

Restoration of Water Quality in the Impaired Waters of Charlotte Harbor – Project Number: 48-032013

Executive Summary

Charlotte County's Restoration of Water Quality in the Impaired Waters of Charlotte Harbor Project (hereinafter called the Project) is a large scale, multi-phased project that primarily addresses Goal number 2, Restore Water Quality, of the Initial Comprehensive Plan of the RESTORE Council by reducing the nutrients and bacteria entering the impaired waters of Charlotte Harbor from the densely urbanized and coastal areas of Charlotte County. Charlotte Harbor is the second largest estuary in the State of Florida. The project implements Objective Water Quality(WQ) J of the Comprehensive Conservation and Management Plan (CCMP) of the Charlotte Harbor National Estuary Program by providing central sanitary sewers to developed areas within 900 feet of waters such as estuarine shorelines, rivers, creeks, canals and lakes. The CCMP is a regional document that covers the 4,700 square miles of the Charlotte Harbor watershed within 12 Florida counties and contains 5 aquatic preserves. The project provides a comprehensive approach aimed at eliminating pollution from aging and non-conforming On-Site Treatment and Disposal Systems (OSTDS, aka septic tanks), constructing a central wastewater system and stormwater improvements to reduce untreated stormwater runoff, and reduce the improper use of pesticides, herbicides, and fertilizers through an educational program on Best Management Practices.

Through this initial step of eliminating non-point source pollution, Charlotte County is laying the foundation to restore the long-term resiliency of the Charlotte Harbor Estuary and its tidal tributaries under which future activities to restore marine habitat can become effective and sustainable for the future.

A pilot project which provides the basis for this request is now underway and substantial financial assistance was required to maintain the affordability of the pilot project to the property owners affected. Funding for the initial pilot project came from multiple sources, including EPA Section 319, TMDL State Grants and a state legislative appropriation. RESTORE funding is crucial to move forward with our next phase.

The total project construction cost for all of the phases is estimated in excess of \$320 million. The total project cost for Area 1A is estimated at \$25,800,000 (rounded) and **Charlotte County is requesting \$5,600,000 from the Gulf Coast Ecosystem Restoration Council to cover 21% of the project cost in order to maintain affordability to property owners.** A detailed cost breakdown is provided in the budget narrative. Area 1A includes 2040 properties of which

1355 are occupied and served by OSTDS's. **Most of the Area 1A properties are on canals with direct access to the Charlotte Harbor Estuary and the Gulf of Mexico.**

The success of the project is measured through a water quality monitoring program that will provide data to support the reduction of nutrients and bacteria in ground water wells and surface water locations throughout the project boundary. A Preliminary Engineering Report was developed for Area 1 and a EPA approved Quality Assurance Project Plan (QAPP) governs the water quality sample collection, testing and reporting of data from the monitoring of 68 ground water wells and 21 surface water (canal) locations. Monitoring began in the pilot area in 2012 in order to establish a baseline for measuring project success. TetraTech provided an initial water quality review of data in June 2013 and confirmed the impact of OSTDS's on the impaired waters of Charlotte Harbor. The sampling parameters and initial findings are provided in greater detail in the following narrative section. Charlotte County anticipates using its Direct Allocation toward refining a multi-year plan for the continued Restoration of Water Quality in the Impaired Waters of Charlotte Harbor project.

Proposal Narrative

Charlotte County's Restoration of Water Quality in the Impaired Waters of Charlotte Harbor addresses non-point source pollution created by urbanized areas that are impacting the impaired water of Charlotte Harbor Estuary. The project specifically implements Goal number 2 of the Initial Comprehensive Plan of the RESTORE Council; **Restore Water Quality.**

Through a comprehensive approach in alignment with goals and objectives outlined in the Charlotte Harbor National Estuary Program Comprehensive Conservation and Management Plan and through a cooperative effort by a number of government and non-profit stakeholders, the project will attack pollution on several fronts including pollution created from On-Site Treatment and Disposal Systems (OSTDS, aka septic systems), untreated stormwater runoff, and control of pollution of pesticides, herbicides, and fertilizers impacting over 29,000 total properties, 17,420 of which are existing homes. This Charlotte County project implements the **RESTORE Comprehensive Plan Objective; To Restore, Improve, and Protect Water Resources.**

This project also ranked very high for Restore Water Quality in the Southwest Florida Regional Ecosystem Restoration Plan submitted by the Joint Florida Gulf National Estuary Programs adopted March 8, 2013.

Charlotte County is proposing a large-scale project that will substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast ecosystem and specifically improves the health of the estuary which improves the health of the Gulf and the wildlife of the gulf such as shellfish, sea turtles, Gulf sturgeon and many more. The project includes removal of OSTDS and constructing a central sewer system and stormwater improvements, and an educational program on Best Management Practices. These efforts will reduce the non-point source pollutant load and mitigate the resulting ecological impacts that are currently impairing the receiving water bodies of Charlotte Harbor. **Through this initial step of eliminating non-point source pollution, Charlotte County is laying the foundation to restore the long-term resiliency of the Charlotte Harbor Estuary and its tidal tributaries under which future activities to restore marine habitat can become effective and sustainable for the future.**

A preliminary engineering report dated March 2010, prepared by Charlotte County Utilities titled "Wastewater Service Program: Area 1 Preliminary Engineering Report" provides supporting information about the condition, age, and design concerns surrounding the existing OSTDS in the priority areas proposed for the Restore Act Project. (See Preliminary Engineering Report in Exhibit A) The report concludes that 53% of the OSTDS in the area were developed prior to 1984 and are no longer in conformance with existing design criteria as outlined in Florida Statutes and are beyond their useful life. As a result, these failing systems are contributing to pollution in Charlotte Harbor.

Implementation Methodology

Charlotte County began developing the Restoration of Water Quality in the Impaired Waters of Charlotte Harbor project in 2009 with the prioritization of areas within Charlotte County that were not on central wastewater disposal. Prioritization was based on the following criteria; proximity to impaired water bodies, OSTDS failures, population density, frequency of beach closures due to bacteria, proximity of existing central wastewater disposal infrastructure and projected road paving projects. Four (4) large areas were identified with a total construction cost in excess of \$320 million by project completion. Area 1 was then sectioned into multiple phases in order to be feasible in both project cost and impact on existing wastewater treatment facilities.

The East and West Spring Lake pilot project, a section of Area 1 with 2455 properties, began permitting and design in 2011 and is expected to be completed by June 2016. This RESTORE proposal is aimed at Area 1A and contains 2040 properties – most of which are on canals with direct access to Charlotte Harbor and the Gulf of Mexico. The total project cost for Area 1A is estimated at \$25,803,760 and Charlotte County is requesting \$5,600,000 or 21% of the project cost. A detailed cost breakdown is provided in the budget narrative.

The Preliminary Engineering Report for the pilot project analyzed 7 options for collecting and treating domestic wastewater including the feasibility of repairing or replacing the existing onsite treatment and disposal systems (OSTDS) and central sewer options including gravity, hybrid gravity, low pressure sewer, and vacuum systems. A number of factors determine the suitability of the wastewater disposal; high seasonal water table, proximity to adjacent systems, degree of land elevation, proximity to water resources, cost to property owners, on-going maintenance, life cycle costs, and power requirements. The report also addresses plant capacity and expansion necessitated by the transmission and collection systems that may be required. Charlotte County anticipates using the RESTORE Direct funds to update the Area 1 Preliminary Engineering Report to include the entire project expansion area presented in this proposal.

Monitoring and Measures of Project Success

Charlotte County will use proven metrics when developing a plan for tracking and measuring project success. As with Area 1, a Quality Assurance Plan (QAPP) will be developed and submitted to EPA for approval to control the water quality sample collection, testing and reporting of data. Pollutant load reductions for a similar project that was modeled using the **StepL** program (an EPA standard accepted method for estimating load reductions from non-point pollution sources) showed an overall reduction of 33% in TSS, 94% reduction in TP, 86% reduction in TN, and an 88% reduction in BOD. The same results are expected across the project area. (TSS – Total Suspended Solids; TP – Total Phosphorous; TN – Total Nitrogen; BOD – Biochemical Oxygen Demand). Monitoring of these same parameters is currently underway in Area 1 at 68 ground water wells and 21 surface water locations. Data compiled will establish a baseline to measure project success.

In June 2013, TetraTech, a leading provider of consulting and engineering services for environmental sustainability, published a Water Quality Review Within East and West Spring Lake (part of Area 1) to summarize data collected to date. (See Exhibit B). TetraTech did an extensive literature review of other studies performed in this area and concluded that “OSTDS’s are a strong contributor of nutrient loadings and resulting decreased water quality within East and West Spring Lake area.”

Charlotte County’s East Port Laboratory (EPL), NELAC Certification #E54436 conducts the majority of the analyses of the water samples in accordance with approved methods in compliance with the National Environmental Laboratory Accreditation Conference Institute (NELAC). Total nitrogen, total Kjeldahl nitrogen, nitrate + nitrite, ammonia nitrogen, total phosphorus total suspended solids, fecal coliform, and biochemical oxygen demand are analyzed by the laboratory for each sample. Temperature, pH, specific conductance, dissolved oxygen and turbidity are also monitored and recorded for each sample with properly calibrated, EPA approved meters. EPL will also be involved in developing the Quality Assurance Plan (QAPP) for the monitoring program of Area 1A, the area addressed in this RESTORE proposal.

Charlotte County has consulted with the Charlotte Harbor National Estuary Program (CHNEP) in developing protocols for sampling and is sharing data from monitoring sites as compiled.

Risks and Uncertainties of Proposed Activities

Daniel M. Byrd, III and C. Richard Cothorn define risk as “the probability of a future loss” in their book titled “Introduction to Risk Analysis: A Systematic Approach to Science Based Decision Making.” Given that 80% of the properties in Area 1 were developed prior to 1990 and that 53% of them were developed prior to 1984 when regulations governing the installation of OSTDS’s became more stringent, Charlotte County believes there is a predictive risk of waste from failing OSTDS’s continuing to enter the water bodies of Charlotte Harbor. OSTDS’s are estimated to have a useful life of up to 20 years.

The age of the OSTDS’s in Charlotte County, however, is not the only risk factor Charlotte County’s OSTDS’s present to water quality. Prior to 1984, OSTDS’s were allowed to be installed in the existing soil; whereas more modern OSTDS drain fields are raised using a suitable soil that was imported to the site. Some developed areas within the Project have elevations as low as 3 feet above sea level. Rising sea levels, tidal influences and rainfall compound the issues surrounding the functionality of OSTDS’s in coastal areas along the Gulf of Mexico.

The proposed activities under this Project, the construction of a centralized wastewater disposal system, and stormwater improvements and public education on Best Management Practices for landscaping and fertilizing, are not risk free. The cost is a heavy financial burden on both the County and the property owner. Financial assistance through grants from programs such as RESTORE is necessary in order to maintain affordability.

Outreach and Education Opportunities

The Project consists of 3 components; (1) the removal of OSTDS's and construction of a centralized wastewater systems, (2) stormwater improvements, and (3) a public education component.

In order to maximize exposure of the project goals and to promote Best Management Practices that minimize the impact of fertilizers, pesticides and herbicides, the County will implement a multi-pronged approach to disseminate information to the public. The County will capitalize on existing environmental organizations focused on the Charlotte Harbor Estuary and its restoration. Activities will include participation in these organizations' sponsored events, utilization of these organizations Web site resources and the dissemination of written material to these organizations. Furthermore, the County will sponsor a minimum of two (2) workshops to explain project goals and successes and to distribute material specific to the use of potential pollutants.

The educational outreach program materials will focus on: environmental impacts of fertilizers, pesticides and herbicides; advising the public to purchase fertilizers, pesticides, and herbicides with the proper product specifications; the demonstration of appropriate application methods; and alternative options more friendly to the environment.

Leveraging of Resources and Partnerships

Charlotte County is requesting \$5,600,000 for Area 1A which has an estimated total project cost of \$25,803,760. Leveraged funds will come from assessments and low interest loans through the State Revolving Fund. In-kind contributions are estimated at 5% of the total Project Cost, or \$1,290,000. In-kind contributions consist of the use of in-house staff time and resources to alleviate project costs related to engineering design, construction inspection, monitoring, and program administration/supervision. The cooperative partners for the project include as follows:

- Charlotte County Public Works
- Charlotte County Health Department (DOH)
- Charlotte Harbor National Estuary Program (CHNEP)
- Charlotte Harbor Environmental Center, Inc. (CHEC)
- Charlotte County Extension Through The Florida Yards And Neighborhoods And Sea Grant Marine Extension Programs (EES)
- Charlotte Harbor Community Redevelopment Area Advisory Committee (CRAAC)
- Lemon Bay Conservancy
- Bonefish & Tarpon Association
- Peace River Valley Citrus
- Southwest Shellfish Association
- Charlotte County Chamber of Commerce

The project is in alignment with existing local, regional, and non-profit cooperating partner goals and objectives. More specifically, the project addresses goals and objectives outlined in the County's Comprehensive Plan and in Priority Actions that are outlined in the Charlotte Harbor National Estuary Program (CHNEP) Comprehensive Conservation and Management Plan (CCMP), the Joint Florida Gulf National Estuary Programs Southwest Florida Regional Ecosystem Restoration Plan, and Southwest Florida Water Management District (SWFWMD) Surface Water Improvement and Management (SWIM) Plan.

Opportunities for additional leveraging of past, present, or future restoration projects and monitoring efforts:

- Public Works MSBU contribution toward storm water improvements and storm water quality
- CHNEP monitoring results that provide for additional pre and post testing information on receiving waters
- Utilization of IFAS educational programs to inform the residents on Best Management Practices
- Project contributes towards reducing the pollutant loading to the receiving waters of Charlotte Harbor to allow for an increase in the success of proposed restoration projects.

Proposal Project Benefits

Charlotte County is laying the foundation upon which habitat restoration and the replenishment of living coastal and marine resources can occur and be effective. With pollutants still entering the water bodies, nutrient and bacteria loads will continue to degrade the water quality needed to revitalize and sustain the Gulf economy. The project provides economic benefits through jobs created during implementation and raises land value due to the availability of central water and sewer. Reducing pollutants entering the water bodies also translates into less beach closures thereby enhancing the quality of life for residents and tourists to the area's shorelines. The project promotes stewardship of the environment through education on potential pollutants used in cleaning and landscaping, and the how alternatives such as rain gardens, organic fertilizing and other "Florida Friendly" practices can help restore and sustain the natural resources for future generations.

Location Information

Area 1: Lat: 26°59'18.32"N Long: 82° 8'47.62"W

Area 2 Lat: 27° 0'30.51"N Long: 82° 5'6.35"W

Area 3 Lat: 27° 1'6.34"N Long: 82°13'5.21"W

Area 4 Lat: 26°55'58.24"N Long: 82°16'19.77"W

Exhibit C includes location maps

1. Overall Location Map identifying Wastewater Expansion areas
2. Prioritized Project Areas, 1 through 4 – including Pilot project location
3. Prioritized Project Area 1
4. RESTORE Act Project Area 1A location

High-Level Budget Narrative

Planning

Engineering, Design, Land Rights and Bid Preparation:	\$1,216,733
Administration, Overhead and Indirect*:	<u>\$4,335,631</u>
TOTAL PLANNING	\$5,552,364

*includes land purchase, public hearing notices, legal services, interest, and internal charges

Construction

Contracts**	\$13,997,127
Administration and Mobilization:	\$579,396
Construction Inspection	\$608,366
Other***	<u>\$3,268,429</u>
TOTAL CONSTRUCTION	\$18,453,319

**includes waste collection lines, lift stations, vacuum station

***includes transmission, central lift station, treatment facilities

Monitoring

Contracts	\$66,477
Data Collection	\$99,715
Monitoring Administration	<u>\$83,096</u>
TOTAL MONITORING	\$249,287

Program Administration	\$12,167
Contingency	<u>\$1,536,622</u>
TOTAL PROJECT COST	\$25,803,760

RESTORE ACT REQUEST \$ 5,600,000

Note that on-going operations and maintenance costs are funded by on-going utility rates and fees for potable water and sanitary sewer service according to the latest resolution approved by the Charlotte County Board of County Commissioners. Stormwater improvements are maintained through property owner assessments as managed by Charlotte County Public Works.

Environmental Compliance Checklist (Appendix B)

See attached checklist

Data/Information Sharing Plan

Charlotte County will share data from its Monitoring plan with funding agencies and other stakeholders as requested. The data will include sample analyses from Project ground water wells and surrounding surface waters prior to implementation of the Project and post construction. As described in the Project

Narrative, Charlotte County will complete a battery of analyses utilizing a NELAC laboratory on water samples to determine pre and post levels of total nitrogen, total Kjeldahl, nitrogen, nitrate + nitrite, ammonia nitrogen, total phosphorus, total suspended solids, fecal coliform, and biochemical oxygen demand. A Quality Assurance Plan (QAPP) will be developed, in accordance with EPA guidelines, to outline the monitoring protocols, sampling locations, and parameters for reporting. Information will be provided through electronic format upon request. EPA's StepL program will be utilized to estimate pollutant load reduction and provide a basis for comparison to evaluate the success of the project in the reduction of pollutants entering the currently impaired water bodies of Charlotte Harbor.

As mentioned previously, Charlotte County has consulted with the Charlotte Harbor National Estuary Program (CHNEP) in developing protocols for sampling and is sharing data from monitoring sites in order to leverage monitoring efforts that are in progress throughout the impaired waters of Charlotte Harbor.

Reference List of Literature

- Water Quality Review Within East & West Spring Lake, Tetra Tech, June 2013
- Charlotte Harbor National Estuary Program Comprehensive Conservation and Management Plan, Update 2013
- Area 1 Preliminary Engineering Report, Charlotte County Utilities, March 2010
- Florida-Friendly Landscaping Program, University of Florida
- STEPL 4.1 Pollutant Tool, Region IV EPA
- Introduction to Risk Analysis: A Systematic Approach to Science-Based Decision Making, Government Institutes, 2000
- Southwest Florida Regional Ecosystem Restoration Plan submitted by the Joint Florida Gulf National Estuary Programs adopted March 8, 2013.

See attached support letters