Loosahatchie River Mitigation Bank

Mitigation Banking Instrument
Memphis Stone and Gravel Company
Shelby County, Tennessee

IRT Members:

US Army Corps of Engineers
US Environmental Protection Agency
US Fish and Wildlife Service
Tennessee Department of Environment and Conservation
Tennessee Wildlife Resource Agency

Sponsor:

Memphis Stone & Gravel Company
111 Wilson Street
Memphis, Tennessee 38106

Agent:

Brophy-Heineke & Assoicates
2978 Shelby Street
Bartlett, Tennessee 38134

October 2016

Table of Contents

Loosahatchie River Mitigation Bank **1**

Basic Agreement **7**

I. Preamble **7**

A. Purpose 7

B. Project Description 7

C. Objectives 8

D. Location, Parcel Ownership, and Bank Sponsor 8

E. Interagency Review Team 8

II. Legal Authorities **9**

A. Federal 9

B. Tennessee 9

III. Bank Establishment **9**

A. Permits 9

B. Bank Establishment 10

C. Financial Assurance Requirements 10

1. Bank Establishment Financial Assurance 10

2. Long-term Management and Maintenance Fund 10

IV. Bank Operation **10**

A. Service Area 10

B. Credit Kind 11

C. Site Access 11

D. Availability, Sale, Transfer, or Use of Credits 11

E. Credit Deficit or Fraudulent Transaction 11

F. Maintenance Provisions 12

G. Monitoring Provisions 12

H. Contingency Plans and Remedial Actions 12

I. Force Majeure 12

J. Default 13

K. Establishment Period 13

L. Operational Period 14

M. Long Term Management and Maintenance 14

N. Sponsor Responsibility Accomplishment; Transfer of Ownership of or Rights in the Bank 14

V. Oversight and Responsibilities **15**

VI. General Provisions **15**

A. Entry into Effect, Modification or Amendment, and Termination of the Instrument . 15

B. Assignment of Obligations under this Instrument 16

C. Notice 16

D. Entire Agreement 16

E. Invalid Provisions 16

F. Effect of Agreement 17

G. Attorney's Fees 17

H. Availability of Funds 17

I. Headings and Captions 17

J. Counterparts 17

K Binding 17

VII. Signatures **18**

Appendix A **20**
I. Site History **20**
II. Site Selection **20**
III. Baseline **23**
A. Agricultural Lands and Emergent Wetlands 27
B. Wooded Areas 27
C. Watercourses 27
D. Hydrology 29
E. Soils 29
F. Vegetation 31
IV. Site Legal Description **33**
V. Existing Mitigation Site **35**

Appendix B **36**
I. Bank Development **36**
A. Development Plans 36
1. Existing Wetland Enhancement 36
2. Bottomland Hardwood Restoration 36
II. Construction **39**
A. Site Construction Plan and Timeline 39
B. Grading 40
C. Vegetation Installation 40
D. Erosion Control and Storm Water Protection Plan 42
E. As-Built Report 43

Appendix C **45**
I. Objective 1: Protection of Aquatic Ecosystems **45**
II. Objective 2: Restoration Results **45**

Appendix D **47**
I. Generation of Credits **47**
II. Credit Generation Schedule **47**

Appendix E **48**
I. Service Area **48**
II. Credit Use and Procedures **48**
III. Accounting Procedures **49**

Appendix F **51**
I. Establishment Period **51**
A. As-Built Reports 51
B. Monitoring Phases 51
1. Construction and Planting Phase 51
2. Post Construction Phase 51
C. Monitoring and Maintenance of the Bank 52
1. Monitoring Requirements and Procedures 52
2. Contingency Plans/Remedial Actions 53

Appendix G **54**
I. Conservation Easement **54**

II. Long-term Management and Maintenance Plan 54

Appendix H 56

Financial Considerations 56

I. Financial Assurances 56

A. Bank Establishment Escrow Account 56

II. Long-term Management and Maintenance Fund 56

Table of Figures

Figure 1: Vicinity map. 21
Figure 2: Aerial map. 22
Figure 3: Existing conditions: agricultural 24
Figure 4: Existing conditions: wetlands and habitats 25
Figure 5: Existing conditions: wooded riparian zones and watercourses. 26
Figure 6: Wetlands and drainage ways. 28
Figure 7: Soils map. 30
Figure 8: Wetlands and NRCS hydric soil data. 32
Figure 9: Plat and legal description. 34
Figure 10: Development activity map. 38
Figure 11: Erosion control map. 44

Table of Tables

Table 1: Acreages, actions, and credit generation. 7
Table 2: Existing wetland features. 23
Table 3: Existing stream features. 23
Table 4: Existing watercourses quality and length. 27
Table 5: Soil types 29
Table 6: NRCS Shelby County hydric soils. 29
Table 7: Dominant species by area. 31
Table 8: Herbaceous species observed in existing mitigation site. 35
Table 9: Construction timetable. 39
Table 10: Planting palette 41
Table 11: Objective 1: protect aquatic ecosystem 45
Table 12: Objective 2 performance standards. 46
Table 13: Wetland credit release schedule. 47

Defined Terms

Bank ..... Loosahatchie River Mitigation Bank

Corps ..... US Army Corps of Engineers

District Engineer ..... US Army Corps of Engineers District Engineer

Fund ..... Long-term Management and Maintenance Fund

Instrument ..... Loosahatchie River Mitigation Bank Mitigation Banking Instrument

IRT ..... Interagency Review Team

LTMMP ..... Long-term monitoring and maintenance plan

Sponsor ..... Memphis Stone & Gravel Company

Steward ..... Long-term Steward

Basic Agreement

I. Preamble

A. Purpose

The Loosahatchie River Mitigation Bank (the "Bank") will offset unavoidable impacts to the waters of the United States authorized by the District Engineer of the US Army Corps of Engineers (the "Corps") and the state of Tennessee pursuant to Sections 404 and 401 of the Clean Water Act. "District Engineer" hereinafter refers to the District Engineer of the Corps of Engineers, Memphis District, or his delegate.

The purpose of this Mitigation Banking Instrument ("Instrument") is to specify the responsibilities for the establishment, use, operation, and maintenance of the Bank. It consists of this "Basic Agreement" establishing the central obligations assumed and consideration provided by each party, as well as detailed "Appendices". The terms and provisions of the Appendices are incorporated into this Instrument. The Bank will provide compensatory mitigation for unavoidable adverse impacts to Waters of the United States and waters of the state and to aquatic habitats that result from activities as authorized by the District Engineer and the state of Tennessee pursuant to sections 404 and 401 of the Clean Water Act.

The purpose of the Bank is to restore and enhance aquatic habitat functionality. The Bank includes 85.10 acres of wetland prior to construction. Historically, 241.35 of the 407.76 acres (59.19%) of the Bank have been used for agriculture for the production of soybeans and winter wheat. The majority of the agricultural areas are upland. The remaining land remains bottomland hardwood forests, similar to the areas that make up the Loosahatchie River riparian areas. Besides the Loosahatchie River there are seven drainage ways within the Bank, all impacted by historical, anthropogenic creations or alterations. Alterations have straightened and channelized drainages to facilitate water drainage, presumably, to facilitate cultivation after the land was cleared. It is likely that the site was bottomland hardwood wetland before these anthropogenic changes. Drainage ways notwithstanding, the site undergoes low velocity flooding during the late winter and spring seasons, due to Loosahatchie River overbank events.

B. Project Description

The Bank will restore or enhance 323.5 acres of wetland habitat in accordance with the provisions of this Instrument. Table 1 summarizes project actions, acreage, and credit generation. The Bank is projected to, among other purposes, provide habitats as shown in Table 1 and as detailed in Appendix A and Appendix B. Mitigation actions and associated acreages are described in Appendix D and shown on Table 1.

Table 1: Acreages, actions, and credit generation.

Activity	Acreage	Credits
Wetland		
Enhancement of existing wetlands	85.1	21.3
Restoration-bottomland hardwood forest	238.4	238.4
	323.5	259.7

Bank development will improve wetland function and habitat through restoration and enhancement actions. These actions include grading to create optimal hydrology for meeting Bank objectives and installation of woody and herbaceous native vegetation. The site will also be protected in perpetuity by a conservation easement and overseen by a long-term steward ("Steward"), financed by a Long-term Management and Maintenance Fund ("Fund") established and funded by the Sponsor.

The improved habitat, water quality, and wetland functionality within the Bank boundaries will provide environmental synergies with the surrounding bottomland hardwood forests.

C. Objectives

1. Improve hydrology, water quality, and habitat functions within the Bank;
2. Provide a self-sustaining wetland complex that will not require maintenance; and
3. Produce credits for the use/sale/or transfer to mitigate for unavoidable impacts to waters of the Unites States and the state of Tennessee.

D. Location, Parcel Ownership, and Bank Sponsor

The Bank is located in Shelby County, Tennessee on a 407.76-acre tract known as the "Horne Property", bounded on the west by Raleigh-Millington Road. The Loosahatchie River crosses the southeast corner of the property. The site location is depicted in Figure 1.

The Bank is comprised of two parcels, identified by Shelby County parcel numbers D0136 00273 and D0136 00274, more particularly described in Appendix A.IV. Memphis Stone & Gravel Company and its affiliated companies (the "Property Owners") own the properties fee simple, including all mineral rights.

The Bank is located across Raleigh-Millington Road from the Charles W Baker Airport. As the Bank design should not increase the number of waterfowl in the area, the Federal Aviation Administration stated in a letter dated 14 May 2014 to the IRT chair that the agency has no objection to the development of the Bank.

The Bank Sponsor ("Sponsor") is the Property Owner, Memphis Stone & Gravel Company.

E. Interagency Review Team

In consideration of the establishment and maintenance of the Bank, the Interagency Review Team ("IRT") is willing to award credits in accordance with the procedures outlined in this Instrument. These credits will be made available to serve as compensatory mitigation pursuant to applicable Federal and Tennessee State laws and regulations. The Corps is the chair of the IRT. The IRT is a group of Federal, State, and local agencies that have reviewed the Instrument, and will advise the chair regarding the establishment and management of the Bank pursuant to the provisions of this Instrument.

The agencies represented on the IRT agree to:

- Provide appropriate oversight in carrying out the provisions of the Instrument;
- Review and provide comments on all project plans, annual monitoring reports, credit review reports, contingency plans, and necessary permits for the Bank in a timely manner;
- Review and confirm reports on the evaluation of success criteria prior to approving credit release; and
- Conduct compliance inspections, as necessary, as determined by the District Engineer in consultation with the Sponsor, to verify credits available in the Bank, recommend corrective measures, if any.

The IRT is comprised the following agencies:

- US Army Corps of Engineers;
- US Environmental Protection Agency;
- US Fish and Wildlife Service;
- Tennessee Department of Environment and Conservation; and
- Tennessee Wildlife Resource Agency.

II. Legal Authorities

The establishment, use, operation, and maintenance of the Bank shall be carried out in accordance with the following principal authorities and the Instrument will be governed and construed in accordance with those authorities:

A. Federal

- Clean Water Act (33 USC §§ 1251 et seq.)
- Rivers and Harbors Act of 1899 (33 USC § 403)
- Regulatory Programs of the Corps of Engineers, Final Rule (33 CFR Parts 330-332)
- Guidance for the Specification of Disposal Sites for Dredged and Fill Material ("404(b)(1) Guidelines," 40 CFR Part 230)
- National Environmental Policy Act (42 USC §§ 4321 et seq.)
- Council on Environmental Quality Procedures for Implementing the National Environmental Policy Act (40 CFR Parts 1500-1508)
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 11988 (Protection of Floodplains)
- Executive Order 13112 (Invasive Species)
- Fish and Wildlife Coordination Act (16 USC §§ 661 et seq.)
- Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981)
- Endangered Species Act (16 USC §§ 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 et seq.)
- Miscellaneous Receipts Statute (31 USC § 3302(b))
- National Historic Preservation Act, as amended (16 USC § 470)

B. Tennessee

- The Tennessee Water Quality Control Act of 1977, Tenn. Code Ann. § 69-3-101, et seq.
- Rules of Tennessee Department of Environment and Conservation Water Quality Control Board, Chapter 0400-40-07 Aquatic Resource Alteration

III. Bank Establishment

A. Permits

The Sponsor shall obtain all appropriate environmental documentation, permits, and other authorizations needed to establish and maintain the Bank prior to the award of any mitigation credits. Compliance with this Instrument does not fulfill the requirement, or substitute, for such authorization. Local authorizations and permits include, but are not limited to, Shelby County approvals, permits, and authorizations issued under the statutory and regulatory provisions listed in the Appendices of this Instrument.

Because the Bank development activities will impact jurisdictional waters, both a Section 404 permit from the District Engineer and a Water Quality Certification from the Tennessee Department of Environment and Conservation shall be obtained prior to commencing Bank

development. The District Engineer will issue a Nationwide 27 Permit upon INSTRUMENT approval.

B. Bank Establishment

The Sponsor agrees to establish the Bank as described in Appendix B and to satisfactorily accomplish all performance standards reflected in Appendix C. In recognition thereof, credits will be awarded to the Sponsor in accordance with the procedures and schedules prescribed in the Appendices, particularly in Appendices C and D. In establishing the Bank, deviations from the prescribed bank development plan and design, including deviations from any performance standards, may only be made with the prior approval of the District Engineer, following consultation with the IRT. To propose modifications to the bank development plan, the Sponsor shall submit a written request to the District Engineer.

C. Financial Assurance Requirements

1. Bank Establishment Financial Assurance

The Sponsor shall furnish an $150,000 escrow account to provide financial assurance underlying the establishment and initial functionality of the Bank. The Financial Assurance utilized by the Sponsor must be approved by the District Engineer before any construction or implementation activities may be conducted on site as part of the establishment period of the Bank, as defined in Article IV.K, and prior to the award of any Bank credits. A Financial Assurance must be instituted throughout the establishment period as described in Article IV.K. No further credits will be awarded from the Bank while the Bank lacks such a Financial Assurance.

2. Long-term Management and Maintenance Fund

The Sponsor shall institute a long-term management and maintenance fund ("Fund") pursuant to Appendix H, established and maintained through an escrow account, to fund management and maintenance actions as defined in Article IV.M of this Basic Agreement and Appendix G, following the termination of the Bank establishment period. The Fund shall be incrementally funded through the Bank establishment period, with the Fund disbursed to a Steward upon the Sponsor's relinquishment of responsibility for long-term maintenance and management of the Bank. The Sponsor agrees to continue to deposit funds in the Fund escrow account until the Fund is fully funded.

a. The Fund escrow account shall be funded through the Bank establishment period by depositing a designated sum corresponding to each sale or transfer of mitigation credits, or use of credits by the Sponsor or compensatory mitigation for its own activities causing adverse impacts to the aquatic environment. This designated sum shall be $200 per wetland credit sold, used, or transferred.

b. The Fund shall be considered to be fully funded when the total value of the escrow account, including the principal amounts deposited and earnings, has accumulated to a total of $65,000.

IV. Bank Operation

A. Service Area

The Bank will provide compensatory mitigation for impacts to the waters of the United States and waters of Tennessee, including wetlands, within the service area. A detailed description and maps of the service areas are included in Appendix E. The service area is

defined by 8-digit hydrologic unit code ("HUC"), in this case the "Loosahatchie" 8-Digit HUC. Mitigation types will be considered as outlined in the April 2008 Final Rule (30 CFR Parts 325 and 332, 40 CFR Part 230).

The Bank may provide compensatory mitigation for impacts to the waters of the United States and waters of Tennessee outside this service area as approved on a case-by-case basis by the IRT pursuant to the procedures and criteria prescribed in Appendix E.

B. Credit Kind

All credits generated in the Bank are of the bottomland hardwood kind. In-kind compensation for wetland resources is preferred; however out-of-kind compensation may be acceptable if it is determined to be practicable and environmentally preferable to other alternatives. This determination may be made on a case-by-case basis during the permit evaluation process by the regulatory agency(ies).

C. Site Access

The Sponsor will allow, or otherwise provide for, access to the Bank by members of the IRT or their agents or designees, as reasonably necessary for the purpose of inspection, compliance monitoring, and remediation consistent with the terms and conditions of this Instrument and the Appendices throughout the establishment period, operational period, and long-term management and maintenance. Inspecting parties shall not unreasonably disrupt or disturb activities on the property. Sponsor shall also allow or otherwise provide for access by any person or entity providing compensatory mitigation under the Financial Assurance provided by the Sponsor for the Bank.

D. Availability, Sale, Transfer, or Use of Credits

1. Subject to the documentation and scheduling provisions of Appendix D, the Sponsor may submit to the IRT written evidence that particular performance standards have been achieved. If the District Engineer, after consulting with the other members of the IRT and the Sponsor, concur that certain performance standards have been achieved, the District Engineer will respond in writing within thirty (30) days of a written request to the Sponsor that the credits associated with those performance standards are available for sale, transfer, or use of mitigation credits, or use by the Sponsor as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment. Each instance of sale or any other transfer of credits to a third party shall be reflected in a credit transaction agreement indicating the number of credits involved in the transaction and expressly specifying that the Sponsor, and its successors and assigns, assume legal responsibility for accomplishment and maintenance of the transferee's compensatory mitigation requirements associated with the impacting project, upon completion of the credit transaction. The Sponsor agrees that it assumes legal responsibility for compensatory mitigation requirements for each Department of the Army permit for which it transfers credits once the permitee has secured the appropriate number and type of credits from the Sponsor.

2. In the event the District Engineer, acting pursuant to Article IV.C.J of this Basic Agreement, accesses the Financial Assurance established pursuant to Article IV.C.1 of this Basic Agreement in order to have any objectives, performance standards, or features of the Bank accomplished, the District Engineer, in consultation with the other members of the IRT, may award credits for sale, use, or transfer by the Sponsor, in a quantity reflecting the Objectives and Performance Standards achieved as a result of such remedial action.

E. Credit Deficit or Fraudulent Transaction

If the District Engineer determine at any point that the Bank is operating at a deficit, or has engaged in fraudulent transactions in the sale, use, or transfer of credits, the District

Engineer will cease award of, and will direct the Sponsor to immediately cease sale, use, or other transfer of, credits. The District Engineer will determine, in consultation with the IRT and the Sponsor, what remedial actions are necessary to correct the situation and will direct their performance prior to the award of any additional mitigation credits.

F. Maintenance Provisions

Following achievement of the performance standards, the Sponsor shall perform all necessary work to maintain those standards as prescribed in Appendix F.

G. Monitoring Provisions

The Sponsor shall perform all necessary work, pursuant to Appendix F, to monitor the Bank during the establishment period to demonstrate compliance with the performance standards established in Appendix C.

H. Contingency Plans and Remedial Actions

In the event the Bank fails to achieve, within the specified time schedule, one or more of the performance standards delineated in Appendix C, the Sponsor shall develop necessary contingency plans and implement appropriate remedial and monitoring actions for the Bank as specified in Appendix F, to attain those objectives and performance standards. Prior to implementing any remediation, monitoring, or other corrective measures, the Sponsor shall obtain approval of the plans. The Sponsor shall obtain all appropriate environmental documentation, permits, and other authorizations needed to implement the contingency plan or take remedial action. In the event the Sponsor fails to implement necessary contingency actions within the prescribed period, the District Engineer (following consultation with the Sponsor and the IRT), will direct remedial, corrective, and/or sanctioning action in accordance with the procedures specified in Appendix F. Alternatively, such remedial action may be accomplished by accessing the financial assurance instrument pursuant to Article IV.J of this Basic Agreement.

I. Force Majeure

The Sponsor may request, pursuant to Article VI.A, and the District Engineer, in consultation with the IRT, may approve changes to the construction, operation, objectives, performance standards, timelines, or credit generation and award schedule of the Bank, pursuant to the standards and procedures specified in Appendix F, if all of the following occur: an act or event causes substantial damage such that it is determined to be a force majeure; such act or event has a significant adverse impact on the quality of the aquatic functions, native vegetation, or soils of the Bank; such act or event was beyond the reasonable control of the Sponsor or the Property Owners, their agents, employees, contractors, or consultants to prevent or mitigate, and neither the Sponsors nor the Property owners, nor any person or entity under the direction or control of the Sponsor or the Property Owners, including their employees, agents, contractors, or consultants could have reasonably foreseen and prevented such damage.

The evaluation of the damage caused by a force majeure and the resulting changes to mitigation requirements involve a communicative process. If the Sponsor asserts a mitigation site has sustained significant adverse impacts due to an event or act that may be determined to be a force majeure, the Sponsor shall give written notice to the District Engineer and the IRT as soon as is reasonably practicable. After receiving written notice, the District Engineer, in consultation with the Sponsor and the IRT, shall evaluate whether the event qualifies as force majeure. The District Engineer, in consultation with the Sponsor and the IRT, will then evaluate whether significant adverse impacts have occurred to the site. If a force majeure event is determined to have occurred and significant adverse impacts are

found to have occurred to the site, the District Engineer, in consultation with the IRT and the Sponsor, shall evaluate whether and to what extent changes to the Bank will be in the best interest of the site and the aquatic environment, and may approve such changes as detailed above. The District Engineer retains reasonable sole discretion over the final determination of whether an act or even constitutes force majeure, whether significant adverse impacts to the Bank have occurred, and to what extent changes to the Bank or its management will be permitted.

Force majeure events may include natural or anthropogenic catastrophic events or deliberate and unlawful acts by third parties, including, but limited to, earthquakes, floods, fire, disease, drought, vandalism, war or other civil disorder which results in significant adverse impacts to the site.

The consequences of any events of force majeure recognized as such by the District Engineer shall not affect the status of previously sold credits.

J. Default

Should the District Engineer, in consultation with the IRT, determine that the Sponsor is in material default of any provision of this Instrument, the District Engineer may cease award of mitigation credits, and may notify the Sponsor that the award, sale and/or transfer of mitigation credits, or use by the Sponsor of credits as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment, are suspended until the delineated deficiencies are rectified. Upon written notification of suspension, the Sponsor shall immediately cease any sale or transfer transactions not yet finally completed, and/or to cease any use by the Sponsor of credits as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment where a Corps, or Tennessee Department of Environment and Conservation permit or authorization, as required, has not yet been issued, until informed by the notifying agency that the award, sale, use, or transfer of credits may be resumed. Should the Sponsor remain in default for a period of ninety (90) days, the District Engineer, following consultation with the IRT, may terminate this Instrument and any subsequent banking operations. In the event such termination action is commenced, the Sponsor agrees to fulfill its pre-existing obligations to perform all establishment, monitoring, maintenance, management, and remediation responsibilities that arise directly from credits that have already been awarded, sold, used, or transferred at the time of termination. In the event of termination, no further sale or transfer of credits may occur, nor any use by the Sponsor of credits as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment within the service area where a District Engineer or Tennessee Department of Environment and Conservation permit or authorization, as required has not yet been issued.

K. Establishment Period

The establishment period of the Bank shall commence on the date the Instrument takes effect pursuant to Article VI.A. The establishment period shall terminate, and the long-term management and maintenance period shall commence, when the District Engineer determines, in consultation with the IRT and the Sponsor, that the following conditions have been met:

1. All applicable performance standards prescribed in Appendix C have been achieved;

2. All available credits have been awarded or the District Engineer, in consultation with the IRT, has approved the Sponsor's written request to permanently cease banking activities;

3. The Sponsor has prepared a Long Term Maintenance and Management Plan ("LTMMP") that has been approved by the District Engineer pursuant to Article IV.L and Appendix G;

4. The Sponsor has either:

(i) assumed responsibilities for accomplishing the LTMMP, in which case the Sponsor will fulfill the role of Steward; or

(ii) assigned those responsibilities to another Steward pursuant to Article I.M.2 of this Basic Agreement;

5. The Fund has been fully funded;

6. The contents of the Fund has been transferred to the Steward; and

7. The Bank has complied with the terms of this Basic Agreement.

L. Operational Period

The operational period of the Bank will commence on the date the Instrument takes effect pursuant to Article VI.A. Following the termination of the establishment period of the Bank, and (1) upon sale, transfer, or use by the Sponsor as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment of all credits, or (2) upon approval by the District Engineer, in consultation with the IRT, of the Sponsor's written request to permanently cease banking activities, the operational period will terminate.

M. Long Term Management and Maintenance

1. The Sponsor shall develop the LTMMP consistent with the guidelines and objectives specified in Appendix G and submit the LTMMP for approval by the District Engineer, in consultation with the other members of the IRT. The Sponsor is responsible, as Steward, for the approval of the LTMMP. The Sponsor may only deviate from the LTMMP upon written approval of the District Engineer, following consultation with the IRT.

2. The Sponsor may assign its long-term management and maintenance responsibilities to a third party assignee, which will then serve as the Steward in place of the Sponsor. The identity of the Steward is subject to the approval by the District Engineer, following consultation with the IRT, in advance of the long-term management and maintenance assignment.

3. Upon execution of a long-term management and maintenance assignment agreement and the transfer of the contents of the Fund, and upon satisfaction of the remaining requirements for the termination of the establishment period under Article IV.K of this Basic Agreement, the Sponsor shall be relieved of all further long-term management and maintenance responsibilities under this Instrument.

N. Sponsor Responsibility Accomplishment; Transfer of Ownership of or Rights in the Bank

The Sponsor shall remain responsible for complying with the provisions of this Instrument, regardless of the ownership status of the underlying real property, unless those responsibilities have been assigned pursuant to the provisions of Article IV.M of this Basic Agreement. The Sponsor shall provide written notice at least sixty (60) days in advance of any transfer of ownership in all or a portion of the Bank real property or rights to another party, by any owners of real property comprising the Bank, or their successors or assigns. Any transfer of ownership or rights other than a lien or mortgage that is subordinate to the conservation easement must be approved by the District Engineer. Such approval shall not be unreasonably withheld.

V. Oversight and Responsibilities

1. The District Engineer shall provide reasonable and appropriate oversight in carrying out the provisions of this Instrument.

2. The District Engineer shall review and provide comments on project plans, monitoring reports, contingency and remediation proposals, and similar submittals from the Sponsor within a reasonable time. The District Engineer shall review and confirm reports on the evaluation of success criteria within a reasonable time of receipt. The District Engineer will coordinate its review with the other members of the IRT. The District Engineer may request a comment period extension in some circumstances.

3. The District Engineer shall periodically inspect the Bank as necessary to evaluate, in consultation with the other members of the IRT, the achievement of performance standards, to assess the results of any corrective measures taken, to monitor implementation of the long term monitoring and maintenance plan ("LTMMP"), and, in general, to verify the Sponsor's compliance with the provisions of this Instrument.

4. The District Engineer shall review requests to modify the terms of this Instrument, determine performance standards achievement for credit award evaluation for each Bank phase, or approve the LTMMP in accordance with the 2008 Mitigation Rule. The District Engineer will coordinate review with members of the IRT so a decision is rendered or comments detailing deficiencies are provided in a timely manner.

5. The District Engineer shall act in good faith when rendering decisions under the instrument.

6. Upon the District Engineer's determination that the requirements of Article IV.K under this Basic Agreement have been satisfied, the District Engineer shall issue a letter certifying that the establishment period has terminated, and that the long-term management and maintenance period has begun, following consultation with the other members of the IRT. Upon satisfaction of the requirements of Article IV.K of this Basic Agreement and consultation with the other members of the IRT, the District Engineer will issue a letter certifying that the operational period has terminated.

VI. General Provisions

A. Entry into Effect, Modification or Amendment, and Termination of the Instrument

1. This Instrument, consisting of both this Basic Agreement and the Appendices, will become effective when it has been signed by the authorized representatives of the District Engineer, IRT and the Sponsor, as of the date of the last of these signatures.

2. This Basic Agreement portion of the Instrument may be amended or modified only with the written approval of the Sponsor and the District Engineer. Amendment or modification of the provisions of the appendices may be effectuated through an exchange of letters signed by the Sponsor and the District Engineer, following consultation with the other members of the IRT, provided the exchange of letters expresses mutual agreement as to the exact language to be deleted or modified, and the exact language to be inserted.

3. This Instrument may be terminated by the mutual agreement of the Sponsor and the District Engineer, following consultation with the IRT, or may be terminated under the terms of Article IV.J of this Basic Agreement in the case of default by the Sponsor. In the event any termination action is commenced, the Sponsor agrees to fulfill its pre-existing obligations to perform all establishment, monitoring, maintenance, management, and

remediation responsibilities that arise directly from credits that have already been sold, used, or transferred at the time of termination.

B. Assignment of Obligations under this Instrument

The Sponsor may be permitted to assign its obligations, responsibilities, and entitlements under this Instrument to a third party. The District Engineer, following consultation with the IRT, must approve the assignee in order for any assignment to effectively relieve the Sponsor of those obligations. In evaluating a prospective assignee, the District Engineer may consider characteristics such as environmental mitigation expertise, wetlands mitigation project or analogous experience, and financial strength and stability. Approval of the assignee will not be unreasonably withheld. The assignee must execute a mitigation bank instrument with the District Engineer under terms identical, to the extent practicable, to the present Instrument. The applicable Financial Assurances established pursuant to Article III.C.1 of this Basic Agreement must be provided by the assignee. The obligations, responsibilities, and entitlements under this Instrument may reside in only a single entity at any one time, and may not be severed or transferred piecemeal. However, the physical ownership of the Bank real property and the obligations, responsibilities, and entitlements under this Instrument are separate and distinct; thus, ownership of the Bank real property may be transferred pursuant to the provisions of Article IV.N, independent of assignment of this Instrument. Once assignment of this Instrument has been properly accomplished, the Sponsor will be relieved of all its obligations and responsibilities under this Instrument. Specific additional provisions pertaining to the assignment of long-term management and maintenance obligations are described in Article IV.M.

C. Notice

Any notice required or permitted hereunder shall be deemed to have been given either (i) when delivered by hand, or (ii) three (3) days following the date deposited in the United States mail, postage prepaid, by registered or certified mail, return receipt requested, or (iii) when sent by Federal Express or similar next-day nationwide delivery system, addressed as follows (or addressed in such other manner as the party being notified shall have requested by written notice to the other party):

Memphis Stone & Gravel Company
Attn: Hal F. Williford, Jr, President
111 Wilson Street
Memphis, Tennessee 38106
(901) 774-7874

US Army Corps of Engineers/Memphis District
167 North Main Street
Room B202
Memphis, Tennessee 38103-1894
(901) 544-0735

D. Entire Agreement

This Instrument, consisting of both this Basic Agreement and the Appendices, constitutes the entire agreement between the parties concerning the subject matter hereof.

E. Invalid Provisions

In the event any one or more of the provisions contained in this Instrument are held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality or unenforceability

will not affect any other provisions hereof, and this Instrument shall be construed as if such invalid, illegal, or unenforceable provision had not been contained herein.

F. Effect of Agreement

This Instrument does not in any manner affect statutory authorities and responsibilities of the signatory parties. This Instrument is not intended, nor may it be relied upon, to create any rights in third parties enforceable in litigation with the United States or the state of Tennessee.

Corps approval of this instrument constitutes the regulatory approval required for the Loosahatchie River Mitigation Bank to be used to provide compensatory mitigation for Department of the Army permits pursuant to 33 C.F.R. 332.8(a)(1). This instrument is not a contract between the Sponsor or the Property Owner and the Corps or any other agency of the Federal government. Any dispute arising under this Instrument will not give rise to any claim by the Sponsor or Property Owner for monetary damages. This provision is controlling notwithstanding any other provision or statement in the Instrument to the contrary.

G. Attorney's Fees

If any action at law or equity, including any action for declaratory relief, is brought to enforce or interpret the provisions of this Instrument, each party to the litigation shall bear its own attorney's fees and costs of litigation.

H. Availability of Funds

Implementation of this Instrument is subject to the requirements of the Anti-Deficiency Act, 32 U.S.C. § 1341, and the availability of appropriated funds. Nothing in this Instrument may be construed to require the obligation, appropriation, or expenditure of any money from the United States Treasury, in advance of an appropriation for that purpose.

I. Headings and Captions

Any paragraph heading or caption contained in this Instrument shall be for convenience of reference only and shall not affect the construction or interpretation of any provision of this Instrument.

J. Counterparts

This Instrument may be executed by the parties in any combination, in one or more counterparts, all of which together shall constitute one and the same instrument.

K. Binding

This Instrument, consisting of both this Basic Agreement and the Appendices, shall be immediately, automatically, and irrevocably binding upon the Sponsor and its heirs, successors, assigns, and legal representatives upon execution by the Sponsor and the District Engineer.

VII. Signatures

IN WITNESS WHEREOF, the parties hereto have executed this Instrument on the date herein below last written.

Parties:

Sponsor

_____ _____

Memphis Stone & Gravel Company
By: Hal F. Williford, Jr, President

Date

_____

_____

District Engineer

_____ _____

Gregg Williams
Regulatory Branch Chief
U.S. Corps of Engineers
Memphis District

Date

[Signatures continue on following page]

Other IRT Members:

Signature by other IRT members indicates assent on the part of the represented organizations to the provisions of this Instrument, but does not give rise to any affirmative obligations, express or implied. This Instrument is not binding on the other IRT members.

_____ _____
_____ Date
_____
_____

_____ _____
_____ Date
_____
_____

_____ _____
_____ Date
_____
_____

_____ _____
_____ Date
_____
_____

_____ _____
_____ Date
_____
_____

Appendix A

General Site Information

I. Site History

Historically, the site was owned by the Horne brothers, and was subsequently bought by Memphis Stone & Gravel. The site has been farmed most of recent history. Before agricultural clearing, the site would have supported bottomland hardwood forest. Agricultural practices led to the abandonment of a streambed and the creation of seven (7) agricultural ditches of varying characteristics.

A 3.06-acre permittee-responsible mitigation site is located on site and can be seen in Figure 8. The site was planted during the winter of 1999/2000 at a density of 400 trees per acre with species that included water tupelo (*Nyssa aquatic*), black gum (*Nyssa sylvatica*), swamp chestnut oak (*Quercus michauxii*), water oak (*Quercus nigra*), Nuttall's oak (*Quercus nuttallii*), willow oak (*Quercus phellos*), Shumard's oak (*Quercus shumardii*), pecan (*Carya illinoensis*), and bald cypress (*Taxodium distichum*). The final monitoring report was submitted in April 2005 describing the presence of low-chroma soils, tree survival near 100%, an influx of hydrophytic vegetation, and hydrophytic plant domination. Another wetland mitigation project is located on an adjacent parcel to the southwest of the site.

II. Site Selection

The Bank vicinity map is included in Figure 1 and an aerial map in Figure 2. This specific area was selected, and had been selected for two other wetland restoration projects previously, as it is an ideal parcel for wetland restoration. The parcels are owned by a landowner willing to permanently protect the land from development. The site is currently permitted for gravel and aggregate mining, but this mining will not take place if this Bank is approved.

As the Loosahatchie River flows through the site, it is a natural floodplain. Additionally, the agricultural history of the site left intermittent and ephemeral streams in very poor, even abandoned, condition.

The majority of the site is constituted by hydric soils, as shown in Figure 7. The majority of the soils are Waverly and Falaya series. The small amount of upland area may be graded as well to provide hydrology and are expected to become hydric after Bank development.

In respect to vegetation, the surrounding habitat is bottomland hardwood forest, indicating that the site can support the same or similar habitat. Additionally, the existing wetland project existing on site is successful and is a model for Bank development.

Figure 1: Vicinity map.

Figure 2: Aerial map.

III. Baseline

The Bank site is 59.19% agriculture with existing wetlands and watercourses, as summarized in Table 2 and Table 3, and depicted in Figure 3, Figure 4, and Figure 5.

Table 2: Existing wetland features.

Wetlands	Quality	Acreage
Wetland 1	Low to Moderate	4.20
Freshwater emergent		2.10
Freshwater forested		2.10
Wetland 2	Moderate	76.68
Freshwater emergent		3.28
Freshwater forested		3.06
Bottomland hardwood		70.34
Wetland 3	Low	1.46
Freshwater emergent		1.46
Wetland 4	Moderate to High	2.76
Bottomland hardwood		2.76
Total		85.10

Table 3: Existing stream features.

Watercourse	Quality	Linear Feet
Drainage Way 1	Low	2,765
Drainage Way 2	Low	4,129
Drainage Way 3	Low	5,252
Drainage Way 4	Low	1,589
Drainage Way 5	Low	584
Drainage Way 6	Low to Moderate	169
Drainage Way 7*	Low	2,466
Drainage Way 8	Low	4,424
Total		21,378

*Loosahatchie River

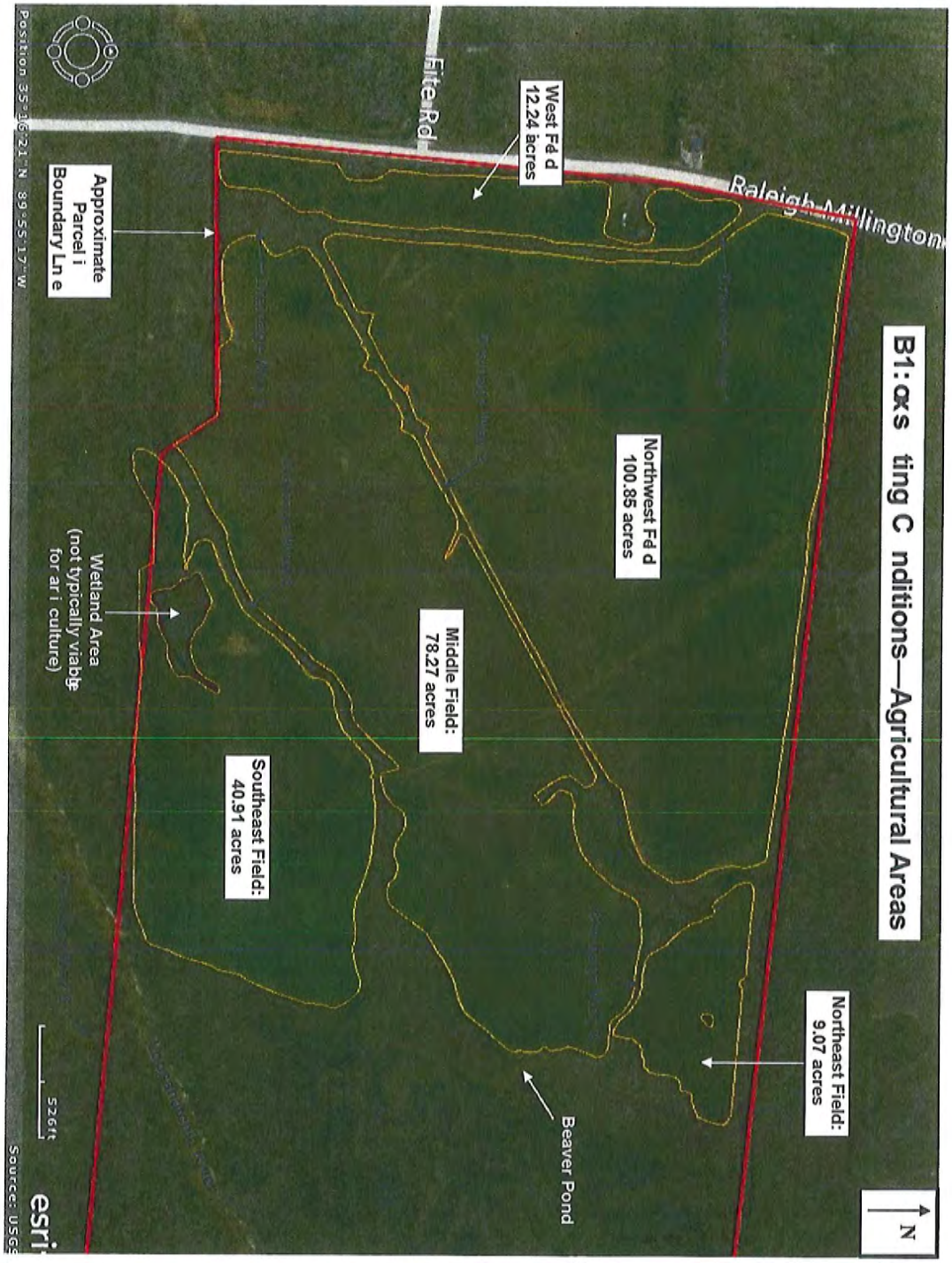

Figure 3: Existing conditions: agricultural

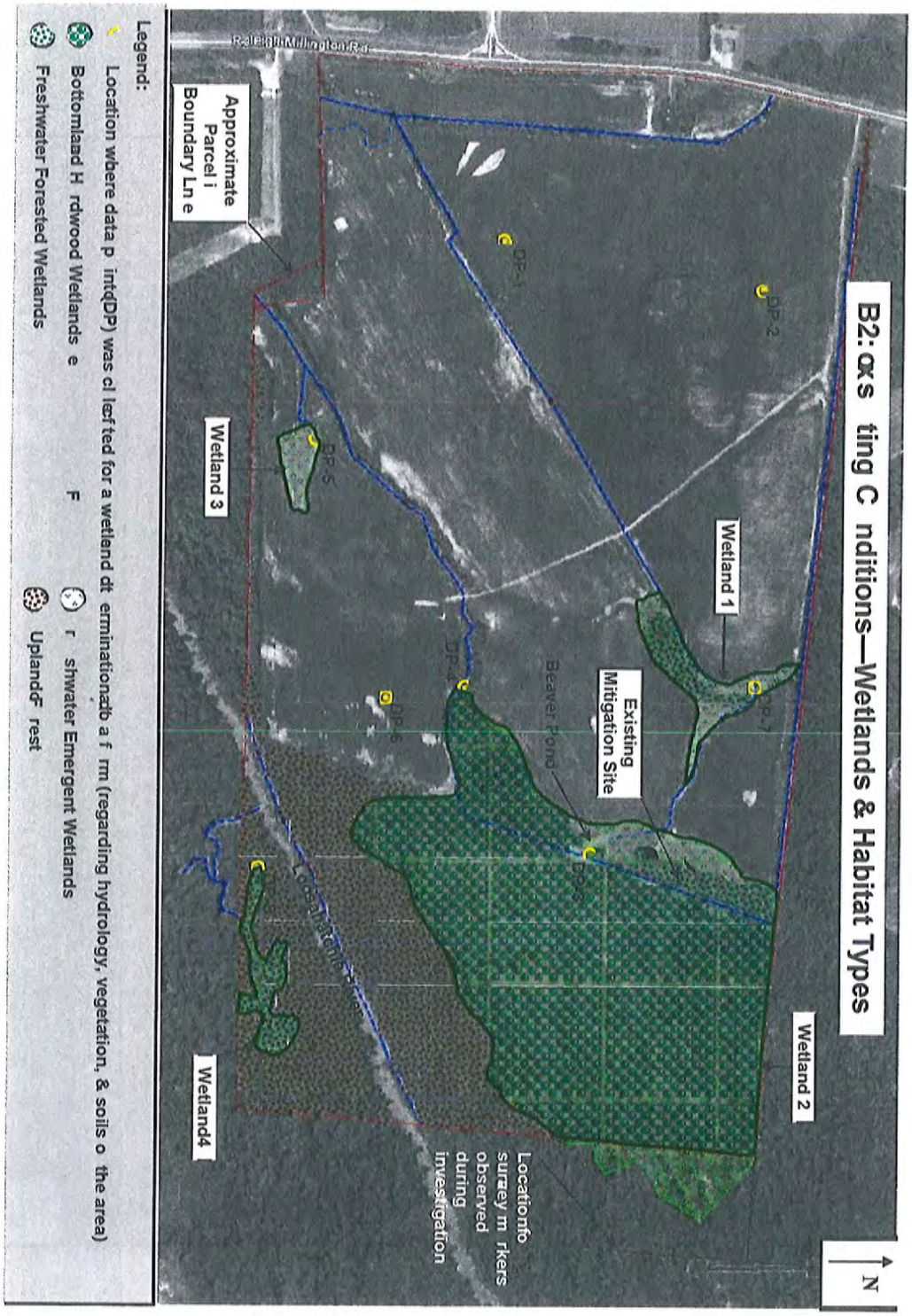

Figure 4: Existing conditions: wetlands and habitats

Figure 5: Existing conditions: wooded riparian zones and watercourses.

A. Agricultural Lands and Emergent Wetlands

The Bank site is divided into five agricultural fields as shown in Figure 3. The 12.24-acre West Field contains an abandoned barn. The 100.85-acre Northwest Field is traversed by a farm path, which leads to the 78.27-acre Middle Field. The Middle Field lies between two drainages. The 9.07-acre Northeast Field is separated from the rest by two drainage ways and includes a small concave area with standing water present near its center. A 4.20-acre, low to moderate quality emergent wetland lies west of the Northeast field. The 40.91-acre Southeast field is the southernmost agricultural field and is surrounded by 1.46 acres of saturated areas (1.46 acres of which is delineated as a low quality emergent wetlands). There is an estimated cumulative 241.35 acres of agricultural fields on the Bank site.

B. Wooded Areas

The wooded areas contain the majority of existing wetlands on site, including the existing 3.06-acre wetland restoration site; a 2.76-acre, moderate to high quality wetland; and a 76.68-acre, moderate quality wetland. Also included within the wooded areas are approximately 47 acres of upland forest, located in the southeast corner of the property. Wooded riparian zones are also present along three drainages and the Loosahatchie River.

C. Watercourses

Five (5) of eight (8) waterways on site are man-manipulated to some degree, which includes the channelized Loosahatchie River as shown in Figure 5. The length and condition of these waterways are summarized in Table 4.

Table 4: Existing watercourses quality and length.

Watercourse	Quality	Linear Feet
Drainage Way 1	Low	2,765
Drainage Way 2	Low	4,129
Drainage Way 3	Low	5,252
Drainage Way 4	Low	1,589
Drainage Way 5	Low	584
Drainage Way 6	Low to Moderate	169
Drainage Way 7*	Low	2,466
Drainage Way 8	Low	4,424
Total		21,378

*Loosahatchie River

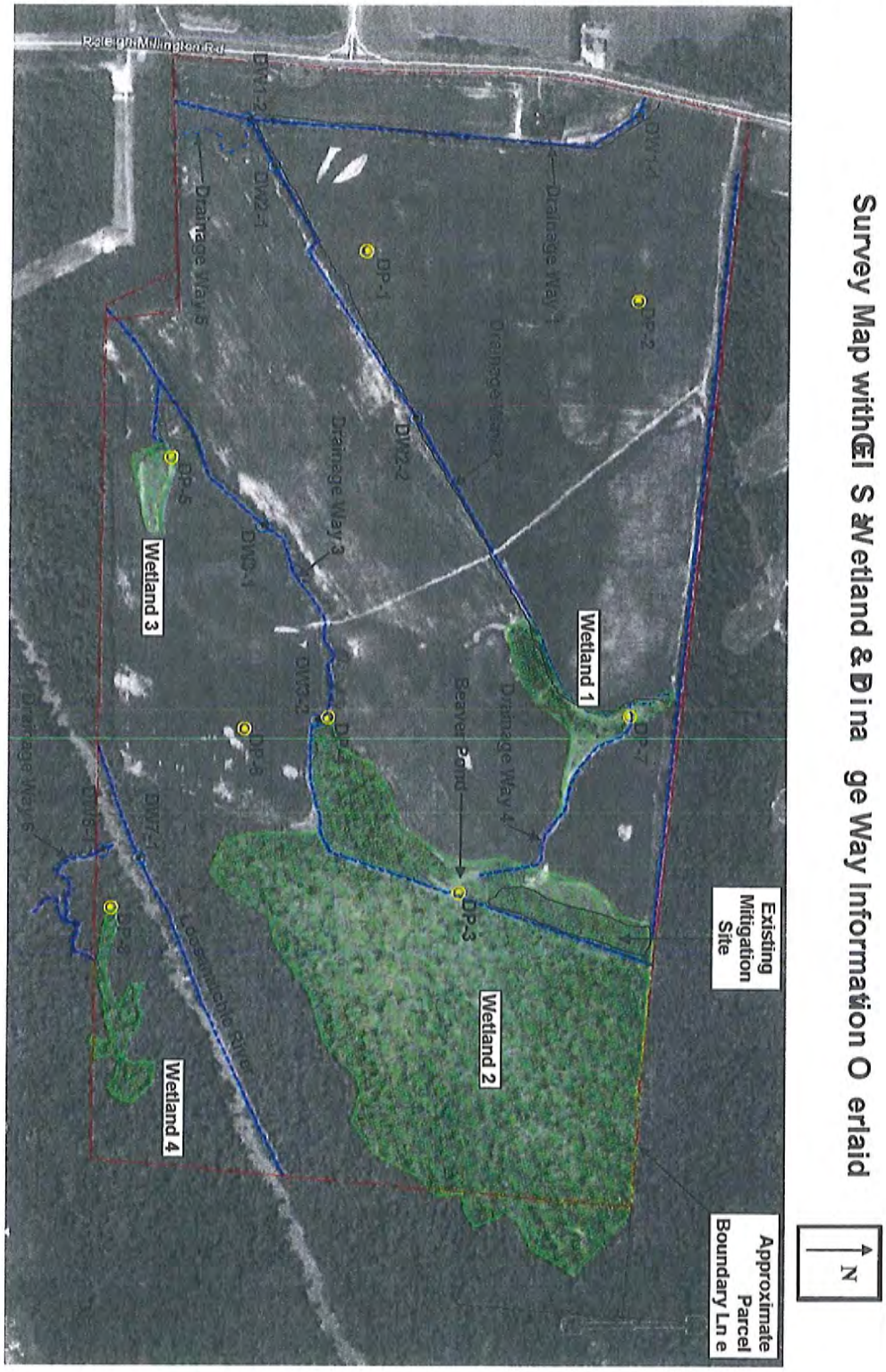

Figure 6: Wetlands and drainage ways.

D. Hydrology

Overland storm flow, direct precipitation, and periodic flooding from the Loosahatchie River influence site hydrology. Drainage appears to flow from the northwest corner toward the southeast corner of the property.

E. Soils

As seen in Figure 7 and summarized in Table 5, the Soil Survey of Shelby County, Tennessee, NRCS describes the soils of the entire project site as follows:

- 57% of the site contains Waverly silt loam
- 28% of the site contains Falaya silt loam
- 10% of the site contains Calloway silt loam
- 2% of the site contains Henry silt loam
- 1% of the site contains Grenada silt loam with 2-5% slopes

Soils for the remaining 2% of the subject property were unknown and classified by NRCS as "water," which was located on the soil map along the Loosahatchie River. Three of the above-listed soils are considered to be hydric soils for Shelby County, Tennessee (Table 6): Waverly silt loam, Falaya silt loam, and Henry silt loam. Thus, approximately 87%, or 354 acres, of the subject property contains hydric soil. Of note, field survey demonstrated that the NRCS-mapped Calloway silt loam area in the northwest corner of the site contained hydric soil indicators.

Table 5: Soil types

Shelby County, Tennessee (TN157)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Ca	Calloway silt loam	41.8	10.3%
Fm	Falaya silt loam	113.8	28.1%
GaB	Grenada silt loam, 2 to 5 percent slopes	3.8	0.9%
He	Henry silt loam	8.2	2.0%
W	Water	7.0	1.7%
Wv	Waverly silt loam	230.2	56.9%
Totals for Area of Interest		**404.9**	**100.0%**

Table 6: NRCS Shelby County hydric soils.

area symbol	area name	mapunit sequence	mapunit symbol	mapunit name	mapunit acres	component name and phase	representative %composition	landforms	hydric rating	hydric criteria
TN157	Shelby County, Tennessee	1	Ba	Bonnie silt loam	273	Bonn	100	Stream terraces	Yes	2B3
TN157	Shelby County, Tennessee	9	Fm	Falaya silt loam	84258	Waverly	9	Flood plains	Yes	2B3
TN157	Shelby County, Tennessee	22	He	Henry silt loam	9958	Henry	100	Stream terraces	Yes	2B3
TN157	Shelby County, Tennessee	23	Ib	Iberia silt loam	753	Iberia	100	Backswamps	Yes	2B3
TN157	Shelby County, Tennessee	43	Sh	Sharkey clay	9534	Sharkey	100	Flood plains	Yes	2B3
TN157	Shelby County, Tennessee	44	Sw	Swamp(roseborough, ponded)	959	Sharkey	100	Flood plains	Yes	2B3, 3
TN157	Shelby County, Tennessee	45	Tu	Tunica silty clay	11823	Tunica	100	Flood plains	Yes	4
TN157	Shelby County, Tennessee	47	Wv	Waverly silt loam	25597	Waverly	100	Flood plains	Yes	2B3

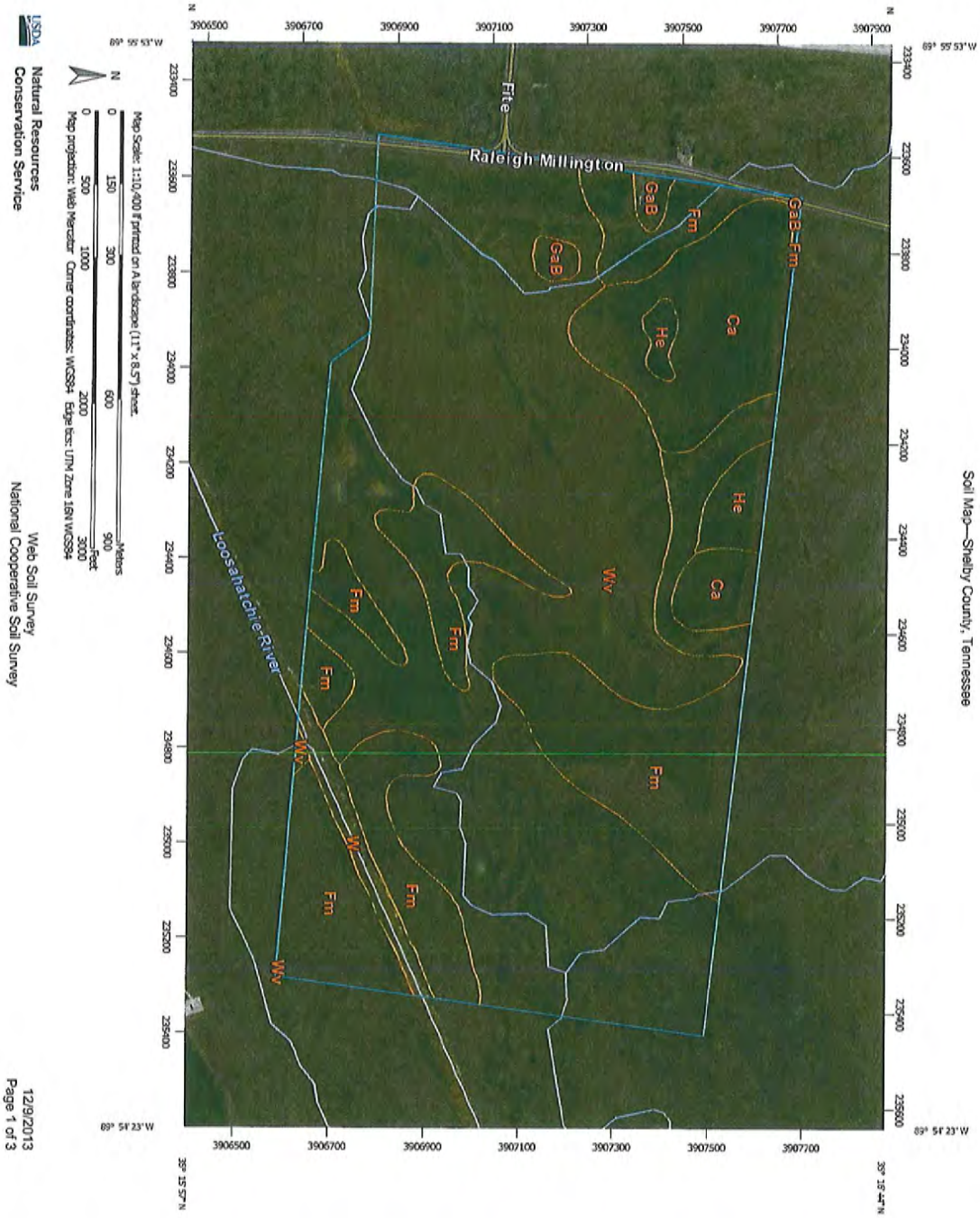

Figure 7: Soils map.

F. Vegetation

The 241.35 acres of agricultural fields rotate soybean and winter wheat, with common milkweed growing within the crops. The wetland area vegetation within the agricultural fields includes green ash, switchgrass, Pennsylvania smartweed, water oak, black willow, white panicle aster, and rough cocklebur.

Throughout the wooded areas, the common species include American hornbeam, green ash, eastern cottonwood, saw greenbriar, bald cypress, eastern poison ivy, boxelder, Indian wildoats, Japanese honeysuckle, black gum, and goldenrod. The majority of the drainage ways have low canopy cover. A detailed summary of species by area is included in Table 7.

Table 7: Dominant species by area.

Area	Dominant Species
Agricultural	Winter wheat (Triticum aestivum, UPL), soybean (Glycine max, UPL), and common milkweed (Asclepias syriaca, UPL).
Existing mitigation	Carya illinoensis (pecan, FACU), Nyssa aquatic (water tupelo, OBL), N. sylvatica (blackgum, FAC), Quercus michauxii (swamp chestnut oak, FACW), Q. nigra (water oak, FAC), Q. nuttallii (Nuttall oak, FACW), Q. phellos (willow oak, FACW), Q. shumardii (Shumard's oak, FAC), and Taxodium distichum (bald cypress, OBL), Acer negundo (boxelder, FAC), A. rubrum (red maple, FAC), A. saccharinum (silver maple, FAC), Betula nigra (river birch, FACW), Fraxinus pennsylvanica (green ash, FACW), Platanus occidentalis (American sycamore,FACW), Populus deltoids (eastern cottonwood, FAC), Salix nigra (black willow, OBL), Ulmus alata (winged elm, FACU), and U. Americana (American elm, FAC). Other tree species noted included Cornus drummondii (roughleaf dogwood, FAC) and Liquidambar styraciflua (sweetgum, FAC). Herbaceous species listed in tables below.
Wetland 1	Fraxinus pennsylvanica (green ash, FACW), Panicum virgatum (switchgrass, FAC), Polygonum pensylvanicum (pennsylvania smartweed, FACW), Quercus nigra (water oak, FAC), Salix nigra (black willow, OBL), and Symphyotrichum lanceolatum (white panicle aster, FACW)
Wetland 2	Acer negundo (boxelder, FAC), A. rubrum (red maple, FAC), Cephalanthus occidentalis (button bush, OBL), Chasmanthium latifolium (indian woodoats, FAC), Fraxinus pennsylvanica (green ash, FACW), Lonicera japonica, (Japaneese honeysuckle, FAC), Nyssa sylvatica (blackgum, FAC), Smilax bona-nox (saw greenbrier, FAC), Solidago rugosa (wrinkleleaf goldenrod, FAC), and Taxodium distichum (bald cypress, OBL)
Wetland 3	Amaranthus viridis (slender amaranth, FAC), Carex spp. (OBL/FACW), Panicum virgatum (switchgrass, FAC), and Xanthium strumarium (rough cocklebur, FAC)
Wetland 4	Carpinus caroliniana (American hornbeam, FAC), Fraxinus pennsylvanica (green ash, FACW), Nyssa biflora (swamp tupelo, OBL), Platanus occidentalis (American sycamore, FACW), Populus deltoides (eastern cottonwood, FAC), Smilax bona-nox (saw greenbrier, FAC), Taxodium distichum (bald cypress, OBL), Toxicodendron radicans (eastern poison ivy, FAC)

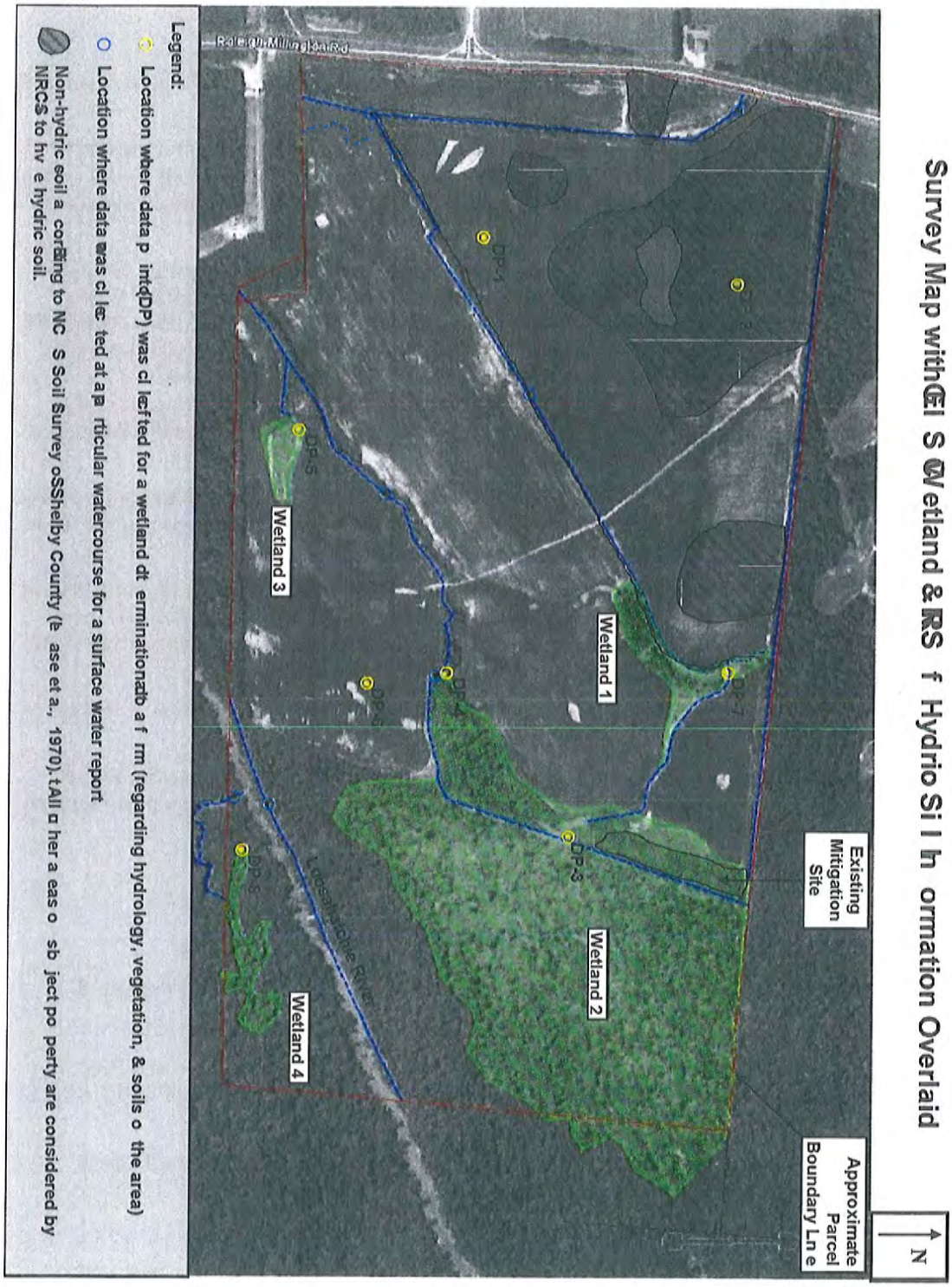

Figure 8: Wetlands and NRCS hydric soil data.

IV. Site Legal Description

The parcel plat is found in Figure 9, and the legal description, replicated below, can be found with the plat.

Description of Tract 1 of the Memphis Stone & Gravel Company property recorded in Instrument Number HZ 9795 in the Shelby County Register's Office, lying on the east side of Raleigh–Millington, in the 1st Civil District of Shelby County, Tennessee, being more particularly described as follows:

Beginning at an iron post found at the northwest corner of Tract 1 of the Memphis Stone and Gravel Company property recorded in Instrument Number HZ 9795, located at Tennessee State Plane Grid Coordinate North 367167.23, East 796416.58, said point also being on the east right-of-way line of Raleigh-Millington Road (108' wide) as recorded in Instrument Number DJ 5472, Then South 81 degrees 27 minutes 29 seconds East, 5731.39 feet along the south line of the Duncan tract recorded in Book 2084, Page 214 to an iron pipe found at the northeast corner of Tract 1;

Then South 07 degrees 59 minutes 00 seconds West, 2864.51 feet along the west line of Lot 7 of the S.B. Hill Estate to an iron pipe found at the southeast corner of Tract 1;

Then North 86 degrees 33 minutes 18 seconds West along the north line of Hubbard (Instrument #F8 6644); Batten (Book 2402, Page 185); Connell (Book 2465, Page 583); and Perkins, passing an iron post found on the top bank of a ditch at 4555.36', but continuing for a total distance of 4570.48 feet to a point;

Then along the east and north line of a 5.112 acre Wetlands Mitigation Area the following two courses:

North 23 degrees 42 minutes 18 seconds West, 365.24 feet to an iron post found;
North 86 degrees 33 minutes 18 seconds West, 1047.72 feet to an iron post found on the east right-of-way line of Raleigh-Millington Road;

Then along the said right-of-way line the following six courses:

North 07 degrees 51 minutes 03 seconds East, 953.62 feet to a point;

North 05 degrees 21 minutes 03 seconds East, 118.06 feet to a point;

North 04 degrees 12 minutes 18 seconds East, 600.12 feet to an iron pin found;

North 05 degrees 21 minutes 03 seconds East, 201.32 feet to a point of curvature;

Then North 10 degrees 411 minutes 16 seconds East along the chord of a 2822.79' radius curve to the right an arc length of 525.89 feet (chord = 525.13') to the point of tangency;

Then North 16 degrees 01 minutes 30 seconds East, 664.66 feet to the Point of Beginning.

Notes:

The above-described tract encompasses 407.76 acres of land, more or less, and is subject to easements that may or may not be recorded.

Easements of record in Instrument Number DJ 5472, K8 9599, ED 6162, K8 9597, AT 9310, X2 9081, J7 4971, DB 6174, and Deed Book 2792, Page 271.

Figure 9: Plat and legal description.

V. Existing Mitigation Site

A 3.06-acre permittee-responsible mitigation site is located on site and can be seen in Figure 8. The site was planted during the winter of 1999/2000 at a density of 400 trees per acre including water tupelo (*Nyssa aquatic*), black gum (*Nyssa sylvatica*), swamp chestnut oak (*Quercus michauxii*), water oak (*Quercus nigra*), Nuttall's oak (*Quercus nuttallii*), willow oak (*Quercus phellos*), Shumard's oak (*Quercus shumardii*), pecan (*Carya illinoensis*), and bald cypress (*Taxodium distichum*). The final monitoring report was submitted in April 2005 describing the presence of low-chroma soils, tree survival near 100%, an influx of hydrophytic vegetation, and hydrophytic plant domination. A more comprehensive list of species is found in Table 8.

Table 8: Herbaceous species observed in existing mitigation site.

Ambrosia trifida	FAC		
Ammannia coccinea	OBL	*Juncus effusus*	OBL
Ampelopsis arborea	FAC	*Juncus secundus*	FAC
Andropogon virginicus	FAC	*Leersia oryzoides*	OBL
Apocynum cannabinum	FACU	*Lobelia cardinalis*	FACW
Betula nigra	FACW	*Lobelia siphilitica*	OBL
Bidens aristosa	FACW	*Ludwigia peploides*	OBL
Boehmeria cylindrical	FACW	*Lycopus rubellus*	OBL
Boltonia asteroids	FACW	*Mikania scandens*	FACW
Brunnichia ovata	FACW	*Mimulus alata*	OBL
Cardamine bulbosa	OBL	*Packera glabella*	OBL
Carex annectens	FACW	*Panicum rigidulum*	FACW
Carex crus-corvi	OBL	*Passiflora incarnata*	NI
Carex frankii	OBL	*Penthorum sedoides*	OBL
Carex lupuliformis	FACW	*Phyla lanceolata*	OBL
Carex squarrosa	FACW	*Pluchea camphorate*	FACW
Cephalanthus occidentalis	OBL	*Polygonum pensylvanicum*	FACW
Chasmanthium latifolium	FAC	*Polygonum setaceum*	OBL
Cicuta maculata	OBL	*Ptilimnium costatum*	FACW
Clematis crispa	FACW	*Ranunculus pusillus*	FACW
Cynanchum leave	FAC	*Ranunculus sardous*	FAC
Cyperus erythrorhizos	OBL	*Rhynchospora corniculata*	OBL
Cyperus pseudovegetus	FACW	*Rubus trivialis*	FACU
Cyperus strigosus	FACW	*Rumex crispus*	FAC
Dichanthelium scoparium	FACW	*Rumex verticillatus*	FACW
Diodia virginiana	FACW	*Sagittaria latifolia*	OBL
Echinochloa crus-galli	FACW	*Scirpus atrovirens*	OBL
Eleocharis obtuse	OBL	*Sesbania herbacea*	FACW
Eupatorium serotinum	FAC	*Sisyrinchium atlanticum*	FACW
Hydrolea uniflora	OBL	*Solidago altissima*	FACU
Hypericum mutilum	FACW	*Symphyotrichum lateriflorum*	FAC
Impatiens capensis	FACW	*Symphyotrichum lanceolatum*	FACW
Ipomoea lacunosa	FAC	*Teucrium canadense*	FACW
Iva annua	FAC	*Toxicodendron radicans*	FAC
Juncus diffusissimus	FACW	*Typha latifolia*	OBL
		Xanthium strumarium	FAC

Appendix B

Bank Development Plan and Design

I. Bank Development

The Bank will restore or enhance 323.5 acres of habitat, including 85.1 acres of enhanced existing wetlands, 238.38 acres of restored bottomland hardwood wetlands, as summarized in Table 1. No treatment will be applied to 79.75 acres, of which 98.5% are upland forest.

A. Development Plans

1. Existing Wetland Enhancement

These 85.1 acres of wetlands were found in four separate areas within the bank site and most were not dramatically affected by agricultural. Of these four existing wetlands, approximately 5.2 acres (6.1%) are freshwater-forested wetlands, 6.8 acres (8.0%) are freshwater emergent wetlands, and 73.1 acres (85.9%) are bottomland hardwood wetlands. Wetland 1 is low to moderate quality; Wetland 2 is moderate quality; Wetland 3 is low quality; and Wetland 4 is moderate to high quality. Existing wetlands will be enhanced by allowing natural regeneration of native hydrophytic plants and the installation of wildlife habitat structures such as brush piles and nest structures for songbirds, woodpeckers, and bats. Additionally, Drainage Way 3 will be plugged with the goal of attenuating wetland hydrology. The enhancement activities of these existing aquatic resources are important for maintaining or improving ecological functions of the watershed and they contribute significantly to the ecological sustainability of the watershed. This enhancement activity will result in a 4:1 credit generation ratio.

2. Bottomland Hardwood Restoration

The majority of the agricultural fields meet two of the three wetland criteria (wetland hydrology and hydric soil), but fail to meet the hydrophytic vegetation criteria due to agricultural land use. Additionally, as a result of clearing and degradation from agricultural impacts, these areas provide very limited ecological function. Bottomland hardwood wetland restoration will be achieved by planting native hydrophytic species and hydrologic modification in some areas via a plug in Drainage Way 3. Planned bottomland hardwood wetlands will be planted with native species of shrubs and trees then seeded with native herbaceous and graminoid species. Quantities of each species will be chosen to increase biodiversity and evenness. However, mast-producing species (oaks) will comprise less than 10% of the total tree biomass in order to maintain a healthy, stable, and productive forest ecosystem without attracting large concentrations of waterfowl. As much of these areas with hydric soil also already meet wetland hydrology criteria, the restoration of wetlands in these areas should be accomplished soundly with the addition of hydrophytic vegetation. The restoration of these 238.38 acres of wetlands are important because bottomland hardwoods serve a critical role in the watershed by reducing the risk and severity of flooding to downstream communities by providing areas to store floodwater as well as ecological services. In addition, these wetlands will improve water quality by filtering and flushing nutrients, processing organic wastes, and reducing sediment before it reaches open water. Bottomland hardwood wetlands are extraordinarily rich in wildlife, more so than most other forest types due to abundant cover and leaf litter, structurally complex and diverse vegetation, and alternating wet and dry periods. Specifically, restored bottomland hardwood

wetlands at the Bank will provide habitat for the Cerulean Warbler and Swainson's Warbler, two bottomland species on the "In Need of Management in Tennessee" list.

In the northwest corner of the site, 45.65 acres of the bank site are deemed by NRCS to contain non-hydric soil (Calloway silt loam and Grenada silt loam), as shown in Figure 8. Data collected from a soil pit in an area judged by NRCS to be non-hydric soil was found to in fact meet hydric soil criteria. Furthermore, all soil pits but one contained hydric soil, albeit the soil characteristics of the soil pit that did not meet hydric criteria were close. Thus, the areas judged by NRCS to contain non-hydric soil (and that are not within the upland buffer will be modified via existing hydrology by creating approximately 17 micro-depressions, each 1-3 acres in size. The micro-depressions will be shallowly excavated (so that approximately 2-6 inches of standing water will be present during portions of the year) and partially surrounded by an earthen berm 6 inches tall. These berms will function to control site hydrology and will be placed to allow low-flow overland runoff to enter depressions and to promote interconnectivity of the depressions. Additionally, portions of Drainage Way 8 (Figure 8 and Figure 10) will be notched to increase hydrology in select areas (Figure 10). Intended habitat of micro-depressions will be restored bottomland hardwood wetlands. Each micro-depression will be planted with trees shown in (Table 10). These scrub-shrub and emergent wetlands will function to conserve wetland biodiversity; to provide terrestrial and aquatic habitats (especially important for birds and other species that rely on the dense cover and food resource the shrub species offer); to retain sediments, elements, and compounds; in nutrient cycling; and to maintain plant communities. These restoration activities will result in a 1:1 credit generation ratio.

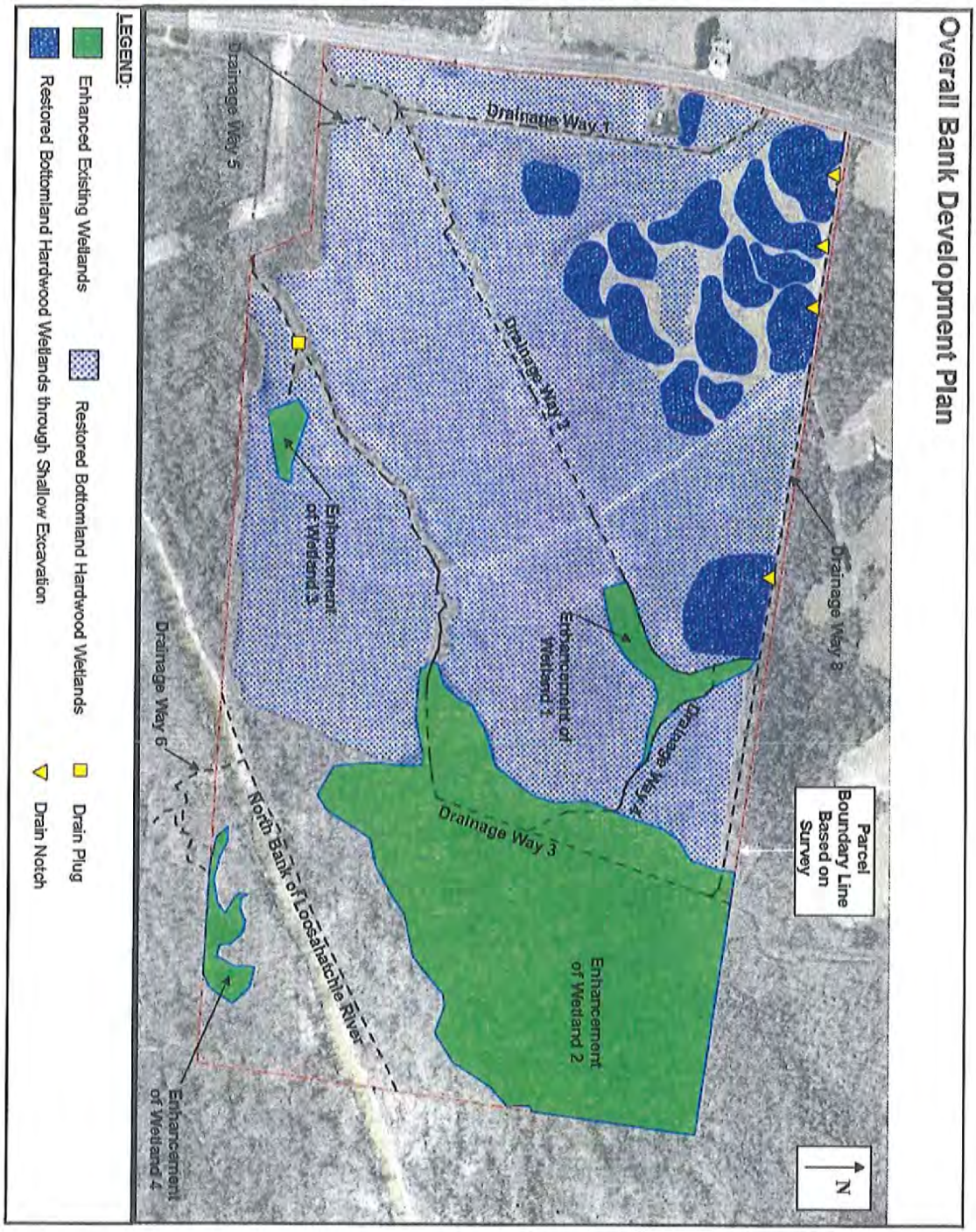

Figure 10: Development activity map.

II. Construction

A. Site Construction Plan and Timeline

All work for this project will take place within the site boundaries as shown in Figure 10. The Bank is surrounded by wooded and agricultural properties. Before any site grading or construction activities begin, Wetlands 1 and 3, which will be vulnerable to damage during construction due to their location, must be flagged in the field and a wetlands protection silt fence will be constructed for additional defense if necessary. Any other erosion control structures deemed necessary will also be constructed and installed at this time (see section D of this Appendix).

As outlined in Table 9, site work will begin with enhancement of existing wetlands in the form of wildlife habitat structures. Brush piles and bird and bat nesting structures will be placed in Wetlands 1, 3, and 4. Three brush piles and several bird and bat nesting structures will be placed on the west side of Wetland 2.

Table 9: Construction timetable.

CATEGORY	TASK	TIME FRAME
Construction	1. Flag existing Wetland 1 and 3 and install protection and other erosion controls according to SWPPP	February 2017
	2. Construct brush piles and install wildlife habitat structure in existing wetlands	February 2017
	3. Construct micro-depressions and berms	February to April 2017
	4. Plug Drainage Way 3, make notches in Drainage Way 8, and dig trenches to micro-depressions	February to April 2017
Planting	5. Plant trees in restored bottomland hardwood wetlands, upland buffers, and riparian zones.	February to March 15, 2017
	6. Broadcast herbaceous/graminoid seeds in restored bottomland hardwood wetlands, upland buffers, riparian zones, and micro-depressions.	March 15 to May, 15 2017
	7. Plant trees in micro-depressions after earthwork is completed during dormant period.	February to March, 15 2017 and/or November 2017 to December 31, 2017

After enhancement of existing wetlands, the second step should be planting the agricultural field. Between November 15 and March 15, trees should be planted in the restored bottomland hardwood wetlands. Access roads to the various areas of the site should be established and traffic should be confined to these designated road(s). From March 15 through May, herbaceous/graminoid seeds should be broadcast in the restored bottomland hardwood wetlands and in microdepressions.

Earthwork for micro-depressions should begin January 1 and be completed by February 15 (earthwork details are provided in the sections entitled "Grading Plan" and "Erosion Control and Storm Water Protection Plan"). Afterwards all exposed soil should be seeded from March 15 to May 15 with those herbaceous and graminoid-type seeds listed in Table 6. Once all earthwork and plantings are complete, Drainage Way 3 should be plugged and notches should be cut in Drainage Way 8. Finally, when access roads are no longer needed, said roads should be broadcasted with seeds.

B. Grading

Beginning in the spring (or as early as February 15), start grading near the northwest corner of the property where micro-depressions will be established. In total, 17 micro-depressions (each 1-3 acres in size) must be excavated. Excavation will be shallow so that approximately 2-6 inches of standing water will be present during portions of the growing season. Each micro-depression, will be excavated 6 inches. All stockpiled soils need to be reasonably free of stone, rocks, clay lumps, roots, toxic materials, and other foreign matter. If earthwork is paused/delayed for more than one week, temporarily stabilize the soil pile from wind and water erosion by seeding with annual rye grass and cover with straw mulch, hydroseed fiber mulch, or a geo-fabric like curlex. To prevent drying out, wet pile once or twice a week as needed. Surround soil stockpiles with erosion control bio-logs or trenched silt fence.

Each micro-depression is to be partially surrounded by an earthen berm (similar to a rice levee) that is 6 inches tall. Construct indicated berms with excess soil resulting from site grading. With a stake every 50 feet along the boundaries indicating the construction of a berm, mark existing elevations and finish elevation of berm to a height of 6 inches above surrounding ground elevation. Earthwork should be constructed in an undulating fashion so as to allow low-flow overland runoff to enter depressions and to promote interconnectivity of the depressions. All down slopes from the existing ground grade around the perimeter of the created wetland and from the top of berm shall be 4:1 (horizontal to vertical). To create as uniform a surface area as possible, smooth the grade using a tractor with a harrow and/or by hand with rakes. No significant tire ruts from vehicles used during the grading process should remain after final grading. After work on the micro-depressions is complete, Drainage Way 8 should be notched and trenches excavated so that a portion of the flow from Drainage Way 8 travels south and passes over the micro-depressions. As shown in Figure 3, a total of four notches should be placed in Drainage Way 8. Drainage Way 3 should also be plugged at this time. The earthen plug should be designed with a core of compactable earth (i.e., red clay hillside material) with rip-rap placed over the top.

C. Vegetation Installation

Prior to the planting of trees or herbaceous material, the site shall be disced to a depth of about 12 inches. If fertilization is determined to be needed, then upon completion of discing, the site, or portions thereof, shall be fertilized. Fertilizer will be broadcast at a mixture of 13-13-13 and at a rate of 150 pounds per acre as needed. Other fertilization methods may be considered

Tree seedlings (as bare roots) will be planted on the mitigation site at a density of approximately 300 per acre (approximately 15-foot centers). Species to be planted will be chosen from the list below, depending upon the availability (see Table 10). Seedlings will likely be obtained from the East Tennessee Nursery, a component of the Tennessee Department of Agriculture. A minimum of ten species will be planted with no species consisting of more than 20% of the total. Emphasis will be placed on planting late-successional species of a higher quality (mainly oaks). It is anticipated that early successional light seeded species, such as eastern cottonwood (*Populus deltoides*), American sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*),red maple (*Acer rubrum*), and silver maple (*Acer saccharinum*), will readily colonize the area and are therefore not included in the list of planted species. Understory species (shrub/small trees) beneficial to wildlife are included in the list of potential species and are indicated by an aesthetic (*). These species will not account for more than 20% of the total. Listed FACU species will only be planted in the upland areas.

Table 10: Planting palette

Species	Common Name	Indicator Status
*Amorpha fruticose**	Indigobush	FACW
Carya aquatica	Water hickory	OBL
Carya illinoinensis	Pecan	FACU
Carya laciniosa	Shell-bark hickory	FACW
Carya ovata	Shagbark hickory	FACU
*Cephalanthus occidentalis**	Common buttonbush	OBL
*Cornus amomum**	Silky dogwood	FACW
*Cornus drummondii**	Rough-leaf dogwood	FAC
*Cornus florida**	Flowering dogwood	FACU
*Diospyros virginiana**	Common persimmon	FAC
*Morus rubra**	Red mulberry	FACU
Nyssa aquatica	Water tupelo	OBL
Nyssa sylvatica	Blackgum	FAC
Quercus bicolor	Swamp white oak	FACW
Quercus lyrata	Overcup oak	OBL
Quercus michauxii	Swamp chestnut oak	FACW
Quercus nigra	Water oak	FAC
Quercus Nuttallii	Nuttall's oak	FACW
Quercus pagoda	Cherrybark oak	FACW
Quercus palustris	Pin oak	FACW
Quercus phellos	Willow oak	FACW
Quercus shumardii	Shumard's oak	FACW
*Sambucus Canadensis**	Elderberry	FACW
Taxodium distichum	Bald cypress	OBL

Tree Planting Specifications

- Tree seedlings will be planted on 15-foot centers (approximately 300 trees / acre);
- Planting will be done within the planting season (November 15 to March 15) after the grading and other construction work is complete; if this work is completed within a planting season, planting will be done during that season.
- Trees will be planted with the root/stem interface immediately at the finished landscape grade.
- Seedlings will be kept moist throughout the planting procedure
- No planted species will comprise more than 1/5 of the total planted trees.

Herbaceous and graminoid (grass-type growth habit) planting material will consist of seeds that will be broadcast during the normal growing season. These seeds will be planted between March 15 and May 15. The seed mix will include an annual grass for quick stabilization as well as native hydrophytic perennial grasses and forbs, such as red top (*Agrostis alba*), Virginia wild rye (*Elymus virginicus*), switch grass (*Panicum virgatum*), and a minimum of 10 species of perennial forbs for long-term vegetation coverage. The actual species planted will depend on the composition of available seed mixes. Seeds will be dispensed by appropriate broadcasting methods, i.e. hand or mechanical.

D. Erosion Control and Storm Water Protection Plan

Prior to implementing grading work, erosion control measures will be included as part of the mitigation Bank Development Plan. Contractor is to provide and maintain erosion control structures during construction. Erosion control BMP (best management practices) measures taken in stream channels and wetlands may include, but not be limited to the installation of reinforced silt fence, staked hay bales, vegetative seeding, temporary coffer dams, rip-rap, erosion control blankets, and if necessary giant cane, cottonwood and willow sprigging in select areas. Construction activities will be coordinated in such a fashion so as to control sedimentation during storm events with consideration of best management practices.

The first step in erosion control is to install trenched silt fence around the four areas designated for establishment of micro-depressions. Reinforced silt fence is suggested. These four areas, which are outlined in orange, are shown in Figure 11. Areas 1 and 2 contain a single micro-depression; Area 3 contains twelve (12) micro-depressions; and Area 4 contains three micro-depressions. Once erosion control structures are in place, earthwork and grading can commence. Staging areas should be evaluated regarding their proximity to watercourses and should be placed in an area that will minimize sediment from entering a watercourse. If construction equipment is entering and leaving the site regularly, a section of surge stone should be placed at the property entryway and any tired vehicle (that may have dirt on the tires) leaving the site should drive across the surge stone in order to reduce the amount of dirt being transferred to the public roads.

If earthwork is paused/delayed for more than one week, any soil piles must be temporarily stabilized from wind and water erosion by seeding with annual rye grass and covering with straw mulch, hydroseed fiber mulch, or a geo-fabric like curlex. To prevent drying out, the soil piles can be wet once or twice a week as needed. Immediately after earthwork is complete in each erosion control area, the areas should be seeded/planted with the species listed in Table 10.

As described previously, four notches and associated trenches will be placed in Drainage Way 8 (to disperse water toward the micro-depressions) and an earthen plug will be constructed within Drainage Way 3 (to attenuate stream flow and help distribute water across the restored bottomland hardwood wetlands). While these stream features are being conducted, live water will be diverted from the stream and wetlands construction areas until they are considered stable and ready for flow conditions. This will require close oversight by a consultant who will be on-site coordinating closely with the project development team and assuring quality control of environmental features and considerations. The contractor is responsible for maintaining adequate drainage during construction. Additionally, the contractor must comply with applicable state water quality standards, the Corps of Engineers 404 permit conditions, Water Quality Certification conditions, Tennessee Construction General Permit, and any other applicable regulations.

E. As-Built Report

An as-built report for each phase of Bank development will be provided within sixty (60) days following completion of each stage of construction: grading and vegetation installation.

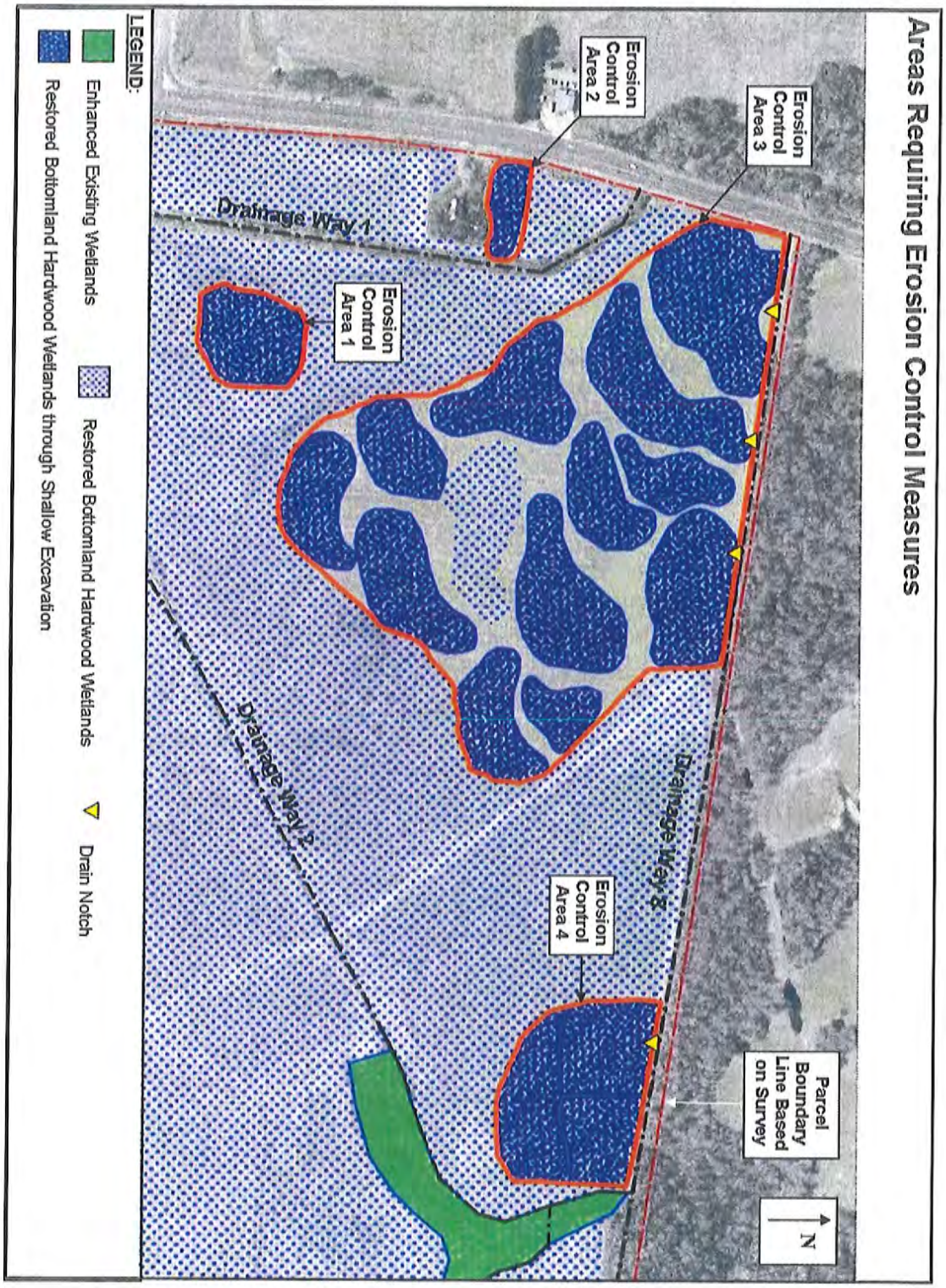

Figure 11: Erosion control map.

Appendix C

Bank Objectives and Performance Standards

I. Objective 1: Protection of Aquatic Ecosystems

Permanently protect aquatic ecosystem functions at the Bank by instituting the Instrument and implementing a conservation easement with permanent funding for site stewardship. Each of the performance standards associated with this objective (summarized in Table 11) must be met before any Bank credits may be awarded, and before any construction or other implementation activities may be initiated pursuant to this Instrument. The initial award of credits in recognition of accomplishment of these performance standards will serve as the IRT's notification that construction and implementation activities are authorized to commence.

Table 11: Objective 1: protect aquatic ecosystem

	Objective 1: Protection	
	Performance Standard	Documentation
1.1	Complete Mitigation Bank Instrument Development	Instrument has been signed by the Sponsor and applicable regulatory agencies.
1.2	Protect ecosystem function by executing conservation easement.	Provide copies of the executed conservation easement with evidence of recordation with Shelby County, Tennessee, Register of Deed's Office. Satisfactory title evidence showing that the grantee of the conservation easement holds title to the conservation easement and that it is subject only to title exceptions approved by the District Engineer (e.g. excepted or reserved easements or rights, liens, encumbrances and other matters affecting title).
1.3	Provide financial assurance mechinism as described in the Instrument	Provide documentation to Corps.
1.4	Establish escrow account for Fund	Provide relevant documentation to Corps

II. Objective 2: Restoration Results

Post-construction performance standards are defined in Table 12 below. These performance standards will be monitored in years 2, 3, 5, and 7 (as-built report will be produced as described in Appendix F.1.A) between June 15th and July 15th. The reports will be provided to the District Engineer no later than October 31st of the same year.

Table 12: Objective 2 performance standards.

Performance Standard	Criteria	Remedial Action
Planted Trees	A minimum density of 225 stems/acre (equivalent to a 75% survival rate) must be maintained for five consecutive years.	Portions of the Bank not meeting this success criteria will be replanted with wetland adapted species as specified in the Instrument.
Hydrophytic Vegetation	At least 50% of all trees, shrubs and herbs, expressed in either plant stems or percent cover, are facultative (FAC) or wetter (FACW or OBL).	Hydrological corrective action to be approved by the Corps, in consultation with the IRT.
Hydrology	Saturation or inundation must occur within 12 inches of the surface for at least 5% of the growing season (14 consecutive days during the period of April 17 through October 19) during years with normal precipitation. Which will be demonstrated based on monitoring well data or through primary or secondary indicators of such as sediment deposits, drift lines, drainage patters, water marks, etc.	Hydrological corrective action to be approved by the Corps, in consultation with the IRT.
Hydric Soils	Soils (in areas not previously determined as containing hydric characteristics) acquire hydric indicators or meet the hydric soil criteria for inundation or saturation.	Hydrological corrective action to be approved by the Corps, in consultation with the IRT.
Invasive Species	By year 5 the coverage of species on the current invasive species list maintained by the Tennessee Exotic Pest Plant Council shall be < 5%.	Efforts to reduce invasive species below 5% will be undertaken, in consultation with the IRT.

Appendix D

Credit Determination and Award Schedule

I. Generation of Credits

Credits will be established and awarded to the Bank upon the Sponsor's demonstration that the performance standards listed in Appendix C have been met. Credit generation worksheets are included in the resource folder and are summarized in Table 1. The Bank will provide bottomland hardwood wetlands credits to those projects approved by the regulating agency(ies).

II. Credit Generation Schedule

Credits will be established and awarded based on the credit release schedules in Table 13. This credit release schedule may be truncated and corresponding credits released, as confirmed by a letter from the District Engineer, if a performance standard is "achieved" as described in Appendix C.II.

Table 13: Wetland credit release schedule.

Activity	Pre-construction	Grading Complete	Vegetation Installation Complete	Year 2	Year 3	Year 5	Year 7	Year 10	
Complete Mitigation Bank Instrument Development	13.00								13.00
Protect ecosystem function by executing conservation easement.	13.00								13.00
Provide financial assurance mechinism as described in the instrument	13.00								13.00
Establish escrow account for Fund	13.00								13.00
Grading/hydrologic restoration complete		38.95							38.95
Vegetation installation complete			38.95						
Woody Density				5.19	5.19	5.19	5.19	5.19	25.97
Hydrophytic woody vegetation				5.19	5.19	5.19	5.19	5.19	25.97
Herbaceous cover				5.19	5.19	5.19	5.19	5.19	25.97
Hydrology				5.19	5.19	5.19	5.19	5.19	25.97
Hydric Soil				5.19	5.19	5.19	5.19	5.19	25.97
Annual Total Credits	52.00	38.95	38.95	25.97	25.97	25.97	25.97	25.97	259.74
Percent of Total	20.0%	15.0%	15.0%	10.0%	10.0%	10.0%	10.0%	10.0%	100.0%

Appendix E

Credit and Debit Use

I. Service Area

Primary service area: "Loosahatchie" HUC (08010209).

A. Mitigation banks are the preferred method of compensatory mitigation for impacts to the Waters of the United States and water of Tennessee, including wetlands (April 2008 Federal Rule and TN Rule), before In-Lieu Fee programs and permittee-responsible mitigation.

B. The Bank may be used on a case-by-case basis to compensate for impacts outside of the approved service area if specifically approved by the District Engineer and IRT, provided that such mitigation would be practicable and environmentally preferable to other mitigation alternatives.

C. In-kind compensation for wetland resources is preferred. Out-of-kind compensation may be considered for the Bank on a case-by-case basis by the regulatory agency(ies) if it is determined to be practicable and environmentally preferable to in-kind compensation.

II. Credit Use and Procedures

A. Bank credits may be used, subject to the approval of the District Engineer and the IRT, to compensate for authorized permanent or temporary impacts, as well as to resolve enforcement or permit compliance actions such as replacing previously implemented project-specific mitigation that was partially or completely failed.

B. Each credit transaction agreement that is associated with a permit must indicate permit number of the impacting project, the number of the impacting project, the number and type of credits transacted, and must expressly specify that the Sponsor, and its successors and assigns, assumes responsibility for accomplishment and maintenance of the permittee's compensatory mitigation requirements associated with the impacting project, upon completion of the credit transaction.

C. Use of Mitigation Bank Credits: Public and private proponents of activities regulated under Sections 401 and 404 of the Clean Water Act (33 U.S. Code §§ 1341, 1344), Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. Code § 403), and other Federal State, and local authorities may be eligible to use the Bank as mitigation for unavoidable impacts. The Bank will be eligible to serve public and private end users by providing advance compensatory mitigation for authorized impacts to regulated areas that require mitigation to settle enforcement claims. The Bank is intended to provide replacement of lost functions and values for wetland habitat.

D. An applicant seeking a permit for a project with adverse impacts to the aquatic environment within the service area must generally obtain the approval of each regulatory agency with jurisdiction over that project in order to use the Bank as a source of compensatory mitigation.

It is solely the determination of the agency(ies) permitting the project with adverse impacts as to whether a proposed use of Bank credits is appropriate and environmentally preferable to other mitigation alternatives.

E. Upon receiving permission to utilize credits from the Bank, the permittee must contact the Sponsor to ensure that credits are available. Upon completion of the transaction, the Sponsor will inform the permitting agencies of each completed transaction, via e-mail or letter with an attached copy of the accounting ledger.

F. Other types of credit users may include, but are not necessarily limited to, purchases made that will not be associated with a particular project or impact (i.e., "good will" purchases), purchases made by natural resource stewards resulting from expenditures from in-lieu fees (or similar type funds), and other conservation purposes.

G. The Sponsor may use the Bank site to provide compensatory mitigation to offset impacts to environmental elements other than aquatic resources. Such use shall result in no physical changes to the Bank Site unless approved by the District Engineer, in consultation with the IRT. The Sponsor must obtain approval from the District Engineer, following consultation with the IRT, prior to establishing currencies other than wetland mitigation credits that are established by Appendix D of this Instrument.

The agencies that regulate those specific environmental elements are responsible for establishing the credit number and release schedule, and determining the appropriateness of using the Bank as compensatory mitigation for impacts to those elements. The District Engineer, in consultation with the IRT, will determine how to withdrawal of those currencies will affect the amount of potential wetland mitigation credits remaining. The Sponsor shall record the award and use of all currencies on the Bank ledger and otherwise follow the procedures as outlined in this Appendix E. Use of the Bank for compensatory mitigation for other environmental elements shall not conflict with the provisions of this Instrument.

III. <u>Accounting Procedures</u>

A. The Sponsor shall establish and maintain for inspection and reporting purposes a ledger of all credits that are awarded through the achievement of specified performance standards, as well as credits that are sold, used or transferred. The Sponsor will record each credit withdrawal transaction that receives a permit with the County in which the impact is occurring, and submit a copy of the recorded transaction to the District Engineer within 30 (thirty) days from the stamped registration date.

B. The following information, at a minimum, will be recorded in the ledger for each transaction:

1. Date of transaction;
2. Number of credits transacted;
3. For credits awarded, reference the performance standard(s) to which the awarded credits correspond;
4. For credit sales/use/transfers, include the name, address, and telephone number of purchaser/user/transferee; and include all of the following information that applies: Permit number(s); Permit issuance date and name of regulatory agency(ies) issuing permits; location of project for which the credits are being purchased/used/transferred; the size of the impacts; and a brief description of the project impacts requiring compensatory mitigation;
5. For credits withdrawn from the ledger for reasons other than credit sale/use/transfer, include specific reason for withdrawal; and
6. Bank credit balance after the award or transaction.

C. The Sponsor will provide an updated Bank ledger to the District Engineer each time credits are awarded, sold, used, or otherwise transferred. This must be provided within

thirty (30) days of any credit transaction. The Sponsor will also submit an annual ledger by February 1 of the following year. The annual ledger must show a cumulative tabulation of all credit transactions at the Bank through December 31 of the ledger year. This ledger will be submitted in conjunction with the monitoring reports until (1) all credits have been awarded and sold, use, or otherwise transferred; or (2) until the District Engineer, in consultation with the IRT, has approved the Sponsor's written request to permanently cease all banking activity.

Appendix F

Establishment Period Monitoring, Reporting, Maintenance, and Remedial Action

I. Establishment Period

During the establishment period, the Sponsor shall monitor and report on the progress of the Bank toward achieving the goals, objectives, and performance standards established by these Appendices and take all actions direct by the District Engineer, following consultation with the IRT, to remediate any consideration that prevents a component of the Bank from achieving the goals, objectives, and performance standards of the Bank.

A. As-Built Reports

As-built reports will be submitted to the District Engineer within ninety (90) days of completing each phase of construction of the Bank generating credits, and must demonstrate compliance with Appendix B. Any modifications to the Bank development plan and design, must be approved by the District Engineer prior to their construction or implementation, following consultation with the other members of the IRT. Year 0 post-construction conditions will be documented in the as-built report for grading, plantings, and other habitat features; and will include photographs and as-built drawings. The as-built reports will also establish baseline conditions for future monitoring.

B. Monitoring Phases

A performance monitoring program will be implemented to determine the degree of success of the mitigation effort during the establishment period. Monitoring will include periodic surveys and site evaluations to establish the foundation on which the Bank can demonstrate to the IRT that pertinent performance standards have been achieved and continue to be maintained. This development plan describes the performance standards as certified in this Instrument, the field methods and procedures for attaining quality assurance and quality control. The monitoring efforts will evaluate and document the success of the performance standards, and the performance standards dictate the data collection and analysis procedures in this plan. Qualified personnel will conduct all monitoring.

1. Construction and Planting Phase

During construction until final stabilization is reached, the site will be inspected twice a week as required by the Tennessee Construction General Permit. Germination of erosion control seeding, stability of temporary erosion control structures, effectiveness of the water spreading structures (re-contouring), and effectiveness of the erosion control measures will be evaluated.

2. Post Construction Phase

Throughout the establishment period, monitoring will take place to determine the status of planted and invasive vegetation, the condition of the soils, and hydrologic regimes. Additionally, the general integrity of hydrologic control structures (Drainage Way 3), functioning of erosion control mechanisms, and overall site condition will be assessed at this time.

C. Monitoring and Maintenance of the Bank

1. Monitoring Requirements and Procedures

Monitoring will take place in annually for five years and once following the seventh and tenth year to determine if the success criteria presented in Appendix C are being attained. Monitoring reports will be submitted after each sampling period and prior to October 15, to the IRT. The first monitoring effort will be conducted approximately six months after the site has been planted. Monitoring reports will be provided to the IRT no later than October 31st.

Planted Tree Survival: Survival of the planted trees will be determined using the wandering-quarter method.[1] This method estimates tree survival by measuring the distance to the nearest planted tree within a quadrant, along an established transect. Quadrants are established using the transect as the bisecting line, and the distance between the randomly-chosen starting point and the nearest planted tree within this quadrant is measured (to the nearest 0.1 foot); this tree then becomes the apex of a new quadrant (still using the azimuth of the transect as the bisecting line), and the distance to the nearest planted tree within this quadrant is then measured. This procedure will be continued until 30 trees are sampled or the edge of the site is reached. Transects will be established within each of the mitigation zones (enhancement and restoration). A minimum of 2.5% of the total number of trees planted in each mitigation zone will be sampled.

Tree survival using the wandering-quarter method is calculated as follows: The mean distance between trees, determined from the measurements collected along the sampled transects, = d. The mean area in square feet per tree (A) is calculated as d * d = A. The density of trees on the site (D) is then calculated by dividing 1.0 acre (43,560 square feet) by the mean area per tree (A). The tree survival rate is calculated as the estimated density per acre (D) divided by the original density of planted trees.

Wetland Characteristics: Permanent 0.1 acre plots will be established within each of the mitigation zones (enhancement and restoration). Sufficient number of plots will be established to sample a minimum of 1% of the site. Data will be collected according to the methods described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. Data collected will include visual estimates of foliar cover for dominant species in each vegetative stratum, a representative soil profile, and information on primary and secondary hydrological indicators.

Areal cover for trees will be estimated using the 0.1-acre plot; however, subplots positioned within the larger plot will be used to estimate areal cover for other vegetation strata. A 5-foot radius subplot will be used to sample the sapling, shrub and liana strata, and a 3.25 foot subplots will be used to sample the herbaceous layer. Plant species dominance will be determined using the 50/20 rule as defined in the COE's wetland delineation manual.

Water Regimes: Field surveys will involve the evaluation of site hydrology to document that it is meeting the criteria set forth by the USACE Wetland Delineation Manual

[1] Brower, J. E., J. H. Zar and C. N. von Ende. 1989. Field & laboratory methods in general ecology. W. C. Brown, pubs., Dubuque, IA. 237p.

(Environmental Laboratory 1987). These evaluations will take place during the annual assessment. Hydrologic features sought will include inundation, saturation, sediment deposits, drainage patterns, water marks, drift lines, etc. Groundwater levels will also be assessed several times through the growing season using a shallow groundwater monitoring wells. Biweekly sampling will be implemented during the first two months of the growing season and monthly thereafter. Alternative continuous loggers (set to record every 24 hours) will be used to monitor ground water levels.

Each monitoring report will at a minimum include the following information:

1. Photographs that visually document the progress of the mitigation effort;
2. Details of the survival of the planted trees, including percent survival and health;
3. A floristic listing of planted and invading plant species and their wetland indicator status [this information provides an indication of the direction (wetter or drier) and health (species diversity; establishment of non-native species) of the mitigation site];
4. Any changes in vegetational composition (compared to previous sampling data);
5. All pertinent information concerning:
   a) soils;
   b) hydrology;
   c) plant vigor (both planted and invading species);
   d) sedimentation and erosion;
   e) observed wildlife usage of the site (including sightings, calls, tracks, scat, etc.) to be used as an indicator of the quality of habitat developing within the mitigation site.

Monitoring reports will be submitted to the Corps and IRT following each monitoring event.

2. Contingency Plans/Remedial Actions

In the event the mitigation bank or a specific phase of the bank fails to achieve success criteria as specified in the banking instrument, the Sponsor shall develop necessary contingency plans and implement appropriate remedial actions for the bank or that phase in coordination with the IRT. In the event the sponsor fails to implement necessary remedial actions within one growing season after notification by the District Engineer of necessary remedial action to address any failure in meeting the success criteria, the District Engineer will notify sponsor and the appropriate authorizing agencies and recommend appropriate remedial actions.

If the District Engineer, after consultation with the IRT, determines that the bank is operating at a deficit, debiting by the sponsor of credits shall immediately cease, and the authorizing agencies, in consultation with the IRT and the sponsor, will determine what remedial actions are necessary to correct the situation. As determined by the District Engineer, in coordination with the IRT and the sponsor, if conditions at the bank site do not improve or continue to deteriorate within one growing season from the date that the need for remediation was first identified in writing to the sponsor by the District Engineer, the Financial Assurance may be accessed.

Appendix G

Long-term Protection and Management

I. Conservation Easement

A. The Sponsor has obtained title evidence satisfactory to the District Engineer showing the ownership in fee title of the Bank property, as well as all liens, easements, rights-of-way, or encumbrances. The Sponsor will ensure, pursuant to Article III.B of the basic Agreement, that an appropriate conservation easement is granted and recorded dedicating in perpetuity the property constituting the Bank that is to be restored or enhanced for credit. This conservation easement must be approved by the District Engineer, following consultation with the IRT, and shall be recorded with Shelby County, Tennessee, Register of Deed's Office. A copy of the recorded conservation easement and title evidence (satisfactory to the District Engineer) showing that the conservation easement is subject only to exceptions to title approved by the District Engineer shall be provided to the District Engineer.

The conservation easement shall reflect that it may not be removed, modified, or transferred without written approval of the District Engineer, in consultation with the IRT. The District Engineer may consider any alteration or rescission of the conservation easement a default of the Sponsor's obligations under this Instrument and may institute appropriate action pursuant to Article IV.J. The Sponsor shall provide no less than sixty (60) days advance written notice to the IRT of any transfer of fee title or any portion of the ownership interest in the Bank real property to another party. Conveyance of any interest in the Bank property shall be subject to this conservation easement. Use prohibitions reflected in the conservation easement will preclude the Bank site from being used for activities that would be incompatible with the establishment and operation of the Bank. All restrictions shall be granted in perpetuity without encumbrances or other reservations, except those encumbrances or reservations approved by the District Engineer, in consultation with the IRT, and not adversely affecting the ecological viability of the Bank. The District Engineer must approve any transfer of ownership, other than a lien or a mortgage that is subordinate to the conservation easement. Such approval shall not be unreasonably withheld.

B. The conservation easement shall provide that all structures, facilities, and improvements within the Bank, including roads, trails, and fences that are merely incidental to the functionality of the Bank site but are necessary to the Bank management and maintenance activities, shall be maintained by the Sponsor for as long as it is necessary to serve the needs of long-term management and maintenance. All structures, facilities, and improvements that directly and substantially contribute to the functionality of the Bank will be included within the responsibilities delineated in the LTMMP.

II. Long-term Management and Maintenance Plan

The Sponsor is responsible for ensuring long-term management and maintenance unless this responsibility is transferred to a third party conservation entity such as the Land Trust of Tennessee or similar organization.

The primary goal of the Bank is to create a self-sustaining natural bottomland hardwood wetland forest system with minimal human intervention. Natural changes to the vegetative

community, other than influence of non-native and invasive species, which occur after bank performance standards have been met are not expected to require remediation.

The long term management and maintenance of the Bank will include annual patrols of the bank site to ensure for signs of trespass and vandalism. Maintenance may include reasonable actions to deter trespass, such as the posting of "No Trespassing" signs and construction and/or repairing fences.

Appendix H

Financial Considerations

The Sponsor will institute and maintain a Financial Assurance as prescribed in Article IV.C.1 of the Basic Agreement, underlying the establishment and functionality of the Bank.

I. Financial Assurances

A. Bank Establishment Escrow Account

The Sponsor shall furnish an $150,000 escrow account to provide financial assurance underlying the establishment and initial functionality of the Bank.

II. Long-term Management and Maintenance Fund

In order to implement the Fund, as prescribed in Article III.C.2 of the Basic Agreement and underlying management and maintenance actions to be taken following completion of the establishment period as described in Article IV.K of the Basic Agreement, the Sponsor will establish an escrow account in an accredited and Federally-insured financial institution, as follows:

A. The Fund escrow account will be incrementally funded until it is fully funded, as prescribed in Article III.C.2 of the Basic Agreement. Once the Fund is fully funded, the Sponsor will be released from any further obligation to deposit a designated sum corresponding to each sale or transfer of credits, or use of credits by the Sponsor as compensatory mitigation for its own activities causing adverse impacts to the aquatic environment. The Sponsor will be permitted to accelerate contributions to the Fund, and by doing so the Sponsor may defer subsequent contributions until the balance of the Fund no longer matches or exceeds the balance required by the computation in Article III.C.2 of the Basic Agreement. The Sponsor will provide to the IRT an annual account statement displaying a cumulative tabulation of all deposits into the Fund escrow account, with each deposit referencing the associated sale/use/transfer transaction, as well as the principal balance and total account balance, as of December 31 of the previous calendar year, by February 1 of each year. This statement will be submitted until (1) the Fund is fully funded; or (2) until the District Engineer, in consultation with the IRT, has approved the Sponsor's written request to permanently cease all banking activity.

B. The Fund escrow account may bear interest or other earnings. Any earnings generated by the escrow funds shall remain deposited with other escrow account funds. Earnings in excess of the full funding amount specified in Article III.C.2 of the Basic Agreement will be returned to the Sponsor at the time that the full funding amount is disbursed to the Steward. The Fund escrow account contents may be invested only in the following: an interest bearing savings or passbook account, savings certificate, or certificate of deposit, held in each case by an institution that is insured by the Federal Deposit Insurance Corporation; alternatively, the Fund principal and earnings may be invested in direct obligations of the Government of the United States of America, in obligations of agencies or insurers that are guaranteed by the Government of the United States of America, or in a money market fund consisting solely of such obligations.

C. The Sponsor will be responsible for all escrow agency and associated account feeds, including account termination and final reconciliation costs, which may not be paid out of escrow account funds, or out of the interest or earnings generated thereon.

D. The terms of the escrow instructions will permit regular recurring deposits to the escrow principal as sales, use, or transfers of credits are made and designated sums corresponding to those sales, use, or transfers are deposited to the escrow account.