

INDIVIDUAL ENVIRONMENTAL REPORT
GOVERNMENT FURNISHED BORROW MATERIAL
JEFFERSON, ORLEANS, PLAQUEMINES, ST. CHARLES,
AND ST. BERNARD PARISHES, LOUISIANA

IER #18



**US Army Corps
of Engineers®**

OCTOBER 2007

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1. Introduction

The U.S. Army Corps of Engineers (USACE) Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report #18 (IER #18) to evaluate the potential impacts associated with the proposed excavation of twelve Government Furnished borrow areas. The proposed action areas are located in southeastern Louisiana (Figures 1-6).

IER #18 has been prepared in accordance with the National Environmental Policy Act (NEPA) 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. The execution of an IER, in lieu of a traditional Environmental Assessment (EA) or Environmental Impact Statement (EIS), is provided for in ER 200-2-2, Environmental Quality (33 CFR §230) Procedures for Implementing the NEPA and pursuant to the Council on Environmental Quality (CEQ) NEPA Implementation Regulations (40 CFR §1506.11). The Alternative Arrangements can be found at www.nolaenvironmental.gov, and are herein incorporated by reference.

CEMVN implemented Alternative Arrangements on 13 March, 2007 under the provisions of the Council on Environmental Quality Regulations for Implementing the NEPA (40 CFR §1506.11). This process was implemented in order to expeditiously complete environmental analysis for the 100-year level of the Hurricane Protection System (HPS) (also known as the Hurricane and Storm Damage Reduction System) authorized and funded by Congress and the Administration. The proposed actions are located in southeastern Louisiana and are part of the Federal effort to rebuild and complete construction of the Hurricane and Storm Damage Reduction System in the New Orleans Metropolitan area as a result of Hurricanes Katrina and Rita.

A total of twelve potential Government Furnished borrow areas investigated by the CEMVN Borrow Project Delivery Team (PDT) are discussed in this IER. The goal of the CEMVN Borrow PDT is to acquire suitable borrow material needed for HPS improvements. CEMVN engineers currently estimate that 150,000,000 cubic yards of suitable material is required to improve Federal and non-Federal levee and floodwall projects. Borrow areas investigated in this IER would provide approximately 26,511,000 cubic yards of suitable material for levee and floodwall projects.

1.1 Purpose and Need for the Proposed Action

The purpose of the proposed action is to identify borrow areas that contain suitable material that can be excavated to supply Federal HPS levee and floodwall projects. The proposed action resulted from the need to provide a total of approximately 150,000,000 cubic yards of suitable clay for HPS projects that include the completion and improvement of hurricane protection levees in southeastern Louisiana. Raising levee elevations and the completion of levees requires the excavation of material from borrow areas necessary for project construction to ensure 100-year level of flood protection for local communities.

The term "100-year level of protection," as it is used throughout this document, refers to a level of protection which reduces the risk of hurricane surge and wave driven flooding that the New Orleans Metropolitan area has a 1% chance of experiencing each year.

1.2 Authority for the Proposed Action

The authority for the proposed action was provided as part of a number of hurricane protection projects spanning southeastern Louisiana, including the Lake Pontchartrain

and Vicinity (LPV) Hurricane Protection Project and the West Bank and Vicinity (WBV) Hurricane Protection Project. Congress and the Administration granted a series of supplemental appropriations acts following Hurricanes Katrina and Rita to repair and upgrade the project systems damaged by the storms that gave additional authority to the USACE to construct 100-year HPS projects.

The LPV project was authorized under the Flood Control Act of 1965 (P.L. 89-298, Title II, Sec. 204) which amended, authorized a “project for hurricane protection on Lake Pontchartrain, Louisiana ... substantially in accordance with the recommendations of the Chief of Engineers in House Document 231, Eighty-ninth Congress.” The original statutory authorization for the LPV Project was amended by the Water Resources Development Acts (WRDA) of 1974 (P.L. 93-251, Title I, Sec. 92); 1986 (P.L. 99-662, Title VIII, Sec. 805); 1990 (P.L. 101-640, Sec. 116); 1992 (P.L. 102-580, Sec. 102); 1996 (P.L. 104-303, Sec. 325); 1999 (P.L. 106-53, Sec. 324); and 2000 (P.L. 106-541, Sec. 432).

The WBV project was authorized under the WRDA, as cited above. The Westwego to Harvey Canal Hurricane Protection Project was authorized by the WRDA of 1986. The WRDA of 1996 modified the project and added the Lake Cataouatche Project and the East of Harvey Canal Project. The WRDA 1999 combined the three projects into one project under the current name.

The Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act of 2006 (3rd Supplemental - P.L. 109-148, Chapter 3, Construction, and Flood Control and Coastal Emergencies) authorized accelerated completion of the project and restoration of project features to design elevations at 100% Federal cost. The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery of 2006 (4th Supplemental - P.L. 109-234, Title II, Chapter 3, Construction, and Flood Control and Coastal Emergencies) authorizes construction of a 100-year level of protection; the replacement or reinforcement of floodwalls; the construction of permanent closures at the outfall canals; the improvement of the Inner Harbor Navigation Canal (IHNC); and the construction of levee armoring at critical locations. Additional Supplemental Appropriations include the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 H.R. 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5th Supplemental), General Provisions, SEC. 4302.

1.3 Prior Reports

A number of studies and reports on water resources development in the proposed project area have been prepared by the USACE, other Federal, State, and Local agencies, research institutes, and individuals, and are herein incorporated by reference. Pertinent studies, reports and projects are discussed below:

Lake Pontchartrain and Vicinity Hurricane Protection Project

- In July 2006, CEMVN signed a Finding of No Significant Impact (FONSI) on an EA #433 entitled, “USACE Response to Hurricanes Katrina & Rita in Louisiana.” The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.
- On 30 October, 1998, CEMVN signed a FONSI on EA # 279 entitled “Lake Pontchartrain Lakefront, Breakwaters, Pump Stations 2 and 3.” The report

evaluated the impacts associated with providing fronting protection for outfall canals and pump stations. It was determined that the action would not significantly impact resources in the immediate area.

- On 2 October, 1998, CEMVN signed a FONSI on EA # 282 entitled “LPV, Jefferson Parish Lakefront Levee, Landside Runoff Control: Alternate Borrow.” The report investigated the impacts of obtaining borrow material from an urban area in Jefferson Parish. No significant impacts to resources in the immediate area were expected.
- On 2 July, 1992, CEMVN signed a FONSI on EA # 169 entitled “LPV, Hurricane Protection Project, East Jefferson Parish Levee System, Jefferson Parish, Louisiana, Gap Closure.” The report addressed the construction of a floodwall in Jefferson Parish to close a “gap” in the levee system. The area was previously leveed and under forced drainage, and it was determined that the action would not significantly impact the already disturbed area.
- On 22 February, 1991, CEMVN signed a FONSI on EA # 164 entitled “LPV Hurricane Protection – Alternate Borrow Area for the St. Charles Parish Reach.” The report addressed the impacts associated with the use of borrow material from the Mississippi River on the left descending bank in front of the Bonnet Carré Spillway Forebay for LPV construction.
- On 30 August, 1990, CEMVN signed a FONSI on EA # 163 entitled “LPV Hurricane Protection – Alternate Borrow Area for Jefferson Parish Lakefront Levee, Reach III.” The report addressed the impacts associated with the use of a borrow area in Jefferson Parish for LPV construction.
- On 2 July 1991, CEMVN signed a FONSI on EA # 133 entitled “LPV Hurricane Protection – Alternate Borrow at Highway 433, Slidell, Louisiana.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 September, 1990, CEMVN signed a FONSI on EA # 105 entitled “LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway, A. V. Keeler and Company Alternative Borrow Site.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 March, 1990, CEMVN signed a FONSI on EA # 102 entitled “LPV Hurricane Protection – 17th Street Canal Hurricane Protection.” The report addressed the use alternative methods of providing flood protection for the 17th Street Outfall Canal in association with LPV activity. Impacts to resources were found to be minimal.
- On 4 August, 1989, CEMVN signed a FONSI on EA # 89 entitled “LPV Hurricane Protection, High Level Plan - Alternate Borrow Site 1C-2B.” The report addressed the impacts associated with the excavation of a borrow area along Chef Menteur Highway, Orleans Parish for LPV construction. The material was used in the construction of a levee west of the Inner Harbor Navigation Canal.
- On 27 October, 1988, CEMVN signed a FONSI on EA # 79 entitled “LPV Hurricane Protection – London Avenue Outfall Canal.” The report investigated

the impacts of strengthening existing hurricane protection at the London Avenue Outfall Canal.

- On 21 July, 1988, CEMVN signed a FONSI on EA # 76 entitled “LPV Hurricane Protection – Orleans Avenue Outfall Canal.” The report investigated the impacts of strengthening existing hurricane protection at the Orleans Avenue Outfall Canal.
- On 26 February, 1986, CEMVN signed a FONSI on EA # 52 entitled “LPV Hurricane Protection – Geohegan Canal.” The report addressed the impacts associated with the excavation of borrow material from an extension of the Geohegan Canal for LPV construction.
- Supplemental Information Report (SIR) #25 entitled “LPV Hurricane Protection – Chalmette Area Plan, Alternate Borrow Area 1C-2A” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR #27 entitled “LPV Hurricane Protection – Alternate Borrow Site for Chalmette Area Plan” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR #28 entitled “LPV Hurricane Protection – Alternate Borrow Site, Mayfield Pit” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR #29 entitled “LPV Hurricane Protection – South Point to GIWW Levee Enlargement” was signed by CEMVN on 12 June, 1987. The report discussed the impacts associated with the enlargement of the GIWW.
- SIR #30 entitled “LPV Hurricane Protection Project, Jefferson Lakefront Levee” was signed by CEMVN on 7 October, 1987. The report investigated impacts associated with changes in Jefferson Parish LPV levee design.
- SIR #17 entitled “LPV Hurricane Protection – New Orleans East Alternative Borrow, North of Chef Menteur Highway” was signed by CEMVN on 30 April, 1986. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR #22 entitled “LPV Hurricane Protection – Use of 17th Street Pumping Station Material for LPHP Levee” was signed by CEMVN on 5 August, 1986. The report investigated the impacts of moving suitable borrow material from a levee at the 17th Street Canal in the construction of a stretch of levee from the Inner Harbor Navigation Canal to the London Avenue Canal.
- SIR #10 entitled “LPV Hurricane Protection, Bonnet Carré Spillway Borrow” was signed by CEMVN on 3 September, 1985. The report evaluated the impacts associated with using the Bonnet Carré Spillway as a borrow source for LPV construction, and found “no significant adverse effect on the human environment.”
- In December 1984, a SIR to complement the Supplement to Final EIS on the LPV Hurricane Protection project was filed with the Environmental Protection Agency.

- The Final EIS for the LPV Hurricane Protection Project, dated August 1974. A Statement of Findings was signed by CEMVN on 2 December, 1974. Final Supplement I to the EIS, dated July 1984, was followed by a Record of Decision (ROD), signed by CEMVN on 7 February, 1985. Final Supplement II to the EIS, dated August 1994, was followed by a ROD signed by CEMVN on 3 November, 1994.
- A report entitled “Flood Control, Mississippi River and Tributaries,” published as House Document No. 90, 70th Congress, 1st Session, submitted 18 December, 1927 resulted in authorization of a project by the Flood Control Act of 1928. The project provided comprehensive flood control for the lower Mississippi Valley below Cairo, Illinois. The Flood Control Act of 1944 authorized the USACE to construct, operate, and maintain water resources development projects. The Flood Control Acts have had an important impact on water and land resources in the proposed project area.

West Bank and Vicinity Hurricane Protection Project

- In July 2006, CEMVN signed a FONSI on an EA # 433 entitled, “USACE Response to Hurricanes Katrina & Rita in Louisiana.” The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.
- On 23 August, 2005, CEMVN signed a FONSI on EA # 422 entitled “Mississippi River Levees – West Bank Gaps, Concrete Slope Pavement Borrow Area Designation, St. Charles and Jefferson Parishes, Louisiana.” The report investigated the impacts of obtaining borrow material from various areas in Louisiana.
- On 22 February, 2005, CEMVN signed a FONSI on EA # 306A entitled “West Bank Hurricane Protection Project – East of the Harvey Canal, Floodwall Realignment and Change in Method of Sector Gate.” The report discussed the impacts related to the relocation of a proposed floodwall moved because of the aforementioned sector gate, as authorized by the LPV Project.
- On 5 May, 2003, CEMVN signed a FONSI on EA # 337 entitled “Algiers Canal Alternative Borrow Site.”
- On 19 June, 2003, CEMVN signed a FONSI on EA # 373 entitled “Lake Cataouatche Levee Enlargement.” The report discussed the impacts related to improvements to a levee from Bayou Segnette State Park to Lake Cataouatche.
- On 16 May, 2002, CEMVN signed a FONSI on EA # 306 entitled “West Bank Hurricane Protection Project - Harvey Canal Sector Gate Site Relocation and Construction Method Change.” The report discussed the impacts related to the relocation of a proposed sector gate within the Harvey Canal, as authorized by the LPV Project.
- On 30 August, 2000, CEMVN signed a FONSI on EA # 320 entitled “West Bank Hurricane Protection Features.” The report evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Project.

- On 18 August, 1998, CEMVN signed a FONSI on EA # 258 entitled “Mississippi River Levee Maintenance - Plaquemines West Bank Second Lift, Fort Jackson Borrow Site.”
- The Final EIS for the WBV, East of Harvey Canal, Hurricane Protection Project was completed in August 1994. A ROD was signed by CEMVN in September 1998.
- The Final EIS for the WBV, Lake Cataouatche, Hurricane Protection Project was completed. A ROD was signed by CEMVN in September 1998.
- In December 1996, the USACE completed a post-authorization change study entitled, “Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area, EIS.” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish between Bayou Segnette and the St. Charles Parish line. A Standard Project Hurricane (SPH) level of protection was recommended along the alignment followed by the existing non-Federal levee. The project was authorized by Section 101 (b) of the WRDA of 1996, Public Law 104-303, subject to the completion of a final report of the Chief of Engineers, which was signed on 23 December, 1996.
- On 12 January, 1994, CEMVN signed a FONSI on an EA # 198 entitled, “West Bank of the Mississippi River in the Vicinity of New Orleans, LA, Hurricane Protection Project, Westwego to Harvey Canal, Jefferson Parish, Louisiana, Proposed Alternate Borrow Sources and Construction Options.” The report evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Levee.
- In August 1994, CEMVN completed a feasibility report entitled “WBV (East of the Harvey Canal).” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of metropolitan New Orleans from the Harvey Canal eastwards to the Mississippi River. The final report recommended that the existing West Bank Hurricane Project, Jefferson Parish, Louisiana, authorized by the WRDA of 1986 (P.L. 99-662), approved November 17, 1986, be modified to provide additional hurricane protection east of the Harvey Canal. The report also recommended that the level of protection for the area east of the Algiers Canal deviate from the National Economic Development Plan’s level of protection and provide protection for the SPH. The Division Engineer’s Notice was issued on 1 September, 1994. The Chief of Engineer’s report was issued on 1 May, 1995. Preconstruction, engineering, and design was initiated in late 1994 and is continuing. The WRDA of 1996 authorized the project.
- On 20 March, 1992, CEMVN signed a FONSI on EA # 165 entitled “Westwego to Harvey Canal Disposal Site.”
- In February 1992, the USACE completed a reconnaissance study entitled “West Bank Hurricane Protection, Lake Cataouatche, Louisiana.” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish, between Bayou Segnette and the St. Charles Parish line. The study found a 100-year level of protection to be economically justified based on constructing a combination levee/sheetpile wall along the alignment followed by the existing non-Federal levee.

Due to potential impacts to the Westwego to Harvey Canal project, the study is proceeding as a post-authorization change.

- On 3 June, 1991, CEMVN signed a FONSI on EA # 136 entitled “West Bank Additional Borrow Site between Hwy 45 and Estelle PS.”
- On 15 March, 1990, CEMVN signed a FONSI on EA # 121 entitled “West Bank Westwego to Harvey Changes to EIS.” The report addressed the impacts associated with the use of borrow material from Fort Jackson for LPV construction. The material was used for constructing the second life for the Plaquemines West Bank levee upgrade, as part of LPV construction.
- In December 1986, the USACE completed a Feasibility Report and EIS entitled, “West Bank of the Mississippi River in the Vicinity of New Orleans, La.” The report investigated the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish between the Harvey Canal and Westwego, and down to the vicinity of Crown Point, Louisiana. The report recommended implementing a plan that would provide SPH level of protection to an area on the west bank between Westwego and the Harvey Canal north of Crown Point. The project was authorized by the WRDA of 1986 (P.L. 99-662). Construction of the project was initiated in early 1991.

1.4 Integration with other Interim Environmental Reports

In addition to this IER, CEMVN is preparing a Draft Comprehensive Environmental Document (DCED) that will describe the work completed and remaining to be constructed. The purpose of the DCED will be to document the work completed by the CEMVN on a system-wide scale. The DCED will describe the integration of individual IERs into a systematic planning effort. Overall cumulative impacts, a finalized mitigation plan, and future operations and maintenance requirements will also be included. Additionally, the DCED will contain updated information for any IER that had incomplete or unavailable data at the time it was posted for public review.

The DCED will be available for a 60-day public review period. The document will be posted on www.nolaenvironmental.gov, or can be requested by contacting CEMVN. A notice of availability will be mailed/ e-mailed to interested parties advising them of the availability of the DCED for review. Additionally, a notice will be placed in national and local newspapers. Upon completion of the 60-day review period all comments will be compiled and appropriately addressed. Upon resolution of any comments received, a Final Comprehensive Environmental Document (FCDC) will be prepared, signed by the District Commander, and made available to any stakeholders requesting a copy.

1.5 Public Concerns

According to the results of focus groups held by Unified New Orleans Plan (UNOP) the public places very high priority on storm protection. The public wants a 100-year or higher level of protection from storm events. The public also feels that the remaining land left in coastal parishes should not be excavated. Some members of the public feel that the borrow areas should be backfilled. The public is concerned about impacting wetlands. The public is concerned about truck haulers causing traffic congestion.

1.6 Data Gaps and Uncertainties

Transportation routes for the delivery of borrow material have not been determined, as it is uncertain to which HPS construction sites each proposed borrow area would provide

material. Large quantities of material would be delivered to HPS construction sites, as well as to other ongoing 100-year flood protection projects in the area. This could have localized short-term impacts to transportation corridors that can not be quantified at this time. CEMVN is completing a transportation study to determine any impacts associated with the transporting of material to construction sites. This analysis will be discussed in future IERs once it becomes available.

Some construction schedules are changing or not known at this time.

2. Alternatives

2.1 Alternatives Development and Preliminary Screening Criteria

NEPA requires that in analyzing alternatives to a proposed action a Federal agency consider an alternative of “No Action.” Likewise, Section 73 of the WRDA of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage.

The HPS includes the completion and raising of storm protection levees in southeastern Louisiana. Raising levee elevations and completion of levees requires the excavation of material from borrow pits for use in project construction. As part of the construction, numerous utilities, including electrical services, gas lines, telephone poles and lines, storm drainpipes, subdrain lines, and storm drain catch basins, would be avoided or relocated. The access routes and land would be cleared using bull dozers and excavators. Woody debris would be stockpiled on-site and placed in the pit once excavation is completed or in some cases the material may be removed to an approved landfill. Silt fencing would be installed around the perimeter of the borrow area to control runoff. Excavation of the borrow areas would commence from the back of the areas to the access road to provide adequate space for staging haul trucks and stockpiled material. To make optimum use of available material, excavation shall begin at one end of the borrow area and be made continuous across the width of the areas to the required borrow depths to provide surface drainage to the low side of the borrow pit as excavation proceeds. During this process, the overburden (topsoil that lays on top of suitable borrow material) would be stockpiled. The excavation shall be long enough to provide the required quantity of material, and shall be accomplished in such manner that all available material within the required width to full depth will be utilized. Upon abandonment, site restoration will include placing the stockpiled overburden back into the pit and grading the slopes to the specified cross-section figure shown in the drawings. If additional overburden is available at the areas it would be used to create gradual side slopes, islands, and smooth out corners within the borrow area to enhance wildlife and fishery habitat. The Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River Report 4: Part V (Appendix D), and CEMVN operating procedures will be referred to when designing the borrow areas.

2.2 Description of the Alternatives

Two alternatives were considered. These included the No-Action and Proposed Action.

No-Action. Under the No Action alternative the proposed borrow areas would not be used by CEMVN. The proposed borrow areas listed in the proposed action would not be excavated. The levees and floodwall projects would be built to authorized or 100-year levels using other sources of material from as yet identified sources.

Proposed Action. The proposed action consists of excavating the proposed twelve borrow areas throughout the New Orleans Metropolitan area. The material would be transported to HPS levee and floodwall construction sites via truck unless otherwise discussed.

Contractor Furnished Borrow Material. Due to the large quantities of clay material needed for HPS projects, the use of pre-approved Contractor Furnished borrow sources is an option that will be discussed in IER 19. IER 19 will also discuss barging or utilizing railroad to transport clay material from a remote site(s) as an alternative.

2.3 Proposed Action

The proposed action (preferred alternative) consists of excavating all suitable material from the proposed twelve borrow areas. In order to serve the borrow needs of CEMVN, personnel from CEMVN Engineering, Real Estate, Office of Counsel, Relocations, and Environmental branches established the Borrow PDT. This team worked closely with other CEMVN offices (Hurricane Protection Office, Protection and Restoration Office, and Regulatory Functions Branch) to accomplish its mission. The team's goal is to locate and procure high quality clay borrow sources suitable for levee and floodwall construction in such a way as to be least damaging to both the natural and human environments within the proposed project areas.

The team investigated and completed environmental coordination on the proposed borrow areas, and is currently investigating others. When an area was proposed for CEMVN borrow procurement, Real Estate personnel acquired right-of-entry to investigate the property. A map of the site was forwarded to the Regulatory Functions Branch for a jurisdictional wetland determination. The proposed borrow area was revised if necessary to avoid jurisdictional wetlands. A CEMVN Archeologist completed a preliminary, in-office survey of mapped cultural resource sites to detect any obvious cultural resources. A CEMVN Biologist completed an in-office survey of aerial photos of the area to see if the potential area raised Coastal Zone Management (CZM) issues based on location, or if there were other obvious environmental issues that could be detected from aerial photography. The Biologist also coordinated with the U.S. Fish and Wildlife Service (USFWS) to ensure the proposed area would not adversely affect threatened or endangered (T&E) species or their critical habitat.

Once the team completed a preliminary site approval, a site visit was conducted. The field team typically consisted of a Project Manager, Biologist, Geologist, Archeologist, and Hazardous, Toxic, and Radioactive Waste (HTRW) Investigator. The area was visually inspected for the presence of obvious HTRW issues and cultural resources. If no HTRW concerns or cultural resources were observed, the area was cleared to proceed with geotech borings to identify soil characteristics.

The proposed action consists of removing all suitable material from the following twelve borrow areas. Excavation would have no effect on cultural resources, or threatened and endangered (T&E) species or their critical habitat. All jurisdictional wetlands and HTRW issues would be avoided.

- The 1418/1420 Bayou Road area is located on the south side of Bayou Road in St. Bernard Parish, Louisiana (Figure 7). The area is 22 acres, with a 0.5 acre access corridor. Approximately 13 acres of young bottomland hardwood (BLH) forest would be impacted. The remaining 9 acres is non-wetland pasture land. The borrow area is expected to contain approximately 439,000 cubic yards of suitable borrow material. The initial area investigated was 43.4 acres; 21.4 acres of jurisdictional wetlands were avoided.

- The 1572 Bayou Road area is located on the south side of Bayou Road in St. Bernard Parish, Louisiana (Figure 7). The area is 9.5 acres, with a 1 acre access corridor. Approximately 3.7 acres of young BLH would be impacted. The remaining 6.8 acres is non-wetland pasture land. The proposed borrow area is expected to contain approximately 164,000 cubic yards of suitable borrow material.
- The 910 Bayou Road area is located on the south side of Bayou Road in St. Bernard Parish, Louisiana (Figure 8). The area is 11.6 acres, with a 0.1 acre access corridor. Approximately 11.7 acres of non-wetland pasture land would be impacted. The proposed borrow area is expected to contain approximately 117,000 cubic yards of suitable borrow material.
- The 4001 Florissant area is located on the south side of Florissant Highway in St. Bernard Parish, Louisiana (Figure 9). The area was initially 10.8 acres, with a 2.2 acre access corridor. The area was reduced to 9.4 acres to leave a buffer between the proposed borrow area and a levee. Approximately 11.6 acres of non-wetland pasture land would be impacted. The proposed borrow area is expected to contain approximately 214,000 cubic yards of suitable borrow material.
- The Dockville area is located on the north side of Bayou Road in St. Bernard Parish, Louisiana (Figure 10). The area is 107 acres, with a 7 acre access corridor. Approximately 107 acres of BLH would be impacted. The proposed borrow area is expected to contain approximately 1,000,000 cubic yards of suitable borrow material.
- The Belle Chasse area is located on the Belle Chasse Naval Air Base (BCB) in Plaquemines Parish, Louisiana (Figure 11). The area was initially proposed as a 37 acre investigation, and was decreased to 8.4 acres at the request of the BCB. Approximately 8 acres of BLH would be impacted. The proposed borrow area is expected to contain approximately 207,000 cubic yards of suitable borrow material. The BCB is developing this area into a recreational area for base personnel.
- The Triumph area is located on the south side of Highway 23, near Boothville, Louisiana, in Plaquemines Parish (Figure 12). This area would be an expansion of an area that was previously environmentally cleared as a borrow and stockpile area. The area is approximately 2.6 acres and was used as a stockpile area during CEMVN Task Force Guardian. The proposed borrow area is expected to contain approximately 50,000 cubic yards of suitable borrow material.
- The Maynard area is located on the west side of I-510 near the intersection of I-10 in Orleans Parish, Louisiana (Figure 13). The area was initially investigated for borrow pit suitability on 102 acres. However, the area was reduced to 44 acres to avoid jurisdictional wetlands. Approximately 44 acres of BLH would be impacted. The proposed borrow area is expected to contain approximately 438,000 cubic yards of suitable borrow material.



Figure 2: Belle Chasse Proposed Borrow Area

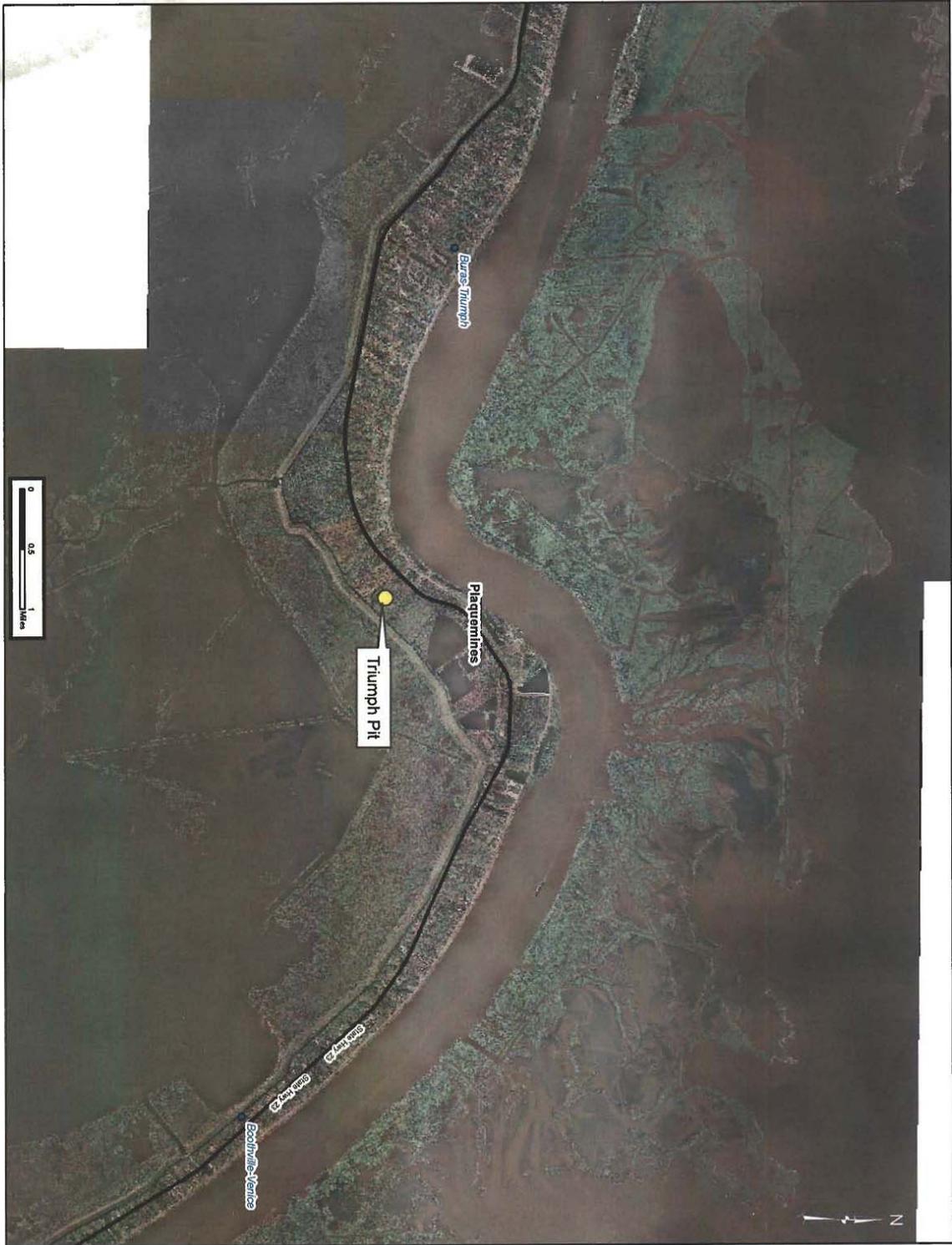


Figure 3: Triumph Proposed Borrow Area



Figure 4: Maynard and Cummings North Proposed Borrow Areas



Figure 5: Churchill Farms Pit A Proposed Borrow Area

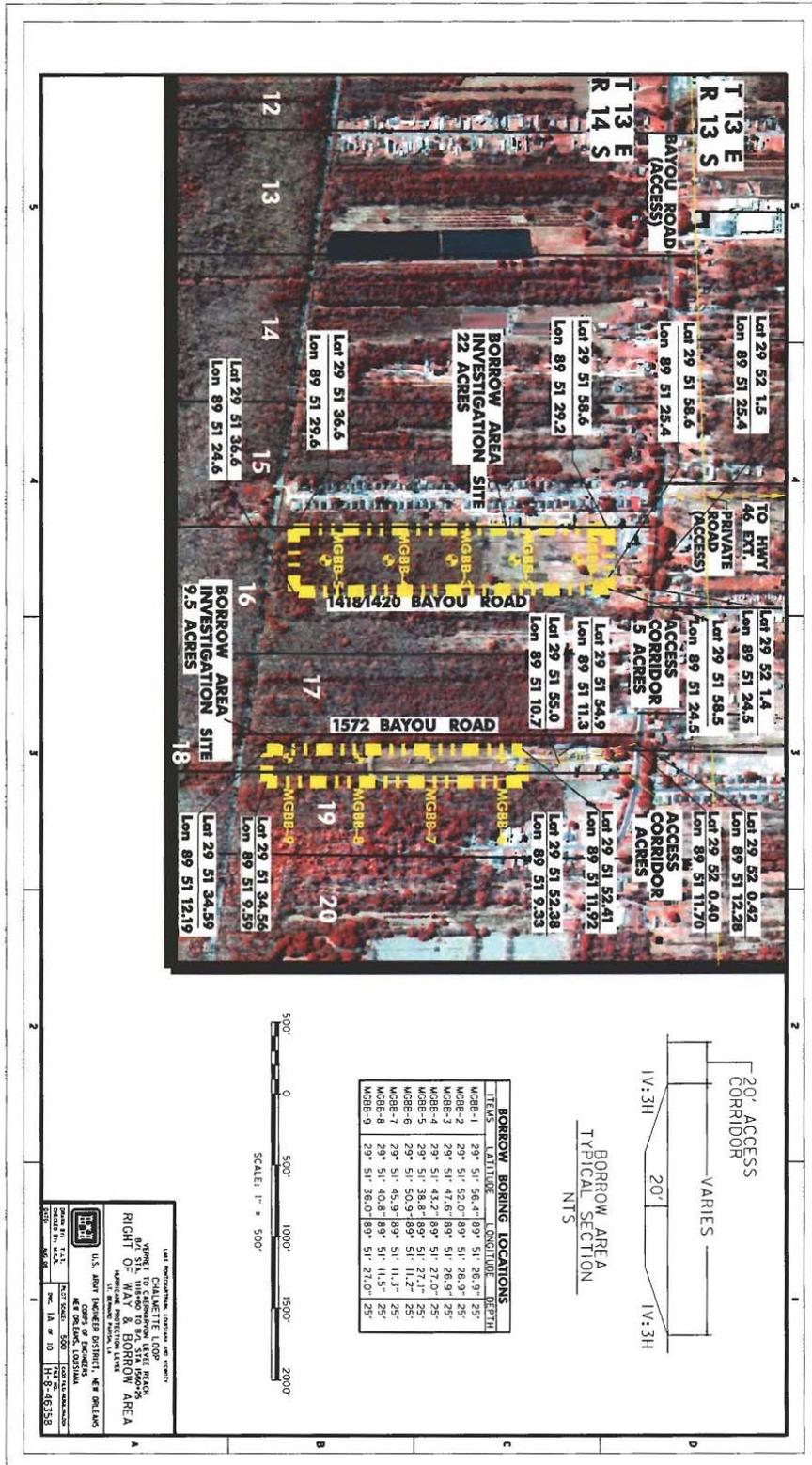


Figure 7: 1418/ 1420 Bayou Road and 1572 Bayou Road

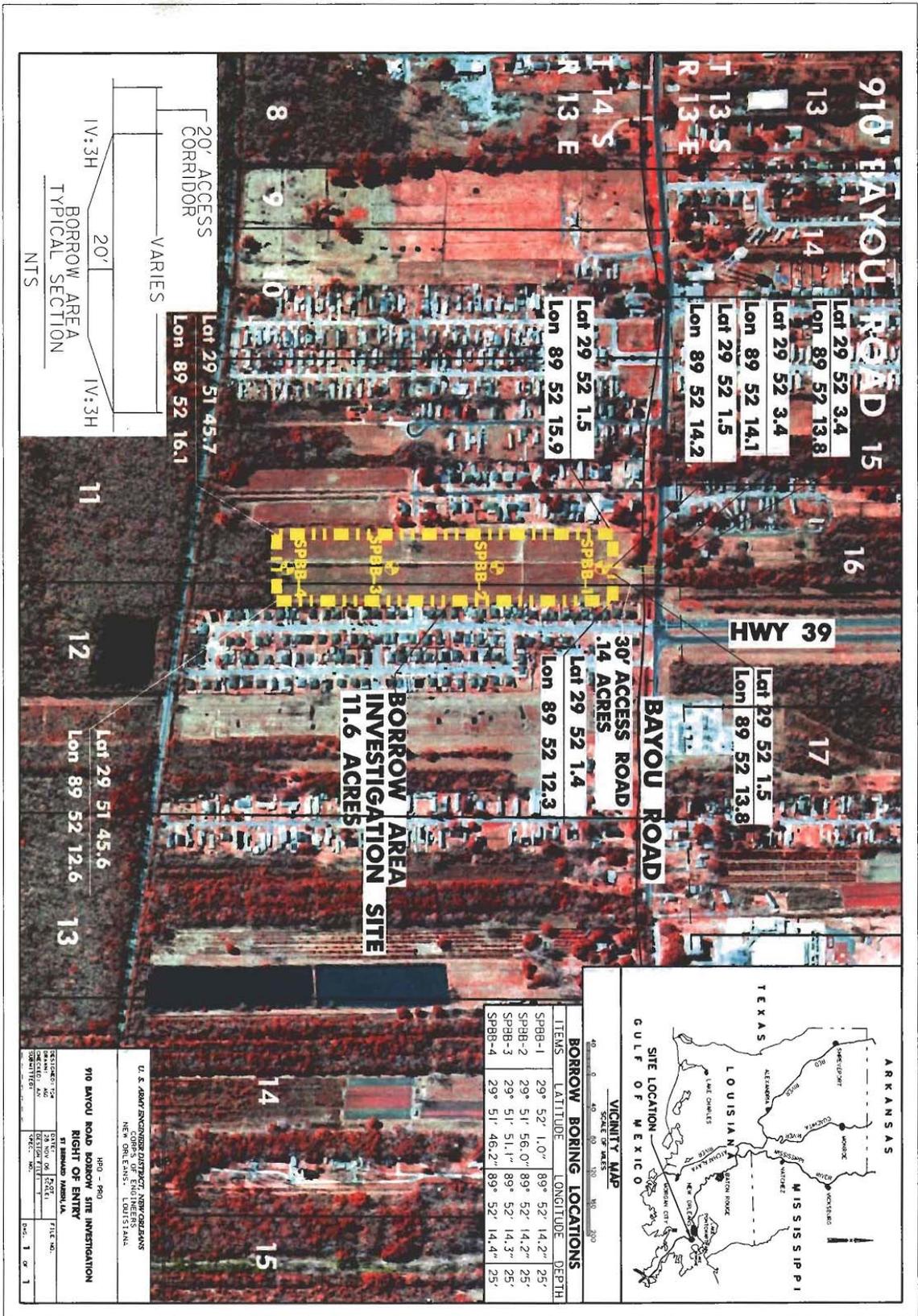


Figure 8: 910 Bayou Road

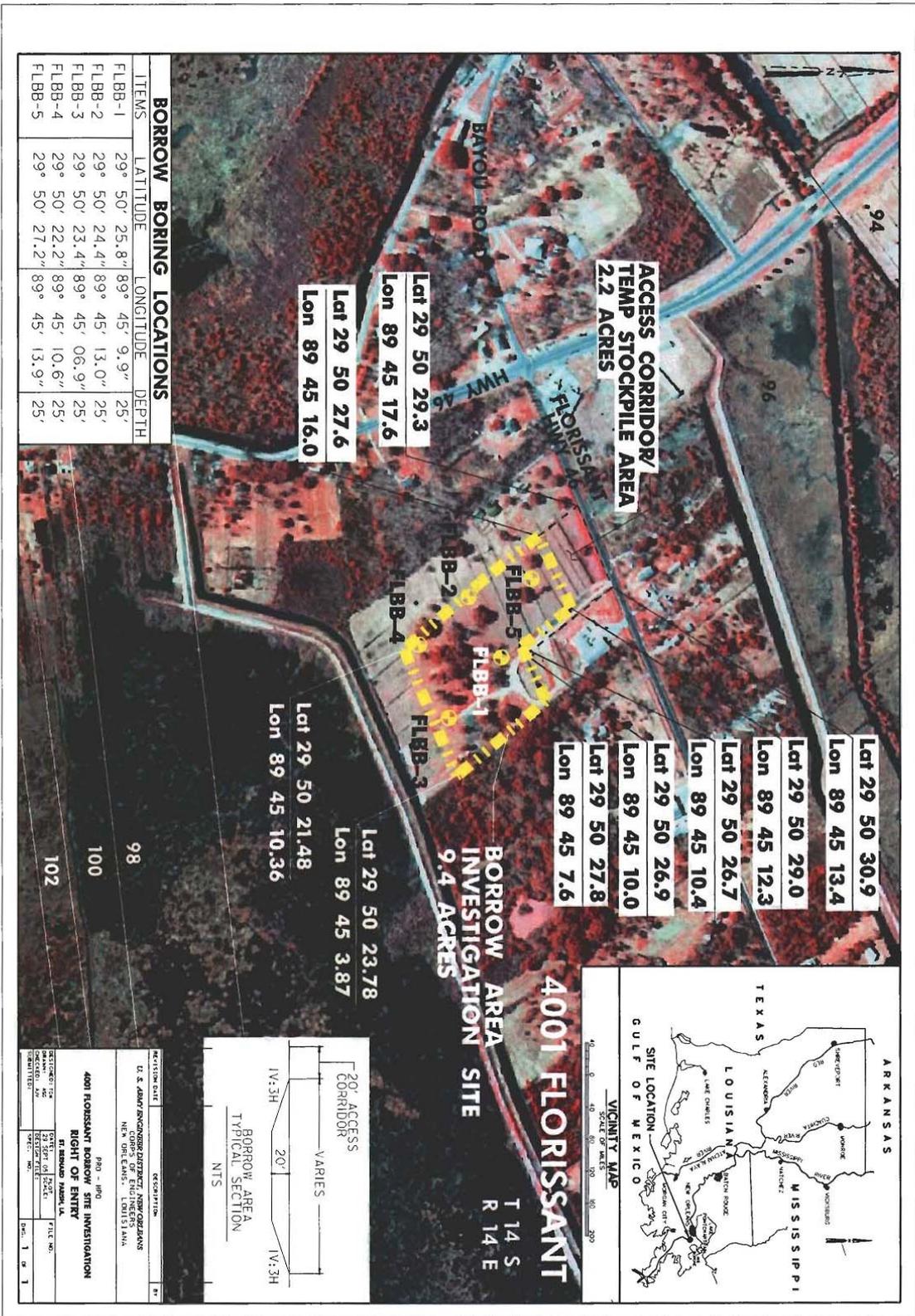


Figure 9: 4001 Florissant

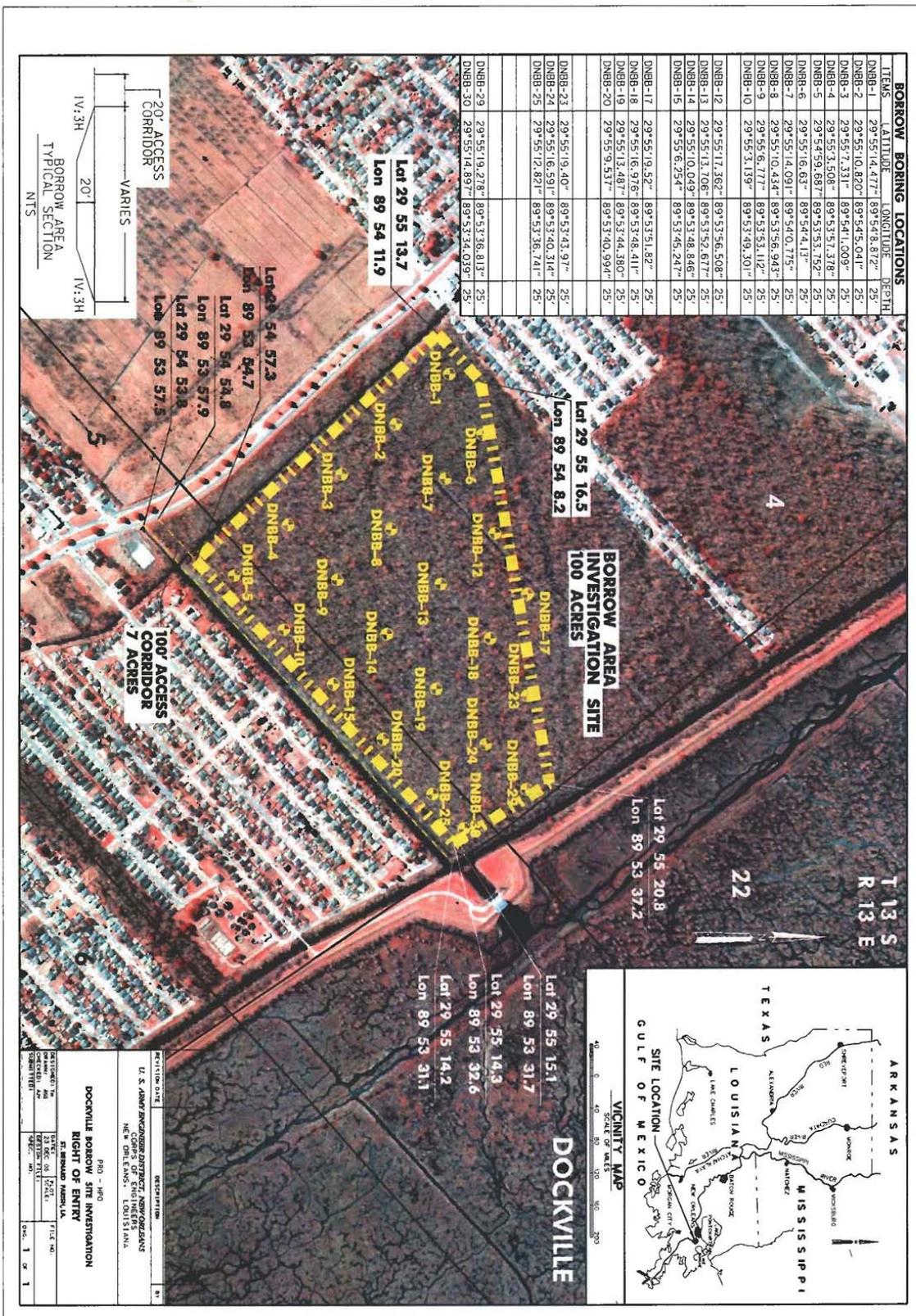


Figure 10: Dockville

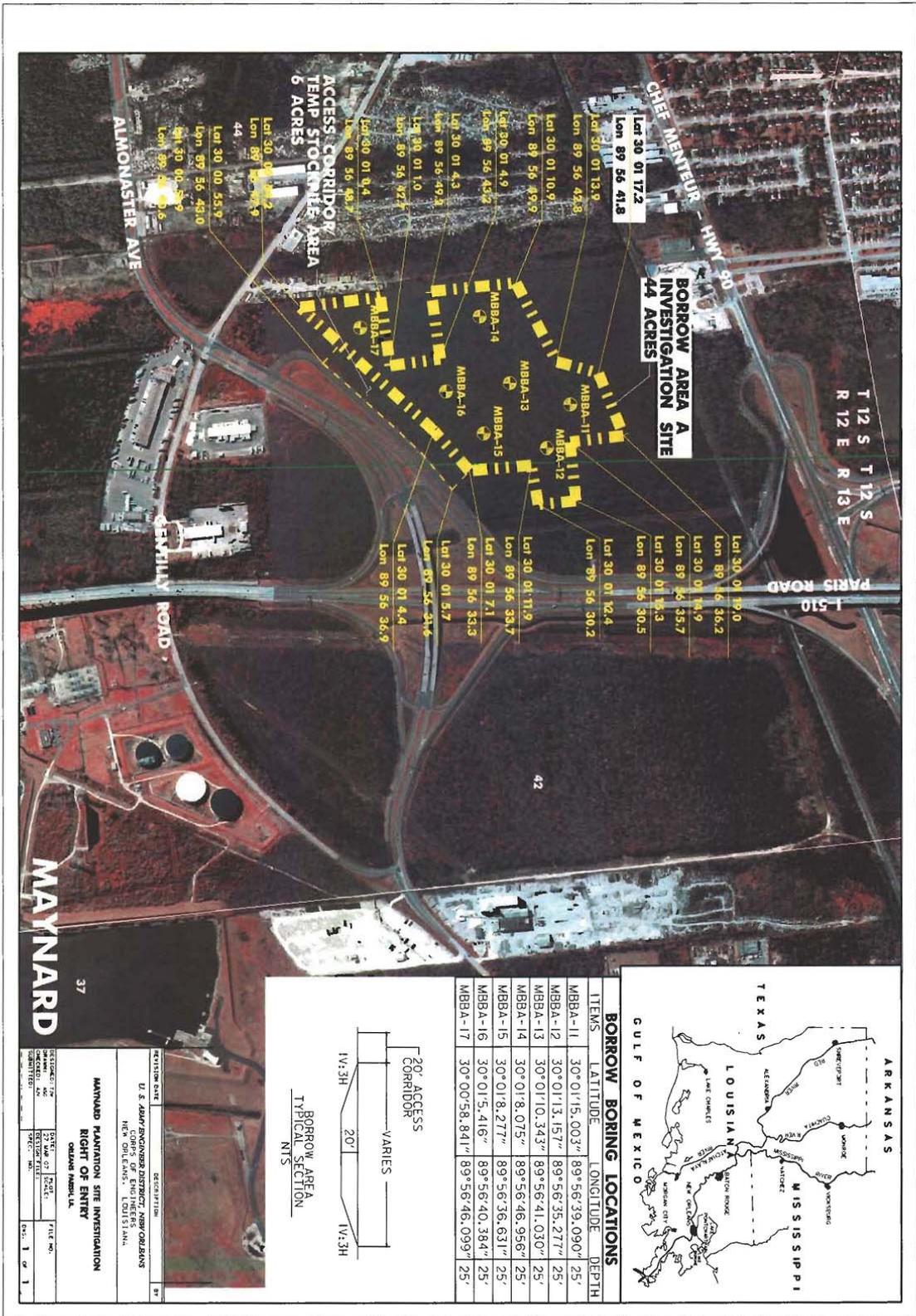


Figure 13: Maynard

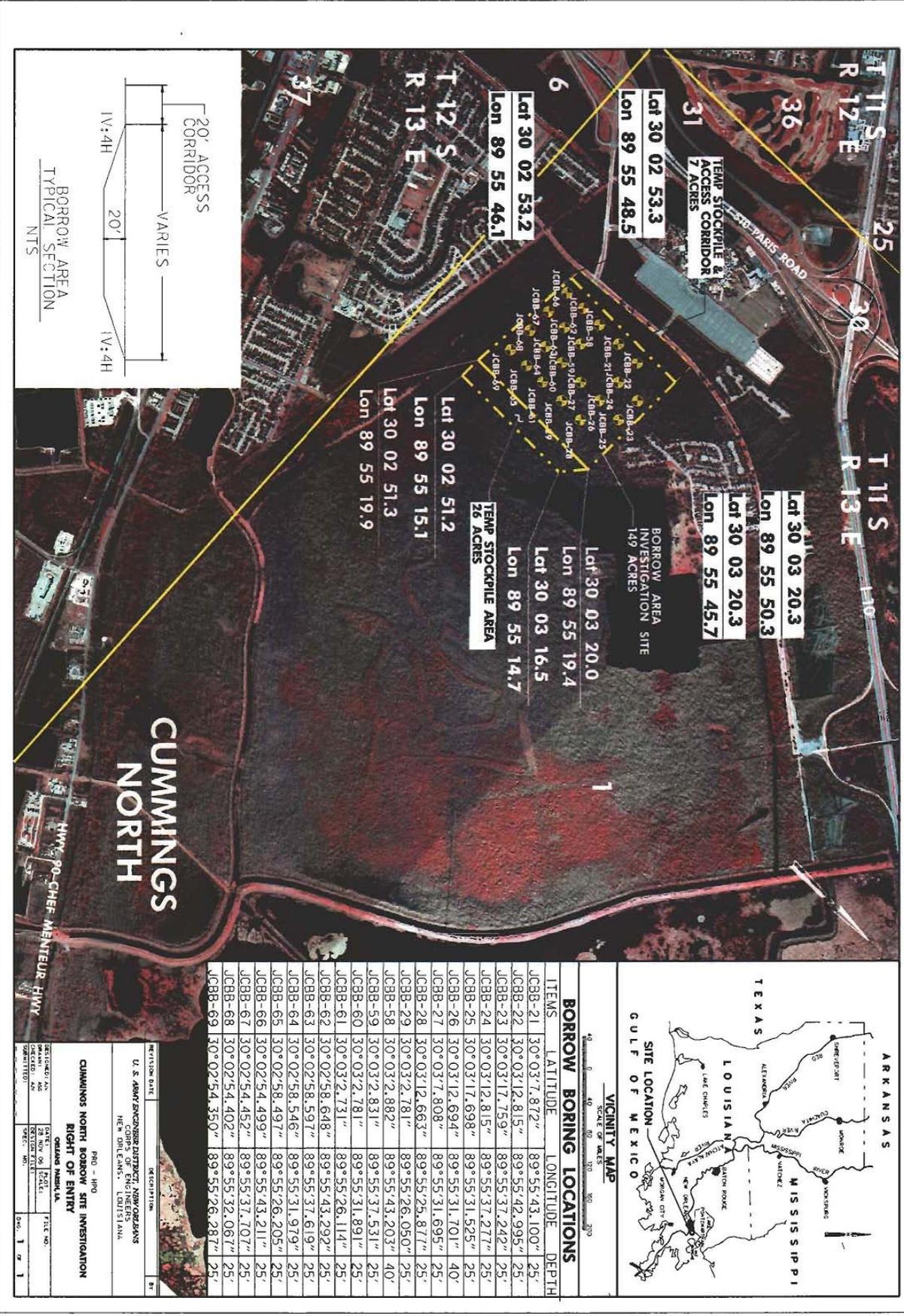


Figure 14: Cummings North

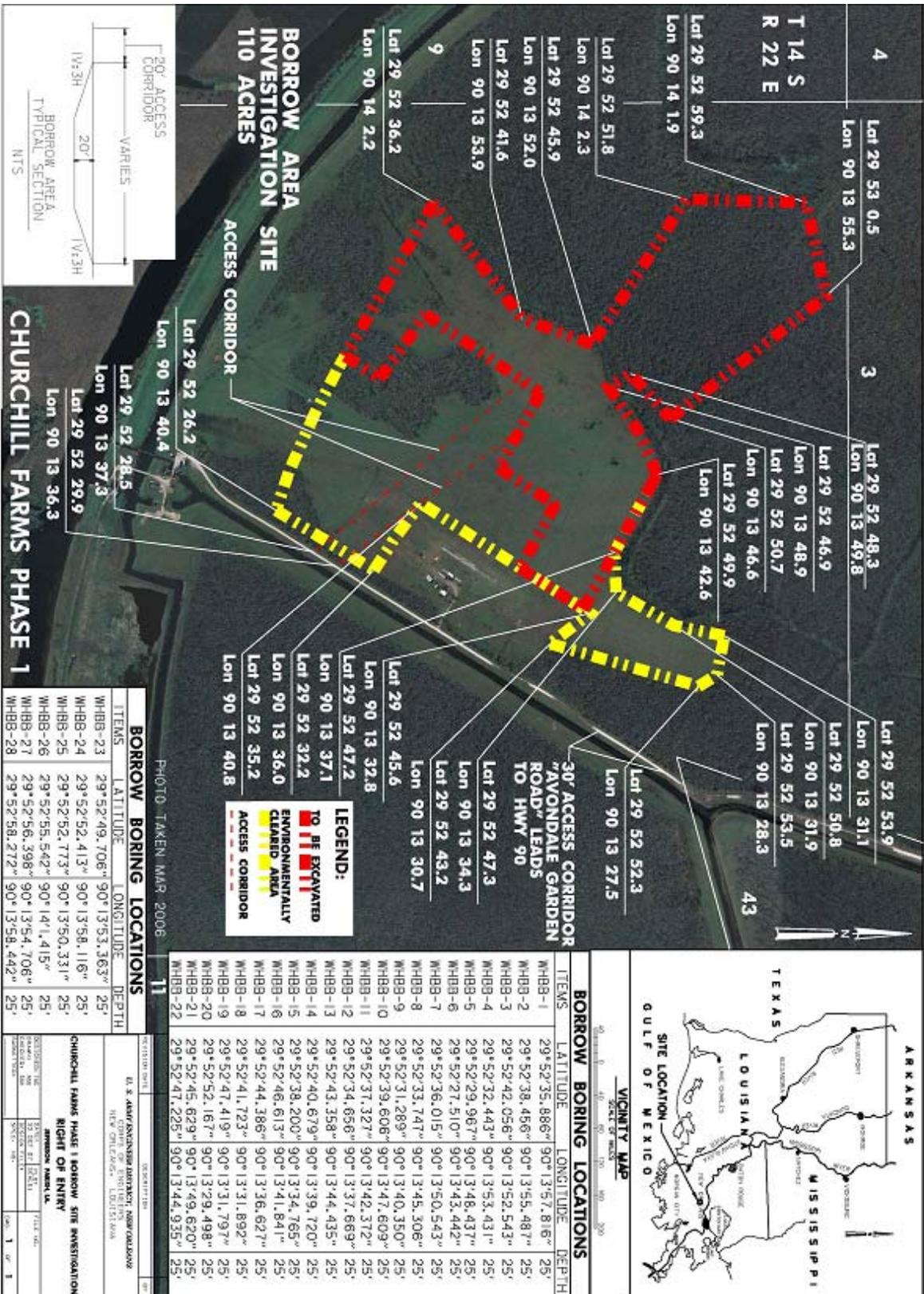


Figure 15: Churchill Farms Pit A



Figure 16: Westbank Site G

- The Cummings North area is located on the east side of Michoud Boulevard in Orleans Parish, Louisiana (Figure 14). The area was initially investigated for borrow suitability on 2,000 acres. However, 1,263 acres were excluded because of the presence of jurisdictional wetlands, and 510 acres excluded because of unsuitable soils. The proposed borrow area is 182 acres of young Chinese tallow trees, including a 7 acre access corridor and 26 acre stockpile area. Most of the trees in the area died from wind damage and inundation during Hurricane Katrina. The area is now covered in dewberry and some Chinese tallow. The proposed borrow area is expected to contain approximately 4,000,000 cubic yards of suitable borrow material.
- The Churchill Farms Pit A area is located on the south side of Highway 90 in Jefferson Parish, Louisiana (Figure 15). The 110-acre area contains approximately 43 acres of forested land and the remaining area is non-wetland pasture. The proposed borrow area is expected to contain approximately 1,150,000 cubic yards of suitable borrow material.
- The Westbank Site G is located on the south side of Highway 90 in Jefferson Parish, Louisiana (Figure 16). The 82-acre area is forested land. The proposed borrow area is expected to contain approximately 1,800,000 cubic yards of suitable borrow material.
- The Bonnet Carré Spillway area between the Mississippi River and Airline Highway has been used as a Government Furnished borrow source since 1985. The area has been disturbed by sand haulers maintaining the Spillway, and existing borrow pits are scattered throughout the area. The area of the Spillway north of Airline Highway (herein referred to as Bonnet Carré North) encompasses 680 acres (Figure 17). The new proposed borrow areas would be designed and constructed with gradual side slopes, irregular shapes, and have some islands to provide fishery habitat. The Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River Report 4: Part V (Appendix D), and CEMVN operating procedures will be referred to when designing the borrow areas. The proposed Bonnet Carré North borrow area is expected to contain approximately 16,932,000 cubic yards of suitable borrow material.

Some of the proposed borrow areas have a designated stockpile area. If additional material is needed for levee construction, the stockpile areas may be utilized as a borrow source if suitable soils are present, rather than impacting new areas.

2.4 Alternatives to the Proposed Action

Another alternative to the proposed action was considered. This was the No-Action alternative.

No-Action. Under the No Action alternative the proposed borrow areas would not be used by CEMVN. The borrow areas listed in the proposed action would not be excavated. HPS projects would be built to authorized 100-year levels using other sources of material from as yet identified sources.

Contractor Furnished Borrow Material. Due to the large quantities of clay material needed for the 100-year HPS projects pre-approved Contractor Furnished borrow is an option that will be discussed in IER 19. IER 19 will also discuss barging or utilizing railroad to transport clay material from a remote area(s) as an alternative.

2.5 Alternatives Eliminated from Further Consideration

The following investigated areas were deemed unsuitable by CEMVN for HPS activities:

- The Cummings South area is located in Orleans Parish. This 153 acre area was investigated, but was declined due to wetlands and unsuitable soil conditions. The area was not investigated any further and will not be used as a Government Furnished borrow source.
- The Myrtle Grove North area is located in Plaquemines Parish. The area was 14.7 acres, and according to a CEMVN jurisdictional wetland determination the area contained 3.65 acres of wetlands mixed into upland areas, making it impractical to excavate without disturbing the wetlands. The area was not investigated any further and will not be used as a Government Furnished borrow source.
- The Fisher area is located in St. Bernard Parish. The area was investigated, and a CEMVN jurisdictional wetland determination indicated that the 17.7 acre area contained approximately 15 acres of wetlands and had an unresolved wetland filling violation. Therefore, the area was not investigated any further and will not be used as a Government Furnished borrow source.
- City Park ponds were offered as a potential borrow source by Orleans Parish. The area was declined because the parish wanted debris and silt removed from the ponds to maintain a shallow depth.
- The Kenilworth area is located in St. Bernard Parish. It was declined because the 11.7 acre site contained 3 acres of wetlands and 3 acres of mixed wetlands. The site was declined because it was deemed too small to provide a sizeable amount of borrow material.
- The Bohemia area is located on the north side of Highway 15 in Plaquemines Parish. The 146 acre area was declined because of unsuitable soil conditions.
- The Vise Highway 46 (St. Bernard Parish), 3336 Bayou Road (St. Bernard Parish), 2938 Bayou Road (St. Bernard Parish), 2129 Bayou Road (St. Bernard Parish), and Oak Grove Lane (Plaquemines Parish) areas were declined because the areas were too small.

3. Affected Environment and Environmental Consequences

3.1 Environmental Setting

The proposed borrow areas described in this IER are located in Jefferson, Orleans, St. Charles, Plaquemines, and St. Bernard parishes. The area is bounded to the north by Lake Pontchartrain and to the east by the Bonnet Carré Spillway heading south into Lake Salvador and eventually into marsh. The area is bordered on three sides by an extensive marsh system that provides a barrier between the cities within these parishes and the Gulf of Mexico. Louisiana's coastal plain remains the largest expanse of coastal wetlands in the contiguous United States. The five St. Bernard Parish areas are located in an urban area of the parish. Four of the areas are located behind the Federal levee system and the 4001 Florissant area is outside. The Triumph area is located in a rural area of Plaquemines Parish while the Belle Chasse area is more urban due to its location on the Naval Base. The Maynard and Cummings North areas are located in the New Orleans East industrial area. The Churchill Farms Pit A and Westbank Site G proposed borrow

area are located in an urban area south of Highway 90. The Bonnet Carré North area is located in a rural area between the Mississippi River and Lake Pontchartrain.

Fauna and Flora

The Louisiana Coastal Plain area contains an extraordinary diversity of estuarine habitats that range from narrow natural levee and beach ridges to expanses of bottomland hardwood (BLH) forest, forested swamps and fresh, brackish, saline marshes, and pasture lands. The wetlands support various functions and values, including commercial fisheries harvesting of furbearers, recreational fishing and hunting, ecotourism, critical wildlife habitat (including threatened and endangered species), water quality improvement, navigation and waterborne commerce, flood control, and buffering protection from storms.

Terrestrial animals that may inhabit some of the proposed borrow areas include nutria, muskrat, raccoon, mink, and otter, which are harvested for their furs. White-tailed deer, feral hogs, rabbits, various small mammals, and a variety of birds, reptiles, and amphibians also occur in the study area. Forests, wetlands, bottomland hardwood forests, and pastures may be found in some of the proposed borrow areas. Agricultural crops grown in the vicinity of some of the proposed borrow areas include citrus fruits and truck crops.

Soils

Soil data for the twelve areas were compiled using the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2007). The mapped soil units are shown in Table 1.

Geotech borings were collected at each area to determine the suitability of the material for levee construction use. The borings were spaced to adequately define the material in the pit, but in no case spaced greater than 500 feet on center. Borings along the proposed borrow area boundary were located no further than one-half of the boring spacing in the area or 250 feet, whichever was less.

The soils were classified, logged, and recorded within seven days of obtaining the samples in the field. The Unified Soil Classification System was used in classifying the soils. A water content determination was made and recorded on all samples classified as fat clay (CH), lean clay (CL), and silt (ML) at one foot intervals (recommended) or two foot intervals (required). For (CH), (CL), and (ML) soils, Atterberg Limits and Organic Content Testing (American Society of Testing and Materials [ASTM] D 2974, Method C), was required every five feet (minimum). Samples with moisture contents at 70% or higher or having a Liquid Limit of 70 or higher were tested for organic content, as well as for a sample two feet above and two feet below that sample (2.5 feet also acceptable). Grain size distribution determinations including both sieve (#200 sieve required) and hydrometer testing was required for samples that classify as CL with a plasticity index (PI) greater than 10 for 2 or more consecutive feet, but not more than one test every 5 feet of sampling.

The resulting classification, plasticity, water content, and organic content determinations and borrow area boring logs with GPS readings at the boring locations were analyzed for potential borrow use by CEMVN to determine the suitability of the soil (Table 1). Geotech testing and soil analysis is ongoing at some of the areas; the area acreages may change due to the results.

Table 1: Soil Survey Map Units

Proposed Borrow Area	Parish	Soil map unit(s)	Slope	Shrink-swell potential	Drained
1418/1420 Bayou Rd.	St. Bernard	Cancienne silt loam	Less than 1%	Moderate	Somewhat poorly
		Cancienne silty clay loam	Less than 1%	Moderate	Somewhat poorly
1572 Bayou Rd.	St. Bernard	Cancienne silt loam	Less than 1%	Moderate	Somewhat poorly
		Shriever clay	Less than 1%	Very High	Poorly
910 Bayou Rd.	St. Bernard	Cancienne silt loam	Less than 1%	Moderate	Somewhat poorly
		Cancienne silty clay loam	Less than 1%	Moderate	Somewhat poorly
4001 Florissant	St. Bernard	Cancienne silt loam	Less than 1%	Moderate	Somewhat poorly
		Shriever clay	Less than 1%	Very High	Poorly
Dockville	St. Bernard	Shriever clay	Less than 1%	Very High	Poorly
		Westwego clay	Less than 1%	High	Poorly
Triumph	Plaquemines	Harahan clay	Less than 1%	Very High	Poorly
Belle Chasse	Plaquemines	Shriever clay	Less than 1%	Very High	Poorly
		Rita mucky clay	Less than 1%	Low	Poorly
Maynard	Orleans	Harahan clay	Less than 1%	Very High	Poorly
		Shriever clay	Less than 1%	Very High	Poorly
Cummings North	Orleans	Kenner muck, drained	Less than 1%	Low	Poorly
Churchill Farms Pit A	Jefferson	Kenner muck	Less than 0.5%	Very High	Very poorly
Westbank Site G	Jefferson	Harahan clay	Less than 1%	Very High	Poorly
		Shriever clay	Less than 1%	Very High	Poorly
Bonnet Carré North	St. Charles	Cancienne frequently flooded	0-3%	Low	Somewhat poorly

3.2 Significant Resources

This section contains a list of the significant resources located in the vicinity of the proposed action, and describes in detail those resources that would be impacted, directly or indirectly, by the alternatives. Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are discussed in Section 4.

The resources described in this section are those recognized as significant 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. Further detail on the significance of each of these resources can be found by

contacting CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of these resources, as well as the laws and regulations governing each resource. Search for “Significant Resources Background Material” in the website’s digital library for additional information. Table 2 shows those significant resources found within the project area, and notes whether they would be impacted by the proposed alternative.

Table 2: Significant Resources in Project Study Area

Significant Resource	Impacted	Not Impacted
Jurisdictional Wetlands		X
Non-Jurisdictional Bottomland Hardwood Forest	X	
Non-Wetland Resources/Upland Resources	X	
Prime and Unique Farmland	X	
Fisheries		X
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Recreational Resources		X
Noise	X	
Air Quality	X	
Water Quality		X
Aesthetics		X
Socioeconomics	X	
Transportation	X	

3.2.1 Jurisdictional Wetlands

Existing Conditions

The jurisdictional wetland habitat types in the proposed borrow areas may include pasture wetlands and cypress swamps. The jurisdictional wetlands contain hydrophytic vegetation, hydric soils, and hydrology indicators. Pasture wetlands are comprised of soft rushes, flat sedges, smartweed, alligator weed, and other wetland grasses. Cypress swamp areas are dominated by bald cypress and tupelo gum. The jurisdictional bottomland hardwood tree species include hackberry, Chinese tallow tree, pecan, American elm, live oak, water oak, green ash, bald cypress, black willow, box elder, and red maple.

The CEMVN Regulatory Functions Branch delineated jurisdictional wetlands during initial investigations of potential borrow areas.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to jurisdictional wetlands at the proposed borrow areas would occur.

Proposed Action

With implementation of the proposed action no direct or indirect impact to jurisdictional wetlands at the proposed borrow areas would occur. The jurisdictional

wetland areas determined by the jurisdictional wetland determination provided by the Regulatory Functions Branch would be avoided (Table 3). The remaining areas would be used as a borrow source.

Table 3: Jurisdictional Wetland Acreage Avoided

Proposed Borrow Area	Parish	Initial Area Investigated (acres)	Jurisdictional Wetlands Avoided (acres)	Size After Jurisdictional Wetland Avoidance (acres)
1418/1420 Bayou Rd.	St. Bernard	43.4	21.4	22
Dockville	St. Bernard	144	49	95
Maynard	Orleans	102	58	44
Bonnet Carré North	St. Charles	1,115	435 mixed	680
Cummings North	Orleans	2,000	1,263	182

The Cummings North area had additional areas avoided due to geotech analysis.

3.2.2 Non-Jurisdictional Bottomland Hardwood Forest
Existing Conditions

The non-jurisdictional bottomland hardwood (BLH) forests are comprised of dominant species such as hackberry, Chinese tallow tree, pecan, American elm, live oak, water oak, green ash, bald cypress, black willow, box elder, and red maple. Some understory species include dewberry, lizard’s tail, and poison ivy. A variety of birds utilize these hardwoods for nesting, breeding, brooding, and as perches. Hard mast (nuts) and soft mast (samaras, berries) provide a valuable nutritional food source for birds, mammals, and other wildlife species. Non-jurisdictional BLH forests do not meet the hydrology criteria for wetlands due to forced drainage features (e.g., manmade ditches, canals, pumping stations).

- The 1418/1420 Bayou Road area includes 13 acres of forested area, comprised of red maple, box elder, pecan, Chinese tallow tree, hackberry, and live oaks.
- The 1572 Bayou Road area contains 3.7 acres of forested area, comprised of box elder, red maple, Chinese tallow tree, pecan, hackberry, and live oaks.
- The Dockville area is 107 acres of forested non-wetlands. The tree canopy is comprised of red maple, green ash, box elder, elm, bald cypress, hackberry, Chinese tallow tree, and live oak.
- The Belle Chasse area contains 8 acres of black willow, Chinese tallow, red maple, and hackberry.
- The Maynard area contains 44 acres of forested areas with species including Chinese tallow tree, red maple, box elder, and mulberry.
- The Churchill Farms Pit A area contains 43 acres of forested land. The forested area is dominated by Chinese tallow tree.
- The Cummings North area contains 182 acres of young Chinese tallow forest.
- The Westbank Site G would impact 82 acres of forested land.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impacts to BLH forest would occur to the proposed borrow areas described in this document.

Proposed Action

With implementation of the proposed action there would be direct and indirect impacts to BLH forest. Mature trees would be cut down with the use of chainsaws or pushed down with bull dozers and excavators. Saw logs could be sold to the mill and younger trees could be processed into pulp wood for paper products. Woody debris leftover would be cleaned up and all berms would be leveled to eliminate hydrologic impacts. Once excavated the area would no longer be viable for silviculture practices and some wildlife habitat would be removed. The area would be converted to ponds and small lakes if water is retained, or by vegetation and woody plants if water is not retained. It is expected that either type of area would attract a variety of wildlife including birds, reptiles, amphibians, and small mammals.

This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have unavoidable impacts to a total of 482.7 acres and 214.62 Average Annualized Habitat Units (AAHUs) of non-jurisdictional BLH. (Habitat Units represent a numerical combination of habitat quality [Habitat Suitability Index] and habitat quantity [acres] within a given area at a given point in time. Average Annual Habitat Units represent the average number of Habitat Units within any given year over the project life for a given area.) Mitigation for unavoidable impacts to non-jurisdictional BLH will be described under a separate IER.

3.2.3 Non-Wetland Resources/Upland Resources

Existing Conditions

Species identified in the non-wet pasture areas include Johnson grass, yellow bristle grass, annual sumpweed, arrow-leaf sida, vasey grass, Brazilian vervain, and eastern false-willow. The scrub/ shrub areas are comprised of Chinese tallow tree, eastern false-willow, wax myrtle, giant ragweed, dew berry, elderberry, red mulberry, pepper vine, and dog-fennel.

The areas listed below show representative vegetation found in the pasture and scrub/ shrub areas.

- The 910 Bayou Road area is approximately 11.7 acres of pasture land. The herbaceous layer comprised of Johnson grass, vasey grass, and great ragweed.
- The 4001 Florissant area is approximately 11.6 acres of non-wet pasture. The herbaceous layer is comprised of yellow bristle grass, annual sumpweed, arrow-leaf sida, eastern false-willow, and Johnson grass.
- The Cummings North area is 182 acres of overgrown thicket predominately dewberry and some Chinese tallow saplings.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to non-wetland resources/ upland resources at the proposed borrow areas.

Proposed Action

With implementation of the proposed action non-wetland resources/upland resources would be cleared and excavated. The areas would likely be converted to ponds and small lakes. The pasture areas would no longer provide grasses for herbivores such as deer, rabbits, and cattle. The thick scrub/shrub areas that provided cover for wildlife would be removed. Some scrub/shrub areas may redevelop around the borrow pit perimeters in time. Borrow pits that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss. The Bonnet Carré North area would hold water, and fill in with sediment if and when the Bonnet Carré Spillway is open.

3.2.4 Prime and Unique Farmland

Existing Conditions

Eight proposed borrow areas contain prime and unique soils according to the NRCS (Table 4). The Maynard area is located in an area that is zoned as urban and developed in Orleans Parish and is exempt.

Table 4: Prime and Unique Farmland Soils Present

Proposed Borrow Area	Parish	Soil map unit(s)	Prime and Unique Farmland Present	Acres of Prime and Unique Farmland
1418/1420 Bayou Rd.	St. Bernard	Cancienne silt loam	Yes	22.0
		Cancienne silty clay loam	Yes	
1572 Bayou Rd.	St. Bernard	Cancienne silt loam	Yes	9.5
		Shriever clay	Yes	
910 Bayou Rd.	St. Bernard	Cancienne silt loam	Yes	11.6
		Cancienne silty clay loam	Yes	
4001 Florissant	St. Bernard	Commerce silt loam	Yes	10.8
		Shriever clay	Yes	
Dockville	St. Bernard	Shriever clay	Yes	80.0
		Westwego clay	No	
Triumph	Plaquemines	Harahan clay	No	N/A
Belle Chasse	Plaquemines	Shriever clay	Yes	N/A

		Rita mucky clay	No	
Maynard	Orleans	Harahan clay	exempt	N/A
		Shriever clay	exempt	N/A
Cummings North	Orleans	Kenner muck, drained	No	N/A
Churchill Farms Pit A	Jefferson	Kenner muck	No	N/A
Westbank Site G	Jefferson	Harahan	No	N/A
		Shriever clay	Yes	66.0
Bonnet Carré North	St. Charles	Cancienne frequently flooded	No	N/A

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to prime and unique farmlands would occur to the proposed borrow areas.

Proposed Action

With implementation of the proposed action prime and unique farmlands would be cleared and excavated. Removing soils from these proposed borrow areas would result in a permanent loss of prime and unique farmlands and the areas would no longer be available for farming. The proposed borrow areas would most likely fill with water and be converted to ponds or small lakes. Borrow areas that do not retain water would probably not be able to produce food and fiber crops. The land would no longer provide grasses for herbivores such as deer, rabbits, or cattle.

3.2.5 Fisheries

Existing Conditions

The Bonnet Carré North area is the only proposed borrow area that contains fisheries. Fish observed in Bonnet Carré’s existing borrow ponds include mosquitofish, killifish, shortnose and spotted gar, redbfin shad, bass, bluegill, and catfish.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to fisheries would occur.

Proposed Action

With implementation of the proposed action non-jurisdictional wetland and upland resources would be cleared and excavated. The existing Bonnet Carré North borrow ponds would be pumped into adjacent ponds, and some fish mortality may occur. Dry land sites may be converted to ponds and small lakes. The areas could provide fishery habitats if stocked by landowners, which would not be inconsistent with other

land uses near the project area. Fish that may thrive in the borrow pits include mosquitofish, killifish, shortnose and spotted gar, redbfin shad, bass, bluegill, and catfish. Landowners could enjoy benefits from fishing once the areas are established.

If overburden is sufficient, sloped and fringe shallows may be created to provide shallows for both near edge and submergent vegetative growth. Overburden material would be used, to the maximum extent practicable, to create fringe wetlands and fishery habitats.

3.2.6 Wildlife

Existing Conditions

The study area contains a great variety of mammals, birds, reptiles, and amphibians. Species inhabiting the area include nutria, muskrat, mink, otter, raccoon, white-tailed deer, skunks, rabbits, squirrels, armadillos, and a variety of smaller mammals. Wood ducks and some migratory waterfowl may be present during winter, especially in the Triumph area due to the proximity of the Mississippi River, which is a major flyway, as well as in coastal wetlands.

Non-game wading birds, shore birds, and sea birds including egrets, ibis, herons, sandpipers, willets, black-necked stilts, gulls, terns, skimmers, grebes, loons, cormorants, and white and brown pelicans are found in the project vicinity. Various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks may be present. Passerine birds in the areas include sparrows, vireos, warblers, mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, cardinals, and crows. Many of these birds are present primarily during periods of spring and fall migrations. The areas may also provide habitat for the American alligator, salamanders, toads, frogs, turtles, and several species of poisonous and nonpoisonous snakes.

The bald eagle is a raptor that is found in various areas throughout the United States and Canada as well as throughout the study area. Bald eagles are federally recognized under the Bald Eagle Protection Act of 1940. The bald eagle feeds on fish, rabbits, waterfowl, seabirds, and carrion (Ehrlich et al. 1988). The main basis of the bald eagle diet is fish, but they will feed on other items such as birds and carrion depending upon availability of the various foods. Eagles require roosting and nesting habitat, which in Louisiana consists of large trees in fairly open stands (Anthony et al. 1982). Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern parishes.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to wildlife would occur to the proposed borrow areas.

Proposed Action

With implementation of the proposed action wildlife would be displaced when the areas are cleared and excavated. The areas may be converted to ponds and small lakes. At that time, some aquatic vegetation may colonize the shallow littoral edge of the pits, and wildlife (otters, alligators, raccoons, wading birds, and ducks) adapted to an aquatic environment would be expected to expand their range into the

new waterbodies. A variety of plant types may develop adjacent to the water that could provide important wildlife habitat utilized for nesting, feeding, and cover. Any pits that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss. The dense vegetation could attract a variety of wildlife including birds, reptiles, amphibians, and small mammals.

A recent survey conducted by the Louisiana Department of Wildlife and Fisheries (LDWF) confirmed that a new eagle nest was built in the vicinity of one of the proposed borrow areas. The nest would be avoided by 1,500 feet as per USFWS guidance from the Bald Eagle Act. An eagle nest was in the vicinity but outside the 1,500-foot buffer zone required by the USFWS of another proposed borrow area. The USFWS concurred with the CEMVN in a 29 May, 2007 memo that the proposed borrow areas were not likely to adversely affect bald eagles or their critical habitat.

3.2.7 Threatened and Endangered Species

Existing Conditions

The brown pelican was the only T&E species that may be in the vicinity of the proposed borrow areas. It is a year-round resident that typically forages on fish throughout the study area. In winter, spring, and summer nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Small coastal islands and sand bars are typically used as loafing areas and nocturnal roosting areas.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impacts to threatened or endangered species or their critical habitats would occur to the proposed borrow areas.

Proposed Action

The proposed action is not likely to adversely affect these T&E species or their critical habitats. The endangered brown pelican may be present in the project vicinity. However, none were seen at the borrow areas described in this document. The USFWS concurred with the CEMVN that excavation of the proposed borrow areas would not be likely to adversely affect the brown pelican or other T&E species, or their critical habitat (Table 5).

Table 5: USFWS T&E Concurrence

Proposed Borrow Area	USFWS Concurrence
1418/1420 Bayou Rd.	15 March, 2007
1572 Bayou Rd.	15 March, 2007
910 Bayou Rd.	7 March, 2007
4001 Florissant	7 March, 2007
Dockville	15 March, 2007
Triumph	20 August, 2007
Belle Chasse	17 April, 2007
Maynard	29 May, 2007
Cummings North	5 April, 2007
Churchill Farms Pit A	17 April, 2007

Westbank Site G	24 May, 2007
Bonnet Carré North	29 May, 2007

3.2.8 Cultural Resources

Existing Conditions

Cultural resources have been considered for each proposed borrow area (Table 6). The level of investigation varied depending on the probability of cultural resources being located within the project area. CEMVN Archaeologists initially evaluated the proposed borrow areas to identify known cultural resources and to assess the potential presence of unrecorded sites. In some cases, CEMVN contracted Cultural Resource Management (CRM) consulting firm to further investigate the proposed areas. Investigations varied for each project area and included background research, reconnaissance surveys, and in some cases subsurface testing (Handly et al. 2007). Section 106 of the National Historic Preservation Act, as amended, involved consultation with the Louisiana State Historic Preservation Officer (LASHPO) and Native American tribes. Initially, consultation was limited to the LASHPO and their staff at the Louisiana Division of Archaeology and the Louisiana Division of Historic Preservation. The consultation was later expanded to include twelve Federally recognized tribes that have an interest in the region.

The results of these investigations revealed that no known listed National Register of Historic Places properties or sites eligible for listing on the National Register of Historic Places exist within the proposed borrow area locations. Background research of the Bonnet Carré North area revealed that no known cultural resources were present within the proposed 680 acre parcel. While the geomorphology and land use history of the Bonnet Carré North area suggests that it is highly unlikely that cultural resources exist within this parcel, the current conditions made testing impracticable.

Archaeological surveys in the vicinity of the proposed borrow areas have identified both prehistoric and historic sites in the vicinity of the proposed action (Wiseman et al. 1979). Given the recent geologic development of the Mississippi delta and the age of deposits within the project area, archaeological sites are not expected to date prior to the Poverty Point phase (1700 – 500 B.C.) (Wiseman et al. 1979). Prehistoric sites, such as shell middens, hunting and gathering camps, habitation sites, villages, and mound sites, tend to be located on active and abandoned distributary channel levee complexes, major beach ridges and on older stable portions of the delta, and in association with freshwater marshes. Similarly, historic period sites, such as forts, plantations, and industrial features tend to be located on levees and waterways.

The dynamic nature of flooding and sedimentation from the Mississippi River has likely buried some archaeological sites, and subsidence has likely inundated others. The proposed borrow areas tend to be located in drained backswamps. While backswamps were utilized for resource extraction during both prehistoric and historic periods, there is little evidence of occupation within this habitat, and thus the likelihood for the presence of undiscovered cultural sites within the proposed project area remains low.

Table 6: Summary of Cultural Resource Investigations & Section 106 Consultation for Government Furnished Borrow Areas

Borrow Area	Cultural Resource Investigations	Date Consulting Party Provided Concurrence on the Project											
		LA SHPO	Chitimacha Tribe of LA	MS Band of Choctaw Indians	Alabama Coushatta Tribe of TX	Caddo Nation of OK	Choctaw Nation of OK	Coushatta Tribe of LA	Jena Band of Choctaw Indians	Quapaw Tribe of OK	Seminole Nation of OK	Seminole Tribe of FL	Tunica-Biloxi Tribe of LA
1418/1420 Bayou Road	CEMVN Investigation	9/14/06	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
1572 Bayou Road	CEMVN Investigation	9/14/06	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
910 Bayou Road	Phase I Cultural Resource Survey by R. Christopher Goodwin	3/29/07	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
4001 Florissant	Phase I Cultural Resource Survey by R. Christopher Goodwin	1/22/07	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dockville	CEMVN Investigation	6/6/07	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Belle Chasse Naval Air Base	Phase I Cultural Resource Survey by Hardlines Design Company	5/31/07	NR	5/7/07	NR	NR	5/3/07	NR	NR	5/3/07	NR	NR	NR
Triumph	CEMVN Investigation	11/7/05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Maynard	Reconnaissance Survey by Earth Search, Inc.	6/7/07	NR	5/11/07	NR	NR	5/22/07	NR	NR	NR	NR	NR	NR
Cummings North	COE Investigation	10/5/06 & 5/8/07	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Churchill Farms Pit A	Reconnaissance Survey by Earth Search, Inc.	8/14/07	NR	NR	NR	NR	7/30/07	NR	NR	NR	7/30/07	NR	NR
Westbank site G	Reconnaissance Survey by Earth Search, Inc.	8/14/07	NR	NR	NR	NR	7/30/07	NR	NR	NR	7/30/07	NR	NR
Bonnet Carré North	Background Research and Proposed monitoring	6/18/07	NR	6/12/07	NR	NR	5/31/07	NR	NR	NR	NR	NR	NR

NC- This organization was *not consulted* during the consultation process

NR- Information on the proposed borrow area was sent to the organization; however, the organization did not to respond. As per 36 CFR 800.3(c)(4), no response implies concurrence with the Federal undertaking.

Discussion of Impacts

No Action

Without implementation of the proposed action, any undiscovered or unreported cultural resources or traditional cultural properties would remain intact and in their current state of preservation. The burial or subsidence of historic land surfaces would continue in the current pattern. There is no reason to believe that this alternative would have any positive or negative impact to cultural resources.

Proposed Action

With implementation of the proposed action no known cultural resources would be impacted because they would be properly buffered and avoided. CEMVN will implement an archaeological monitoring program during excavation of borrow pits at the Bonnet Carré North area to ensure that unrecorded cultural sites are not inadvertently damaged or destroyed.

Any undiscovered cultural resources may be damaged during borrow and construction operations. However, it is unlikely that any cultural sites would be inadvertently damaged because the borrow areas tend to be located in areas not associated with cultural sites. Furthermore, the CEMVN will instruct all construction contractors to halt excavations should cultural resources be encountered during the excavation of any borrow pit. Therefore, no direct or indirect impacts to cultural resources are expected, and there is no reason to believe that the proposed action would have any positive or negative impact to cultural resources or traditional cultural properties.

3.2.9 Recreational Resources

Existing Conditions

The region in which the proposed action may take place is rich with recreation resources. The potential borrow areas, with exception of Bonnet Carré North, have some recreational potential, but contain no recreational infrastructure or specific features, and are located on privately owned land not accessible to the public.

The primary function of Bonnet Carré Spillway is to relieve flooding of the Mississippi River by diverting water from the river into Lake Pontchartrain. The corridor has historically been use by the local population for recreation. In the past decade public use of the spillway for recreational purposes has become more organized and regulated. Visitors to the spillway engage in a variety of outdoor recreation activities including boating, water skiing, fishing, crawfishing, swimming, hunting, birding, dog training, camping, picnicking, birding, bicycling, operating off-road motorcycles, all-terrain vehicles (ATV), and remote controlled (R/C) airplanes.

Use of the spillway is estimated in the hundreds of thousands visitors each year, and there are several recreation outgrants and leases issued to State and Local agencies/organizations. The U.S. 61 Lower Guide Levee Recreation Area, an outgrant to St. Charles Parish, is heavily utilized and officially designated as a recreational area on the project lands. The recreation area currently features a two-lane concrete boat launch, paved parking for 15 vehicles with trailers, fishing docks, a metal shed pavilion, several picnic tables, primitive camping sites, and two portable toilets for visitors. Since 1972, CEMVN has issued annual use permits to the Spillway Radio Control Club Inc. to operate radio controlled model airplanes from a designated site near the spillway

structure. The club has an exemplary record in the maintenance of its designated area, its safe manner of operation, and its compliance with all permit conditions. More recent outgrants include the South Louisiana Trailblazers, the ATV Club maintaining the off-road ATV trails, and New Orleans Metro Area Mountain Bike Organization, which maintains the mountain bike trail. Numerous use permits for recreational activities are issued by CEMVN on a case-by-case basis. These include permits for dog trial events, cross country running races, scout groups, and similar type activities.

Discussion of Impacts

No Action

Without implementation of the proposed action there should be no direct or indirect impacts to recreation resources at the proposed borrow areas.

Proposed Action

With the exception of the actions in the Bonnet Carré North area, the proposed action should cause no significant direct or indirect impacts to recreation. In some cases, depending on how the end site is left, the habitat may be suitable to support some recreational activities it didn't previously support (e.g., wildlife viewing, fishing) on land that is privately owned and not accessible to the public.

In the Bonnet Carré North area, if and when possible, efforts would be made to avoid directly impacting the recreation infrastructure. In general, the proposed action would likely disrupt recreation activities temporarily during the excavation process. The excavated areas should retain water and become aquatic habitats that would provide additional fishing and birding areas. In some areas, the excavation may impact areas and trails designated for off-road (ATV) recreation. One of the proposed borrow areas appears to include the area utilized and maintained by the radio control airplane club. This site should be avoided if possible or recreated in another area.

3.2.10 Noise Quality

Existing Conditions

There is no data available regarding the existing conditions in the proposed borrow areas.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to noise would occur at the proposed areas.

Proposed Action

With implementation of the proposed action there would be minimal temporary impacts to noise within the project areas. The proposed borrow areas would produce elevated noise levels initially due to clearing and grubbing of the areas. Bull dozers, excavators, haul trucks, and chainsaws would be used to clear the land. Once the area is cleared excavators, diesel pumps, and haul trucks would be used during the borrow excavation. The sounds produced from this equipment are powered by diesel engines that produce about the same noise as diesel engines in commercial trucks.

Construction activities could have short term sound levels that are high. Some of these areas are in semi-residential areas, although most are in primarily rural areas.

3.2.11 Air Quality

Existing Conditions

As of June 15, 2005, the 1-hour ozone standard for the New Orleans area (Orleans, Jefferson, St. Bernard, Plaquemines, and St. Charles parishes) was revoked and replaced by an 8-hour standard. The New Orleans area is currently not subject to any conformity requirements of the Clean Air Act. In other words, these parishes are now in attainment of the 8-hour ozone standard and all other criteria pollutant National Ambient Air Quality Standards (NAAQS). The parishes listed above are currently in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impact to air quality would occur at the proposed areas.

Proposed Action

With implementation of the proposed action there would be minimal temporary impacts to air quality in Orleans, Jefferson, St. Bernard, Plaquemines, and St. Charles parishes. Dust particles would be generated by activities that disturb and suspend soils such as equipment operating on disturbed soils, bulldozing, compacting, truck dumping, and grading operations. Operation of construction equipment and support vehicles would also generate volatile organic compounds (VOCs), particulate matter (PM) 10, PM 2.5, nitrogen oxides (NO_x), carbon monoxide (CO), ozone (O₃) and sulfur oxides (SO_x) emissions from diesel engine combustion. The construction equipment and haul trucks should have catalytic converters and mufflers to reduce exhaust emissions. The construction equipment should have the same emissions as local traffic in the areas.

Dust suppression methods would be implemented to minimize dust emissions. Air emissions from the proposed action would be temporary and should not significantly impair air quality in the region. Due to the short duration of the construction projects, any increases or impacts on ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or State ambient air quality standards.

3.2.12 Water Quality

Existing Conditions

There is no data available regarding the existing conditions in the proposed borrow areas.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impacts to water quality would occur.

Proposed Action

Despite the use of best management practices, with implementation of the proposed action there would be some disturbances to water quality in the immediate vicinity of the proposed borrow areas. Silt fencing and hay bales would be installed around the perimeter of the proposed borrow areas to control runoff. To make optimal use of available material, excavation would begin at one end of the borrow area and be made continuous across the width of the areas to the required borrow depths, to provide surface drainage to the low side of the borrow pit as excavation proceeds. Excavation for semi-compacted fill would not be permitted in water nor shall excavated material be scraped, dragged, or otherwise moved through water. In some cases the borrow areas may need to be drained with the use of a sump pump. Upon abandonment, site restoration would include placing the stockpiled overburden back into the pit and grading the slopes to the specified cross-section figures. Abrupt changes in grade shall be avoided, and the bottom of the borrow pit shall be left relatively smooth and sloped from one end to the other. Any excavation below the depths and slopes specified shall be backfilled to the specified permissible excavation line in accordance with construction plans and specifications. Abrupt changes in borrow area alignment shall be avoided.

3.2.13 Transportation

Existing Conditions

Additional information on the potential impacts associated with transporting borrow material is being developed by CEMVN and will be discussed in future IERs.

- St. Bernard Parish: Bayou Road and Florissant Highway are two lane streets that intersect Highway 39 (East Judge Perez Drive), a four lane traffic corridor. The Dockville area fronts East Judge Perez Drive on the southwest. The St. Bernard Parish area is still undergoing clean-up from the devastation due to Hurricanes Katrina and Rita. As of October 2007, debris hauling trucks are still working in the area.
- Plaquemines Parish: The Belle Chasse area is on the Belle Chasse Naval Air Station property just south of Rinard Road a two way street that leads into Russel Drive, which intersects the Belle Chasse Highway. The Triumph area fronts Highway 23 in the southern end of Plaquemines Parish.
- Orleans Parish: The Maynard area fronts a service road that connects Almonaster Avenue with the Chef Menteur Highway. The Cummings North area fronts Michoud Boulevard on the west. Michoud Boulevard bisects Lake Forest Boulevard that leads to Interstate 510. The New Orleans east area is still undergoing clean-up from the devastation due to Hurricanes Katrina and Rita. As of October 2007, debris hauling trucks are still working in the area.
- Jefferson Parish: The Churchill Farms Pit A area is adjacent to an unnamed shell road on the east. The Westbank Site G area is located across the street from the Churchill area. Garbage trucks can be seen daily traversing Highway 90 in route to local landfills. The northern entrance to the proposed Churchill Farms Pit A area also intersects with Highway 90.
- St. Charles Parish: The Bonnet Carré North area has been a source for Government Furnished borrow material since 3 September, 1985, according to several SIRs for the LPV Project. The only two vehicular transportation routes

that pass through the spillway are Airline Highway (U.S. Highway 61) and Interstate Highway 10 (I-10). There is no access to I-10 directly from the spillway. U.S. Highway 61 is the major usable transportation corridor across the Bonnet Carré North area. River Road and CCC Road are also utilized for accessing from the east and west. Sand haulers utilize the floodway as a sand pit and haul on a daily basis. Optional transportation corridors include railroads that traverse the spillway and the Mississippi River on the south end.

Discussion of Impacts

No Action

Without implementation of the proposed action no direct or indirect impacts to ground transportation would occur. Alternative transportation would be required to move borrow material to HPS construction sites. Material would continue to be excavated from the Bonnet Carré North area for authorized projects.

Proposed Action

With implementation of the proposed action construction equipment such as bulldozers and excavators would need to be delivered and haul trucks would be entering and exiting the areas on a daily basis during the period of construction. The truck hauling would temporarily impede vehicle traffic and result in a minimal reduction of the level of service (LOS, a metric describing traffic volume relative to capacity) on some local road segments. Flagmen, signage, cones, barricades, and detours would be used where required to facilitate the movement of heavy equipment and local traffic on affected road segments. As previously mentioned, the proposed design of all areas would require methods to avoid exposure of adjacent traffic routes and other urban developments. Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all approved borrow areas. The current traffic volume at these areas is unknown.

- St. Bernard Parish: The 1418/1420, 910, 1572 Bayou Road, and 4001 Florissant Highway areas are located on a road segment in the southern portion of St. Bernard parish that doesn't receive heavy traffic loads. If the proposed borrow areas are used, material would more than likely be used for levees closest to the construction sites, minimizing the disruption of transportation through developed areas. The process used in transporting the borrow material would be similar to methods used in removing debris following Hurricanes Katrina and Rita. Ongoing clean-up of the parish utilizes haul trucks to move construction and demolition debris. Therefore, transportation is currently somewhat altered by the clean-up work. While efforts to restore existing developments in the parish are ongoing, the reduced population has also led to reduced residential congestion at the present time.
- Plaquemines Parish: The Belle Chasse area is near Highway 23, a road segment that is used by large trucks daily hauling freight to and from Venice, Louisiana to supply local industry. The area is only 8 acres in size, so truck hauling would be short lived from the area.
- Orleans Parish: The Maynard and Cummings areas are in Orleans Parish. One of the areas is located in the Almonaster-Michoud industrial district along the Gulf Intracoastal Waterway between Almonaster Boulevard and Chef Menteur Highway just west of Paris Road. The Cummings area is located between Chef

Mentour Highway and I-10, just east of Paris Road and Interstate 510. The area is commercial in nature, the majority being automobile junk yards. The area sustains commercial trucking, and a truck stop is located on Almonaster Avenue. Clay haulers should blend in with the local commercial traffic in the area.

- Jefferson Parish: The Churchill Farms Pit A and Westbank Site G areas are located in a rural area close to Highway 90, a heavily used commercial road on the west bank of Jefferson parish. Following Hurricane Katrina much of the traffic included debris disposal in surrounding landfills. The area is commercial in nature with some large landfills in the area. Currently, an unnamed road is being used to supply clay material for the Lake Cataouatche levee. Clay haulers should blend in with the local commercial traffic in the area. U.S. Highway 90 and an adjacent unnamed road would be used for accessing the area.
- St. Charles Parish: The Bonnet Carré North area, if utilized with proper pit management, should have minimal effects on transportation due to the large expanse of land and road accessibility to the individual pits.

Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all potential borrow areas. The current traffic volume at these areas is unknown.

3.2.14 Aesthetics

Existing Conditions

Most of the proposed borrow areas are of little visual significance, as their private land use does not allow for general public access. The Bonnet Carré North area is the exception. The Bonnet Carré Spillway provides public access utilizing maintenance roads as conduits to various recreational activities (see Section 3.2.9). The Bonnet Carré North maintenance roads provide differing viewsheds into both irregular- and geometrically-shaped pits surrounded by a variety of vegetation. Duckweed and water hyacinth are carried on the borrow areas' water surfaces with the occasional view of cypress stumps. Vegetation present at the edges of the pits includes smartweed, Cyprus, alligator weed, and pennywort. Maintenance activities and sand deposited as the result of spillway operations has resulted in elevation changes where willow and Baccharis thrive as backdrops and serve to visually screen the sightlines from one borrow pit to another. Visually, the Bonnet Carré Spillway area appears to contain borrow areas as defined in Figure 16-4, Appendix 16, Mississippi River Mainline Levees Enlargement and Seepage Control Study, July 1998 (a supplement to the EIS: Mississippi River and Tributaries Project Mississippi River Levees and Channel Improvement).

Discussion of Impacts

No Action

Without implementation of the proposed action, visual resources would either evolve from Existing Conditions in a natural process, or be manipulated as dictated by required Bonnet Carré Spillway operations and maintenance. Routinely the Bonnet Carré North area is denuded of vegetation and sand deposits are cleared in order to meet required hydrological flow requirements for the operation of the floodway. Sand is redeposited during spillway events.

Proposed Action

The proposed action involves the development of borrow pit(s) in the Bonnet Carré North area. The development of these borrow pits would involve denuding the area of vegetation and the probable development of one large borrow pit. Previously, traditional borrow areas were excavated in a rectangular shape with no aesthetic concerns as outlined in Figure 16-1, Appendix 16, Mississippi River Mainline Levees Enlargement and Seepage Control. Maintaining the aesthetic and habitat quality along the river is a high priority. To achieve this, borrow areas should be utilized as positive environmental features. Bonnet Carré Spillway's new borrow area at Bonnet Carré North should be designed and constructed with gradual side slopes, irregular shapes, and have some islands, and where practical vegetation should be allowed to serve as its backdrop. Specific design guidelines for these borrow areas are found in Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River, Lower Mississippi River Environmental Program, Report 4, April 1986 (Appendix D), and CEMVN operating principles.

3.3 Socioeconomic Resources

As previously indicated, the purpose of this report is to describe existing conditions, possible future of no action at the proposed sites, and potential future impacts of extracting clay materials at the sites within five parishes of the New Orleans Metropolitan Statistical Area (MSA) needed to restore and improve protection damages caused by Hurricanes Katrina and Rita. For the purpose of this IER, the No Action alternative assumes that these specific sites would not be selected for use but alternate sites will be found and the 100-year levee work would continue. The incremental impacts to significant resources of acquiring the borrow material from different, unspecified alternate sites are assumed to be zero.

3.3.1 Land, Water, Minerals, Fisheries, and Agriculture

Existing Conditions

The existing conditions include land, water, natural resources, and pasture land that may be influenced by the proposed action, and the metropolitan areas needing additional protection under the emergency recovery program. Under this proposal, approximately 1,268.5 acres of land would be used in collecting material from various sites. All of the proposed borrow sites fall within areas of the LPV, WBV, and the New Orleans to Venice, Louisiana (NOV) projects.

The proposed borrow areas in St. Bernard Parish include approximately 162.3 acres from five leveed areas, including a 107-acre site at Dockville along LA Highway 39; three smaller sites of 9.4, 10.5, and 11.7 acres eastward along Bayou Road; and another 10.6 acres along the Florissant Highway in the vicinity of Yscloskey. About 127 acres are BLH forests adjacent to patches of pasture and other agricultural land.

Two leveed borrow areas totaling 192 acres along the west bank of Jefferson Parish are proposed, including 110 acres of Churchill Farms Pit A south of U.S. Highway 90, 43 acres of it pasture and 67 acres forest; and another 82 acre in the Westbank G site along the south side of U.S. 90 in the vicinity of Westwego, Louisiana. Land within the Churchill Farms Pit A area is within an undeveloped leveed area. The Westbank G area is immediately adjacent to residential development east of the site and undeveloped land and a canal along the west side.

Two leveed Orleans Parish areas totaling 226 acres are proposed in the vicinity of the Almonaster-Michoud Industrial District and a second industrial site in New Orleans East, including 44 acres below Chef Menteur Highway, near the intersection of Almonaster Avenue and Paris Road, and a 182 acre site east of Paris Road and south of Chef Menteur Highway (U.S. Highway 90).

Proposed borrow areas in Plaquemines Parish include approximately 2.6 leveed acres along the west bank of the river in the community of Triumph, Louisiana; and 8.4 leveed acres adjacent to the Belle Chasse Naval Air Base in Belle Chasse, Louisiana.

In addition, proposed borrow would be taken as needed from 680 acres within the Bonnet Carré Spillway in St. Charles Parish operated and maintained by the CEMVN to reduce flood damage under high river stages along the Mississippi River. The periodic opening of the spillway has led to the collection of top soil that is a source of material used for building CEMVN hurricane protection levees and commercial purposes by local haulers. The spillway has also been used for recreation as well.

Discussion of Impacts

No Action

As a result of the unprecedented quantities of clay borrow material required to bring hurricane protection systems to the 100-year level of protection, the alternatives for completing this work are limited in scope. For the purpose of this IER, the No Action alternative is defined such that if the proposed borrow sites listed in the IER are not selected for use, an alternate site(s) will be found and the 100-year HPS work would continue. The incremental impacts to significant resources of acquiring the borrow material from a different unspecified alternate site are assumed to be zero.

If none of the proposed borrow sites are used the land would then be available for other purposes since most are within the Metropolitan New Orleans area, and all are within the hurricane protection system. However, borrow material would have to be procured from another location in the area in order to have enough suitable borrow material to build the HPS to the 100-year level of protection.

Proposed Action

With implementation of the proposed action, non-wetland areas would be converted for use as borrow areas to be used for levee and floodwall construction in adjacent areas. The cumulative impacts and added level of protection provided would be dependent upon a variety of factors, including the latest technical information available for construction and the level of protection needed based on public concerns and related cost considerations. While small sections of Plaquemines and St. Bernard parishes would be converted from pasture for flood protection purposes, these parishes are part of the New Orleans MSA, and a relatively small amount of land is used for agricultural purposes. No areas have been identified as threatening mineral rights or timber production. The social and economic purposes of the project are designed to protect land and other resources of the local, regional, and national economy.

3.3.2 Flood Control and Hurricane Protection

Existing Conditions

With the exception of the Florissant area, all proposed areas fall within existing flood and hurricane protection areas of Jefferson, Orleans, St. Bernard, Plaquemines, and St. Charles parishes. The Florissant area is unleveed. All parishes in the vicinity have been highly sensitive to flood and hurricane damage, requiring an extensive network of structures, pumping systems, and evacuation routes. The rate of erosion in some areas appears to have declined since the 1960's, but the loss of barrier islands, erosion, and subsidence of wetlands have continued in many areas in close proximity of the project sites. Hurricanes Katrina and Rita, which occurred in August and September of 2005, respectively, created heavy damage that required an immediate effort to restore existing conditions and re-establish protected areas of the community whenever possible.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. No action at the proposed project sites would require material from alternative sites.

Proposed Action

With implementation of the proposed action suitable material would be excavated from the proposed borrow areas. This is the procedure used to create most of the storm surge reduction infrastructure for the Metropolitan New Orleans area.

3.3.3 Business, Industry, Employment, and Income

Existing Conditions

The proposed sites are not currently used for business and industrial purposes generating employment. However non-wetland areas in close proximity to urban areas provide value and potential income. The project sites total approximately 1268.5 acres within close proximity to urban developments of the New Orleans MSA.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. No action at the proposed project sites would require material from alternative sites. The collection of alternative material may be an added cost to the project that would be reflected in the project construction cost. However, no incremental impacts on business and industry relative to the proposed alternative are anticipated.

Proposed Action

None of the proposed project sites have been identified as impacting businesses, industries or related employment. However, the proposed project would support business and industry by advancing the HPS, providing protection from storm surges during storm events.

3.3.4 Population and Housing

Existing Conditions

While the proposed borrow areas are themselves unpopulated, they are all within project areas established for additional hurricane and flood protection, which influences the metropolitan population and housing.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. No action at the proposed project sites would require material from alternative sites. Material taken from alternative sites will have no incremental effect on population settlement patterns, but may further delay recovery from Hurricanes Katrina and Rita.

Proposed Action

While most of the proposed borrow areas are located within leveed areas of the New Orleans MSA, the preferred alternative would not require the relocation of existing housing units or the displacement of population. While adjacent areas include urban and suburban developments, the engineering design and environmental analysis indicate no adverse impacts to housing units or that would cause residential displacement.

The smaller proposed borrow areas in St. Bernard Parish are in proximity of areas previously used for housing, but vacant prior to Hurricane Katrina. The largest tract, 107 acres at Dockville, was previously undeveloped.

The proposed borrow site in Churchill Farms Pit A is vacant leveed land that is undeveloped for residential purposes. The 82- acre site on Westbank G is vacant but located immediately adjacent to a residential development.

As previously noted, the two proposed borrow areas in Orleans Parish are in the vicinity of the Almonaster-Michoud Industrial District and a New Orleans East industrial site. No adverse impact to residential property is anticipated.

The Plaquemines Parish proposed borrow areas are leveed but have not been developed for residential purposes.

The proposed borrow area in the Bonnet Carré Spillway is used for public land and would have not impact on adjacent population and housing. The function of the spillway is to protect property in adjacent areas, including residential developments.

3.3.5 Property Values, Tax Revenues, Public Facilities, and Services

Existing Conditions

Located within the Metropolitan New Orleans area, all of the proposed borrow areas have more value than the large tracts of in close proximity to public facilities and services, by indirectly if not directly contributing to the local tax base. The close proximity of the project sites to additional urban developments adds value to the adjacent area,

commercial and residential property values, public facilities and services, utilities, public transit, safe highways, streets and bridges, police and fire protection facilities and services, schools and educational services, hospitals and health care services, and the many other public facilities and services of local, state, and federal agencies.

Of the five parishes discussed in this report, the specified median value of housing units reported by home-owners ranged from \$85,200 in St. Bernard Parish to as high as \$110,100 in Plaquemines Parish. The “future conditions” paragraph below indicate the latest and most detailed census information specifying the value of residential property in related census tracts, although all of the sites proposed are currently on vacant property.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. No action at the proposed project sites would require material from alternative sites. No incremental effects on property values relative to the proposed action are anticipated.

Proposed Action

Planning for the proposed alternative has attempted to balance the cost and the need for recovery as soon as possible, with consideration of property values, public facilities and services, and the concerns of the local tax base. The proposed sites are located within existing or authorized hurricane protection systems, adding value for various purposes ranging from industrial, commercial, residential, institutional, and public purposes in the New Orleans MSA, including valuable flood control and hurricane protection purposes. The impacts of Hurricane Katrina have included damage to property values that have not yet been fully evaluated. None of the proposed sites are property used for commercial or residential property.

With the exception of the 10.6 acre site along Florissant Highway near Shell Beach, the proposed borrow areas in St. Bernard Parish covered approximately 151 acres along four sites within the LPV, adding value prior to the destruction of Hurricane Katrina. As mentioned above, about a 107-acre site at Dockville along LA Highway 39 is undeveloped. The five proposed borrow areas were identified on four census tracts with specified owner-occupied housing units with median values ranging from \$66,700 to \$76,000. Much of the census tracts were damaged by Hurricane Katrina.

The proposed borrow areas in Jefferson Parish include 110 acres of the Churchill Farms Pit A south of U.S. Highway 90, 43 acres of it pasture and 67 acres forest; and another 82 acre in the Westbank G site is located along the south side of U.S. 90 in the vicinity of Westwego, Louisiana immediately adjacent to existing residential development. As in the case of many areas throughout the Metropolitan New Orleans area, Westbank Site G is in close proximity to existing residential developments, with low elevations subject to frequent storm flooding. The extraction of material immediately adjacent to existing urban developments would require appropriate protection to avoid future impacts to adjacent areas and maintain property values. The two proposed borrow areas were identified on census tracts 276.01 and 276.02 with specified owner-occupied housing units of median values \$58,800 and \$60,300 respectively.

The two proposed borrow areas in Orleans Parish total 226 acres, and are in the vicinity of the Almonaster-Michoud Industrial District and a nearby industrial site, both within the LPV. The property is within census tracts 17.30 and 17.33; the 2000 census reported that specified owner-occupied housing units had median values \$54,500 and \$ \$87,700. Current planning indicates that the value of this property would be of greater value if used to improved flood and hurricane protection. Much of the property at the two census tracts were severely damaged by Hurricane Katrina.

Proposed borrow areas in Plaquemines Parish include 2.6 acres along the west bank of the river in the community of Triumph, Louisiana (in census tract 507); and about 8.4 acres near the Belle Chasse Naval Air Base (in census in tract 503). The 2000 census indicated that the median value of specified residential units in census 501 was \$132,400; the median value of specified units of census tract 503 an estimated \$107,900; and the median value of specified units in tract 507 approximately \$61,500. Many of the housing units along the east bank of Plaquemines Parish were destroyed by Hurricane Katrina and have not been restored. Similar to the other proposed borrow areas, one of the functions of the plan is to improve future protection of property values, maintain public facilities and services, and sustain the tax base of communities threatened by flood damage and hurricanes.

The 680 acres at the proposed borrow area in the Bonnet Carré Spillway in St. Charles Parish has been used for divert potential flood damage caused by high river stages along the Mississippi River. The sediment created by spillway operations has been trucked to other areas for fill material. Most of census tract 601 includes the vacant spillway for its value in maintaining flood protection in urban developments downstream. It includes a small adjacent area used for including residential, commercial, and industrial purposes. The 2000 census estimated the median value of specified housing units at \$85,900. As in the case of plans for the other sites, the proposed dredged material from the spillway sites could help maintain a level of protection of property values, public facilities and services, and other developments and services subject to storm damage.

3.3.6 Community and Regional Growth Existing Conditions

Generally, desirable community and regional growth is considered growth that provides a net increase in benefits to local or regional economy, social conditions, and the human environment, including water resource development. Similarly to other references to social and economic conditions, community and regional has been heavily dependent on the unique flood and hurricane protection systems created by borrow areas. The proposed project sites planned are to improve flood and hurricane protection.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. The no action alternative would require finding of alternative borrow sites in different areas. No incremental impacts on community and regional growth are anticipated.

Proposed Action

The preferred alternative would support community and regional growth by advancing the HPS, providing protection from storm surges during storm events.

3.3.7 Health and Safety

Existing Conditions

The immediate project sites do not include health and safety facilities providing related services.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. The no action alternative would require finding of alternative borrow sites in different areas. The no action scenario would require alternative borrow locations, which would raise construction costs. However, no incremental impacts on health and safety are anticipated.

Proposed Action

While the proposed borrow areas would be used for improvements in the larger community, including facilities for health and safety, none of the sites would be immediately adjacent to such facilities. Implementation of the sites would be subject to Federal, State, and Local safety and health regulations.

3.3.8 Community Cohesion

Existing Conditions

The proposed project sites are located in unpopulated areas. However, the proposed project is designed to benefit areas beyond the immediate project sites, and also benefit community cohesion of the larger community of the Metropolitan New Orleans area, and the nation at large.

Conditions brought about by water resource development can impact community cohesion in different ways. The basic objectives of water resource development have essentially been to provide additional protection through flood control and hurricane protection, improved navigation, environmental restoration, and recreation through civil works as needed by the local, region, and nation. Public involvement with the community is part of this process.

Discussion of Impacts

No Action

With implementation of this alternative Federal HPS projects would be built to authorized or 100-year levels using Contractor Furnished or other borrow areas. The no action alternative would require finding of alternative borrow sites in different areas. No incremental impacts relative to the proposed action are expected.

Proposed Action

The proposed action would support community cohesion by advancing the HPS, which provides protection from storm surges.

3.4 Hazardous, Toxic, and Radioactive Waste

The USACE is obligated under Engineer Regulation 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 the proposed action. ER 1165-2-132 identifies CEMVN HTRW policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act [RCRA] regulated), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), will be treated as project costs if the requirement is the result of a validly promulgated Federal, State or Local regulation.

An ASTM E 1527-05 Phase I Environmental Site Assessment (ESA) was completed for the proposed borrow areas. The Phase I ESA documented the Recognized Environmental Conditions (REC) for the proposed project areas. If a REC cannot be avoided, due to the necessity of construction requirements, the CEMVN may further investigate the REC to confirm presence or absence of contaminants, actions to avoid possible contaminants. Federal, State, or Local coordination may be required. Because CEMVN plans to avoid RECs the probability of encountering HTRW in the project area is low.

A copy of the Phase I ESA referenced below will be maintained on file at CEMVN and are incorporated herein by reference. Copies of these reports are available by requesting them from CEMVN, or accessing them at www.nolaenvironmental.gov.

HTRW Land Use Histories and Phase I HTRW ESAs have been completed for all of the proposed borrow areas:

- The Phase I ESA for 1418/1420 Bayou Road was completed on 13 October, 2006. No RECs were identified.
- The Phase I ESA for 1572 Bayou Road was completed on 13 October, 2006. No RECs were identified.
- The Phase I ESA for 910 Bayou Road was completed on 4 April, 2007. The former agricultural use of the property may have left residues of pesticides or herbicides in the soil.
- The Phase I ESA for 4001 Florissant was completed on 8 November, 2007. No RECs were identified.
- The Phase I ESA for Dockville was completed on 21 May, 2007. There was evidence of past oil drilling operations on the site. Soil and groundwater sampling was recommended. The locations of the abandoned drill sites were mapped, and the area would be avoided during construction activities.
- The Phase I ESA for Belle Chasse was completed on 18 June, 2007. The following three possible RECs were found near the study site:

1. Historical concerns were noted related to the likely use of herbicides and insecticides on a golf course adjoining the property. Soil and groundwater sampling was recommended. The REC area would be avoided.
 2. On-site concerns were noted concerning former oil drilling operations on the southeastern and western portions of the site. Soil and groundwater sampling was recommended. The RECs would be avoided.
 3. Off-site concerns were noted concerning numerous gas and oil wells located in the Stella Oil and Gas Field, east and southeast of the subject site. Soil and groundwater sampling was recommended. Sampling will not be conducted because the RECs are off-site and would not be impacted by construction.
- The Phase I ESA for Triumph was completed on 4 November, 2005. No RECs were identified.
 - The Phase I ESA for Maynard was completed on 4 June, 2007. Soil and groundwater sampling was recommended on the western portion of the site because of concerns regarding the Fletrich Transportation Systems facility that was formerly located near the site. Sampling will not be conducted because the RECs are off-site and would not be impacted by construction.
 - The Phase I ESA for Cummings North was completed on 4 April, 2007. There were potential onsite concerns from illegal solid waste dumping on the western portion of the subject site. There were also potential offsite concerns because of the current and historical use of the Recovery Waste Management facility, which is located southeast of the subject site, across Chef Menteur Highway. The facility is reportedly utilized as a Type II landfill. Additional assessment of the property was recommended. The REC area would be avoided.
 - The Phase I ESA for Churchill Farms Pit A was completed on 22 June, 2007. Three RECs were found: a stockpile of nitromethane, above-ground storage tanks for diesel fuel, and an old oil well site. The location of the RECs were mapped and the areas would be avoided.
 - The Phase I ESA for Westbank Site G was completed on 21 July, 2007. Two abandoned oil/ gas wells were identified. No other RECs were found. The locations of the RECs were mapped and the areas would be avoided.
 - The Phase I ESA for Bonnet Carré North was completed on 23 July, 2007. The following three possible RECs were found near the study site:
 1. There are at least seven pressurized pipelines in the area that transfer petroleum, butadiene, ethylene, propane, propylene, and butane. As long as the borrow activity does not impact the pipelines no problems should be anticipated from this source.
 2. There are several plugged and abandoned oil wells on the Spillway property. The locations of these areas were mapped and would be avoided during borrow activities.
 3. Some concern was noted regarding the possible presence of contaminants in the soil within the floodway because water from the Mississippi River

flows over the site during spillway openings. The River water has some contamination, mainly metals. However, because of the large water volume in the river any contaminants would be diluted. Also, rainfall in the area would tend to wash away any contaminants in the sediment deposited on the spillway. Sand haulers remove the topsoil within the top four to five feet daily and provide the sand to local parishes.

4. Cumulative Impacts

NEPA requires a Federal agency to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impacts of the action. Cumulative impact is defined as the “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR §1508.7).” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Borrow material has been obtained in the past by CEMVN for HPS and other projects in southeast Louisiana. CEMVN has been working at an accelerated schedule to rehabilitate the HPS system after Hurricanes Katrina and Rita, and build the system to 100-year level of protection by June 2011. An estimated 150,000,000 cubic yards of borrow material will be needed to complete the 100-year level of protection. Borrow material will also be needed to perform levee lifts and maintenance for at least 50 years after construction is completed. CEMVN is in the process of implementing construction projects to raise the hurricane protection levees associated with the federal LPV, WBV, and NOV Hurricane Protection projects to authorized elevations. This includes modifications to flood protection projects not covered by this IER. Levee improvements throughout the LPV and WBV projects would require substantial amounts of borrow material, and some of the borrow pits needed have been identified in this document to provide adequate material in proximity to proposed flood protection projects. In addition to modifying and raising existing structures, three new outfall canal closure structures are proposed at the 17th Street, Orleans Avenue, and London Avenue Outfall Canals in the Orleans East Bank Basin, and a new closure structure is proposed for within the IHNC area. All of these flood protection projects are currently in the planning and design stages and impacts from these component projects will be addressed in separate IERs.

Other CEMVN projects such as Morganza to the Gulf, Donaldsonville to the Gulf, Larose to Golden Meadows, Grand Isle non-Federal levees, Plaquemines West Bank non-Federal levees, and other ongoing civil works investigations will require suitable borrow material. State and Local levee and floodwall construction efforts will require borrow material as well. Pre-approved Contractor Furnished borrow areas are also being investigated and utilized to supply large quantities of material for levee and floodwall projects.

The construction of the proposed borrow areas would have short-term cumulative effects on transportation. It is anticipated that 150,000,000 cubic yards of material would be needed to raise levee elevations regionally to meet the needs of the HPS. It is unknown the total number of truck trips required or haul routes for the movement of this quantity of material, but cumulative short-term impacts to transportation are expected to occur. Additional information related to transportation impacts is being collected and will be discussed in future IERs.

Even though minimal in size when compared to the extent of forested and pasture areas directly and indirectly affected by previous development activities, the excavation and

use of the proposed borrow material for HPS construction would contribute cumulatively to land alteration and loss within the Metropolitan New Orleans area. After borrow area excavation the land may be converted to ponds and small lakes, making it unsuitable for farming, forestry, or urban development in the reasonably foreseeable future. Habitat would be changed to favor aquatic and semi-aquatic species over the terrestrial ones that now occupy the areas. Borrow areas that do not retain water would be colonized by vegetation and woody plants, which would favor terrestrial species. This would attract the same species that are currently found in the areas.

Based on historical human activities and land use trends in this region, it is reasonable to anticipate that future activities would further contribute to cumulative degradation of land resources. It is anticipated that through efforts taken to avoid and minimize adverse effects of this Federal action and the mandatory implementation of a mitigation plan that functionally compensates unavoidable remaining impacts the proposed borrow areas would not result in substantial direct, secondary or cumulative adverse impact on the environment. The mitigation plan is discussed in Section 7.

5. Selection Rationale

The proposed action consists of excavating Government Furnished borrow areas in the New Orleans Metropolitan area. CEMVN determined that the proposed work would have no impact upon jurisdictional wetlands, fisheries, T&E species, cultural resources, recreational resources, water quality, and aesthetics, and no significant impact on BLH, non-wetland/ upland resources, wildlife, prime and unique farmland, noise quality, air quality, transportation, and socioeconomics. There is an identified need for over 150,000,000 cubic yards of borrow material, and the proposed action meets approximately 18% of this demand. The estimated amounts of borrow material are projected quantities, and subject to change based on geotechnical analysis. Because of this need, CEMVN will need to investigate acquiring all potentially viable areas for the next few years. Contractor Furnished borrow is an option that will be explored in IER 19. Barging or utilizing railroad to transport clay material from a remote area will also be discussed as an alternative in IER 19.

6. Coordination and Consultation

6.1 Public Involvement

Extensive public involvement has been sought in preparing this IER. The projects analyzed in this IER were publicly disclosed and described in the Federal Register on 13 March, 2007 and on the website www.nolaenvironmental.gov. Scoping for this project was initiated on 12 March, 2007 through placing advertisements and public notices in USA Today and The New Orleans Times-Picayune. Nine public scoping meetings were held throughout the New Orleans Metropolitan area to explain scope and process of the Alternative Arrangements for implementing NEPA between 27 March and 12 April 2007, after which a 30 day scoping period was open for public comment submission. Additionally, CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. The public is able to provide verbal comments during the meetings and written comments after each meeting in person, by mail, and via www.nolaenvironmental.gov.

6.2 Agency Coordination

Preparation of this IER has been coordinated with appropriate Congressional, Federal, State, and Local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and

State agency staff played an integral part in the project planning and alternative analysis phases of the project (members of this team are listed in Appendix C). This interagency environmental team was integrated with the CEMVN PDT to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly meetings with resource agencies were also held concerning this and other CEMVN IER projects. The following agencies, as well as other interested parties, are receiving copies of this draft IER:

- U.S. Department of the Interior, Fish and Wildlife Service
- U.S. Department of the Interior, National Park Service
- U.S. Environmental Protection Agency, Region VI
- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Natural Resources Conservation Service
- Louisiana Advisory Council on Historic Preservation
- Governor's Executive Assistant for Coastal Activities
- Louisiana Department of Wildlife and Fisheries
- Louisiana Department of Natural Resources, Coastal Management Division
- Louisiana Department of Natural Resources, Coastal Restoration Division
- Louisiana Department of Environmental Quality
- Louisiana State Historic Preservation Officer

LDNR reviewed the proposed action for consistency with the Louisiana Coastal Resource Program (LCRP). All proposed borrow activities discussed in this document were found by LDNR to be consistent with the LCRP (Table 7).

Table 7: LDNR Coastal Zone Consistency Determination Concurrence

Proposed Borrow Area	LDNR LCRP Consistency Determination
1418/1420 Bayou Road	12 March, 2007
1572 Bayou Road	12 March, 2007
910 Bayou Road	12 March, 2007
4001 Florissant	12 March, 2007
Dockville	12 March, 2007
Belle Chasse	25 September, 2007
Triumph	July, 2006
Maynard	25 September, 2007
Cummings North	25 September, 2007
Churchill Farms Pit A	25 September, 2007
Westbank Site G	22 July, 2007
Bonnet Carré North	22 July, 2007

CEMVN received a draft Coordination Act Report from the USFWS on 25 October, 2007. This document will be available for public review.

7. Mitigation

All non-jurisdictional BLH forest impacts were assessed by the USFWS and CEMVN under NEPA, Fish and Wildlife Coordination Act, and WRDA 1986 requirements, and mitigation for those impacts would be obtained. Under the alternative arrangement process implemented, mitigation planning and implementation for unavoidable impacts

will be done under a separate investigation and discussed in additional IERs being written.

Field data were collected by CEMVN and USFWS Biologists at the following proposed forested borrow areas: 1418/1420 Bayou Road, 1572 Bayou Road, Dockville, Maynard, Cummings North, Westbank Site G, and existing data from adjacent land was used for the Churchill Farms Pit A and Belle Chasse. Quantitative analysis, utilizing existing methodologies for water resource planning, has identified the acreages and habitat type for the direct or indirect impacts of implementing the proposed action. A Habitat Assessment Model (HAM) was run for each area identified as having unavoidable impacts. The model provides the AAHUs needed to mitigate for the proposed impacts (Table 8).

Table 8: BLH AAHUs of Mitigation Needed

Proposed Borrow Area	Parish	BLH impacted (acres)	AAHUs Needed
1418/1420 Bayou Rd.	St. Bernard	13.0	6.20
1572 Bayou Rd.	St. Bernard	3.7	1.79
Dockville	St. Bernard	16.0 young BLH	6.72
		57.8 BLH	37.06
		24.9 BLH w/ cypress	17.46
Belle Chasse	Plaquemines	8.0	3.68
Maynard	Orleans	44.0	14.65
Cummings North	Orleans	182.0	54.14
Churchill Farms Pit A	Jefferson	29.9	10.62
Westbank Site G	Jefferson	82.0	45.52
Total		461.3	197.84

Mitigation IERs will be prepared documenting and compiling the unavoidable impacts discussed in each IER. The mitigation IERs will implement compensatory mitigation as early as possible. All mitigation activities will be consistent with standards and policies established in the Clean Water Act Section 404 and the appropriate USACE policies and regulations governing this activity.

A DCED will be prepared once the IERs are completed documenting and compiling these unavoidable impacts and those for all other proposed actions within the LPV and WBV which are being analyzed through other IERs. Mitigation planning is being carried out for groups of IERs, rather than within each IER, so that large mitigation efforts could be taken rather than several smaller efforts, increasing the relative economic and ecological benefits of the mitigation effort. The mitigation IER and DCED will be made available for public review and comment.

8. Compliance with Environmental Laws and Regulations

Construction of the proposed action would not commence until the proposed action achieves environmental compliance with all applicable laws and regulations, as described below.

Environmental compliance for the proposed action will be achieved upon coordination of this IER with appropriate agencies, organizations, and individuals for their review and

comments; USFWS and NOAA National Marine Fisheries Service (NMFS) confirmation that the proposed action would not adversely affect any T&E species, or completion of Endangered Species Act Section 7 consultation (Table 5); Louisiana Department of Natural Resources (LDNR) concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LCRP (Table 7); coordination with the LASHPO (Table 6); receipt and acceptance or resolution of all Fish and Wildlife Coordination Act recommendations; and receipt and acceptance or resolution of all Louisiana Department of Environmental Quality comments on the air quality impact analysis documented in the IER.

9. Conclusions

9.1 Interim Decision

The proposed action consists of excavating twelve borrow areas that are located in non-jurisdictional wetland areas that would have no significant effect on cultural resources or threatened and endangered species. This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have unavoidable impacts to a total of 461.3 acres and 197.84 AAHUs of non-jurisdictional BLH. Mitigation for unavoidable impacts to non-jurisdictional BLH will be described under a separate IER. CEMVN determined that the proposed work would have no impact upon jurisdictional wetlands, fisheries, T&E species, cultural resources, recreational resources, water quality, and aesthetics, and no significant impact on BLH, non-wetland/ upland resources, wildlife, prime and unique farmland, noise quality, air quality, transportation, and socioeconomics.

9.2 Prepared By

IER # 18 was prepared by Michael Brown, Biologist, NEPA Compliance, with relevant sections prepared by Danielle Tommaso - Environmental Resources Specialist; Dr. Chris Brown - HTRW; Dr. Valerie McCormack - Cultural Resources; Hope Pollman - Recreational Resources; Richard Radford - Aesthetics; Robert Lacy - Socioeconomics; Gib Owen - Environmental Team Leader; and Soheila Holley – Senior Project Manager.

The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

9.3 Literature Cited

Anthony, R.G., R.L. Knight, G.T. Allen, B.R. McClelland, and J.I. Hodges. 1982. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. *Trans. N. Am. Wildl. Nat. Resour. Cong.* 47:332-342.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The birder's handbook: A field guide to the natural history of North American birds.* Fireside Book, Simon & Schuster, Inc. New York, N.Y. 785 pp.

Handly, M., G. Abry, and W. P. Athens. 2007. *Phase I Cultural Resources Survey and Archaeological Inventory of a Proposed Borrow Area, LA36 and Bayou Road, Sebastopol, St. Bernard Parish, Louisiana.* Submitted to the CEMVN by R. Christopher Goodwin & Associates, Inc.

Wiseman, D. E., R. A. Weinstein, and K.G. McCloskey 1979. Cultural Resources Survey of the Mississippi River – Gulf Outlet, Orleans and St. Bernard Parishes, LA. Submitted to CEMVN.

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Appendix A: List of Acronyms and Definitions of Common Terms

AAHUs: Average Annualized Habitat Units
ASTM: American Society of Testing and Materials
ATV: All-terrain vehicles
BCB: Belle Chasse Naval Air Base
BLH: Bottomland Hardwood
CEQ: Council on Environmental Quality
Clay Classifications: CH: Fat clay/ CL: lean clay/ ML: Silt
CRM: Cultural Resource Management
CZM: Coastal Zone Management
DCED: Draft Comprehensive Environmental Document
EA: Environmental Assessment
EIS: Environmental Impact Statement
FCDC: Final Comprehensive Environmental Document
FONSI: Finding of No Significant Impact
HAM: Habitat Assessment Model
HPS: Hurricane Protection System (aka, Hurricane and Storm Damage Reduction System)
HTRW: Hazardous, Toxic, and Radioactive Waste
IER: Individual Environmental Report
IHNC: Inner Harbor Navigation Canal
LDNR: Louisiana Department of Natural Resources
LDWF: Louisiana Department of Wildlife and Fisheries
LOS: Level of service
LPV: Lake Pontchartrain and Vicinity Hurricane Protection Project
MSA: Metropolitan Statistical Area
NAAQS: National Ambient Air Quality Standards
NEPA: National Environmental Policy Act
NMFS: NOAA National Marine Fisheries Service
NOV: New Orleans to Venice Hurricane Protection Project
PDT: Project Delivery Team
PI: Plasticity index
R/C: Remote controlled
ROD: Record of Decision
SIR: Supplemental Information Report
SPH: Standard Project Hurricane
T&E: Threatened or Endangered Species
UNOP: Unified New Orleans Plan
USACE: U.S. Army Corps of Engineers
CEMVN: Mississippi Valley Division, New Orleans District
USDA: U.S. Department of Agriculture
NRCS: Natural Resources Conservation Service
USFWS: U.S. Fish and Wildlife Service
WBV: West Bank and Vicinity Hurricane Protection Project
WRDA: Water Resources Development Acts (various years)

Appendix B: Public Comment and Responses Summary

Appendix C: Members of Interagency Environmental Team

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Agaha Brass	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
Frank Cole	Louisiana Department of Natural Resources
John Ettinger	U.S. Environmental Protection Agency
Jeffrey Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
Jeffrey Hill	NOAA National Marine Fisheries Service
Christina Hunnicutt	U.S. Geologic Survey
Barbara Keeler	U.S. Environmental Protection Agency
Kirk Kilgen	Louisiana Department of Natural Resources
Tim Killeen	Louisiana Department of Natural Resources
Brian Lezina	Louisiana Dept. of Wildlife and Fisheries
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillippe	Louisiana Dept. of Environmental Quality
Manuel Ruiz	Louisiana Dept. of Wildlife and Fisheries
Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

**Appendix D: Part V of The Environmental Design Considerations for Main Stem
Levee Borrow Areas Along the Lower Mississippi River Report 4**

PART V: DESIGN CONSIDERATIONS FOR FISHERIES AND WILDLIFE

Routine Considerations

24. This section describes economical environmental considerations that can be routinely implemented to benefit fisheries and wildlife. Individually, borrow sites often pose constraints which limit options of the engineer, environmental planner, and contractor. After limitations to design and excavation have been identified (Part II) and site-specific data (paragraphs 22-23) suggest that routine considerations for fish and wildlife are warranted, users may follow the guidance outlined in this section to make minor changes in borrow pit design to improve fish and wildlife resources.

Basin Morphometry

25. Depth. Whenever suitable depths of borrow materials and ground water permit, sites should be excavated to a depth adequate to permit the formation of a permanent pool of water. At a minimum, borrow pits must exceed 4-foot maximum depth and 2-foot mean depth to retain some water during dry periods. Mean depth is obtained by dividing the volume of the borrow pit by the surface area of the pit. Maximum depths of 7 to 10 feet are recommended, as they are optimal for fish and fishing and overlap the optima for wildlife (4 to 10 feet). Ideally, mean depth should exceed 3 feet.

26. Basin and shoreline shapes. Shoreline slopes should be variable but with slopes of from 3 to 4H:1V on the leveeward and riverward sides of the pit. Steep slopes at these locations increase basin concavity, which will provide a substantial area of water during dry periods and increase the productivity of benthic invertebrates and fish. A slope of 4:1 is gradual enough for wildlife and livestock to traverse and can be safely mowed, if necessary. Upstream and downstream ends of pits and traverses should have slopes of about 10:1 to provide ample shallow area for bass, bluegill, and other sunfishes to spawn and for wading birds and shoreline birds to feed. The bottom slope should be about 25:1, beginning at a depth of 3 feet

along the levee side and tapering to the maximum attainable depth near the riverward side (Figure 2).

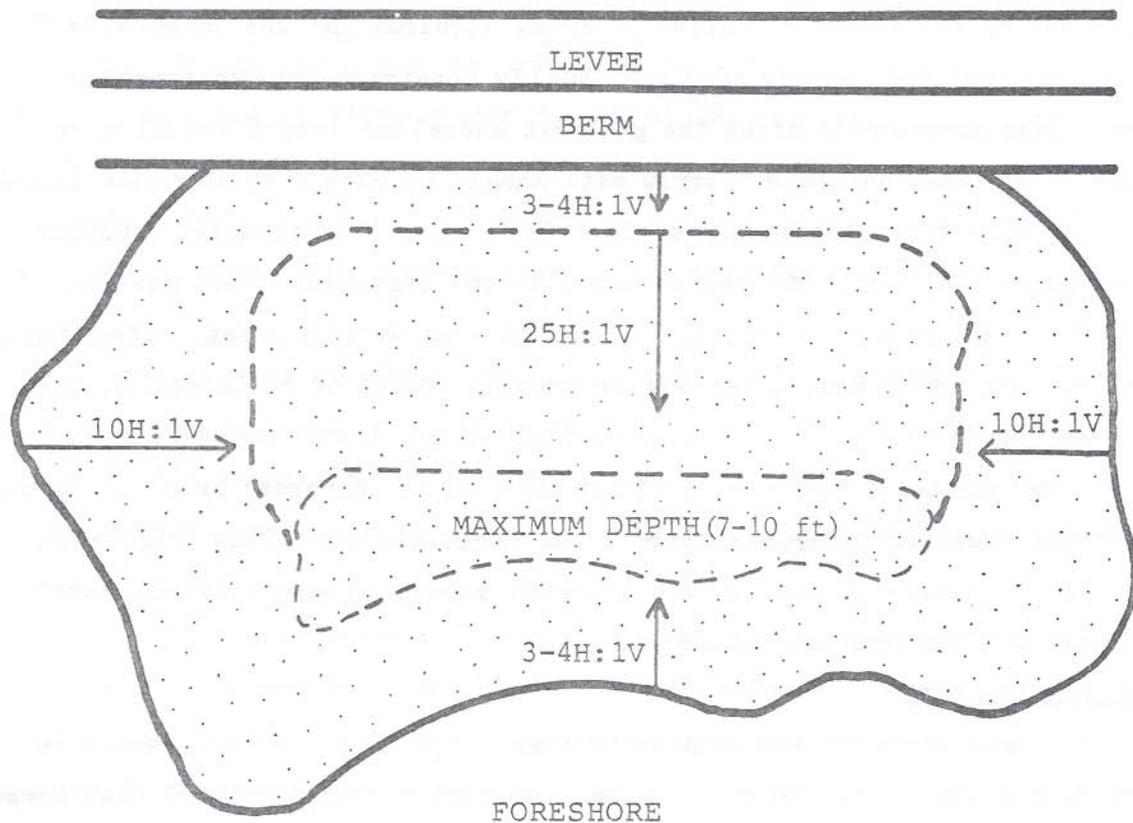


Figure 2. Diagram of a borrow pit, indicating optimal side and bottom slopes and maximum depth

27. Wildlife considerations should be emphasized at shallow borrow pits with maximum depths ≤ 3 feet. The basin shape should be similar to that proposed for deep borrow pits (see Figure 2), with side slopes of 4:1 along the levee and river sides but 20:1 along the ends of the pit and upstream and downstream from traverses. The goal is to increase habitat for shorebirds and wading birds. The bottom slope should be 25:1, beginning at a depth of 1.5 feet along the levee side and sloping toward the river side.

28. Design features that increase the length of shoreline relative to surface area (shoreline development index, SDI) benefit fisheries and wildlife by increasing the amount of nearshore area. Ultimately, borrow pit size will be set by the amount of borrow material required and the acceptable depth of excavation. Borrow pits are usually constructed in rectangular shapes. Long narrow pits offer the greatest shoreline length relative to surface area. When possible, borrow pits should be made 5 to 10 times longer than wide, with traverses at appropriate intervals. For example, a borrow pit 100 yards wide and 1,000 yards long with two traverses would have an SDI of 2.3, a desirable level, and a surface area of 20.6 acres. Otherwise, shorelines should be made irregular to provide an SDI of at least 2.0, the median SDI of 25 borrow pits studied by Cobb et al. (1984) and Buglewicz (1985). The aesthetic value of a borrow pit can be increased by rounding its corners and creating irregularities in the riverward shoreline (Figure 2). These irregularities should be curved gently enough to be easily excavated with available earthmoving equipment.

Cover and Structure

29. Excavation of borrow pits is disruptive to wildlife inasmuch as clearing, grubbing, and stripping remove vegetative cover. The US Army Corps of Engineers (1978) recommends minimizing impacts of construction activities on vegetation. For example, leaving existing woody and brushy vegetation in areas of shallow or poor-quality borrow material provides edge and cover that increase fish, wildlife, and aesthetic values.

30. Whenever possible, trees should be left standing along the fore-shore margin and ends of a borrow pit. Natural revegetation of small herbaceous plants and shrubs occurs within 1 or 2 years. However, trees require many years to attain a size large enough to provide cover or shade and nesting, roosting, or denning sites for wildlife. Mature trees left standing along the riverward margin of the borrow pit increase habitat diversity and suitability at minimal project cost. Tall trees and mast-, berry-, or fruit-producing species should be selectively retained because of their special value for wildlife. Trees with cavities are particularly important as they

may furnish den or nest sites. Where they exist, two or three cavity trees or dead snags per acre should be retained in locations where they will not impede excavation.

31. Seeding of ground cover immediately after construction will minimize erosion and provide habitat for wildlife. Natural revegetation is rapid, but seeding mixtures of plant species with high food and cover value increases wildlife use of postconstruction plant communities (see Yoakum et al., 1980). Herbs that produce seed in a single growing season should be established as a part of normal construction activities. Flooding is a primary determinant of plant community composition, and species of plants to be seeded should be selected on the basis of their adaptability to site-specific conditions. Fredrickson and Taylor (1982) provide guidance on selecting plants based on anticipated flooding regimes of the Lower Mississippi River.

32. Most new borrow pits have relatively shallow, smooth basins that afford only limited cover or structure for fish or wildlife. Irregularities in shoreline provide some cover and structure. Islands or peninsulas formed when shallow or undesirable fill materials are encountered also are of value to fish and wildlife. These areas should not be disturbed during borrow pit excavation.

33. Brush provides an efficient way of concentrating fish and providing cover for wildlife. For fish, some trees or root balls could be saved during excavation and pushed into the deeper part of pits to provide cover. Deeper pits (≥ 7 feet deep) are best suited for fish attractors. These may need to be anchored in areas where flood flows could float them out of the pit. Brush shelters should not exceed 0.1 percent of the borrow pit area, and brush piles could be left on nonaccess margins of pits to provide cover for wildlife. Brush piles for wildlife can be circular (15 to 25 feet in diameter) or rectangular (25 to 50 feet long by 10 to 15 feet wide). They should be placed at a density of not more than one structure per 2.5 acres. The structures should not impair access and should be constructed only in relatively open areas.

Complex Considerations

34. Complex design considerations are intended to substantially improve fish, wildlife, and recreational resources but at additional cost of levee construction. Complex design considerations that are marginally feasible or highly site-specific will be mentioned briefly with accompanying references, whereas considerations that may have broader application will be discussed in more detail.

Basin Morphometry

35. Borrow pit basin morphometry can be modified to benefit fish and wildlife more extensively than the routine considerations outlined earlier. Shaping shorelines and modifying bottom topography have more potential than do modifying basin slopes or water depth. Side and bottom slopes outlined earlier (paragraphs 26 and 27) cannot be improved upon and are also recommended as complex design considerations. Except for environmental management strategies for long sections of levees and island construction, routine guidance on depth (paragraph 25) also is recommended for complex designs.

36. In general, borrow pits with large surface areas are better for fish (>10 acres), fishing (>10 to 25 acres), and wildlife (>30 acres) than those with surface areas <10 acres, if water depths are adequate. In some cases, however, limited depths of suitable borrow materials will result in excavation of large shallow borrow pits. Excavation of wide, shallow pits and associated longer haul distances for borrow material and potential increased right-of-way needs are often required to improve control of underseepage, hydraulic performance, and environmental conditions under certain foundation conditions (US Army Corps of Engineers, 1978).

37. Depth. In areas where long reaches of the main-line levees are being raised or modified, special efforts should be made to excavate at least one deep borrow pit that will have a permanent pool (see paragraph 25) for every mile of levee, especially where construction results in most pits being shallow (≤ 3 feet deep) due to engineering constraints. Permanent pools in borrow pits are most valuable in areas where permanent standing water is

limited. A single perennial borrow pit pool in a 1-mile section of levee will have value for most wildlife. Although costs of special efforts to obtain a single permanent pool may be high, the benefits to wildlife can be ascribed to a much larger area than the pit itself. When depths are not limited by geological features, all pits should be excavated to depths of 7 to 10 feet (the optimum range) or deeper (see paragraph 25).

38. Basin and shoreline shapes. Borrow pits with irregular shorelines tend to be of more value for recreation, fisheries, and wildlife than rectangular pits. Extremely convoluted shorelines will not necessarily increase the aquatic productivity (see Appendix A, paragraph 48) and may be detrimental in areas subjected to strong flow during floods because of the resulting erosion. Highly irregular shorelines may substantially increase excavation costs if curvatures require special maneuvers of equipment. Aesthetically, gently curving shorelines can make a typical borrow pit seem more like a pond or lake than a remnant of excavation. Fisheries benefit from an irregular shoreline (SDI = 2.0-3.4) because it improves aesthetic qualities and permits anglers to fish more of the borrow pit surface area from shore. However, it is recognized that much borrow pit fishing is from boats and that efforts to increase shoreline relative length for this purpose may not be justifiable in all instances. Wildlife benefits arise primarily from the diversity of habitat (edge) that can be created by an irregular shoreline. Edge results from the border between two different habitats (Yoakum et al., 1980), and benefits are derived from edge formed when water, land, forest, shrubs, open fields, or levees border one another.

39. The most efficient method of increasing shoreline irregularity for fisheries and wildlife, without jeopardizing shore stability, is to round otherwise square corners of pits during excavation and design peninsulas or islands (Figures 3 and 4). Traditional traverses are valuable because they are similar to peninsulas and provide visual isolation between pool segments when water levels are low. They also facilitate movement of anglers, landowners, and wildlife across long borrow pits. A single large peninsula with a bifurcate point may increase (a) the amount of shoreline of a borrow pit

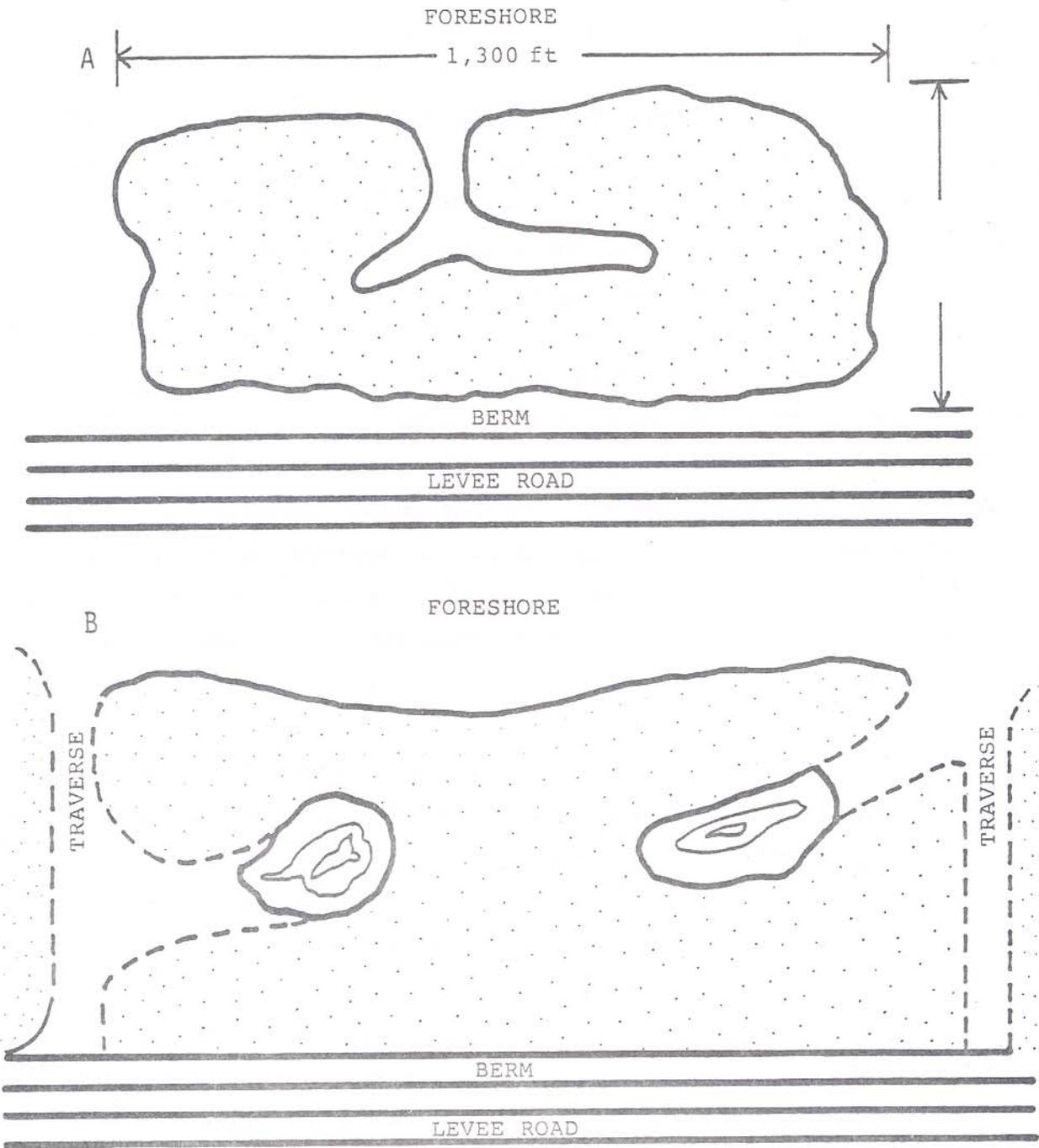


Figure 3. Plan view A illustrates a single forked peninsula that increases shoreline length by about 30 percent. Plan view B illustrates two peninsulas with elevated points that originate from traverses. This design results in peninsulas at normal water levels and islands when water levels are high. It should partially deflect floodwaters away from the levee.

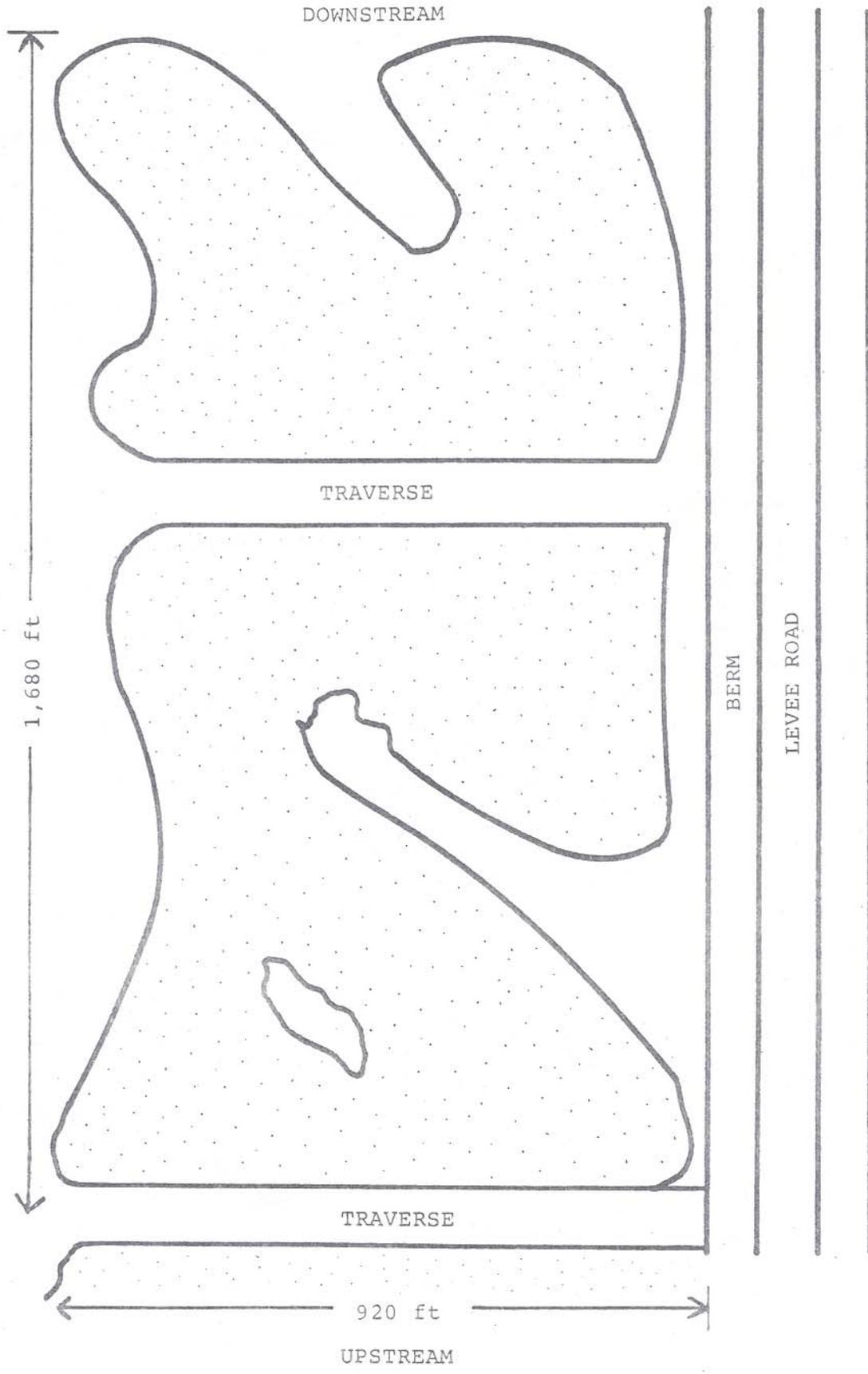


Figure 4. Orientation of islands and peninsulas to limit deflection of floodwaters into the levee and impediments to hauling borrow material to the levee during construction

by 30 percent (Figure 3A), (b) the visual segregation of parts of the pit, and (c) the ability of anglers to fish more surface area from shore. With the peninsula facing the levee side of a pit, hauling of borrow materials to the levee would not be greatly impeded.

40. Peninsulas and islands in pits located near the river where floodwaters may develop measurable flow should be oriented to deflect flowing water away from the levee (Figures 3B and 4). Less caution is needed in borrow pits 0.5 mile or more from the river, especially those with a forest buffer between them and the river. Peninsulas and islands oriented to deflect flows away from levees (Figure 4) should not impede efforts to haul borrow materials to the levee as much as peninsulas or islands oriented parallel to the levee.

41. To be stable, peninsulas and islands should have side slopes of about 4:1 and a width of at least 30 feet when the borrow pit basin is full of water. Their surfaces should be raised 2 feet above the bank-full elevation to ensure that they will not be submerged when pits are full of water. Side slopes of 4:1 will allow fishermen to fish from edges and provide wildlife with easy access to and from the water. With a width of 30 feet, these features should withstand annual flooding and afford ample room for anglers or wildlife. A peninsula originating from a traverse need only be raised above the elevation of the traverse at its point (Figure 3B). During construction, excavation equipment can move over the neck of such peninsulas to haul materials to the levee. When flooded, peninsulas originating from traverses will form islands; they will be continuous with the traverse when water levels are low. Islands and peninsulas are not expensive to construct (see Appendix A, paragraph 38); however, more rights-of-way may be required to make up for the borrow material that must be left in the pit to form these features. They have high value for aesthetics, fisheries, and wildlife and are recommended for all borrow pits, including those warranting only routine considerations, when they are at least 7 feet deep.

Cover and Structure

42. Planting and seeding. Vegetative ground cover should be established immediately following construction to control erosion. Seeding also improves habitat for wildlife and enhances aesthetic values. Natural revegetation will usually occur rapidly; however, the quality of vegetative cover at construction sites is improved for wildlife when mixtures of herbs, grasses, shrubs, and hardwoods are planted. Plantings of trees may be desired to increase visual isolation and aesthetics in areas surrounding borrow pits. Routine revegetation of areas subject to erosion can benefit wildlife at little increase in project cost if mixtures of grasses and herbaceous plants of high food value are seeded.

43. Survival of plants selected for seeding is enhanced when they are well adapted to the annual flooding cycle at a specific site. Therefore, planting recommendations should be made by a wildlife planning specialist with consideration of soils, duration of flooding, vegetative communities in the surrounding area, anticipated land use, and physical characteristics of the borrow site.

44. Shelters. Borrow pits with maximum depths ≥ 7 feet are most suitable for the addition of brush or artificial shelters to attract sport fish. These shelters can be made from natural or artificial materials cabled together and anchored to withstand flood flows. They represent a one-time project investment and should be installed after excavation is complete.

45. Shelters can be fabricated from a variety of materials, but brush and hardwood logs are easiest and least expensive to obtain. Brush or logs can often be obtained during clearing activities. These can be stacked, cabled, and anchored at selected locations to provide artificial shelters. Cabling may be necessary to prevent woody materials that dry out during drought from floating away when the area floods. Logs can also be tied together to form a variety of configurations, then weighted and anchored in designated locations. A large pole driven into the pit bottom with brush or tires attached around its base forms a permanent structure.

46. A relatively small area of shelter (about 0.1 percent of the pit area) will attract sport fish and improve fishing. This represents one structure 20 feet long, 10 feet wide, and 3 to 4 feet high for each 5 surface acres of water. Shelters should be placed in deep water near the river side of the pit so that they remain submerged during periods of low water. They should be identified with a pole driven into the bottom at the site, as described in the previous paragraph. The pole would also provide a tie-up for anglers in small boats.

47. Shelters should last many years with proper selection of materials. Hardwoods such as oak will decay more slowly than softer woods such as black willow or sycamore. Selection of larger diameter wood also results in a slower rate of decomposition. Woody materials that are permanently covered with water last much longer than those exposed to the air every year.

48. The cost of constructing brush shelters can vary significantly, depending on the type of material used and the size and location of the structure. By using woody materials obtained at the construction site, costs would arise primarily from the labor and materials required to anchor the structures. Some labor would be required to dispose of cleared vegetation if it were not used to construct brush shelters.

49. Wildlife brush shelters provide protection for a variety of small game and nongame species. However, they appear to have only limited application for borrow areas. Brush piles constructed for wildlife should be placed on the river side of borrow pits. If these areas will be exposed to high-velocity flows during flooding, shelters should be securely anchored and cabled. Their use should be restricted to areas where natural cover is limited. These structures should be of the size and density recommended in paragraph 33.

50. Vegetative cover for islands should consist of a multilayered canopy of trees, shrubs, and seed-producing plants or ground cover, because islands are well suited as habitat for nongame birds. They also are valuable for animals such as beavers and turtles. Where islands are constructed, ground cover should be established by seeding mixtures of grasses, forbs,

and shrubs. Trees with high potential wildlife value should be planted at a density of one tree per 100 square feet to augment natural seeding and accelerate the development of a tree canopy by several years. Planting should take place as soon as construction has been completed.

Recreation Development

51. Development of recreation facilities at selected levee borrow pits is a possibility along the Lower Mississippi River. Construction of recreation facilities such as boat ramps would have to be cost-shared by the local project sponsor, who would also have to acquire fee title to needed lands. Recommended recreation facilities would have to be justified and the cost-sharing agreement approved under Federal rules and regulations for such projects. Given these constraints, therefore, development of recreation facilities at levee borrow pits would be rare.

Landside Borrow Pits

52. Opportunities for managing borrow pits to improve fish and wildlife resources are sometimes better for pits on the land side than on the river side of levees because riverine flooding does occur. One major problem with landside borrow pits, however, is the influx of poor-quality water, especially in agricultural areas. Management possibilities for fisheries include eradication of undesirable species, stocking of desirable species, and water-level manipulation. Possibilities for wildlife include creating artificial marshes that can be flooded at appropriate times to attract waterfowl or shore, water, or wading birds. In addition, prevention of annual flooding can benefit populations of small ground-dwelling mammals and the nesting success of perching birds (Fredrickson, 1979; EL, 1985).

Water-Control Structures

53. Water-control structures could improve riverside borrow pit habitat for fish and wildlife by maintaining water levels during low-flow dry periods of the year. However, these structures are impractical for most sites, as few borrow pits have a dependable source of ground water or a watershed of sufficient size to maintain water levels through summer and fall or to refill a pit if it were drained for management purposes during these

seasons (Hynson et al., 1985). A dependable water source (watershed or ground water) that exceeds expected losses to evaporation and seepage is needed.

54. Unless water can be pumped from a nearby source and water levels manipulated (a common practice on wildlife refuges, see Fredrickson and Taylor, 1982), water-control structures should be considered only for borrow pits with 3 to 5 acres of watershed for every acre-foot of water capacity (Soil Conservation Service, 1971, 1973). For example, a 20-acre borrow pit with a mean depth of 4 feet (volume = ca. 80 acre-feet) should have a watershed of from 240 to 400 acres. Sites suitable for water-control structures will be few, but they might be found in a broad drainageway or at a low point in a natural depression. A site survey would be required to assess the size of the watershed relative to the volume of a proposed borrow pit. If a proposed borrow pit has a sufficient watershed and elevational gradient for drainage or a dependable ground-water source, as well as the potential for water-level management, several useful references for further information include the Soil Conservation Service (1971), Atlantic Waterfowl Council (1972), Yoakum et al. (1980), and Hynson et al. (1985).

