Natural Resources Conservation Service

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT For the LONG BEACH WATERSHED

(Hydrologic Unit Number 03170009-0603)

A supplement to the original environmental impact statement for providing updated impacts for the channel modification of Canal 1; includes supplemental watershed agreement No. 2.

Harrison County, Mississippi

September 2015



The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the bases of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, or all or part of an individual's income is derived from any public assistance program, or protected genetic information in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases will apply to all programs and/or employment activities.)

If you wish to file a Civil Rights program complaint of discrimination, complete the <u>USDA Program Discrimination Complaint Form</u> (PDF), found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, by fax (202) 690-7442 or email at program.intake@usda.gov.

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail directly or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.) please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Natural Resources Conservation Service

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT For the LONG BEACH WATERSHED

(Hydrologic Unit Number 03170009-0603)

A supplement to the original environmental impact statement for providing updated impacts for the channel modification of Canal 1; includes supplemental watershed agreement No. 2.

Harrison County, Mississippi

September 2015



The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the bases of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, or all or part of an individual's income is derived from any public assistance program, or protected genetic information in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases will apply to all programs and/or employment activities.)

If you wish to file a Civil Rights program complaint of discrimination, complete the <u>USDA Program Discrimination Complaint Form</u> (PDF), found online at http://www.ascr.usda.gov/complaint-filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, by fax (202) 690-7442 or email at program.intake@usda.gov.

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail directly or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.) please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

For

Channel Modifications to Canal 1 Long Beach Watershed

Harrison County, Mississippi (Hydrologic Unit Number 03170009-0603)

A supplement to the original environmental impact statement for providing updated impacts for the channel modifications of Canal 1; includes supplemental watershed agreement No. 2.

Prepared by:

U.S. Department of Agriculture, Natural Resources Conservation Service
In Cooperation with the U.S. Army Corps of Engineers Mobile District and
The Sponsoring Local Organizations: Long Beach Water Management District, City of Long Beach and the
Harrison County Soil and Water Conservation District

AUTHORITY

The original work plan was prepared under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566), as amended (16 U.S.C. Parts 1001-1008, 1010 and 1012).

ABSTRACT

Canal 1 is a manmade canal constructed in or about 1918 originating in Harrison County near the western edge of Gulfport. The Long Beach Watershed plan and Environmental Impact Statement was developed in 1989 to modify Canal 1 in order to reduce flooding to urban areas along the canal. Local project sponsors have chosen to update the Environmental Impact Statement in order to identify the impacts of channel modification. The purpose of the channel modifications is to reduce flooding to the residences and business along the canal. The modification consists of 3.8 miles of widening, side-sloping and grading of the earth-lined channel, and 0.2 miles of rock riprap lined channel. The project installation cost is estimated to be \$3,233,700. Minimal environmental impacts have been identified on wildlife habitats and wetlands associated with the remaining work for Canal No. 1, the subject of this Supplemental Environmental Impact Statement. Appropriate measures will be implemented to mitigate adverse effects.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

This document fulfills the requirements of the National Environmental Policy Act and is to be considered authorization for funding under Public Law 83-566.

COMMENTS AND INQUIRIES:

Comments and inquires must be received by April 1, 2015. Submit comments and inquiries to: Kurt Readus, State Conservationist USDA, Natural Resources Conservation Service, 100 W. Capitol Street, Suite 1321

Jackson, Mississippi 39269, (601) 965-5205

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistance Secretary for Civil Rights. USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.)

To file a complaint of discrimination, complete, sign and mail a program discrimination complaint form, available at any USDA office location or online at www.ascr.usda.gov, or write to:

Office of the Assistant Secretary for Civil Rights

1400 Independence Avenue, SW.

Washington, DC 20250-9410

Or call toll free at (866) 632-9992 (voice) to obtain additional information, the appropriate office or to request documents. Individuals who are deaf, hard of hearing, or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish). USDA is an equal opportunity provider, employer, and lender.

Persons with disabilities who require alternative means for communication of program information (e.g., Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

LONG BEACH WATERSHED

Supplemental Watershed Agreement No. 2

For Canal 1 Channel Modifications

Between the

Long Beach Water Management District
City of Long Beach
Harrison County Soil and Water Conservation District

State of Mississippi

And the

Natural Resources Conservation Service (Referred to herein as NRCS) United States Department of Agriculture

Whereas, application has heretofore been made to the Secretary of Agriculture by the sponsors for assistance in preparing a supplemental environmental impact statement for works of improvement for the Long Beach Watershed, State of Mississippi, under the authority of the Watershed Protection and Flood Prevention Act, as amended (16 U. S. C. Sections 1001 to 1008, 1010, and 1012); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, there has been developed through the cooperative efforts of the sponsors and NRCS an Supplemental Environmental Impact Statement for works of improvement for the Long Beach Watershed, State of Mississippi, hereinafter referred to as the SEIS, which is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS and the sponsors hereby agree on this SEIS and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this supplemental watershed agreement and including the following:

- 1. **Term**. The term of this agreement is for the expected life of the project (100 years) and does not commit the NRCS to assistance of any kind beyond that point unless agreed to by all parties.
- 2. Costs. The costs shown in this agreement are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.
- 3. Real Property. The sponsors will acquire all land rights, easements, or right-of-ways as will be needed in connection with the works of improvement. The amount and percentages of the real

property acquisition cost to be borne by the Sponsors and NRCS are as shown in the cost-share table in item 5 hereof.

- 4. Uniform Relocation Assistance and Real Property Acquisition Policies Act. The sponsors hereby agree that they will comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4601 et.seq. as further implemented through regulations in 49 C.F.R. Part 24 and 7 C.F.R. Part 21) when acquiring real property interests for this federally assisted project. If the sponsors are legally unable to comply with the real property acquisition requirements of the Act, they agree that, before any federal financial assistance is furnished; they will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.
- 5. Cost-share for Channel Modification. The percentages of total canal project costs to be paid by the sponsors and by NRCS are as follows:

_	-	- 2
C`n	nal	- 1
La	паі	

Works of Improvement	NRCS	Sponsors	Total
Cost Sharable Items			
Channel Modifications (Construction Cost)	\$1,895,700	\$0	\$1,895,700
Relocation, Replacement in-kind	\$0	\$0	\$0
Relocation, Required Decent, Safe, Sanitary	\$0	\$0	\$0
Sponsors Planning Costs	NA	\$0	\$0
Sponsors Engineering Costs	NA	\$0	\$0
Sponsors Project Administration a/	NA	\$6,000	\$6,000
Land Rights Acquisition Cost b/	NA_	\$930,400	\$930,400
Subtotal: Cost-Share Costs	\$1,895,700	\$936,400	\$2,832,100
Cost-Share Percentages	65%	35%	100%
Non Cost-Sharable Items c/			
NRCS Engineering & Project Administration a/	\$401,600	NA	\$401,600
Natural Resources Rights	NA	\$0	\$0
Federal, State and Local Permits	NA	\$0	\$0
Relocation, Beyond Required decent, safe, sanitary	NA	\$0	\$0
Subtotal: Non Cost-Share Costs	\$401,600	\$0	\$401,600

a/The sponsors and NRCS will each bear the costs of project administration that each incurs.

b/The sponsors will acquire with other than Watershed Protection and Flood Prevention Act Funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the sponsors' share of the cost for works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing.

- c' If actual Non Cost-Sharable item expenditures vary from these figures, the responsible party will bear the change.
- 6. Floodplain Management. Before construction of any project for flood prevention, the sponsors shall agree to participate in and comply with applicable Federal floodplain management and flood insurance programs.
- 7. Water and mineral rights. The sponsors will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to State law as may be needed in the installation and operation of the works of improvement. Any costs incurred shall be borne by the sponsor and these costs are not eligible as part of the sponsors cost-share.

- 8. Permits. The sponsors will obtain and bear the cost for all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement. These costs are not eligible as part of the sponsors cost-share.
- 9. NRCS assistance. This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the Rehabilitation Plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.
- 10. Additional agreements. A separate agreement will be entered into between NRCS and the sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
- 11. Amendments. This SEIS may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may de-authorize or terminate funding at any time it determines that the sponsors have failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS shall promptly notify the sponsors in writing of the determination and the reasons for the de-authorization of project funding, together with the effective date. Payments made to the sponsors or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the sponsors having specific responsibilities for the measure involved.
- 12. Prohibitions. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
- 13. Operation and Maintenance (O&M). The sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with the Operation and Maintenance Agreement. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project life (100 years). Although the sponsor's responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the sponsors acknowledge that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.
- 14. Memorandum of Understanding. A Memorandum of Understanding (MOU) shall be prepared between NRCS and the project sponsors that identifies and establishes a maximum value of the non-federal in-kind contribution. All project sponsors providing in-kind services and/or land rights acquisition for the rehabilitation project shall sign the MOU. Only costs accrued for activities included in the MOU shall be considered as part of the non-federal in-kind contribution. Determination of the final amount to be credited shall be at the sole discretion of NRCS.

15. Nondiscrimination provisions. The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistance Secretary for Civil Rights. USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.)

To file a complaint of discrimination, complete, sign and mail a program discrimination complaint form, available at any USDA office location or online at www.ascr.usda.gov, or write to:

USDA

Office of the Assistant Secretary for Civil Rights 1400 Independence Avenue, SW. Washington, DC 20250-9410

Or call toll free at (866) 632-9992 (voice) to obtain additional information, the appropriate office or to request documents. Individuals who are deaf, hard of hearing, or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish). USDA is an equal opportunity provider, employer, and lender.

Persons with disabilities who require alternative means for communication of program information (e.g., Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

16. Certification Regarding Drug-Free Workplace Requirements. (7CFR Part 3021). By signing this watershed agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15);

Conviction means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and (iii) temporary

personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of sub-recipients or subcontractors in covered workplaces).

Certification:

- A. The sponsors certify that they will or will continue to provide a drug-free workplace by:
 - (1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.
 - (2) Establishing an ongoing drug-free awareness program to inform employees about:
 - (a) The danger of drug abuse in the workplace;
 - (b) The grantee's policy of maintaining a drug-free workplace;
 - (c) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
 - (3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).
 - (4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:
 - (a) Abide by the terms of the statement; and
 - (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.
 - (5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4) (b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant.
 - (6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employee who is so convicted:
 - (a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

- (7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).
- B. The sponsors may provide a list of the site(s) for the performance or work done in connection with a specific project or other agreement.
- C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

17. Certification Regarding Lobbying (7 CFR Part 3018). (applicable if this agreement exceeds \$100,000).

- A. The sponsors certify to the best of their knowledge and belief, that:
 - (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
 - (3) The sponsors shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.
- B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

18. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR Part 3017).

- A. The sponsors certify to the best of their knowledge and belief, that they and their principals:
 - (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction; violation of Federal or State

antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

- (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (A)(2) of this certification; and
- (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or Local) terminated for cause of default.
- B. Where the primary sponsors are unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

19. Clean Air and Water Certification.

(Applicable if this agreement exceeds \$100,000, or a facility to be used has been subject of a conviction under the Clear Air Act (42 U.S.C. Section 7413(c)) or the Federal Water Pollution Control Act (33 U.S.C. Section 1319(c)) and is listed by EPA, or is not otherwise exempt)

- A. The project sponsoring organizations signatory to this agreement certify as follows:
 - (1) Any facility to be utilized in the performance of this proposed agreement is (_____), is not (x) listed on the Environmental Protection Agency List of Violating Facilities.
 - (2) To promptly notify the NRCS-State administrative officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any facility which is proposed for use under this agreement is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities.
 - (3) To include substantially this certification, including this subparagraph, in every nonexempt sub-agreement.
- B. The project sponsoring organization(s) signatory to this agreement agrees as follows:
 - (1) To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.
 - (2) That no portion of the work required by this agreement will be performed in facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.
 - (3) To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.

- (4) To insert the substance of the provisions of this clause in any nonexempt sub agreement.
- C. The terms used in this clause have the following meanings:
 - (1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).
 - (2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).
 - (3) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under section 112 of the Air Act (42 U.S.C. Section 7412).
 - (4) The term "clean water standards" means any enforceable limitation, control condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. Section 1317).
 - (5) The term "facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or sub-agreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

20. Assurances and Compliance

As a condition of the grant of cooperative agreement, the sponsor assures and certifies that it is in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as a specifically set forth herein.

State, Local, and Indian Tribal Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7 C.F.R. Parts 3015, 3016, 3017, 3018, 3021, 3052.

Nonprofit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 C.F.R. Parts 3015, 3017, 3018, 3019, 3021, and 3052.

21. Examination of Records.

The sponsors shall give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

22. Signatures Long Beach Water Management District P. O. Box 748 Long Beach, MS 39560 Zip Code Address Date 4-12-15 The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the Long Beach Water Management District adopted at a meeting held on Jul 12, 2015 (Date). takey 5 chultz for Drawer W, Gulfourt, MS 39502 cretary Address Zip Code BY Sovefu glay Harrison County Soil and Water **Conservation District** Title Dice Chair 12238 Ashley Drive Gulfport, MS 39503 Zip Code Address Date 7-2-15 The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the Harrison County Soil and Water Conservation District adopted at a meeting held on 7-2-15 (Date). Zip Code Secretary City of Long Beach 201 Jeff Davis Avenue Long Beach, MS 39560 Title Zip Code Address Date The signing of this supplemental watershed agreement was authorized by a resolution of the governing body of the City of Long Beach adopted at a meeting held on $|\phi||_{\mathcal{O}}/2$ of \mathcal{O} (Date).

Natural Resources Conservation Service United States Department of Agriculture

100 W. Capitol Street, Suite 1321 Federal Building

Jackson, Mississippi 39269 Address Zip Code

Title: State Conservationist

Date $\frac{9/3/2015}{}$

Table of Contents

	Page
Supplemental Watershed Agreement	
Summary of the Supplemental Draft Environmental Impact Statement	
Purpose and Need for the Remaining Work	5
Purpose	5
Need	5
Scope of the EIS	5
Affected Environment	
Background and Current Status	7
Flooding	
Development of Alternatives	
Description of Alternatives	
Environmental Evaluation for Watershed Planning/Comparison of Alternatives	
Risk and Uncertainty	
Environmental Consequences	
Natural Environment	
Cultural Resources	
Downstream Effects of Project	
Consultation, Coordination, and Public Participation	
Project Coordination	
Agency Coordination	
The Preferred Alternative	
References	
List of Preparers	
Index	
IIIdex	4 2
List of Plan Tables	
Table A. Summary of Scoping	
Table B. Federally Listed Species of Potential Occurrence in Harrison County	
Table C. Environmental Evaluation/Comparison of Alternatives for Canal No. 1	
National Economic Development Account	
Regional Economic Development Account	
Other Social Effects Account	16
Environmental Quality Account	17
Table D. List of Plan Preparers	43

List of National Watershed Manual Prime Tables

Table 1. E	stimated Installation Cost	35
Table 2. E	stimated Cost Distribution – Structural Measures	35
Table 3B. S	tructural Data	36
Table 4. E	stimated Average Annual NED Costs	39
Table 5. E	stimated Average Annual Flood Damage Reduction Benefits	39
Table 6.	Comparison of NED Benefits and Costs	39
	List of Figures	
Figure No.	Long Beach Watershed Map Environmental Justice Minority Groups Canal No. 1	62
Figure No. 2	2 Environmental Justice Minority Groups Canal No. 1	64
Figure No. 3	B Environmental Justice % Below Poverty Level Canal No. 1	65
Figure No.		66
Figure No. :	Conceptual Alignment Inset 1	67
Figure No.		68
Figure No.	7 Conceptual Alignment Inset 3	69
Figure No. 8		70
Figure No. 9	Conceptual Alignment Inset 5	71
	Appendices	
Appendix A		46
Appendix B		61
Appendix C		63
Appendix D		72
Appendix E	Other Supporting Information	77
	coping Meeting September 20th, 2001	
Project S	coping Meeting August 14, 2007	83
	Environmental Report January 2009	
	tected Species List	
	Technical Report April 2009	
Phase I C	Cultural Resources Survey December 2008	157

Summary of the Supplemental Environmental Impact Statement for the Long Beach Watershed

<u>Project Name</u>: Long Beach Supplemental Environmental Impact Statement for the channel modification of Canal 1

<u>Authorization</u>: Public Law 83-566 (16 U.S.C. Parts 1001 – 1008, 1010 and 1012)

County: Harrison

State: Mississippi

Mississippi Congressional District: 4

Sponsors: Long Beach Water Management District, Harrison County Soil and Water Conservation

District, City of Long Beach

Hydrologic Unit Number: 03170009-0603

Latitude and Longitude: Upper end of Canal 1: Lat. 30.3836, Long -89.1366

Description of Preferred Alternative: Improve 3.8 miles of earth-lined channel and install 0.2 miles of

rock riprap lined channel

Resource Information:	Watershed
Drainage Area (acres)	10,857
Land Use (acres)	
Grass Land	688
Forest Land	4,206
Urban and Built-Up	4,825
Idle Land	536
Marsh Land	546
Other	56
Land Ownership:	
% Private	89.4%
% Federal	0%
% State/Local	10.6%
Wetlands (lacustrine acres) Total:	3,587.1
Estuarine and Marine	387.6
Palustrine Emergent	90.8
Palustrine Forested or Shrub	3,033.7
Lacustrine	75.0
Floodplains:	
Floodplains Total	1,861.4
Grassland	34.4
Forestland	1,043.5
Urban and Built-Up	695.8
Idle Land	77.6
Other	10.1

Project Beneficiary Profile

	Harrison County (1)	Mississippi (1)	Nation (1)				
Population	194,029	2,986,450	313,873,685				
% White Alone	70.6	59.9	77.9				
% Black or African American Alone	23.4	37.4	13.1				
% American Indian & Alaska Native Alone	0.6	0.6	1.2				
% Asian Alone	2.9	0.9	5.1				
% Native Hawajian & Other Pacific Islander Alone	1.0	0.1	0.2				
% Tow or More Races	2.4	1.1	2.4				
% Hispanic or Latino	5.4	2.9	16.9				
% White Alone, not Hispanic or Latino	66.1	57.6	63.0				
Median per capita income	\$23,378	\$20,670	\$28,051				
Median household income	\$43,593	\$38,882	\$53,046				
Median value owner-occupied housing units	\$143,900	\$100,200	\$181,400				
Persons living below the poverty level	18.2%	22.3%	14.9%				
1) 2012 Data from http://quickfacts.census.gov/qfd/states/28000.html, State and County Quick Facts							

<u>Threatened and Endangered Species</u>: There are no threatened or endangered species known to be present in the Canal No. 1 study area. A letter was received May 2009 from USFWS stating: "no impacts anticipated to any federal listed species."

<u>Cultural Resources</u>: According to the Cultural Resources Survey completed by Earth Search in December of 2008, there are no sites or structures of archaeological or historical significance known to be present in the Canal No. 1 study area. The Mississippi Department of Archives and History concurred with the survey in a letter dated March 10, 2009.

<u>Climate:</u> Average Annual Precipitation: 63.41 inches Average Annual Temperature: 77.1 degrees

<u>Topography:</u> The watershed lies in the Gulf Coast Flatwoods Physiographic area, a flat strip of land which parallels the coastline and terminates in a man-made seawall and white-sand beach. Elevations range between 5 and 30 feet above mean seal level.

Relevant Resource Concerns from Scoping: Floodwater, Streams, Lakes and Wetlands, Clean Water Act, Floodplain Management, Wetlands, Air Quality, Clean Air Act, Riparian Areas, Land Use and Flora, Fish and Wildlife Habitat, Endangered and Threatened Species, Flood Damages, Sponsors Cost, NED Cost, Historic Properties, Local and Regional Economy, Public Health and Safety, Transportation

<u>Problem Identification</u>: Homes and businesses, as well as roads and bridges, utilities and other public facilities within the watershed, are vulnerable to flooding due to the inadequacy of existing drainage provided by Canal No. 1. The total value of at-risk property in the Canal No. 1 floodplain is estimated to be \$11,750,300. The average annual cost of damage to structures and their contents from flooding in the Canal No. 1 floodplain is \$1,069,300.

Alternative Plans Considered:

- 1. No Action (Future Without Federal Project): Sponsors would leave the Canal 1 unimproved. With this alternative there would not be reduction in flood damage along the canal.
- 2. Alternative 2 (Channel improvements): Improve 3.8 miles of earth-lined channel and install 0.2 miles of rock riprap lined channel. This alternative would provide flood damage reduction benefits to the homes along Canal 1.

<u>Purpose and Need for the Remaining Work</u>: To reduce flooding to residences and businesses located within the floodplain of Canal No. 1. The purpose of *the remaining work which is the focus of this Supplemental EIS* is to implement the additional improvements necessary to reduce flood damages to 121 structures located along Canal No. 1.

Remaining Project Measures to be Completed: Proposed improvements to the 4.7 miles of Canal 1 between the Naval Construction Battalion Center (NCBC) and Espy Avenue include 3.8 miles of widening, side-sloping and grading of the earth-lined channel, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. The earth-lined channel sections will be constructed with 3:1 side slopes and a bottom width of 30-40 feet. The existing bottom width is 18-40 feet. These improvements will significantly enhance the capacity of Canal No. 1 and reduce damages associated with flooding in the Canal No. 1 floodplain.

Project Costs:	Public Law 83-566 funds	Sponsor's funds	Total Project Costs
Construction	\$1,895,700	\$0	\$1,895,700
Engineering	\$360,200	\$0	\$360,200
Project Administration	ı \$41,400	\$6,000	\$47,400
Land rights	\$0	\$930,400	\$930,400
Total for Sites 15 and	1 16 \$2,297,300	\$936,400	\$3,233,700

<u>Project Benefits</u>: Reduces flooding to 121 homes located along Canal 1. Modifications to Canal 1 will provide \$492,200 of average annual flood damage reduction benefits.

Net Beneficial effects:

Monetary: Provides net benefits of \$369,300.

Number of Direct Beneficiaries: Offsite 310

Benefit to Cost Ratio: 3.1:1.0

Period of Analysis: 104 Years

Project Life: 100 Years

Funding Schedule:	Year 2015	Year 2016	Year 2017	Year 2018
Federal Funds	\$0	\$360,200	\$947,800	\$989,300
Non-Federal Funds	\$465,200	\$465,200	\$6,000	\$0

<u>Mitigation</u>: Minimization measures include sediment control features such as 3:1 channel side-slopes, vegetation of disturbed areas every 500 feet of construction, sediment traps within constructed channel

segments, and small equipment usage for selective snagging activities. Compensatory measures include reforestation of 119 acres to replace the loss of pine and hardwood habitats. Mitigation for the potential loss of approximately 0.01 acres of wetland will be determined during the Section 404 permitting process.

Environmental Values changed or lost: Loss of 61 acres riparian timber. Planting of 119 acres of hardwood tree species.

<u>Major Conclusions</u>: Modification to Canal 1 will provide flood damage reduction benefits for 121 homes/business along the canal.

Areas of Controversy: None

Issues to be Resolved: None

Evidence of Unusual Congressional or Local Interest: None

Is this report in compliance with executive orders, public laws, and other statues governing the formulation of water resource projects? Yes <u>x</u> No___

Purpose and Need for the Remaining Work

Purpose

To reduce flooding to residents and businesses along Canal 1 by modifying the channel to carry a larger capacity of runoff. The remaining proposed work will reduce flood damages to 121 residences and businesses located along the canal.

Need

To address public health and safety issues surrounding the flooding to residences and businesses located along Canal No. 1.

Scope of the EIS

A scoping process was conducted to determine objectives and primary concerns of the project sponsors and to identify other relevant issues and environmental concerns associated with Canal No. 1. Several meetings and watershed site visits were held with project sponsors, landowners, and other agency personnel to discuss issues on, and potential impacts to, human health and safety, flooding, land use and management, wetlands, riparian habitat, and fish and wildlife habitat. Areas of potential concern were evaluated and are listed in Table A along with their relevance to the proposed action.

Table A. Summary of Scoping

ITEM / CONCERN	Relevant to the proposed action		RATIONALE		
	YES	NO			
SOILS					
Upland Erosion		Х	Upstream area is mostly urban.		
Stream bank erosion		Х	Stream bank is stable.		
Sedimentation		Х	Little sedimentation from urban areas upstream.		
Prime and Unique		Х	None present.		
Farmland					
WATER					
Floodwater	X		Major concern.		
Streams	X		Potential impacts with some alternatives.		
Lakes and Wetlands	X		Potential impacts with some alternatives.		
Surface Water Quality		X	Potential impacts with some alternatives.		
Surface Water Quantity		Х	No effects		
Ground Water Quantity		X	No effects		
Clean Water Act	X		Alternatives may require USACE 404 permit.		

Table A. Summary of Scoping Continued

ITEM / CONCERN	Relevar		Summary of Scoping Continued RATIONALE				
TEM/CONCERN	propose						
	YES	NO					
Regional Water Mgt. Plans, Waters of the United States and Coastal Zone Management Areas		Х	None present in area of project.				
Floodplain Management	Х		121 structures impacted by 500-year flood event				
Sole Source Aquifers		X	No sole source aquifers identified in Coastal Mississippi.				
Wetlands	X		Potential impacts with some alternatives				
Wild and Scenic Rivers	- 1	X	None present in area of project.				
AIR			Trong product in area of projects				
Air Quality	Х		Possible temporary increase in PM-10 or other potential emissions with some alternatives.				
Clean Air Act	Х		Permits may be required if it involves emission of a regulated pollutant.				
PLANTS							
Endangered and		Х	None Present				
Threatened Species							
Essential Fish Habitat		X	No designated areas in the area of the project.				
Invasive Species		X	Low potential for any species introduction.				
Natural Areas		X	No designated areas in the area of the project.				
Riparian Areas	X		Potential decrease with some alternatives.				
Ecological critical areas		Х	None present in the area of the project.				
Forest resources		Х	Low potential for significant affect.				
Land Use and Flora	X		Potential change with some alternatives.				
Mineral Resources		Х	None Present				
ANIMALS							
Fish and Wildlife Habitat	X		Potential changes in habitat with some alternatives.				
Coral Reefs		Х	None Present.				
Endangered and Threatened Species	X		"Not likely to adversely affect" determination concurred in by USFWS.				
Invasive Species		Х	No invasive species in the area of the project and no potential for introduction.				
Migratory Birds/Bald and Golden Eagles	X		No impacts to migratory birds or eagles.				
HUMANS			<u> </u>				
Cultural Resources			No impacts				
Flood Damages	X		Annual flood damages = \$1,069,300				
Cost, Sponsor	X		Proposals must be within the economic capacity of the sponsors.				
Cost, NED	X		Required criteria by P & G.				
Historic Properties	X		No documented NRHP sites in area of project.				
Environmental Justice and Civil Rights	Х		The channel modifications will decrease flooding to individuals along Canal 1.				
Local and Regional Economy	X		Increased protection with some alternatives.				
Potable Water Supply		X	No impacts				
Public Health and Safety	X		Potential damages to residences with the no action alternative.				
Recreation		X	No impacts				
Transportation	X		Potential damages with the no action alternative.				
Employment		Х	No impacts				
Scenic Beauty and Parklands		Х	No impacts				
Scientific Resources		X	None present in area of project				

Affected Environment

Background and Current Status

The Long Beach Watershed Plan and EIS was completed in 1989. The project was formulated for the purpose of reducing flood damages to residences and businesses by improving two canals, Canal No. 1 and Canal No. 2-3. These canals were originally constructed in 1918. Since 1918, urbanization within the drainage area of the Long Beach Watershed has steadily increased causing need for improvements. After completion of the Long Beach Watershed Plan and EIS in 1989, Canal 2-3 improvements were completed in 2012 with Canal No. 1 improvements still remaining. This Supplemental EIS will update the effects of implementing Canal No.1 in order to reduce flooding to residences and businesses along the canal.

Canal No. 1 is a man-made canal located at the upper end of Johnson Bayou and flows into the St. Louis Bay which flows in a southwesterly direction. The original Long Beach Watershed Plan and EIS proposed improvements to the 4.7 miles of Canal 1 between the Naval Construction Battalion Center (NCBC) and Espy Avenue including 3.8 miles of earth-lined channel construction, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. The earth-lined channel sections are proposed to be constructed with 3:1 side slopes and a bottom width of 30-40 feet. The existing bottom width is 18-40 feet. These improvements will significantly enhance the capacity of Canal No. 1 and reduce damages associated with flooding in the Canal No. 1 floodplain.

Size and Location:

Detailed information regarding the size and location may be found on pages 5-9 of the original watershed Plan-EIS. The material presented in this section is intended to update or supplement information presented in the 1989 document.

Climate:

Based on the Southeast Regional Climatic Center, the Mississippi Gulfport Naval Center's climate data was updated in 2012 with average annual figures based on data from 1935 to 2012. The average annual precipitation is 63.41 inches. The wettest month is July with an average of 7.42 inches and the driest month is October with an average of 2.98 inches. The average annual temperature is 77.1 degrees Fahrenheit. January is the coldest month with an average temperature of 61.0 degrees and July and August are the hottest months with an average temperature of 90.6 degrees.

Geology, Topography and Soils:

Information regarding geology, topography and soils may be found on pages 6 and 7 of the original Watershed Plan-EIS. There is no perceived need to update this information.

Population:

The Long Beach Watershed is located entirely in Harrison County. According to the 2012 Census information Harrison County has a population of 194,029. The county population is 70.6% white, 23.4% black, 5.4% Hispanic and 0.6% Native American. The City of Long Beach, which contains 42 percent of the area of the watershed, had a population of 15,300 in 2012 according to the 2010 Census Estimates.

The City of Pass Christian, which contains 13 percent of the watershed, had a population of 4,920 in 2012. According to the U.S. Environmental Protection Agency's Environmental Justice Map Figure No. 2, The population along Canal No. 1 from 28th St. southwest to Klondike St. is 10-30% minority; the south side of Canal No. 1 from Klondike southwest to Beatline Rd. is 1-10% minority and the population on the south side of canal from Beatline Rd. southwest to Menge Ave. is 40-100% minority. Based on data that was collected during the inventory of houses we do not foresee an influx of population or a build out along the Canal. The area that is affected by the canal is located within a floodplain area; any construction in this area is governed by local floodplain management.

Social and Economic Data:

The largest single employer in the City of Long Beach is Triton Systems, Inc., a manufacturer of automated teller machine (ATM) equipment. Triton currently employs 185 workers according to the Harrison County Development Commission. The largest employer in the City of Pass Christian is DuPont DeLisle, a manufacturing company, which employs 850 workers. The unemployment rate for Harrison County was 8.4% in 2012 compared to the State of Mississippi at 9.0%. The unemployment rate for the county is slightly lower than the 8.9% rate from the original 1986 watershed plan.

Land Use and Development

Much of the land along Canal No. 1 has been developed for residential or other uses an inventory of parcels abutting the canal right-of-way revealed that there are 292.8 acres of residential property adjacent to the canal. This represents slightly more than one-third of the 868.4 acres contained in land parcels abutting the Canal No. 1 right-of-way. Another 357.6 acres (41.2 percent of the total) remain undeveloped. The remaining 25 percent of the acreage contained in parcels adjacent to the canal is primarily devoted to services (121.4 acres of 14.0 percent) or agriculture and forestry (82.3 acres or 9.5 percent). The balance of 14.2 acres, representing only 1.6 percent of the total, is divided among trade, transportation, utilities and industrial uses.

Development is fairly intensive south of the canal in the older sections of the City of Long Beach. Population density in this area exceeds 2,000 persons per square mile. In the newer section of the city located north of the canal, population density is closer to 1,000 persons per square mile. The most sparsely populated portion of the study area is located west of Beatline Rd. in Pass Christian and unincorporated Harrison County. Population Density in the area bounded by Pineville Rd. on the north, Second St. on the south, Espy Ave. on the west and Beatline Rd. on the east, is only about 300 persons per square mile. Much of this area is occupied by the Harrison County Development Commission's Long Beach Industrial Park. Many of the houses that were destroyed or damaged by Hurricane Katrina have not been rebuilt.

There are 121 structures consisting predominantly of residences and businesses currently impacted by flooding during the 500-year flood event, 107 structures are impacted by the 100-year flood event.

Floodplain Management

Harrison County, which includes the Long Beach Watershed, is a participating member of the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA).

The NFIP was created to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances; and to provide access to affordable flood insurance protection for property owners. To participate in the NFIP, local communities have to agree to adopt and enforce floodplain management ordinances designed to reduce future flood risks to existing and new construction. The current Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) for Harrison County (FIS # 28047CV001A) were published in 2007 and are largely based on hydrologic and hydraulic analysis completed in 1985.

Flood Waters

There are 121 structures including homes and businesses located within the 500-year floodplain along Canal No. 1 and 107 of these structures are located within the 100-year floodplain along the canal. These structures receive damages from floodwaters during large storm events.

Flood Damages

The 121 structures including homes and businesses that are located within the 500-year floodplain along Canal No. 1. These structures incur an estimated total of \$1,069,300 in average annual damages from flooding along Canal No 1.

Public Health and Safety

Landowners living and working along Canal No. 1 are at risk during flood events, they can incur damages to houses and businesses. They may also need to use alternate routes during flooding to avoid dangerous floodwaters on roads and bridges.

Water Quality

The general water quality of Canal No. 1 was noted during a field survey conducted October 13-16, 2008. Water in the channel was consistently turbid and murky brown. The flow was impeded in places by beaver dams, woody debris, or man-make ponds. The presence of anthropogenic trash and other debris in the water was noted. However, Canal No. 1 is not included in the Mississippi Department of Environmental Quality (MDEQ) "List of impaired Water Bodies" (MDEQ 2009). There are no scenic streams in the project corridor.

Wetlands and U.S. Jurisdictional Waters

Preliminary wetland investigations with on-site inspections were conducted along the 4.7-mile length of Canal No. 1 within the project limits during the period from October 13-15, 2008. The field reconnaissance included a 125-foot corridor on either side of the canal. The preliminary survey identified 4.74 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of U.S. jurisdictional waters within the project area. A second wetlands survey was conducted in March and April, 2009, to evaluate changes to the preliminary wetlands delineation. The revised survey revealed 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area.

Fish and Wildlife Habitat

Typical vegetation characteristics of the project area were recorded by biologists during an October 13-16, 2008, field survey. Three community types were identified; mixed forest, pasture, and rural/developed. Mixed forest communities are typically dominated by mature hardwoods with scattered pines and somewhat dense undergrowth. Pasture in the study area is located within the limits of a grassy power-line right-of-way. The rural/developed community is associated with roads, residences and commercial property and includes small areas of upland mixed forest and pasture, as well as mowed lawns, hardwoods, and ornamental trees and shrubs.

Vegetational characteristics of the project area vary with the landscape. In undeveloped areas vegetation includes plant species associated with the upland mixed forest and maintained pasture communities. Near the canal it is typically mature upland hardwood/pine forest with dense shrubbery. The electrical power-line right-of-way located alongside a portion of the canal consists of herbaceous species that are kept cut.

Riparian area species proliferating along the canal include water oak, willow oak, southern red oak, sweet gum, live oak, magnolia bay, Chinese tallow, red maple, persimmon, blackgum, loblolly pine, and black willow. Chinese privet and devils walking stick exist throughout the shrub layer. Common vines mixed throughout include peppervine, roundleaf greenbrier, and blackberry.

The canal edges and wetland areas feature common rush, smartweed, bushy bluestem, eastern baccharis, titi, beaked rush, St. Johnswort, alligator weed and arrowhead. In the power-line right-of-way and maintained pastures, noted species included Vasey's grass, dallisgrass, dogfennel, goldenrod, giant goldenrod, pokeweed, cogon grass, wax myrtle, little bluestem, and Bermuda grass.

Fish and Wildlife

Faunal communities noted in the project area include both aquatic and terrestrial species. Aquatic species are limited by the character of Canal No. 1 as a man-made channel for discharge of storm water. There is little flow during dry periods, so the canal is generally unsuitable for fish species. Canal No. 1 empties into Johnson Bayou which is part of the Bay of Saint Louis estuary. The estuary supports important fisheries resources, including spotted sea trout, redfish, brown and white shrimp and blue crab. The turbidity of water in Canal No. 1 impeded observation of aquatic species in the canal and precluded the identification of species below the surface. No sampling was conducted in connection with the field survey, but small fish of indeterminate species, as well as frogs, turtle and surface invertebrates were observed.

Terrestrial species in the project area include small mammals, reptiles, and avian species. Whitetail deer, raccoon, fox, and cottontail rabbit are common. The fox squirrel is found where deciduous trees are present on uplands, and gray squirrels occur along drainages. Common bird species include pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, eastern towhee, and tufted titmouse. Common snake species include cottonmouth, copperhead, rough green snake, rat snake, coachwhip, and speckled kingsnake. Fence lizards and glass lizards are also common.

The presence of wildlife in the project area is highly influenced by roadways and human development. Canal No. 1 and the drains which flow into it represent a vital source of water for wildlife species that inhabit the area, whether on a permanent or seasonal basis, as well as for species whose migratory routes traverse the corridor and for those which seek temporary shelter of forage in the vicinity of the canal.

Threatened and Endangered Species

The USFWS lists 15 species of plants and animals that are threatened or endangered that may potentially occur in Harrison County (see Table B). In addition, the bald eagle (Haliaeetus leucocephalus) is currently protected statewide under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. None of the listed or protected species were observed during field surveys.

Table B. Federally Listed Species of Potential Occurrence in Harrison County

Common Name	Federal	Year	Habitat Description
Scientific Name	Status	Listed	GL III
Alabama red-bellied turtle	E	1987	Shallow vegetated streams, rivers, or
Psuedemys alabamenis			backwaters
black pine snake	С	N/A	Sandy, well-drained soils; open pine
Pituophis melanoleucus Iodingi			forests, moderate to sparse midstory; and
1	ļ		well-developed herbaceous understory
			dominated by grasses
brown pelican	E	1970	Coastal waters no more than 20 miles out
Pelecanus occidentalis			to sea
gopher tortoise	Т	1987	Deep sand ridges which originally
Gopherus Polyphemus			supported longleaf pine and patches of
<u></u>			scrub oak
green turtle	Т	1978	Coastal waters
Chelonia mydas			
gulf sturgeon	Т	1991	Salt waters into large coastal rivers to
Acipenser oxyrinchus desotoi			spawn
Kemp's Ridley sea turtle	E	1970	Coastal waters
Lepidochelys kempli			
leatherback turtle	E	1970	Coastal waters
Dermochelys comacea			
loggerhead sea turtle	T	1978	Coastal waters
Caretta caretta			
Louisiana black bear	Т	1992	Bottomland hardwoods
Ursus americanus luteolus			
Louisiana quillwort	E	1992	Sandy soils and gravel bars in or near
Isoetes louisianenis]	shallow blackwater streams and overflow
			channels in riparian woodland/bayhead
			forests of pine flatwoods and upland
			longleaf pine
Mississippi gopher frog	E	2001	Both upland sandy habitats historically
Rana capito sevosa			forested with longleaf pine and isolated
,			temporary wetland breeding sits
piping plover	T	1986	Coastal beaches
Charadrius melodus			
red-cockaded woodpecker	E	1970	Open, mature, and old-growth pine
Picoides borealis			ecosystems of the southeastern U.S.
West Indian manatee	E	1967	Large, slow-moving rivers, river mouths,
Trichechus manatus	-	150,	and shallow coastal areas such as coves
meneemas manatus			and bays
			2110 2010

Source: U. S. Fish and Wildlife Service (2008) Legend: T-Threatened, E-Endangered, C-Candidate for listing.

Flooding

In the Long Beach Watershed Plan and Environmental Impact Statement the project sponsors identified the flooding of homes and businesses as the major problem confronting watershed management planners. With proposed improvements to Canal No. 1 identified in the Watershed Plan-EIS still pending, flooding continues to be the major problem. This was painfully evident during Hurricane Katrina in 2005 when areas along both sides of the canal all the way from Johnson Bayou to Klondyke Road were inundated. This represents some 80 percent of the canal length included between the project limits of the Watershed Plan-EIS. Most of this flooding was, of course, caused by the tidal surge which pushed water from the Bay of Saint Louis into Bayou Portage and up the channels of connecting waterways. Nevertheless, flooding from major rainfall events continues to be a significant source of concern. The original Watershed Plan-EIS noted that there had been steadily increasing urbanization in the watershed since canals number 1 and 2-3 were constructed in 1918. Steadily expanding development has progressively reduced natural land cover, increasing runoff and the associated flooding due to shrinking drainage capacity.

Effects of Turkey Creek Overflow

Turkey Creek Watershed lays North & East of and shares a common boundary with the Long Beach Watershed. It is well known that during time of peak flows, some of the Turkey Creek floodwater breaks over the watershed boundary along 28th Street and flows into the Long Beach Watershed. The effect of the Turkey Creek overflow on Canal No. 1 is a major concern to the residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. Further investigation into the Turkey Creek overflow was warranted and conducted to answer these concerns.

The original planning determined that the vast majority of the overflow that occurred from Turkey Creek was transported downstream by Canal No. 2-3. As a result, hydrographs of the expected overflow from Turkey Creek for the various storm frequencies were developed and used in the hydrologic analysis of Canal No. 2-3. The hydrologic analysis of Canal No. 1 did not include any overflow from Turkey Creek. Various documents have been found that support this view. An NRCS trip report in 1985, during the flooding following Hurricane Juan, only reported on flow into Canal No. 2-3 from Turkey Creek. Consulting engineers in 1986 reported that the most serious flooding along Canal No. 2-3 is due to overflow from Turkey Creek.

Analysis of USACE cross-sectional survey data and the latest available (Post Katrina) LiDAR elevation data yielded much information. The analysis concentrated on a 3,500 foot long stream reach of Canal-1 that is just downstream of 28th street. Canal No. 1 and Canal No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate into unique stream systems that are not hydraulically connected. The Canal No. 1 stream reach is largely located within the U.S. Naval Reservation at Gulfport.

It is obvious that the general topography slopes downward from east to west or from Canal No. 1 to Canal No. 2-3. Canal No. 2-3 generally has a more defined stream channel and much greater flow capacity

overall than Canal-1 within this reach. It is also obvious that the channel elevation of Canal No. 1 is approximately three to five feet higher than the channel elevation of Canal No. 2-3 in a given section. Canal No. 2-3 in general has significantly more conveyance than Canal No. 1 given the same elevation. This difference in elevation/conveyance between the two channels indicates that floodwater from Canal No. 1 will overflow into Canal No. 2-3, but the reverse is not likely to occur. Overflow from Canal No. 1 within this reach will migrate toward Canal No. 2-3 while overflow from Canal No. 2-3 will just be conveyed downstream in the overbank section.

LiDAR also shows two areas within the Navy Reservation where the flow of water down Canal No. 1 will be disrupted. One area appears to be a low water crossing where the channel is partially blocked and the flow is diverted west toward Canal No. 2-3. The other area shows a significant break in the dike on the west side of the channel that allows flow to escape Canal No. 1 and go west toward Canal No. 2-3. Once again it should be noted that once water overflows or is diverted from Canal No. 1 into Canal No. 2-3, it is lost to the Canal No. 1 system and will not be replaced.

Additional questions have been raised on how the planned improvement to Canal-1 will affect the quantity and timing of overflow from Turkey Creek as well as the remaining flow down Turkey Creek. The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that the Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm.

In summary, all analysis conducted supports the original planners decision that the vast majority of any overflow from Turkey Creek will be transported downstream by Canal No. 2-3. Although some overflow from Turkey Creek could eventually make its way down Canal No. 1, the amount would be limited to the minimum channel capacity of Canal No. 1 within this reach and would be insignificant when compared to the storm discharges used for the downstream analysis. It should also be noted that due to the increased distance that any overflow from Turkey Creek would have to travel, it would likely not add directly to the peak flow on Canal No. 1, but would instead just prolong the flow after the peak.

Development of Alternatives

The primary objective of the Sponsors is to reduce the \$1,069,300 in annual damages due to flooding. Both the original 1989 environmental study and the more recent USACE analysis made use of hydraulic modeling to determine the extent of existing exposure to flooding conditions and to evaluate the potential benefits of both structural and nonstructural measures. In formulating the original alternatives, it was determined that the topography of the area limited the available structural measures for reducing flooding to clearing and snagging, selective snagging, channel enlargement and a levee. The nonstructural measures given consideration included warning techniques, the purchase of existing structures and relocation of residents and businesses, and simple flood proofing techniques. An incremental analysis was undertaken in order to determine the cost-effective channel section that would minimize the risk to public safety due to flooding.

Description of Alternatives

Three alternatives were evaluated for the original Watershed Plan-EIS. Alternative No. 1 was the "No Action" option, furnishing a base condition by which to measure the effects of other alternatives. Projected average annual damages due to flooding in the Canal No. 1 floodplain would be unaffected by foregoing implementation of the project.

Alternative No. 2 is the recommended alternative, consisting of improvements on Canal 1 which includes 3.8 miles of earth-lined channel, 0.2 miles of riprap lined channel, and 0.7 miles of selective snagging.

For 2014, the updated costs are \$1,895,700 for construction, \$930,400 for Land Rights, and 407,600 for Technical Assistance (Engineering, Construction Inspection, and Project Administration), for a total cost of \$3,233,700.

Alternatives Considered but Eliminated from Detailed Study

Alternative No. 3, the nonstructural option, involves moving, closing in, elevating or building floodwalls around approximately 121 buildings at a cost of \$7,629,300 (NRCS,1989:25 updated to 2014 costs).

U.S. Department Agriculture Natural Resources Conservation Service	08-03	Watershed: Long Beach County/State: Harrison County, MS Canal No. 1
Table C. Environmental Evaluation for Watershed Planning/Comparison of Alternatives		

Purpose: These tables document existing resource concerns/conditions and summarizes the effects and impacts of proposed watershed alternatives and activities on natural, human, and cultural resources.

National Economic Development Account

2 (8010 1101 1101 1101 1101 1101 1101 110			
Project Investment	No Action \$0	Preferred Alternative 2 \$3,233,700	
NED Account Beneficial Annual	\$0	\$492,200	
Adverse Annual	\$0	\$122,900	
Net Beneficial	\$0	\$369,300	

Regional Economic Development Account (RED)^{1/}

Other Social Effects Account

	No Action	Preserred Alternative 2
Health and Safety	See Comments	See Comments
Impact to Rural Development	Continued flood damages	Decreased flood damages
Impact Disadvantaged Persons	Continued flood damages	Decreased flood damages
Social well-being	Heightened anxiety	Maintained
Maintaining Productivity	Continued flood damages	Decreased flood damages
Beneficiaries (number)	None	310 Beneficiaries
Bridges/Roads Benefited (number)	None	Six roads
Business/Homes/Public Facilities Benefited 3/	None	103 homes and 18 businesses with reduced flooding
Domestic Water Supplies	None	None
Other	See Comments	See Comments

¹⁷The RED Account was not included in the plan since it was not identified as an issue during plan development

Environmental Quality Account

	No action Alternative 1	Preferred Alternative 2
Threatened/endangered species	Not likely to adversely affect	Not likely to adversely affect
Landscape resources (aesthetics)	Maintain existing resources	Maintain existing resources
Streams/corridors enhanced/protected (miles)	Maintain existing resources	Maintain existing resources
Lakes/reservoirs/enhanced protected (surface acres)	Maintain existing resources	Maintain existing resources
Water quality	No effect	Short-term negative impact due to construction activities
Wetlands (acres)	Maintain existing resources	Loss of 0.01 acres of palustrine wetlands
Upland/riparian habitat created/enhanced (acres)	Maintain existing resources	Maintain existing resources with mitigation plan
Air quality	No effect	Short-term minor negative impact due to construction activities
Clean Water Act	No effect	404 permit may be required
Clean Air Act	No effect	Permits may be required
Cultural resources	No effect	No effect
Fish and wildlife habitat	No effect	Loss of 61 acres riparian habitat Compensatory mitigation gain of 61 acres riparian and 58 acres hardwood tree plantings.
Land use	Increased flood damage	Decrease flood damage
Riparian area	No effect	Maintain existing resources with mitigation plan
Floodplain management	No flood protection	Increased flood protection
Stream channel modification	None	Increase stream channel capacity
Environmental Justice	No effect	No effect
Migratory Bird Treaty Act	No effect	No effect
Essential Fish Habitat	None present	None present
Natural Areas	None present	None present
Parklands	None present	None present
Ecologically critical areas	None present	None present
Invasive Species	No effect	No effect

Comments:

<u>Cultural Resources:</u> If cultural resources are discovered during implementation, then policies and procedures found in NRCS General Manual 420 part 401 and National Cultural Resources Procedures Handbook (H_190_601) will be initiated. According to a letter dated March 10, 2009, the Mississippi Department of Archives and History concurs with the findings of the cultural resources survey conducted by Earth Search in October of 2008.

<u>Health & Safety</u>: School bus routes, emergency vehicle access, and access to towns and medical facilities will be affected during flood events for the No Action alternatives.

<u>Impact to Disadvantaged Persons</u>: People are adversely affected by flood events during the No Action alternative. Figure No. 2 displays the U. S. Environmental Protection Agency's 2010 Environmental Justice map of the minority groups along Canal No. 1. The northwest side of Canal No. 1 has a population that is 0-10% minority and the southeast side of Canal No. 1 is 10-20% minority. Figure No. 3 displays the poverty level groups along Canal No. 1; the northwest side of Canal No. 1 is 10-20% below the poverty level and the southeast side is 0-10% below the poverty level.

Other

Air Quality: The short-term negative impacts are minor air pollution increases inherent to construction activities.

Cumulative Effects: The modification to Canal No. 1 for the Preferred Alternative will provide increased flood protection to houses and businesses located along the canal.

Risk and Uncertainty

Engineering

The structural information for the planned channel improvement is based on data collected and analyzed for the 1989 planning effort. All costs are estimated based on those quantities. There is a potential for changes in actual quantities when final surveys and designs are completed. Unit costs are estimated, and may change during contracting. The actual location for placement of excavated materials has not been located, but land rights costs and transportation costs have been estimated and included in the alternative cost.

Hydrology and Hydraulics

The original planning for the Long Beach Watershed was competed in 1989. The original hydraulic and hydrologic (H&H) models and channel design were to be used for all analysis needed to complete the updated EIS. However, the final H&H runs could not be located in the files. A decision was made to use the best data available to update the depths of inundation at each structure needed for economic analysis. A matching set of WSP2 and TR20 runs for each alternative (Present and Future Condition) dated October of 1987 were selected for use. A thorough check of these runs did not reveal any major problems with the input/output that would raise concerns about the accuracy of the results. It should be noted that the results of these H&H runs do not match the results in the final plan. However, since the economic analysis is based on the relative difference between the two alternatives, these runs are considered more than adequate for this task. Care has been taken to refer to any results taken from these runs in general terms or as differences between alternatives rather than specific numbers to avoid confusion.

Additional analysis was conducted to determine the effects of the project on the area downstream of the designed Canal-1 channel or downstream of Espy Avenue. The downstream area was analyzed by modifying an existing USACE HEC-RAS model to run a steady flow analysis for each alternate using the peak discharges produced by the corresponding TR20 model. The model used for the downstream analysis provides sufficient detail to determine the downstream effects of the project on flora and fauna. This method was also utilized to determine the effects of the project on the existing houses and businesses located downstream of the improved channel. It should be noted that the successful use of this method depends not only on the accuracy of the model used, but also on the accuracy of the discharges used and the house and business inventory.

It is highly recommended that new hydrologic & hydraulic models be developed during the final design that covers Canal-1 from 28th Street downstream to the bay. This comprehensive model will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal-1 design. This model should be used to update the appropriate Flood Insurance Rate Maps

(FIRMs) needed to comply with the National Flood Insurance Program (NFIP). The final design phase should also include a check of the existing house and business inventory to update any changes needed. The updated inventory and model will ensure that all downstream effects of the constructed channel on current improvements have been accurately identified and mitigated for.

Economics

A database of houses used by the U.S. Army Corps of Engineers for the Section 205 Turkey Creek Flood Damage Reduction Study was used as a base to gather information on houses in the floodplain. The houses were then ground checked to determine which houses had been demolished, rebuilt to new elevations and also for new construction. The Harrison County Assessor website was used to update house values for completing the economic analysis.

Environmental Consequences

Flooding

Floodplain Management

There is not a significant change in the extent of the existing mapped floodplain expected due to the construction of the improved channel. The floodplain upstream of the improved Canal No. 1 is already zoned and changes to the existing boundaries will be limited. The floodplain downstream of the improved channel is controlled by the 100-year tidal surge and the existing boundary will not change. The most significant change to the existing floodplain will occur within the 3.8 mile length of the improved channel. The average width of the 100-year floodplain will decrease approximately 150 feet between without and with project conditions. The smaller storms will have an even greater decrease in the average width between without and with project conditions due to a higher percentage of the flow being carried within the channel. For example, the average width of the 5-year floodplain will decrease approximately 550 feet between without and with project conditions. The without and with project floodplain is well documented in the original Long Beach Watershed Plan. Appendix B of this document contains maps showing the extent of the 100-year and 500-year floodplains for both without and with project conditions.

Even though there is not a significant change expected in the regulated floodplain due to the construction of Canal No. 1, it is highly recommended that the current Flood Insurance Study (FIS) and appropriate Flood Insurance Rate Maps (FIRMs) be updated during the final design stage if and when the project is accepted and funded. Updating the floodplain during the final design will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal No. 1 design.

The potential enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the future with project condition analysis. It has been suggested that this reduced floodplain be preserved as undeveloped area in order to reduce potential runoff. The NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize future flooding. In this case, the existing floodplain maps could be used as is. In any case, the existing floodplain regulations should be strictly enforced to minimize encroachment and reduce the runoff potential.

Floodwaters

The following demonstrates the average difference in elevation, top-width, and velocity expected between the without and with project conditions for Canal No. 1. The average difference in elevation will decrease approximately 0.9 feet for the 100-year flood event, 1.0 feet for the 10-year flood event, and 1.3 feet for the 1-year flood event. The average difference in total width will decrease approximately 150 feet for the 100-year flood event, 450 feet for the 10-year flood event, and 400 feet for the 1-year flood event. The average difference in flow velocity will increase approximately 0.3 feet per second (Ft/S) for the 100-year flood event, 0.5 Ft/S for the 10-year flood event, and 0.6 Ft/S for the 1-year flood event.

Flood Damages

There are 121 structures including homes and businesses that are located within the 500-year floodplain along Canal No. 1. These structures will benefit from the modifications to Canal No 1. Be decreasing the depth of flooding along the canal. There will be a reduction of approximately \$428,000 in average annual flooding damages.

Public Health and Safety

There are no public health issues associated with the construction of the canal. There will be a decrease in the depth of flooding along the canal during flood events which will help with flooding of roads and bridges.

Natural Environment

Water Quality

As stated in the original Watershed Plan-EIS (on page 52), the primary impact to water quality is urban runoff. The proposed project will have little impact on the water quality of the canal. The point discharge sites empty into lateral ditches before entering the canal and therefore, the proposed action will have little effect on these sources. Canal No. 1 is not included in the Mississippi Department of Environmental Quality (MDEQ) "List of Impaired Water Bodies" (MDEQ 2009).

Again, as stated in the original Watershed Plan-EIS, the effect on the downstream water quality of Johnson Bayou will be limited because the detention time in the canal will change only slightly. Turbidity levels may temporarily increase during construction and before vegetation is established, however, timing of construction and construction techniques will be used to minimize the effects of increased turbidity levels. Sediment decreasing construction techniques include sediment traps at the lower end of the channel, vegetation of spoil, berm, and channel slopes every 500 feet of construction, and channel side slopes constructed at 3:1. Water quality impacts due to construction of channel 1 are not expected to violate any state water quality standards.

The removal of materials impeding flow in the canal, in sections to be improved by means of selective snagging, would be accomplished primarily with hand-operated equipment, water-based equipment, or other small equipment used in a manner intended to minimize soil and water disturbance.

Wetlands and U.S. Jurisdictional Waters

The survey effort determined there would be direct impacts on jurisdictional wetlands and waters of the United States. This includes 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, 4.56 miles of Canal No. 1 and 0.7 miles of ditches. However, the only permanent resource loss anticipated as a result of the project involves a fingerlike projection of palustrine wetland located on the south side of the canal immediately east of milepost 14500. Widening of the channel at this point would cause the loss of less than 500 square feet (approximately 0.01 acre) of existing wetland which would either be excavated to expand the canal or filled to stabilize the canal bank. During the design phase the engineers will work

with NRCS biologist to choose access points that have higher concentrations of invasive species or non-sensitive plant communities. Access will be accomplished by moving from one access side to the other without crossing the canal with equipment.

Other than this one wetland impact, it is not anticipated that any jurisdictional waters will be filled in connection with the project. The purpose of the project is to clear and/or widen the existing channel in order to increase its carrying capacity and enhance its operational functionality. The centerline of the channel will be realigned in some sections in order to avoid impacts to delineated wetlands. In most cases relocation of the centerline will be limited to 10-20 feet; in no case will it exceed 50 feet. As the bottom width of the canal will be widened to 30 to 40 feet along most of its length, realignment of the centerline as little as 10-20 feet may be only a matter of excavating on one side of the existing channel rather than the other. These are details that will be addressed in the design phase of the project. Where the canal is shifted or expanded away from a connecting ditch or other water course, it may or may not prove necessary to extend the tributary to maintain the connection. Where the canal is shifted or expanded toward a ditch or other water course, it is possible some portion of the tributary would be subsumed by the widened channel. However, it is not expected that any portion of a connecting waterway would be filled.

Fish and Wildlife Habitat

Any impacts to flora in the project area resulting from the modification of Canal No. 1 will be minor and temporary. Reforestation of approximately 61 acres temporarily cleared within the channel right-of-way will be accomplished and an additional 58 acres of tree plantings will be accomplished on cleared land within the watershed.

Fish and Wildlife

Any impacts to fish and wildlife habitat in the project area resulting from modification of Canal No. 1 will be minor and temporary. Approximately 61 acres of riparian area will be cleared within the channel right-of-way. Reforestation of this acreage of riparian area will be accomplished along the channel boundaries and an additional 58 acres of tree plantings will be completed on cleared land within the watershed. Some migratory bird habitat will be lost due to clearing of 61 acres of riparian timber along the canal, but will be replaced by mitigation area plantings.

There are no known federal or state threatened or endangered species in the work area. No changes in salinity are expected in the work area due to construction of project.

Threatened and Endangered Species

The USFWS has concurred that "there are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project." However, to minimize the potential for downstream impacts on state or federally listed threatened or endangered species or their habitat, in Johnson Bayou, Bayou Portage, the Bay of Saint Louis or environs, suitable measures will be taken to prevent increased siltation

and deposition of added sediment below the western limit of the Canal No. 1 project at Espy Avenue both during and after construction of the proposed improvements. These measures include construction of earth-lined channel sections with 3:1 side slopes: vegetation of spoil berm and channel slopes after every 500 feet of construction; and installation of sediment traps at the downstream end of the constructed channel.

Soils

General soil types identified in the Soil Survey of Harrison County were reviewed and compared with the list of hydric soils obtained from the NRCS. Hydric soils found to be present in the Canal No. 1 corridor included the following: Atmore silt loam, Hyde silt loam, Plummer loamy sand, and Ponzer and Smithton soils. A hydric soil is defined as one formed under conditions of saturation, flooding or ponding prolonged sufficiently during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory 1987). Low-chroma color, an indicator of hydric soils, was observed at all sample plot. Re-vegetation of the area along Canal No.1 may be affected by the anaerobic soil conditions. This may result a longer re-establishment period than normal conditions.

Hydrology

The natural hydrology of the project corridor has been altered significantly by urban development. Hydrological indicators observed by surveyors included inundation, saturation in the upper 12 inches, drainage patterns in wetlands, oxidized root channels in the upper 12 inches and water-stained leaves. Five of the 14 sample plots (A, B, C, D and E) showed signs of hydrological activity, including inundation, saturation in the upper 12 inches, drainage patterns, sediment deposits, water-stained leaves and oxidized root channels in the upper 12 inches. Two plots (U1 and U2) revealed no indications of hydrology.

Cultural Resources

Earth Search, Incorporated (ESI) conducted a Phase 1 survey and cultural resources management assessment for the proposed channel modifications to Canal No. 1 during a three-day period from October 15 through 17, 2008. The Phase 1 survey effort included both archaeological and architectural surveys. Before undertaking the fieldwork, ESI researchers performed a comprehensive search of the relevant literature and reviewed the pertinent public records on file at the Mississippi Department of Archives and History (MDAH) in Jackson. Materials reviewed recorded standing structures in the area. Other materials examined included geomorphological data, maps and aerial photography. Preliminary historical investigations included secondary documentation located in local and regional archives and record depositories. The archaeological survey covered an Area of Potential Effect (APE) parallel to the canal and within 30 meters, or a little less than 100 feet, of either side of the channel. For the purposes of the architectural survey, the APE encompassed a quarter-mile buffer surrounding the waterway.

Previous Investigations

Research at MDAH revealed that 13 previous cultural resources surveys have been undertaken within one mile of Canal No.1. However, four of the 13 survey reports were not available for review. By examining the other nine, ESI researchers determined that one archaeological site and numerous standing structures 50 years of age or older have previously been recorded within a one-mile buffer area. A December 2000 survey by James Lauro identified one early-to-mid-20th-century site which has not been catalogued by MDAH. A February 2007 survey, in connection with the proposed construction of a new Harper McCaughan Elementary School to replace the facility destroyed by Hurricane Katrina, uncovered what was believed to have been the historic site of Hahn Brothers Nursery. The site was assigned a catalogue number (22HR973) but determined to be ineligible for nomination to the National Register of Historic Places (NRHP). A total of 29 structures at least 50 years old were located within one mile of the Canal No.1 project area. Of those, one is listed on the NRHP, three are considered eligible for nomination to the NRHP and six are considered potentially eligible.

Archaeological Survey

Field investigations in the project area consisted of pedestrian survey with judgmental shovel testing. Two transects, one on either side of the canal within 30 meters (less than 100 feet) of the bankline, were surveyed. Shovel-testing was limited to high-probability areas defined on the basis of the local geomorphology. Excavations were 30 centimeters (12 inches) in diameter with a maximum depth of 50 centimeters (20 inches). Excavated soils were screened through quarter-inch mesh. All soils were replaced upon completion of testing. The Mississippi Department of Archives and History concurs with the findings of the cultural resources survey, according to a letter dated March 10, 2009.

Most of the project area was cleared, allowing excellent visibility for the pedestrian survey. While recent debris (bottles, cans, etc.) was much in evidence, there were no signs of any artifacts sufficiently aged to warrant further investigation. Shovel tests in the high-probability areas revealed two strata. The upper consisted of a mix of very dark grayish brown soil and light gray sand to a depth of 35 centimeters (or 13.8 inches). The lower was a layer of unmixed light gray sand from 35 centimeters below the surface to the maximum depth of the excavation (50 centimeters or 20 inches). All shovel tests were negative, and there was no evidence of culture-bearing strata in the project area. Nevertheless, if cultural resources are discovered at anytime during the implementation of the project, work should cease until the Mississippi Department of Archives and History (MDAH) can assess the significance of the find and make a recommendation regarding how any such discovery should be handled. In the event of inadvertent discovery of cultural resources, NRCS will follow its discovery procedures as outlined in the Mississippi State Level Agreement. If excavated materials are to be stored, yarded, or spread off-site in new or unevaluated areas, these new areas in most cases will require an archaeological inventory as well as additional consultation.

Architectural Survey

An APE spanning 400 meters (.25 mile), 200 meters on either side of the canal, was established for the purposes of the architectural survey. All standing structures at least 50 years old, located within the limits of the APE, were to be recorded on MDAH Historic Resource Inventory forms. Digital photographs were also to be taken to document the appearance of recorded structures. However, only one culturally significant site was identified. The Resource Inventory form and digital photographs of the Courtenay Cemetery may be found in the Phase 1 Cultural Resources Survey report. The unmarked cemetery is located approximately 100 meters (a little less than 330 feet) due east of Espy Avenue. Access is via an easy-to-miss unsigned gravel lane, and there is no gateway or other entrance to the historical/contemporary burial ground. The cemetery, while roughly square, shows no indication of having lain out according to any plan. Grave markers are randomly distributed among the oaks and other shade trees. No other improvements are visible. There are approximately 50 markers, but the names and dates on some are indiscernible. There is a single brick-masonry tomb which appears to represent the earliest interment in the cemetery. All other burials are below the surface. There is also a granite obelisk and several simple folk-style markers made of poured concrete covered in tile. The earliest burial date is 1892; the majority fall between 1950 and 1980. As the nearly hidden cemetery lies on the very edge of the one-eighth-of-a-mile project area buffer, channel modifications will have no effect on the property.

Downstream Effects of Project

Long Beach Canal 1 was designed to end at the limits of the 100-year tidal surge which occurs along Espy Avenue. The area downstream of Espy Avenue was not modeled or analyzed during the original planning. This has left many questions and concerns unanswered on the projects effect on downstream development and aquatic resources. A HEC-RAS model was developed to determine the effects of the project downstream of the proposed channel. The following analysis shows us the average difference in velocity and elevation expected between the pre-project and post-project conditions.

The channel between Espy and Menge Avenues has seen significant modification and increased development over the years. The results of the modeling show that there is a small increase in storm elevations expected for this area. The larger storms (25-year to 500-year) produced no change in velocity but had an average increase in elevation of 0.35 feet. The smaller storms (1-year to 10-year) produced an average increase in velocity of 0.19 F/S and an average increase in elevation of 0.57 feet. The greater increase in the velocity and elevation for the smaller storms is due to the fact that the smaller storms are more confined to the channel and are less dependent on the floodplain.

The channel enters Johnson Bayou just downstream of Menge Avenue. This area is mostly undisturbed and considered rich in aquatic resources. The results of the modeling show that there is no significant change in either elevation or velocity for the area downstream of Menge Avenue. The larger storms (25-year to 500-year) produced an average increase in velocity of 0.02 F/S and an average increase in elevation of 0.06 feet. The smaller storms (1-year to 10-year) produced an average increase in velocity of 0.06 F/S and an average increase in elevation of 0.13 feet. The greater increase in the velocity and

elevation for the smaller storms is due to the fact that the smaller storms are more confined to the channel and are less dependent on the floodplain.

By the time the floodwaters get to the confluence of Johnson Bayou and Bayou Portage, there is not a measurable difference in the without and with project elevation and velocity results for any storm modeled. It is obvious that as you proceed downstream from the improved Canal-1 that the difference in without and with project conditions rapidly dissipates. Due to the extremely minor changes in velocity and elevations downstream of the work area, it is expected that there will be no downstream effects on flora and fauna due to installation of the project. There are no direct or indirect impacts anticipated to tidal and tidally influenced waters or wetlands located downstream of the Canal-1 project. Additionally, there are no anticipated impacts to any tidal or non-tidal areas located downstream of the proposed action area.

The downstream boundary conditions used for these runs were critical to provide meaningful results. The average high tide was used for the starting elevation of the analysis shown. It should be noted that as the downstream boundary elevations get higher due to storm surge, the differences between the pre-project and post-project runs become even smaller.

Two residential houses located just upstream of Menge Avenue will incur increased flooding as a result of this project. Neither house is currently inundated by the 100-YR storm under pre-project conditions, while both houses are inundated by the 500-YR storm under pre-project conditions. The completed project will increase the average depth of the 500-year storm at the two houses an average of 0.19 feet. In addition, the two houses would be inundated by depths of 0.13 feet and 0.61 feet by the 100-year storm under post project conditions. A build out or population growth analysis along Canal No. 1 was not conducted, it is evident from the site visit that many of the houses that were damaged or destroyed by Hurricane Katrina were not rebuilt. New construction is regulated by the local floodplain management board.

Cumulative Effects

The modifications to Canal No. 1 will provide average annual benefits of \$492,200 from reduced flooding. The combination of the improvements of Canal No. 1 and Canal No. 2-3 will provide even more benefits to the residents and business owners along both canals. The most significant change to the existing floodplain of Canal No. 1 will occur within the 3.8 mile length of the improved channel. The average width of the 100-year floodplain will decrease approximately 150 feet between without and with project conditions. The smaller storms will have an even greater decrease in the average width between without and with project conditions due to a higher percentage of the flow being carried within the channel. For example, the average width of the 5-year floodplain will decrease approximately 550 feet between without and with project conditions.

The improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

Consultation, Coordination, and Public Participation

Project Coordination

Information regarding public and agency involvement in development of the original Long Beach Watershed Plan and Environmental Impact Statement may be found in the "Consultation and Public Participation" section of the Watershed Plan-EIS (SCS, 1989:65). "Letters of Comment Received" from interested agencies were attached as Appendix A of that document. Written comments were submitted by the U.S. Environmental Protection Agency, the U.S. Department of Commerce, the U.S. Department of Health and Human Services, the Missippi Department of Wildlife, Fisheries and Parks, and the U.S. Department of the Interior. A public meeting was held at the Long Beach Public Library on July 17, 1989 for the purpose of presenting the Draft Watershed Plan-EIS and affording an opportunity for area residents and other interested individuals to submit comments regarding the plan. The meeting was attended by 33 persons. Those submitting comments were generally in support of the project, although some expressed concern about the fact that it would not go beyond Espy Avenue in Pass Christian. "These concerns were adequately addressed during the course of the meeting," according to the original report.

Agency Coordination

As previously noted in Section 1.2 (Project Scoping) agency coordination for the SEIS update of the original Watershed Plan began with a scoping meeting held on August 14, 2007. The following agencies were represented at that meeting: the Long Beach Water Management District, one of the principal sponsors of the original study; the Natural Resources Conservation Service, successor agency to another of the principal sponsors (the Soil Conservation Service); the U.S. Army Corps of Engineers, a cooperating agency for the present study; and the Mississippi Forestry Commission.

Letters soliciting the views of officials representing potentially interested agencies and organizations were sent to representatives of the following:

Jena Band of Choctaw Indians

Mississippi Band of Choctaw Indians

Tunica-Biloxi Indians of Louisiana, Inc.

U.S. Army Corps of Engineers – Mobile District

U.S. Department of Agriculture – Mississippi Farm Service Agency

U.S. Department of Agriculture – Forest Service

U.S. Department of Agriculture - Natural Resources Conservation Service

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

National Marine Fisheries Service

Mississippi Department of Marine Resources

Mississippi Department of Environmental Quality

Mississippi Department of Finance and Administration

Mississippi Department of Archives and History

State of Mississippi – Office of the Governor

Mississippi State Director of Rural Development

Mississippi Department of Wildlife, Fisheries and Parks - Natural Heritage Program

Mississippi Forestry Commission

Mississippi Soil and Water conservation Commission

Mississippi Department of Transportation

Southwest Mississippi Planning and Development District

Gulf Regional Planning Commission

Gulf Restoration Network

Responses were received from individuals representing six of the contacted agencies: the U.S. Environmental Protection Agency; Mississippi Department of Marin Resources; Mississippi Department of Wildlife, Fisheries and Parks; the Jena Band of Choctaw Indians; the U.S. Fish and Wildlife Service; and the U.S. Army Corps of Engineers. Copies of the Solicitation of Views (SOV) letter and all responses received may be found in Appendix 1. The following comments – some of which have already been addressed directly in previous chapters – were offered in the letters of response.

U.S. Environmental Protection Agency – In a letter dated January 2, 2009, Heinz J. Muller, chief of the NEPA Program Office, Office of Policy and Management, recommended that the SEIS include discussion of impacts on "existing hydraulics and hydrology (including...changes in the FEMA designated floodplain and the 'adopted regulatory floodway'), protected species, soils, geology, hazardous materials, underground storage tanks, the transportation network, recreational opportunities, air quality, noise, cultural resources, aesthetics, socioeconomics, and land use." On behalf of the EPA Region 4 Water Protection Division, he also asked that the SEIS "include an analysis of how the proposed project could

(or will) serve as a diversion canal for any adjacent streams." This request had particular reference to the Turkey Creek basin, an EPA priority watershed.

Mississippi Department of Marine Resources – In a letter dated December 18, 2008, Greg Christodoulou, coastal resource management specialist, noted that while it seemed unlikely tidal systems would be directly affected by the project, the SEIS should address "indirect impacts to tidal and tidally influenced waters and wetlands located... downstream from the proposed action area."

Mississippi Department of Wildlife, Fisheries and Parks – In a letter dated December 4, 2008, Andy Sanderson, Mississippi Natural Heritage Program ecologist, noted that "the Mississippi coast has suffered a great deal of habitat loss since the agency last commented on this project" in 1989. He also noted the presence of five protected species (manatee, saltmarsh topminnow, Mississippi diamond back terrapin, gulf salt mash snake and least killifish) in Saint Louis Bay, Bayou Porage, tributary streams and adjacent marshes. Nothing that channel improvements can "increase storm water runoff conveyance and stream flow velocities, and potentially increase transport of contaminants" he stressed the need for precautions to prevent erosion and sedimentation. He also recommended that measures be implemented to forestall the potential disturbance or loss of wetlands due to increased development resulting from a reduction in the risk of flooding.

Jena Band of Choctaw Indians – Environmental Director Lillie McCormick stipulated, in a letter dated December 23, 2008, that the project would not have a significant impact on any property held by the Jena Band of Choctaw Indians.

U.S. Fish and Wildlife Service – Fish and Wildlife Biologist David Felder confirmed, in a letter dated May 4, 2009, "There are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project."

U.S. Army Corps of Engineers – In a letter dated December 2, 2008, John McFadyen of the Mobile District acknowledged receipt of the solicitation of views letter regarding the project and noted that he would serve as project manager for the Corps. In a follow-up email on December 22, 2008, Mr. McFayden said that USACE officials had indicated their desire to have the Corps included as a cooperating agency in the development of the Supplemental EIS for Canal No. 1 improvements.

Public Involvement

Public involvement in the development of the original Watershed Plan-EIS dates from as early as January 16, 1986 when a meeting was held with affected property-owners to discuss the need for a "study [of] the effects of Turkey Creek overflowing into the Long Beach Canal No. 1" (SCS, 1989:56). As noted above, a public meeting was held at the Long Beach Public Library on July 17, 1989 for the purpose of presenting the Draft Watershed Plan-EIS and receiving comment on it.

Public Meetings

August 14th, 2007 - Scoping meeting was held to discuss updating the SEIS.

November 19, 2013 - A meeting was held between the Oklahoma NRCS and sponsors to discuss the project.

February 4^{th} , 2015 - A public meeting is scheduled to present the updated SEIS.

Preferred Alternative

Overall the Recommended Alternative would involve improvements to roughly 4.7 miles of Canal No. 1 between the NCBC and Espy Avenue, including 3.8 miles of earth-lined channel construction, about two-tenths of one mile of rock riprap-lined channel construction and seven-tenths of one mile of selective snagging. As noted in the original Watershed Plan-EIS, the earth-lined channel sections will be constructed with 3:1 side slopes due to the sandy bank materials (SCS, 1989:30). The plan initially called for most construction to be performed from one side of the canal with most spoil being deposited on one side as well. This aspect of the plan has been modified slightly to include the removal of spoil material from the project area and its transport to a suitable deposition site. The channel section reinforced by the placement of rock riprap will be constructed with 2:1 side slopes in order to provide adequate flow capacity within the narrower canal segment. The rock lining will prevent erosion due to accelerated water velocity from the Beatline Road crossing to the point 950 feet downstream at which the channel widens out again. Earthen channel slopes and berms will be re-vegetated after every 500 feet of construction, or at least weekly, soil moisture conditions permitting. This will serve to stabilize the banks, inhibiting erosion and reducing the excess sedimentation that might otherwise occur during construction.

In order to minimize the impact of proposed improvements on wetlands and natural habitat areas located along Canal No.1, the recommended alignment of the canal was modified at selected locations as shown in Exhibit A - Conceptual Alignment. (Conceptual alignment drawings will be found in Appendix C). The route of the canal improvement will remain within the floodway boundaries The upstream end of the project is located where Canal No. 1 flows out of the Naval Construction Battalion Center (NCBC) and into the City of Long Beach proper. The Recommended Alternative calls for selective snagging in the first 0.7 miles from the eastern city limits to the vicinity of Commission Road. The canal right-of-way would be 100 feet wide throughout this section and would be located immediately south of a 100-foot Mississippi Power Company servitude beginning roughly 1,560 feet west of the east end of the project. The canal would have a bottom width of 10 feet. A grade control structure would be installed on the upstream side of the Commission Road crossing. The existing canal alignment would be altered slightly beginning on the downstream side of Commission Road in order to pass between two delineated wetland areas, one on the south side of the canal just east of Klondyke Road and the other on the north side of the canal immediately west of Klondyke Road. Canal widening would also commence in this section. The modified alignment would shift the canal 50 feet or more north of its present course from Klondyke Road to the vicinity of Quarles Avenue, a street which terminates on the south side of the canal. Swinging into a more southwesterly track at this point, the improved canal would avoid another delineated wetland area on the northwest bank of the drainage basin. The 110-foot right-of-way width maintained heretofore would narrow to 100 feet, with the bottom width being reduced from 40 to 30 feet.

The modified canal would shift back to the southeast of its current alignment, before crossing Pineville Road, in order to avoid a small delineated wetland area on the northwest side of the drainage facility (see Figure No. 6, Appendix C). South of Pineville it would pass between the Tower Plaza property and a larger wetland area located on the southeastern side of the canal. It would also cross over to the north side of the Mississippi Power servitude. The 100-foot right-of-way with 30- foot bottom would be maintained

throughout this section. Roughly 4,500 feet downstream from the Pineville Road crossing, the canal would traverse a fingerlike extension of a delineated wetland area located on the southeast side of the canal, requiring the mitigation of approximately 500 square feet of wetland that would be incorporated into the widened drainage structure (see Figure No. 7, Appendix C).

The path of the proposed Canal No. 1 right-of-way begins to diverge from that of the Mississippi Power servitude just east of Beatline Road. The right-of-way would also narrow to 70 feet at the Beatline crossing and then to 60 feet another 650 feet downstream (see Figure No. 8, Appendix C). The 30 foot bottom width on the upstream side of Beatline will be maintained through the 70 foot right-of-way section on the downstream side, then reduced to 20 feet in the 60 foot-wide right-of-way section encompassing roughly the next 400 feet of the canal. In this narrower section of the canal, with its 60 to 70 foot right-of-way and 20 to 30 foot canal bottom width, stretching for 1,050 feet or so downstream from Beatline Road to just beyond the western city limits of Long Beach, the channel will be lined with rock riprap to prevent erosion and accommodate the significant increase in velocity attributable to the temporarily diminished capacity of the canal.

From the lined section to the end of the project at Espy Avenue, a distance of almost one mile, Canal No. 1 would be enlarged to maintain a 40 foot canal bottom within a 110-foot right-of-way. The alignment of the canal within this section would be largely unchanged, crossing the Mississippi Power servitude again and running along its southern edge for a short distance before the paths of the two utilities diverge in traversing the Long Beach Industrial Park.

Permits and Compliances

The USACE has participated in the development of this Supplemental Environmental Impact Statement (SEIS) as a cooperating agency with the Natural Resources Conservation Service (NRCS) and Long Beach Water Management District (LBWMD). The original study determined that a Section 404 permit would be required for the proposed canal improvements based on two criteria: (1) total drainage area upstream of the proposed construction and (2) area affected at the normal high-water mark. The USACE has indicated it will use the SEIS as the NEPA document on which to base a decision regarding the issuance of a Section 404 or Section 10 permit. Section 10 of the Rivers and Harbors Act of 1899 requires that a permit be obtained from the Corps for certain structures or work in or affecting navigable waters of the United States prior to undertaking the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U. S., including wetlands, prior to undertaking the work (33 U.S.C. 1344). For regulatory purposes, the Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark and/or other waters identified as navigable by the USACE. Land clearing operations involving vegetation removal with mechanized equipment such as front-end loaders, backhoes, or bulldozers with sheer blades, rakes, or discs; windrowing vegetation; land leveling; or other soil

disturbance in areas subject to Corps jurisdiction may be considered placement of dredged material under USACE jurisdiction. In order to determine the level of Corps jurisdiction, final wetland delineation for the project (including dredged material disposal sites) should be conducted in accordance with the Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual. Any work in waters of Canal No. 1 subject to the ebb and flow of the tide will require authorization under Section 10. It will also be necessary to comply with the requirements of 40 CFR Part 230 ("Section 404(b) (1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material"); 33 CFR Part 320.4 ("General Policies for Evaluating Permit Applications"); and 33 CFR part 332 ("Compensatory Mitigation for Losses of Aquatic Resources"). The Corps has indicated that the proposed Canal No. 1 project appears to be compatible with the USACE Mississippi Coast Improvements Program (MsCIP) project on Canal No. 2-3 which was scheduled to begin in the first quarter of 2009. (Improvements to the Long Beach canals are listed among the "Authorized Interim Projects" in Table 1-1 of the Corps's Mississippi Coastal Improvements Program (MsCIP) - Comprehensive Pion and Integrated Programmatic Environmental Impact Statement (USACE, 2009: 1-5).

It is recommended that the sponsors coordinate with the Mississippi Department of Marine Resources on Coastal Zone Management Plan consistency for Mississippi and determine if additional permits are required by the State for consistency other than Mississippi Marine Resources.

The sponsors will need to work with the local floodplain zoning authorities to determine building permit requirements. A No-Rise / No-Impact Certification may be required or a Conditional Letter of Map Revision CLOMR/LOMR if the regulatory floodway boundaries are encroached.

Mitigation

Mitigation features included in the recommended plan incorporate avoidance and minimization of adverse impacts, as well as compensation for unavoidable losses of fish and wildlife habitat. Avoidance measures include re-alignment of the center line of some sections of the channel to avoid impacts to delineated wetlands.

Minimization measures include several sediment control features: construction of earth-lined channel sections with 3:1 side-slopes; vegetation of spoil berm and channel slopes after every 500 feet of construction; and installation of sediment traps at the downstream end of constructed channels. The sediment traps will provide storage for increased sediment yields during construction, as well as normal yields from the watershed. Traps consist of channel sections excavated an additional two feet for a distance of approximately 350 feet. Other minimization measures include selective snagging to be performed with hand-operated and other small equipment in a manner designed to minimize soil and water disturbance.

Compensatory activities include reforestation with hardwood species to offset clearing of pine and hardwoods. Compensation related to works of improvement on Canal No. 1 includes reforestation of approximately 61 acres temporarily cleared within the channel right-of-way. An additional 58 acres of reforestation will be located on suitable cleared land within the watershed. Suitable cleared land criteria

includes: ownership or easement of the land for the life of the project to insure protection and maintenance of the plantings, soil and hydrologic characteristics that are adequate for tree survival and growth. Tree plantings will consist of hardwood species, including at least four different kinds of oaks, and are to be planted in alternating rows on a 12-foot matrix spacing scheme.

The potential loss of approximately 0.01 acres of wetland as a result of improvements to Canal No. 1 will be mitigated separately and the specifics of that mitigation will be determined during the Section 404 permitting process. Two homes are shown to have increased depths of flooding as a result of installation of the recommended plan. Flood proofing or other types of damage mitigation will be provided for these properties during final design and installation of the project.

Costs and Benefits

Information regarding the projected costs and benefits associated with the installation of improvements identified in the Long Beach Watershed Plan - Environmental Impact Statement may be found on pages 33-37 of said document and in tables 1-6 following on pages 38-45. The project has \$492,200 in average annual benefits associated with reduced flooding to the structures located along Canal No. 1, the average annual cost over the next 100 years is \$119,400. The total installation cost for improvements to both Canal No. 1 and Canal No. 2-3 was \$1,794,900. Nearly two-thirds of that total was attributed to improvements along Canal No. 1. The Canal No. 1 funding requirement of \$1,161,000 (in 1988 dollars) included costs for construction (\$814,500), engineering (\$129,900), project administration (\$57,100) and land rights (\$159,500). The construction cost included \$58,400 in mitigation-related expenses.

A preliminary cost estimate expressed in current (2014) dollars shows a total estimated construction cost for Canal No. 1 improvements of \$3,223,700. This total includes \$1,795,700 for actual construction, \$407,600 for engineering and permitting expenses and \$100,000 for remaining wetlands mitigation. It also includes \$930,400 for costs which may be incurred for the acquisition or use of land. These figures are preliminary and based on current unit prices for labor and materials. Actual costs will vary to one degree or another, depending on prevailing economic conditions when construction actually gets underway.

Table 1 - Estimated Installation Cost Long Beach Watershed, Mississippi (Dollars) \mathcal{V}

	Estimated Cost (Dollars)	(Dollars)	
Installation Cost Item	PL-83-566 Funds Other Funds	Other Funds	Total
Structural Measures			
Canal 1 Project Cost	\$2,297,300	\$936,400	\$3,233,700
TOTAL PROJECT COST	\$2,297,300	\$936,400	\$3,233,700

17 Price base 2014.

December 2014

Table 2 - Estimated Cost Distribution - Structural Measures Long Beach Watershed, Mississippi (Dollars) 1/

	Public	Public Law 83-566 Funds	ds	F		Other Funds	spu			Total
Evaluation Unit	Construction	Engineering	Admin.	10tal PL-83-566	PL-83-566 Construction Engineering Landrights Admin.	Engineering	Landrights	Admin.	lotal Other	Installation
Structural Measures										
Canal 1	\$1,895,700	\$360,200	\$41,400	\$41,400 \$2,297,300	\$0	0\$	\$930,400	\$6,000	\$936,400	\$3,233,700
GRAND TOTAL	\$1,895,700	\$360,200	\$41,400	\$41,400 \$2,297,300	0\$	0\$	\$930,400 \$6,000	\$6,000	\$936,400	\$3,233,700
17 Price base 2014.										December 2014

TABLE 3B - STRUCTURAL DATA

Structural Data Long Beach Watershed, Mississippi

Gradient (ft.ft.) Bottom (ft.ft.) Side (ft.ft.) Aged Built (ft.ft.) As Aged As Built (ft.ft.) Aged As Built (ft.ft.) Aged Built (ft.ft.) As Aged As Aged As Built (ft.ft.) As Aged (ft.ft.) As Aged As Aged (ft.ft.) Aged (ft.ft.) <th< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>Channel Dimensions</th><th>imensions</th><th></th><th>n value</th><th>lue</th><th>Velocities</th><th>ties</th><th></th><th></th><th></th><th>1</th></th<>								Channel Dimensions	imensions		n value	lue	Velocities	ties				1
Bottom Elevation Side Aged As Excavation Type Existing Width (ft.msl) Slope Aged As Excavation Type African 22 14.7 2.0 N N NII M 22 11.7 2.0 N N NII M 40 11.4 3.0 0.030 0.025 1.83 1.58 NII M A=1490 18.4 P=1250 0.100 0.16 6200 II M A=1490 18.4 P=1250 0.100 0.16 6200 II M A=1490 18.4 P=1250 0.100 0.16 0.16 0.16 0.10 N II M A=2400 18.4 P=1010 0.100 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.225 1.49 II M A=2170 16.8 <td< th=""><th></th><th></th><th></th><th></th><th>\rightarrow</th><th>_</th><th>:</th><th></th><th></th><th></th><th>•</th><th>\dashv</th><th>(ft./sk</th><th>(2)</th><th></th><th></th><th></th><th> </th></td<>					\rightarrow	_	:				•	\dashv	(ft./sk	(2)				
22 14.7 2.0 VIII M 22 14.7 2.0 VIII M 22 11.7 2.0 VIII M 40 11.4 3.0 0.030 0.025 1.83 1.58 II M A=1490 18.4 P=1250 0.100 0.16 6200 II M 43 11.2 2.0 0.030 0.025 1.36 11 M 443 11.2 2.0 0.030 0.025 1.36 II M 443 11.2 2.0 0.030 0.025 1.36 II M A=2400 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2510 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2510 1	Hydraulic Gradient	100 Year Water Hydraulic Freq. Surface Gradient	Water Hydraulic surface Gradient	Hydraulic Gradient		9	radient ft./ft.)	Bottom Width	Elevation (ft. msl)	Side	Aged		Aged 1/	As Built	Excavation	Type of	Existing Channel	Present Flow
22 14.7 2.0 VIII M 22 11.7 2.0 VIII M 40 11.4 3.0 0.030 0.025 1.83 1.58 II M A=1490 18.4 P=1250 0.100 0.16 6200 II M 43 11.2 2.0 0.030 0.025 1.36 1.44 II M 40 11.1 3.0 0.030 0.025 1.36 II M A=2400 16.8 P=1010 0.100 0.025 1.36 I.44 II M A=2400 16.8 P=1010 0.100 0.025 1.29 II M A=2400 16.8 P=1010 0.100 0.025 1.74 II M A=2510 16.8 P=1010 0.100 0.025 1.74 II M A=2510 16.8 P=1010 0.100 0.025 1.29 II M	Discharge Feet msl (cfs)	Discharge Feet msl (cfs)	Elevation Feet msl		(#./ft.)									7	(cu yds.)	WOTK 3/	type 4/	Conditic 5/
22 14.7 2.0 NI M NI M 22 11.7 2.0 0.030 0.025 1.83 1.58 NI M NI M 40 11.4 3.0 0.030 0.025 1.83 1.58 NI M M 43 11.2 2.0 0.00 0.030 0.025 1.36 1.44 M M 40 11.1 3.0 0.030 0.025 1.36 1.44 M M A=2400 16.8 P=1010 0.100 0.025 1.36 1.44 M M A=2400 16.8 P=1010 0.100 0.025 1.78 1.74 M M A=2170 16.8 P=1010 0.100 0.025 1.78 1.74 M M A=2510 16.8 P=1010 0.100 0.025 1.78 1.74 M M A=2510 16.8 P=1010 0.1	10+40															VIII	M	Д .
22 11.7 2.0 H </td <td>46+27 0.92 1150 20.8</td> <td>1150</td> <td>_</td> <td>20.8</td> <td></td> <td></td> <td></td> <td>22</td> <td>14.7</td> <td>2.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ΛI</td> <td>×</td> <td>۵.</td>	46+27 0.92 1150 20.8	1150	_	20.8				22	14.7	2.0						ΛI	×	۵.
40 11.4 3.0 0.030 0.025 1.83 1.58 II M A=1490 18.4 P=1250 0.100 0.16 6200 II M 43 11.2 2.0 1 A 1 M B 43 11.2 2.0 1 A B B B B 40 11.1 3.0 0.030 0.025 1.36 1.44 B B A=2400 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2400 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2400 16.8 P=1010 0.100 0.025 1.74 II M A=2170 16.8 P=1010 0.100 0.25 1.74 II M A=2510 16.8 P=1010 0.100 0.28 B B B 24				20.8				22	11.7	2.0						ΛI	M	P
40 11.4 3.0 0.030 0.025 1.83 1.58 11 M A=1490 18.4 P=1250 0.100 0.16 6200 11 M 43 11.2 2.0 1 M M M 43 11.2 2.0 1 M M M 40 11.1 3.0 0.030 0.025 1.34 M M A=2400 16.8 P=1010 0.100 0.22 1.49 11 M A=2400 16.8 P=1010 0.100 0.25 1.49 11 M A=2400 16.8 P=1010 0.100 0.25 1.49 11 M A=2170 16.8 P=1010 0.100 0.25 1.74 11 M A=2510 16.8 P=1010 0.100 0.28 1.74 11 M 24 9.5 2.0 0.030 0.025 1.78 1.74 <td></td> <td>-</td> <td>-</td> <td>-</td> <td>0.00018</td> <td></td> <td>0.00036</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>13100</td> <td></td> <td></td> <td></td>		-	-	-	0.00018		0.00036								13100			
A=1490 18.4 P=1250 0.100 0.16 6200 II M 43 11.2 2.0 11 M II M 43 11.2 2.0 11 M M 40 11.1 3.0 0.030 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.22 1.49 II M A=2400 16.8 P=1010 0.100 0.25 1.49 II M A=2170 16.8 P=1010 0.100 0.25 1.49 II M A=2510 16.8 P=1010 0.100 0.25 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.04 II M 24 9.5 2.0 2.0 1.1400 II M I	55+40 1.48 1120 20.7	1120		20.7				40	11.4	3.0	0.030	0.025	1.83	1.58		=	Σ	_
43 11.2 2.0 11 M 43 11.2 2.0 11 M 43 11.2 2.0 11 M 40 11.1 3.0 0.030 0.025 1.36 1.44 11 M A=2400 16.8 P=1010 0.100 0.022 1.5400 11 M A=2400 16.8 P=1010 0.030 0.025 1.49 11 M A=2170 16.8 P=1010 0.100 0.025 1.74 11 M A=25170 16.8 P=1010 0.100 0.025 1.78 1.74 11 M A=2510 16.8 P=1010 0.100 0.025 1.78 1.74 11 M A=2510 16.8 P=1010 0.100 0.028 20100 11 M 24 9.5 2.0 2.0 11 M 11 24 9.5 2.0 2.	7/ 240 20.7			20.7				A=1490	18.4	P=1250	0.100		0.16					
43 11.2 2.0 II M 43 11.2 2.0 II M 40 11.1 3.0 0.030 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.022 1.49 II M A=2400 16.8 P=1010 0.100 0.025 1.49 II M A=2170 16.8 P=1010 0.100 0.25 I.74 II M A=2510 16.8 P=1010 0.100 0.25 I.74 II M A=2510 16.8 P=1010 0.100 0.28 I.74 II M 24 9.5 2.0 2.0 II M II M 24 9.5 2.0 II II M II M 24 9.5 2.0 II II II M Indicate the indicate the indicate the indicate the indicate the indicate				H	0.11121		0.00046								6200			
43 11.2 2.0 II M 40 11.1 3.0 0.030 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.022 1.5400 II M A=2400 16.8 P=1010 0.100 0.025 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.025 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M 24 9.5 2.0 2.0 2.0 1.0 M II 24 9.5 2.0 1.0 1.0 II M 24 9.5 2.0 1.0 1.0 II M 24 9.5 2.0 2.0 2.0 2.0 2.0 2.0		1400 20.6	20.6					43	11.2	2.0						11	Σ	Ы
40 11.1 3.0 0.030 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.022 15400 II M 40 10.7 0.030 0.035 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.25 1.74 II M A=2510 16.8 P=1010 0.100 0.25 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M 24 9.5 2.0 0.20 0.28 1.74 II M 24 9.5 2.0 0.030 0.025 1.74 III M 24 9.5 2.0 II III M III A 9.5 2.0 II III III <td>20.5</td> <td></td> <td>20.5</td> <td>20.5</td> <td></td> <td></td> <td></td> <td>43</td> <td>11.2</td> <td>2.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>II</td> <td>M</td> <td>Ы</td>	20.5		20.5	20.5				43	11.2	2.0						II	M	Ы
40 11.1 3.0 0.030 0.025 1.36 1.44 II M A=2400 16.8 P=1010 0.100 0.22 15400 II M 40 10.7 0.030 0.035 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.25 1.74 II M A=2510 16.8 P=1010 0.0030 0.025 1.78 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M 24 9.5 2.0 2.0 11 M M 24 9.5 2.0 11 M III M 24 9.5 2.0 11 M III M	0.00021				0.00021		0.00101								1400			
A=2400 16.8 P=1010 0.100 0.022 15400 II M 40 10.7 0.030 0.035 1.52 1.49 III M A=2170 16.8 P=1010 0.100 0.025 1.74 II M A=2510 16.8 P=1010 0.100 0.28 1.74 II M A=2510 16.8 P=1010 0.100 0.28 II M 24 9.5 2.0 2.0 II M 24 9.5 2.0 II M A=250 III M	60+80 1.79 870 20.4	870		20.4				40	11.1	3.0	0.030	0.025	1.36	1.44		II	Σ	Д
40 10.7 0.030 0.025 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.025 1.74 II M A=2510 16.8 P=1010 0.025 1.78 1.74 II M A=2510 16.8 P=1010 0.100 0.28 20100 II M 24 9.5 2.0 2.0 11 M M 24 9.5 2.0 III M A 9.5 2.0 III M	7/ 530 20.4			20.4				A=2400	16.8	P=1010	0.100		0.22					
40 10.7 0.030 0.025 1.52 1.49 II M A=2170 16.8 P=1010 0.100 0.25 1.74 II M 30 10.3 3.0 0.030 0.025 1.78 1.74 II M A=2510 16.8 P=1010 0.100 0.28 20100 II M 24 9.5 2.0 0.20 11 M M 24 9.5 2.0 III M III M	900000	900000	900000	900000	9000000		0.00036								15400			
A=2170 16.8 P=1010 0.100 0.025 1.74 11 M 30 10.3 3.0 0.030 0.025 1.78 1.74 11 M A=2510 16.8 P=1010 0.100 0.28 11 M 24 9.5 2.0 11 M 11 M 24 9.5 2.0 11 M 11 M	71+80 1.79 1010 20.4	1.79 1010		20.4				40	10.7	0.030	0.030	0.025	1.52	1.49		=	Σ	Ы
30 10.3 3.0 0.030 0.025 1.78 1.74 11 M A=2510 16.8 P=1010 0.100 0.28 20100 11 M 24 9.5 2.0 11 M M 24 9.5 2.0 11 M 1400 11 M	7/ 610 20.4			20.4				A=2170	16.8	P=1010	0.100		0.25					
30 10.3 3.0 0.030 0.025 1.74 11 M A=2510 16.8 P=1010 0.100 0.28 11 M 24 9.5 2.0 11 M 24 9.5 2.0 11 M 24 9.5 2.0 11 M	800000						0.00045											
A=2510 16.8 P=1010 0.100 0.28 Colloo Colloo II M 24 9.5 2.0 II M II M 24 9.5 2.0 II M II M	79+70 1.79 1030 20.3	1030		20.3				30	10.3	3.0	0.030	0.025	1.78	1.74		=	Σ	۵
24 9.5 2.0 11 M 24 9.5 2.0 11 M 1400 1400 1400	7/ 710 20.3			20.3				A=2510	16.8	P=1010	0.100		0.28					
24 9.5 2.0 II M 24 9.5 2.0 II M 1400 II M	0.00011	0.00011	0.00011	0.00011			0.00043				ŀ				20100			
24 9.5 2.0 II M III M	98+30 2.12 2100 20.1	2.12 2100 20.1	20.1					24	9.5	2.0						11	M	Ь
	19.6	19.61	19.6	9.61				24	9.5	2.0						11	M	Ь
	0.00024	0.00024	0.00024	0.00024	0.00024		0.00104								1400			1

TABLE 3B – STRUCTURAL DATA CONTINUED Structural Data

Structural Data Long Beach Watershed, Mississippi

							Channel D	Channel Dimensions		n value	ılue	Velocities (ft./sec)	ities ec)				
Channel Name	Station	Drainage Area	100 Year Freq.	Water Surface	Hydraulic Gradient	Gradient (ft./ft.)	Bottom Width	Elevation (ft. msl)	Side Slope	Aged	As Built	Aged 1/	As Build	Excavation	Type	_	Presei Flow
		(71111)	Design Discharge (cfs)	Feet msl	(III/III)								73	(cu yds.)	Work 3/	Type 4/	Conditi 5/
Canal No. 1	55+66	2.12	09/1	9.61			30	9.4	3.0	0.030	0.025	2.85	2.51		Ξ	×	Ь
	1/		490	19.6			A=1490	16.5	P=930	0.100		0.34					
					0.00027	0.00042								40500			
	132+70	2.85	1180	18.7			09	8	3.0	0.030	0.025	1.69	2.23		=	Σ	Ы
	1/		1020	18.7			A=3660	14.4	P=1770	0.100		0.28					
					0.0000	0.00045								54600			
	165+85	3.67	2090	18.4			30	6.5	3.0	0.030	0.025	2.56	2.68		11	Σ	Ь
	//		009	18.4			A=1550	13.4	P=520	0.100		0.38					
					0.00018	0.00041								54400			
	194+50	4.10	2900	17.9			23	5.3	2.0						IIA	Σ	Ь
				17.7	0.00033	0.00033	23	5.3	2.0					009	VII	Σ	Ы
	194+80	4.10	2760	17.7			30	5.3	2.0	0.035	0.035	4.06	4.06		IIIA	Σ	a
	1/		520	17.7			A=2360	14.5	P=1220	0.100		0.22					
					0.00058	0.00058								7900			
	200+00	4.10	2330	17.4			20	5	1.50	0.030	0.030	4.86	4.86		VII	¥	Ч
	//		810	17.4			A=2790	14.5	P=1220	0.100		0.29					
					0.00067	0.00033								3100			
	203+00	4.10	2400	17.2			20	4.9	1.50	0.035	0.035	5.08	5.08		IIA	×	Ы
	//		840	17.2			A=2360	14.5	P=1220	0.100		0.36					
					0.00100	0.00040								1900			
	204+00	4.10	2680	17.1			40	4.9	3.00	0.030	0.025	2.85	2.7		=	Σ	Ы
	//		250	17.1			A=1020	14.5	D=710	0.100		0.25			=	Σ	Ь
					0.00021	0.00048								25700			
	213+65	4.36	3310	16.9			40	4.4	3.00	0.030	0.025	3.45	2.53		=	Σ	Ы

TABLE 3B - STRUCTURAL DATA CONTINUED

Structural Data

Long Beach Watershed, Mississippi

							Channel Dimensions	imensions		n value	lue	Velocities	ties				
												(ft./sec)	();				
Channel	Station	Drainage	100 Year	Water	Hydraulic	Gradient	Bottom	Elevation	Side	Aged	As	Aged			Туре	Existing	Preser
Name		Area	Freq.	Surface	Gradient	(ft./ft.)		(ft. msl)	Slope		Built				of	Channel	Flow
		(mi2)	Design		(ft./ft.)									(cu yds.)	Work	type 4/	Conditi
			Discharge (cfs)	Feet msl											3/		ک/
Canal	//		380	19.6			A=1250	12.8	P=710	0.100		0.31					
					0.00030	0.00044								81500			
	255+50	5.42	2340	15.7			40	2.6	3.00	0.030 0.025	0.025	2.23	1.13		п	Σ	Ь
	//		1370	15.7			A=4380	11.7	P=1650	0.100		0.31					
					0.00012	0.00012								1200			
	257+20	5.42	3700	15.6			14	2.5	2.50								
11																	

¹⁷ Aged Velocities are based on design discharges.

² As-Built Velocities are based on bankfull discharge or the 10-year frequency discharge, whichever is smaller.

channel (includes bar removal and major clearing and snagging operation.) IV-Clearing and Snagging. V-Stabilization as primary purpose (by continuous treatment or localized 31 I-Establishment of new channel including necessary stabilization measures. II- Enlargement or realignment of existing channel or stream. III-Cleaning out natural or manmade problem areas present capacity adequate). VI-Grade Control Structure. VII-Rock riprap lined channel area. VIII-Selective snagging.

4 N-Unmodified, well defined natural channel or stream. M-Manmade ditch or previously modified channel. O-None or practically no defined channel.

⁵/ P-Perennial – Flows at all times except during extreme drought.

1-Intermittent - Continuous flow through some seasons of the year, but little or no flow through other seasons.

E-Ephemeral- Flows only during periods of surface runoff, otherwise dry.

S- Ponded water with no noticeable flow - caused by lack of outlet or high ground water.

6 Road section with headwater and tailwater conditions shown on separate lines.

77 This line represents the out-of-bank flow segment at this station.

Table 4 - Estimated Average Annual NED Costs Long Beach Watershed, Mississippi

(Dollars) 1/

	(~	onurs)	
Evaluation Unit	Amortized Installation	O&M & Replacement	Total
Rehabilitation	·		
Canal 1	\$109,000	\$10,400	\$119,400
GRAND TOTAL	\$109,000	\$10,400	\$119,400

Discount rate is 3.375% with a 104 year period of analysis. Price base 2014.

December 2014

Table 5 - Estimated Average Annual Flood Damage Reduction Benefits Long Beach Watershed, Mississippi (Dollars) 1/

		(Dona				
Canal 1	Dai	e Annual mages	Average Dama	ages	An	erage nual
	Withou	ıt Project	With P	roject	Ber	nefits
	Ag	Non-Ag	Ag Related	Non-Ag	Ag.	Non-Ag
Item	Related	Related		Related	Relate [/]	Related
Floodwater Damage						
Urban	-	\$1,069,300	-	\$641,300	-	\$428,000
Subtotal	-	\$1,069,300	-	\$641,300	•	\$428,000
Indirect Damage ^{2/}	-	160,400	-	\$96,200	-	\$64,200
GRAND TOTAL	-	\$1,229,700		\$96,200	-	\$492,200

Table 6 - Comparison of NED Benefits and Costs Long Beach Watershed, Mississippi

(Dollars) 1/

		Averaş	ge Annual Benefits				
Evaluation	Damage I	Reduction ²	Oti	1er ^{3/}		Average Annual	Benefit- Cost
Unit					Total	Cost 4/	Ratio
	Agricultural	Non-Agricultural	Agricultural	Non-Agricultural			
Canal 1					\$492,200	\$119,400	4.1:1.0
TOTAL		\$492,200			\$492,200	\$119,400	4.1:1.0

Discount rate is 3.375% with a 104 year period of analysis; all values are updated to 2014. From table 5.

December 2014

Discount rate is 3.375% with a 104 year period of analysis. Price base 2014.

December 2014

Indirect benefits were calculated as 25% for road and bridge benefits, 15% for Urban and 10% for all other benefits in table, as shown in Economics Guide, Page 32, dated 1964.

REFERENCES

- 1. Draft Supplemental Environmental Impact Statement for Canal No. 1 Improvements, Long Beach Watershed Plan-Environmental Impact Statement, November 2012
- 2. Environmental Laboratory, Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1 (Vicksburg MS: U.S. Army Corps of Engineers Waterways Experiment Station, 1987). http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf

3. Harrison County Development Commission, "MS Coast Major Employers," (Gulfport, MS: Harrison County Development Commission, 2009). Internet data source. http://mscoast.org/county-profile/major-employers/

- 4. U.S. Army Corps of Engineers Mobile District, Section 205 Turkey Creek Flood Damage Reduction Study Project Information Report (Mobile AL: U.S. Army Corps of Engineers, 2005).
- 5. U.S. Army Corps of Engineers, Economics Guidance Memorandum (EGM) 01-03, Generic Depth Damage Relationships (U.S. Army Corps of Engineers, 2000).
- 6. U.S. Army Corps of Engineers, Wetlands Delineation Manual (Washington DC: U.S. Army Corps of Engineers, 1987). Wetlands Research Program Technical Report Y-87-1.
- 7. U.S. Census Bureau, 2000 Census, http://factfinder.census.gov.
- 8. U.S. Congress, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Public Law 109-59, August 10, 2005).
- 9. U.S. Congress, Federal Water Pollution Control Act, as amended ("Clean Water Act" as amended through Public Law 107-303, November 27, 2002). http://epw.senate.gov/water.pdf
- 10. U.S. Congress, Farmland Protection Policy Act, as amended (through Public Law 110-246, May 22, 2008). Subtitle 1 (Sec. 1539-1549) of Agriculture and Food Act of 1981 (Public Law 97-98m December 22, 1981).
- 11. U.S. Congress, *Endangered Species Act of 1973*, as amended (Public Law 93-205, December 28, 1973). http://epw.senate.gov/esa73.pdf
- 12. U.S. Congress, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 19 70, as amended (Public Law 91-646, July 6, 1971).
- 13. U.S. Congress, *National Environmental Policy Act of 1969*, as amended (Public Law 91-190, January 1. 1970).
- 14. U.S. Congress, Department of Transportation Act of 1966 (Public Law 89-670, October 15, 1966).
- 15. U.S. Congress, Land and Water Conservation Fund Act of 1965, an amended (Public Law 988-578, September 3, 1964).
- 16. U.S. Congress, Watershed Protection and Flood Prevention Act, as amended (Public Law 83-566, August 4, 1954).
- 17. U.S. Department of Agriculture Natural Resources Conservation Service, 2014. National Watershed Program Handbook.
- 18. U.S. Department of Agriculture Natural Resources Conservation Service, 2014. National Watershed Program Manual.
- 19. U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey of Jackson County, Mississippi (Washington DC: Natural Resources Conservation Service, 2006). http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/
- 20. U.S. Department of Agriculture Natural Resources Conservation Service, 1998. Water Resources Handbook for Economics Part 611

- 21. U.S. Department of Agriculture, Soil Conservation Service, Long Beach Watershed Plan and Environmental Impact Statement, Harrison County, Mississippi (Jackson MS: USDA Soil Conservation Service, 1989
- 22. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, NCDC Cooperative Stations, "Gulfport Naval Center, Harrison County: Average Rainfall," (Washington, DC: National Climatic Data Center, 2009b). Cited on World Climate internet site. http://www.worldclimate.com/
- 23. U.S. Department of Commerce, U.S. Census Bureau, *State and County Quick Facts* (Washington, DC: U.S. Census Bureau, 2009). Internet data source. http://quickfacts.census.gov/qfd/
- 24. U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, Coastal Data: Topographic Contours for Hancock, Harrison and Jackson Counties, MS (Washington, DC: National Oceanographic and Atmospheric Administration, 2005): Two-foot elevation contours generated from LIDAR collected by Earth Data, Inc. for NOAA in cooperation with the State of Mississippi and made available by the Mississippi Automated Resource Information System (MARIS).
 - http://www.maris.state.ms.us/HTM/DownloadData/CoastalData.html
- 25. U.S. Department of Commerce, U.S. Census Bureau, 2000 Census: Summary File 3 (Washington, DC: U. S. Census Bureau, 2002).
- 26. U.S. Department of Commerce, U.S. Census Bureau, 2000 Census: Summary File 1 (Washington, DC: U.S. Census Bureau, 2001). http://www.census.gov/en.html
- 27. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, NCDC TD 9641 Clim 81 1961-1990 Normals, "Gulfport Naval Center, Harrison County: 24-Hour Average Temperature, "(Washington, DC: National Climatic Data Center, 2009a). Cited on World Climate internet site. http://www.worldclimate.com/
- 28. U.S. Department of Interior, National Park Service, National Register of Historic Places (Washington, D.C.: National Park Service, 2009). http://www.nationalregisterofhistoricplaces.com/
- 29. U.S. Department of the Interior, U.S. Fish and Wildlife Service, *National Wetlands Inventory* (Washington DC: U.S. Fish and Wildlife Service, 2008). http://www.fws.gov/wetlands/
- 30. U.S. Department of Transportation, Federal Highway Administration, "Guidance for Preparation and Processing Environmental and Section 4(f) Documents" (Washington DC: Federal Highway Administration, October 30, 1987). FHWA Technical Advisory T 6640.8A. http://www.fhwa.dot.gov/
- 31. U.S. Department of Transportation, Federal Highway Administration, Office of Environmental and Planning, Noise and Air Quality Branch, *Highway Traffic Noise Analysis and Abatement Policy and Guidance* (Washington DC: Federal Highway Administration, 1995). http://www.fhwa.dot.gov
- 32. U.S. Department of Transportation, Federal Highway Administration, FHWA Functional Classification Guidelines: Concepts, Criteria and Procedures (Washington DC: Federal Highway Administration, 1989) http://www.fhwa.dot.gov
- 33. U.S. Environmental Protection Agency, "Counties Designated 'Nonattainment'" (Washington DC: U.S. Environmental Protection Agency, 2008a). Map. http://www.epa.gov/air/oaqps/greenbk/mapnpoll.html
- 34. U.S. Environmental Protection Agency, "Sole Source Aquifers in the Southeast" (Atlanta GA: U.S. Environmental Protection Agency, 2008b). USEPA Region IV Sole Source Aquifer Program. http://www.epa.gov/safewater/sourcewater/pubs/reg4.pdf

- 35. U.S. Environmental Protection Agency, "Erosion, Sediment and Runoff Control for Roads and Highways" (Washington DC: U.S. Environmental Protection Agency, 1995). EPA-841-F-95-008d. http://water.epa.gov/polwaste/nps/index.cfm
- 36. U.S. Environmental Protection Agency, "Surf Your Watershed" (Washington DC: U.S. Environmental Protection Agency, 2008b). Internet website. http://cfpub.epa.gov/surf/locate/index.cfm
- 37. U.S. Government Printing Office, Code of Federal Regulations (Washington DC: U.S. Government Printing Office, 2008)
- 38. U.S. Environmental Protection Agency, "Environmental Justice In Your Community". Internet website. http://www.epa.gov/environmentaljustice/mapping.html
- 39. U.S. Water Resources Council, 1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies

Table D - List of Preparers

NRCS1/

Name	Current Position-years	Education	Experience-years
Billy R. Porter	Assistant State Conservationist, Water Resources – 15	B.S. Agricultural Economics	Economist – 14 Soil Conservationist-4
Gary W. Utley	Hydraulic Engineer-30	B.S. Agricultural Engineering	Resource Engineer-2
Steven P. Elsener	Biologist-36	B.S. Wildlife Ecology	Soil Conservationist-3
Richard L. Lane	Planning Engineer-23	B.S. Agricultural Engineering	Project Engineer-2 Area Engineer-7
K.C. Kraft	Archaeologist -13	B.A. Anthropology M.A. Anthropology PhD Anthropology	Archaeologist-23
April Burns	Water Resources Planning Coordinator-10	B.S. Ag Economics	Ag Economist – 6

¹⁷The draft watershed plan and environmental impact statement was reviewed and concurred with by State staff specialists having responsibility for engineering, soils, agronomy, range conservation, biology, cultural resources, forestry, and geology. This review was followed by review of the document by the NWMC.

Other Individuals

Name	Current Position-years	Education	Experience-years
Neel-Schaffer, Inc.	<u> </u>		
Barry Brupbacher	Senior Project Manager-6	M.S. Urban Studies	Sr PM-6, Transport/Env Planner-30
David Ruhl	Senior Project Manager-6	B.S. Civil Engineering – B.S. Geology	Sr PM-5, Project Engineer-22
Robert Walker	Senior Vice President-6	B.S. Civil Engineering	Sr VP-6, VP-5, SrPM-5, PM-7
James Wilkinson	Planning 111–8	M.U.R.P	Plan 111-8, Sr Trans Plan-13, Trans Plan-12
Alane Young	Geologist 111-5	B.S. Geology, M.S. Geology	Project Geologist-26
Scott Holland	Project Manager	B.S. Civil Engineering	
William E. Knesal, Jr., P.E.	President-19	B.S. Civil Engineering	
Erin Netterville	Biologist	N/A	_
Steve Smith	Biologist	N/A	
Earth Search, Inc.			
Rhonda Smith	Senior Project Manager-16	M.A. Anthropology	Archaeologist-22
Jill-Karen Yakubik	Principal Investigator-26	PhD, Anthropology	Archeologist-32

Distribution List

Tunica-Biloxi Indians of Louisiana, Inc.

- U.S. Army Corps of Engineers Mobile District
- U.S. Department of Agriculture- Mississippi Farm Service Agency
- U.S. Department of Agriculture Forest Service
- U.S. Department of Agriculture Natural Resources Conservation Service
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service

National Marine Fisheries Service

Mississippi Department of Marine Resources

Mississippi Department of Environmental Quality

Mississippi Department of Archives and History

State of Mississippi – Office of Governor

Mississippi State Director of Rural Development

Mississippi Department of Wildlife, Fisheries and Parks - Natural Heritage Program

Mississippi Forestry Commission

Mississippi Soil and Water Conservation Commission

Mississippi Department of Transportation

Southwest Mississippi Planning and Development District

Gulf Regional Planning Commission

Gulf Restoration Network

INDEX

Alternatives	
Costs	iv, 3, 14, 31, 35
Cultural Resources	
Economics	
Endangered Species	
Flood Plain	iv, 1, 6, 22
Impacts	12, 15, 16, 18, 19, 20
Land Use	
Land Ownership	
National Economic Development	16
Prime Farmland	
Project Benefits	
Project Costs	
Project Purpose	
Soil	4, 51
Sponsors	ii, iii, iv, v, vi, vii, 1, 12
Water Quality	18
Wetlands	

Appendix A: Comments and Responses



May 14, 2015

Kyle Swanier, Conservation Biologist Mississippi Natural Heritage Program Mississippi Department of Wildlife, Fisheries, and Parks 2148 Riverside Drive, Jackson Mississippi 39202

Dear Mr. Swanier,

In response to your letter dated March 11, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

NRCS agrees with your recommendations concerning implementation of best management practices, wetland disturbance and erosion prevention. Monitoring during project implementation will be performed to assure compliance. If unforeseen impacts to designated wetlands occur, miligation will be provided.

Respectfully

Kurt Readus

State Conservationist



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 4 ATLANTA FEDERAL CENTER 61 FORSYTH STREET ATLANTA, GEORGIA 30303-8960

April 20, 2015

Kurt Readus State Conservationist USDA Natural Resources Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, Mississippi 39269

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (DSEIS) For the LONG BEACH WATERSHED CEQ Number: 20150049

Dear Mr. Readus:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Draft Supplemental Environmental Impact Statement (DSEIS) for the Long Beach Watershed in accordance with its responsibilities under Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act.

Background: The Long Beach Watershed DSEIS is a supplement to the original environmental impact statement (1989) that includes updated information for the channel modification of Canal 1. The DSEIS also includes a supplemental watershed agreement No. 2. According to NRCS, the project sponsors are updating the Environmental Impact Statement in order to identify the impacts of modifying the channel to reduce flooding to urban areas which include 121 residences and businesses along the canal. The proposed modifications include 3.8 miles of widening, side-sloping and grading of the earth-lined channel, and 0.2 miles of rock riprap lined channel. The Long Beach Watershed shares a common border with the Turkey Creek Watershed.

EPA Comments and Recommendations:

Floodplain:

 Comment: EPA is concerned that decreasing the size of the floodplain as defined by FEMA flood plains and flood insurance and FIS maps invites encroachment of development which will only exacerbate existing flooding issues.

> Internet Address (URL) « http://www.epa.gov Recycled/Recyclable » Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

<u>Recommendation</u>: Preserving undeveloped areas along the canal and allowing those areas to flood, similar to the approach that is being taken in Turkey Creek, provides a step toward a more long-term solution.

• Comment: The DSEIS proposes increasing the capacity of the canals which will decrease the floodplain by 150 ft, 450 ft, and 400 ft for the 100-year, 10-year, and 1-year flood events respectively. The flow velocity will also increase by 0.3 ft/s, 0.5 ft/s, and 0.6 ft/s for the 100-year, 10-year, and 1-year flood events respectively. According to the DSEIS, FEMA floodplain maps and the Flood insurance maps will be modified after the channel improvements are complete.

Recommendation: EPA believes that this action may result in more development around the canal in the future. Should this occur, then larger canals may be needed in the future. A more sustainable solution to address future watershed issues should be considered similar to what is being considered in Turkey Creek.

• Comment: The Long Beach Watershed shares a common boundary with the Turkey Creek Watershed According to information in the DSEIS, during time of peak flows, the vast majority of any overflow from Turkey Creek will be transported downstream by Canal #2-3, and some of the Turkey Creek floodwater breaks over the watershed boundary along 28th Street and flows into the Long Beach Watershed. By letter dated 1/2/09, EPA requested that the DSEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. EPA particularly stated the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin. The DSEIS discusses the effects of the Turkey Creek overflow on Canal #1 and Canal #2-3, but it does not appear to specifically discuss the impacts of the project to the drainage conditions within the Turkey Creek basin.

Recommendation: EPA would like to reiterate its previous request for an analysis of the impacts of the proposed project to the drainage conditions within the Turkey Creek basin. EPA requests that the Final SEIS indicate how much overflow from Turkey Creek is entering the Long Beach Watershed, and whether the improvements of Canal #1 will in turn affect the drainage of Turkey Creek (e.g., increase the quantity of overflow from Turkey Creek).

• Comment: According to the DSEIS, the survey conducted identified 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area. The only permanent impact would be 0.01 acres of palustrine wetland that would be lost to the channel widening. The project will involve clearing a total of 61 acres which would be considered temporary since they will be replanting the 61 acres and an additional 58 acres after the project is completed. Revegetation may be affected due to anaerobic soil conditions and any newly planted trees may take a while to grow back.

Recommendation: EPA notes that although there are only 0.01 acres of permanent impacts, there are substantial impacts to the riparian area which may include clearing of wetlands. Clearing should be minimized as much as possible both for surface roughness and bank stabilization. Also, efforts to mitigate/address some of the temporal loss should be considered.

• Turkey Creek Overflow: According to the DSEIS, Canal No. 1 and Canal No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate. The Canal No. 1 stream reach is largely located within the U.S. Naval Reservation at Gulfport. During time of peak flows, some of the Turkey Creek floodwater crosses over the watershed boundary along 28th Street and flows into the Long Beach Watershed. The effect of Turkey Creek overflow on Canal #1 is a concern to the Long Beach residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. To reduce flooding to residents and businesses along Canal #1, the NRCS is proposing to modify the channel to carry a larger capacity of runoff.

Comment: EPA notes that the improvements to Canal 2 in Turkey Creek have been implemented. However, it is unclear what impact these improvements have had on potential overflows to Long Beach Residents. The Final SEIS should include this information.

Impacts of Overflows

• The DSEIS States that the channel modifications is designed to reduce flooding to 121 residences and business along the canal by modifying the channel to carry a larger capacity of runoff. The DSEIS indicates that the channel improvements would result in a decrease in storm elevations by 0.9 ft, 1.0 ft, and 1.3 ft for the 100-year, 10-year, and 1-year flood events respectively. However, downstream from the channel improvements, storm elevations will increase by 0.35 ft for the 25-yr to 100-yr storm and 0.57 ft for the 1-yr to 10-yr storm. Velocity would also increase by 0.19 ft/s for the 1-yr to 10-yr storm. As a result, two residential homes will experience increased flooding. Currently the homes are not inundated by the 100-yr storm but after the channel improvements are completed, these homes will be inundated by 0.13 ft to 0.61 ft of water. The homes currently flood during the 500-yr event but after the project is completed, flooding would increase by 0.19 ft.

<u>Recommendation</u>: The DSEIS notes the potential residential impacts, but does not discuss efforts to compensate or offset impacts to these residents.

According to the DSEIS, improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

Comment: The Final SEIS should provide information or data that supports the reduction in flooding to structures and the lack of adverse impacts to the environment. This information would be helpful because local residents and others remain concerned about potential flooding in their communities and it may further support the benefits of the proposed modification.

 Compensatory Mitigation Comment: Compensation for impacts to fish and wildlife habitat include planting an additional 58 acres of trees on suitable cleared land within the watershed. However, there is no description of what is considered suitability.

Recommendation: It is recommended that the Final SEIS describe or explain what is considered "suitable cleared land" as it relates to the compensatory mitigation activity (for example, is it based on certain zoning requirements/restrictions, proximity to Canal #1, etc.). It is also recommended that the Final SEIS indicate the estimated amount of "suitable cleared land" currently available in the watershed.

Other Comments or Clarifications:

Comment: In order to minimize the effects of increased turbidity levels, sediment decreasing construction techniques will be implemented, including: (a) sediment traps at the lower end of the channel; (b) channel side slopes constructed at 3:1; and (c) vegetation of spoil, berm, and channel slopes. However, the DSEIS contains discrepancies regarding the distance that spoil berm and channel slopes will be vegetated. Some pages of the DSEIS (e.g., Pages 21 and 31) state that spoil berm and channel slopes will be vegetated every 1,000 feet of construction, but other pages (e.g., Pages 3, 23, and 33) state that spoil berm and channel slopes will be vegetated every 500 feet of construction.

Recommendation: This Final EIS should correct this discrepancy.

 Comment: Page 31 of the DSEIS explains that the centerline of some sections of the channel will be realigned in order to avoid impacts to some delineated wetlands.
 However, this avoidance measure is not included in the "Mitigation" section on Page 33.

Recommendation: Since mitigation features included in the recommended plan incorporate avoidance and minimization of adverse impacts, as well as compensation for unavoidable losses of fish and wildlife habitat, it would be appropriate to also have the avoidance measure identified under the "Mitigation" section, Page 33. For the convenience of the reader, it is recommended that the realignment of the centerline of sections of the channel be identified in the "Mitigation" section (Page 33) as an avoidance measure.

Comments: Some of the Survey data or correspondence appear to be 5-7 years old.
 (i.e., Cultural Resource Surveys, Fish and Wildlife Survey). Is the information still up-to-date and do the agencies still support the previous findings?

Thank you for the opportunity to review this DSEIS. We rate this document EC-1 Environmental Concerns; We have concerns that the proposed action identifies the potential for impacts to the environment that should be further avoided/minimized and addressed in the Final SEIS. We also strongly agree with the need for a robust monitoring and evaluation program to determine the potential for any adverse impacts from the project.

Please contact Ken Clark of my staff at (404) 562-8282 if you have any questions or want to discuss our comments further.

Sincerely,

Heinz J. Mueller, Chief NEPA Program Office



May 14, 2015

Heinz J. Mueller, Chief NEPA Program Office U.S. Environmental Protection Agency, Region 4 Atlanta Federal Center 61 Forsyth Street Atlanta, Georgia 30303-8960

Dear Mr. Mueller

In response to your letter dated April 20, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

NRCS has provided responses to your comments and recommendations below:

Floodplain:

Comment 1: EPA is concerned that decreasing the size of the floodplain as defined by FEMA flood plains and flood insurance and FIS maps invites encroachment of development which will only exacerbate existing flooding issues.

Recommendation: Preserving undeveloped areas along the canal and allowing those areas to flood, similar to the approach that is being taken in Turkey Creek, provides a step toward a more long-term solution.

Comment 2: The DSEIS proposes increasing the capacity of the canals, which will decrease the floodplain by 150 ft., 450 ft., and 400 ft. for the 100-year, 10-year, and 1-year flood events respectively. The flow velocity will also increase by 0.3 ft./s, 0.5 ft./s, and 0.6 ft./s for the 100-year, 10-year, and 1-year flood events respectively. According to the DSEIS, FEMA floodplain maps and the flood insurance maps will be modified after the channel improvements are complete.

Recommendation: EPA believes that this action may result in more development around the canal in the future. Should this occur, then larger canals may be needed in the future. A more sustainable solution to address future watershed issues should be considered similar to what is being considered in Turkey Creek.

NRCS Response Comment 1 & 2: NRCS agrees that the enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the

Natural Resources Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, MS 39269 Voice (601) 965-5205 An Equal Opportunity Provider and Employer



future with project condition analysis. However, the NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize flooding. The following paragraph was added to the SEIS on Page 20 recommending that this be considered.

The potential enlargement of Canal-1 will reduce the existing floodplain and could result in more development around the canal in the future. This expectation of increased runoff was considered and included in the future with project condition analysis. It has been suggested that this reduced floodplain be preserved as an undeveloped area in order to reduce potential runoff. The NRCS certainly has no objection to leaving the reduced floodplain area undeveloped to help minimize future flooding. In this case, the existing floodplain maps could be used as is. In any case, the existing floodplain regulations should be strictly enforced to minimize encroachment and reduce the runoff potential.

Comment 3: The Long Beach Watershed shares a common boundary with the Turkey Creek Watershed According to information in the DSEIS, during time of peak flows, the vast majority of any overflow from Turkey Creek will be transported downstream by Canal #2-3, and some of the Turkey Creek floodwater breaks over the watershed boundary along 28th Street and flows into the Long Beach Watershed. By letter dated 1/2/09, EPA requested that the DSEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. EPA particularly stated the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin. The DSEIS discusses the effects of the Turkey Creek overflow on Canal #1 and Canal #2-3, but it does not appear to specifically discuss the impacts of the project to the drainage conditions within the Turkey Creek basin.

Recommendation: EPA would like to reiterate its previous request for an analysis of the impacts of the proposed project to the drainage conditions within the Turkey Creek basin. EPA requests that the Final SEIS indicate how much overflow from Turkey Creek is entering the Long Beach Watershed, and whether the improvements of Canal #1 will in turn affect the drainage of Turkey Creek (e.g., increase the quantity of overflow from Turkey Creek).

NRCS Response Comment 3: The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm. The following paragraph was added to the SEIS on Page14 to address this comment.

Additional questions have been raised on how the planned improvement to Canal-1 will affect the quantity and timing of overflow from Turkey Creek as well as the remaining flow down Turkey Creek. The improved channel is located far enough downstream that there is no change in the backwater effect from Canal-1 at the area that the Turkey Creek overflow occurs near 28th Street. This means that there is no change in overflow from Turkey Creek to the Long Beach Watershed expected for any given storm. The implementation of Canal-1 will not affect the quantity or timing of overflow from Turkey Creek for any given storm. Also, the

Natural Resources Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, MS 39269 Voice (601) 965-5205 An Equal Opportunity Provider and Employer



implementation of Canal-1 will not affect the quantity or timing of flow down the Turkey Creek Watershed for any given storm.

Comment 4: According to the DSEIS, the survey conducted identified 2.72 acres of palustrine wetlands, 2.89 acres of lacustrine wetlands, and 5.26 miles of jurisdictional waters within the project area. The only permanent impact would be 0.01 acres of palustrine wetland that would be lost to the channel widening. The project will involve clearing a total of 61 acres which would be considered temporary since they will be replanting the 61 acres and an additional 58 acres after the project is completed. Re-vegetation may be affected due to anaerobic soil conditions and any newly planted trees may take a while to grow back.

Recommendation: EPA notes that although there are only 0.01 acres of permanent impacts, there are substantial impacts to the riparian area which may include clearing wetlands. Clearing should be minimized as much as possible both for surface roughness and bank stabilization. Also, efforts to mitigate/address some of the temporal loss should be considered.

NRCS Response Comment 4: NRCS agrees with the recommendation to minimize clearing of the riparian area and all efforts will be made to minimize temporal losses.

Turkey Creek Overflow: According to the DSEIS, Canal No. 1 and Canal. No. 2-3 are hydraulically connected and share a common 100-year floodplain within this reach. Downstream of this common floodplain the two canals separate. The Canal No. 1 stream reach is largely located within the U. S. Navel Reservation at Gulfport. During time of peak flows, some of the Turkey Creek floodwater crosses over the watershed boundary along 28th Street and flows into the Long Beach Watershed. The effect of Turkey Creek overflow on Canal No. 1 is a concern to the Long Beach residents downstream. The quantity and timing of any overflow from Turkey Creek down Canal No. 1 will affect both the existing function of the channel as well as the design of the modified channel. To reduce flooding to residents and businesses along Canal No. 1, the NRCS is proposing to modify the channel to carry a larger capacity of runoff.

Comment 5: EPA notes that the improvements to Canal 2 in Turkey Creek have been implemented. However, it is unclear what impact these improvements have had on potential overflows to Long Beach Residents. The Final SEIS should include this information.

NRCS Response Comment 5: Detailed analysis of the environmental impacts of the implemented Canal 2-3 in the Long Beach Watershed were not considered to be part of the current SEIS and were not conducted. Any detailed analysis of Canal 2-3 was limited to what directly effects Canal-1 such as the division of the Turkey Creek overflow. Observations of what worked well and/or what didn't work as expected have been ongoing since the implementation of Canal 2-3. These lessons learned during and since the implementation of Canal 2-3 will certainly be considered in the final design phase of Canal-1.

Impacts of Overflows

USDA - NRCS

The DSEIS States that the channel modification is designed to reduce flooding to 121 residences and business along the canal by modifying the channel to carry a larger capacity of runoff. The DSEIS indicates that the channel improvements would result in a decrease in storm elevations by 0.9 ft., 1.0 ft., and 1.3 ft. for the 100-year, 10-year, and 1-year flood events respectively. However, downstream from the channel improvements, storm elevations will increase by 0.35 ft. for the 25-year to 100-year storm and 0.57 ft. for the 1-year to 10-year storm. Velocity would also increase by 0.19 ft./s for the 1-year to 10-year storm. A result, two

Natural Resources Conservation Service 100 W Capitol Street, Suite 1321 Jackson, MS 39269 Volce (601) 965-5205 An Equal Opportunity Provider and Employer



residential homes will experience increased flooding. Currently the homes are not inundated by the 100-year storm but after the channel improvements are completed, these homes will be inundated by 0.13 ft. to 0.61 ft. of water. The homes currently flood during the 500-year event but after the project is completed, flooding would increase by 0.19 ft.

Recommendation: The DSEIS notes the potential residential impacts, but does not discuss efforts to compensate or offset impacts to the residents. According to the DSEIS, improvements to Canal 2-3 that were completed in 2012 have provided reduced flooding to structures with no known negative impacts to the surrounding environment.

Comment 6: The Final SEIS should provide information or data that supports the reduction in flooding to structures and the lack of adverse impacts to the environment. This information would be helpful because local residents and others remain concerned about potential flooding in their communities and it may further support the benefits of the proposed modifications.

NRCS Response Comment 6: Page 34 of the document indicates that flood proofing or other types of damage mitigation will be provided for the two properties with increased flooding. Detailed analysis of the environmental impacts of the implemented Canal 2-3 were not considered to be part of the current SEIS and were not conducted. Any detailed analysis of Canal 2-3 was limited to what directly effects Canal-1 such as the division of the Turkey Creek overflow. Observations of what worked well and/or what didn't work as expected have been ongoing since the implementation of Canal 2-3. These lessons learned during and since the implementation of Canal 2-3 will certainly be considered in the final design phase of Canal-1.

Comment 7 Compensatory Mitigation: Compensation for impacts to fish and wildlife habitat include planting an additional 58 acres of trees on suitable cleared land within the watershed. However, there is no description of what is considered suitability.

Recommendation: It is recommended that the Final SEIS describe or explain what is "suitable cleared land" as it relates to the compensatory mitigation activity (for example, is it based on certain zoning requirements/restrictions proximity to Canal No. 1 etc.) It is also recommended that the Final SEIS indicate the estimated amount of "suitable cleared land" currently available in the watershed.

NRCS Response Comment 7: NRCS agrees with the comment and "suitable cleared land" will be described in the final plan.

Other Comments or Clarifications Comment 8: In order to minimize the effects of increased turbidity levels, sediment decreasing construction techniques will be implemented, including: (a) sediment traps at the lower end of the channel; (b) channel side slopes constructed at 3:1; and (c) vegetation of spoil, berm, and channel slopes. However, the DSEIS contains discrepancies regarding the distance that spoil berm and channel slopes will be vegetated.

Recommendation: This Final EIS should correct this discrepancy.

NRCS Response Comment 8: NRCS agrees discrepancies will be corrected, all distances will be changed to every 500 ft.

Natural Resources Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, MS 39269 Voice (601) 965-5205 An Equal Opportunity Provider and Employer



Comment 9: Page 31 of the DSEIS explains that the centerline of some sections of the channel will be realigned in order to avoid impacts to some delineated wetlands. However, this avoidance measure is not included in the "Mitigation" section on Page 33.

NRCS Response Comment 9: NRCS agrees, changes to text will be made to add avoidance measures to Mitigation section on page 33.

Comment 10: Some of the Survey data or correspondence appear to be 5-7 years old. (i.e., Cultural Recourses Surveys, Fish and Wildlife Survey). Is the information still up-to-date and do the agencies still support the precious findings?

NRCS Response Comment 10: Yes, information is still up-to-date. Commenting agencies still support previous findings.

Respectfully,

Kurt Readus

State Conservationist

Natural Resources Conservation Service 100 W Capitol Street, Suite 1321 Jackson, MS 39269 Voice (601) 965-5205 An Equal Opportunity Provider and Employer



United States Department of Agriculture

May 14, 2015

Willa J. Brantley Bureau Director, Wellands Permitting Mississippi Department of Marine Resources 1141 Bayview Avenue Biloxi, MS 39530

Dear Ms. Brantley,

In response to your letter dated March 27, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS.

The Joint Application Form and Notification form will be completed after final design prior to any construction. The wetland delineation report has been reviewed and is considered current by our Area Biologist for that area.

Respectfully.

Kurt Readus

State Conservationist



MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

March 27, 2015

United States Department of Agriculture Natural Resources Conservation Service Attn: Kurt Readus 100 W. Capitol Street, Suite 1321 Jackson, MS 39269

RE: DMR-090274; SAM-2009-01918-JBM; USDA; Supplemental EIS, City of Long Beach Watershed Improvements

Dear Mr. Readus:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request to review the draft Supplemental Environmental Impact Statement (EIS) for the Long Beach Watershed, Mississippi. Please note the comments made in response to the previous review on December 18, 2008 (enclosed). In addition, it is recommended that an updated wetland delineation be submitted with the Joint Application and Notification form. Thank you for the opportunity to comment on your project.

For more information, questions concerning this correspondence, or to obtain an application packet, contact Greg Christodoulou with the Bureau of Wetlands Permitting at (228) 523-4109 or greg.christodoulou@dmr.ms.gov.

1 7,11

Sincerely

Willa J. Brantley / Bureau Director, Wetlands, Permitting

WJB/qsc

Enclosure

Cc: MS Coastal Team, USACE Regulatory Division, Mobile District

114) Bayview Avenue • Biloxi, MS 39536 • (228) 374-5000



MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Sam Polles, Ph.D. Executive Director

March 11, 2015

U.S. Department of Agriculture 100 W. Capitol Street, Suite 1321 Jackson, MS 39269

Re:

Supplemental Environmental Impact Statement

R# 10750

Long Beach Watershed Harrison County, Mississippi

To Mr. Kurt Readus:

In response to your request for information dated February 9, 2015, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

The following species of concern may occur within 2 miles of the proposed project area:

The following species of con-				STATE
SCIENTIFIC NAME	COMMON NAME	FED	STATE	RANK
Charadrius alexandrinus	Southeastern Snowy Ployer		LE	S2
tenuirostris Charadrius melodus	Piping Plover	LE, LT	LE	S2N
Erythrodiplax umbrata	Band Winged Dragonlet			SI
Lilacopsis carolinensis	Carolina Lilaeopsis			S2S3
Macrodiplax balteata	Marl Pennant			S2
Sternula antillarum	Least Tern	PS:LE		S3B

State Rank

Mississippi Museum of Natural Science ● 2148 Riverside Drive ● Jackson, Mississippi 39202-1353 ● (601) 354-7303

St.— Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extinpation

^{\$2 —} Imperiled in Mississippi because of ranty (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extigation

S3 Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences)

State and Federal Status

LE Endangered — A species which is in danger of extinction throughout all or a significant portion of its range LT Threatened — A species likely to become endangered in foreseeable future throughout all or a significant portion of its range.

Based on information provided, we conclude that if best management practices are properly implemented, monitored, and maintained (particularly measures to prevent, or at least, minimize negative impacts to water quality), the proposed project likely poses no threat to listed species or their habitats.

Recommendations:

We recommend that best management practices be properly implemented, monitored, and maintained for compliance, specifically measures that will prevent suspended silt and contaminants from leaving the site in stormwater run-off as this may negatively affect water quality and habitat conditions within nearby streams and waterbodies.

In addition, portions of this project site are underlain by hydric soils and may be designated wetlands. If this project is approved, we ask that serious consideration be given to the cumulative impacts of wetland disturbance and elimination, and that appropriate in-kind mitigation be provided.

We recommend that areas up and downstream of the project area be monitored for increased erosion due to proposed channel alterations. Any additional erosion due to the proposed project should be addressed to prevent increased turbidity in receiving waters.

Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Sincerely,

Kyle Swanier, Conservation Biologist Mississippi Natural Heritage Program

(601) 576-6047

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys, most natural areas in Mississiph have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site



United States Department of Agriculture

May 14, 2015

Piet deWilt, PhD 7325 Puncheon Landing Road Pocomoke, MD 21851

Dear Mr. deWitt,

In response to your letter dated March 7, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service is providing the following responses to your questions.

- Did NRCS prepare a Notice of Intent to prepare this statement and if it did, when was the Notice published in the Federal Register? Yes, a Notice of Intent was prepared in April 2014 and sent to the responsible federal agency for publication.
- In addition, what impact statement is the subject statement supplementing? The Long Beach Watershed Plan and Environmental Impact Statement, 1989.
- 3. Is the Town Creek Watershed project still active or has it been terminated? Yes, Town Creek is an existing watershed with an approved plan and EIS in MS. The sponsors were requesting NRCS begin the process to build Dam No. 5. The EIS was required to be updated. As we begin the process of updating the EIS, the watershed funding was stopped, therefore we stopped work on updating the EIS. I would not say the project is dead but waiting on further funding.

Respectfully.

Kurt Readus

State Conservationist

Natural Resources Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, MS 39269 Voice (601) 965-5205 An Equal Opportunity Provider and Employer

Culberson

7325 Puncheon Landing Road Pocomoke, Maryland 21851 March 7, 2015

Kurt Readus State Conservationist Natural Resources Conservation Service 100 West Capital Street Suite 1321 Federal Building Jackson, Mississippi 39269

Dear Mr. Readus.

On March 6, 2015, the U.S. Environmental Protection Agency (FPA) announced the availability of a draft supplemental environmental impact statement (EIS) on the "Long Beach Watershed." You were identified as the contact person for the document. I am writing to ask if the NRCS prepared a Notice of Intent to prepare this statement, and if it did, when the Notice was published in the <u>Federal Register</u>. In addition, what impact statement is the subject statement supplementing?

In addition, on July 25, 2003, the EPA announced the availability of a drall supplemental EIS on the "Town Creek Watershed." Is this project still active or has it been terminated?

Thank you for your time and consideration

Respectfully,

Piet deWitt, PhD

Piet delvitt-



United States Department of Agriculture

May 14, 2015

Joseph Paige Water Quality Certification Branch Mississippi Department of Environmental Quality Post Office Box 2261 Jackson, MS 39225

Dear Mr. Paige,

In response to your letter dated March 6, 2015, regarding the Draft Supplemental Environmental Impact Statement for the Long Beach Watershed, the Natural Resources Conservation Service would like to thank you for reviewing the draft SEIS. NRCS agrees with your comments regarding obtaining permits from the U.S. Army Corps of Engineers and the MDEQ.

The project sponsors will work with the appropriate agencies to obtain the required permits before construction begins.

Respectfully,

Kurt Readus

State Conservationist

Bullocis ax.

STATE OF MISSISSIPPI PLE BALL T GRADENIN MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY GEOGRAPHIC ESTATION DESTRUCTOR

March 6, 2015

Mr. Kurt Readus Natural Resource Conservation Service 100 W. Capitol Street, Suite 1321 Jackson, Mississippi 19269

Dear Mr. Readus.

Re: I as ironmental Impact Statement Long Beach Watershed Harrison County

The Miss/ssippi Department of Environmental Quality, Environmental Permits Division has received your request for comments on the above referenced project by letter dated February 9, 2015. Based on the information provided,

- It appears that the project area may contain jurisdictional waters and could require a Clean Water Act Section 404 permit. The applicant should contact Mr. Munther Sahawneh (251-694-3782) of the U.S. Army Corps of Engineers- Mobile District for further information.
- Please be aware, if this project is disturbing more than 1 acre of land, it will require coverage
 under a construction general permit for control of stermwater/sediment runoff. Please contact
 the appropriate branch of MDEQ permitting for this coverage prior to commencement of
 construction at 601-961-5171.

Please feel free to contact me at (601) 961-5624, should there be any questions

Sincercly

Water Quality Certification Branch

cc: Mr. Munther Sahawneh, U.S. Army Corps of Engineers, Mohile District

OFFICE OF POLITION CONTROL

POST ONLY BOX 2261 • Lance of Mission 19225-2261 • Tel 4601 961 51. 1 • For 1601 951 6612 • www.d.q.state mains
An Eq. at Orace, entry Expression

LONG BEACH WATER MANAGEMENT DISTRICT

POST OFFICE BOX 748 LONG BEACH, MISSISSIPPI 39560

November 24, 2008

Mr. David Felder U. S. Fish and Wildlife Service 6578 Dogwood View Parkway, Suite A Jackson MS 39213

Subject:

Solicitation of Views

Supplemental Environmental Impact Statement for Long Beach Watershed

Canal No. 1 Channel Modifications Harrison County, Mississippi

Dear Mr. Felder:

The Natural Resources Conservation Service and Long Beach Water Management District conducted a Scoping Meeting for the subject project on August 14, 2007. The scoping meeting contributed to the development of a scope relating to the preparation of Supplemental Environmental Impact Statement (EIS) to update the "Environmental Impact Statement for Long Beach Watershed, Harrison County, Mississippi" dated October 1989.

In association with the Long Beach Water Management District, the Natural Resources Conservation Service is proceeding with the preparation of the Supplemental EIS for Canal No. 1. The purpose of this letter is to solicit views from agencies and elected and appointed officials; which by law, interest, or expertise can assist the project planners with the timely identification of economic, social, and environmental opportunities and constraints within the study area.

A map showing the limits of the project is attached. The following information can be downloaded from the ftp site referenced below:

- The minutes of the August 14, 2007 scoping meeting;
- a PDF file of the initial EIS:
- comments received in association with the September 2001 scoping meeting;
- · aerial imagery of the study area; and
- associated project maps.

Because some of the files are large, it is suggested that you copy the files to a local drive before you try to open them.

ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1_SEIS/

Written comments regarding the project should be directed to:

Alane C. Young, RPG Necl-Schaffer, Inc. 833 Highway 90, Suite 13 Bay Saint Louis, MS 39520 Phone (228) 466-5155 Fax (228) 466-5156

Email - alane.young@neel-schaffer.com

The District requests that all comments be provided by November 30, 2008

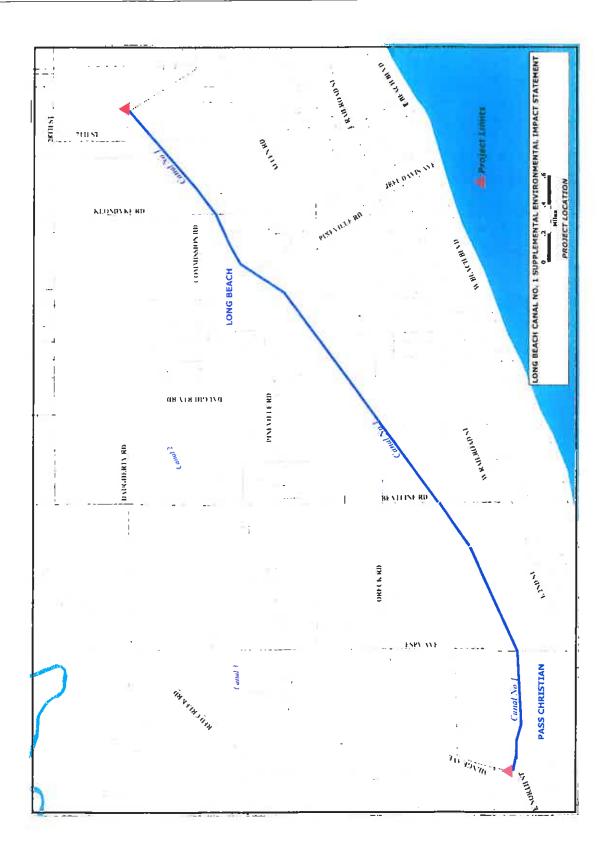
If you have any questions or need additional information, please contact Alane directly.

Sincerely,

Brett Mallette

Brett Mallette Chairman

Enclosures





DEPARTMENT OF THE ARMY MOBILE DISTRICT, CORPS OF ENGINEERS P.O. BOX 2288 MOBILE, AL 36628-0001

December 2, 2008

Mr. Brett Mallett, Chairman Long Beach Water Management District Post Office Box 748 Long Beach, Mississippi 39560

Dear Mr. Mallett:

We are in receipt of your request in preparation of a Supplemental Environmental Impact Statement from the Department of the Army (DA) to perform dredging and fill. Specifically, the project is in Canal Number 1, Long Beach, Harrison County, Mississippi.

The request has been assigned the file number SAM-2008-01918-JBM, which should be referred to in all future correspondence with this office. The request is also identified as Canal Number 1 Channel Modifications.

I have been assigned as Project Manager for this action and can be reached by telephone at (251) 690-3222, by e-mail at john.b.mcfadyen@usace.army.mil or by mail to: U.S. Army Corps of Engineers, Mobile District, Attention: CESAM-RD-C, McFadyen, Post Office Box 2288, Mobile, Alabama, 36628-0001. After I have thoroughly reviewed your application package, I will let you know if additional information is needed before we can complete our evaluation.

Please take a moment to visit our website where you can track the status of your application and complete our customer satisfaction survey. Our website is: www.sam.usacc.army.mil/rd/reg/.

Sincerely,

John McFadyen

Project Manager Regulatory Division

Copy Furnished:

Neel-Schaffer, Inc. Attention: Ms. Alane C. Young 833 Highway 90, Suite 13 Bay St. Louis, Mississippi 39520

Mississippi Department of Marine Resources 1141 Bayview Avenue, Suite 101 Biloxi, Mississippi 39530



DEPARTMENT OF THE ARMY

VICKSBURG DISTRICT, CORPS OF ENGINEERS 4155 CLAY STREET VICKSBURG, MISSISSIPPI 39183-3435

December 2, 2008

Operations Division

REPLY TO ATTENTION OF:

SUBJECT: Long Beach Water Management District, Canal No. 1 Channel Modifications, Harrison County, Mississippi

Ms. Alane C. Young Neel-Schaffer, Incorporated 833 Highway 90, Suite 13 Bay Saint Louis, Mississippi 39520

Dear Ms. Young:

Your recent correspondence, subject as above, has been forwarded for action to the Mobile District, Corps of Engineers, since the proposed projects fall within the geographic boundaries of their District.

Their contact information is:

U.S. Army Engineer District, Mobile Attention: Regulatory Branch Post Office Box 2288 Mobile, Alabama 36628

Telephone: (251) 690-2658

Sincerely,

Michael F. McNair, R.F. Chief, Regulatory Branch

-NIVE Melan



MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Saut Pilles, Ph. D. Co. of the Dates of

December 4, 2008

Alane C. Young, RPG Neel-Schaffer, Inc. 833 Highway 90 Suite 13 Bay Saint Louis, MS 39520

Re: Canal No. 1 Channel Modifications Solicitation of Views Long Beach, Harrison County, Mississippi

R# 6961

To Alane Young,

In response to your request for information dated November 24, 2008, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

Since 1989, the Mississippi coast has suffered a great deal of habitat loss since the agency last commented on this project. The comments included below are a result of these losses and a better understanding of how channel modifications can affect sensitive habitats such as marshes and tidal streams.

According to the information provided, there are documented occurrences of the following species in St. Louis Bay, Bayou Portage, and their surrounding tributaries and marshes: Manatee, Manatus trichechus (LE, MS; LE, Fed); Saltmarsh Topminnow, Funchulus jenkinsi (LE, MS); Mississippi Diamondback Terrapin. Malaclemys terrapin pileata (S2); Gulf Salt Marsh Snake. Nerodia clarkii clarkii (S2); and Least Killifish, Heterandria formosa (S3).

Reference information:

LE - Findangered - A species which is in danger of extraction throughout all or a significant portion of its range. \$2 - A species that is imperited in MS because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

\$3 - Rare or common in Mississippi (on the order of 2), to 100 occurrences).

Mississippi Museum of Natural Science • 2148 Riverside Drive • Jackson, Mississippi 39202-1353 • [601] 354-7363

The widening and desnagging of channels will increase stormwater runoff conveyance and stream flow velocities, and potentially increase transport of contaminants. Precautions are planned to prevent erosion and sedimentation within the project area and areas upstream of the natural stream segments. However, increased stream velocity may increase erosion and sedimentation of the downstream natural channel areas resulting in negative impacts to crucial marsh habitat and to water quality. In addition, the project could result in wetland disturbance and elimination caused by increased development in areas where the risk of flooding is decreased.

Should the proposed project be permitted, we suggest the following be considered as partial mitigation:

Place into perpetual easements, parcels of wetlands or land that could be restored to wetlands along either side of the canals to contain increased stormwater capacities. This would benefit the marshes and bays that the canals feed and prevent further habitat degradation in these areas. This would help compensate for potential increased floodwater capacity, slow water velocity, prevent downstream erosion, and filter out contaminants and sediment before stormwater enters the canals. It would also prevent these areas from becoming developments within the floodplain and eliminate the need for continued canal modifications.

Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

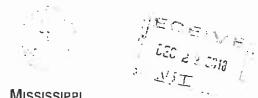
Sincerely,

Andy Sanderson, Ecologist

Mississippi Natural Heritage Program

(601) 354-6367, ext. 117

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's mre, threatened, and endargered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific fe'd surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.



MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

December 18, 2008

Mr. Brett Mallett. Chairman Long Beach Water Management District P.O. Box 748 Long Beach. MS 39560

RE: DMR-090274

Dear Mr. Mallett:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request for assistance in the preparation of a Supplemental Environmental Impact Satement (EIS) to review proposed channel modifications to Canal 1 located in Long Beach, Harrison County, Mississippi. While it appears that tidal systems will not be directly impacted by the proposed action, indirect impacts to tidal and tidally influenced waters and wellands located further downstream are possible. Additionally, the final Supplemental EIS should contain anticipated impacts to tidal and non-tidal areas downstream from the proposed action area. A Joint Application form (enclosed) should be submitted to this office for review and determination of Coastal Zone Consistency (CZC) for the proposed project. Thank you for the opportunity to comment on your request.

For more information or questions concerning this correspondence, contact Greg Christodoulou with the Bureau of Wetlands Permitting at (228) 523-4109.

Sincerely.

Greg Christodoulou

Coastal Resource Management Specialist

Enclosure

cc: Alane C. Young, Neel-Schaffer, Inc. s

1141 Baytrew Avenue: State 101 • Brown MS 39530 • (228) 371-5000

From: McFadyen, John B SAM [John.B.McFadyen@usace.army.mil]

Sent: Monday, December 22, 2008 7:10 AM To: Alane.young@neel-schaffer.com

Cc: Steele, Jason W SAM; Sahawneh, Munther N SAM; Litteken, Craig J SAM; Smith, Thomas E

SAM; Brown, Linda T SAM; Jacobson, Jennifer L SAM

Subject: Long Beach Canal 1 Supplemental EIS (SEIS)

Alane;

This responds to the Long Beach Water Management District's (LBWMD) letter of November 24, 2008, regarding the subject project.

The Corps would like to be a co-operating agency with the NRCS in the preparation of the SEIS. If a Section 404 or Section 10 permit is required we would use the SEIS as our NEPA document to support a permit decision. Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for certain structures or work in or affecting navigable waters of the U.S., prior to conducting the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344). For regulatory purposes, the Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified as navigable by the Mobile District.

Please be advised that land clearing operations involving vegetation removal with mechanized equipment such as front-end loaders, backhoes, or buildozers with sheer blades, rakes, or discs; windrowing vegetation; land leveling; or other soil disturbance in areas subject to Corps jurisdiction may be considered placement of dredged material under our jurisdiction. In order to determine the level of Corps jurisdiction a wetland delineation of the project area (including dredged material disposal sites) should be conducted in accordance with Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual. Results of the delineation will be reviewed/approved by the Corps in order to determine the limits of Corps jurisdiction under Section 404. Any work in waters of Canal 1 subject to the ebb and flow of the tide will required authorization under Section 10, therefore, upstream limits of tidal waters in Canal 1 should be identified.

The SEIS should include a statement of the project purpose and need as well as a addressing compliance with 40 CFR part 230 (Section 404(b)(1) guidelines), 33 CFR part 320.4, General policies for evaluating permit applications and 33 CFR part 332, Compensatory mitigation for losses of aquatic resources. The SEIS should also address the secondary (indirect) impacts of the channel improvements as well as cumulative impacts as required by the NEPA. The proposed Canal 1 project appears to be compatible with the Corps (MsCIP) project on Canals 2&3, which is scheduled to begin in the first quarter of 2009.

We look forward to working with the LBWMD, NRCS and Neel-Shaffer, Inc. on the SEIS.

John B. McFadyen, P.G.
Project Manager
U.S. Army Corps of Engineers, Mobile District
Regulatory Division, Coastal Branch (SAM-RD-C)
(251) 690-3222 Voice (251) 690-2660 Fax
NOTE: new e-mail address john.b.mcfadyen@usace.army.mil



Jena Band of Choctaw Indians

P.O. Box 14 • Jena, Louisiana 71342-0014 • Phone: 318-992-2717 • Fax: 318-992-8244

December 23, 2008

Alane C. Young, RPG Neel-Schaffer, Inc. 833 Highway 90, Suite 13 Bay Saint Louis, MS 39520

RE: SOLICITATION OF VIEWS

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR

LONG BEACH WATERSHED

CANAL NO. 1 CHANNEL MODIFICATION

HARRISON COUNTY, MISSISSIPPI

To Whom It May Concern:

Reference is made to your letter, dated November 24, 2008, concerning the above-proposed project.

After thorough review of the documents submitted, it has been determined that there will be no significant impact in regards to the Jena Band of Choctaw Indians.

Should you have any questions, please feel free to call me.

McConnick

Sincerely,

Lillie McCormick
Environmental Director

Jena Band of Choctaw Indians

I see the second of the second

Ph: 318-992-8258

Fax: 318-992-8244



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-6960

January 5, 2009

W 5 3606

Alane C. Young, RPG Neel-Schaffer, Inc. 833 Highway 90, Suite 13 Bay Saint Louis, MS 39520

SUBJ: EPA's Scoping Comments for the Supplemental Environmental Impact Statement (SEIS)
Long Beach Watershed, Canal No. 1 Channel Modifications, Harrison County, MS

Dear Mr. Young:

Consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) Region 4 appreciates the opportunity to provide scoping comments on the proposed Supplemental Environmental Impact Statement (SEIS) for the proposed canal project. It is our understanding that the Long Beach Water Management District will be modifying Canal No. 1 from the crossing at Menge Avenue in Pass Christian, Mississippi, to the crossing at 7th Street in Long Beach. Mississippi. It is our understanding that the SEIS is intended to supplement and update the original Environmental Impact Statement (EIS) developed for the Long Beach Watershed in October 1989.

EPA recommends that the Supplemental Environmental Impact Statement (SEIS) include discussions on the proposed project's impacts to: existing hydraulies and hydrology (including discussions on changes in the FEMA designated floodplain and the "adopted regulatory floodway"), water quality, aquatic habitat and wildlife, terrestrial habitat and wildlife (including migratory birds), protected species, soils, geology, hazardous materials, underground storage tanks, the transportation network, recreational opportunities, air quality, noise, cultural resources, aesthetics, socioeconomics, and land use. EPA Region 4's Water Protection Division has specifically requested that the SEIS include an analysis of how the proposed project could (or will) serve as a diversion canal for any adjacent streams. In particular, the analysis should investigate impacts to the drainage conditions within the Turkey Creek basin, an EPA priority watershed. The SEIS should also address the indirect and cumulative effects of the proposed project.

EPA Region 4 recommends that the SEIS identify any waters impacted by the proposed project that are classified "High Quality Waters" or "Nutrient Sensitive Waters" or are included on the State of Mississippi's current 303(d) list of impaired waters. Any Total Maximum Daily Load (TMDL) studies that have been completed should also be fully identified.

memat Address (URL) + http://ac.micpa.gov Recycled/Recyclable - Printed Alla V. getuble Of Bashdicker | Recycla Pillar | Printed 2014 Poetsur (1700) Should you have questions, please feel free to coordinate with Region 4 staff member, Paul Gagliano, P.E., at 404/562-9373 or at gagliano.paul@epa.gov, or Region 4's Mississippi Watershed Coordinator, Mr. Kenneth Dean, at 404/562-9378 or at dean.williamkenneth@epa.gov.

Sincerely, 1

Heinz J. Mueller, Chief NEPA Program Office

Office of Policy and Management



enginoers plannors surveyors environmental scientists landscape prchitects

April 29, 2009

Mr. David Felder U. S. Fish and Wildlife Service 6578 Dogwood View Parkway, Suite A Jackson MS 39213

Re: Long Beach Water Management District Canal No. 1 Channel Modifications

Supplemental Environmental Impact Statement

Dear Mr. Felder:

The attached Solicitation of Views (SOV) letter was sent to you and to other representatives of the U. S. Fish and Wildlife Service last fall shortly after the above-referenced project was initiated by the Long Beach Water Management District and Natural Resources Conservation Service. To date there has been no response from anyone at your agency, and as we cannot complete the project without USFWS input, I am writing to request your assistance in securing the needed information. Specifically, we need to know if there are any federally designated threatened or endangered species in Harrison County, Mississippi which could conceivably be affected by this project.

It is possible that our original SOV letter should have been directed to someone other than yourself. If that is the case, please forward the attached copy to someone in your office who will be able to respond. Your assistance in this matter will be greatly appreciated. Please feel free to contact me at (228) 374-1211 or at james.wilkinson@neel-schaffer.com if you have any questions about the project.

Sincerely,

NEEL-SCHAFFER, INC.

James D. Wilkinson

Planner III

attachment

772 Howard Avenue, Biloxi, MS 39530-3820, 228.374.1211, Fax 228.374.1216



United States Department of the Interior

FISH AND WILDLIFE SERVICE Mississippi Field Office 6578 Dogwood View Parkway, Suite A Jackson, Mississippi 39213

May 4, 2009

Mr. James Wilkinson Neel-Schaffer 772 Howard Avenue Biloxi, Mississippi 39530

Dear Mr. Wilkinson:

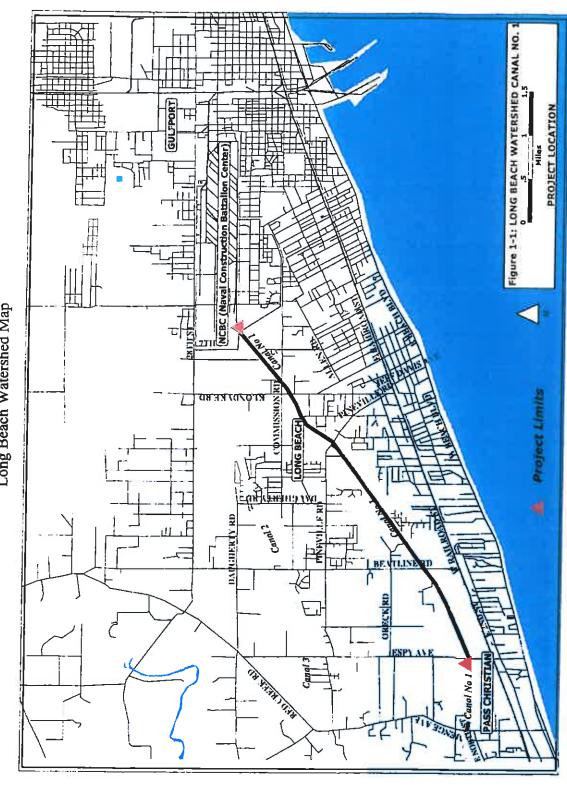
The U.S. Fish and Wildlife Service (Service) has received your letter dated April 29, 2009, regarding the Long Beach Water Management District's Canal No. 1 Channel Modifications Project in Harrison County, Mississippi. Our comments are submitted in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

There are no known federally listed threatened or endangered species, or their habitats, within the project area. Therefore, the Service anticipates no impacts to any listed species to occur as a result of the proposed project.

If you have any questions, please contact our office, telephone: (601) 321-1131.

David Felder Fish and Wildlife Biologist Appendix B: Project Map

Figure No. 1 Long Beach Watershed Map



Appendix C: Support Maps

Figure No. 2
Environmental Justice Minority Groups
Canal 1



Figure No. 3
Environmental Justice % Below Poverty Level
Canal 1



Figure No. 4
Conceptual Alignment

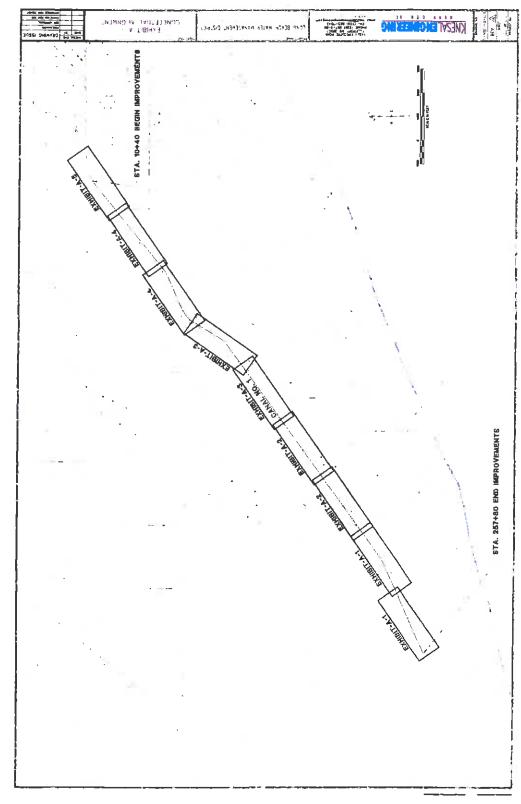


Figure No. 5 Conceptual Alignment Inset 1

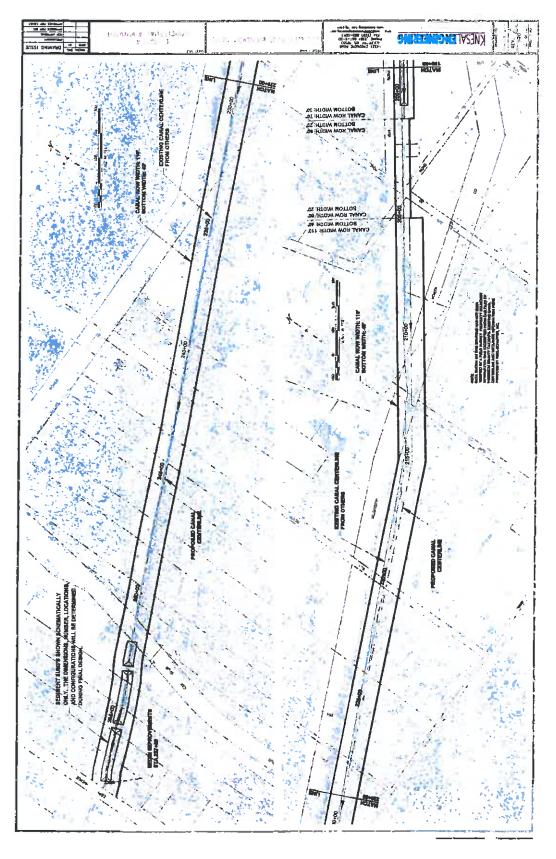


Figure No. 6 Conceptual Alignment Inset 2

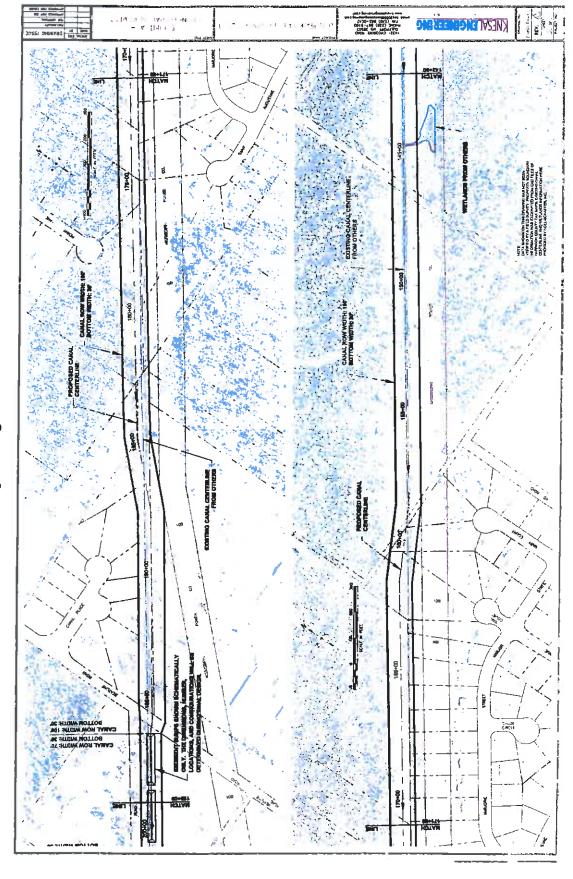


Figure No. 7Conceptual Alignment Inset 3

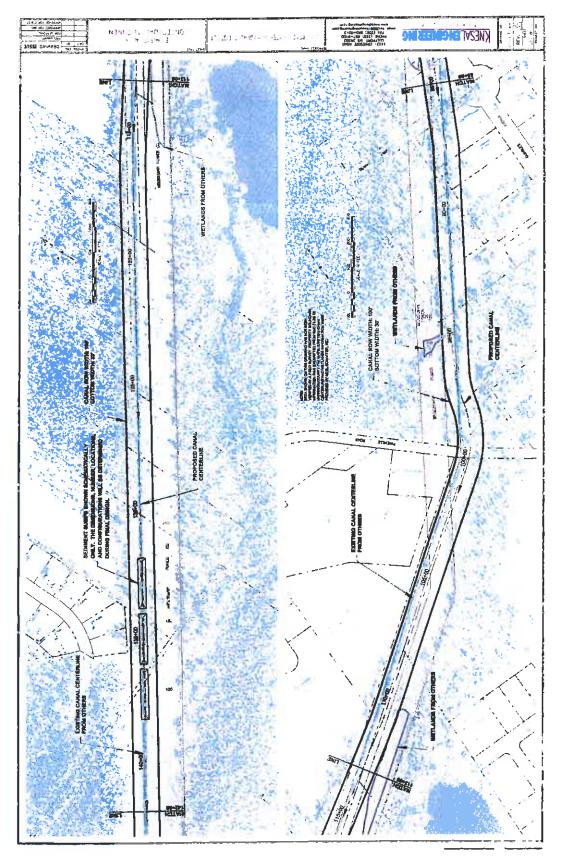


Figure No. 8
Conceptual Alignment Inset 4

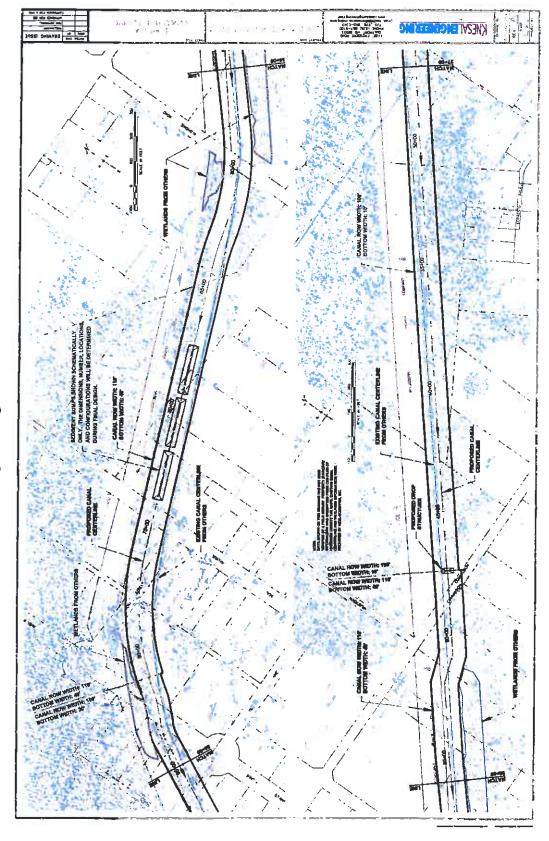
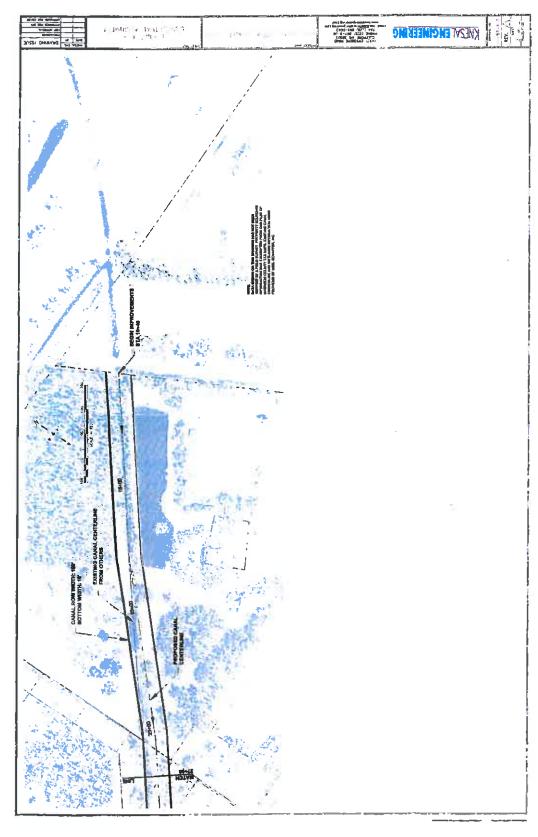


Figure No. 9
Conceptual Alignment Inset 5



Appendix D: Investigation and Analysis Report

Investigation and Analysis Report

Biology

The survey undertaken in October of 2008 covered a corridor 125 feet wide on either side of the canal. Location data for use in mapping jurisdictional wetlands and waters of the U.S. were collected with a Trimble GeoXH global positioning system (GPS) unit. The data collected were then entered into a geographic information systems (GIS) program for analysis. Project area photographs, a list of plant species observed and data sheets for delineated wetlands may be found in appendices to the Final Wetlands Technical Report. A follow-up visit to the project area was conducted jointly by ERG biologists with the USACE project manager on March 23, 2009. At that time the Corps representative recommended certain modifications to the initial delineation. The ERG biologists returned to the project area on April 22, 2009 to evaluate the USACE recommendations. The changes were subsequently made and incorporated in the final report.

The identification of hydrophytic vegetation was based on the "National List of Plant Species" that Occur in Wetlands" (Reed 1988). Observed plant species were classified as obligate wetland, facultative wetland, facultative upland or upland. Hydrophytic vegetation is prevalent in an area when the dominant species in a plant community are typically adapted for life in saturated soil conditions (Environmental Laboratory 1987).

A determination regarding the presence of wetland hydrology was made on the basis of on-site visual observation of geomorphic and hydrological characteristics, including inundation, saturation, watermarks, drift lines, drainage patterns, oxidized root channels, and water-stained leaves. Soil pits were also excavated to reveal saturated soil present in areas not inundated at the time of the survey.

Finally, soil profiles were examined to seek out hydric soil indicators. Additional information was obtained from the Soil Survey of Harrison County, Mississippi (U.S. Department of Agriculture 1975). And a list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office.

Engineering

Project formulation

Alternatives considered were a) No-Action (Future without project), b) Channel Improvement, and c) non-structural measures (flood proofing and relocation). Costs for Channel Improvement and Non-structural measures were updated from 1989 data.

Engineering Design

Engineering design data from the 1989 EIS was used for analysis in this update. Unit costs were estimated and the quantities from the original designs were used to develop cost estimates. These costs were compared to the figures developed in the 2012 study, and the costs indexed from the 1989 study, and found to be reasonably comparable. Costs were updated using ENR construction cost index and current construction costs. The 2012 study was the update done by Neel-Schaffer for the Long Beach Water Management District.

Economics

A database of houses used by the U.S. Army Corps of Engineers for the Section 205 Turkey Creek Flood Damage Reduction Study was used as a base to gather information on houses in the floodplain. The houses were then ground checked to determine which houses had been demolished, rebuilt to new elevations and also for new construction. The Harrison County Assessor website was used to update house values for completing the economic analysis. Damage Factors from the Corps of Engineers (U.S. Army Corps of Engineers, 2000) were used to calculate depth damages to structure and content damages for the following storms: 500-year, 100-year, 50-year, 25-year, 10-year, 5-year, 2-year and 1-year. The depth damage factors used are a generic factor; the damages from actual floods could be more or less than the figures calculated. A build out analysis for new construction in the area due to the implementation of this project was not completed. Many of the houses that were destroyed during Hurricane Katrina have not been rebuilt; any new construction along the canal is regulated by the local floodplain board. The decrease in depth and velocities of the flood waters due to this project being implemented will not result in a decrease of the floodplain area relevant enough to warrant an increase in housing construction.

The indirect benefits were calculated as 10% of agricultural related benefits, 15% for urban benefits and 25% of road and bridge benefits as shown in the Economics Guide, page 32, dated 1964. This is the latest data found with the indirect benefit calculations.

Hydrology

The original planning for the Long Beach Watershed Plan was completed in 1989. Engineering field surveys were completed for the selected bridge and valley sections required. Hydrologic data including reach lengths and N-Values were developed as needed. TR-61 or the WSP2 computer program was utilized to compute the water surface profiles needed for hydraulics. Hydrologic parameters including reach lengths, drainage area and Time of Concentration (Tc) were developed as needed. Runoff curve numbers were developed for both present and with project conditions. TP-40 was utilized to obtain the 24 Hour duration rainfall for the selected storm frequencies if applicable. The eight storms analyzed for each alternative included the 1-Yr, 2-Yr, 5-Yr, 10-Yr, 25-Yr, 50-Yr, 100-Yr, and 500-Yr frequency 24-Hour duration rainfall events. Alternatives evaluated included the present condition (Existing Channel) and the future condition (Designed Channel) runs. The TR20 computer program for project formulation was used to analyze the hydrology for the different alternatives. Detailed flood insurance studies from FEMA were utilized to calibrate the WSP2 and TR20 models for present conditions. Output from the WSP2 and TR20

models provided all the H&H data needed to evaluate economic damages and benefits for the alternatives.

The original hydraulic and hydrologic (H&H) models and channel design were to be used for all analysis needed to complete the updated EIS. However, the final H&H runs could not be located in the files. A decision was made to use the best data available to update the depths of inundation at each structure needed for economic analysis. A matching set of WSP2 and TR20 runs for each alternative (Present and Future Condition) dated October of 1987 were selected for use. A thorough check of these runs did not reveal any major problems with the input/output that would raise concerns about the accuracy of the results. It should be noted that the results of these H&H runs do not match the results in the final plan. However, since the economic analysis is based on the relative difference between the two alternatives, these runs are considered more than adequate for this task. Care has been taken to refer to any results taken from these runs in general terms or as differences between alternatives rather than specific numbers to avoid confusion.

Due to the lack of original data files and the methods used to set up the WSP2 and TR20 models, additional work was required to create all the data needed to analyze the Long Beach Watershed. The main reason this additional work was required was that the TR20's were setup to only produce peak discharges at limited locations. It should be noted that this method does not necessarily affect the quality of the results, but certainly increases the workload required. All of the original files and data provided were thoroughly read and researched to gleam all pertinent data. All of the basic input data required for WSP2 and TR20 for each alternative were compiled in Excel to check and validate the original data used. All of the road and valley cross sections used in the original analysis for each alternate was entered into Excel and graphed to facilitate the research and analysis needed. This same cross-sectional data was also utilized to develop input for an additional cross-sectional ratings computer program executed for the purpose of obtaining more complete top width, velocity, and flow area data. The rating tables produced by WSP2 for each cross-section and alternate were also entered into an Excel spreadsheet to compute the average velocity for each rating point. This same data was also utilized to interpolate any and all missing data for each cross-section, storm, and alternate; including peak elevations, flow areas, and average velocities. Finally, all pertinent peak results for each cross-section, storm, and alternate were compiled into a single Excel spreadsheet for further use in analyzing the Long Beach Watershed.

The economic analysis was initiated by creating an Excel table that contained the peak elevation at each cross-section for each storm and alternative. An additional spreadsheet was provided by the economist that included the identification, floor elevation, and location (Lat-Long) of each structure inventoried by the economist. A Geo-HEC-RAS project was developed and utilized to create a common stationing between the cross-sections and the structures being evaluated. The peak elevation for each alternative and storm combination was then interpolated at each structure location/station using the peak elevation results from TR20. The depth of inundation for each structure by each storm and alternative was then computed. The reduction in flooding from present to future condition for each structure and storm was also computed and analyzed. This data was then returned to the economist for the computation of damages and benefits.

Additional analysis was conducted to determine the effects of the project on the area downstream of the designed Canal-1 channel or downstream of Espy Avenue. This area of concern was not addressed during the original planning of the Long Beach Watershed. The downstream area was analyzed by modifying an existing USACE HEC-RAS model to run a steady flow analysis for each alternate using the peak discharges produced by the corresponding TR20 model. A sensitivity analysis using different starting elevations was conducted with the average high tide being selected as the appropriate starting elevation. The results of these runs were transferred into an Excel spreadsheet to facilitate further analysis. The average change in the elevations and velocities over multiple cross-sections were computed for each alternative. The difference in the without and with project results produced the expected average increase in elevation and velocity for a given stream reach. The same HEC-RAS model was also utilized to produce the peak elevations for each storm and alternative needed for the economic analysis of the structures located downstream of Espy Avenue. The model used the same starting elevations and discharges that were used in the original planning effort.

Additional analysis was also conducted to address some concerns over the possible overflow of Turkey Creek into the upper end of Canal-1 during storm events. Determination of the exact flow that each of the three separate stream systems would carry for a given storm is extremely difficult if not impossible to model. Flow quantity and paths in this complex area would also change over time and from storm to storm. Therefore, the analysis concentrated on where any possible overflow would likely be conveyed downstream rather than the quantity of the overflow. A USACE HEC-RAS model for Turkey Creek and Canals 1 and 2-3 was used as a base model. Inspection of the cross-sections used in the HEC-RAS model was extremely helpful to help understand the dynamics of the overflow. Heavy use was also made of the ArcMap 10.0 analysis tools and available data layers such as ortho imagery and topographic sheets. The post-Katrina LiDAR elevation dataset was the most heavily used and helpful data used for this analysis. Numerous contours and flow paths were developed from the LiDAR dataset to help determine the path of any overflow. Limited time was spent in looking at the difference in timing of the storm hydrographs for Turkey Creek and Canal-1.

It is highly recommended that new hydrologic & hydraulic models be developed during the final design that covers Canal-1 from 28th Street downstream to Saint Louis Bay. This comprehensive model will allow any updates needed to the hydraulics or hydrology to be made and can incorporate any changes made to the final Canal-1 design. This model should be used to update the appropriate Flood Insurance Rate Maps (FIRMs) needed to comply with the National Flood Insurance Program (NFIP). The final design phase should also include a check of the existing house and business inventory to update any changes needed. The updated inventory and model will ensure that all downstream effects of the constructed channel on current improvements have been accurately identified and mitigated for.

Prime Farmland and Soils Information

Prime farmland and soils information was obtained from "Soil Survey of Harrison County, Mississippi," issued in June 1975.

Appendix E: Other Supporting Information

Project Scoping Meeting: September 20. 2001 On September 20, 2001 a site visit to the proposed channel 1 of the Long Beach project was conducted. The group toured portions of the watershed including bridges at street crossings and an area potentially suitable for a retention basin. Attendees were:

Gerald Miller, Environmental Protection Agency
Jerry Brashier, Mississippi Department of Marine Resources
Robert Seyfarth, Mississippi Department of Environmental Quality
Daniel Gregg, US Fish & Wildlife Service
Patric Harper, US Fish & Wildlife Service
Allison Felsher, Mississippi Department of Marine Resources
Wayne Ellis, Natural Resources Conservation Service
Jim Garner, Natural Resources Conservation Service
Larry Williams, Natural Resources Conservation Service
Tyree Harrington, Natural Resources Conservation Service
Scott Culberson, Natural Resources Conservation Service
Robin Shelby, Natural Resources Conservation Service

We need follow-up maintenance to assure the minimal number of trees per acre on mitigation sites. Better yet, mitigation should be through purchasing into a bank where improvements have already been established.

What happens to people down stream when additional water gets to the end of the enlarged channel? Be sure to identify the area that will get increased flooding.

Will the project be designed to provide relief for the current residents or for future development as well? The NEPA document should state this decision. If future needs are to be planned into the project, we need to know how many building construction variances have been issued in the floodplain since entering into the flood insurance program? Also, what is the rate of building construction within the watershed.

If this canal ties into Turkey Creek drainage, the additional flow must be addressed.

The old channel has healed nicely and looks good as habitat; water quality is good; clearing will be problematic.

Could clearing be done on only one side of the channel?

We need local ordinances that require all developments to hold, on site, the first inch of rainfall or the 30-year storm, which ever is greater.

Water quality will definitely decrease with installation of the enlarged ditch. This could have various impacts, including the fisheries of Bay St. Louis, which is one of the most important fisheries in Mississippi. We need to check for available water quality data.

Retention basins are needed to trap run-off and reduce the amount of pollution leaving the drainage area. Buffer strips should offset any deficiency in this aspect.



Conservation Service

Suite 1321, Federal Building 100 West Capitol Street Jackson, Mississippi 39269

May 17, 1993

Mr. Bill Bunkley U.S. Army Corps of Engineers OP-SP P. O. Box 2288 Mobile, AL 36628

Dear Mr. Bunkley:

As you requested, the following is being transmitted for your use:

1. A listing of those individuals who participated in the environmental coordination of Long Beach Watershed;

2. A listing of mitigation acres for the Long Beach Watershed;

3. A listing of soils in the Long Beach Watershed showing those with

hydric and hydric inclusion soils;

4. A land rights map for channel 2-3 showing in detail the location of the channel and spoil placement for work areas; a wetlands mitigation map showing those soils which are hydric and those with hydric inclusions; included on this map are the locations of channel 1 and channel 2-3 area of spoils placement and area of migitation.

I hope this information is what you will need. If not, please let me know, and we will provide additional information.

Sincerely,

Fredrick E. Keeter

Water Resources Staff Leader

Attachments

cc: Billy Davis, Area Conservationist, SCS, Hattiesburg, MS David Peacock, District Conservationist, SCS, Gulfport, MS Calvin McElreath, Civil Engineer, SCS, Oxford, MS

FEkeeter:db

YELLOW COPY



The Soll Conservation Service is an agency of the Department of Agriculture

ENVIRONMENTAL COORDINATION FOR LONG BEACH WATERSHED WITH OUTSIDE AGENCIES

Agency	Personnel.	Address	Telephone No.
Environmental Protection Agency	Gerald Miller	345 Gourtland St., N.W. Atlanta, GA 30365	
Office of Pollution Control	Jim Morris	P. O. Box 10385 Jackson, MS 39289-0385	(601) 961-5151
U.S. Fish and Wildlife Service	Danny Dunn	P. O. Drawer 1190 Daphne, AL 36526	(205) 441-5181
Miss. Department of Wildlife Conservation - Bureau of Marine Resources	Dishe Hunt	P. O. Drawer 959 Long Beach, MS 39560	(601) 385-5860

September 2015

MITIGATION AREAS FOR LONG BEACH WATERSHED

Location	Acres of Hydric Soils	Mitigation Acres
Areas along Channel 2-3		32
Areas along Channel 1	 .	52
Area in TS8S - R12W Section 16	46	90
Area in TS8S - R12W Section 20	4	8
Area in TS8S - R12W Section 19	22	32
Total .	72	214

Project Scoping Meeting: August 14, 2007

LONG BEACH WATER MANAGEMENT DISTRICT

POST OFFICE BOX 748 LONG BEACH, MISSISSIPPI 39560

Andy Hughes Division Administrator Federal Highway Administration 666 North Street, Suite 105 Jackson, MS 39202-3199

Subject:

Scoping Meeting, Long Beach Water Management District

Supplemental Environmental Impact Statement for Long Beach Watershed

Canal No. 1 Channel Modifications Harrison County, Mississippi

Dear Mr. Hughes,

The Natural Resources Conservation Service and Long Beach Water Management District will conduct a Scoping Meeting for the subject project at 10:00 a.m. on August 14, 2007, at the West Harrison County Civic Center, 4670 West Espy Avenue, Long Beach, Mississippi. This scoping meeting is a follow-up to the meeting and site visit held on September 20, 2001 for proposed work on Canal No. 1. This scoping meeting will assist us in developing a Supplemental Environmental Impact Statement (EIS) to update the "Environmental Impact Statement for Long Beach Watershed, Harrison County, Mississippi" dated October 1989.

The purpose of this meeting is to solicit views from agencies and elected and appointed officials which by law, interest, or expertise can assist the project planners with the timely identification of economic, social, and environmental opportunities and constraints within the study area.

A preliminary Aerial map showing both the original study area and the current conditions will be available for review, as well as City of Long Beach planning information identifying plans for rebuilding the area.

Enclosed with this letter are a tentative meeting agenda, a project fact sheet, and a map of the project limits. Additional information, including a PDF of the initial EIS, comments received in association with the September 2001 scoping meeting, aerial imagery of the study area, and associated project maps can be downloaded from the following ftp site. Because some of the files are large, it is suggested that you copy the files to a local drive before you try to open them.

ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1 SEIS/

We request you review the material and provide any questions, problems, or concerns that you have about the project during the meeting. This includes <u>providing any information</u> you may have concerning the study area at the meeting. To assist us in preparing for this meeting, by August 7, 2007, please email the consultant Project Manager at <u>barry.brupbacher@neel-schaffer.com</u> regarding who will attend from your organization.

LONG BEACH WATER MANAGEMENT DISTRICT

POST OFFICE BOX 748 LONG BEACH, MISSISSIPPI 39560

At the conclusion of the meeting, the Water Management District hopes to reach a consensus regarding the project Purpose and Need; and the technical studies, which will have to be accomplished to support the preparation of a Supplemental EIS. Written comments regarding the project should be directed to:

Barry Brupbacher
Neel-Schaffer, Inc.
800 Jackson Avenue, Suite B
Mandeville, LA 70448
Email - barry.brupbacher@neel-schaffer.com

The District requests that all comments be provided by August 21, 2007.

If you have any questions or need additional information, please contact Barry directly by email or phone at 985-778-3105.

Sincerely,

Brett Mallette Chairman

Enclosures

LONG BEACH WATER MANAGEMENT DISTRICT

POST OFFICE BOX 748 LONG BEACH, MISSISSIPPI 39560

SCOPING MEETING

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS)

FOR THE

LONG BEACH WATERSHED AFFECTED BY THE PROPOSED

CANAL NO. 1 CHANNEL MODIFICATIONS

PROPOSED BY THE

NATURAL RESOURCES CONSERVATION SERVICE (NRCS)

FOR THE

LONG BEACH WATER MANAGEMENT DISTRICT
HARRISON COUNTY, MISSISSIPPI

PRELIMINARY AGENDA (Meeting Begins at 10:00 a.m.)

- I. Welcome
- II. Project Overview Presentation
- III. Viewing of Exhibits and GIS files
- IV. Questions
- V. Lunch (11:30 a.m.)
- VI. Field Trip to site
- VII. Return to Facility for Final Discussion and Comments

Meeting Minutes August 14, 2007 Scoping Meeting

Long Beach Water Management District
Supplemental Environmental Impact Statement for Long Beach Watershed
Canal No. 1 Channel Modifications
Harrison County, Mississippi

Attendance:

Larry Wilson, USDA, Natural Resources Conservation Service (NRCS) Tyree Harrington, USDA, NRCS Tom Smith, Corps of Engineers Randall Harvey, Corps of Engineers John McFadyen, Corps of Engineers Randy Wilson, Mississippi Forestry Commission Brett Mallette, Long Beach Water Management District (LBWMD) Dave Marshall, LBWMD Stacey Schultz, Dukes, Dukes, Keating & Faneca, P.A. Bill Knesal, Knesal Engineering Joe Culpepper, Knesal Engineering Robert Walker, Neel-Schaffer, Inc. Barry Brupbacher, Neel-Schaffer, Inc. Rosemary Aldridge, Neel-Schaffer, Inc. Jim Wilkinson, Neel-Schaffer, Inc. Liz Cox, Neel-Schaffer, Inc

Barry Brupbacher opened the meeting and introduced Larry Williams, who presented a brief history of the project. Mr. Williams addressed the following points:

- Initial EIS completed in 1989
- Project hydrology considered flows from three drainage basins (Turkey Creek drainage basin, Canal No. 1 drainage basin, and drainage basin for Canals No. 2 and No 3). Flows from the three basins intermingle during storm events.
- EIS provided for improvements to Canal No 1, and Canals No 2/3. Computed benefits were not isolated by drainage basin.
- Benefits were considered over a 100-year life cycle
- In 2001, since Canal No. 1 improvements had not been implemented, NRCS reopened the scoping process in association with LBWMD; project continued on hold until present effort.
- Because so much time has elapsed since publication of initial EIS, NRCS now believes that a Supplemental EIS may be required in order to carry the Canal No I project improvements forward into construction.

Mr. Brupbacher then reviewed the handout exhibits. A copy of the handout package can be downloaded at the following ftp site:

ftp://ftp.neel-schaffer.com/Mississippi/Jackson/Public/Long_Beach_Canal_1_SEIS/

1

Mr. Brupbacher then introduced the Turkey Creek Flood Damage Reduction Study for discussion. The COE Study was completed just prior to the landfall of Hurricane Katrina in 2005. COE Engineer Randal Harvey indicated that:

- Hydraulics/hydrology modeling considered entire Turkey Creek watershed, including Turkey Creek, Canals No. 1, 2 and 3
- Alternatives were evaluated to determine the maximum net benefit.
- Improvements to Canals No 1, 2 and 3 were not included in the final recommendations because they did not produce the best economic benefit.

Tom Smith noted that COE planning post Katrina documented the need for a number of projects in Harrison County, including a project which would improve Canals No. 2/3. The Corp would be undertaking the design for that project utilizing in-house resources.

Corps representatives indicated that all data compiled in their recent work would be made available for work on Canal No. 1

Other topics discussed included:

- Project Area Bill Knesal confirmed that the project area would not include the Naval Construction Battalion Center
- Wetlands project will affect wetlands. Corps requested copies of the delineation maps developed for the initial EIS. Larry indicated that he would search NRCS files for the information
- 3. Design Features— The initial design concept provided for a canal section with 3 to 1 slide slopes, which should support re-vegetation of the canal banks. Also, a sediment trap was provided to mitigate water quality concerns. The initial design located excavated spoil on a berm next to the canal. However, Bill Knesal, engineer for the LBWMD, indicated that excavated spoil would be relocated to a disposal area.
- 4. Environmental Justice Based on available demographic information, environmental justice is not considered a concern.
- 5. Bike Path -MDOTD has approved a transportation enhancement grant for a bike path, one segment of which is conceptually located adjacent to Canal No. 1 within the project area. Brett Mallette, representing the LBWMD, clarified the position of the District with respect to the Bike Path Brett indicated that the easements obtained for the canals were strictly for drainage. Consequently, the collocation of a bike path within the canal easement would necessitate some entity to secure new easements to allow for the construction of a bike path. He also noted that the District is concerned that a bike path may impair access to the canal for maintenance, and that this issue would have to be resolved.

Following lunch, a tour of the project area was undertaken and the group returned to the meeting facility for concluding remarks relating to the requirements for supplementing the 1989 EIS.

Cooperating Agencies – Invitations will be issued to the Corps of Engineers, the USF&WS, EPA, the Mississippi Department of Marine Resources, and the Mississippi Department of Environmental Quality.

Technical Updates - Supplemental EIS should include updates to the following Technical Studies:

- Cultural Resources
- Natural Resources, including water quality, habitat, Threatened and Endangered Species and Wellands

Mr. Brupbacher reminded all parties that written comments should be submitted by August 21, 2007.

There being no other business, the scoping meeting was adjourned.



Long Beach Water Management District and NRCS

Canal Number 1 Channel Modifications Supplemental Environmental Impact Statement (SEIS)

Harrison County, MS

1" Edition

PROJECT PURPOSE AND NEED

In order to improve flood control along Canal Number 1 and reduce costs associated with flooding, the Natural Resources Conservation Service (NRCS) and the Long Beach Water Management District (LBWMD) propose to modify the existing Canal Number 1 through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. An original Environmental Impact Statement (EIS) was conducted for this work in 1989, encompassing work on Canal Number 1, Canal Number 2, and Canal Number 3. Most of the improvements to Canal Number 2 and 3 have been completed. This Supplemental EIS (SEIS) is being prepared to update the portion of the EIS work previously prepared relating to Canal Number 1. The proposed project is needed to reduce costs and impacts to families from flooding along Canal Number 1.

LOCATION

Canal Number 1 is a man-made canal constructed in about 1918. The four miles of Canal Number 1 proposed to be modified begins at the watershed boundary near the U.S. Navy Construction Battallion base and continues westward to Espy Avenue.

■ RECOMMENDED ALTERNATIVE

"Structural measures" are the recommended alternative for the project. The planned structural measures consist of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3 to 1 side slopes and bottom widths ranging from 30 to 40 fect. The rock riprap-lined reach is planned due to limited right-of-way widths. Selective snagging will be performed along 0.7 miles of Canal Number 1 to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel.

For more information, contact:
Bill Knesal, Knesal Engineering Services, Inc.,
(228) 867-9100, P.O. Box 3288, Gulfport, MS 39505
btllka knesalengineering.com

Barry Brupbacher, Neel-Schaffer, Inc., (985-674-9820 800 Jackson Avenue, Mandeville, LA 70448 barry brupbacher@neel-schaffer.com



NATURAL ENVIRONMENT

The original EIS provides a detailed analysis of the natural environment impacted by this project. The purpose of this SEIS will be to review and update current conditions of the study area and evaluate impacts from the proposed project. Below is a summary of impacts from the original EIS.

Resource	Effect
Air Quality	No effect
Coastal Zone	No effect
Threatened/Endangered Species	None present
Fish and Wildlife habitat	Loss of some units
Floodplains	Reduced
Historic and Cultural Properties	No effect
Prime and Unique Fannland	No effect
Water Quality	Temporary reduction
	during construction
Wetlands	No net change
Wild and Scenic Rivers	Not present

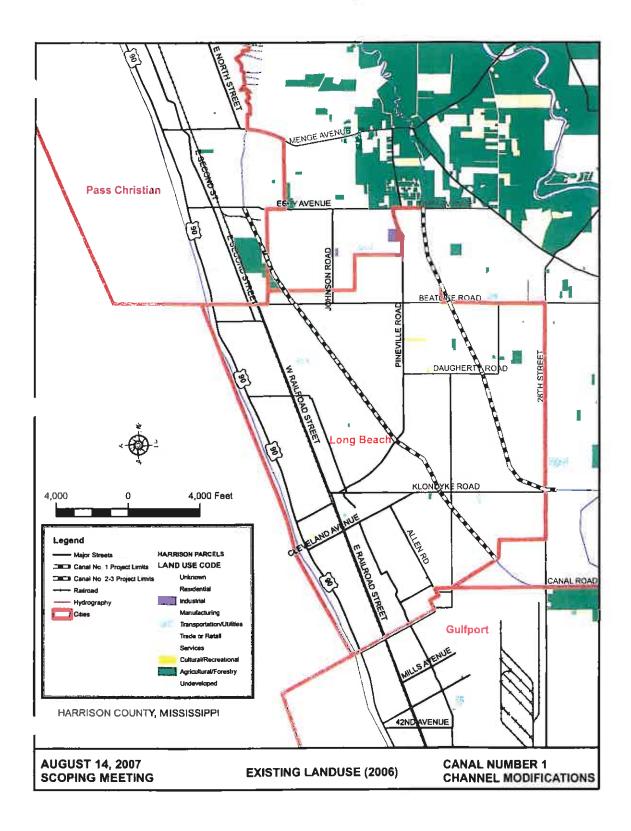
MITIGATION MEASURES

The loss of forest land habitat will be mitigated by the planting of hardwood species in the right-of-way areas along the canal and within the Long Beach Industrial Park. The channel will be constructed with 3:1 side slopes to encourage establishment of herbaceous aquatic vegetation. This vegetation will reduce bank erosion and improve sediment trapping. Also, sediment traps will be located at the lower end of the channel to reduce downstream sedimentation during and following construction.

PUBLIC INVOLVEMENT

The Public Involvement Program is outlined below and is subject to review and modification as the project develops.

- <u>Bulletin Board</u> Post up-to-date information on one or more bulletin boards at public facilities in the Long Beach area showing monthly project progress.
- <u>Public Meetings and Hearing</u> Conduct a Public Hearing on the project in an open house format where attendees may review exhibits, discuss issues with project personnel, and provide written and verbal comments.





Long Beach Canal #1 Field Trip Itinerary - August 14, 2007 Scoping Meeting



USDA - NRCS

September 2015

Natural Environment Report Canal No. 1 Channel Modifications Long Beach Water Management District Harrison County, Mississippi

January 2009

Prepared for:

Neei-Schaffer, Inc.

and

Long Beach Water Management District

Prepared by:
Environmental Research Group, LLC
Centreville, Mississippi

TABLE OF CONTENTS

1.0	INTRODUCTION	1-1
1.1	Background	1-1
1.2	Project Objective	
2.0	NATURAL ENVIRONMENT	2-1
2.1	Water Quality	
2.2	Wetlands and U.S. Jurisdictional Waters	2-1
2.3	Floral Communities	2-1
2.4		2-2
2.5	Threatened and Endangered Species	
	2.5.1 Background	
	2.5.2 Federal and State Protected Species	2-3
3.0	SUMMARY/RECOMMENDATIONS	3-1
4.0	REFERENCES CITED	4-1
FIG	URES	
Figu	re 1. Canal No. 1 Channel Modification Study Area	1-2
-	re 2. Proximity of Study Area to Johnson Bayou and St. Louis Bay	2-6

APPENDICIES

Appendix A. Agency Response Letters Appendix B. State Protected Species List

Canal No. 1 Channel Modifications

1.0 INTRODUCTION

1.1 Background

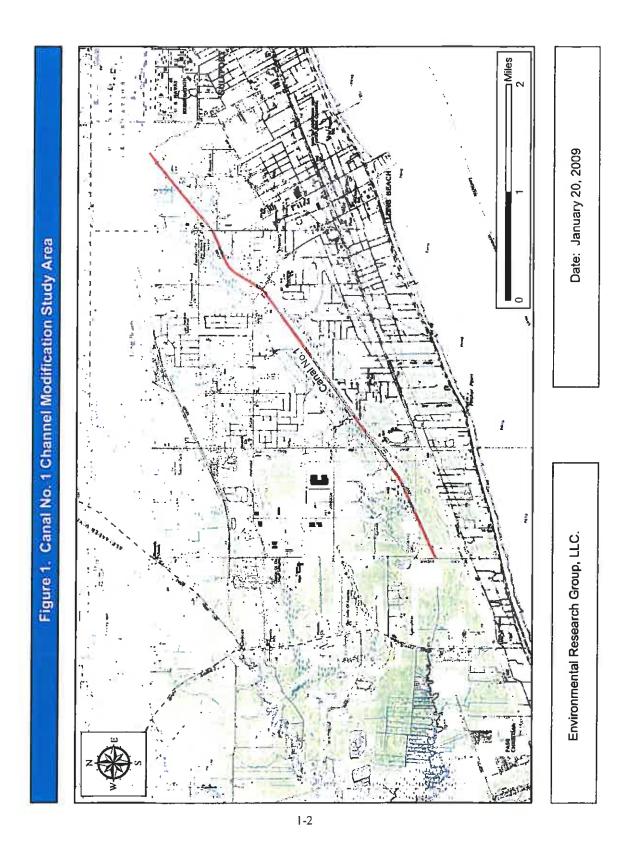
Canal No. 1 is a man-made canal that was constructed in 1918 near the City of Long Beach in Harrison County, Mississippi. The 4.7 mile section of Canal No. 1 covered in this report begins near the U.S. Navy Construction Battalion Base and continues west to Espy Avenue (Figure 1).

An Environmental Impact Statement (EIS) was conducted in 1989, encompassing work on Canal No. 1, 2, and 3. The improvements to Canal No. 2 and 3 have been completed. A Supplemental EIS (SEIS) is being prepared to update the EIS prepared for Canal No. 1. The purpose of the SEIS will be to review and update current conditions of the study area and evaluate impacts associated with the proposed project. The proposed project is needed to reduce costs and impacts to families from flood damages.

The Long Beach Water Management District (LBWMD) proposes to modify the existing canal through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. The proposed project consists of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3:1 side slopes and bottom widths ranging from 30 to 40 feet. The rock riprap-lined section is required due to limited right-of-way (ROW) width. Selective snagging will be performed along 0.7 miles to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel. The channel would be constructed with 3:1 side slopes to encourage establishment of vegetation. This vegetation would reduce bank erosion and improve sediment trapping. Also, sediment traps will be placed at the lower end of the channel to reduce downstream travel of sediment during and following construction.

1.2 Project Objective

Environmental Research Group, LLC (ERG), a sub-consultant to Neel-Schaffer, Inc. (NSI), was tasked by the Long Beach Water Management District to provide a natural environment report within the proposed project area. This field survey included the flora and faunal communities of the surrounding area, threatened and endangered species in the project area, and the general water quality associated with Canal No. 1. Water quality is described in this report based on visual observation of the existing conditions. No samples were collected and no water quality testing was performed.



USDA – NRCS 117 September 2015

2.0 NATURAL ENVIRONMENT

2.1 Water Quality

The general water quality of Canal No. 1 was noted during the field survey on October 13-16, 2008. The existing channel is a murky brown color throughout the project area. Some areas of the canal are flowing while others are blocked because of beaver dams, woody debris, or from man-made ponds. Ditches connected to the canal were also murky colored. Anthropogenic trash and other debris occurred within the water that flows through this system.

Canal No. 1 flows into Johnson Bayou, which flows into the St. Louis Bay. Neither Canal No. 1 or Johnson Bayou are listed on Mississippi Department of Environmental Quality's (MDEQ) 305(b) Water Quality Report or the 303(d) List of Impaired Water Bodies (MDEQ 2009). There are no scenic streams in the project corridor. The nearest scenic stream is Wolf River (MDWFP 2009) which is approximately three miles northeast of Canal No. 1 and flows into the St. Louis Bay.

2.2 Wetlands and U.S. Jurisdictional Waters

ERG biologists conducted a preliminary wetland investigation with on-site inspections along 4.7 miles of Canal No. 1 and a 125-foot wide corridor on each side of the existing canal on October 13-16, 2008. A total of 4.74 acres of jurisdictional wetlands, 2.89 acres of ponds, and 5.26 miles of waters of the U.S. were identified within the project area.

The results of the surveys as well as the methods used are covered in a report titled <u>Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi (ERG 2009).</u> The USACE has the authority to make the final decision regarding the jurisdictional status of wetlands and waters of the U.S. The USACE should be contacted to verify these finding and to determine the appropriate permit requirements prior to the disturbance of any jurisdictional areas.

2.3 Floral Communities

The project area is located within the Outer Coastal Plain Mixed Forest Ecological Province (Rudis 1999). During the field survey on October 13-16, 2008, typical vegetation characteristics of the project area were recorded by ERG biologists. The information collected during field reconnaissance, along with the current aerial photography, was used to classify the project area into three vegetation communities. A description of the community types is included in the following paragraphs.

Mixed Forest

Upland areas are typically dominated by mature hardwoods with scattered pines throughout and a somewhat dense scrub/shrub layer. Dominant vegetation observed included water oak (Quercus nigra), loblolly pine (Pinus taeda), wax myrtle (Myrica cerifera), red maple (Acer rubrum), Chinese tallow (Triadica sebifera), blackberry (Rubus louisianus), and baccharis (Baccharis halimifolia).

<u>Pasture</u>

A maintained power line ROW that parallels Canal No. 1 supports pasture grasses. Dominant grasses observed in these areas consisted of little bluestem (Schizachyrium scoparium), bermudagrass (Cynodon dactylon), and goldenrod (Solidago altissima). Emergent wetlands

Canal No. 1 Channel Modifications

were identified within the project area along the power line ROW. Dominant vegetation included in these areas included common rush (*Juncus effuses*), sedges (*Carex* spp.), common spikerush (*Eleocharis palustris*), shortbristle horned beakedsedge (*Rhynchospora corniculata*), smartweed (*Polygonum hydropiperoides*), St. Johnswort (*Hypericum cistifolium*), Chinese tallow, titi (*Cyrilla racemiflora*), and switchcane (*Arundinaria gigantea*). On the edges of some of the wetlands were little bluestem, Johnsongrass (*Sorghum halepense*), panic grass (*Dichanthelium acuminatum*), water oak, magnolia bay (*Magnolia virginiana*), goldenrod, and dogfennel (*Eupatorium capillifolium*).

Rural/Developed

The rural community type consists of roadways, residences, and commercial businesses. Rural areas contain small areas of the upland mixed forest and pasture community types discussed above in addition to homes, barns, and other dwellings. This community type includes mowed residential lawns and decorative trees. Flora present in these areas includes native hardwood trees as well as ornamental trees, shrubs, and grasses.

2.4 Faunal Communities

Aquatic Species

While the aquatic communities lend diversity to the area, their overall contribution to wildlife habital is diminished due to the fact that Canal No. 1 is a man-made channel for the discharge of stormwater. Upstream of Menge Avenue, Canal No. 1 has little resemblance to a natural stream. Above the area of tidal influence, the canal has little flow during the dry periods of the year and has little value as a fishery resource. Canal No. 1 empties into Johnson Bayou which is part of the Bay of St. Louis estuary. This estuary supports important fisheries resources including spotted sea trout, redfish, brown and white shrimp, and blue crab (USDA 1989).

Observation of aquatic wildlife within the canal was difficult due to high water turbidity. In many areas, the water appeared tannic and aquatic animals could not be seen below the surface. No sampling for aquatic vertebrates or invertebrates was performed as part of the field surveys. Several of the larger drains and ponds had some small fish species, but no collection was made to determine species. Several frogs, turtles, and surface invertebrates (beetles, etc.) were seen during the field surveys.

<u>Terrestrial Species</u>

The project area is located within the Outer Coastal Plain Mixed Forest Ecological Province (Rudis 1999). Common fauna varies with the age and composition of timber stands, percent of deciduous trees, proximity to openings, and presence of bottomland forest types. The project site is inhabited by common fauna, including small mammals, reptiles and avian species. Whitetail deer (Odocoileus virginianus), raccoon (Pryocon lotor), fox (Vulpes vulpes and Urocyon cinereoargenteus), and cottontail rabbit (Sylvilagus floridanus) are common. The fox squirrel (Sciurus niger) is common when deciduous trees are present on uplands and gray squirrels (Sciurus carolinensis) occur along drainages.

Common bird species include the pine warbler (*Dendroica pinus*), cardinal (*Cardinalis cardinalis*), summer tanager (*Piranga rubra*), Carolina wren (*Thryothorus ludovicianus*), rubythroated hummingbird (*Archilochus colubris*), blue jay (*Cyanocitta cristata*), eastern towhee (*Pipilo erythrophthalmus*), and tufted tilmouse (*Baeolophus bicolor*).

Common forest snakes include the cottonmouth (Agkistrodon piscivorus), copperhead (Agkistrodon contortrix), rough green snake (Opheodrys aestivus), rat snake (Elaphe obsoleta),

Canal No. 1 Channel Modifications

coachwhip (Masticophis flagellum), and the speckled kingsnake (Lampropeltis getula). Fence lizards (Sceloporus sp.) and glass lizards (Ophisaurus sp.) are also common.

Wildlife within the project area is highly influenced by the existing roadways and regional development of the area. Wildlife use of these areas includes permanent inhabitance, seasonal inhabitance, migratory routes, temporary shelter, or foraging. Due to its constant source of water, Canal No. 1 and the drains that flow into it are important to the wide variety of wildlife.

2.5 Threatened and Endangered Species

2.5.1 Background

The Endangered Species Act (ESA) [16 U.S.C. 1531 et. seq.] of 1973, as amended, was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All federal agencies or projects utilizing federal funding are required to implement protection programs for designated species and to use their authorities to further the purposes of the act. Responsibility for the identification of a threatened or endangered species and development of any potential recovery plan lies with the Secretary of the Interior and the Secretary of Commerce.

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are the primary agencies responsible for implementing the ESA. The USFWS is responsible for birds and terrestrial and freshwater species, while the NMFS is responsible for non-bird marine species. The responsibilities of these agencies under the ESA include: (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other federal agencies concerning measures to avoid harm to listed species.

An endangered species is a species in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Species may be considered endangered or threatened when any of the five following criteria occurs: (1) The current/imminent destruction, modification, or curtailment of their habitat or range; (2) Overuse of the species for commercial, recreational, scientific, or educational purposes; (3) Disease or predation; (4) The inadequacy of existing regulatory mechanisms; and (5) Other natural or human-induced factors affect continued existence. Delisted species have been removed from the list of endangered and threatened wildlife and plants; however, these species are monitored by the states for no less than five years and/or are protected by other federal regulations.

2.5.2 Federal and State Protected Species

Federal Species

The USFWS lists 15 species of plants and animals that are Threatened or Endangered in Harrison County (USFWS 2008) (Table 1). It should also be noted that the bald eagle (Haliaeetus leucocephalus) is currently protected statewide under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Canal No. 1 Channel Modifications

Table 1. List of Federally Protected Species in Harrison County, Mississippi

Соттол Name	Scientific Name	Federal Status	Year Listed	Habitat Descriptions
Alabama red-bellied turtle	Psuedemys alabamensis	E	1987	Shallow vegetated streams, rivers, or backwaters
black pine snake	Pituophis melanoleucus lodingi	С	N/A	Sandy, well-drained soils: open pine forests, moderate to sparse midstory, and a well-developed herbaceous understory dominated by grasses
brown pelican	Pelecanus occidentalis	E	1970	Coastal waters no more than 20 miles out to sea
gopher lortoise	Gopherus polyphemus	Т	1987	Deep sand ridges which originally supported longleaf pine and patches of scrub oak
green ludle	Chelonia mydas	Т	1978	Coastal waters
gulf sturgeon	Acipenser oxyrınchus desolo	Т	1991	Salt waters into large coastal rivers to spawn
Kemp's ridley	Lepidochelys kempii	E	1970	Coasial waters
leatherback turtle	Dermochelys comacea	Е	1970	Coastal waters
loggerhead turtle	Caretta caretta	T	1978	Coastal waters
Louisiana black bear	Ursus americanus luteolus	Т	1992	Bottomland hardwoods
Louisiana quillwort	Isoetes louisianensis	E	1992	Sandy soils and gravel bars in or near shallow blackwater streams and overflow channels in riparian woodland/bayhead forests of pine flatwoods and upland longleaf pine
Mississippi gopher frog	Rana capito sevosa	E	2001	upland sandy habitats historically forested with longleaf plne and isolated temporary wetland breeding sites
piping plover	Charadrius melodus	Т	1986	Coastal beaches
red-cockaded woodpecker	Picoides borealis	Ε	1970	Open, mature and old-growth pine ecosystems of the Southeastern U.S.
West Indian manatee	Trichechus manalus	E	1967	Large, slow-moving rivers, river mouths, and shallow coastal areas such as coves and bays

E = Endangered
T = Threatened
C = Candidate for listing

Source: USFWS 2008

Canal No. 1 Channel Modifications

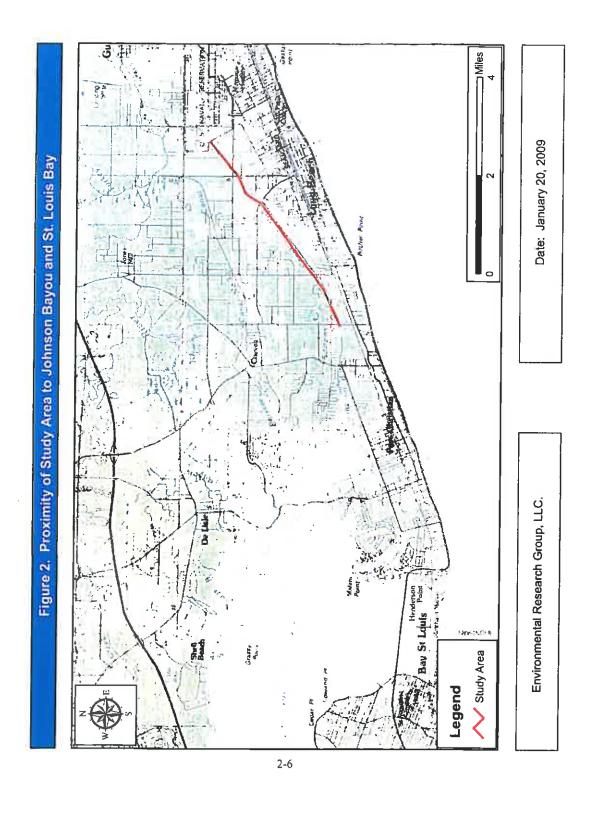
The USFWS has designated critical habitat for the gulf sturgeon and piping plover; however, no critical habitat is located within the project area or within the immediate vicinity of the project area. None of the species identified in Table 1 were observed during field surveys. However, potential habitat may exist near the project area or downstream of the project area. Potential Impacts to these species should be analyzed in detail in the SEIS.

Solicitation letters were submitted to the Mississippi Natural Heritage Program (MNHP), USFWS, and the Mississippi Department of Marine Resources (MDMR) prior to commencement of this report. A letter was received from the MNHP dated December 4, 2008 which expressed concern regarding the project nature and how channel modifications can affect sensitive habitats such as marshes and tidal streams. The MNHP recommends that perpetual easements, parcels of wetlands or land that could be restored to wetlands along either side of the canal, be put into place to contain increased stormwater capacities. This measure would help compensate for the potential increased floodwater capacity, slow water velocity, prevent downstream erosion, and act as a filtration system before storm water enters the canal (Appendix A).

A letter was received from the MDMR dated December 18, 2008 which stated that although the proposed project area would not directly impact tidal systems, indirect impacts to tidal and tidally influenced waters and wetlands located further downstream are possible. This letter also stated that the SEIS should contain anticipated impacts to tidal and non-tidal areas downstream from the proposed project area. Enclosed with their letter, the MDMR sent a Joint Application form that should be submitted to their office for review and determination of Coastal Zone Consistency (CZC) for the proposed project (Appendix A).

State Species

The MNHP maintains a list of state protected species. This list includes species whose occurrence in Mississippi is or may be in jeopardy, or with known or perceived threats or population declines. These species are not necessarily the same as those protected under the ESA. Currently, there are 106 species listed by the State of Mississippi for Harrison County consisting of 45 animals and 61 plants (MNHP 2008) (Appendix B). The MNHP letter indicated that documented occurrences of the following species were found in St. Louis Bay, Bayou Portage, and their surrounding tributaries and marshes: Manatee (*Trichechus manatus*); Saltmarsh Topminnow (*Fundulus jenkinsi*); Mississippi Diamondback Terrapin (*Malaclemys terrapin pileata*); Gulf Salt Marsh snake (*Nerodia clarkii clarkii*), and Least Killifish (*Heterandria formosa*). Canal No. 1 flows into Johnson Bayou, which eventually connects to the St. Louis Bay (Figure 2). Impacts to the above listed species associated with the proposed project should be analyzed in the SEIS.



3.0 SUMMARY/RECOMMENDATIONS

Field surveys were conducted by ERG biologists on October 13-16, 2008. All areas of potential habital, including all stream crossings, were surveyed to determine the presence or absence of protected species. No federally listed or state listed species were observed; however, potential habitat may exist near or downstream of the proposed project area. In addition, the MNHP has documented occurrences of the manatee, saltmarsh topminnow, Mississippi diamondback terrapin, Gulf salt marsh snake, and least killifish downstream of the proposed project. Impacts to both federal and state species should be analyzed in detail in the SEIS.

The water quality of Canal No. 1 is consistently turbid and a murky brown color. Some areas of the canal have flowing water while other areas are blocked. None of the water features within the proposed project area are listed on the state water quality reports (MDEQ 2008).

A total of 4.74 acres of jurisdictional wetlands, 2.89 acres of ponds, and 5.26 miles of waters of the U.S. were identified within the project area. A separate wetlands technical report, <u>Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi</u> (ERG 2009), has been written to detail the findings. The USACE has the authority to make the final decision regarding the jurisdictional status of wetlands and waters of the U.S. The USACE should be contacted to verify these finding and to determine the appropriate permit requirements prior to the disturbance of any jurisdictional areas.

Any impacts to the flora or fauna in the project area as a result of the modification of Canal No. 1 should be minor and temporary. Recommendations from the Mississippi Natural Heritage Program and the Mississippi Department of Marine Resources to minimize indirect impacts downstream from the proposed project area should be considered during the SEIS process.

4.0 REFERENCES

- Environmental Research Group, LLC (ERG). 2009. Wetlands Technical Report, Canal No. 1 Channel Modifications, Long Beach Water Management District, Harrison County, Mississippi.
- Mississippi Department of Environmental Quality. 2009. Water Home. Internet Website: http://www.deq.state.ms.us/MDEQ.nsf/page/Main WaterHome?OpenDocument
- Mississippi Department Wildlife, Fisheries, and Parks (MDWFP). 2009. Mississippi Scenic Streams Stewardship Act, § 51-4-71 Pilot Programs. Internet Website: http://home.mdwfp.com/more.aspx
- Mississippi Natural Heritage Program (MNHP). 2008. Threatened and Endangered Species List for Harrison County. Prepared by Museum of Natural Science. Internet Website: http://museum.mdwfp.com/science/nhp_online_data.html
- Rudis, V.A. 1999. Ecological Subregion Codes by County, Coterminous United States. Forest Inventory and Analysis Research Work Unit, Southern Research Station, U.S. Department of Agriculture, Forest Service, Asheville, NC.
- U.S. Department of Agriculture (USDA). 1989. Long Beach Watershed Plan and Environmental Impact Statement, Harrison County, Mississippi. Prepared by the U.S Department of Agriculture Soil Conservation Service, Long Beach Water Management District, City of Long Beach, and the Harrison County Soil and Water Conservation District.
- U.S. Department of Agriculture (USDA). 1975. Soil Survey of Harrison County, Mississippi. Prepared by the Natural Resources Conservation Service.
- U.S. Fish and Wildlife Service (USFWS). 2008. List of Threatened and Endangered Species by County. Internet Website: http://www.fws.gov/southeast/jackson/SpeciesbyCounty.pdf

125

State Protected Species List

Scientific Name	Common Name	State Rank	Federal Status
Accipiter striatus	Sharp-shinned hawk	S1?B,SZN	
Acipenser oxyrinchus desotoi	Gulf sturgeon	S1	T
Aimophila aestivalis	Bachman's sparrow	S3?B,SZN	
Anas fulvigula	Mottled duck	S3B,S4N	_
Caretta caretta	Loggerhead	S1B,SZN	T
Chardrius melodus	Piping plover	SZN	T
Coturnicops noveboracensis	Yellow rail	S2N	
Drymarchon corais couperi	Eastern indigo snake	S1	
Egretta rufescens	Reddish egret	SZN	
Enneacanthus gloriosus	Bluespotted sunfish	S3	
Falco columbarius	Merlin	SZN	<u>.</u>
Fallicambarus byersi	Lavender burrowing crayfish	S3	
Fallicambarus danielae	Speckled burrowing crayfish	\$2	
Fundulus jenkinsi	Saltmarsh topminnow	S3	
Gopherus polyphemus	Gopher tortoise	S2	
Grus canadensis pulla	Mississippi sandhill crane	S1	
Haematopus palliatus	American oystercatcher	SPB,SZN	
Haliaeetus leucocephalus	Bald eagle	S1B,S2N	DL
Heterandria formosa	Least killifish	S3	
Heterodon simus	Southern hognose snake	SH	
Laterallus jamaicensis	Black rail	S2N	
Lepidochelys kempii	Kemp's ridley	S1N	E
Macrochelys terminckii	Alligator snapping turtle	S3	
Malaclemys terrapin pileata	Mississippi diamondback terrapin	\$2	
Nerodia clarkii clarkii	Gulf salt marsh snake	S2?	
Notropis chalybaeus	ironcolor shiner	S2	
Nycticorax nycticorax	Black-crowned night heron	S3?B,SZN	
Onthophagus polyphemi	tortoise commensal scarab beetle	S?	
Pandion haliaetus	Osprey	S3B,SZN	
Pelecanus erythrorhynchos	American white pelican	S2N	
Pelecanus occidentalis	Brown pelican	S1N	E
Peromyscus polionotus	Oldfield mouse	S2S3	
Picoides borealis	Red-cockaded woodpecker	S1	E
Pituophis melanoleucus lodingi	Black pine snake	\$2	
Procambarus fitzpatricki	Spiny tailed crayfish	S2	
Pseudemys sp.	Mississippi redbelly turtle	S1	
Pseudotriton montanus	Mud salamander	S2S3	
Rana heckscheri	River frog	S1	
Rana sevosa	Dark gopher frog	S1	
Regina rigida sinicola	Gulf crayfish snake	53?	
Rhadinaea flavilata	Pine woods snake	S3?	
Sterna antillarum	Least tern	S3B,SZN	
Sterna maxima	Royal tern	S1B,S4N	
Thryomanes bewickii	Bewick's wren	S2S3B,SZN	
Trichechus manatus	Manatee	SZ	
Agalinis aphylla	Coastal plain false-foxglove	S2S3	
Agalinis filicaulis	Thin stemmed false-foxglove	S2?	
Agrimonia incisa	Incised groovebur	S3S4	
Andropogon perangustatus	Elliott's bluestem (Var.2)	S1?	

Scientific Name	Common Name	State Rank	Federal Status
Aristida condensata	Sandhills three awn	S3S4	
Avicennia nitida	Black mangrove	SH	
Burmannia biflora	Northern burmannia	S3S4	
Calopogon barbatus	Bearded grass-pink	S2S3	
Carex exilis	Coast sedge	S2	
Chamaecrista deeringiana	Florida senna	S1	_
Cleistes divaricata	Spreading pogonia	\$3	
Coreopsis basalis	Golden-mane tickseed	S1?	
Dichanthelium erectifolium	Erect-leaf witchgrass	\$3\$4	
Elyonurus tripsacoides	Pan american balsamscale	SH	_
Epidendrum conopseum	Green-fly orchid	S2	
Eriocaulon texense	Texas pipewort	S2S3	
Gaylussacia frondosa	Dangleberry	S2S3	
Helianthemum arenicola	Gulf rockrose	S1S2	
llex amelanchier	Juneberry holly	S3	
llex cassine	Dahoon holly	S2	
llex myrtifolia	Myrtle holly	S3S4	
Ipomoea pes-caprae	Railroad vine	S2S3	
Isoetes louisianensis	Louisiana quillwort	S2	E
Juniperus silicicola	Southern red cedar	\$2	
Lachnocaulon digynum	Pineland bogbutton	\$2	
Lilaeopsis carolinensis	Carolina lilaeopsis	S2S3	_
Lindera subcoriacea	Bog spice bush	\$2	
Linum macrocarpum	Large fruited flax	S2	
Lycopodium cernuum	Nodding clubmoss	S2	
Macranthera flammea	Flame flower	S3?	
Melanthium virginicum	Virginia bunchflower	S2S3	
Mikania cordifolia	Florida keys hempvine	S3S4	
Panicum nudicaule	Naked-stemmed panic grass	S2	
Paronychia erecta	Beach sand-squares	S1S2	
Paspalum monostachyum	Gulfdune paspalum	SU	
Peltandra sagittifolia	White arum	\$2\$3	
Petalostemon gracilis	Pine barrens prairie clover	S2S3	_
Physalis angustifolia	Coast ground-cherry	S3S4	
Pinguicula planifolia	Chapman's butterwort	S2	
Pinguicula primuliflora	Southern butterwort	S3	
Plantanthera blepharigiottis	Large white fringed orchid	S2	
Plantathera cristata	Crested gringed orchid	S3	
Plantathera integra	Yellow fringeless orchid	S3S4	
Polanisia tenuifolia	Slender-leaf clammy-weed	S1S2	
Polygala hookeri	Hooker's milkwort	S1S2	
Quercus myrtifolia	Myrtle-leaf oak	S1?	
Rhynchospora macra	Large beakrush	S3	-
Rhynchospora stenophylla	Chapman beakrush	S1?	
Ruellia noctiflora	Night-flowering ruellia	\$2	
Ruellia pedunculata spp pinetorum	Pine barren ruellia	S3	
Sarracenia leucophylla	Crimson pitcher-plant	S2S3	
Sorghastrum apalachicolense	Open indian grass	\$3	
Spiranthes longilabris	Giant spiral ladies'-tresses	S2S3	

Scientific Name	Common Name	State Rank	Federal Status
Stewartia malacodendron	Silky camellia	S3S4	
Stylisma aquatica	Water southern morning-glory	S1	
Syngonanthus flavidulus	Yellow pipewort	S2?	
Utricularia purpurea	Purple bladderwort	S2S3	1
Xyris chapmanii	Chapman's yellow-eyed grass	S2?	
Xyris drummondii	Drummond's yellow-eyed grass	S2	
Xyris flabelliformis	Fan-shaped yellow-eyed grass	รบ	
Xyris scabrifolia	Harper's yellow-eyed grass	S1S2	

Source: MNHP 2008

- S1 Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
- S2 Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
- \$3 Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).
- S4 Widespread, abundant, and apparently secure in the state, but with cause for long-term concern (more than 101 occurrences).
- S5 Demonstrably widespread, abundant, and secure in the state.
- SH Of historical occurrence in Mississippi, perhaps not verified in the past 20 years, and suspected to be extant. An element would also be ranked SH if the only known occurrence(s) were destroyed, or if it had been sought extensively and unsuccessfully looked for. Upon verification of an extant occurrence, SH ranked elements would typically receive an S1 rank.
- SR Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.
- SU Possibly in peril in Mississippi but status uncertain; need more information. May also be represented by \$?.
- \$? Unranked: Element is not yet ranked in the state.
- SX Element is believed to be extirpated from the state.
- SE Exotic: An exotic established in the state; may be native in nearby regions (e.g. pecans along the eastern seaboard of the U.S.)
- SA Accidental: accidental or casual in the state (i.e., infrequent and far outside usual range).
- SZ Zero occurrences in the state. Not of practical conservation concern in the state, because there are no definable occurrences, although the taxon is native and appears regularly in the state.
- SP Potential: Element potentially occurs in the state but no occurrences reported.
- SR Reported: Element reported in the state but without persuasive demonstration which would provide a basis for either accepting or rejecting (e.g. misidentified specimen) the report.
- SRF Reported falsely: Element erroneously reported in the state and the error has persisted in the literature.
- **HYB** Hybrid: Element represents hybrid of species.
- SSYN Synonym
- ? Inexact
- C Captive or Cultivated

Breeding Status: (Applicable to migratory species, malnly birds, but also includes sea turtles, some lish, and some insects).

- B Breeding Status
- N Non-breeding Status

Wetlands Technical Report

FINAL WETLANDS TECHNICAL REPORT

CANAL NO. 1 CHANNEL MODIFICATIONS LONG BEACH WATER MANAGEMENT DISTRICT HARRISON COUNTY, MISSISSIPPI

April 2009



Prepared By:

ERG

Environmental Research Group, LLC

FINAL

Wetlands Technical Report Canal No. 1 Channel Modifications Long Beach Water Management District Harrison County, Mississippi

April 2009

Prepared for:

Neel-Schaffer, Inc.

and

Long Beach Water Management District

Prepared by:
Environmental Research Group, LLC
Centreville, Mississippi

TABLE OF CONTENTS

ACRONYMS/ABBREVIATIONSi
1.0 INTRODUCTION 1- 1.1 Background 1- 1.2 Project Objective 1- 1.3 Clean Water Act 1- 1.4 Interim Regional Supplement 1-
2.0 METHODS2-
3.0 RESULTS 3- 3.1 Vegetation 3- 3.2 Soils 3- 3.3 Hydrology 3- 3.4 Jurisdictional Areas Affected 3-
4.0 SUMMARY
5.0 REFERENCES CITED
List of Figures
Figure 1. Canal No. 1 Channel Modification Study Area
List of Tables
Table 1. Summary of Potential Wetlands and Walers of the U.S3-2
APPENDICES
APPENDIX A. Photographs of the Project Area APPENDIX B. Plant Species Observed APPENDIX C. Data Sheets

Canal No. 1 Channel Modifications

Final Wetlands Technical Report

ACRONYMS/ABBREVIATIONS

EIS	Environmental Impact Statement
ERG	Environmental Research Group, LLC

FAC Facultative

FACU Facultative Upland FACW Facultative Welland

GIS Geographic Information System
GPS Global Positioning System

LBWMD Long Beach Water Management District

NSI Neel-Schaffer, Inc.

NRCS Natural Resources Conservation Service

OBL Obligate Wetland
PEM Palustrine Emergent
PFO Palustrine Forested
POW Palustrine Open Water
PSS Palustrine Scrub Shrub

ROW Right-of-Way

SEIS Supplemental Environmental Impact Statement

USACE U.S. Army Corps of Engineers USDA U.S. Department of Agriculture USGS U.S. Geological Survey

UPL Upland

1.0 INTRODUCTION

1.1 Background

Canal No. 1 is a man-made canal that was constructed in 1918 near Long Beach in Harrison County, Mississippi. The 4.7 mile section of Canal No. 1 proposed to be modified begins near the U.S. Navy Construction Battalion Base and continues west to Espy Avenue (Figure 1).

An Environmental Impact Statement (EIS) was conducted in 1989, encompassing work on Canal No. 1, Canal No. 2, and Canal No. 3. The improvements to Canal No. 2 and 3 have been completed. A Supplemental EIS (SEIS) is being prepared to update the EIS work previously prepared for Canal No. 1. The proposed project is needed to reduce costs and impacts to families from flood damages. The purpose of the SEIS will be to review and update current conditions of the study area and evaluate impacts from the proposed project.

The Long Beach Water Management District (LBWMD) proposes to modify the existing canal through construction of channel modifications. These modifications include structural measures to enlarge portions of the existing channel and perform selective snagging along the remainder of the channel. The proposed project consists of 3.8 miles of channel enlargement of earth-lined channel and 0.2 miles of rock riprap lined channel. The earth-lined channel will have 3 to 1 side slopes and bottom widths ranging from 30 to 40 feet. The rock riprap-lined reach is planned due to limited right-of-way (ROW) widths. Selective snagging will be performed along 0.7 miles of Canal No. 1 to remove log jams, free or affixed logs, and rooted trees in danger of falling into the channel. Hardwood species would be planted in the ROW areas along the canal and within the Long Beach Industrial Park. The channel would be constructed with 3:1 side slopes to encourage establishment of vegetation. This vegetation would reduce bank erosion and improve sediment trapping. Also, sediment traps will be placed at the lower end of the channel to reduce downstream travel of sediment during and following construction.

1.2 Project Objective

Environmental Research Group, LLC (ERG), a sub-consultant to Neel-Schaffer, Inc. (NSI), was tasked by the Long Beach Water Management District to provide a delineation of the jurisdictional wetlands and waters of the U.S. within the proposed project area.

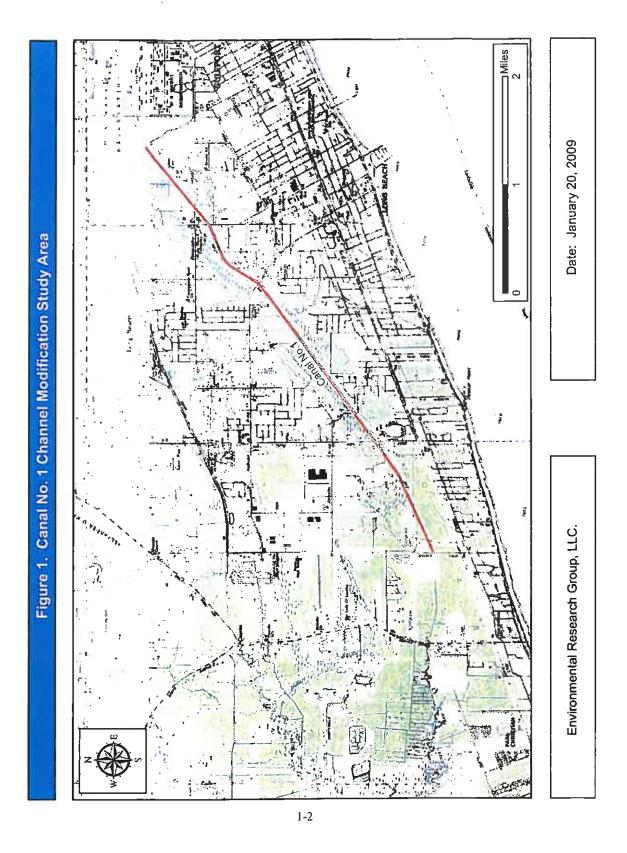
1.3 Clean Water Act

The objective of the Clean Water Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the U.S. Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into waters of the U.S., including deepwater habitats, special aquatic sites, and wellands. The U.S. Army Corps of Engineers (USACE) has the authority to make decisions regarding the jurisdictional status of a wetland. Therefore, the USACE should be contacted prior to disturbance of any area investigated during this preliminary effort.

Canal No. 1 Channel Modifications

Final Wetlands Technical Report

135



Potential jurisdictional wellands were investigated utilizing the three-parameter approach for a routine on site determination as defined by the USACE (Environmental Laboratory 1987).

The USACE defines wetlands as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

In order for an area to be considered a jurisdictional welland by the USACE, it must have evidence of hydrophytic vegetation, hydric soils, and welland hydrology. Under normal circumstances (site not altered in the last 5 years), the absence of any one of these three parameters results in a non-welland determination. If disturbed conditions are present, then consideration must be given to what conditions would have been present had the disturbance not occurred.

1.4 Interim Regional Supplement

On December 17, 2008 the USACE announced by public notice the publication and one-year trial implementation period of the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region to the 1987 Wetland Delineations Manual. This supplement provides technical guidance and procedures for identifying and delineating wetlands that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act. Thirty days after the public notice, the Supplemental data forms and indicators must be used for any data collection for wetland delineations. The Atlantic and Gulf Coastal Plain Region consists of all or portions of the District of Columbia and the following states: Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, New Jersey, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, and Virginia (Environmental Laboratory, 2008).

Since the field effort for this project was collected prior to this notice using the 1987 Manual, and has not yet been submitted to the Corps it will be grandfathered. Documentation must be submitted to the Corps which shows the field data was collected prior the 30 days for the date of the public notice in order to qualify for the grandfather provision. Once documentation and field data have been reviewed and approved be the Corp, a written determination will be issued (USACE 2008).

2.0 METHODS

ERG biologists conducted a preliminary investigation with on-site inspections along 4.7 miles of Canal No. 1 and a 125-foot wide corridor on each side of the existing canal on October 13-16, 2008. The limits of the wetlands and waters of the U.S. identified in this report were mapped using a Trimble GeoXH global positioning system (GPS) unit and the data was input into a geographic information system (GIS) program for analysis. Photographs of the project area are located in Appendix A, plant species observed are located in Appendix B, and data sheets of the wetlands are located in Appendix C.

An ERG biologist met with Mr. John McFadden of the USACE, Mobile District on March 23, 2009 to verify our findings. Mr. McFadden recommended a couple of changes to the original delineation. ERG biologists revisited the proposed project area on April 22, 2009 to evaluate the USACE recommendations. Changes were made and have been incorporated in this report.

Plant communities and dominant plant species were identified to determine the presence of hydrophytic vegetation. The National List of Plant Species that Occur in Wetlands (Reed 1988) was used to determine the indicator status of dominant plant species. Plants were classified as obligate welland (OBL), facultative welland (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL) species. Hydrophytic vegetation is prevalent in an area when the dominant species comprising the plant community or communities are typically adapted for life in saturated soil conditions (Environmental Laboratory 1987).

Wetland hydrology was determined by on-site visual observation of geomorphic and hydrologic characteristics including inundation, saturation, water marks, drift lines, drainage patterns, oxidized root channels, and water stained leaves. Additionally, soil pits were dug to determine if soil saturation was present in non-inundated areas at the time of the survey.

Soil profiles were examined for hydric soil indicators to determine if hydric soils were present. Additional soils information was taken from the Soil Survey of Harrison County, Mississippi (U.S. Department of Agriculture 1975). A list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office.

3.0 RESULTS

ERG Biologists conducted a field investigation on October 13-16, 2008. The study area included 4.7 miles of the existing canal and a 125-foot wide corridor on each side of the existing canal.

3.1 Vegetation

Vegetational characteristics of the proposed project area vary according to landscape position. The undeveloped areas include upland mixed forest or maintained pasture. Vegetation near the canal is typically mature upland hardwood/pine forest with a dense shrub layer. The study area has many downed trees most likely a result of Hurricane Katrina. Paralleling the canal is a maintained electrical power line right-of-way (ROW) that consists of herbaceous species.

Vegetation along the canal is characterized by a community dominated by mature upland hardwoods with scattered pines and a dense shrub layer. This community consists of mature and immature water oak (*Quercus nigra*), willow oak (*Quercus phellos*), southern red oak (*Quercus falcata*), sweetgum (*Liquidambar styraciflua*), live oak (*Quercus virginiana*), magnolia bay (Magnolia virginiana), Chinese tallow (*Triadica sebifera*), red maple (*Acer rubrum*), persimmon (*Diospyros virginiana*), blackgum (*Nyssa sylvatica*), loblolly pine (*Pinus taeda*), and black willow (*Salix nigra*). Chinese privet (*Ligustrum* sinense) and devils walking stick (*Aralia spinosa*) exist throughout the shrub layer, and peppervine (*Ampelopsis arborea*), roundleaf greenbrier (*Smilax rotundifolia*) and blackberry (*Rubus* spp.) are common vines mixed throughout.

Common rush (Juncus effusus), smartweed (Polygonum spp.), bushy bluestem (Andropogon glomeratus), eastern baccharis (Baccharis halimifolia), titi (Cyrilla racemiflora), beaked rush (Rhynchospora corniculata), and St. Johnswort (Hypericum cistifolium), Alligator weed (Alternanthera philoxeroides), and arrowhead (Sagitteria sp.) are commonly found along the edge of the canal and in wetland areas.

Vasey's grass (Paspalum urvillei), dallisgrass (Paspalum dilatatum), dogfennel (Eupatorium capillifolium), goldenrod (Solidago altissima), giant goldenrod (Solidago gigantea), pokeweed (Phytolacca americana), cogon grass (Imperata cylindrica), wax myrtle (Morella cerifera), little bluestem (Schizachyrium scoparium), and Bermuda grass (Cynodon dactylon) were noted within the power line ROW and in maintained pastures.

Sample Plots A, B, C, D, E, and U1 support hydrophytic vegetation (Appendix C). Hydrophytic vegetation is prevalent when more than 50 percent of the dominant species at a sample plot are OBL, FACW, or FAC.

3.2 Soils

The NRCS Soil Survey for Harrison County was reviewed to determine general soil types found within the proposed alignment (USDA 1975). A list of hydric soils in the area was obtained from the local Natural Resources Conservation Service (NRCS) office. Hydric soils within the corridor include: Atmore silt loam (At), Hyde silt loam (Hy), Plummer loamy sand (Pm), and Ponzer and Smithton soils (Pa). A hydric soil is defined as a soil that is formed under conditions of saturation, flooding, or ponding long enough

Canal No. 1 Channel Modifications

Final Wetlands Technical Report

during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory, 1987). Low-chroma color, an indicator of hydric soils, was observed at all Sample Plots.

3.3 Hydrology

Hydrology throughout the project corridor has been influenced by residential and commercial development resulting in localized modifications to drainage patterns. Hydrology indicators observed in the project corridor included inundation, saturation in the upper twelve inches, drainage patterns in wetlands, oxidized root channels in the upper 12 inches, and water-stained leaves. Sample Plots A, B, C, D, and E showed indications of hydrology. Indicators observed included inundation, saturation in the upper 12 inches, drainage patterns, sediment deposits, water-stained leaves, and oxidized root channels in the upper 12 inches. Plots U1 and U2 showed no indications of hydrology (Appendix C).

3.4 Jurisdictional Areas Affected

The proposed project would have direct impacts to jurisdictional wetlands and waters of the U.S. Based on our observations, potential jurisdictional areas that would be affected by the proposed project total 2.72 acres of wetlands, 2.89 acres of ponds, 4.56 miles of Canal No. 1, and 3,647 linear feet (0.7 miles) of ditches (Figure 2-1 thru 2-6). A summary of potential jurisdictional features identified within the study area are presented in Table 1.

Table 1.
Potential Jurisdictional Features Identified within the Study Area

	РОТ	ENTIAL IMPA	стѕ
FEATURE	Waters	Wetlands	Open Water
Canal No. 1	4.56 miles (24,062 feel)		
Ditches	0.7 miles (3,647 feet)		
Ponds			2.89 acres
Wetlands		2.72 acres	
Total	5.26 miles (27,709 feet)	2.72 acres	2.89 acres

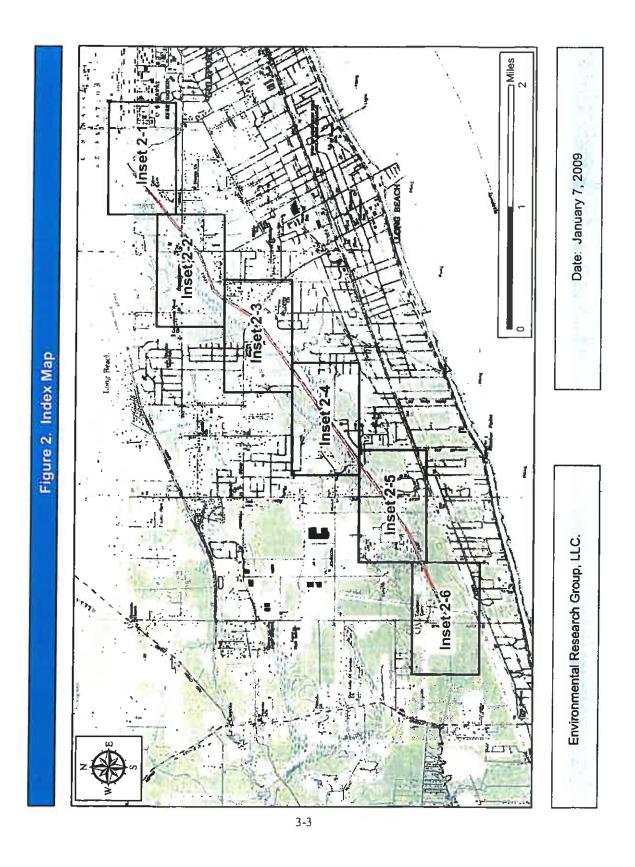
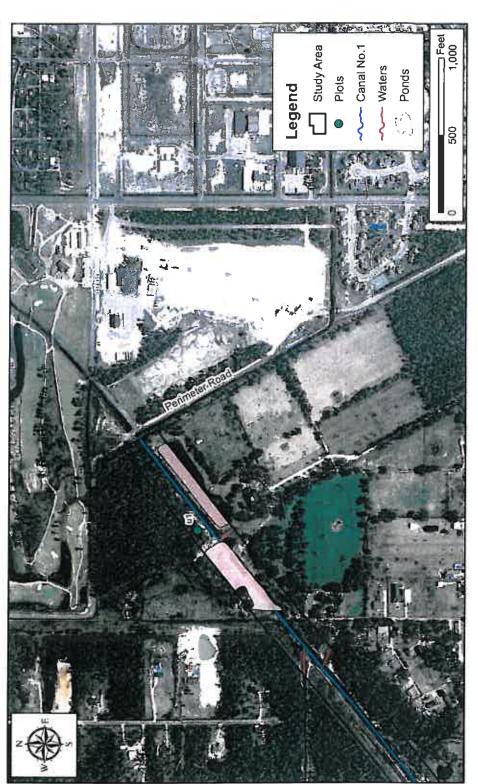


Figure 2-1. Potential Jurisdicitonal Features within the Study Area



Date: January 7, 2009

Environmental Research Group, LLC.



Date: January 7, 2009

Environmental Research Group, LLC.

Date: April 23, 2009



Environmental Research Group, LLC.

Date: April 23, 2009

Environmental Research Group, LLC.

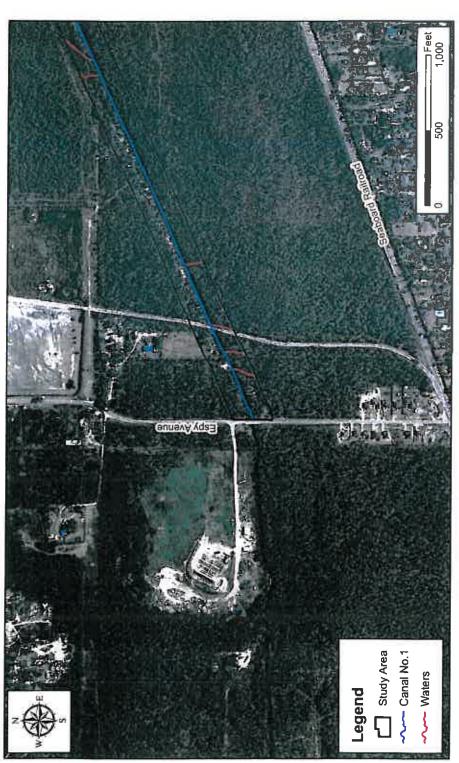


Figure 2-5. Potential Jurisdicitonal Features within the Study Area



Date: January 7, 2009

Environmental Research Group, LLC.



Date: January 7, 2009

Environmental Research Group, LLC.

4.0 SUMMARY

Potential jurisdictional wetlands and waters of the U.S. have been identified within the proposed corridor. ERG biologists conducted a preliminary investigation with on-site inspections along 4.7 miles of Canal No. 1 and a 125-foot wide corridor on each side of the existing canal on October 13-16, 2008. An ERG biologist met with Mr. John McFadden of the USACE, Mobile District on March 23, 2009 to verify our findings. Mr. McFadden recommended a couple of changes to the original delineation. ERG biologists revisited the proposed project area on April 22, 2009 to evaluate the USACE recommendations. Changes were made and have been incorporated in this report.

A lotal of 2.72 acres of jurisdictional wetlands, 2.89 acres of ponds, and 5.26 miles of waters of the U.S. were identified within the project area. Any changes or additions to the study corridors would need to be reevaluated as necessary.

The USACE has the authority to make the final decision regarding the jurisdictional status of wetlands and waters of the U.S. NSI should review this report. Once approved internally, NSI should submit this report to the USACE for their concurrence and to determine the appropriate permit requirements prior to the disturbance of any jurisdictional areas.

5.0 REFERENCES CITED

- Environmental Laboratory. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. ERDC/EL TR-08-30. US Army Corp of Engineers Engineer Research and Development Center. Vicksburg, MS. 175 pp. + append.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. + append.
- Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands: Southeast (Region 2). U.S. Department of Interior, Fish and Wildlife Service. Biological Report 88(26.2). 124 pp.
- U.S. Department of Agriculture. 1975. Soil Survey of Harrison County, Mississippi. Prepared by the Natural Resources Conservation Service.
- U.S. Army Corps of Engineers. 2008. Public Notice No.: CENAP-OP-R. Application No.: Draft Atlantic & Gulf Coast Regional Supplement to the 1987 Wetland Delineation Manual. December 17, 2008. Internet Website http://www.nap.usace.army.mil/cenap-op/regulatory/spn/spn/8 Final Regional Supplement.pdf

APPENDIX A Photographs of the Project Area



Photo 1. Canal No. 1 at Commission Road crossing.



Photo 2. Ephemeral ditch (Waters 2).



Photo 3. Pond (Waters 3) on Canal No. 1. View of overflow.

A-1



Photo 4. Pond created by dam on Canal No. 1 (Waters 3).



Photo 5. Pond on Canal No. 1 (Waters 4) near boundary of Naval Reserve Base.



Photo 6. Sample Plot U1.

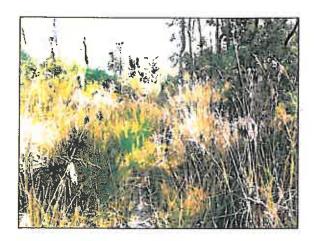


Photo 7. Palustrine Emergent/Palustrine Scrub-Shrub Wetland (Sample Plot A).



Photo 8. Palustrine Emergent Wetland (Sample Plot B).



Photo 9. Palustrine Emergent Wetland (Sample Plot C).



Photo 10. Palustrine Emergent Wetland (Sample Plot D).



Photo 11. Palustrine Emergent Wetland (Sample Plot E).



Photo 12. Ephemeral ditch (Waters 7).



Photo 13. Intermittent ditch (Waters 15).



Photo 14. Beaver dam in Canal No. 1.



Photo 15. Sample Plot U2.

A-5

APPENDIX BPlant Species Observed

Species	Common Name	Growth Habit	Indicator Status
Andropogon glomeratus	bushy bluestem	Н	FACW+
Baccharis halimifolia	eastern baccharis	Н	FAC
Betula nigra	river birch	T/S	FACW
Callicarpa americana	American beautyberry	S	FACU-
Campsis radicans	trumpet creeper	V	FAC
Carya illinoinensis	pecan	T/S	FAC+
Carya texana	black hickory	T/S	UPL
Cyperus spp	flatsedge	Н	OBL
Diospyros virginiana	persimmon	T/S	FAC
Eupatorium capillifolium	dogfennel	Н	FACU
Fagus grandifolia	American beech	T/S	FACU
Gleditsia triacanthos	honeylocust	T/S	FACW
Impatiens capensis	jewel weed	Н	FAC-
Juncus effusus	common rush	Н	FACW+
Juniperius virginiana	eastern redcedar	T/S	FACU-
Liquidambar styraciflua	sweetgum	T/S	FAC+
Lonicera japonica	Japanese honeysuckle	Н	FACU
Morus rubra	red mulberry	Т	FAC
Paspalum notatum	bahiagrass	Н	FACU+
Pinus echinata	shortleaf pine	Т	UPL ,
Pinus taeda	toblotly pine	Т	FAC
Platanus occidentalis	American sycamore	Т	FACW-
Polygonum spp	smartweed	Н	OBL
Populus deltoides	eastern cottonwood	Υ	FAC+
Pueraria montana	kudzu	V	NI
Quercus alba	white oak	T/S	UPL
Quercus falcata	southern red oak	T	FACU-
Quercus nigra	water oak	T/S	FAC
Quercus phelios	willow oak	Т	FACW-
Quercus stellata	post oak	Т	FACU
Rubus spp.	blackberry	S	FAC
Rhus copallinum	winged sumac	S	NI
Sapium sebiferum	Chinese tallow	S	FAC
Saururus cernuus	lizard's tail	Н	OBL
Salix nigra	black willow	T	OBL
Sassafras albidium	sassafras	T/S	FACU
Smilax rotundifolia	greenbrier	H/V	FAC
Solidago spp.	goldenrod	S	FACU+
Sorghum halepense	Johnsongrass	Н	FACU
Taxodium distichum	bald cypress	Т	OBL
Toxicodendron radicans	poison ivy	V	FAC
Ulmus alata	winged elm	T/S	FACU+
Ulmus americana	American elm	T/S	FACW

APPENDIX C Data Sheets

Project/Site: Applicant/Owner: Investigator	Long Brach Canal #1 Long Brach Luter Managem 5. Smith, P. Wetterville	ent District	County: 4	0-14-08 arrison US	
Is the site signification is the area a potential to the site area and the site of the sit	stances exist on the site? ntly disturbed (Atypical Situation)? ntial Problem Area? Itain on reverse.)	Yes 60	Community ID: Transect ID: Plot ID.	PEM/I	255
VEGETATION				Pho	to#14
7. Rubus loui 8. Cyclia vack	Stitus H FACW Stitus H FACW ALERA H FACW ALERA H FACW ALERA CONTRICULATED OBC STATUS H FACW ALERA H FACW AL	Dominant Plant Species 9.		Stratum	Indicator FACW +
Stream, L Asrial Pho Other No Recorded D Field Observations Depth of Surfac Depth to Free N	tala Avašable : DEME (in.) Water In Pit; > (In.)	Water Mark Drift Lines Sediment D Drainage P Secondary Indicato Oxidized R Water-Stale Local Soil S FAC-Neutri	n Upper 12 Inches ts Deposits atterns in Wetlands rs (2 or more require col Channels in Upper ted Leaves Survey Data	•	
Two prima	ry and one secondar	y indicators	observed		

DILS				Plot A, Photo # 14
Map Unit Name (Series and Phase):	Ponzer & Smith	ton sals (PS)	Oralnage Class	very poorly drained
Taxonomy (Subgroup)	Terric Mediso	prists	Confirm Mapped Type?	Yes No
Profile Descriptions:			AA Ma Ab Jadaa ad	Today Occasions
Depth	Matrix Color	Mottle Colors	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
(inches) Horizon	(Munsell Moist)	(Munsell Moist)	NON Q	Sandy Joan
0-16 1		A)me		301114 9444
Hydric Soil Indicators. Histosol Histic Epipedon Sulfidic Odor Aquic Moisture Regim X Gleyed or Low-Chrom		Organic Listed o	ions ganle Content In Surface Laye Streaking in Sandy Soils n Local Hydric Soils List explain in Remarks)	er in Sandy Soils
Remarks LOW CHYOMO ETLAND DETERMINATION	colors alosen	ved		
Hydrophytic Vegetation Press Wetland Hydrology Present? Hydric Soils Present?		(Circle)	ampling Point Within a Wellar	nd? (Circle)
Remarks	teria met ->	Tucisdicti	ona l	
UN GMEE ON	exic her	, 5 (1, 100, 10)		

Project/Site: Long Banch Cam 1 # 1 Applicant/Owner: Long Beach Water Maragethi Investigator: 5. Smith, F. Aletterville	ent District	County:	0-14-08 -a mison Ms
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes No Yes Qd Yes No	Community ID: Transect ID: Plot ID:	B
VEGETATION			Photo# 15
Dominant Plant Species 1. Phyn Chestora Cornic white H 2. Julius effusius H 3. Polygonum hydroforoides H 4. Hyparicum Cishfolium H 5. Tradica sebitera T 6. Cyrila vacemi flora H 8.	Dominant Plant Species 9, 10, 11, 12, 13, 14, 15, 16,		
HYDROLOGY Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other		n Upper 12 Inches	
No Recorded Data Available Field Observations: Depth of Surface Water: Surface (in.) Depth to Free Water in Pit: Surface (in.)	Secondary Indicato Oxidized R Water-Stair Local Soil S FAC-Neutre	Deposits atterns in Wetlands rs (2 or more requir oot Channels in Up ned Leaves Survey Data	ed):
Depth to Saturated Soil: Surface (in.)			

	Atmore 5:11	1 0.0	Drainage Class	poorly drained
			Field Observations	- Pool 4 - Charles
Taxonomy (Subgroup)	Plinthic Po	leagurits	Confirm Mapped Type?	Yes No
Profile Descriptions.				
Depth	Matrix Color	Mottle Colors	Mottle Abundance/	Texture, Concretions,
(inches) Horizon	(Munsell Molst)	(Munsell Moist)	Size/Contrast	Structure, etc.
)-16	101831			
Hydric Soil Indicators:				
Histosol		Соя	ncretions	
Histic Epipedon		Hig	h Organic Content in Surface Lay	er in Sandy Soils
Sulfidic Odor		Org	ganic Streaking in Sandy Soils	
Sulfidic Odor Aquic Moisture Regime	•		ganic Streaking in Sandy Soils ted on Local Hydric Soils List	
		List		
Aquic Moisture Regime Gleyed or Low-Chroma		List	ted on Local Hydric Soils List	
Aquic Moisture Regime		List	ted on Local Hydric Soils List	
Aquic Moisture Regime Gleyed or Low-Chroma	Colors	List	ted on Local Hydric Soils List	
Aquic Moisture Regime Gleyed or Low-Chroma Remarks	Colors	List	ted on Local Hydric Soils List	
Aquic Moisture Regime Gleyed or Low-Chroma Remarks Low - Chroma	colors obser	List Oth	ted on Local Hydric Soils List	nd? (Circie)
Aquic Moisture Regime Gleyed or Low-Chroma Remarks LOW-Chroma TLAND DETERMINATION Hydrophytic Vegetation Present? Hydric Solls Present? Remarks	no No	List Oth	led on Local Hydric Soils List ner (Explain in Remarks)	
Aquic Moisture Regime Gleyed or Low-Chroma Remarks LOW-Chroma TLAND DETERMINATION Hydrophytic Vegetation Present? Hydric Solls Present?	no No	List Oth	led on Local Hydric Soils List ner (Explain in Remarks)	

Investigator. S. Swith E. Netterville	Ment District Date: 10-14-08	
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes No Community ID: PEM Yes No Plot ID: Plot ID:	
VEGETATION	Photo#1	6 6
Dominant Plant Species 1. Arundinaria aigantea H FACW 2. Phynchospora Yorniculata H OBL 3. Hypericum cistifolium H FACW 4. Schizachuriu m sceparium H FACW 5. Sorghum traleperise H FACU 6. Dictiontrelium acuminatum H FAC 7.	Dominant Plant Species Stratum Indicator 9. 10.	
TEM on Powerline right of - NO	iy	
✓ Recorded Data (Describe In Remarks):	Wetland Hydrology Indicators:	
Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations:	Primary Indicators: Inundated X Saturated in Upper 12 Inches Water Marks Drift Lines Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required):	
Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Avaitable	Inundated X Saturated in Upper 12 Inches Water Marks Drift Lines Sediment Deposits	
Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations: Depth of Surface Water: YLDYLL (in.)	Inundated X Saturated in Upper 12 Inches Water Marks Orifi Lines Sediment Deposits Drainage Patterns in Wetlands Secondary Indicators (2 or more required): X Oxidized Root Channels in Upper 12 Inches Water-Stained Leaves	

				Pot C. Photo
Map Unit Name (Series and Phase):	Amore silt		Oralnage Class Field Observations	poorly drained
Taxonomy (Subgroup)	Plinthic Pale	eaquults	Confirm Mapped Type?	Yes No
Profile Descriptions:				
Depth	Matrix Color	Mottle Colors	Mottle Abundance/	Texture, Concretions,
(inches) Horizon	(Munsell Moist)	(Munselt Molst)	Size/Contrast	Structure, etc.
O-1ce 1	10NR-311	NOME		schody loam
Hydric Soll Indicators: Histosol Histic Epipedon Sulfidic Odor Aquic Moisture Regirt Gleyed or Low-Chron		High Orga	retions Organic Content In Surface Laye nic Streaking in Sandy Soils d on Local Hydric Soils List ' (Explain in Remarks)	r in Sandy Soils
Remarks	colors observe			
COOL CHI SING				
TI AND DETERMINATION				
TLAND DETERMINATION	ant? (No (
	7 —7	,	s Sampling Point Within a Wellan	d? (Circle)
Hydrophytic Vegetation Present? Hydric Soils Present? Remarks	No No	ts this		24 ' '
Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present? Remarks	Mo No	ts this		24 ' '

Investigator 5 SMith, E. Netkerville	nt District	Date:	to-14-08 Harrison WS	1,414
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Alypical Situation)? Is the erea a potential Problem Area? (If needed, explain on reverse.)	Yes No Yes No Yes No	Community ID. Transect ID: Plot ID:	PEM	
VEGETATION			Photo	#18
1. Hypricum cistifolium H FACW 2. Schizachyrium Scopnium H FACUL 3. Magnolia Virginiana T FACW+ 4. Quercus niato T FACW+ 5. Solidago altifrima. H FACW+ 6. Euxadrium Capillahium H FACW 7. Dominthelium acuminatum H FACW 8. "Percent of Dominant Species that are OBL, FACW or FAC" 4/1=5 (excluding FAC-). Remarks: PEM on a power line right-y-way			Stratum	Indicator
HYDROLOGY				
HIDIOLOG.				
X Recorded Data (Describe in Ramarks): Streem, Lake, or Tide Gauge X Aerial Photographs Other No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: Inundated X. Saturated In Water Marks Drift Lines	Upper 12 inches		
X Recorded Data (Describe in Ramarks): Stream, Lake, or Tide Gauge X Aerial Photographs Other	Primary Indicators: Inundated X. Saturated In Water Marks Drift Lines Sediment De Drainage Pat Secondary Indicators Oxidized Roc Water-Staine Local Soil Su FAC-Neutral	Upper 12 Inches posits ttems in Wellands (2 or more require of Channels in Up ad Leaves urvey Data	red):	

SOILS				
Map Unit Name (Series and Phase): Taxonomy (Subgroup)	Panzer & Smith Terric Media		Drainage Class Field Observations Confirm Mapped Type?	Very prorty drained
		·		
Profile Descriptions: Depth (inches) Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc. Oranic Isand Sondy Iran
Hydric Soil Indicators Histosol Histic Epipedon Sulfidic Odor Aquic Moisture Regin		Organic Listed or	ions ganic Content in Surface Laye Streaking in Sandy Soils n Local Hydric Soils List xplain in Remarks)	er In Sandy Soils
Low chroma	colors obser	wed		
WETLAND DETERMINATION				
Hydrophytic Vegetation Pre- Welland Hydrology Present Hydric Soils Present?	7	(Circle)	ampting Point WithIn a Wella	(Circle) nd? (Fes No
all three c	literia met =	> Junisaliah	onal	
				Approved by HQUSACE 3/92

DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

	·	
Project/Site: Long Beach Canal No. 1 Applicant/Owner: Long Brach Water Man Investigator: 3. Smith & E. Netterwille	legement District	Date: 4/22/09 County: Harrison State: MS
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes (No Yes (No Yes (No	Community ID: PEM Transect IO: Plot ID: E
VEGETATION		
Dominant Plant Species Stratum Indicator 1. January ethnic H FACWY 2. Rubus lausianus H FACWY 3. Sapium Schiterum S FAC 4. Acer rubrum S FAC 5. Sulidaga giganta H FACW 5. Lanicare japanica H FACW 7. 8. Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC). Remarks. Maintained Power line 20	Oominant Plant Species 9	
HYDROLOGY		
Recorded Data (Describe in Remarks); Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations:	Wetland Hydrology Indicators Primary Indicators: Inundated Saturated in Upper Water Marke Drift Lines Sediment Deposits Drainage Patterns (2)	12 inches
Depth of Surface Water: Depth to Free Water in Pit: Depth to Saturated Soit: (n.)	Secondary Indicators (2 d Oxidized Root Cha Water-Stained Lear Local Soil Survey D FAC-Neutral Test Other (Explain In R	nnels in Upper 12 Inches vee Bata
Remarks: Fringe wetland near la	ke	

В2

Appendix B Blank and Example Cata Forms

SOILS	PlotE
Map Unit Name (Series and Phase): PONZET 3 Sm	
Profile Description: Depth (inches) Horizon (Munsell Moist) O-4 1 NA 4-16 Z 5Y611	Mottle Colors Mottle Abundance/ Munsell Motel) Size/Contrast Organic Texture, Concretions, Structure, etc. Organic
Hydric Soil Indicators: Historol Histic Epipedon Sulfidic Odor Aquic Mosture Regune Reducing Conditions Gleyed or Low-Chroma Colors	Concretions X High Organic Content in Surface Layer in Sandy Soils X Organic Streaking in Sandy Soils Listed on Local Hydric Soils List Listed on National Hydric Soils List Other (Explain in Remarks)
Four primary indic	ators observed

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Solls Present?	No (Circle) No No	(Circle) Is this Sampling Pount Within a Wetland?
Remarks: All three	criteria met	-D Jurisdictional

Approved by HQUSACE 3/92

Appendix B. Blank and Example Data Forms

вз

DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: Long boach Cona #1 Applicant/Owner: Long beach Water Manage Investigator: 5. Smith, E. Nettruille	ment District		10-14-0 Hercison MS	
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes Wo	Community ID: Transact ID: Plot ID:	UPL	
VEGETATION			Phototi	i V
Dominant Plant Species 1. Triadica Sebitera HIS FAC 2. Acet rubrum S FAC 3. Morella Cerifera S FAC+ 4. Pubuslovisionus H FAC 5. Overus nigra TIS FAC 6. Raccharis halimitalia H FAC 7. 8.	Dominant Plant Species 9. 10. 11. 12. 13. 14. 15.		Stratum	Indicator
upland area dominated by C	. tallow		_	
Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available	Water Mark	n Upper 12 Inches Is		
Field Observations: Depth of Surface Water:	Secondary Indicator Oxidized Ro Water-Stain Local Soil S FAC-Neutra	atterns in Wetlands rs (2 or more require ool Channels in Up; ved Leaves Survey Data	ed):	
Remarks: No indicators observed				

Map Unit Name (Series and Phase):	Atmore sil	Joan (At)	Drainage Class	poorly drained
Taxonomy (Subgroup)	Plinthic Pal	eaquults	Field Observations Confirm Mapped Type?	Yes No
Profile Descriptions: Depth	Matrix Color	Mottle Colors	Mottle Abundance/	Texture, Concretions,
(inches) Horizon	(Munsell Moist)	(Munsell Moist)	Size/Contrast	Structure, etc.
Hydric Soil Indicators. Histosol			retions	
Histic Epipedon Sulfidic Odor Aquic Moisture Regim Gleyed or Low-Chrom		Orga	Organic Content in Surface Laye nic Streaking in Sandy Soils d on Local Hydric Soils List r (Explain in Remarks)	er in Sandy Soils
Sulfidic Odor Aquic Moisture Regim Gleyed or Low-Chrom Remarks		Orga V. Liste Othe	nic Streaking in Sandy Soils d on Local Hydric Solls List	er in Sandy Soils
Sulfidic Odor Aquic Moisture Regime Gleyed or Low-Chrome Remarks Law - Qhrome TLAND DETERMINATION	na Colors O	Orga Liste Othe	nic Streaking in Sandy Soils d on Local Hydric Solls List	er in Sandy Soils
Sulfidic Odor Aquic Moisture Regim Gleyed or Low-Chrom Remarks	na Colors O	Orga Liste Othe	nic Streaking in Sandy Soils d on Local Hydric Solls List	(Circle)
Sulfidic Odor Aquic Moisture Regime Gleyed or Low-Chrome Remarks TLAND DETERMINATION Hydrophytic Vegetation Present? Hydric Solts Present? Remarks	ent? Ges No	Orga Liste Othe Othe Othe Othe Othe Othe Othe Ot	nic Streaking in Sandy Soils d on Local Hydric Solis List r (Explain in Remarks)	(Circle) nd? Yes

DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Applicant/Owner: UNA Bench Wary Managem Investigator: S. Smith, E. Netterville	ent District	Date: County: State:	10-16-08 Harrison MS	
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes No Yes No Yes No	Community II Transect ID: Plot ID:	o: UPL UB	
EGETATION		_	Photo	± 40
ominant Plant Species 1. Styli Fachi grium Scoparum H FACIL 2. Hypericum Cishi Silium H FACIL 3. Schidago Alfissima H FACIL 4. Cynaton dachylon H FACIL 5. 6. 7. 8. Percent of Dominant Species that are OBL, FACW or FACIL (excluding FAC).	Dominant Plant Species 9.			dicator
. Pasture on powerline right-of-	nay			
/DROLOGY X Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge	Wetland Hydrology India	5:		
/DROLOGY X Recorded Data (Describe in Remarks):	Wetland Hydrology India Primary Indicator Inundate	s: d d in Upper 12 Inch arks	15 15	
PROLOGY Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations:	Wetland Hydrology India Primary Indicator Inundate Saturate Water M. Drift Line Sedimen Drainage Secondary Indica	s: d in Upper 12 Incherts s 1 Deposits Patterns in Wellar tors (2 or more rec	nds julred):	
/DROLOGY X Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Y Aerial Photographs Other No Recorded Data Available	Wetland Hydrology Indicator Primary Indicator Inundate Saturate Water M Drift Line Sedimen Drainage Secondary Indica Water-Si Local So	s: d in Upper 12 Incher arks s 1 Deposits Patterns in Wellar tors (2 or more rec Root Channels in ained Leaves il Survey Data	nds julred):	
PDROLOGY X Recorded Data (Describe in Remarks): Stream, Laks, or Tide Gauge X Aerial Photographs Other No Recorded Data Available Field Observations: Depth of Surface Water:	Wetland Hydrology Indicator Primary Indicator Inundate Saturate Water M Drift Line Sedimen Drainage Secondary Indica Oxidized Water-Si Local So FAC-Net	s: d in Upper 12 Incher arks s 1 Deposits Patterns in Wellar tors (2 or more rec Root Channels in ained Leaves il Survey Data	nds julred):	

OILS				Plot U2, Photo # 40
Map Unit Name (Series and Phase): Taxonomy (Subgroup)	Plummer la	•	Drainage Class Field Observations Confirm Mapped Type?	Poorly drained
Profile Descriptions Depth (inches) Horizon () - (o •)	Matrix Color (Munsell Moist) 104R 5/2	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc. Sand
Hydric Soil Indicators. Histosol Histoc Epipedon Sulfidic Odor Aquic Molsture Regim		Organ	stions Irganic Content in Surface Lay c Streaking in Sandy Soils on Local Hydric Soils List Explain in Remarks)	yer in Sandy Soils
Remarks LOW CHADMO	colors obser	ved		
ETLAND DETERMINATION Hydrophytic Vegetation Prese Wetland Hydrology Present? Hydric Soils Present?	Yes (4) Yes (4) Yes (4) No	(Cîrcle)	Sampling Point Within a Wells	(Circle)
Remarks All Mull Cri	ilevia not m	ut -> Wonju	uidictional	
				Approved by HQUSACE 3/92

Phase I Cultural Resources Survey



PHASE I CULTURAL RESOURCES SURVEY FOR CANAL NO. 1 CHANNEL MODIFICATIONS, LONG BEACH WATER MANAGEMENT DISTRICT, HARRISON COUNTY, MISSISSIPPI



December 2008

EARTH SEARCH, INC. P.O. Box 770336 New Orleans, LA 70177-0336

Submitted to

Neel-Schaffer, Inc. 800 Jackson Avenue, Suite C Mandeville, LA 70448

PHASE I CULTURAL RESOURCES SURVEY FOR CANAL NO. 1 CHANNEL MODIFICATIONS, LONG BEACH WATER MANAGEMENT DISTRICT, HARRISON COUNTY, MISSISSIPPI

Ву

Jason Kennedy, Jeanne Marquez, and Rhonda L. Smith

Submitted by

Jill-Karen Yakubik, Ph.D., RPA Principal Investigator

Earth Search, Inc. P.O. Box 770336 New Orleans, LA 70177-0336

Prepared for

Neel-Schaffer, Inc. 800 Jackson Avenue, Suite B Mandeville, LA 70448

December 2008

ABSTRACT

Earth Search, Inc. (ESI), undertook a Phase I survey and cultural resources assessment for the proposed modifications to Canal No. 1, Long Beach, Harrison County, Mississippi, for Neel-Schaffer, Inc. Field investigations included pedestrian survey, judgmental shovel testing, and a architectural survey. The work was necessary as part of a supplemental Environmental Impact Statement (EIS). For the purposes of the archaeological survey the Area of Potential Effects (APE) consists of a 30 meter (m) (98.4 foot [ft]) area paralleling either side of the canal. The project area includes approximately 100.5 acres (A) (40.7 hectares [ha]). Shovel testing and pedestrian survey did not reveal any artifacts or culture-bearing strata in the project area. There is no evidence of archaeological deposits in the area. For the purposes of the architectural survey the APE includes a 400 m (0.25 mile [mi]) buffer of the canal totaling approximately 670.2 A (272 ha). The standing structure survey recorded one cemetery greater than 50 years of age within the APE. The National Register of Historic Places (NRHP) eligibility of the cemetery is undetermined. Proposed channel modifications will have no impact on the cemetery. The proposed modifications will have no affect on historic resources. No additional cultural resources investigations are recommended.

i

TABLE OF CONTENTS

CHAPTER I INTRODUCTION	1
CHAPTER 2 PREVIOUS INVESTIGATIONS	3
CHAPTER 3 FIELD INVESTIGATIONS	7
CHAPTER 4 CONCLUSIONS AND RECOMMENDATIONS	14
REFERENCES CITED	15

LIST OF FIGURES

Figure 1. Excerpts from the USGS Pass Christian and Gulfport NW, MS 1:24,000 topographic quadrangles showing the project area, in pink	2
Figure 2. Excerpts from the USGS Vidalia, Bay Saint Louis, Pass Christian, Gulfport S, Gulfport N, and Gulfport NW, MS 1:24,000 topographic quadrangles showing the project area, a one-mile buffer, and the locations of historic standing structures within approximately one-mile of the project area.	6
Figure 3. Typical shovel test profile	8
Figure 4. Excerpts from the USGS Pass Christian and Gulfport NW, MS 1:24,000 topographic quadrangles showing the location of Courtenay Cemetery in relation to the project area	9
Figure 5. Landscape of Courtenay Cemetery	10
Figure 6. Above-ground tomb (Reach's family vault)	11
Figure 7. Photo of granite obelisk	11
Figure 8. Folk grave marker	12
Figure 9. Folk grave markers	12
Figure 10. Photo of earliest grave marker.	13

LIST OF TABLES

Table 1. Previously Recorded Standing Structures Greater Than 50 Years of Age.....5

CHAPTER 1 INTRODUCTION

On October 15-17, 2008, Earth Search, Inc. (ESI), performed a Phase I survey and cultural resources management assessment for the proposed channel modifications to Canal No. 1, Long Beach Water District, Harrison County, Mississippi. The work was undertaken for Neel-Schaffer, Inc., as part of a supplemental Environmental Impact Statement (EIS). Both an archaeological and an architectural survey were performed. Prior to the commencement of fieldwork, a comprehensive literature search and records review was performed. Background research included examination of records on file at the Mississippi Department of Archives and History (MDAH), Jackson, Mississippi. Cultural resources reports, site files, and National Register of Historic Places (NRHP) records were reviewed for the project area. Also, previously recorded standing structures were reviewed. Geomorphological data, maps, and aerial photographs were examined and reviewed. Historical research included a review of available secondary documentation such as local and regional historic archives and records. This report provides the results of the background research and field investigations.

Project Area Description

The project area includes that part of Canal No. 1 that extends approximately 4.2 miles (mi) (6.8 kilometers [km]) eastward from Espy Avenue to just northeast of the intersection of Commission and Klondyke roads (Figure 1). For the purposes of the archaeological survey, the Area of Potential Effect (APE) was restricted to an area lying 30 meters (m) (98.4 feet [ft]) from each side of the canal and parallel to it. This includes approximately 100.5 acres (A) (40.7 hectares [ha]). For the purposes of the architectural survey, the APE includes a 400 m (0.25 mile [mi]) buffer of the canal totaling approximately 670.2 A (272 ha).

Report Organization

Chapter 2 presents previous investigations undertaken in the vicinity of the project area. Chapter 3 details the methodology and results of the field investigations. Chapter 4 provides ESI's conclusions and recommendations.

Final Supplemental Watershed Plan

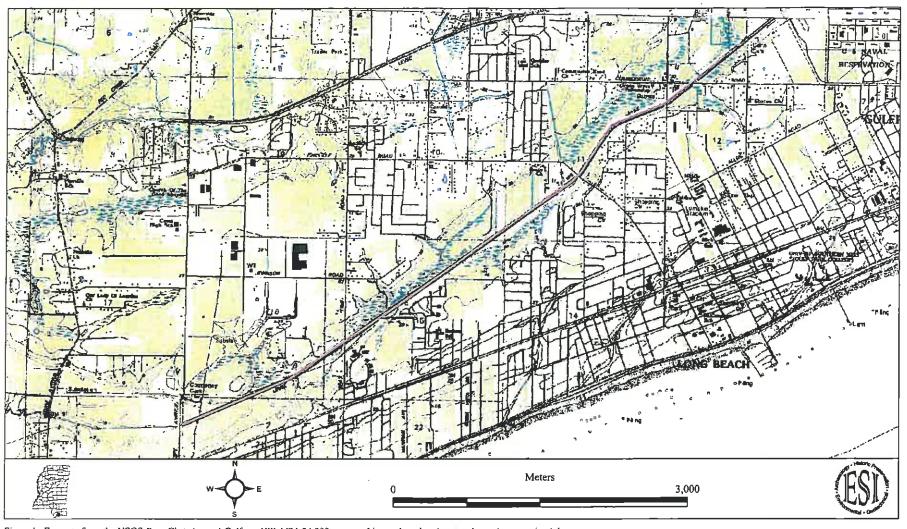


Figure 1. Excerpts from the USGS Pass Christian and Gulfport NW, MS 1:24,000 topographic quadrangles showing the project area, in pink.

2

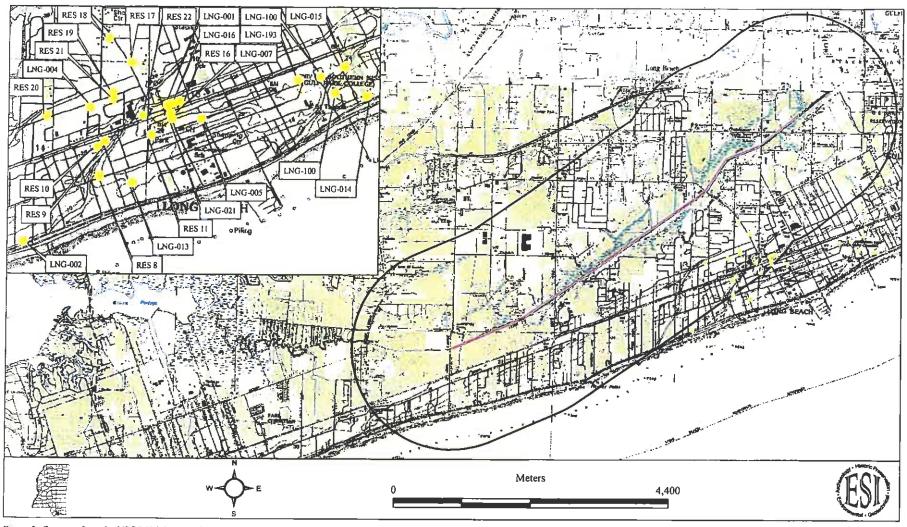


Figure 2. Excerpts from the USGS Vidalia. Bay Saint Louis, Pass Christian, Gulfport N, and Gulfport NW. MS 1:24,000 topographic quadrangles showing the project area, a one-mile buffer, and the locations of historic standing structures within approximately one-mile of the project area.

6

CHAPTER 2 PREVIOUS INVESTIGATIONS

Research at the MDAH, Jackson, revealed that 13 previous cultural resources surveys have been undertaken within one mile (1.6 km) of Canal No. 1. Also, one archaeological site and numerous standing structures greater than 50 years of age have been previously recorded within the buffer area. The previous investigations are summarized below. Table I at the end of this chapter lists the previously recorded structures. Four of the reports were not available at that time that the research was undertaken: Lauro 1988, Stowe and Stowe 2001a, Lauro 2007, and Lauro 2008a.

Mann 1993

On September 26, 1993, Cyril B. Mann Jr. conducted a survey for a proposed condominium in Harrison County, Mississippi. Pedestrian survey was conducted with shovel tests excavated at 20-m (65.62 ft) intervals over the 21 A (8.49 ha) tract of land. No cultural resources were identified during the course of this survey (Mann 1993).

Mann 1994a

On March 31 and April 1, 1994, Mann conducted a survey for a proposed construction site in Harrison County, Mississippi. The project area was a 20.15 A (8.15 ha) tract of land just to the north of U.S. 90. Pedestrian survey was conducted with shovel tests excavated at 25-m (82.02 ft) intervals. No cultural resources were identified during the course of this survey (Mann 1994a).

Mann 1994b

On June 15, 1994, Mann conducted a survey for Lewis and Mitchell, Inc., of a proposed site for in the Long Beach Industrial Park in Harrison County, Mississippi. The project area was a 150 A (3.56 ha) tract of land just to the east of Johnson Bayou. Pedestrian survey was performed with shovel tests excavated at 25-m (82.02 ft) intervals. No cultural resources were identified during the course of this survey (Mann 1994b).

Mann 1995

In August 1995, Mann conducted a survey for a proposed construction site in Harrison County, Mississippi. Pedestrian survey was conducted with shovel tests excavated at 25-m (82.02 ft) intervals over the 150 A (60.69 ha) project area. No cultural resources were identified during the course of this survey (Mann 1995).

Lauro 2000

In December 2000, James Lauro conducted a cultural resources survey in Harrison County, Mississippi. The project area was approximately 18 A (7.27 ha). Fieldwork included pedestrian survey and shovel testing at 20 meter-m (65.62 ft) intervals. One early- to midtwentieth century site was identified during survey; however, it was not assigned a site number by MDAH. No other cultural resources were recorded as a result of this survey (Lauro 2000).

Stowe and Stowe 2001b

On August 29, 2001, Noel and Rebecca Stowe conducted a cultural resources survey of a 12 A (4.85 ha) proposed development in Long Beach, Harrison County, Mississippi. The project

area was pedestrian surveyed with judgmental shovel tests excavated in high probability areas. Two structures were noted in the report but neither was stated as being greater than 50 years of age. No other cultural resources were identified (Stowe and Stowe 2001b).

Banguilan et al. 2007

In February 2007, FEMA conducted a Phase I survey for the Long Beach School District for the proposed construction of a new Harper McCaughan Elementary School because the original school was damaged beyond repair by Hurricane Katrina. The proposed project area consisted of 85.71 A (34.63 ha) on Commission Road. One site, 22HR973, was recorded during the course of fieldwork. It is believed to have been the historic location for the Hahn Brothers Nursery as historic artifacts consistent with the operation of a nursery and cement piers were located at the site. Site 22HR973 was considered ineligible for nomination to the NRHP. No other cultural resources were identified as a result of this survey (Banguilan et al. 2007).

Lauro 2008b

In February 2008, Lauro conducted a cultural resources survey for Waggoner Engineering in Harrison County, Mississippi. The project area was approximately 38 A (15.35 ha) and was pedestrian surveyed with judgmental shovel testing. No cultural resources were identified as a result of this survey (Lauro 2008b)

Lauro 2008c

In late April and early May 2008, Lauro conducted a cultural resources survey for Waggoner Engineering in Harrison County, Mississippi. The approximately 27 A (10.93 ha) project area was pedestrian surveyed and shovel tested. No cultural resources were identified as a result of this survey (Lauro 2008c).

Standing Structures

There have been 29 structures greater than 50 years of age recorded within one mile (1.6 km) of the project area (Table 1 and Figure 2). Of those, one is listed on the NRHP, three are considered eligible for nomination to the NRHP, and six are potentially eligible for nomination. A portion of the Scenic Drive Historic District, a National Register Historic District (NRHD), is also within the one mile buffer and along the Pass Christian gulf shore. All of the structures are located in and around the community of Long Beach.

Table 1. Previously Recorded Standing Structures Greater Than 50 Years of Age.

77	2						NRHP
State #	Property Name		Date	Use	Form	Style	Status
04/-LNG-001	Greenvale; W. J. Quarles Homeplace		1884	vacant	2 Story Cottage	Victorian	listed
047-LNG-002	Boggsdale	632-36 W. Beach Blvd.	c. 1865	N/A	N/A	N/A	N/A
047-LNG-004	Watts House	107 W. 4th Ave.	c.1890	res	N/A	N/A	potentially elimble
047-LNG-005	McGinnis-Wharton Hall; Long Beach Preshvierian Church		1036	145		Minimal	
	Hancock County Bank Building;		0001	2	Cottage Freestanding	Classical	incligible
047-LNG-007	Southern Star Lodge	126 Jeff Davis Ave.	1926	lodge	Commercial	Revival	eligible
(Greek	potentially
047-LNG-013	Rev. William T. Griffin House	426 Russell Ave.	1908	res	2 Story Central Hall	Revival	eligible
047-LNG-014	Oakhaven	822 E. Beach Blvd.	c. 1900	res	Oueen Anne Cottage	Victorian	potentially
047-LNG-015		134 Beach Park Pl.	1930	res	N/A	Г	cligible
047-LNG-016		Next to 122 E. Railroad Ave.	c. 1850	res	Farm House	N/A	N/N
047-LNG-021	Beach City Hall	201 Jeff Davis Ave.	A/N	A/A	N/A	N/A	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
047.T MG 100	ampus, University of		-0061				
- 1	Suppli	Gull Park College	1956	8	Multiple	Multiple	N/A
047-LNG-101		Y X	۷/2 2/3	4/2	4/N	V.V.	V /V
ı	Lloyd Hall, Gulf Park Campus,		Τ			Unit	444
047-LNG-103		N/A	N/A	N/A	N/A	N/A	N/A
Resource #8		426 Magnolia St.	c. 1920 res		N/A	N/A	ineligible
Resource #9			c. 1925 res	Γ	N/A	N/A	ineligible
Resource #10	Long Beach Cemetery	Girard St. & W. 1st St.	late 19th C	Een	Brick-masonry tombs & stone headstones	A/N	ineliaible
Resource #11		Pine St. W. of Church St.	c. 1935	Γ	N/A	tsman	ineligible
Resource #16	H. Y. Ouarles House	124 E. Bailroad St	7001	780	W/N	*	potentially
Resource #17			7	Γ	N/A	Craffeman	ineligible
		ite Park	\mathbf{T}			TIMITE TO TO	men Erore
Resouce #18		Lanc	c. 1925	res	N/A	Craftsman	ineligible
Resource #19			c. 1900	res	L-shape	т	Y/X
Resource #20		620 W. Old Pass Rd.	c. 1905	res	Front-gable		N/A
Resource #21	Mt. Pilgrim Missionary Baptist Church 306 w. old Pass Rd.		1938	acc	N/A	N/A	N/A
Kesource #22		220 Railroad St.	c. 1905	res	N/A	Craftsman	N/A

Ľ

CHAPTER 3 FIELD INVESTIGATIONS

Archaeological Survey

Methods. Field investigations in the project area consisted of pedestrian survey and judgmental shovel testing. Two transects, one on either side of the canal, were surveyed. These transects were located within 30 m (98.4 ft) of the canal bankline. Shovel testing was restricted to high probability areas defined on the basis of the local geomorphology. Shovel tests measured 30 centimeters (cm) (12 inches [in]) in diameter and were excavated to a maximum depth of 50 cm below surface (cmbs) (20 inbs). Excavated soils were screened through 0.25 in (6.4 mm) mesh. The stratigraphic associations in each shovel test were recorded using standard nomenclature. Shovel tests were backfilled upon conclusion.

Results. Along 50-70 percent of the canal, unimproved roads and cleared residential properties parallel the canal alignment and provided excellent ground visibility for the pedestrian survey. Although modern debris (e.g. bottles, cans, etc.) was scattered lightly throughout the area, no artifacts were noted during the pedestrian survey. Shovel tests in the high probability areas revealed two strata (Figure 3). Stratum I is a mixed 10YR 3/2 (very dark grayish brown) and 10YR 7/1 (light gray) sand (0-35 cmbs [0-13.8 inbs]). Stratum II is a 10YR 71 (light gray) sand (35-50 cmbs [13.8-20 inbs]). All shovel tests were negative. Also, there is no evidence of culture-bearing strata in the project area.

Architectural Survey

For the purposes of the architectural survey an APE of 400 m (0.25 mi) was established (200 m [0.125 mi] to either side of the centerline). Within the APE, all standing structures greater than 50 years of age were recorded utilizing MDAH Historic Resource Inventory forms. Photographs were taken using a Nikon digital camera. A single cultural resource, a historic/modern cemetery was recorded in the APE (Figure 4). The Resource Inventory form for this property is included in Appendix A.

Courtenay Cemetery. This unmarked cemetery is approximately 100 m (328.1 ft) due east of Espy Avenue with no apparent entrance (Figure 5). The roughly square-shaped parcel is accessed via an easy-to-miss, unmarked gravel lane. There is no gateway or other type of formal entrance. The cemetery seems completely unplanned, with markers randomly placed and no drives or site features other than shade trees. There are approximately 50 marked burials, but the names are indiscernible on some. All but one burial is below ground. It is apparent by the style of construction that the single, above-ground, brick-masonry tomb is the oldest in the cemetery, however, it has no visible date (Figure 6). The only other high-style marker is a granite obelisk (Figure 7). Of the remaining modern headstones, the majority are the more mainstream, granite markers while there are several simple, folk-style markers of poured concrete or those covered in tile (Figures 8 and 9). The cemetery evolved in a few phases. The earliest burial is dated 1892 while the majority came in three waves between 1950 and 1980 (Figure 10). This nearly hidden cemetery lies at the very edge of the 0.125 mi buffer, therefore, channel modifications will have no effect on the property.

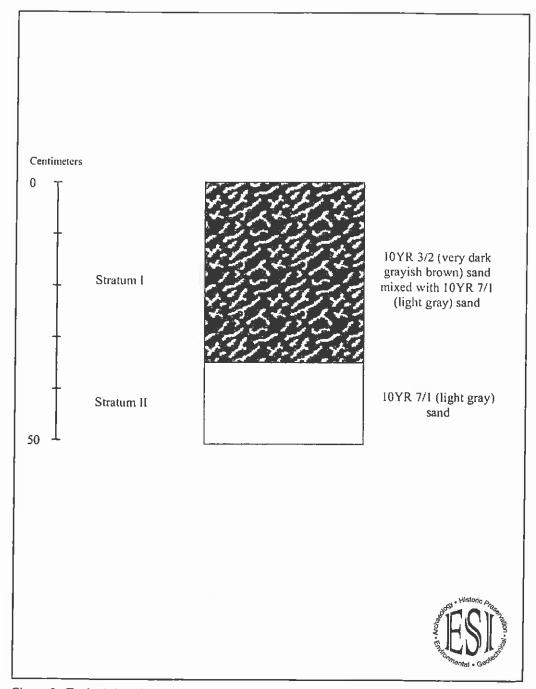


Figure 3. Typical shovel test profile.

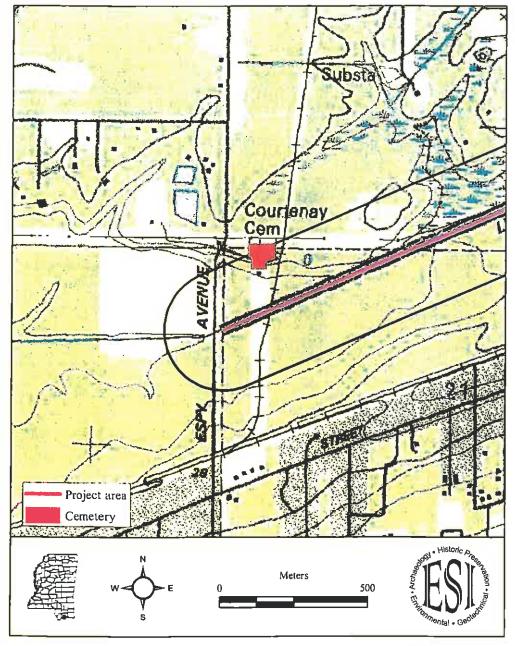
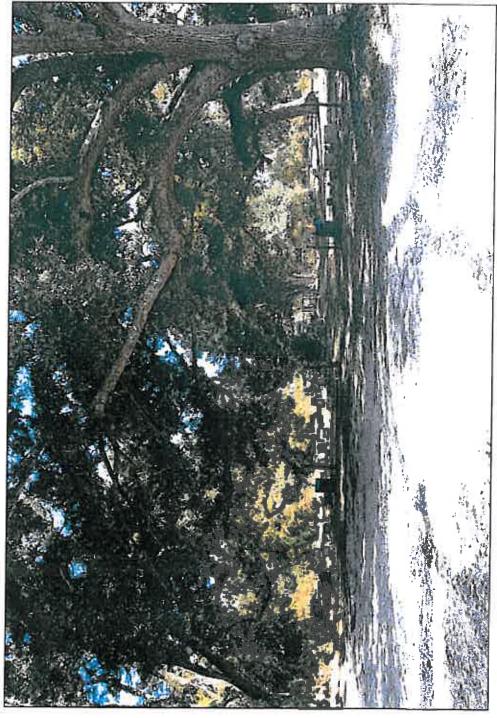


Figure 4. Excerpts from the USGS Pass Christian and Gulfport NW, MS 1:24,000 topographic quadrangles showing the location of Courtenay Cemetery in relation to the project area.



igure 5. Landscape of Courtanay Cemeter



Figure 6. Above-ground tomb (Reach's family vault).



Figure 7. Photo of granite.



Figure 8. Folk grave marker.



Figure 9. Folk grave markers.



Figure 10. Photo of earliest grave marker.

CHAPTER 4 CONCLUSIONS AND RECOMMENDATIONS

ESI conducted a Phase I survey and cultural resources assessment of the Canal No. 1 project area in Long Beach, Mississippi. The work was performed for Neel-Schaffer, Inc., as part of a supplemental EIS for proposed channel modification. Pedestrian survey and shovel testing throughout the project area did not result in the recordation of any new archaeological sites. The architecture survey identified one historic/modern cemetery within 0.25 mi (400 m) of the project area. Proposed modifications including channel widening and spoil deposition will have no affect on Courtenay Cemetery. It is ESI's opinion that planned modifications to Canal No. I will have no affect on historic resources. No additional cultural resources investigations are recommended.

REFERENCES CITED

- Banguilan, Alvin J., Gregory D. Lockard, Claudia Watson, and Kristine Sinkez
 - 2007 Phase I Cultural Resources Survey of the Proposed Harper McCaughan Elementary School Relocation, Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.

Lauro, James

- 1988 Cultural Resources Survey Long Beach Channels 1&2-3 Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2000 Cultural Resource Survey of Approximately 18 Acres in Long Beach, Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2007 Cultural Resources Survey of 18 Acre Tract of Land. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2008a Phase 1 of Cultural Resources Survey of Proposed 35 Acre Tract of Land. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2008b Phase I Cultural Resource Survey of Proposed Water System Improvements (Project W12) Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2008c Phase I Cultural Resource Survey of Proposed Pass Christian Water System Improvements (Project S13) Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.

Mann Jr, Cyril B.

- 1993 A Cultural Resource Survey of a Proposed Condominium Development Site in Harrison County, Mississippi, Performed at the Request of Mr. Larry Lewis for Brown and Mitchell, Inc. Submitted to the Mississippi Department of Archives and History, Jackson.
- 1994a A Cultural Resource Survey of a Proposed Construction Site to be Located in Harrison County, Mississippi, Performed at the Request of Mr. William E. Knesal, Jr., P.E. Submitted to the Mississippi Department of Archives and History, Jackson.
- 1994b A Cultural Resource Survey of a Proposed 8.8 Acre Site to be Located in Long Beach, Harrison County, Mississippi, Performed at the Request of James P. Carney of Heritage Properties Incorparated. Submitted to the Mississippi Department of Archives and History, Jackson.

1995 A Cultural Resource Survey of a the Long Beach Industrial Park Located in Long Beach, Harrison County, Mississippi, Performed at the Request of Mr. Larry Lewis for Brown and Mitchell, Inc. for the Harrison County Development Commission, Master Permit Application. Submitted to the Mississippi Department of Archives and History, Jackson.

Stowe, Noel R. and Rebecca Stowe

- 2001a Cultural Resources Survey of Proposed 12 Acre Development in Long Beach. Submitted to the Mississippi Department of Archives and History, Jackson.
- 2001b Cultural Resources Survey of Proposed 12-Acre Development in Long Beach, Harrison County, Mississippi. Submitted to the Mississippi Department of Archives and History, Jackson.

MISSISSIPPI DEPARTMENT of ARCHIVES AND HISTORY



HISTORIC PRESERVATION

Ken P Pool, director • Jim Woodrick, acting director
PO Box 571, Jackson, MS 39205-0571

601-576-6940 • Fax 601-576-6955

mdah.state.ms.us

March 10, 2009

Mr. Brett Mallette Long Beach Water Management District P.O. Drawer W Gulfport, Mississippi 39502

RE: Phase I Cultural Resource Survey for Canal No. 1 Channel Modifications, Long Beach Water Management District, MDAH Project Log #02-121-09, Harrison County

Dear Mr. Mallette:

We have reviewed the December 2008 cultural resources survey report by Dr. Jill-Karen Yakubik, Principal Investigator, received on February 18, 2009, for the above referenced undertaking, pursuant to our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After review, we concur that no archaeological resources listed in or eligible for listing in the National Register of Historic Places are likely to be affected. Also, while it is our determination that the Courtenay Cemetery is potentially eligible for listing in the NRHP under Criterion A (for its vernacular markers), we concur that the project will have no effect on this resource. Therefore, we have no objection with the proposed undertaking.

There remains the possibility that unrecorded cultural resources may be encountered during the project. Should this occur, we would appreciate your contacting this office immediately in order that we may offer appropriate comments under 36 CFR 800.13.

Please provide a copy of this letter to Ms. Yakubik. If you need further information, please let us know.

Sincerely,

(M

/Jim Woodrick Review and Com

Review and Compliance Officer

FOR: H.T. Holmes

State Historic Preservation Officer

c: Clearinghouse for Federal Programs

Board of Trustees: Kane Ditto, president / Rosemary Taylor Williams, vice president / Reuhen V. Anderson / Lynn Crosby Gammill / E. Jackson Garner / Duncan M. Morgan / Hilda Cope Poyall / Martis D. Ramage, Jr. / Roland Weeks / Department director: H. T. Hølmes