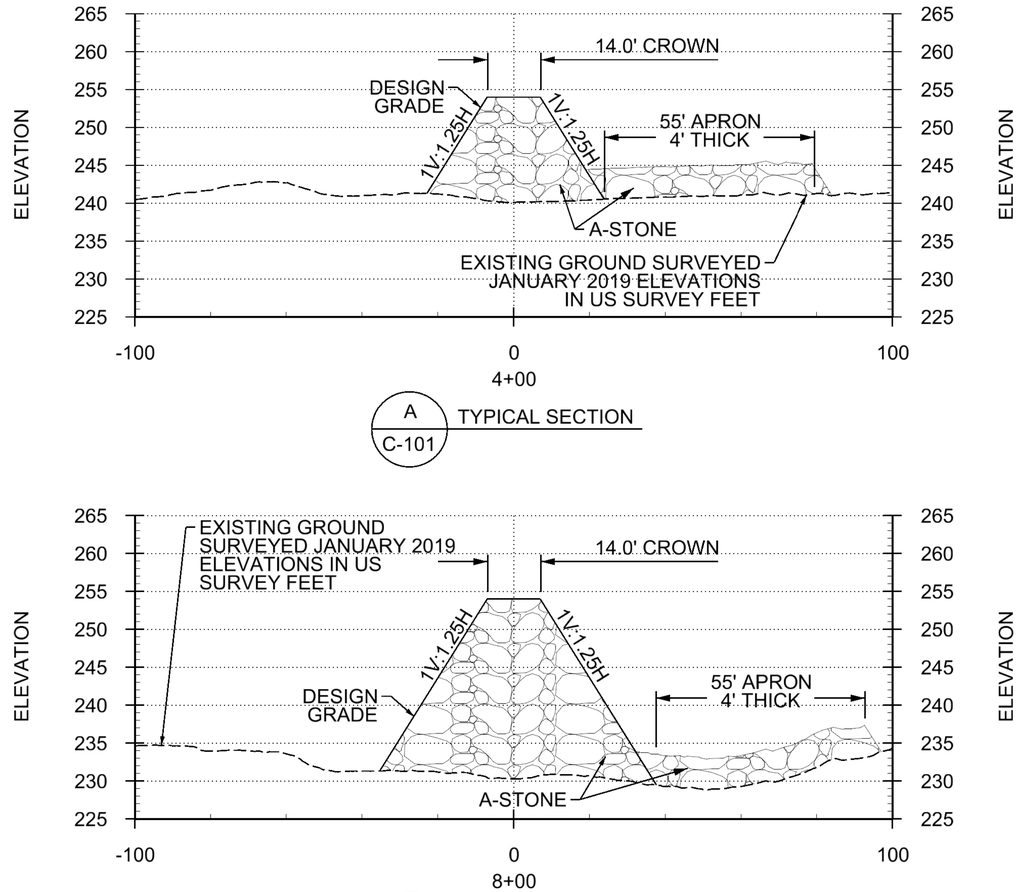
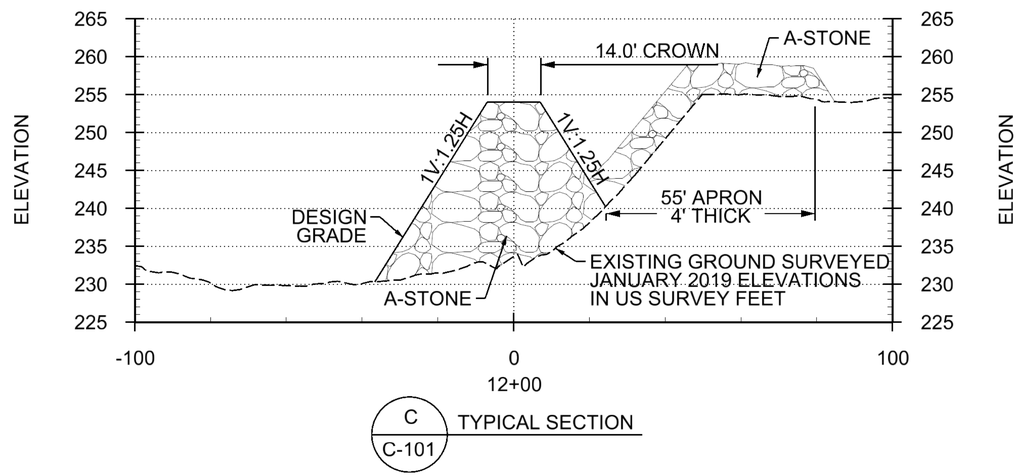


A / C-101 TYPICAL SECTION

B / C-101 TYPICAL SECTION



C / C-101 TYPICAL SECTION

0 20' 40'

SCALE:1"=20'

2:1 VERTICAL EXAGGERATION

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MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
PLOT SCALE: FULL SCALE
PLOT DATE: 18-JAN-2019
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DATE: 18-JAN-2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: C-301 CROSSSECTIONS

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

CROSS SECTIONS

Sheet ID
C-301

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US Army Corps
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Memphis District

MISSISSIPPI RIVER CHANNEL IMPROVEMENT

ISLAND 18 SCOUR REPAIRS

ISLAND 18 CLOSURE STRUCTURE

DYER COUNTY, TENNESSEE

RIVER MILE 837L

FEBRUARY 2019

US Army Corps
of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.		DATE: 11-FEB-2019	
DWN BY: PAS	CKD BY: DSC	SOLICITATION NO.:	
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.		CONTRACT NO.:	
PLOT SCALE: NTS	PLOT DATE: 11-FEB-2019	FILE NUMBER:	
SIZE: ANSI D	FILE NAME: G-001 COVERSHEET		

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

COVER SHEET

Sheet ID
G-001

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US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

OVERALL PLAN VIEW

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.	DATE: 13-FEB-2019
DWN BY: PAS	CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.	SOLICITATION NO.
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SIZE: ANSI D	CONTRACT NO.
FILE NAME: C-100 OVERALLPLANVIEW	FILE NUMBER:

Sheet ID
C-100

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Y=13111240.68
Z=273.58

2. SET 3/4" IRON PIN
X=864695.83
Y=13113746.09
Z=271.62

POB:
N: 13113625.54
E: 864188.25

BEGIN CLOSURE CONSTRUCTION
N: 13113693.88
E: 864062.49
(TIE TO EXISTING GROUND)

GRADED STONE C BANK PAVING. SEE SHEET C-100.

CLOSURE STRUCTURE CENTERLINE

UPSTREAM SIDE SLOPES 1V:1.25H

N: 13114103.05
E: 863309.62

N: 13114126.92
E: 863265.69

GRADED STONE C BANK PAVING. SEE SHEET C-100.

DOWNSTREAM SIDE SLOPES 1V:1.5H

END CLOSURE CONSTRUCTION
N: 13114429.25
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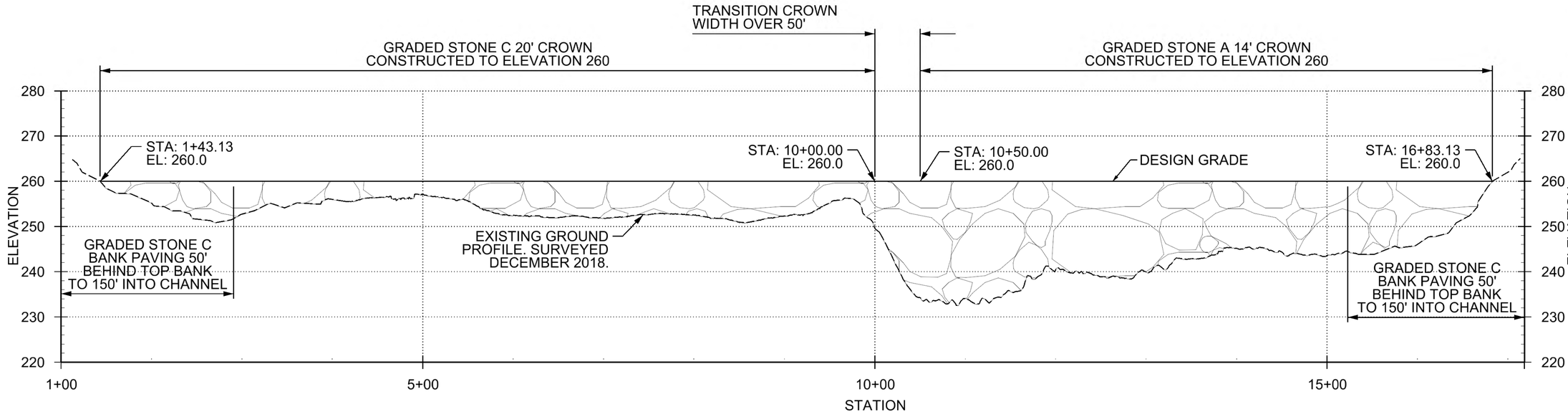

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
PLOT SCALE: 1"=60'
PLOT DATE: 13-FEB-2019
STATE PLANE: TENNESSEE
ANSI D
FILE NAME: C-101 PLANANDPROFILE
DATE: 13-FEB-2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

PLAN AND PROFILE

Sheet ID
C-101

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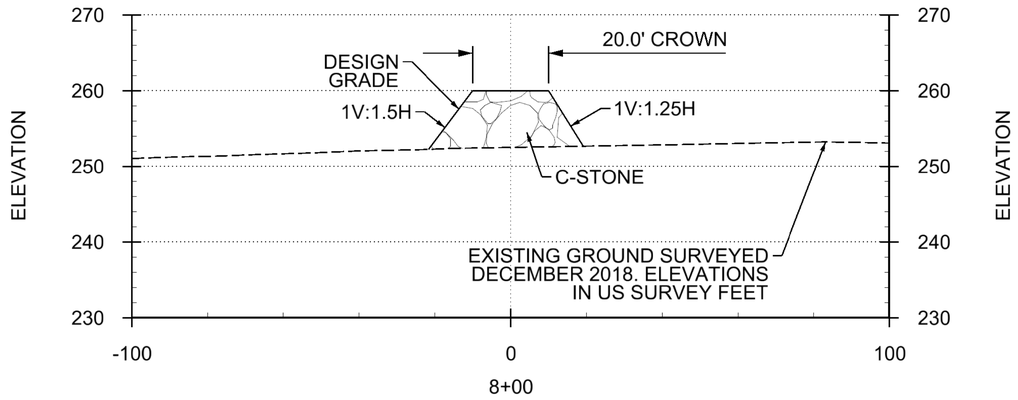

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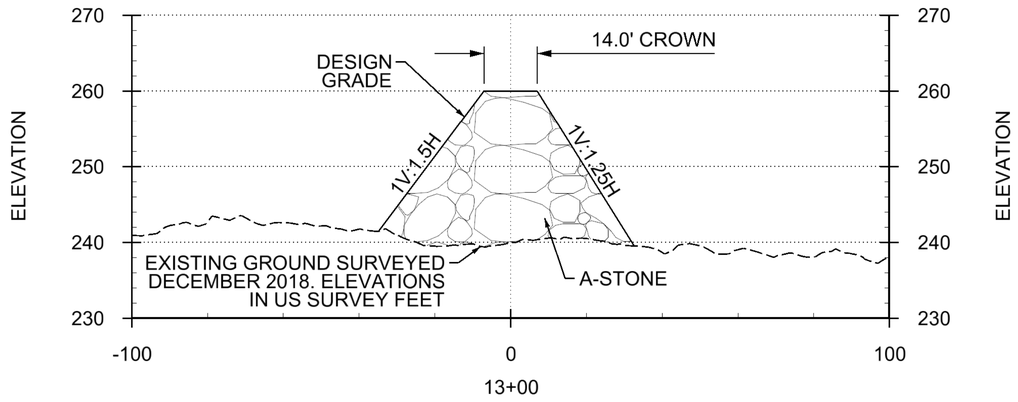

B C-101 TYPICAL SECTION

0 20' 40'

SCALE:1"=20'

2:1 VERTICAL EXAGGERATION

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DARIAN S. CHASTEEN, P.E.
PLOT SCALE: 1=20'
PLOT DATE: 13-FEB-2019
SIZE: ANSI D
FILE NAME: C-300_TYPICALSECTIONS
DATE: 13-FEB-2019
SOLICITATION NO.
CONTRACT NO.
FILE NUMBER:

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

TYPICAL SECTIONS

Sheet ID
C-300

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT
MEMPHIS, TENNESSEE

DESIGNED BY: PRESTON SNYDER, P.E.
DWN BY: PAS
CKD BY: DSC
SUBMITTED BY: DAMIAN S. CHASTEEN, P.E.
PLOT SCALE: 1=200'
PLOT DATE: 19-FEB-2019
SIZE: ANSI D
FILE NAME: C-100_OVERALLPLANVIEW

DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

MISSISSIPPI RIVER CHANNEL IMPROVEMENT
ISLAND 18 SCOUR REPAIRS
ISLAND 18 CLOSURE STRUCTURE
DYER COUNTY, TENNESSEE
RIVER MILE 837L

Sheet ID

OVERALL PLAN VIEW

C-100

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Appendix D– 404(b)(1) Evaluation

DRAFT

SECTION 404(b)(1) EVALUATION

Island No. 18/Dyer County Little Levee Emergency Repairs
Mississippi River
Dyer County, Tennessee

I. PROJECT DESCRIPTION

a. Location. The Dyer County Little Levee (DCLL) is a non-Federal levee located in Dyer County, Tennessee, between the mainline Mississippi River Levee, the Mississippi River and the Obion River. The DCLL begins at the Mississippi River Mainline Levee (MRL) east of Boothspoint and extends to the Obion River, between river miles 820 and 840. Island No. 18 lies adjacent to a dike field that aids in maintaining navigational safety. The project area is at approximately river mile (RM) 837, and is along the left descending bank (LDB) of the Mississippi River at RM 837, within Everett Lake, and along the banks of Island No. 18.

b. General Description. The top bank of the Mississippi River at approximately River Mile 837 and a sand closure structure were breached by flooding and high water velocity. This breach has allowed high flows into the Lake Everett and caused scour along the riverside toe of the DCLL and the LDB of the lake.

Due to the high priority nature of the work described herein, the U.S. Army Corps of Engineers (USACE), Memphis District (MVM), completed Phase 1 of the emergency repairs on 2 February 2019. To date, approximately 65,600 tons of Class A riprap has been placed at a thickness of up to 25 feet to restore approximately 1,275 feet of the LDB of the main channel. The crown width of the restored LDB totals approximately 14 feet with up- and downstream slopes of approximately 1-foot horizontal to 2.5 feet vertical (1H:2.5V). A 55-foot wide riprap apron consisting of 27,200 tons of graded 'C' riprap has been placed directly behind the restored top bank for the entire length of the structure approximately 4 feet thick to prevent scour behind the repair. The Phase 1 repairs also included placement of approximately 28,800 tons of Class C riprap along approximately 900 feet of the DCLL (LDB of Everett Lake) to repair the immediate damage and prevent likely failure of the DCLL. The riprap was placed along the bank from the toe of the DCLL riverward for approximately 150 feet at a typical slope of 1H:1.5V. This levee protects approximately 12,000 acres of land including residences, other important community assets, and the Mainline Mississippi River Levee/Highway 181. Riprap was delivered by barge, and the work was performed by floating plant using barge mounted draglines or hydraulic excavators. The Phase 1 repairs were required to restore the riverbank and reduce the water velocity as well as the amount of water entering Everett Lake as substantial damage to the DCLL/Everett Lake Road was occurring.

Phase 2 is proposed to include the Everett Lake Closure Structure replacement, which provides immediate protection for the DCLL/Everett Road. The structure would be constructed using approximately 88,000 tons of graded C riprap, and will replace the structure that was constructed of sand in the 1960's, but has been breached and is no longer functioning. The bank protection

adjacent to the structure on the LDB of Everett Lake will extend from approximately 200 feet upstream of the structure to the existing bank protection on DCLL placed during Phase 1. The bank protection adjacent to the structure on the right descending bank (RDB) will extend from approximately 100 feet upstream to approximately 300 feet downstream of the closure. Currently, continued high water is still actively eroding the bank upstream of the completed Phase 1-DCLL riprap protection.

c. Authority and Purpose. USACE has authority under Public Law 84-99 (PL 84-99), Flood Control and Coastal Emergencies (FCCE) (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities, including rehabilitation of flood control works threatened or destroyed by flood. The constructed and proposed work along the toe of the DCLL is authorized as part of PL 84-99. The purpose of the repairs is to reconstruct the levee toe to the pre-flood section and grade and stabilize the active scour using riprap protection.

The work to restore the top bank of the Mississippi River, additional paving and repairs on existing Dike #2, and restoration of the Island No. 18 Closure Dike is authorized by the MR&T Channel Improvement Authority as authorized under the 1928 Flood Control Act.

As a result of flooding over the past several years, significant damage has occurred at RM 837 in several areas as described above. An emergency declaration was released on 11 January 2019 to allow for the high priority work to be completed in an expedited manner. The top LDB of the Mississippi River failed and was becoming more unstable within the Island No. 18 complex. In addition, prior to the Phase 1 repairs, the likelihood of DCLL failure was very high due to the observed progression of bank failures. While the likelihood of failure has been reduced for the immediate future, an emergency situation remains due to continuing flood conditions forecast throughout the Spring of 2019. The DCLL supports a public road, protects approximately 12,000 acres of agriculturally developed land, 30 homes, 1 business, a church and 41 farm buildings. The total value of the structures is estimated at $2,935,000. It is also estimated that approximately 80 people reside within the area. With the levee in its current condition, this prolonged high water event is likely to cause the continued erosion of the levee if action is not taken. The sandbar on the riverside of Island No. 18, which is utilized by the federally endangered interior least tern during their reproductive season, is being damaged because of the changes to flow patterns.

d. General Description of Dredged and /or Fill Material.

(1) General Characteristics of Fill Material. Fill material for the project requires Graded Riprap A as well as Graded C Riprap. Size requirements for the riprap are shown below:

Graded Riprap "C"	
Riprap Weight (LBS)	Cumulative Percent (Finer by Weight)
400	100
250	70-95
100	50-80
30	32-58
5	15-34
1	0-15
NOTE: 5 percent of the material can weigh more than 400 pounds; however, no piece shall weigh more than 500 pounds.	

Graded Riprap "A"	
Riprap Weight (LBS)	Cumulative Percent (Finer by Weight)
5,000	100
2,500	70-100
500	40-65
100	20-45
5	0-15
1	0-5

(2) Quantity of Material. Phase 1: To date, approximately 65,600 tons of Class A riprap has been placed at a thickness of up to 25 feet to restore approximately 1,275 feet of the LDB of the main channel. The crown width of the restored LDB totals approximately 14 feet with up- and downstream slopes of approximately 1-foot horizontal to 2.5 feet vertical (1H:2.5V). A 55-foot wide riprap apron consisting of 27,200 tons of graded C riprap has been placed directly behind the restored top bank for the entire length of the structure at approximately 4 feet thick to prevent scour behind the repair. The Phase 1 repairs also included placement of approximately 28,800 tons of graded C riprap along approximately 900 feet of the DCLL (LDB of Everett Lake) to repair the immediate damage and prevent likely failure of the DCLL. The riprap was placed along the bank from the toe of the DCLL riverward for approximately 150 feet at a typical slope of 1H:1.5V.

Phase 2: Phase 2 is proposed to include the Everett Lake Closure Structure replacement, which provides immediate protection for the DCLL/Everett Road. Construction of the Everett Lake Closure Structure would require placing approximately 32,000 tons of graded A riprap and 56,000 tons of graded C riprap across approximately 1,500 feet of the upstream end of Everett Lake to replace the failed structure. This structure replaces the structure that was constructed of sand in the 1960's, but has been breached and is no longer functioning. The bank protection adjacent to the structure on the LDB of Everett Lake will extend from approximately 200 feet upstream of the structure to the existing bank protection on DCLL placed during Phase 1. The bank protection adjacent to the structure on the right descending bank (RDB) will extend from approximately 100 feet upstream to approximately 300 feet downstream of the closure. Currently, continued high water is still actively eroding the bank upstream of the completed Phase 1-DCLL riprap protection.

(3) Source of Material. The material associated with bank grading would consist of recent alluvium deposits (mostly sands) and is essentially the same material composing the substrate below the water line. The graded riprap used for the proposed activities would be obtained from quarries producing riprap which meets USACE specifications.

e. Description of Proposed Discharge Sites.

(1) Location. Phase 1 Repairs: The Mississippi River top LDB restoration is located at approximately River Mile 837 at the upstream end of Island No. 18/Everett Lake. The DCLL scour repair is located along the top LDB of Everett Lake approximately 4,000 feet downstream of the mouth of Everett Lake.

Phase 2 Repairs: The structure would be moved downstream by approximately 900 feet to avoid constructing in the scour hole. Riprap would also be placed along the LDB of Everett Lake/toe of the DCLL to restore the pre-flood section and grade to prevent further degradation and to stabilize the bank.

(2) Size. The total length of the riprap placement along the banks is expected to total approximately 3,900 feet. The breakdown of that placement is as follows: Top bank restoration totaled approximately 400 feet (Phase 1-includes RDB and LDB), completed DCLL stabilization totaled approximately 900 feet (Phase 1), Phase 2 DCLL stabilization will total approximately 1200 feet, Everett Lake Closure Structure will total approximately 1400 feet (Phase 2- includes RDB and LDB).

(3) Type of Habitat. Everett Lake existed as an isolated slough located between RM 837 and 832 prior to the bank failure. It is approximately 3.8 miles in length and ranges in width from approximately 700 to 900 feet. A substantial amount of alluvial materials, likely consisting of silts/clay, were washed out due to the recent scouring action. Substrate in the channel of the chute likely currently consists nearly entirely of sands. Near the top bank repairs the overstory mostly consisted of medium to large cottonwood trees greater than between 10 and 20 inches diameter breast height (dbh) and small (3-5 inches dbh) sugarberry trees.

The DCLL scour consisted of approximately 2,500 linear feet of an actively caving bank along which nearly all riparian habitat had been washed into Everett Lake. Approximately 900 feet of the scour has been repaired as described above. The remaining scour damage will be repaired, likely this spring/summer (2019). The top bank breach was, similarly, an area that had been scoured with significant riparian vegetation being lost into the channel/Everett Lake. The substrate consists of recent alluvium (mostly sands). The remaining trees along the Dyer County Little Levee consisted mostly of large cottonwood trees. Very little understory was present, but was likely dominated by poison ivy, greenbriar, and trumpet vine.

(4) Timing and Duration of Discharge. The Phase 1 repairs began on January 14, 2019, and were completed on February 2, 2019. Construction on Phase 2 began on April 15, 2019 and is expected to be complete on May 18, 2019. River stages needed to float equipment and material into the chute are $\geq$ 28 feet on the Caruthersville gage. During construction, work typically occurs daylight to dark until completion.

f. Description of Disposal Method. Riprap is delivered by barge, and the work is performed by floating plant using barge mounted draglines or hydraulic excavators. A river stage of 28-35 feet

on the Caruthersville gage is needed to allow for sufficient flotation of barge mounted equipment and material at the upstream entrance to the chute.

II. FACTUAL DETERMINATION

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. A change in substrate elevation and slope within the footprint of the rock protection occurred with the breach of the top bank and during the repairs. Phase 1: The crown width of the restored LDB totals approximately 14 feet with up- and downstream slopes of approximately 1-foot horizontal to 2.5 feet vertical (1H:2.5V). A 55-foot wide riprap apron consisting of 27,200 tons of graded C riprap has been placed directly behind the restored top bank for the entire length of the structure at approximately 4 feet thick to prevent scour behind the repair. The Phase 1 repairs also included placement of approximately 28,800 tons of Class C riprap along approximately 900 feet of the DCLL (LDB of Everett Lake) to repair the immediate damage and prevent likely failure of the DCLL. The riprap was placed along the bank from the toe of the DCLL riverward for approximately 150 feet at a typical slope of 1H:1.5V. Phase 2: The structure would be moved downstream by approximately 900 feet to avoid constructing in the scour hole, and will replace the structure that was constructed of sand in the 1960's, but has been breached and is no longer functioning. Construction of the Everett Lake Closure Structure would require placing approximately 32,000 tons of graded A riprap and 56,000 tons of graded C riprap across approximately 1,500 feet of the upstream end of Everett Lake to replace the failed structure. The closure structure would be constructed with an upstream slope of 1V:1.25H and a downstream slope of 1V:1.5H with an approximate 14-foot crown. Riprap would also be placed along the LDB of Everett Lake/toe of the DCLL to restore the pre-flood section and grade to prevent further degradation and to stabilize the bank.

(2) Sediment Type. A substantial amount of alluvial materials, likely consisting of silts/clay, were washed out due to the recent scouring action. Substrate in the channel of the chute likely consists nearly entirely of sands, at present. This material does not change the substrate type or composition in the immediate area of discharge or downstream. Riprap placed along the bank or used to restore the top bank and closure structure is either graded riprap C (approximately 1-400 pounds in size) or graded riprap A (approximately 1-5,000 pounds in size). Natural concentrations of stones this size are not typically found on the lower Mississippi River.

(3) Dredged and Fill Material Movement. The Phase 1 repairs have prevented some of the movement of material that was actively washing away. Active erosion is still occurring within the project area which requires the Phase 2 repairs. Extreme high flows may cause some riprap to be dislodged from the bank in the future; however, no major failures are likely to occur. Riprap size and thickness, as well as appropriate tying in and stabilization would minimize the potential for movement of the proposed rock fill. The Phase 2 repairs would have the same effect on material movement.

(4) Physical Effects on Benthos. Due to the frequency of high velocities, the actively caving banks, and the shifting sand substrate, few or no mussels are likely to be within close proximity of the project footprint. There is the potential for low densities of freshwater mussels

and aquatic insects to be present in limited portions of Everett Lake, such as areas protected from high flows with stable substrates. It is unlikely that benthic species and/or aquatic insects exist within the active scour areas. Post project, as more natural bank conditions return the benthic community may begin to return to the post project condition.

(5) Other Effects. N/A

(6) Action Taken to Minimize Impacts. To minimize impacts, work limits include areas where active scour poses a threat to the levee, dike field, and/or top bank of the Mississippi River. Every effort is being made to preserve all trees not interfering with construction. Vegetative clearing would only be the minimum necessary to key the rock into the bank (approximately 2 feet from top bank). Based on the sandy soils and extent of the active scour at these locations, the clearing/grading activities would not exceed what would be lost if no action is taken. Contractors are also responsible for an approved environmental protection plan for the prevention/control of pollution and habitat disruption that may occur to the environment during construction.

b. Water Circulation, Fluctuation, and Salinity Determination.

(1) Water.

(a) Salinity. No effect.

(b) Water Chemistry. No expected change.

(c) Clarity. No significant change in clarity is expected as active scour causes heavy sediment movement. Flood season also naturally decreases clarity.

(d) Color. No expected change.

(e) Odor. No expected change.

(f) Taste. No expected change.

(g) Dissolved Gas Levels. No expected change.

(h) Nutrients. No expected change.

(i) Eutrophication. No expected change.

(j) Others as Appropriate. Not applicable.

(2) Current Patterns and Circulation.

(a) Current Patterns and Circulation. Heavy flows that had been impacting the top banks of the Mississippi River and Everett Lake will be slowed and restored to the pre-flood condition. No other major changes in current patterns and circulation are expected.

(b) Velocity. Current velocity through Everett Lake will be slowed to the pre-flood condition.

(c) Stratification. Work would be conducted while river stages are between 28-35 feet on the Caruthersville gage. Stratification would not occur as a result of the proposed activities, and no changes to stratification are expected throughout other portions of the year.

(d) Hydrologic Regime. The proposed repairs would re-stabilize the Island No. 18 complex, protect approximately 60 acres of riparian habitat, and is expected to cause accretion upstream of the Everett Lake Closure Structure on the landside eventually resulting in approximately 25 acres of wetland/riparian habitat. The proposed Phase 2 Everett Lake Closure Structure would be constructed at an average elevation of 260 feet NAVD88, which is approximately 12-13 feet lower than the original structure. This would, at least partially, meet an objective of the Lower Mississippi River Conservation Committee's 'Restoring America's Greatest River Initiative' by improving aquatic connectivity in Everett Lake. Overbank flow would enter Everett Lake more frequently, and for a longer duration than pre-breach.

(3) Normal Water Level Fluctuations. Normal fluctuations in water level would not be impacted.

(4) Salinity Gradients. No expected change.

(5) Action Taken to Minimize Impacts. To minimize impacts, work limits include areas where active scour poses a threat to the levee, dike field, and/or top bank of the Mississippi River. Every effort is being made to preserve all trees not interfering with construction. Vegetative clearing would only be the minimum necessary to key the rock into the bank (approximately 2 feet from top bank). Based on the sandy soils and extent of the active scour at these locations, the clearing/grading activities would not exceed what would be lost if no action is taken. Contractors are also responsible for an approved environmental protection plan for the prevention/control of pollution and habitat disruption that may occur to the environment during construction.

c. Suspended Particulate/Turbidity Determination.

(1) Expected Changes in suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites. Some sediments (mostly sands) would be disturbed when the graded riprap is first deposited onto the riverbank and into the channel. This minimal increase in turbidity would be transitory and not detectable from the surface. Material graded during bank preparation consists of alluvium deposits (mostly sands) which is the same material that has recently fallen into the river due to bank caving and similar to what is located on the channel bottom. Minor increases in sediment load would be expected with grading activities; however, any increases in turbidity

would be transitory and minor compared to the natural sediment load of the river, especially during high river stages.

(2) Effects on Chemical and Physical Properties of the Water Column.

(a) Light Penetration. The temporary increase in turbidity during construction would be minor and of short duration. The proposed project would have no lasting effect on light penetration.

(b) Dissolved Oxygen. No change is expected.

(c) Toxic Metals and Organics. No change is expected.

(d) Pathogens. No change is expected

(e) Aesthetics. The breach of the top bank as well as the scour along the DCLL has altered the aesthetics of the project area by causing the loss of riparian habitat. The project has placed riprap where there was once a natural riparian bank; however, further aesthetic degradation has been prevented. In time, natural re-vegetation of the top bank will result in similar habitat. Overall, there would be no significant impacts to the aesthetics of the project area.

(f) Others as Appropriate. None are noted.

(3) Effects on Biota.

(a) Primary Production. The proposed work should have no distinguishable effects on primary productivity.

(b) Suspension/Filter Feeders. Due to the high velocities, actively caving banks, and sandy substrate, few or no mussels are likely to inhabit the proposed areas of rock placement along Everett Lake or the main channel of the Mississippi River.

(c) Sight Feeders. Resident fish are adapted to turbidity increases that occur with high water events. Project-related turbidity increases would be minor compared to these natural events. Since fish and other sight feeders are highly mobile, project impacts to sight-feeding organisms would be insignificant and short term.

(4) Actions Taken to Minimize Impacts. To minimize impacts, work limits include areas where active scour poses a threat to the levee, dike field, and/or top bank of the Mississippi River. Every effort is being made to preserve all trees not interfering with construction. Vegetative clearing would only be the minimum necessary to key the rock into the bank (approximately 2 feet from top bank). Based on the sandy soils and extent of the active scour at these locations, the clearing/grading activities would not exceed what would be lost if no action

is taken. Contractors are also responsible for an approved environmental protection plan for the prevention/control of pollution and habitat disruption that may occur to the environment during construction.

d. Contaminant Determinations. Riprap used for the bank protection are considered inert material. The bank is comprised of mostly sands; thus, any material introduced via grading would have low potential for pollutants due to minimal organic material content. There is a low likelihood that any contaminants would be introduced or translocated due to construction.

e. Aquatic Ecosystems and Organism Determination.

(1) Effects on Plankton. Effects, if any, on plankton communities are expected to be insignificant and of short duration.

(2) Effects of Benthos. Due to the frequency of high velocities, the actively caving banks, and the shifting sand substrate, few or no mussels are likely to be within close proximity of the project footprint. There is the potential for low densities of freshwater mussels and aquatic insects to be present in limited portions of Everett Lake, such as areas protected from high flows with stable substrates. It is unlikely that benthic species and/or aquatic insects exist within the active scour areas. Post project, as more natural bank conditions return the benthic community may begin to return to the post project condition.

(3) Effects on Nekton. Nekton would be temporarily displaced during construction but expected to return shortly after project completion. Resident fish in the Mississippi River are adapted to turbidity increases that occur with high water events. Minor increases in sediment load would be expected with grading activities; however, these effects would be transitory and minor compared to natural events in the Mississippi River. Since fish and other sight feeders are highly mobile, project impacts to sight-feeding organisms within Everett Lake or the Mississippi River would be insignificant and short term.

(4) Effects on Aquatic Food Web. Temporary reductions in benthic macroinvertebrate communities and drift from such a small area should not significantly impact the aquatic food web. These organisms would quickly colonize the area after construction.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Aquatic Sites. N/A

(b) Wetlands. The riparian vegetation adjacent to the riverside toe of the DCLL is comprised largely of cottonwood and sugarberry trees; however, none of the area within the project footprint is identified as wetlands on the National Wetlands Inventory (https://www.fws.gov/wetlands/Data/Mapper.html). The riparian vegetation in the Phase 1 construction areas was actively being lost into the channel due to streambank erosion. While the LDB of Mississippi River was stabilized by the Phase 1 construction, there are still areas of instability along the top bank of Everett Lake and the DCLL. Within the proposed Phase 2 repair

area, most of the riparian vegetation along the top bank has been impacted by the erosion described above. Hydrology will not be altered.

With the bank stabilization activities, vegetative clearing would be the minimum necessary to key the rock into the bank. Based on the sandy soils and extent of the active scour at these locations, these activities would not exceed what would be lost if no action is taken. Every effort would be made to preserve all trees not interfering with construction. This project is expected to prevent the loss of approximately 60 acres of riparian/wetland habitat, as well as eventually establishing approximately 25 acres of wetland due to accretion behind the replacement closure structure.

(c) Mud Flats. N/A

(d) Vegetated Shallows. N/A

(e) Riffle and Pool Complexes. None exist within the project area.

(6) Threatened and Endangered Species. The sandbar adjacent to the Island No. 18 Dike Field utilized by least terns during the low water nesting season is near the proposed activities; however, no impacts to the species are expected since habitat is inundated and least terns would not be present during construction, the sandbar will not be impacted.

Pallid sturgeon could utilize any areas connected to the main channel of the Mississippi River during portions of the year. Pallid sturgeon spawning sites have not yet been documented on the lower Mississippi River, but spawning is suspected to occur on gravel bars. No gravel bars will be impacted by the proposed work. No significant adverse impacts to pallid sturgeon are expected due to the proposed actions.

Based on the current velocities, unstable substrate, and rate of bank caving at the proposed location of rock deposition, no fat pocketbook mussels are expected to occur within the vicinity of the project. No significant adverse impacts to the fat pocketbook mussel are expected due to the proposed actions.

Every effort would be made to leave all trees not interfering with construction; however, some vegetation within 2 feet from top bank may be removed in areas of vertical banks for construction equipment to key the rock into the bank. This vegetation would be lost due to the ongoing erosion should no action be taken. The intent is to complete repairs during the time when Indiana bats and northern long-eared bats would not be present; however, timing is dependent on river stages. Based on the type of habitat present in the immediate vicinity, rate of active bank caving, and proposed timing of the actions, no impacts to the Indiana bat or northern long-eared bat are expected. Pursuant to Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service concurred with the USACE not likely to adversely affect determination for federally listed species and critical habitat.

(7) Other Wildlife. Some wildlife in the immediate area of construction may be temporarily displaced due to construction. However, since all work would be done from barges floating in the river, any disturbance would be minimal and short-lived.

(8) Actions Taken to Minimize Impacts. See Section (6) Threatened and Endangered Species, above.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Construction would occur when river stages are between 28-35 feet on the Caruthersville gage. Fill material would be placed in depths varying from less than one foot to the depth of the channel bottom (a maximum of approximately 40 feet depending on river stages at the time of construction). Water velocities are expected to be similar to the main channel of the Mississippi River. Flow direction is downstream, although localized eddy currents may have been present in some locations prior to and during construction. Natural turbulence is characteristic of the lower Mississippi River. Stratification would not occur as a result of the proposed bank stabilization measures. The proposed activities would take place over approximately 30 days. Minor increases in sediment load would be expected with the proposed activities; however, any increases in turbidity would be transitory and minor compared to the natural sediment load of the river, especially during high river stages.

(2) Compliance with Applicable Water Quality Standards. Emergency Section 401 water quality certification has been granted by the State of Tennessee for the constructed Phase 1 and Phase 2 activities.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supply. N/A

(b) Recreational and Commercial Fishing. Fishing should not be affected by the proposed work.

(c) Water Related Recreation. N/A

(d) Aesthetics. The breach of the top bank as well as the scour along the DCLL has altered the aesthetics of the project area by causing the loss of riparian habitat. The project has placed riprap where there was once a natural riparian bank; however, further degradation of the aesthetics has been prevented. In time, natural re-vegetation of the top bank will result in similar habitat. Overall, there would be no significant impacts to the aesthetics of the project area.

(e) Parks, National Historical Monuments, National Seashore, Wilderness Areas, Research Sites and Similar Preserves. No sites exist within the footprint of the proposed project.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. No significant adverse cumulative effects are anticipated beyond those discussed above in Section II.

h. Determination of Secondary Effects on the Aquatic Ecosystem. No significant adverse secondary effects are anticipated beyond those discussed above in Section II.

III. FINDING OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

a. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

b. The purpose of the activities is to reconstruct the levee to the pre-flood section and grade and stabilize the active scour using riprap protection. No practicable alternatives to the proposed discharges were identified that would have less adverse effect on the aquatic ecosystem.

c. Section 401 water quality certification has been received from the State of Tennessee for the Phase 1 and Phase 2 activities.

d. The proposed project is not likely to adversely impact the federally endangered Indiana bat, interior least tern, pallid sturgeon, or fat pocketbook mussel or the federally threatened northern long-eared bat. Pursuant to Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service concurred with the USACE not likely to adversely affect determination for federally listed species and critical habitat.

e. The proposed work would not significantly affect human health and welfare, the municipal water supply, or commercial or sport fishing. No long-term impacts on plankton communities; breeding, spawning, or nursery habitats; or shellfish areas are expected. No adverse impacts to wetlands should occur due to the proposed actions. No other special aquatic sites are located in the proposed work areas.

f. No significant adverse impacts to aquatic life or terrestrial wildlife, dependent on aquatic ecosystems, are expected due to the proposed project.

g. The proposed work should not cause significant adverse impacts on ecosystem diversity, productivity, or stability.

h. No adverse impacts on recreational, aesthetic, or economic values are anticipated. The proposed repairs would lower the risk of failure of the Dyer County Little Levee.

i. To minimize impacts, work limits include areas where active scour poses a threat to the levee, dike field, and/or top bank of the Mississippi River. Every effort is being made to preserve all trees not interfering with construction. Vegetative clearing would only be the minimum necessary to key the rock into the bank (approximately 2 feet from top bank). Based on the sandy soils and extent of the active scour at these locations, the clearing/grading activities would not exceed what would be lost if no action is taken. Contractors are also responsible for an

approved environmental protection plan for the prevention/control of pollution and habitat disruption that may occur to the environment during construction.

j. Pursuant to 36 CFR 800.3(a)(1), the District Archaeologist has determined that this project has no potential to cause effects to historic properties eligible for the National Register of Historic Places. The material that was destroyed was previously dredged materials; therefore, no cultural resources were impacted. Thus, no further Section 106 National Historic Preservation Act consultation is required. However, if prehistoric or historic artifacts, human bones, or other archaeological materials subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are found during construction, all activities are to cease immediately in that area and the Memphis District Archaeologist, shall be contacted. State Historic Preservation Officer and tribal NAGPRA representatives, the local sheriff, etc., will be contacted as required by state and federal law.

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