ENVIRONMENTAL ASSESSMENT #494

Iberia Parish Wastewater Treatment, Wetland Assimilation Project

Iberia Parish and St. Martin Parish, Louisiana

US Army Corps of Engineers®

DECEMBER 2009

TABLE OF CONTENTS

List of Figures

List of Appendices

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), has prepared this Environmental Assessment # 494 (EA # 494) to evaluate the potential environmental effects associated with the proposed construction and operation of a new sanitary wastewater treatment facility discharging secondarily-treated wastewater to the Spanish Lake wetlands for tertiary treatment as a wetlands assimilation project. As shown in figure 1, New Iberia, centered in Iberia Parish, is located in south central Louisiana west of the Atchafalaya Basin, approximately 100 miles west of New Orleans, and 50 miles south west of Baton Rouge. The Spanish Lake wetland is owned by the State Land Office, managed by Louisiana Department of Wildlife and Fisheries (LDWF), and is located approximately three miles northwest of the City of New Iberia, Louisiana.

EA # 494 has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2.

Figure 1. Location of the City of New Iberia, LA

Source: IDF, 2008.

1.1 AUTHORITY FOR THE PROPOSED ACTION

This project was initiated as a joint effort between Iberia Parish and CEMVN under the Corps' Environmental Infrastructure Program (Section 219 of the 1992 Water Resources Development Act (WRDA), as amended by Section 108, Consolidated Appropriations Act, 2001, 106 Stat. 4835). This section of WRDA authorizes the Corps of Engineers to assist a non-Federal interest

(in this case, Iberia Parish) in carrying out water-related environmental infrastructure and resource protection and development projects. Projects eligible for inclusion under the Section 219 program include water supply and storage; and treatment, distribution and wastewater treatment systems, including wastewater treatment plants.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

There are multiple purposes of, and needs for, the proposed CEMVN action. The purposes and needs for the proposed action are to:

1. Provide Iberia Parish Sewerage District No. 1 cost-effective sanitary wastewater treatment for the existing wastewater generated;
2. Provide additional wastewater treatment capacity to accommodate anticipated growth in the next 15-20 years;
3. Improve treatment capability to address more stringent treatment requirements expected in the future; and
4. Stimulate productivity in the Spanish Lake wetlands by discharging nutrient rich wastewater for tertiary treatment.

The geographical service area under consideration for the proposed project is an area northwest of the City of New Iberia in northern Iberia Parish. The area is primarily industrial/commercial around the Acadiana Regional Airport and residential in the Coteau community (WSN, 2005). Wastewater generated in this area is currently routed to the City of New Iberia's treatment facility or is serviced by individual septic systems in the Coteau area (WSN, 2005). Current sewage flow from the service area is approximately 300,000 gallons per day during dry weather and up to 1,000,000 gallons per day after heavy precipitation.[1]

Sewerage District No. 1 of Iberia Parish provides sanitary sewer service to approximately 3,000 customers in portions of the unincorporated areas of the Parish (Iberia Parish Master Plan, 2001). Projections for the 20-year planning period indicate a future population of approximately 54,614 in those areas by 2020 and the greatest portion of population growth is projected to occur in Sewerage District No. 1 (Iberia Parish Master Plan, 2001).

The Parish is also interested in attracting additional industrial and commercial development within the service area and expects the demand for additional wastewater treatment capacity to increase (WSN, 2005). Based on the anticipated costs for continuing to send wastewater to the City of New Iberia's treatment plant, Iberia Parish examined other options for sewage treatment for the service area (USACE, 2003). The Parish expected that developing a facility with a design capacity of 1.5 million gallons per day would meet the long term needs, but initially, a permitted discharge of approximately 800,000 gallons per day would be sufficient.

Permit writers at Louisiana Department of Environmental Quality (LDEQ) indicate that ongoing studies of the Total Maximum Daily Load (TMDL)[2] would most likely require lower discharge limits in more sensitive drainage basins (Iberia Parish Master Plan, 2001). The preliminary modeling by LDEQ indicates future limits could be required to be significantly lower than the

[1] The differential between dry and wet weather flow is expected to decrease as a product of the Parish's Sewer System Evaluation Survey and ongoing efforts to reduce infiltration/inflow into the system from rainfall events.
[2] The TMDL Study is a statewide analysis of waterways' abilities to absorb pollutants and the determination of the level of pollutant discharge beyond which the waterways would be unacceptably degraded.

current averages for biochemical oxygen demand (BOD), total suspended solids (TSS), and ammonia-nitrogen (Iberia Parish Master Plan, 2001).

The project is also needed to provide tertiary treatment as these discharge regulations are expected to get more stringent in the future. Of the 37 estuaries in the Gulf of Mexico area, the Vermilion-Teche Basin is characterized as having one of the highest levels of eutrophic[3] conditions (Comite Resources, 2008). The Louisiana Department of Environmental Quality (LDEQ) is expected to make the water quality standards more stringent by lowering the allowable concentrations of nitrogen and phosphorus that may be discharged from treatment facilities (Comite Resources, 2008).

The need to meet more stringent discharge limits anticipated for nitrogen and phosphorus as well as the isolated nature of the Spanish Lake wetlands lends to the consideration of a wetlands assimilation project to meet ecological needs for the wetland. Historically, river spring flood events of Bayou Teche would have inundated the riparian wetlands in the vicinity of Spanish Lake introducing substantial amounts of nutrients and sediments to these wetland communities (Comite Resources, 2008). Much of this water would have moved as sheet-flow through these wetlands, providing ideal conditions for nutrient and sediment retention. Changes in land use have increased nutrient concentrations in upland runoff, but isolated these nutrients from the wetlands. The impact of these elevated nutrient levels, combined with the channelization of distributaries and wetlands for flood control has led to the nutrient rich water being isolated from wetlands and discharged directly to major distributaries (Comite Resources, 2008). This has led to a number of ecological changes within the Spanish Lake area, including contributing to the eutrophication of basin waters, reduced wetland productivity, and decreased wetland surface elevation (Comite Resources, 2008).

Discharging the Sewage District No. 1 treated effluent to a wetland assimilation project would introduce treated sanitary wastewater into a suitable wetland to ensure growth and health of the wetland (LDEQ, 2009a). Natural wetland loss is caused, in part, by insufficient sedimentation, relative sea level rise, and land subsidence (LDEQ, 2009a). The introduction of the nutrient rich wastewater to natural wetlands would be beneficial in that it stimulates productivity in the wetland (LDEQ, 2009a). This productivity promotes vertical accretion through increased organic matter deposition and the formation of soil through increased root growth; this vertical accretion helps maintain the wetlands. Additionally, the total suspended solids provided by the wastewater also increase the sediment level in the wetland (LDEQ, 2009a).

1.3 PRIOR REPORTS

On 19 June 2003, the CEMVN signed a Letter Report, entitled "Iberia Parish, Louisiana, Environmental Infrastructure, CWIS 076310." The document authorized CEMVN to enter into a Design Agreement with Iberia Parish, Louisiana to provide Federal technical, planning, and design assistance for Iberia Parish's wastewater and to conduct a preliminary assessment of land costs and development of appropriate analyses to address the Parish's need for a 1.5 MGD wastewater treatment facility.

[3] A eutrophic waterbody typically has excessive concentrations of nutrients (e.g., nitrogen and phosphorus) and experiences rich algal blooms resulting in poor water quality. The waterbodies are characteristically deficient in oxygen and lack fish species diversity because only species tolerant of poorly oxygenated waters can thrive.

There are no prior Environmental Assessments (EAs) or Environmental Impact Statements (EISs) prepared in association with the proposed action.

1.4 PUBLIC CONCERNS

A public hearing to address questions on the proposed wastewater treatment system and wetlands discharge was held September 23, 2009 at the Main Courthouse Building in New Iberia, LA (Iberia Parish Council, 2009). At that meeting, Mr. David Moore, Engineer representing Freyou, Moore and Associates, Project Engineers, provided responses to questions raised at a previous meeting by Ms. Deborah White, President of the Louisiana Chapter of Sewerage Victims Rights. He (Mr. Moore) explained the testing that would be conducted on the site by the Parish and by the necessary state and federal agencies. Ms. White stated that this is an environmental issue and accepted the responses provided by the engineering firm.

Other concerns included the Parish's liability for potential effects to landowners' property, whether LDEQ and the USEPA had approved the project, whether the industrial waste from "the air base" could be excluded from the treatment system, and whether the Parish would indemnify the landowners for damages that occur now or in the future.

1.5 DATA GAPS AND UNCERTAINTY

At the time of submission of this EA, engineering evaluations had not been completed for the proposed action. Final selection of engineering details is ongoing, but any changes to the design of the proposed action would be confined to the treatment facility located on a 12 acre site provided by the Parish (site of Pump Station 2 and lagoon system). Accordingly, such changes would not be expected to result in different impacts to the natural or human environment outside of the boundaries of that 12 acre site.

The environmental analysis has also been performed prior to completion of plans and specifications or a construction contractor's plan for construction. The analysis is based on reasonable assumptions regarding how the proposed actions would be constructed. However, the description of the proposed action in this EA does not represent any formal commitment to final design, equipment for use, vendors for supply of materials, or methods of construction; instead it gives an approximation of how these features would be constructed. These assumptions reasonably quantify the magnitude and nature of the impacts of the proposed actions, but do not prescribe detailed materials, quantities, or design specifications.

In the event there are substantial changes to the proposed action relevant to environmental concerns that would invalidate the assumptions on which this analysis is based or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts as construed herein, a supplemental environmental analysis will be prepared.

1.6 CHARACTERIZATION OF THE SERVICE AREA EFFLUENT

In 2009, the City of New Iberia completed an evaluation of the commercial users discharging to the sanitary sewer system to verify that the City's wastewater treatment plant could adequately treat the discharges from its users (City of New Iberia, 2009). Because the discharge from the proposed service area currently goes to the City of New Iberia's treatment plant, the commercial

users that would be discharging to the new system were included in that survey. The survey examined commercial users to evaluate whether chemicals could be entering the sanitary sewer system that could potentially harm the City's wastewater treatment plant. The surveys were provided to Iberia Parish and to the CEMVN. Based on the survey, the Parish determined that the commercial users discharging to the current system would not damage the proposed system. The survey and the Parish's determination included evaluations of the effluent from the University of Louisiana at Lafayette's New Iberia Research Center (NIRC).

Because approximately one-third of the base flow into the service area (100,000 of the 300,000 gallons/day) is associated with the maintenance of approximately 6,000 non-human primates at the NIRC,[4] the CEMVN requested information on the facility, its operations, and its wastewater pretreatment procedures to better understand its waste stream. Follow-up communication with representatives from NIRC provided important information regarding its operations and standard operating procedures, which would not change in the event the proposed facility and discharge system become operational. The questions asked by the CEMVN and the answers provided by the NIRC are included in Appendix B.

2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The CEMVN, in cooperation with its non-Federal sponsor, Iberia Parish, is proposing to construct and operate a new wastewater treatment system for primary and secondary wastewater treatment south of the Acadiana Regional Airport. The new treatment system would incorporate a wetlands assimilation project and discharge the wastewater to the existing Spanish Lake wetlands for tertiary treatment. The location of the project features is shown in figure 2.

To construct and operate the new treatment system would require:

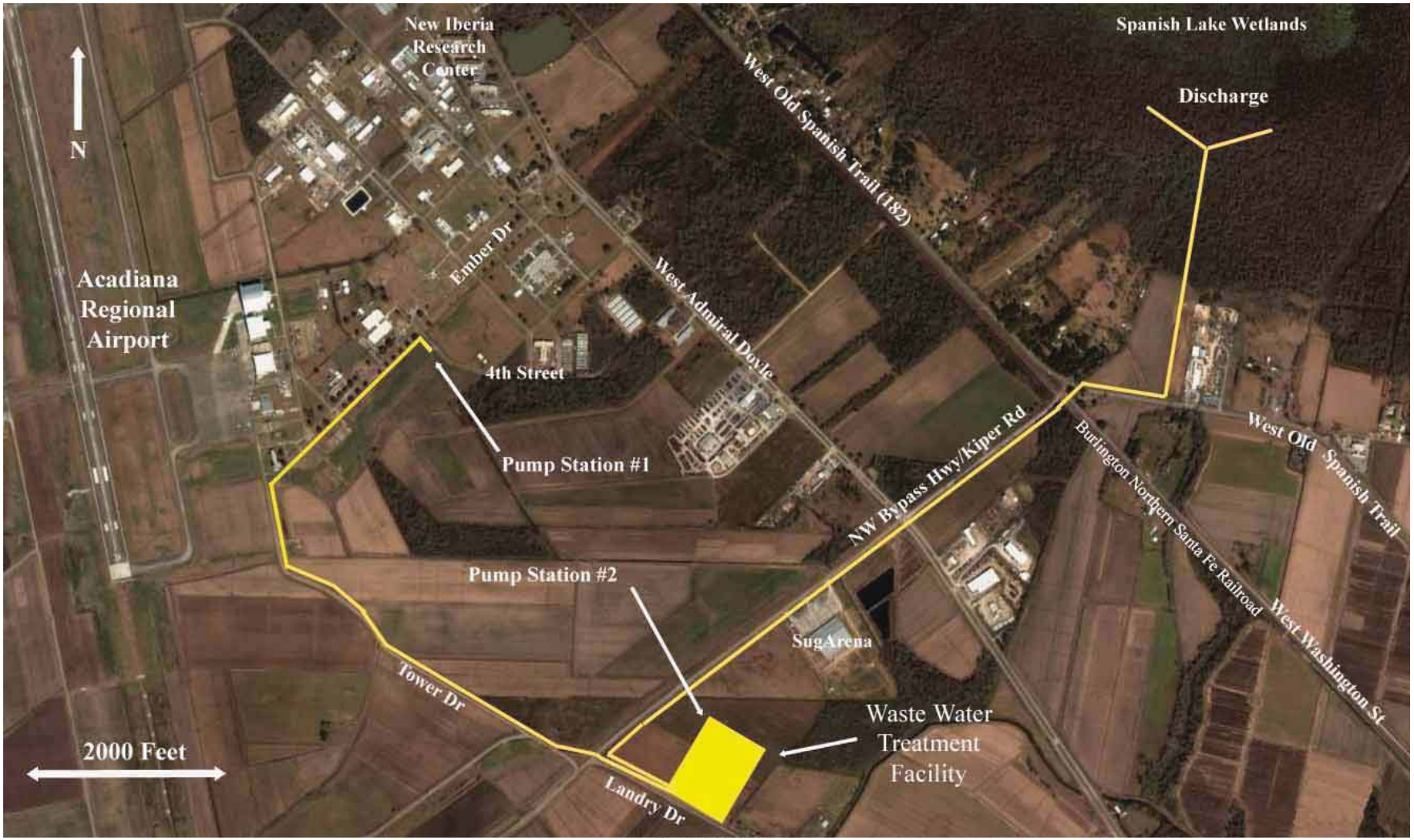
1. Extensive modification of an existing pumping station (Pump Station #1) on 4th Street;
2. Construction of the new treatment facility on an approximately 12-acre site off Landry Drive;
3. Construction of a new pumping station (Pump Station # 2) at the site of the new treatment facility(off Landry Drive);
4. Construction of a new force main (piping) between Pumping Station #1 and the wastewater treatment system, and Pumping Station #2 and the Spanish Lake wetlands; and
5. Construction of the discharge system into the wetlands along the southern and western borders of the Spanish Lake wetlands.

[4] The New Iberia Research Center maintains accreditation with the American Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC); has a file with the National Institutes of Health-Office of Laboratory Animal Welfare (NIH-OLAW) Animal Welfare Assurance Number A3029-01; and is approved by the Center for Disease Control (CDC) for the importation of non-human primates. The Center is also registered with the United States Department of Agriculture (USDA) as a class "R" research facility.

Sections 2.1 through 2.4 provide additional detail regarding the construction of these features of the proposed action.

Pumping stations in sewage collection systems are typically designed to handle raw sewage that is gravity fed from underground pipelines within a service area. Sewage is stored in an underground pit, known as a wet well; the wet well is equipped with electrical instrumentation to detect the depth of sewage and pumps to move the material out. When the sewage level in the wet well rises to a predetermined elevation, a pump in the wet well is activated to pump the material into and through a pressurized pipe system called a force main. The force main is the piping system that moves sewage from the wet well and pumping station to the wastewater treatment facility. During periods of high flows into the wet well (e.g., during peak flow periods or wet weather), redundant pumps in the wet well are also used.

Figure 2. Proposed Action Project Features



2.1 THE PROPOSED ACTION

2.1.1 MODIFICATIONS TO PUMPING STATION #1 AND NEW FORCE MAIN

Pump Station One (PS1) is on the west/south side of 4th Street near the intersection with Ember Drive to the east of the Acadiana Airport. As shown in figure 3, the structure is an 11 feet x 22 feet x 16 feet concrete block above grade and poured concrete below grade facility that currently pumps wastewater from the service area to the City of New Iberia's treatment facility. In order to operate the new system, PS1 would be demolished and rebuilt at approximately the current location. The existing 11' by 22' concrete block building and all equipment would be demolished and removed from the site for recycling or disposal at the Parish landfill or similar appropriate disposal facility.[5]

For the replacement PS1, the existing foundation structure would be modified to a larger wet well utilizing three new submersible pumps. The larger wet well would approximately double the existing capacity to 600,000 gallons, providing additional storage to assimilate peak flow surges. A new pre-cast 10-feet diameter concrete manhole and base would be included to contain check valves and control valves for operating the new pumping station. Demolition and re-building PS1 would require approximately 4 weeks to complete.

Figure 3. Pump Station #1

In addition to the modification of PS1, a new force main would need to be installed to carry the effluent from PS1 to the new treatment plant. The new PS1 force main would be an

[5] There are two permitted C and D (Type III) landfills in Iberia Parish and two in St. Martin Parish to the north.

approximately 10-inch diameter high-density polyethylene (HDPE) schedule 40 pipe that would be installed within the existing road rights-of-way.

The approximately two feet wide by four feet deep trench for installing the force main would be excavated within the existing, maintained, right-of-way, with the excavated materials deposited to the side of the trench. Once the force main was placed and leak tested, the trench would be backfilled with a layer of crushed aggregate and the excavated material that had been side-cast to match the pre-existing grade. The ground surface would be re-seeded to facilitate the re-growth of surface vegetation. To ensure occupational safety, the contractor would use industry standard traffic controls, safety measures, and equipment during construction.

As shown in figure 2, the PS1 force main would be constructed to proceed northwest on the west/south side of 4th Street about 200 feet to Ember Drive. At the intersection with Ember Drive, the force main would turn 90-degrees to the southwest and proceed for approximately 1,800 feet on the south side of Ember Drive to the intersection with Hangar Drive. At that intersection, the force main would turn south then southeast proceeding for approximately 4,200 feet on the east side of Tower Drive to the intersection with Northwest Bypass Highway/Kiper Road/LA Highway 3212.

In order to cross Northwest Bypass Highway/Kiper Road/LA Highway 3212 and not require lane closures, the force main would be constructed by boring under the road. Once under the Northwest Bypass Highway/Kiper Road/LA Highway 3212, the force main would proceed an additional 800 - 1,000 feet along the plant entrance driveway[6] to the southeastern corner of the site property. In that vicinity, the new 10-inch force main would be temporarily connected to the existing 8-inch force main that connects PS1 to the City of Iberia's wastewater treatment facility. This tie-in would allow uninterrupted service for wastewater treatment until the new wastewater treatment system was constructed and operating. After the new treatment system was operational, the connection to the 8-inch would be closed, but maintained, in the event that system failure necessitated sending wastewater to the City of New Iberia's treatment works. The length of the original 8-inch force main between PS1 and this tie-in location would be flushed, capped, and abandoned in place.

In total, approximately 7,000 feet of force main would be installed between PS1 and the new treatment facility, which would take approximately 3 weeks to construct.

2.1.2 CONSTRUCTION OF WASTE WATER TREATMENT SYSTEM

As depicted in figure 2, the new wastewater treatment facility would be constructed on an approximately 12-acre site near the corner of Landry Road and Northwest Bypass Highway/Kiper Road/LA Highway 3212. The site is currently owned by Iberia Parish and is used for row-crop agriculture, but the Parish has planned to convert it to commercial use. The new treatment system would include: headworks, where large debris would be removed prior to entering the lagoon system; the aeration and settling lagoons; a chlorination unit for disinfecting the effluent prior to discharge to the Spanish Lake wetlands, and a permanent support building. The system would be designed and constructed for a maximum of 1.5 million gallons per day,

[6] The plant entrance driveway would exit from the south side of Northwest Bypass Highway/Kiper Road/LA Highway 3212 and proceed in a southeastern direction parallel to, and to the east of, Landry Road.

but the facility would be permitted by LDEQ to discharge a maximum of 800,000 gallons per day.

The influent to the proposed treatment facility would be conveyed from the discharge force main of PS1 through the headworks' mechanical bar screen, prior to discharge into the aerated lagoon. A mechanically driven traveling rake assembly would remove the screened debris from the bar rack and discharge the debris into a screening container. The collected material would be disposed of at an appropriately-permitted facility on a routine basis.

The proposed treatment facility would be an aerated/facultative lagoon system consisting of an approximately 2.3 million gallon aerated reactor basin followed by a series of three approximately two million gallon aerated settling basins totaling approximately six million gallons. Biochemical oxygen demand (BOD) removal would occur in the aerated lagoon and solids separation, stabilization, and storage would occur in the settling lagoons. Aeration is required in the settling ponds to retard algae growth and release carbon dioxide from microbial respiration. Prior to discharge to the treatment wetlands, the effluent would pass through a chlorine contact chamber for disinfection. Gaseous chlorine would be stored on site in two 150-pound cylinders. Chlorine removal is expected to occur naturally due to dissipation by way of turbulence during the effluent's route through the force main to the discharge points.

The footprint of disturbance for laydown areas as well as the system construction would affect the majority of the 12-acre property. Construction details concerning the lagoon system continue to be refined, but the lagoon system would be large ponds lined with an impermeable membrane and built over approximately four acres of the 12-acre site. Prior to construction, the surface two feet of topsoil would be stripped from the construction area and stored on the site for use by the Parish.

Additional excavated material that is unsuitable for re-use in the lagoon berms would be temporarily stored on site for re-use elsewhere by the Parish. New electrical service would be extended from overhead power lines to the site and construction of the headworks, lagoons, chlorination unit, and all associated piping, controls, and ancillary equipment would take approximately four months to complete.

2.1.3 CONSTRUCTION OF PUMPING STATION #2 AND NEW FORCE MAIN

After exiting the chlorine contacting chamber, the wastewater would flow to the new Pump Station #2 (PS2) prior to discharge to the Spanish Lake wetlands. PS2 would be a below-grade concrete wet well with pumps, valves, and piping that would operate similar to PS1. PS2 would be fabricated as a pre-cast concrete structure with an inside diameter of approximately 10 feet, a depth of approximately 20 feet, and a volume of approximately 12,000 gallons. The wet well would be constructed to have approximately one foot above the ground surface grade and be accessed through a pre-cast manhole.

Piezometer data from the construction site indicate ambient groundwater is within 5 feet of the surface. Due to the depth and size of the excavation necessary to construct PS2, dewatering wells or well points would be installed in the vicinity and would be continually pumped prior to, and during, construction. Pumping the groundwater out would lower the ambient groundwater elevation below the lowest extent of construction allowing construction in dry conditions. Groundwater pumped from the site would be piped approximately 1,000 feet to the Armenco Branch Canal (southeast of the construction site) and discharged to the surface waters. Data

regarding the groundwater within the surface formation are not available, so the quantity of groundwater that would be generated during construction is uncertain.

Similar to the force main construction from PS1 to the treatment system, the PS2 discharge would require construction of a new 10-inch force main from the PS2 to the distribution system in the Spanish Lake wetlands. The approximately two feet wide by four feet deep trench for installing the force main would be excavated primarily within existing maintained rights-of-way (except for approximately 1,000 feet, which would run between commercial property and an agricultural field) and the excavated materials would be deposited to the side of the trench. Once the force main had been installed and leak tested, the trench would be backfilled with a layer of crushed aggregate and the excavated material that had been side-cast would be re-graded match the pre-existing grade. The ground surface would be re-seeded to facilitate the re-vegetation.

As shown in figure 2, the new force main would proceed approximately 800-1000 feet from PS2 along the facility access driveway to the south side of Northwest Bypass Highway/Kiper Road/LA Highway 3212. At that location, the force main would turn 90-degrees to the northeast and proceed approximately 3,500 feet within the existing state highway right-of-way to West Admiral Doyle Drive. At this point, the trench would be stopped and construction would continue by boring a penetration under West Admiral Doyle Drive. This would allow the construction to continue to the opposite (north) side of West Admiral Doyle Drive without interrupting service at the road.

From the north side of West Admiral Doyle Drive, the force main construction would continue as a trench excavation to the south side of the Burlington Northern Santa Fe railroad and West Old Spanish Trail (182). As with the West Admiral Doyle Drive crossing, the force main would be constructed under the Burlington Northern Santa Fe railroad and West Old Spanish Trail (182) with a directional boring of approximately 250 feet. On the north side of West Old Spanish Trail (182), the force main would proceed in an eastern direction for approximately 900 feet on the north side of West Old Spanish Trail. To the west of the New Century Fabricators, Inc. facility, the force main would turn 90-degrees to the north proceeding between the New Century Fabricators property and an agricultural field for about 1,000 feet to the Spanish Lake wetlands.

No road closures are expected to be necessary to construct the force main and industry standard traffic controls and OSHA safety procedures would be used by the contractor.

2.1.4 CONSTRUCTION OF THE EFFLUENT DISTRIBUTION SYSTEM

From the location where the force main enters the Spanish Lake wetlands, construction and installation would proceed similar to the preceding construction (10-inch pipe in a 2-foot wide x 4-foot deep excavation), with the exception of needing to clear and grub the standing vegetation within the 20-foot width of construction. As shown in figure 2, the force main would proceed approximately 2,300 feet into the Spanish Lake wetland before reaching the branched split for the discharge array. The 20-foot width of construction would be needed to trench and construct the force main piping and an access walkway along the entire length of all force main sections.

The discharge array construction would split flow from the 10-inch force main into two separate 6-inch force mains proceeding approximately 900 feet on the left (west) branch and 900 feet on the right (east) branch. At approximately 160-foot intervals along the respective branches, effluent would be discharge through valves onto a pre-formed concrete splash block and flow

into the treatment wetland. Each discharge point would have an adjustable valve to modify the flow rate, if needed.

The two separate discharge branches and the main line would be accessible for service and maintenance by a walkway that would be installed at the time of force main construction. The walkway would begin after crossing into the wetlands along the new 10" force main and continue along the entire length of the force main and each branch of the discharge array for a total distance of approximately 3,100 feet. No lighting or electrical utility outlets are planned. The walkway would be constructed by clearing all woody vegetation within the 20-foot construction right-of-way. Once cleared up to one foot of the top organic material would be mucked up for the four –foot wide walkway to provide a good base. All cleared woody material and mucked soil and organic matter would be removed or excavated with a small bulldozer or front-end loader. The stripped material would be loaded into haul trucks and taken to an appropriate Parish-owned site for disposal or beneficial re-use. The total area of disturbance to construct the force main and distribution array in the Spanish Lake wetlands would be less than 1.5 acres (20 foot width x 3,100 foot length = 62,000 square feet = 1.42 acres).

Once cleared and stripped, the four-foot wide walkway would be constructed. Construction would begin by placing a geotextile fabric on the ground surface and thereafter adding a one-foot thick layer of sand, a second layer of geotextile fabric, and a six-inch thick layer of crushed aggregate. The total quantity of sand and crushed aggregate necessary to construct the walkway would be approximately 460 cubic yards and 230 cubic yards respectively and the surface area affected by the walkway would be less than 1/3 of an acre (4 foot width x 3,100 foot length = 12,400 square feet = 0.28 acres).

The walkway would be contained by flanking 2-inch x 12-inch pressure treated lumber (vertical facing), supported on either side by 2-inch x 4-inch pressure treated timber driven approximately four feet into the substrate. To facilitate the flow of surface water through the walkway, a four-inch diameter pipe would be placed every 100-feet of walkway. These pipes would have their ends wrapped with a suitable geotextile material to reduce plugging.

The construction time to complete both force mains and the walkway would be approximately 4 weeks.

2.1.5 TREATMENT WETLANDS AND DISCHARGE TO BAYOU TORTUE

Tertiary treatment for the discharge water would be provided by approximately 350 acres of wetlands south of Spanish Lake (Comite Resources, 2008). The treatment system and pipeline distribution system would be designed to discharge up to 1.5 million gallons per day, but would have a permitted limit of 800,000 gallons per day (LDEQ, 2009).

As depicted in figure 4, when treated water is discharged into the southwest corner of the receiving wetland, the natural hydrological gradient of the basin would direct flow northward to the east of Spanish Lake (Comite Resources, 2008). Isolated from Spanish Lake by a perimeter levee, wetland water would generally move to the east and north to a berm extending east from the Spanish Lake levee to a crawfish farm berm (USACE, 2009). This east-west berm was constructed to divert surface flow to a drainage ditch moving surface flow east into the lower reach of Bayou Tortue then into Bayou Teche (LDEQ Sanitary Wastewater Discharge Permit Application, 2009). Backwatering from Bayou Teche and Bayou Tortue would be minimized because of a flap gate on the discharge into Bayou Tortue (see figure 5).

The drainage ditch is located on property owned by St. Martin Parish, which is to clear the ditch of existing vegetation and woody debris and is to maintain the ditch to ensure continued drainage from the wetland area pursuant to an intergovernmental agreement (Appendix E) between it and Iberia Parish. (Iberia Parish, 2009.)

Figure 4. Surface Flow Though Spanish Lake Wetlands and Discharge

Figure 5. Discharge Flap Gate Into Bayou Tortue

2.1.6 OPERATIONS AND MAINTENANCE

In addition to the activities necessary to construct the components described in section 2.1, this EA considers the impacts to the human environment associated with the operation and maintenance of the proposed facility, including all LDEQ permit requirements and actions necessary to operate and maintain the system (e.g., inspections, repairs, in-kind replacements), as well as all necessary monitoring. Operation and maintenance requirements for the proposed treatment system would include:

1. Wastewater sampling, analysis, and reporting as required by the discharge permit;
2. Daily bar screen inspection/cleaning and periodic emptying of screenings container;
3. Daily inspection of chlorination facilities; and
4. Routine maintenance and in-kind replacement of aerators, bar screen, and chlorination equipment.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

The no action alternative was the only alternative to the proposed action formally considered in this EA.

2.2.1 NO ACTION

Taking no action to construct and operate a new wastewater treatment system for Iberia Parish would involve the continued conveyance of wastewater from the service area to the City of New Iberia's Sewage Treatment Plant. For this alternative, there would be no modifications to PS1 and the raw wastewater from the service area would be collected and conveyed through the existing force main to the City of New Iberia's recently constructed treatment plant. The new treatment plant has a capacity of 6 million gallons per day, with up to 2 million gallons per day of capacity reserved for the contribution from this portion of Iberia Parish. However anticipated growth in both the City of New Iberia and Sewerage District No. 1 of Iberia Parish's unincorporated areas will require additional treatment capacity. Sewerage District No. 1 (SD1) currently pays a fee for the use of the City of New Iberia's Sewage Treatment Plant. There is a plan for this fee to significantly increase. This alternative was eliminated due to the significant increase in cost and the future need for increased capacity for SD1.

2.3 ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

2.3.1 AERATED LAGOON DISCHARGING TO BAYOU TORTUE

This alternative would involve routing the sanitary sewer flows from the service area to an aerated lagoon system identical to the treatment system described in the proposed action, but not including the Spanish Lake wetlands assimilation component. After secondary treatment to reduce BOD and solids to acceptable levels, the effluent would be pumped from the new PS2, to a new outfall on Bayou Tortue. For this alternative, all modifications to PS1, the construction of PS2, and the force main construction between PS1 the new treatment facility would be necessary as described for the proposed action. However, the force main from PS2 would not be routed to the Spanish Lake wetlands to discharge (as described in the proposed action), but would be routed within existing rights-of-way to discharge directly to Bayou Tortue on the north side of Spanish Lake, thus bypassing the wetlands assimilation component of the proposal. The

wetlands assimilation component plays an important role in wastewater treatment. The wetlands act as tertiary waste water treatment by processing Phosphorus and Nitrogen and using them as nutrients. Bypassing the wetlands would mean that secondarily-treated waste water would be discharged directly into the bayou. This alternative was eliminated from detailed consideration because new wastewater treatment facilities will not be issued the required permits to discharge secondarily-treated wastewater directly to surface waters in Louisiana.

2.3.2 TERTIARY TREATMENT DISCHARGING TO BAYOU TORTUE

This alternative would require the construction and operation of a different type of wastewater treatment system (e.g., activated sludge process) at the site selected for the proposed action. A typical activated sludge process[7] would begin with one or two stages of aeration tanks where raw sewage undergoes primary treatment to aerobically reduce the organic content. After a sufficient primary treatment, the wastewater would be transferred to clarifier tanks where the sludge settles out. The supernatant[8] would be separated from the sludge and sent to a chlorinator/de-chlorinator for disinfection prior to discharge. Some of the activated sludge from the clarifier bottoms would be returned to the head of the aeration system to re-seed the new sewage entering the aerobic process and the remainder would be removed from the system for disposal. A significant portion of the nutrient (e.g., nitrogen and phosphorus) removal process for an activated sludge process is removed in the residual sludge.

For this alternative, all modifications to PS1, the construction of PS2, and the force main construction between PS1 the new treatment facility would be necessary as described for the proposed action. However, the force main from PS2 would not be routed to the Spanish Lake wetlands to discharge (as described in the proposed action). The effluent from the tertiary treatment process would most likely be piped approximately 1,000 feet southeast along Landry Road to the Armenco Branch Canal (southeast of the new treatment system) for discharge to the surface waters. This alternative was eliminated from detailed consideration because of the much higher cost of design, construction, and operation of an activated sludge system.

2.3.3 DISCHARGE TO CRAWFISH PONDS

Comments on the proposed action from the Louisiana Department of Wildlife and Fisheries (LDWF, 2009) asked the CEMVN to evaluate the alternative of discharging the effluent into the privately-owned crawfish ponds to the east of Spanish Lake, instead of into the state-owned wetlands. The crawfish ponds are hydrologically isolated from the wetlands as explained in section 3.1.3. An example of one of these crawfish ponds (south of the wetlands discharge channel) is shown in figure 6. This alternative was not evaluated in detail because the crawfish ponds are part of an active, privately owned, commercial aquaculture enterprise. The crawfish in these wetland ponds are maintained for human consumption; discharge of secondarily treated wastewater into a commercially owned food production operation would not be appropriate. On this basis, this alternative was eliminated from detailed consideration.

[7] Activated sludge is the name given to the active biological material produced by activated sludge treatment facilities.
[8] Supernatant is the liquid above a settled sludge layer.

Figure 6. Crawfish Ponds East of Spanish Lake

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ENVIRONMETNAL SETTING

The project area is situated in south central Louisiana north of the City of New Iberia, west of the Atchafalaya Basin within the Vermilion-Teche basin. The Spanish Lake wetland is located approximately three miles northwest of the City of New Iberia on the western edge of the Mississippi River floodplain between the Pleistocene Terrace and the natural levee of Bayou Teche (Comite Resources, 2008).

3.1.1 CLIMATE

The study area has a subtropical marine climate influenced by the many water surfaces of the lakes, bayous, streams, rivers, and the Gulf of Mexico. Throughout the year, these water bodies modify the relative humidity and temperature conditions decreasing the range between the extremes. When southern winds prevail, these effects are increased, thus imparting the characteristics of a marine climate.

New Iberia, LA climate is hot during summer when temperatures tend to be in the 80's and cool during winter when temperatures tend to be in the 50's. The warmest month of the year is July with an average maximum temperature of approximately 91 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of approximately 41 degrees Fahrenheit. Temperature variations between night and day tend to be fairly limited during summer with a difference that can reach 18 degrees Fahrenheit, and moderate during winter with an average difference of 20 degrees Fahrenheit. The annual average precipitation for New Iberia is approximately 61 inches. Rainfall in is fairly evenly distributed throughout the year, but July is the wettest month of the year averaging approximately 6.5 inches (NOAA, 2009).

3.1.2 GEOLOGY AND SOILS

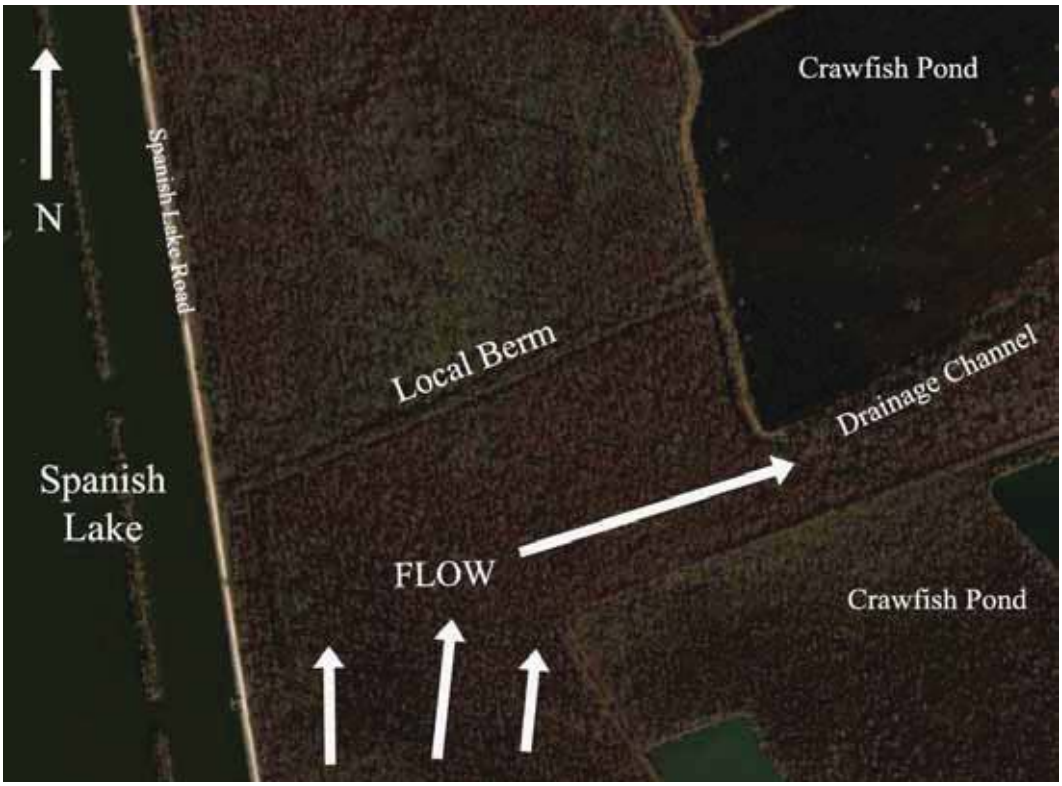
The Spanish Lake wetland soils are classified as Aligator (At) (Comite Resources, 2008). Soils in this group are subject to frequent flooding and the water limits the use of equipment and potential agricultural use. These soils are poorly drained at low elevations on the alluvial plain and flooding occurs for extended periods; natural fertility is high, surface runoff is very slow, and water and air move very slowly through the soil (Comite Resources, 2008). The study area is not in a recharge area for any major underlying aquifer, so little or no loss of surface water to groundwater recharge is expected (Comite Resources, 2008).

3.1.3 SURFACE WATER HYDROLOGY

A small watershed serves the Spanish Lake wetland. The wetland collects surface water runoff from the south and southwest, along with pumped discharge from a residential community, surrounded by a berm, to the southeast. Hydraulically isolated from Spanish Lake by a perimeter levee, water within the Spanish Lake wetlands generally migrates to the east and north to a berm extending east from the lake levee to a crawfish farm berm (see figure 7). As previously shown

in figure 5, this east-west berm was constructed to divert flow to a man-made ditch that drains to the east into the lower reach of Bayou Tortue through a flap gate.

Figure 7. Local Berm Within Spanish Lake Wetlands



Bayou Tortue, the discharge system for Spanish Lake, empties into Bayou Teche approximately 2,000 feet downstream from the drainage ditch flap gate. The flap gate in the man-made drainage ditch prevents backwater from Bayou Teche and Bayou Tortue from entering wetland system (USACE, 2009).

LiDAR[9] topographic data (LSU Atlas) indicates that prior to construction of the berm and drainage ditch, the natural sheet flow was likely northerly (between the lake levee and the crawfish pond levee) into Bayou Tortue. Local landowners have partially breached the berm near its west and east ends allowing high water to flow north through the breaches to reduce water surface elevations during high water in the wetland (USACE, 2009). A small ditch parallel to the Spanish Lake levee further enables northward flow through the berm. The ditch appears poorly defined south of the berm, but becomes a more effective conveyance north of the berm (USACE, 2009).

Ponding has been observed in the interior of the wetland and likely contributed to the deterioration of the swamp (Comite Resources, 2008). The ponding appears to be caused by low areas that may not have a discharge outlet during dry periods and little to no infiltration of surface waters into groundwater would be expected in the wetland (Comite Resources, 2008).

9 LiDAR stands for Light Detection and Ranging and is a technology that uses an airborne scanning laser rangefinder to produce detailed and accurate topographic surveys.

Effluent flow into the crawfish ponds during routine conditions would be highly unlikely because of the height and low permeability of the berms surrounding the crawfish ponds and the expected direction of the surficial flow when discharging from the Spanish Lake wetland. According to the land surface elevations measured with LIDAR and the hydrology modeling, extreme events (near 100-yr frequency rainfall or larger) could overtop the crawfish pond berm north of the berm that runs between Spanish Lake and the crawfish ponds (labeled "Local Berm" in Figure 7) because the crawfish pond berm in that section is lower than it is south of that berm. However, the impact of the surface water overtopping the berm at this location during a 100-yr frequency rainfall would be negligible. As designed, the majority of discharge from the wetland would flow through the discharge channel to the east into Bayou Tortue and not reach this location. In addition, based on estimates of flow into the Spanish Lake wetland during an extreme event, the flow contribution from the effluent discharge would be diluted to approximately two percent of the original concentration. The berm along the north and south sides of the drainage ditch are higher than the predicted water surface elevations during a 100-yr frequency event, thus isolating the wetland discharge from the adjacent crawfish ponds.

3.2 IMPORTANT RESOURCES

This section identifies the significant resources located in the vicinity of the proposed action, and describes those resources that would be impacted, directly or indirectly, by the alternatives. Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR§1508.7)." Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered in this EA.

The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of Federal, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public.

3.2.1 AIR QUALITY

3.2.1.1 Existing Conditions

The U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, called "criteria" pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air but forms in the atmosphere when three atoms of oxygen (0^3) are combined by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of NOx and

VOC, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air.

The Clean Air Act General Conformity Rule (58 FR 63214, November 30, 1993, Final Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans) dictates that a conformity review be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS. A conformity assessment would require quantifying the direct and indirect emissions of criteria pollutants caused by the Federal action to determine whether the proposed action conforms to Clean Air Act requirements and any State Implementation Plan (SIP).

The general conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution. It is called a conformity rule because Federal agencies are required to demonstrate that their actions "conform with" (i.e., do not undermine) the approved State Implementation Plan (SIP) for their geographic area. The purpose of conformity is to (1) ensure Federal activities do not interfere with the air quality budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS. Federal agencies make this demonstration by performing a conformity review when the actions they are planning to carry out will be conducted in an area designated as a non-attainment or maintenance area for one of the criteria pollutants.

If one or more of the priority pollutants were not in attainment, then the proposed action would be subject to detailed conformity determinations unless these actions are clearly *de minimus* emissions. Use of the *de minimus* levels assures that the conformity rule covers only major Federal actions (USEPA, 1993). A conformity review requires consideration of both direct and indirect air emissions associated with the proposed action. Sources that would contribute to direct emissions from this project would include demolition or construction activities associated with the proposed action and equipment used to facilitate the action (e.g., construction vehicles). To be counted as an indirect emission, the Federal proponent for the action must have continuing control over the source of the indirect emissions. Sources of indirect emissions include commuter activity to and from the construction site (e.g., employee vehicle emissions). Both stationary and mobile sources must be included when calculating the total of direct and indirect emissions, but this project would involve only mobile sources.

For all of Iberia Parish and St. Martin Parish all six parameters are in attainment of the air quality standards (USEPA, 2007). Because the project area is designated as an attainment area, no conformity review is required for the proposed action.

3.2.1.2 Discussion of Impacts

3.2.1.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative

Under the no action alternative, there would be no potential for direct, indirect, or cumulative effects to air quality because constructing and operating the wastewater treatment system and wetlands assimilation project in the Spanish Lake wetlands would not occur.

3.2.1.2.2 Future Conditions with Proposed Action

Direct

Probable direct impacts to air quality would include temporary diesel emissions from the operation of construction equipment and temporary creation of fugitive dust when completing construction of PS1, PS2, force mains, and the treatment facility.

Indirect
The indirect effects to air quality of implementing the proposed action would be related to the emissions from transportation of personnel and equipment to and from the job site on a daily basis until the completion of construction.

The indirect effect of implementing the proposed action could also involve odor issues associated with the operation of the treatment plant. Odor from the aerated lagoon system would not be expected to be noticeable to residents as the nearest residence would be over 4,000 feet to the west on West Admiral Doyle Drive and the nearest commercial building, the SugArena, would be approximately 1,500 feet to the northeast.

Cumulative
The cumulative effects to air quality would be the combined emissions from the direct and indirect sources from constructing the proposed action, when added to other emissions sources within the region. Because of the short duration of construction, the cumulative impacts of the proposed action on air quality are minimal.

3.2.2 WATER QUALITY

3.2.2.1 Existing Conditions

Surface waters in the project area consist of lakes, bayous, ponds, wetlands, canals, drainage ditches, aquaculture (crawfish ponds), and other drainageways. The named waterbodies include Spanish Lake, Bayou Tortue, Bayou Teche, and the Spanish Lake wetlands. Surface drainage is primarily to the north-east into Bayou Tortue and Bayou Teche.

Water quality in the project area is affected by both point source and non-point source discharges. Point sources include mainly industrial, municipal, and sewer discharges. Non-point sources include storm water runoff, industrial discharges, landscape maintenance activities, forestry, agriculture, and natural sources.

Section 303(d) of the Clean Water Act (CWA) requires states to identify waterbodies that are not meeting water quality standards and to develop total maximum daily loads (TMDLs) for those pollutants suspected of preventing the waterbodies from meeting their standards. TMDLs are the maximum amount of a given pollutant that can be discharged into a water body from all natural and anthropogenic sources including both point and non-point source discharges. In Louisiana, the Department of Environmental Quality (LDEQ) oversees the program.

The LDEQ surface water monitoring program is designed to measure progress towards achieving water quality goals at state and national levels, to gather baseline data used in establishing and reviewing the state water quality standards, and to provide a data base for use in determining the assimilative capacity of the waters of the state. Information is also used to establish permit limits for wastewater discharges. The program provides baseline data on a water body to monitor long-term trends in water quality.

The results of the ongoing water quality monitoring at a location are compared to standards to protect the public health and welfare in accordance with Section 303(d) of the Clean Water Act. The most recently reported summary (2005) for Sub-segment 060301, Bayou Teche from the headwaters to Keystone Lock and Dam, indicates that this sub-segment is not supporting its designated uses (LDEQ, 2005). Suspected causes of impairment are carbofuran, organic enrichment/low dissolved oxygen, nitrites-nitrates, total phosphorus, fecal coliform bacteria, siltation, and turbidity from crop production, municipal discharges, and unknown sources (LDEQ, 2005).

Water quality surveys performed within the Spanish Lake wetlands indicate that nitrate concentrations were near, or below, the level of detection (0.02 mg/l), and ammonium levels ranged from below detection levels (<1.0 mg/l) to 1.5 mg/l (Comite Resources, 2008). These low concentrations are very similar to other wetlands along the Louisiana coastal zone that are not receiving riverine water, and are indicative of possible inorganic nitrogen deficiency (Comite Resources, 2008). However, total Kjeldahl nitrogen (TKN)[10] concentrations, were as high as 3.1 mg/l. These high total nitrogen and low inorganic nitrogen concentrations indicate that nitrogen is predominately in organic forms, such as humic substances, tannins, and vegetation, which are not available for assimilation by phytoplankton (Comite Resources, 2008).

3.2.2.2 Discussion of Impacts

3.2.2.2.1 Future Conditions with No-Action

Direct
Implementing the no action alternative would not result in any temporary or permanent direct effects to water quality in the project area.

Indirect
Implementing the no action alternative would not result in any temporary or permanent indirect negative effects to water quality. However, not implementing the proposed action would prevent the introduction of a beneficial source of nutrients for the Spanish Lake wetland as well as preventing the beneficial effect of contributing a higher water quality tributary to Bayou Tortue and eventually Bayou Teche.

Cumulative
Taking no action to construct and operate a wastewater treatment system and wetlands assimilation project in the Spanish Lake wetlands would not result in any cumulative effects to water quality. The sanitary wastewater from the service area is currently sent to the City of New Iberia's wastewater treatment facility where sufficient capacity exists to treat the current volume of wastewater from the service area to meet their permitted discharge limits. The existing capacity at the City of New Iberia's treatment plant could also accommodate growth within the service area.

3.2.2.2.2 Future Conditions with Proposed Action

Direct

[10] TKN is the sum of organic nitrogen; ammonia (NH_3); and ammonium (NH_4^+) in the chemical analysis of soil, water, or wastewater (e.g., sewage treatment plant effluent). To calculate Total Nitrogen (TN), the concentrations of nitrate-N and nitrite-N are determined and added to TKN.

Construction of PS1, PS2, force mains, and the treatment facility would take place in areas of significant previous disturbance, are not in proximity to important surface water resources, and would not be expected to result in direct effects to water quality. With required best management practices in place during construction, the temporary effects to water quality would be minimal.

Within the Spanish Lake wetland, the direct effects to water quality from the clearing, grubbing, and excavation for the force main, and construction of the walkway would likely cause some temporary, construction-related decrease in the water quality. The localized temporary decrease in water quality would result from an increase in turbidity and suspended sediments, a mobilization of nutrients and detritus from wetlands leading to a localized reduction in dissolved oxygen. Earth-moving activities during construction disturb soils and can create indirect water quality effects (e.g., increased turbidity and suspended sediments) in the event of uncontrolled runoff. These temporary effects could be avoided with good sediment control practices required during construction. No permanent, direct effects to water quality would be expected as a consequence of constructing the discharge array and access.

Indirect

No significant indirect effects to water quality would be expected from discharging the wastewater effluent to the Spanish Lake wetlands. According to the LDEQ Permit, "During the preparation of this permit, it has been determined that the discharge [of treated wastewater to the Spanish Lake wetland] would have no adverse impact on the existing uses of the receiving water body. As with any discharge, however, some change in existing water quality may occur" (LDEQ, 2009).

There is a potential for indirect effects to water quality from residual chlorine from the treatment process. The treatment system design details continue to be refined, but, as stated in the LDEQ Permit (Appendix D), "Future water quality studies may indicate potential toxicity from the presence of residual chlorine in the treatment facility's effluent. Therefore, the permittee is hereby advised that a future Total Residual Chlorine Limit may be required if chlorine is used as a method of disinfection" (LDEQ, 2009). If such a limit were imposed, the Parish would be required to provide for de-chlorination of the effluent prior to a discharge, but this issue would be addressed based on data from the initial discharges from the treatment system as well as ongoing monitoring in the Spanish Lake wetlands.

In their Planning Aid Letter evaluating the proposed new treatment plant and assimilation project, the USFWS expressed a concern that commercial and industrial growth within the service area may contribute potentially harmful pollutants that could eventually be transferred in the discharge to the Spanish Lake wetlands (USFWS, 2009). The current City of New Iberia treatment plant does accept wastewater from the current commercial and industrial users within the service area and their operations were evaluated by the City of New Iberia's 2009 survey of commercial dischargers (City of New Iberia, 2009). Based on the results of these surveys, Iberia Parish does not anticipate any commercial or industrial users contributing wastewaters that could contribute heavy metals or potentially toxic substances to the waste stream.

As stated in section 1.6, the New Iberia Research Center (NIRC) is located within the service area. Approximately one-third of the base flow into the service area comes from the NIRC. The center currently places all fecal material into biohazard bags on a daily basis and has it hauled away by a commercial vender. In addition, during study periods, excreta is collected and

shipped to the sponsoring company for analysis. This material is not released into the sanitary sewer thus no indirect impacts on water quality are expected. The NIRC has no intentions to change its waste management protocol in the future. However, if protocols were to change, the NIRC would coordinate with the Parish SD #1.

Cumulative

To avoid any negative cumulative effects on water quality, the draft LDEQ permit specifies that the loading rates must not exceed 15 $g/m^2/yr$ total nitrogen or 4 $g/m^2/yr$ total phosphorus nor should the effluent exceed 800,000 gpd; to comply with the permit, the system would be operated to ensure that these loading thresholds were not exceeded. In the event of expansion, the Parish would have to reapply with LDEQ.

The cumulative effect of the proposed action on water quality would be a net improvement over the existing conditions. The wetlands have a higher capacity for processing Phosphorus and Nitrogen than does the treatment plant (due to longer residence time). Therefore, after flowing through the wetlands, the water entering the bayou will have gone through tertiary treatment. The water released into the bayou would often be of better quality than the receiving stream. The use of the Spanish Lake wetlands for effluent assimilation would lead to improved water quality because of the higher quality flow contribution into Bayou Tortue and Bayou Teche. As management of the wetland ecosystem improves the wetland functioning, waters discharged through the assimilation project would contribute to the improvement of water quality in the larger Vermilion-Teche basin. (Comite Resource, 2008).

3.2.3 WETLANDS AND BOTTOMLAND HARDWOOD FOREST

3.2.3.1 Existing Conditions

These resources are institutionally important because of: the Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968 and Section 906 of the Water Resources Development Act of 1986 and the Fish and Wildlife Coordination Act of 1958, as amended.

Wetlands are technically important because: they provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities. Wetlands are publicly important because of the high value the public places on the functions and values that wetlands provide.

Bottomland hardwood forest is technically important because: it provides necessary habitat for a variety of species of plants, fish, and wildlife; it often provides a variety of wetland functions and values; it is an important source of lumber and other commercial forest products; and it provides various consumptive and non-consumptive recreational opportunities. Bottomland hardwood forest is publicly important because of the high priority that the public places on its esthetic, recreational, and commercial value.

The Vermilion-Teche basin contains roughly 243,000 acres of wetlands in Vermilion, Iberia, and St. Mary parishes (LACoast, 2009), but has lost 42,293 acres (14.8 percent) of marsh since 1932;

nearly half of the habitat was lost between 1951 and 1974 (LACoast, 2009). Marshes in the basin are primarily fresh, intermediate, and brackish with relatively few salt marshes (LACoast, 2009).

Although the basin is geologically stable and benefits from the emerging Atchafalaya River delta, the dredging of navigation and petroleum access canals and the construction of spoil banks and levees has altered the geomorphologic and hydrologic conditions (LACoast, 2009). The effects of these alterations vary greatly from place to place, but generally have created artificial barriers between wetlands and wetland maintenance processes, or removed natural barriers between wetlands and wetland decay processes (LACoast, 2009). Interior marshes, traditionally maintained by annual flooding with fresh water in the spring, have deteriorated and many landowners have responded to changing conditions caused by large-scale alterations by managing hydrologic conditions on a small scale using marsh management techniques (LACoast, 2009).

The Spanish Lake wetlands are bounded by the Spanish Lake levees to the north and west, LA Highway 182 and residential areas to the west, crawfish pond levees and an abandoned landfill to the east, and residential and agricultural lands to the south (USFWS, 2009). The Spanish Lake wetlands consist of dry and semi-flooded bottomland hardwood forest, and permanently flooded swamp; the targeted area for the proposed wetlands assimilation project would encompass approximately 335 acres of these forest community types (USFWS, 2009).

An analyses of the water chemistry, hydrology, sediment, vegetation composition, and primary productivity in the Spanish Lake wetland has been completed and published in a Use Attainability Analysis (UAA, Appendix I) to evaluate the suitability of the Spanish Lake wetlands to receive effluent discharge (Comite Resources, 2008).

According to the UAA, the wetlands are hydrologically controlled by rainfall, upland runoff, and the impounded nature of the area with rainfall being the major source of freshwater into the area (USFWS, 2009). LA Highway 182, the Spanish Lake levees, urban development, and the abandoned landfill prevent most surrounding upland runoff from reaching the remaining natural wetlands (USFWS, 2009). Water depths increase from well drained to 0.5-inch in the southwest and two to four inches in the southeast to over 1.5 feet in the section between the landfill and the southeast corner of Spanish Lake (USFWS, 2009). These wetlands also provide floodwater storage and perform important water quality functions by reducing dissolved nutrient levels and removing suspended sediments (USACE, 2009).

The Spanish Lake Wetlands were logged for cypress in the early half of the 20th century and the current forest structure is all secondary growth; the forest is in poor condition due to this logging as well as prolonged inundation (Comite Resources, 2008). The dominant tree species throughout the forested wetland community are red maple (*Acer rubrum)*, Chinese tallow (*Sapium sebiferum*), black willow (*Salix nigra*), water oak (*Quercus nigra*), hackberry (*Celtis occidentalis*), ash (*Fraxinus pensylvania*), American elm (*Ulmus americana*), and black locust (*Robbinia pseudoacacia*) (USFWS, 2009).

There are no wetlands within the area of potential disturbance outside of the Spanish Lake wetlands.

3.2.3.2 Discussion of Impacts

3.2.3.2.1 Future Conditions with No-Action

Direct
There would be no direct impacts to wetlands under the no action alternative.

Indirect
In the absence of the proposed action, the Spanish Lake wetlands would continue to be influenced by the Spanish Lake levee to the north, suburban housing development to the south and the surface water flow constraints described in the existing conditions. With the limited watershed providing it freshwater, the wetlands would continue in their degraded state.

Cumulative
Under the no action alternative, there would be no cumulative changes to wetlands and the area would remain substantially unchanged.

3.2.3.2.2 Future Conditions with Proposed Action

Direct
The direct effects to the Spanish Lake wetlands would be as a result of the construction activities necessary to construct the force main discharge array and the access. As described in section 2.1.4, the footprint of disturbance to construct the force main and walkway would be less than 1.5 acres (1.42 acres) and the area in which the walkway would be placed would be less than 1/3 of an acre (0.28 acre).

Indirect
The proposed action would provide a positive discharge that conveys wastewater effluent through the wetland system without significantly increasing peak water surface elevations during storm events (USACE, 2009). While sufficient topographic data are not available to draw conclusions about water stagnation, it does appear that the effluent would drain northerly through the wetland to the berm and drainage ditch, particularly on a long-term average basis (USACE, 2009). Isolated pockets of ponding may form at times, but deposition of organic material would, over long periods of time, accumulate in these lower elevation areas reducing stagnation. Some significant increases in daily water levels during low flow/dry scenarios could be expected (USACE, 2009), but the effect of the additional water during low flow/dry periods would be to improve the wetland.

Should the wetland be unexpectedly impacted by treated effluent, the guidelines for corrective actions are included in the draft LDEQ discharge permit (Appendix D). In the draft permit, it states that if wetland monitoring shows that there is (1) more than a 20% decrease in naturally occurring litter fall or stem growth; or (2) a significant[11] decrease in the dominance index or stem density of bald cypress, then corrective actions would be taken.

Specifically, within 180 days of a decrease in either of the above-required biological criteria, Iberia Parish would develop a study and test procedures to determine the cause. A determination would be made to indicate whether or not the effluent caused the impact to the natural wetland. Within nine months of the decrease in either of the above-required biological criteria, Iberia

[11] Alpha probability level of <0.05.

Parish would be required to demonstrate to LDEQ what caused the problem and to develop a comprehensive plan for the expeditious elimination and prevention of such cause.

The plan would be implemented within 90 days of the determination of the cause and the plan would provide specific corrective actions to be taken to achieve compliance with the above biological criteria within the shortest period of time. In addition, with its monthly Discharge Monitoring Report, Iberia Parish would submit the following additional information:

i. Any data and/or substantiating documentation that identifies the pollutant(s) and/or source(s) of effluent toxicity;
ii. Any studies/evaluations and results on the treatability of the facility's effluent toxicity;
iii. Any data which identifies effluent toxicity control mechanisms or measures that could be installed or implemented which would reduce or remove the effluent toxicity; and
iv. Steps taken, or proposed, to prevent such violation(s) from reoccurring.

In addition, if studies and tests indicate that the effluent caused the impact to the natural wetland, then the permit may be re-opened to include appropriate limitations and conditions to ensure protection of water quality standards.

There remains a degree of uncertainty regarding the three parameters that affect the loading of nitrogen and phosphorus on the treatment wetlands. The:

1. Nutrient concentrations of the influent into the treatment system,
2. Removal or sequestration rates for nutrients in the treatment process, and
3. Total volume of wastewater that would be treated through the system and discharged to the wetland.

The concentration of total nitrogen and total phosphorus in the wastewater entering the wastewater treatment system has been estimated, but would not be known until system monitoring begins. The fraction of the total nitrogen and total phosphorus removed from or sequestered within the lagoons from the reduction of BOD and TSS in the system would not be certain until the process monitoring begins. Lastly, the volume of wastewater to be treated would be highly affected by ambient precipitation and that would also not be known until measured over the duration of operations.

These uncertainties preclude reliable prediction of the expected loading of nitrogen and phosphorus within the Spanish Lake wetlands. However, the draft LDEQ permit specifies that the loading rates must not exceed 15 $g/m^2/yr$ total nitrogen or 4 $g/m^2/yr$ total phosphorus nor should the effluent exceed 800,000 gpd; to comply with the permit, the system would be operated to ensure that these loading thresholds were not exceeded. In the event of expansion, the Parish would have to reapply with LDEQ.

Cumulative

The introduction of treated municipal wastewater into the highly perturbed Spanish Lake wetland would be a major step towards its ecological restoration (Comite Resources, 2008). The nutrient component of wastewater effluent would increase wetland plant productivity, which would help offset regional subsidence by increasing organic matter deposition on the wetland surface

(Comite Resources, 2008). The freshwater component of the effluent would provide a buffer for saltwater intrusion events, especially during periods of drought (Comite Resources, 2008). These factors contribute to the cumulative effect.

3.2.4 FISHERIES AND WILDLIFE

3.2.4.1 Existing Conditions

This resource is institutionally important because of the Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918. Wildlife resources are technically important because: they are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources. Wildlife resources are publicly important because of the high priority that the public places on their esthetic, recreational, and commercial value.

The Fish and Wildlife Coordination Act provides that whenever the waters or channel of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the USFWS and with the head of the agency exercising administration over the wildlife resources of the state where construction would occur, with a view to the conservation of wildlife resources.

The USFWS reviewed the UAA (Comite Resources, 2008) and the Preliminary Engineering Report (WSN, 2005) and provided the CEMVN with a Planning-aid Letter in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended 16 U.S.C. 661, et seq.). The Planning –aid Letter indicated that the Spanish Lake wetlands provide valuable habitat for fish and wildlife within Federal trusteeship, including migratory and resident waterfowl, wading birds, songbirds, and interjurisdictional fishes (USFWS, 2009). The wetlands also provide valuable habitat for small mammals, white-tailed deer, and various amphibians and reptiles (USACE, 2009).

Special habitats exist along the coastal areas of the Iberia Parish (e.g., Vermilion Bay) for colonial nesting wading bird colonies (Iberia Parish Master Plan, 2001). The wetlands may also host colonial nesting sites for wading birds (e.g., great blue heron, black-crowned night heron, cattle egret, ibis, roseate spoonbill) that are not listed in the database maintained by the Louisiana Department of Wildlife and Fisheries because the database is updated primarily by monitoring colony sites that were surveyed in the 1980s (USFWS, 2009). Other recognized special habitat areas within Iberia Parish are the Attakapas Wildlife Management Area, Lake Fausse Pointe State Park, and the Avery Island Jungle Gardens and Bird Sanctuary.

3.2.4.2 Discussion of Impacts

3.2.4.2.1 Future Conditions with No-Action

Direct

Under the no action alternative, there would be no direct impacts to the fisheries and wildlife of the Spanish Lake wetlands, Bayou Tortue, or Bayou Teche.

Indirect

Failing to provide wastewater treatment capability and treated effluent to the Spanish Lake wetlands would prevent the beneficial effects from accruing to the wetland thereby not improving the fish and wildlife habitat.

Cumulative
Under the no action alternative, there would be no cumulative changes to the local trends in fish and wildlife abundance and diversity and the area would remain substantially unchanged.

3.2.4.2.2 Future Conditions with Proposed Action

Direct
Direct effects to wildlife habitat in the Spanish Lake wetland would result from the clearing of vegetation from 1.5 acres for the construction right-of-way and the grubbing of topsoil and placement of the walkway on 0.3 acres within the construction right-of-way. Mobile species of wildlife could find refuge in nearby habitat, but sessile and dormant species would likely be destroyed during construction.

Indirect
Indirect effects to wildlife species due to construction activities (e.g., noise, vibration) within the Spanish Lake wetlands would be short term and temporary. However, the area of disturbance would be a relatively small part of the local habitat and mobile species could find refuge in other areas until the construction disturbance is over.
Depending on when the construction of the discharge array took place, there could be construction related effects to colonial nesting birds if rookeries exist in the Spanish Lake wetlands. Until a new comprehensive colonial nesting survey is conducted throughout the region to determine the location colonies, the USFWS recommends that a qualified biologist inspect the proposed construction site for nesting wading birds (USFWS, 2009). If a rookery were identified, all activity within 1,000 feet of the rookery would be restricted to the non-nesting period (USFWS, 2009). On-site personnel would be informed of the need to identify and avoid colonial nesting birds and their nests during the breeding season (USFWS, 2009).

Coordination with the USFWS indicates that no significant effects to fish or wildlife are expected to occur from implementing the proposed action (USFWS, 2009). As such, the responsibilities of the USACE to protect migratory birds under Executive Order (EO) 13,186 (66 FR 3853 (17 January 2001)) would be met.

Cumulative
Improvements to the wetland habitat described in section 3.2.3 (e.g., increase wetland plant productivity) would lead to enhanced habitat for fish and wildlife (Comite Resources, 2008). These factors contribute to the cumulative beneficial effect within the wetland, but the improved water quality (reduced pollutant load) in the discharge would add cumulative benefits (300,000 gpd of cleaner water) to the fish and wildlife resources of Bayou Tortue and Bayou Teche.

3.2.5 ENDANGERED OR THREATENED SPECIES

3.2.5.1 Existing Conditions

This resource is institutionally important because of: the Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of

1940. Endangered (E) or threatened (T) species are technically important because the status of such species provides an indication of the overall health of an ecosystem. These species are publicly important because of the desire of the public to protect and to preserve them and their habitats.

Except for the occasional transient species, no Federally listed endangered, threatened, or candidate species under USFWS jurisdiction are known to exist in the project area (USFWS, 2009). However, the American alligator is common in canals. This species is listed as threatened under the Similarity of Appearance clause of the Endangered Species Act (Federal Register 1981, Vol. 46, pp. 40664-40669), but is not biologically threatened or endangered. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required with the USFWS.

The USFWS Planning Aid Letter (USFWS, 2009) states, "According to our records, there are no known occurrences of Federally listed threatened or endangered species within the proposed project area or vicinity. No further ESA consultation with the Service would be required for the proposed action unless there are changes in the scope or location of the proposed project or the project has not been initiated within one year from the date of this letter." (USFWS, 2009).

3.2.5.2 Discussion of Impacts

3.2.5.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative
Taking no action would not have any effect on protected species as none have been identified in the vicinity of the project.

3.2.5.2.2 Future Conditions with Proposed Action

Direct, Indirect, and Cumulative
Consultation with appropriate resource agencies indicates that no listed endangered, threatened, or candidate species are known to exist in the potential project impact areas. The USFWS concurred with our determination in their Planning Aid Letter dated 6 October 2009. Therefore, no direct, indirect, or cumulative effects would be predicted to protected species as a result of implementing the proposed action.

3.2.6 CULTURAL RESOURCES

3.2.6.1 Existing Conditions

This resource is institutionally important because of: the National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979; as well as other statutes. Cultural resources are technically important because of: their association or linkage to past events, to historically important persons, and to design and/or construction values; and for their ability to yield important information about prehistory and history. Cultural resources are publicly important because preservation groups and private individuals support their protection, restoration, enhancement, or recovery.

Historically, the Iberia Parish area was primarily a fresh-water marsh and bottomland hardwood wetland, used mostly for crawfishing, trapping, and waterfowl hunting. During the late nineteenth and early twentieth centuries, and with the construction of levee systems, much of the area was drained; Spanish Lake was created and the surrounding area developed for agricultural production. Geomorphic history of the area also suggests that the area could be characterized as having a low probability of historic site presence due to a lack of natural water resources in the area. Most of the historic settlement patterns occurred along natural levees of nearby Bayou Teche. Soil profiles from the June 2009 geotechnical borings were also examined for evidence of buried soils and cultural material. Poorly drained loamy to clay soils were primary throughout this particular area and yielded no artifacts. The majority of the area proposed for project work is extremely developed and disturbed agricultural farmland. In addition, the continued agricultural disturbance over the last several decades in the project area offers further support that there is a low likelihood of discovering intact cultural resources.

The cultural resource investigation of the proposed project area included a site record and map search, field visits and soil boring examination. The site record search shows that previously recorded historic period archaeological sites 16IB118, 16IB117, 16IB116, 16IB64, 16IB65 and 15IB63; are present and fall within the area of potential effect. These sites were recorded by Goodwin and Associates in 1990 for Southern Gas Company and are primarily historic in nature. They contain discontinuous scatters of ceramic fragments, glass, and metal scraps from farming machinery or debris dating from the last 50-100 years. According to site records on file with the LDOA, none of the aforementioned sites are eligible for inclusion in the National Register of Historic Places. Louisiana's State Historic Preservation Officer agreed with the finding of a Corps archeologist in June 2009 based on pedestrian and visual surveys, of "no historical properties affected" in a letter dated September 9, 2009. Tribal consultation was conducted in June 2009 and there were no concerns.

3.2.6.2 Discussion of Impacts

3.2.6.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative

The No Action Alternative, not providing a wastewater treatment facility for unincorporated areas of northern Iberia Parish, would have no direct impacts on historic or cultural resources. Existing conditions would persist within the proposed project area.

3.2.6.2.2 Future Conditions with Proposed Action

Direct

With implementation of the proposed action no cultural resources would be impacted. A review of reports, archaeological site distribution maps and U.S.G.S. quadrangle maps show that the proposed project location, which is currently leased for agricultural production of sugar cane and soy beans, would not have a direct impact on any known cultural resources.

Indirect

There would be no indirect impacts in the project area as much of the cultural resources that may have been present have long lost integrity due to continued agricultural development of the area.

Cumulative

Cumulative impacts would be the additive combination of impacts to cultural resources by other Federal, state, local, and private efforts. No cumulative impacts would be expected.

3.2.7 RECREATIONAL RESOURCES

3.2.7.1 Existing Conditions

This resource is institutionally important because of the Federal Water Project Recreation Act of 1965, as amended, and the Land and Water Conservation Fund Act of 1965, as amended. Recreational resources are technically important because of the high economic value of recreational activities and their contribution to local, state and national economies. Recreational resources are publicly important because of: the high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.

There are several recreation features adjacent to the project area. The Old Spanish Trail Scenic Byway provides a scenic route and a historic marker/civil war interpretive site. Spanish Lake provides boat launches, piers/fishing wharfs, picnic tables, and a walking trail/road around the water edge. The water is shallow and does not support all water sports, but is used by kayakers and canoers. Duck and squirrel hunting, bird watching, remote-control model boating and geo-caching are additional activities associated with the lake. Other recreation features near the project include a golf course, ball fields, and fairgrounds. SugArena Acadian Fairgrounds hosts rodeos, horse shows, dog trials, boat shows, outdoor concerts, festivals and agriculture events.

3.2.7.2 Discussion of Impacts

3.2.7.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative
Without implementation of the proposed action, the conditions within the recreational environment would continue as they have in the past and would be dictated by the natural land use patterns and processes and recreational opportunities that have dominated the area in the past. Direct, indirect and cumulative impacts would be negligible.

3.2.7.2.2 Future Conditions with Proposed Action

Direct No direct impacts to recreation as a result of the proposed action were identified.

Indirect
A potential indirect impact may result from odor from the waste treatment facility. Proximity to the facility, wind direction, and amount of odor emitted would determine the degree of impact. Effects to recreation features and activities associated with the SugArena Acadiana Fairgrounds from the aerated lagoon system would not be expected to be noticeable due to the distance from those features. There is a future recreational vehicle park planned at the SugArena Acadian Fairgrounds. However, this facility would be approximately 1,500 feet to the northeast. Over time, improvements to the wetlands may lead to improvements in hunting and fishing conditions.
Cumulative Additionally, improving the wetlands may attract birds and bird watchers. As a result, the project would have a positive cumulative impact to recreation.

3.2.8 NOISE

3.2.8.1 Existing Conditions

The project area includes residential, commercial, and natural areas with varying degrees of associated noise. Changes in noise are typically measured and reported in units of dBA, a weighted measure of sound level. The primary sources of noise within the area include aircraft takeoff and landing at the Acadiana Regional Airport, everyday vehicular traffic along nearby roadways (typically between 50 and 60 dBA at 100 feet), train traffic, maintenance of roadways and the other structures (typically between 80 and 100 dBA at 50 feet), and large events at the SugArena.

Noise effects to the residences and businesses within the project area are dominated by transportation sources such as aircraft at the Acadiana Regional Airport, trains, garbage and construction trucks, private vehicles, and emergency vehicles. Noise ranging from about 10 dBA for the rustling of leaves to as much as 115 dBA (the upper limit for unprotected hearing exposure established by the Occupational Safety and Health Administration) is common in areas where there are sources of industrial operations, construction activities, and vehicular traffic.

The U.S. Federal Transit Administration (FTA) has established noise impact criteria founded on well-documented research on community reaction to noise based on change in noise exposure using a sliding scale (USFTA, 1995). The FTA Noise Impact Criteria groups noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks where quiet is an essential element of their purpose,
- Category 2: Residences and buildings where people normally sleep (e.g., residences, hospitals, and hotels with high nighttime sensitivity), and
- Category 3: Institutional buildings with primarily daytime and evening use (e.g., schools, libraries, and churches).

There are no Category 1, 2, or 3 properties within 1,000 feet of the construction activities for PS1, PS2, the treatment facility, or the distribution system in the Spanish Lake wetlands. At the intersection of West Old Spanish Trail and Northwest Bypass Highway/Kiper Road/LA Highway 3212, there are Category 2 residences within 300 feet of the new force main on the north side of West Old Spanish Trail.

3.2.8.2 Discussion of Impacts

3.2.8.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative

Without constructing and operating the wastewater treatment system and wetlands assimilation project in the Spanish Lake wetlands, the direct, indirect, and cumulative effects to noise within the area would remain unchanged from current conditions where the largest source of noise would be aircraft at the Acadiana Regional Airport, trains on the Burlington Northern Santa Fe Railroad, and truck traffic on nearby roads.

3.2.8.2.2 Future Conditions with Proposed Action

Direct
With implementation of the proposed action, the direct impacts from noise would be minimal. Noise generated during the modifications to PS1, construction of PS2, the treatment facility and force mains, and the effluent distribution system in the Spanish Lake wetlands would be temporary and construction-related. Several Category 2 residences near the intersection of West Old Spanish Trail and Northwest Bypass Highway/Kiper Road/LA Highway 3212, would be within approximately 350 feet of the force main construction on the north side of West Old Spanish Trail. This noise generated from this work would occur during typical Monday-Friday 9:00 am-5:00 pm and the work in proximity to these receptors would be less than a week in duration.

Indirect
The indirect effects to noise from the transportation of material and personnel for the construction of the project features would also have temporary noise effects. The noise within project corridor would be temporarily impacted by transportation activities needed to move equipment and materials to and from the sites, but these impacts would last only through the construction period. Other temporary noise effects from annual maintenance activities could be expected. There would be no noise impacts from operation of the facility equipment or pump stations as the pump systems would be below ground. The long-term impacts on noise would be minimal.

Cumulative
The cumulative effects to noise in the project area caused by construction and operation of the proposed action would be minimal.

3.2.9 AESTHETICS (VISUAL RESOURCES)

3.2.9.1 Existing Conditions

This resource is institutionally important because of the laws and policies that affect visual resources, most notably NEPA. Visual resources are publicly and technically important because of the high value placed on the preservation of unique natural and cultural landscapes.

The landscape is relatively flat and characteristic of the lands around southern Louisiana. The agricultural lands are stripped of trees and other vegetation, but still retain some scenic quality, while the landscape in and around the denser urban areas features structured green spaces alive with many types of trees and vegetation. Streets are lined with shade trees and small forested areas which offer buffering and softening effects to the harsh, man-made neighborhoods and commercial areas, thereby reducing noise and unsightly views. Natural (or somewhat natural) features of intrinsic visual quality include Spanish Lake and its surrounding wetlands. This area features wetlands mixed with a forested canopy, which would help to screen any unpleasant odors that may emanate from the natural, decomposing organic matter found here.

There are a number of primary thoroughfares traversing the area around the project site. These thoroughfares include LA 182 (part of the Old Spanish Trail Scenic Byway), LA 3212, LA 674, LA 675, LA 31, LA 88, and U.S. Highway 90. The majority of these thoroughfares (including LA 3212, LA 88, LA 675, portions of LA 31, and U.S. Highway 90) all have view sheds

featuring vast agricultural and farm lands with back drops of some forestation and other natural features. These views are not without a peaceful, and appealing intrinsic scenic quality. The drive along LA 182 (a.k.a. Old Spanish Trail Scenic Byway) is one of varying scenery. These view sheds include scenes of water features and fields framed by forested lands. Other view sheds involve drives through quaint and peaceful communities offering varying degrees of architectural and natural scenes. The drive along LA182 is anything but monotonous, and offers enough changes in scenery to keep the onlooker interested for many miles. LA 3212 would bear the brunt of view sheds into the immediate project vicinity. The project sites for the existing pump station and the proposed pump station (and its attached facilities) are visible from this thoroughfare.

3.2.9.2 Discussion of Impacts

3.2.9.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative
Without implementation of the proposed action, visual resources would either change from existing conditions in a natural process, or change as dictated by future land-use maintenance practices. Regardless of what the future holds for the project area, visual access to the Spanish Lake wetlands would continue to be minimal as most of the area is visually obscured and inaccessible.

3.2.9.2.2 Future Conditions with Proposed Action

Direct and Indirect
With implementation of the proposed action, the direct and indirect impacts to visual resources would be minimal. Visually, the majority of the footprint of disturbance necessary to construct the proposed action would be within disturbed areas with no special visual resources. Modifications to PS1 and construction of PS2 would be substantially below grade and the visual effects from force main construction would be temporary and construction-related. The new lagoon berms associated with the treatment facility would create a visual barrier not currently in the landscape, but the elevation of the berms would be less than eight feet above the current grade. The construction of the effluent distribution system within the Spanish Lake wetlands would represent a change in the visual characteristics of this habitat, but because of the density of the habitat, there are no viewpoints external to the wetland from which the construction and operation of the system would be visible.
The movement of construction material and construction of PS1, PS2, the treatment system, and the new force mains would also have minimal impacts on visual resources. The visual attributes of the project corridor would be temporarily impacted by transportation activities needed to move equipment and materials to and from the sites. However, these impacts would last only through the construction period. The long-term impacts on visual resources would be minimal.

Cumulative

The cumulative impacts of the proposed action alternative in this instance include the incremental impacts to aesthetic (visual) resources (not only in the project area, but to the region around the project area, Louisiana and the United States) resulting from the past, present and reasonably foreseeable future impacts associated with the proposal, which in this instance would include the visual disturbances associated with the construction of the project and potentially, the

loss or conversion of native landscapes and scenic vistas as the population in this area grows, with associated increases in commercial, utilitarian, and industrial infrastructure where those scenic vistas and native landscapes once prevailed.

3.2.10 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

There must be reasonable identification and evaluation of all HTRW contamination within the vicinity of the proposed action. ER 1165-2-132 identifies the USACE policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act (RCRA) regulated), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), would be treated as project costs if it is required as the result of a validly promulgated Federal, state, or local regulation.

A Phase I Environmental Site Assessment (ESA) was prepared for the project site of the proposed Iberia Parish Waste Water Treatment Plant. This report, dated 26 October 2009, is on file in CEMVN-PM-RP. No further investigation is suggested in the project area. In general, the area investigated is industrial in the north and agricultural in the south. There are no signs of recognized environmental concerns; however, caution is suggested during construction, since the potential for contamination exists, due to the proximity of various significant facilities. Environmental records present no sites of significant interest due to releases or violations. Site reconnaissance of the area did not discover any sites or areas of environmental concern within the project footprint. The remnants of pesticides and herbicides that potentially could be at the waste water treatment plant site are expected to be insignificant. Petroleum and other chemicals of concern commonly found in roadway runoff are also expected to be below levels of concern along the pipeline alignments. These factors lead the USACE Environmental Assessment Team to recommend that no further investigation is needed of the project areas, but caution is advised in the developed areas.

It is recommended that further investigation be undertaken by the wastewater treatment facility operator to analyze constituents of the wastewater that is to be sent to the plant. A specific location of concern is the New Iberia Research Center. The facility may be discharging wastes containing pharmaceuticals or other harmful substances which may not be removed by the wastewater treatment process. It is unknown what effects these pharmaceuticals would have on the wetlands and the wildlife therein, but analytical data could prove very beneficial for future management of the proposed disposal method.

3.2.10.1 Discussion of Impacts

3.2.10.1.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative

No specific HTRW concerns were identified from previous site investigations (USACE, 2009a). Therefore, no direct, indirect, or cumulative effects from HTRW would be predicted from implementing the no action alternative.

3.2.10.1.2 Future Conditions with Proposed Action

Direct
No specific HTRW concerns were identified from previous site investigations (USACE, 2009a); no direct effects from HTRW would be predicted from implementing the proposed action.

Indirect
The potential to create HTRW materials during the construction process remains an environmental concern. Storage, fueling, and lubrication of equipment and motor vehicles associated with the construction process would be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants, and oil would be managed and stored in accordance with all Federal, state, and local laws and regulations. Used lubricants and used oil would be stored in marked corrosion-resistant containers and recycled or disposed in accordance with appropriate requirements. The construction contractor would be required to develop a Spill Control Plan.

Cumulative
New Iberia Research Center may be discharging wastes containing pharmaceuticals which may not be removed by the wastewater treatment process. It is unknown what effects these pharmaceuticals would have on the wetlands, the wildlife therein and other waters that may receive the flow from those wetlands.

3.2.11 FARMLAND

3.2.11.1 Existing Conditions

Within NEPA evaluations, the USACE must consider the protection of the nations' significant and important agricultural lands from irreversible conversion to uses that result in their loss as an environmental or essential food production resource. The Farmland Protection Policy Act (FPPA), 7 USC 4201 et seq., and the U.S. Department of Agriculture's (USDA) implementing procedures (7 CFR § 658) require Federal agencies to evaluate the adverse effects of their actions on prime and unique farmland, including farmland of statewide and local importance.

The Parish-owned 12-acre parcel to be used for the construction and operation of the treatment facility has been leased for agricultural use, but has been planned by the Parish for commercial use. There are no prime and unique farmlands within the proposed project area.

3.2.11.2 Discussion of Impacts

3.2.11.2.1 Future Conditions with No-Action

Direct, Indirect, and Cumulative
There are no protected farmlands designated within the potential area of effect; thus, taking no action would have no more or less effect than the proposed action alternative.

3.2.11.2.2 Future Conditions with Proposed Action

Direct, Indirect, and Cumulative

The actions necessary to construct and operate the proposed action would not involve conversion of, or otherwise cause direct, indirect, or cumulative effects to prime, unique, or important U.S. farmland.

4 CUMULATIVE IMPACTS

To avoid negative cumulative impacts, the draft LDEQ permit specifies that the loading rates must not exceed 15 $g/m^2/yr$ total nitrogen or 4 $g/m^2/yr$ total phosphorus nor should the effluent exceed 800,000 gpd; to comply with the permit, the system would be operated to ensure that these loading thresholds were not exceeded. In the event of expansion, the Parish would have to reapply with LDEQ.

Negative effects associated with implementation of the proposed action that could contribute cumulatively with the effects of other projects include temporary construction-related increases in truck traffic, noise and vibration, vehicle and equipment emissions, and localized degradation of water quality. Implementing the proposed action would require the removal of vegetation on less than 1.5 acres of habitat within the Spanish Lake wetlands and a loss of less than 0.3 acres of wetlands for construction of the access path. The positive cumulative effects of implementing the proposed action include the temporary expansion of the local economy through the construction-related expenditures, the provision of lower cost sanitary wastewater treatment within this area of Iberia Parish, and the ecological benefits to the Spanish Lake wetlands, Bayou Tortue, and Bayou Teche.

5 COORDINATION

Preparation of this EA has been coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, are receiving copies of this EA:

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

A Water Quality Certification has been applied for with Louisiana Department of Environmental Quality (LDEQ) via application dated 23 November 2009 and will go out for 10 day public review within the 30 day public review of this EA. The Water Quality Certification will be acquired prior to signing of any Finding of No Significant Impact (FONSI), if such be the determination.

Section 106 of the NRHP, as amended, requires consultation with SHPO and 14 Federally listed Native American tribes with interest in Louisiana cultural resources. SHPO, in a letter dated 9 September 2009 and Native American tribes (Seminole and Alabama-Coushatta) in letters dated 17 June 2009 and 26 June 2009 respectively, responded stating they have reviewed the proposed action and determined that it would not adversely affect any cultural resources.

The USFWS reviewed the proposed action in accordance with the Fish and Wildlife Coordination Act and prepared a Planning Aid Letter for the proposed Iberia Parish Wastewater Treatment and Wetland Assimilation Project, Iberia Parish, Louisiana, dated 6 October 2009.

The USFWS' recommendations, in accordance with the Fish and Wildlife Coordination Act, will be incorporated into project design, execution, and monitoring to the extent practicable. The USFWS' recommendations, and the CEMVN's response to them, are listed below:

Recommendation 1.

The USFWS expressed a concern that commercial and industrial growth within the service area may contribute potentially harmful pollutants (e.g., heavy metals, petroleum by-products, etc) that could eventually be transferred in the discharge to the Spanish Lake wetlands.

CEMVN Response 1.

The current City of New Iberia treatment plant does accept wastewater from the current commercial and industrial users within the service area and their operations were evaluated by the City of New Iberia's 2009 survey of commercial dischargers (City of New Iberia, 2009). Based on the results of these surveys, Iberia Parish does not anticipate any commercial or industrial users contributing wastewaters that could contribute heavy metals or potentially toxic substances to the waste stream.

Recommendation 2.

The USFWS recommends that the CEMVN fully analyze whether there is potential for the project to cause further degradation of the current forest conditions for the targeted project area.

CEMVN Response 2.

In addition to the Use Attainability Analysis (Comite Resources, 2008), the Preliminary Engineering Report (CDM, 2005), and the LDEQ draft discharge permit (LDEQ, 2009), the CEMVN prepared a separate analysis of drainage and hydrology in a Hydraulic Report (CEMVN, 2009) (Appendix H). These evaluations examined and affirmed the expected benefits to the forests within the targeted project area.

Recommendation 3.

In order to ensure that the fish and wildlife resource values receive equal consideration with project implementation, an alternatives analysis should also be conducted to ensure that the other potential methods of wastewater disposal are appropriately explored.

CEMVN Response 3.

The Environmental Assessment examines the proposed action and the no action alternative. Other alternatives were considered but eliminated without further consideration (see section 2.3).

Recommendation 4.

The CEMVN should determine if future discharges into the Spanish Lake discharge canal could interfere with water management of Spanish Lake.

CEMVN Response 4.

The Spanish Lake discharge canal is the downstream water body receiving discharge from the proposed wetlands assimilation project in Bayou Tortue. Spanish Lake does have a pumping station designed to enable pumping of water from Bayou Tortue into Spanish Lake in the event that the water surface elevations in lake are so low that the fishery is in danger. However, the project discharge into Bayou Tortue would likely be of higher water quality than the ambient water quality in Bayou Tortue after passing through the wetlands assimilation project; there would be no concern about the discharge interfering with the water management of Spanish Lake.

Recommendation 5.

The USFWS recommends that qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies of wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbill), anhingas, and/or cormorants. All activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period.

CEMVN Response 5.

Concur.

Recommendation 6.

The USFWS recommends that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests, and should avoid affecting them during the breeding season (i.e., the time period outside the activity window).

CEMVN Response 6.

Concur.

6 MITIGATION

The draft LDEQ permit specifies that the loading rates must not exceed 15 $g/m^2/yr$ total nitrogen or 4 $g/m^2/yr$ total phosphorus nor should the effluent exceed 800,000 gpd; to comply with the permit, the system would be operated to ensure that these loading thresholds were not exceeded. In the event of expansion, the Parish would have to reapply with LDEQ.

Minimal impacts to wetlands have been identified that might require compensatory mitigation (permanent impacts to .28 acres). However, beneficial utilization of the wastewater effluent would result in overall positive environmental benefits to approximately 335 acres of wetlands. These benefits greatly exceed the permanent adverse impacts due to operating and maintaining this system. Therefore there is no need for compensatory mitigation.

7 MONITORING

The Iberia Parish's draft wastewater treatment facility operating permit requires Iberia Parish to follow a detailed monitoring program to validate compliance with permit limits. The draft

permit is attached as Appendix D. The monitoring requirements are presented within four sub-sections of Part II:

1. Section A describes the monitoring and reporting frequency, report style, and submittal requirements (forms, deadlines, etc.);
2. Section B addresses the Pollution Prevention including a self-audit assessment and annual report to LDEQ;
3. Section C describes the requirements to monitor contributing industries and consider pretreatment requirements if needed; and
4. Section D includes the wetland system monitoring requirements (biological parameters) over the five-year duration of the permit.

In the event that monitoring indicates that the discharge system is not operating within the permit constraints, corrective action is required. The type and frequency of monitoring are shown in the draft permit at the top of page 6 of 12, Part II. This is followed by a description of how to monitor each parameter in the permit, measurements to obtain, and how to assess performance. Distinct criteria are included on page 11 of 12, Part II, to assess wetland performance and then describe specific deadlines and actions to be taken to diagnose the cause of problems and create a remediation plan to address concerns for wetland performance.

8 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the proposed action would be achieved upon: coordination of this EA with appropriate agencies, organizations, and individuals for their review and comments; U.S. Fish and Wildlife Service (USFWS) confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species; Louisiana Department of Natural Resources concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program; receipt of a Water Quality Certificate from the State of Louisiana; public review of the Section 404(b)(1) Public Notice; signature of the Section 404(b)(1) Evaluation; receipt of the Louisiana State Historic Preservation Officer Determination of No Affect on cultural resources; and receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations. Any Finding of No Significant Impact (FONSI) would not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

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

Executive Order (E.O.) 11988. E.O. 11988, Floodplain Management, addresses minimizing or avoiding adverse impacts associated with the base floodplain unless there are no practicable alternatives. It also involves giving public notice of proposed actions that may affect the base floodplain. The proposed action would not accelerate development of the floodplain for the following reasons: flooding potential and conditions conducive for development were established initially when the area was modified by construction of Spanish Lake, the crawfish ponds, the landfill, and the surrounding residential areas.

Executive Order 11990. E.O. 11990, Protection of Wetlands, has been important in project planning. The proposed action would improve the Spanish Lake wetlands.

Clean Air Act. The original 1970 Clean Air Act (CAA) authorized the USEPA to establish National Ambient Air Quality Standards (NAAQS) to limit levels of pollutants in the air. USEPA has promulgated NAAQS for six criteria pollutants: sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, lead, and particulate matter (PM-10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these standards is considered a "non-attainment" area. The 1990 Amendments require that the boundaries of serious, severe, or extreme ozone or CO non-attainment areas located within Metropolitan Statistical Areas (MSAs) or Consolidated Metropolitan Statistical Areas (CMSAs) be expanded to include the entire MSA or CMSA unless the governor makes certain findings and the Administrator of the USEPA concurs. Consequently, all urban counties included in an affected MSA or CMSA, regardless of their attainment status, will become part of the non-attainment area. The project is located in Iberia Parish and St. Martin Parish, which are both classified as attainment areas; therefore NAAQS are not applicable to this project.

Clean Water Act. The Clean Water Act (CWA; 33 *U.S.C.* 1251-1387; Act of June 30, 1948, as amended) is a very broad statute with the goal of maintaining and restoring waters of the United States. The CWA authorizes water quality and pollution research, provides grants for sewage treatment facilities, sets pollution discharge and water quality standards, addresses oil and hazardous substances liability, and establishes permit programs for water quality, point source pollutant discharges, ocean pollution discharges, and dredging or filling of wetlands. The intent of the CWA's §404 program and it's §404(b)(1) "Guidelines" is to prevent destruction of aquatic ecosystems including wetlands, unless the action will not individually or cumulatively adversely affect the ecosystem.

Section 404(b)(1) guidelines were used to evaluate the discharge of dredged or fill material for adverse impacts to the aquatic ecosystem. The following actions would be taken to minimize the potential for adverse environmental impacts. The loss of wetlands within the footprint of disturbance to construct the discharge array was not mitigated because of the net benefit to the Spanish Lake wetlands from operation of the wetlands assimilation project. The proposed project complies with the requirements of the guidelines. The LDEQ Water Quality Certification letter will complete the certification process.

Endangered Species Act. The Endangered Species Act (16 *U.S.C.* 1531-1543; P.L. 93-205, as amended) was enacted in 1973 to provide for the conservation of species that are in danger of extinction throughout all or a significant portion of their range. "Species" is defined by the Act to mean either a species, a subspecies, or, for vertebrates *(i.e.,* fish, reptiles, mammals, etc.) only, a distinct population. No threatened or endangered species or their critical habitat would be impacted by the proposed action. The USFWS concurred with our determination in their Planning Aid Letter dated 6 October 2009.

Fish and Wildlife Coordination Act. The Fish and Wildlife Coordination Act (16 *U.S.C.* 661-666c; Act of March 10, 1934, as amended) requires that wildlife, including fish, receive equal consideration and be coordinated with other aspects of water resource development. This is accomplished by requiring consultation with the USFWS whenever modifications are proposed to a body of water and a Federal permit or license is required. This consultation determines the

possible harm to fish and wildlife resources, and the measures that are needed to both prevent the damage to and loss of these resources, and to develop and improve the resources, in connection with water resource development. To fulfill the responsibilities of the Fish and Wildlife Coordination Act, the USFWS provided a Planning Aid Letter dated 6 October 2009.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act of 1918 (MBTA) is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possessing, transporting, and importing of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over-utilization. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR §21.11). The USFWS addressed compliance with this Act in their Planning Aid Letter dated 6 October 2009.

National Environmental Policy Act. The National Environmental Policy Act (NEPA; 42 *U.S.C.* 4321-4347; Pub. L. 91-190, as amended) requires Federal agencies to analyze the potential effects of a proposed Federal action that would significantly affect the quality of the human environment, including historical, cultural, or natural aspects of the environment. It specifically requires agencies to use a systematic, interdisciplinary approach in planning and decision-making, to insure that environmental values may be given appropriate consideration, and to provide detailed statements on the environmental impacts of proposed actions including: (1) any adverse impacts; (2) alternatives to the proposed action; and (3) the relationship between short-term uses and long-term productivity. The agencies use the results of this analysis in decision-making. The preparation of this Environmental Assessment is a part of compliance with NEPA.

National Historic Preservation Act. Congress established the most comprehensive national policy on historic preservation with the passage of the National Historic Preservation Act of 1966 (NHPA). In this Act, historic preservation was defined to include "the protection, rehabilitation, restoration and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, or culture." The Act led to the creation of the National Register of Historic Places, a file of cultural resources of national, regional, state, and local significance. The act also established the Advisory Council on Historic Preservation (the Council), an independent Federal agency responsible for administering the protective provisions of the act. The major provisions of the NHPA are Sections 106 and 110. Both sections aim to ensure that historic properties are appropriately considered in planning Federal initiatives and actions. Section 106 is a specific, issue-related mandate to which Federal agencies must adhere. It is a reactive mechanism that is driven by a Federal action. Section 110, in contrast, sets out broad Federal agency responsibilities with respect to historic properties. It is a proactive mechanism with emphasis on ongoing management of historic preservation sites and activities at Federal facilities. Coordination of this project with SHPO fulfills the requirements to comply with the NHPA, and the SHPO letter dated September 9, 2009, concludes this process.

Louisiana Revised Statutes. Once complete, the plans and specifications for this sanitary sewerage treatment system would need to be approved by the Louisiana Department of Health and Hospitals pursuant to La. R.S. 40:4(A)(6).

9 CONCLUSION

The draft LDEQ permit specifies that the loading rates must not exceed 15 g/m^2/yr total nitrogen or 4 g/m^2/yr total phosphorus nor should the effluent exceed 800,000 gpd; to comply with the permit, the system would be operated to ensure that these loading thresholds were not exceeded. In the event of expansion, the Parish would have to reapply with LDEQ.

The proposed action consists of the construction and operation of a new sanitary wastewater treatment facility discharging secondarily-treated wastewater to the Spanish Lake wetlands for tertiary treatment as a wetlands assimilation project. This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have no impact upon cultural resources and would cause direct loss of 0.3 acres of wetland habitat within the Spanish Lake wetland. However, the introduction of treated municipal wastewater into the highly perturbed Spanish Lake wetland would increase wetland plant productivity and be a major step towards its ecological restoration (Comite Resources, 2008).

10 PREPARED BY

The point of contact and responsible manager for the preparation of EA #494 is Tammy Gilmore, CEMVN. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267. The draft EA was prepared by Michael McGarry, ecologist, David Miller & Associates, Inc. with relevant sections prepared by Christopher Brown, PhD - HTRW; Jerica Richardson - Cultural Resources; Debra Wright - Recreational Resources; Kelly McCaffrey- Aesthetics (Visual Resources); and Virginia Brisley/Chad Chauvin - Project Manager. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

11 REFERENCES

City of New Iberia. 2009. Pretreatment Inspection Report.

Comite Resources. 2008. Iberia Parish Wetland Assimilation Use Attainability Analysis (UAA). Comite Resources, Inc. 11643 Pride Port Hudson Rd., Zachary, LA 70791.

Iberia Industrial Development Foundation (IDF). 2008. Iberia Parish Community Profile. On line at: www.iberiabiz.org.

Iberia Industrial Development Foundation (Iberia Parish Master Plan). 2001. Infrastructure Master Plan for Iberia Parish, Louisiana. Prepared by Chenevert Songy Rodi Soderberg, Inc., February 2001.

Iberia Parish. 2009. Intergovernmental Agreement Between Iberia Parish and St. Martin Parish. Signed by Ernest Freyou, President Iberia Parish and Guy Cormier, President St. Martin Parish.

Iberia Parish Council. 2009. Iberia Parish Council Public Hearing on the Proposed Waste Water Treatment Plan for the Acadiana Regional Airport Near the Acadiana Fairgrounds. Parish Council Chambers, Main Courthouse Building, New Iberia, Louisiana on Wednesday September 23, 2009.

Louisiana Coastal Wetlands Conservation and Restoration Task Force (LACoast). 2009. The Louisiana Coastal Wetlands Conservation and Restoration Task Force Website. On Line at: www.lacoast.gov.

Louisiana Department of Environmental Quality (LDEQ). 2005. Addendum to the 2000 Bayou Teche TMDL for Biochemical Oxygen-Demanding Substances, Subsegments 060301 and 060401. Water Quality Monitoring Section, Water Quality Assessment Division, Office of Environmental Assessment.

Louisiana Department of Environmental Quality (LDEQ). 2009. Draft Louisiana Pollutant Discharge Elimination System (LPDES) Permit to Discharge Treated Wastewater Into the Spanish Lake Wetlands. File Number: LA0124605, AI Number: 164731, Activity Number: PER200900001.

Louisiana Department of Environmental Quality (LDEQ). 2009a. Wetland Assimilation Projects Webpage Summary. On Line at: http://deq.louisiana.gov/portal/tabid/2960/Default.aspx.

Louisiana Department of Wildlife and Fisheries (LDWF). 2009. Letter from Robert Barham, Secretary to Virginia Brisley, Project Manager regarding the Spanish Lake Wetland Assimilation Project, Iberia Parish. Dated July 30, 2009.

National Oceanic and Atmospheric Administration (NOAA). 2009. NOAA Southern Regional Climate Center. Data for New Iberia, LA. On Line at: www.srcc.lsu.edu/climateNormals/

U.S. Army Corps of Engineers (USACE). 2003. Letter Report: Iberia Parish Louisiana, Environmental Infrastructure, CWIS 076310. June 19, 2003.

U.S. Army Corps of Engineers (USACE). 2009. Hydraulic Report, Iberia Parish Wastewater Treatment, Wetlands Assimilation Project. Prepared by Taylor Engineering, Jacksonville, FL.

U.S. Army Corps of Engineers (USACE). 2009a. Phase I Environmental Site Assessment (ESA), Proposed Iberia Parish Wastewater Treatment Plant. Dated 26 October 2009.

U.S. Federal Transit Administration (USFTA). 1995. Transit Noise and Vibration Impact Assessment. FTA Report DOT-T-95-16, April 1995.

U.S. Fish and Wildlife Service (USFWS). 2009. Planning-aid Letter for the Proposed Iberia Parish Wastewater Treatment and Wetland Assimilation Project, Iberia Parish, Louisiana. Dated 6 October 2009.

Waldemar S. Nelson and Company, Inc. (WSN). 2005. Preliminary Engineering Report: Iberia Parish Wastewater Treatment Project, Iberia Parish, Louisiana. Project No. 20040156.

APPENDICES TO

ENVIRONMENTAL ASSESSMENT #494

Iberia Parish Wastewater Treatment, Wetland Assimilation Project

Iberia Parish and St. Martin Parish, Louisiana

LIST OF APPENDICES

Appendix A – List of Acronyms

ASTM	American Society for Testing and Materials
BLH	Bottomland Hardwood Forest
BNSF	Burlington Northern Santa Fe
BOD	Biochemical Oxygen Demand
CEMVN	Corps of Engineers, Mississippi Valley Division, New Orleans District
CEQ	The President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Ft Per Second
CW	Civil Works Program
CWA	Clean Water Act
CY	Cubic Yard
CZM	Coastal Zone Management
dBA	Decibels
EA	Environmental Assessment
EFH	Essential Fish Habitat
EM	Engineering Manual
EO	Executive Order
ER	Engineering Regulation
ESA	Environmental Site Assessment
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
HTRW	Hazardous, Toxic, and Radioactive Waste
LERRD	Lands, Easements, Rights-of-Way, Relocations, and Disposal
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
MBTA	Migratory Bird Treaty Act
mg/l	Milligrams per Liter
ML	Milliliters
MPH	Miles per Hour
MSA	Metropolitan Statistical Area
NAA	Non Attainment Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NIRC	New Iberia Research Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	National Resources Conservation Service
NWR	National Wildlife Refuge
O&M	Operations And Maintenance
OMRR&R	Operations, Maintenance, Repair, Replacement, & Rehabilitation
PL	Public Law
PPA	Project Partnering Agreements
PSI	Pounds Per Square Inch
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RED	Regional Economic Development

ROD	Record of Decision
ROW	Right-of-Way
SCORP	State Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
TSS	Total Suspended Solids
TMDL	Total Maximum Daily Load
USACE	United States Army Corps Of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish And Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
WRDA	Water Resources Development Act

Appendix B – Members of the Interagency Environmental Team

Tammy Gilmore/Biologist — US Army Corps of Engineers, MVN

Mike McGarry/Ecologist — David Miller and Associates, Inc.

Jamie Phillipe — Louisiana Department of Environmental Quality

Brigette Firmin — US Fish and Wildlife Service

Eric Glisch — US Army Corps of Engineers, MVN

Jerica Richardson/Archeologist — US Army Corps of Engineers, MVN

J. Christopher Brown/Biologist — US Army Corps of Engineers, MVN

Kelly McCaffrey/Landscape Architect — US Army Corps of Engineers, MVN

Debra Wright/ Outdoor Recreation Planner — US Army Corps of Engineers, MVN

Appendix C - CEMVN Questions and NIRC Responses 13 October 2009

CEMVN Question: Please characterize how the effluent from research using biohazard agents is controlled.

NIRC Response: Only pathogens, recombinant DNA and viral vectors are used at NIRC. The Center does not perform cell or tumor line, toxin, chemical carcinogen/mutagen, or radioisotope research. All potentially infectious material is handled as biohazardous material and disposed of as such in red biohazard bags. All red bag clinic material (gauze, bandaging, sharps containers, etc.) is processed by an autoclave sterilizer on site and hauled away in a compactor by commercial vendor.

All fecal material (i.e., "gross debris" in NIRC standard operating procedures) is picked up daily, placed into biohazard bags and hauled away by a commercial vendor as medical waste. This material is not technically biohazardous medical waste, as it is just fecal material from a colony of animals. However the current sewer system cannot handle the volume of feces this represents, therefore it is picked up and shipped out. The commercial vendor picks up approximately 35,000 pounds per month of "red bag" waste. Present in the fecal material would be typical gastrointestinal infectious agents such as shigella and e.coli. As the vast majority of the facility is breeding and holding areas, this fecal material is not contaminated with anything that would not be seen in the general human population.

Material used for pharmacokinetic studies may be excreted by the animal during the active study period of 24-96 hours. The typical duration of study is such that metabolites and/or material used for dosing have cleared the animal's system, thus there would be no risk of excretion into the sewer. As dictated by the nature of the study, excreta is collected and shipped to the sponsoring company for analysis and this material is not released into the sanitary sewer.

CEMVN Question: What quantities and frequencies apply to the use of these biohazard agents?

NIRC Response: It is nearly impossible to quantify the amount of study material present or define frequency of use as it is quite variable. The material is typically used during the initial phase of the study and then disposed of after adequate chemical inactivation or shipped back to the sponsor. The quantities administered can range from micrograms to milligrams of infectious material per study animal. Viral or bacterial concentrates are received from [the study] sponsor, diluted in vehicle to obtain optimal dose prior to dosing. Remaining concentrates are returned to the sponsor, diluted concentrate is inactivated with equal volumes of bleach prior to disposal at NIRC.

CEMVN Question: Do these agents enter the sanitary sewer?

NIRC Response: No.

CEMVN Question: If not, how are these biohazard agents segregated from the waste stream?

NIRC Response: The use and disposal of study material for research is strictly overseen by the study protocol. This protocol will dictate the disposal method for the actual study material. The residual material will either be shipped back to the [study] sponsor or will be deactivated in bleach before being released into the sanity sewer as inactivated material.

CEMVN Question: What % of animal stock is involved in research activities?

NIRC Response: As of 9 October 2009, approximately 12% of the population is on study.

CEMVN Question: Does the NIRC perform research activities on vaccinations or hormone therapy?

NIRC Response: NIRC does not perform chemical, toxin, carcinogenic, or related research. The research conducted by the NIRC is primarily confined to infectious disease studies, usually vaccine candidates or biological therapeutic regimens used to help the body fight an infectious disease. Very seldom pharmacokinetic studies of 24-96 hour duration are performed. These studies consist of administration of a study material and the subsequent testing of the animal's ability to use and excrete the material. During these short-term studies all excreta are collected and shipped to the sponsor for analysis.

CEMVN Question: As a registered laboratory, are there regulations and permitting for waste water discharges, in addition to the New Iberia wastewater permit?

NIRC Response: No

CEMVN Question: What pharmaceuticals are used in the care and handling of primates at

NIRC?

NIRC Response: The pharmaceuticals in use in the care of the primates at the New Iberia Research Center are the same as those typically used in a veterinary clinic or human hospital. At any point in time approximately 300 of the 6500 animals housed at NIRC are on some type of clinical pharmaceutical treatment due to illness. These pharmaceuticals are FDA approved OTC or prescription medications. Most animals are treated for an acute episode of illness and then placed back into the general colony.

CEMVN Question: What endocrine disrupting compounds are used in the care and handling of

primates at NIRC?

NIRC Response: There is one chimpanzee on Zovia birth control.

CEMVN Question: What personal care products are used in the care and handling of primates

at NIRC?

NIRC Response: None

CEMVN Question: What pharmaceuticals are used in research protocols at NIRC?

NIRC Response: Vaccine candidates, small molecule material (non-steroidal anti-inflammatories, blood pressure medications) for pharmacokinetics, monoclonal antibodies for infectious disease therapies and therapeutic proteins for inflammatory conditions.

CEMVN Question: What endocrine disrupting compounds are used in research protocols at

NIRC?

NIRC Response: *None*

CEMVN Question: What personal care products are used in research protocols at NIRC?

NIRC Response: *None*

Appendix D – Draft Discharge Permit

DAVID

BOBBY JINDAL
GOVERNOR

HAROLD LEGGETT, PH.D.
SECRETARY

JUL 17 2009

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

Certified Mail# 7005 1820 0002 2360 7984

FILE NUMBER: LA0124605
AI NUMBER: 164731
ACTIVITY NUMBER: PER20090001

Sewerage District No. 1 of Iberia Parish
Spanish Lake Wetland Assimilation Project
2617 Northside Road, Suite 100
New Iberia, Louisiana 70563-0953

Attention: Mr. Joseph M. Gonzalez, Sr., Executive Director

Subject: Draft Louisiana Pollutant Discharge Elimination System (LPDES) permit to discharge treated sanitary wastewater into the Spanish Lake Wetlands; thence into Bayou Tortue; thence into Bayou Teche from a publicly owned treatment works serving the unincorporated areas of Iberia Parish in the vicinity of the Acadiana Regional Airport and the University of Louisiana at Lafayette's New Iberia Research Center.

Gentlemen:

The Department of Environmental Quality proposes to issue an LPDES permit with the effluent limitations, monitoring requirements, and special conditions listed in the attached DRAFT PERMIT. Please note that this is a DRAFT PERMIT only and as such does not grant any authorization to discharge. Authorization to discharge in accordance with this permitting action will only be granted after all requirements described herein are satisfied and by the subsequent issuance of a FINAL PERMIT.

This Office will publish a public notice one time in the local newspaper of general circulation, and in the Department of Environmental Quality Public Notice Mailing List. A copy of the public notice containing the specific requirements for commenting to this draft permit action will be sent under separate cover at the time the public notice is arranged. In accordance with LAC 33:IX.6521.A, the applicant shall receive and is responsible for paying the invoice(s) from the newspaper(s). LAC 33:IX.6521 states, "...The costs of publication shall be borne by the applicant."

The invoice, fee rating worksheet, and a copy of the fee regulations will be sent under a separate cover letter as applicable. Please note that a copy of the fee rating worksheet is also attached to this draft permit. A copy of the entire Louisiana Water Quality Regulations (Volume 14) may be obtained from the LDEQ Office of Environmental Assessment, Post Office Box 4314, Baton Rouge, Louisiana 70821-4314, (225) 219-3236.

Pursuant to LAC 33.IX.1309.I, LAC 33.IX.6509.A.1 and LAC 33.I.1701, you must pay any outstanding fees to the Department. Therefore, you are encouraged to verify your facility's fee status by contacting LDEQ's Office of Management and Finance, Financial Services Division at (225) 219-3863. Failure to pay in the manner and time prescribed could result in applicable enforcement actions as prescribed in the Environmental Quality Act, including, but not limited to revocation or suspension of the applicable permit, and/or assessment of a civil penalty against you.

A Municipal Water Pollution Prevention Environmental Audit Report Form will be furnished upon finalization of the permit. Please consult Part II, Section B of the permit for instructions regarding this audit.

For all sanitary treatment plants, the plans and specifications must be approved by the Department of Health and Hospitals, Office of Public Health Center for Environmental Health Services, Post Office Box 4489, Baton Rouge, LA 70821-4489, (225) 342-7395.

Should you have any questions concerning any part of the DRAFT PERMIT, public notice requirements, or fees, please contact Mr. Todd Franklin, Office of Environmental Services, Water Permits Division, at the address on the preceding page or telephone (225) 219-3102. Please reference your Agency Interest Number, AI 164731, and your Louisiana Pollutant Discharge Elimination System Number, LA0124605, on all future correspondence to the Department.

Sincerely,

Tom Killeen, Environmental Scientist Manager
Municipal and General Water Permits Section

jtf

Attachments (Draft Permit-Parts I-III, Statement of Basis, and Fee Sheet)

cc: Mr. Todd Franklin
Water Permits Division

IO-W

ec: Ms. Gayle Denino
Office of Management & Finance

Mr. Ronnie Bean
Water Permits Division

Permit Compliance Unit
Office of Environmental Compliance

For Public Notice
Public Participation Group
Office of Environmental Assistance

Public Health Chief Engineer
Office of Public Health
Department of Health and Hospitals

DRAFT

PERMIT NUMBER:
LA0124605

AGENCY INTEREST NUMBER: AI 164731

ACTIVITY NUMBER:
PER20090001

DEQ
LOUISIANA

OFFICE OF ENVIRONMENTAL SERVICES

Water Discharge Permit

Pursuant to the Clean Water Act, as amended (33 U.S.C. 1251 et seq.), and the Louisiana Environmental Quality Act, as amended (La. R. S. 30:2001 et seq.), rules and regulations effective or promulgated under the authority of said Acts, and in reliance on statements and representations heretofore made in the application, a Louisiana Pollutant Discharge Elimination System permit is issued authorizing

Sewerage District No. 1 of Iberia Parish
Spanish Lake Wetland Assimilation Project
2617 Northside Road, Suite 100
New Iberia, Louisiana 70563-0953

Type Facility: publicly owned treatment works serving the unincorporated areas of Iberia Parish in the vicinity of the Acadiana Regional Airport and the University of Louisiana at Lafayette's New Iberia Research Center

Location: on Tower Drive, approximately 0.75 miles northwest of its intersection with LA Highway 3212, Iberia Parish

Receiving Waters: Spanish Lake Wetlands; thence into Bayou Tortue; thence into Bayou Teche (Subsegment 060401)

to discharge in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III attached hereto.

This permit shall become effective on

This permit and the authorization to discharge shall expire five (5) years from the effective date of the permit.

Issued on **DRAFT**

Cheryl Sonnier Nolan
Assistant Secretary

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee is authorized to discharge from:

Outfalls 001 - treated sanitary wastewater (design capacity is 0.8 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic		Discharge Limitations				Monitoring Requirements	
	Storet Code	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.	Measurement Frequency	Sample Type
Flow-MGD	50050	Report (MGD)	Report (MGD)	---	---	Continuous	Recorder[1]
BOD_5	00310	200 lbs/day	---	30 mg/l	45 mg/l	1/week	3 Hr Comp
TSS	00530	600 lbs/day	---	90 mg/l	135 mg/l	1/week	3 Hr Comp
Fecal Coliform[2] colonies/100ml	74055	---	---	200	400	1/week	Grab
pH (Standard Units)[3]	00400	---	---	---	---	1/week	Grab
Magnesium, Total	00927	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Lead, Total[4]	01051	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Cadmium, Total[4]	01027	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Chromium, Total[4]	01034	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Copper, Total[4]	01042	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Zinc, Total[4]	01092	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Iron, Total	01045	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Nickel, Total[4]	01067	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Silver, Total[4]	01077	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Selenium, Total[4]	01147	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/6 months	3 Hr Comp
Nitrogen, Total[5 & 6]	00600	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/quarter	3 Hr Comp
Phosphorus, Total[6]	00665	Report (lbs/day)	---	Report (mg/l)	Report (mg/l)	1/quarter	3 Hr Comp

[1] Includes totalizing meter or totalizer.

[2] See Part II, Section A, Paragraph 8

[3] The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units. The permittee shall report on the Discharge Monitoring Reports both the minimum and maximum instantaneous pH values measured.

[4] If any individual analytical test result is less than the minimum quantification level (MQL) listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements. Please note that the laboratory minimum detection level must be at or below the listed MQL.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Pollutant	MQL
Lead	5 µg/L
Cadmium	1 µg/L
Chromium	10 µg/L
Copper	10 µg/L
Zinc	20 µg/L
Nickel	40 µg/L
Silver	2 µg/L
Selenium	5 µg/L

[5] Total Nitrogen will be reported as the sum of Total Kjeldahl Nitrogen (TKN) plus Nitrate and Nitrite.

[6] Data obtained from the TN and TP analysis will be used to derive nutrient loading per square meter of wetlands which will be reported in the Annual Wetland Monitoring Report. **If loading rates exceed 15 g/m^2/yr total nitrogen or 4 g/m^2/yr total phosphorus, then either the loading rates must be reduced or the assimilation area must be increased.**

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location:

Outfall 001, at the point of discharge from the last treatment unit and before entering the distribution system into the wetland area. The distribution points will be utilized in any combination and rotation necessary to ensure uniform coverage and to maximize the assimilation potential and the productivity of the wetland. The discharge patterns shall be recorded and included in the Annual Wetland Monitoring Report.

PART II

OTHER REQUIREMENTS

In addition to the standard conditions required in all permits and listed in Part III, the office has established the following additional requirements in accordance with the Louisiana Water Quality Regulations.

SECTION A. GENERAL STATEMENTS

1. The Louisiana Department of Environmental Quality (LDEQ) reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon additional water quality studies and/or TMDL's. The LDEQ also reserves the right to modify or revoke and reissue this permit based upon any changes to established TMDL's for this discharge, or to accommodate for pollutant trading provisions in approved TMDL watersheds as requested by the permittee and/or as necessary to achieve compliance with water quality standards. Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

   In accordance with LAC 33:IX.2903., this permit may be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitations issued or approved under sections 301(b)(2)(c) and (D); 304(b)(2); and 307(a)(2) of the Clean Water Act, if the effluent standard or limitations so issued or approved:

   a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   b) Controls any pollutant not limited in the permit; or

   c) Requires reassessment due to change in 303(d) status of waterbody; or

   d) Incorporates the results of any total maximum daily load allocation, which may be approved for the receiving water body.

2. This permit does not in any way authorize the permittee to discharge a pollutant not listed or quantified in the application or limited or monitored for in the permit.

3. Authorization to discharge pursuant to the conditions of this permit does not relieve the permittee of any liability for damages to state waters or private property. For discharges to private land, this permit does not relieve the permittee from obtaining proper approval from the landowner for appropriate easements and rights of way.

4. For definitions of monitoring and sampling terminology see Part III, Section F.

5. 24-hour Oral Reporting: Daily Maximum Limitation Violations

   Under the provisions of Part III Section D.6.e.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to the Office of Environmental Compliance within 24 hours from the time the permittee became aware of the violation followed by a written report in five days.

   Pollutants: None

6. As an exception to Part III Section D.6.e.(1), the permittee shall report all overflows in the collection system with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries

OTHER REQUIREMENTS (cont.)

shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and the ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary). All other overflows and overflows which endanger human health or the environment must be reported in the manner described in Part III, Section D.6 of the permit.

7. The permittee shall achieve compliance with the effluent limitations and monitoring requirements specified for discharges in accordance with the following schedule:

   EFFECTIVE DATE OF THE PERMIT

8. Future water quality studies may indicate potential toxicity from the presence of residual chlorine in the treatment facility's effluent. Therefore, the permittee is hereby advised that a future Total Residual Chlorine Limit may be required if chlorine is used as a method of disinfection. In many cases, this becomes a NO MEASURABLE Total Residual Chlorine Limit. If such a limit were imposed, the permittee would be required to provide for dechlorination of the effluent prior to a discharge.

9. DISCHARGE MONITORING REPORTS

   Monitoring results must be reported on a Discharge Monitoring Report (DMR) form (EPA No. 3320-1 or an approved substitute). All monitoring reports must be retained for a period of at least three (3) years from the date of the sample measurement. The permittee shall make available to this Department, upon request, copies of all monitoring data required by this permit.

   If there is a no discharge event at any of the monitored outfall(s) during the reporting period, enter "No Discharge" in the upper right corner of the Discharge Monitoring Report.

   Discharge Monitoring Report (DMR) forms shall be prepared and submitted for each outfall per the instructions and submission schedules below:

   A. For monitoring frequencies once per month or more often (i.e. 1/week, 1/day, 1/batch, 1/discharge event), one DMR form per month (summarize monitoring results monthly) must be prepared and submitted quarterly.

   B. For once per quarter monitoring frequencies, one DMR form per quarter must be prepared and submitted quarterly.

   C. For once per 6 months monitoring frequencies, one DMR form per six month period must be prepared and submitted semi-annually.

   D. For once per year monitoring frequencies, one DMR form per year must be submitted annually.

   Quarterly Submission Schedule

Monitoring Period	DMR Postmark Date
January, February, March	April 28th
April, May, June	July 28th
July, August, September	October 28th
October, November, December	January 28th

OTHER REQUIREMENTS (cont.)

Semiannual Submission Schedule

Monitoring Period	DMR Postmark Date
January - June	July 28th
July – December	January 28th

Annual Submission Schedule

Monitoring Period	DMR Postmark Date
January-December	January 28th

Duplicate copies of DMRs (one set of originals and one set of copies) signed and certified as required by LAC 33:IX.2503, and all other reports (one set of originals) required by this permit shall be submitted to the Permit Compliance Unit at the following address:

Department of Environmental Quality
Office of Environmental Compliance
Enforcement Division
Post Office Box 4312
Baton Rouge, Louisiana 70821-4312
Attention: Permit Compliance Unit

10. The acceptance of hauled domestic septage is prohibited unless otherwise authorized by this Department. Septage is defined in LAC 33:IX.2313 as the liquid and solid material pumped from a septic tank, cesspool, portable toilet, Type III marine sanitation device, any similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained that receives only domestic sewage.

OTHER REQUIREMENTS (cont.)

SECTION B. MUNICIPAL WATER POLLUTION PREVENTION

Pollution Prevention Requirements

1. The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. A copy of the Environmental Audit Form has been attached to this permit. Please make additional copies to be utilized for each year of this permit. Additional copies can be obtained upon request.

   The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	12 Months from Audit Period Beginning Date	3 Months from Audit Period Ending Date

   These reports shall discuss the following items:

   a. The influent loading, flow, and design capacity of the facility;
   b. The effluent quality and plant performance;
   c. The age of the wastewater treatment facility;
   d. Bypasses and overflows of the tributary sewerage system and treatment works;
   e. The ultimate disposition of the sewage sludge;
   f. Landfilling of sewage sludge and potential alternatives (if applicable);
   g. New developments at the facility;
   h. Operator certification and training;
   i. The financial status of the facility; and
   j. A subjective evaluation of conditions at the facility.

2. A resolution from the permittee's governing body shall be obtained as part of the Environmental Audit Report. This resolution shall include, at a minimum, the following:

   a. An acknowledgement that the governing body has reviewed the Environmental Audit Report;

   b. A description of actions that the permittee will take to maintain compliance with the permit conditions, and if necessary, include a schedule outlining major projects to be accomplished.

3. The Environmental Audit Report and the governing body's resolution must be signed by a duly authorized representative of the permittee and shall be maintained with the permit and permit related records (i.e. lab data, DMRs), and made available upon request by duly authorized regional inspectors and/or DEQ Headquarters representatives.

OTHER REQUIREMENTS (cont.)

SECTION C. CONTRIBUTING INDUSTRIES AND PRETREATMENT REQUIREMENTS

1. The following pollutants may not be introduced into the treatment facility:

   a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works are specifically designed to accommodate such discharges;

   c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, resulting in Interference;

   d. Any pollutant, including oxygen demanding pollutants (e.g., BOD5), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;

   e. Heat in amounts which will inhibit biological activity in the POTW resulting in Interference but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;

   f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

   g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and

   h. Any trucked or hauled pollutants, except at discharge points designated by the POTW.

2. The permittee shall require any indirect discharger to the treatment works to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act, including any requirements established under LAC 33:IX.Subpart 2.Chapter 61.

3. The permittee shall provide adequate notice of the following:

   a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 and 306 of the Clean Water Act if it were directly discharging those pollutants; and

   b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

   c. Any notice shall include information on (1) the quality and quantity of effluent to be introduced into the treatment works, and (2) any anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

OTHER REQUIREMENTS (cont.)

SECTION D. WETLAND SYSTEM MONITORING REQUIREMENTS

1. **MONITORING AND REPORTING shall apply to both discharge area and reference area as defined in the following chart:**

PARAMETER	WETLAND COMPONENT		
	FLORA	SEDIMENT	SURFACE WATER
Species Classification	P		
Percentage of Whole Cover (for each species)	P		
Growth Studies	A_1		
Water Stage			M
Metals Analysis: Mg, Pb, Cd, Cr, Cu, Zn, Fe, Ni, Ag, Se	P_1	P_1	P
Nutrient Analysis I: TKN, TP	$P_{1,2}$	$P_{1,2}$	Q
Nutrient Analysis II: NH_3N, NO_2N, NO_3N, PO_4		P_1	Q
Others: BOD_5, TSS, pH, Dissolved Oxygen			P
Accretion Rate		P	

SPECIES CLASSIFICATION

Within the three Discharge Area sites and within the Reference Area site, three or more 10 x 100 m quadrates should be established. These plots must be oriented perpendicular to the hydrological gradient. All trees within these subplots with a diameter at breast height (dbh) greater than 3.2 cm should be tagged with an identification number.

The relative importance of each major tree species in both the Discharge and Reference Areas will be based on the density (total number), dominance (basal area), and frequency of occurrence in each of the plots using equations 1-4 (Barbour et al. 1987).

Relative density = (individuals of a species)/(total individuals of all species) (1)
Relative dominance = (total basal area of a species)/(total basal area of all species) (2)
Relative frequency = (frequency of species)/(total frequency of all species in area) (3)
Importance Value = Relative density + Relative dominance + Relative Frequency (4)

PERCENTAGE OF WHOLE COVER and GROWTH STUDIES

Productivity of a forested wetland is defined as the sum of stem growth (perennial productivity) and leaf and fruit fall (ephemeral productivity). Above-ground net primary productivity (NPP) should be calculated as the sum of ephemeral and perennial productivity, and presented as live dry weight per square meter per year basis ($g/m^2/yr$).

Perennial productivity should be calculated using diameter at breast height (dbh) measurements of all trees with dbh greater than 3.2 cm within the subplots defined above. Measurements of dbh should be taken during two consecutive

OTHER REQUIREMENTS (cont.)

winters when trees are dormant, and biomass calculated using allometric equations (Megonigal et al. 1997; Scott et al. 1985). The following steps should be used to calculate perennial productivity:

- Estimate biomass (in kg) from dbh using allometric equations (see Table 1 below).
- Sum biomass per study site and divide by area (in kg/m^2) of the study site. This calculates the biomass per unit area (kg/m^2) for each year and study site.
- Subtract Year 1 biomass (kg/m^2) from Year 2 biomass, and multiply by 1000. This calculates the perennial productivity as g/m^2/yr.

Table 1. Regression equations used to convert diameter at breast height (DBH) measurements to overall perennial biomass. All equations are in the form: Biomass = f (DBH), where biomass is in kg, DBH is in cm and f is the parameterized function.

Species	Biomass f(D)	DBH Range	Reference
Fraxinus spp.	Biomass (kg) = ((2.669*((DBHcm*0.394)^1.16332))*0.454	>10 cm	Megonigal et al. '97
Taxodium distichum	Biomass (kg) = 10^(-.97+2.34*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Nyssa aquatica	Biomass (kg) = 10^(-919+2.291*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Acer rubrum	Biomass (kg) = ((2.39959*((DBHcm*0.394)^2)^1.2003))*0.454	10-28 cm	Megonigal et al. '97
Quercus nigra	Biomass (kg) = ((3.15067*((DBHcm*0.394)^2)^1.21955))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg) = ((5.99898*((DBHcm*0.394)^2)^1.08527))*0.45	>28 cm	Megonigal et al. '97
Salix spp.	Biomass (kg) = 10^(-1.5+2.78*LOG10(DBHcm))	n.a.	Scott et al. 1985
Other Species	Biomass (kg) = ((2.54671*((DBHcm*0.394)^2)^1.20138))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg) = ((1.80526*((DBHcm*0.394)^2)^1.27313))*0.45	>28 cm	Megonigal et al. '97

Ephemeral productivity should be measured using 0.25 m^2 leaf litter boxes, with screened bottoms and approximately 10 cm wide sides. Six boxes should be placed randomly in each of the 10 x 100 m quadrates within the Discharge Area and Reference Area. Leaves and other materials that collect in the boxes should be gathered bimonthly, separated into leaves and woody material, dried to a constant weight, and weighed. Ephemeral productivity should be calculated by summing the dried weight of leaves from each box over one year and extrapolating to g/m^2/yr.

Net Primary Production: Aboveground net primary production (NPP) will be calculated as the sum of leaf litter and wood protection, and will be given in g/m^2/yr.

WATER STAGE

Water stage is a gauged measurement of the water depth, which will assist in determining stress in the wetlands from hydrologic loadings and will determine the existence of a zone of influence resulting from wastewater applications. The zone around the discharge serves to assimilate the wastewater most effectively. This zone grows larger as wastewater continues to be discharged and the assimilative capacity of the immediate area becomes saturated. The water stage at set points within each of the three (3) Discharge Area sites and the Reference Area site shall be measured monthly.

METALS, NUTRIENT I, NUTRIENT II, AND OTHER ANALYSIS

Samples of the flora, sediment, and surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following metals and nutrients: Magnesium, Lead, Cadmium, Chromium, Copper, Zinc, Iron, Nickel, Silver, Selenium, Total Kjeldahl Nitrogen, and Total Phosphorus.

OTHER REQUIREMENTS (cont.)

Samples of the sediment and surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following nutrients: Ammonia-Nitrogen, Nitrite Nitrogen, Nitrate Nitrogen, and Phosphate.

Samples of the surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following parameters: Biochemical Oxygen Demand (BOD_5), Total Suspended Solids, pH, and Dissolved Oxygen.

Sampling procedures to be used during the wetland monitoring phase.

Water quality analyses must be conducted according to test procedures approved under 40 CFR Part 136.

For soils/sediments, sample preservation, handling, and analysis must meet the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, or most recent revision) or an equivalent substitute as approved by the administrative authority.

ACCRETION RATES

Accretion rates will provide an indication of the how the effluent is contributing sediment and organic matter into the wetland area. Feldspar markers will be laid on the wetland surface in each of the three (3) Discharge Area sites and the Reference Area site, with each plot having three 0.25 m^2 subplots where 1 cm thick powdered feldspar clay will be placed (Cahoon and Turner 1989). The subplots will be marked at each corner with PVC poles. Every four years, the thickness of material deposited on top of the feldspar marker at one subplot of each plot will be measured destructively by taking a 20 cm x 20 cm plug using a shovel or trowel, cleanly slicing the core into several sections to reveal the horizon, then measuring the thickness of material above the surface of the horizon at 10 different locations. The rate of vertical accretion will be calculated by dividing the mean thickness of material above the surface of the horizon by the amount of time the horizon had been in place.

The **Discharge Area** is defined as the area of wetlands directly affected by effluent addition, and is inclusive of the delineated assimilation area.

The **Reference Area** is defined as wetland area that is nearby and similar to the Discharge Area, but that is not affected by effluent addition.

Water quality will be monitored by taking water samples from the monitoring sites along the path of flow of the effluent in the Discharge Area and from one or more Reference Area sites.

Compared to data from the Use Attainability Analysis, Reference Area, and annual Wetland Monitoring Reports, the effects of the discharge on the biological integrity (as defined above) may be accurately assessed.

Sampling in the **DISCHARGE AREA** must be conducted as follows:

Collection of a minimum of three samples per site in each of three sites:

1) Near site location: Latitude 30° 2′ 24″ North
Longitude 91° 50′ 47″ West

OTHER REQUIREMENTS (cont.)

2) Mid site location: Latitude 30° 2′ 55″ North
Longitude 91° 50′ 52″ West

3) Out site location: Latitude 30° 3′ 17″ North
Longitude 91° 50′ 56″ West

Exception: Only one sample per site in each of the three sites for those samples collected quarterly.

Sampling in the **REFERENCE AREA** must be conducted as follows:

Collection of a minimum of three samples in the Reference Area. All three samples will be taken from a site or sites similar to the Discharge Area.

Reference Area location: Latitude 30° 3′ 45″ North
Longitude 91° 51′ 2″ West

Exception: Only one sample per site in the Reference Area for those samples collected quarterly.

A: ANNUALLY. Sample once per year at all three (3) DISCHARGE AREA sites and the REFERENCE AREA site and included in the yearly report.
A_1 – Stem growth and litter fall.

M: MONTHLY. Samples should be taken at all three (3) DISCHARGE AREA sites and the REFERENCE AREA site each month and include in the yearly report.

P: PERIODICALLY. Sampling must be made once during September through November in the fourth year of the permit period for all three (3) DISCHARGE AREA sites and the REFERENCE AREA site.

P_1 – Sample preservation, handling, and analysis must meet the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, or most recent revision) or an equivalent substitute as approved by the administrative authority.

P_2 – Sampling to be conducted in summer to reflect peak growth.

Q: QUARTERLY. Sampling (one sample collected per site) must be made every three months annually for all three (3) DISCHARGE AREA sites and the REFERENCE AREA site.

OTHER REQUIREMENTS (cont.)

Parameters are to be sampled and monitored for the specified wetland component at all Discharge Areas and the Reference Area.

WETLAND MONITORING REPORT REQUIREMENT SCHEDULE	
REPORT	**DUE DATE**
Annual Wetland Monitoring Report[1]	**NO LATER THAN** 30 days from one (1) year from the effective date of the permit
Annual Wetland Monitoring Report[1]	**NO LATER THAN** 30 days from two (2) years from the effective date of the permit
Annual Wetland Monitoring Report[1]	**NO LATER THAN** 30 days from three (3) years from the effective date of the permit
Annual Wetland Monitoring Report[1] and the Fourth Year Wetland Monitoring Report[2]	**NO LATER THAN** 30 days from four (4) years from the effective date of the permit
Annual Wetland Monitoring Report[1]	**NO LATER THAN** 30 days from five (5) years from the effective date of the permit

[1] Annual Wetland Monitoring Report **must be submitted on the attached forms** and shall consist of:

Parameter	Wetland Component
Growth Studies (Stem Growth & Litter Fall)	Flora
Water Stages	Surface Water
Metal Analysis	Effluent Water
Nutrient Analysis I	Surface Water
Nutrient Analysis II	Surface Water
Other Parameters	Surface Water

[2] Fourth Year Wetland Monitoring Report **must be submitted on the attached forms** and shall consist of:

Parameter	Wetland Component
Species Classification	Flora
Percentage of Whole Cover	Flora
Metal Analysis	Flora, Sediment, & Surface Water
Nutrient Analysis I	Flora & Sediment
Nutrient Analysis II	Sediment
Accretion	Sediment

In the event that a permit is not reissued in a timely manner, the Annual Wetland Monitoring Report shall be submitted for the years following the expiration date of the permit and shall be due 30 days after the anniversary of the effective date of this permit.

OTHER REQUIREMENTS (cont.)

A copy of each report required by this permit shall be submitted to the Permits Compliance Unit, and shall also be submitted to the Water Permits Division and Water Quality Assessment Division at the following addresses:

Louisiana Department of Environmental Quality
Office of Environmental Compliance
Enforcement Division
Post Office Box 4312
Baton Rouge, Louisiana 70821-4312
Attention: Permit Compliance Unit

Louisiana Department of Environmental Quality
Office of Environmental Services
Water Permits Division
Municipal and General Water Permits Section
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

Louisiana Department of Environmental Quality
Office of Environmental Assessment
Water Quality Assessment Division
Post Office Box 4314
Baton Rouge, Louisiana 70821-4314

2. **If wetland monitoring shows that there is:**

- **MORE THAN A 20% DECREASE IN NATURALLY OCCURRING LITTER FALL OR STEM GROWTH; OR**
- **SIGNIFICANT* DECREASE IN THE DOMINANCE INDEX OR STEM DENSITY OF BALD CYPRESS**
- **SIGNIFICANT* DECREASE IN FAUNAL SPECIES DIVERSITY AND MORE THAN A 20% DECREASE IN BIOMASS**

then, within 180 days of a decrease in any of the above required biological criteria, the permittee shall develop a study and test procedures to determine the origination of the cause. A determination shall be made to indicate whether or not the impact to the natural wetland was caused by the effluent. The permittee must demonstrate to the Department what has caused the problem within 9 months of the decrease in any of the above required biological criteria and develop a comprehensive plan for the expeditious elimination and prevention of such cause. The plan shall be implemented within 90 days of the determination of the cause. The plan shall provide specific corrective actions to be taken to achieve compliance with the above biological criteria within the shortest period of time. In addition, the permittee shall submit the following with the Discharge Monitoring Report in the months of January, April, July and October:

i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;
ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity;
iii. any data which identifies effluent toxicity control mechanisms or measures that could be installed or implemented which would reduce or remove the effluent toxicity; and steps taken or proposed to be taken to prevent such violation(s) from recurring.

OTHER REQUIREMENTS (cont.)

In addition, **if studies and tests indicate that the impact to the natural wetland was caused by the effluent, then this permit may be reopened to include appropriate limitations and conditions to ensure protection of water quality standards.**

**Note:* *One-way analysis of variance analysis will be carried out to compare treatment and control area parameters using statistical software. An alpha probability level of <0.05 will be used to define a significant difference. Comparisons of means with significant ANOVA tests will be made using Tukey-Kramer Honestly Significant Difference (HSD) test (Sall and Lehman 1996). Other statistical tests may be authorized by LDEQ as appropriate.*

3. **If loading rates exceed 15 g/m^2/yr total nitrogen or 4 g/m^2/yr total phosphorus, then either the loading rates must be reduced or the assimilation area must be increased.**

Suggestions for sampling during the wetland monitoring can be found in *The Use of Louisiana Swamp Forests for Application of Treated Municipal Wastewater: Standard Operating Procedures for Monitoring the Effects of Effluent Discharge*. John W. Day, Jr., Joel Lindsey, Jason N. Day, and Robert R. Lane, Comite Resources, Inc. (Used with the permission of Dr. John W. Day, Jr., March 14, 2003).

PART III
STANDARD CONDITIONS FOR LPDES PERMITS

SECTION A. GENERAL CONDITIONS

1. Introduction
   In accordance with the provisions of LAC 33:IX.2701, et seq., this permit incorporates either expressly or by reference ALL conditions and requirements applicable to Louisiana Pollutant Discharge Elimination System Permits (LPDES) set forth in the Louisiana Environmental Quality Act (LEQA), as amended, as well as ALL applicable regulations.

2. Duty to Comply
   The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Louisiana Environmental Quality Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. Penalties for Violation of Permit Conditions
   a. LA. R. S. 30:2025 provides for civil penalties for violations of these regulations and the Louisiana Environmental Quality Act. LA. R. S. 30:2076.2 provides for criminal penalties for violation of any provisions of the LPDES or any order or any permit condition or limitation issued under or implementing any provisions of the LPDES program. (See Section E. Penalties for Violation of Permit Conditions for additional details).

   b. Any person may be assessed an administrative penalty by the State Administrative Authority under LA. R. S. 30:2025 for violating a permit condition or limitation implementing any of the requirements of the LPDES program in a permit issued under the regulations or the Louisiana Environmental Quality Act.

4. Toxic Pollutants
   a. Other effluent limitations and standards under Sections 301, 302, 303, 307, 318, and 405 of the Clean Water Act. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, the state administrative authority shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

   b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

5. Duty to Reapply
   a. Individual Permits. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The new application shall be submitted at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the state administrative authority. (The state administrative authority shall not grant permission for applications to be submitted later than the expiration date of the existing permit.) Continuation of expiring permits shall be governed by regulations promulgated at LAC 33:IX.2321 and any subsequent amendments.

b. General Permits. General permits expire five years after the effective date. The 180-day reapplication period as defined above is not applicable to general permit authorizations. Reissued general permits may provide automatic coverage for permittees authorized under the previous version of the permit, and no new application is required. Requirements for obtaining authorization under the reissued general permit will be outlined in Part I of the new permit. Permittees authorized to discharge under an expiring general permit should follow the requirements for obtaining coverage under the new general permit to maintain discharge authorization.

6. Permit Action
This permit may be modified, revoked and reissued, or terminated for cause in accordance with LAC 33:IX.2903, 2905, 2907, 3105 and 6509. The causes may include, but are not limited to, the following:

a. Noncompliance by the permittee with any condition of the permit;

b. The permittee's failure in the application or during the permit issuance process to disclose fully all relevant f acts, or the permittee's misrepresentation of any relevant facts at any time;

c. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;

d. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge; or

e. Failure to pay applicable fees under the provisions of LAC 33: IX. Chapter 13;

f. Change of ownership or operational control;

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. Property Rights
This permit does not convey any property rights of any sort, or any exclusive privilege.

8. Duty to Provide Information
The permittee shall furnish to the state administrative authority, within a reasonable time, any information which the state administrative authority may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the state administrative authority, upon request, copies of records required to be kept by this permit.

9. Criminal and Civil Liability
Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to La. R.S. 30:2025.

10. Oil and Hazardous Substance Liability
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

11. State Laws
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Clean Water Act.

12. Severability
If any provision of these rules and regulations, or the application thereof, is held to be invalid, the remaining provisions of these rules and regulations shall not be affected, so long as they can be given effect without the invalid provision. To this end, the provisions of these rules and regulations are declared to be severable.

13. Dilution
A permittee shall not achieve any effluent concentration by dilution unless specifically authorized in the permit. A permittee shall not increase the use of process water or cooling water or otherwise attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve permit limitations or water quality.

14. Facilities Requiring Approval from Other State Agencies
In accordance with La R.S.40.4(A)(6) the plans and specifications of all sanitary sewerage treatment systems, both public and private, must be approved by the Department of Health and Hospitals state health officer or his designee. It is unlawful for any person, firm, or corporation, both municipal and private to operate a sanitary sewage treatment facility without proper authorization from the state health officer.

In accordance with La R.S.40.1149, it is unlawful for any person, firm or corporation, both municipal and private, operating a sewerage system to operate that system unless the competency of the operator is duly certified by the Department of Health and Hospitals state health officer. Furthermore, it is unlawful for any person to perform the duties of an operator without being duly certified.

In accordance with La R.S.48.385, it is unlawful for any industrial wastes, sewage, septic tanks effluent, or any noxious or harmful matter, solid, liquid or gaseous to be discharged into the side or cross ditches or placed upon the rights-of-ways of state highways without the prior written consent of the Department of Transportation and Development chief engineer or his duly authorized representative and of the secretary of the Department of Health and Hospitals.

SECTION B. PROPER OPERATION AND MAINTENANCE

1. Need to Halt or Reduce not a Defense
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Duty to Mitigate
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

3. Proper Operation and Maintenance
   a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

   b. The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and other functions necessary to ensure compliance with the conditions of this permit.

4. Bypass of Treatment Facilities
   a. ***Bypass***. The intentional diversion of waste streams from any portion of a treatment facility.

   b. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Section B.4.c. and 4.d of these standard conditions.

   c. Notice
      (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Office of Environmental Services, Water Permits Division, if possible at least ten days before the date of the bypass.

      (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in LAC 33:IX.2701.L.6, (24-hour notice) and Section D.6.e. of these standard conditions.

   d. Prohibition of bypass
      (1) Bypass is prohibited, and the state administrative authority may take enforcement action against a permittee for bypass, unless:

         (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

         (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

         (c) The permittee submitted notices as required by Section B.4.c of these standard conditions.

      (2) The state administrative authority may approve an anticipated bypass after considering its adverse effects, if the state administrative authority determines that it will meet the three conditions listed in Section B.4.d(1) of these standard conditions.

5. Upset Conditions
   a. Upset. An exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

   b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Section B.5.c. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

   c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      (1) An upset occurred and that the permittee can identify the cause(s) of the upset;

      (2) The permitted facility was at the time being properly operated; and

      (3) The permittee submitted notice of the upset as required by LAC 33:IX.2701.L.6.b.ii. and Section D.6.e.(2) of these standard conditions; and

(4) The permittee complied with any remedial measures required by Section B.2 of these standard conditions.

d. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. Removed Substances
Solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be properly disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the state and in accordance with environmental regulations.

7. Percent Removal
For publicly owned treatment works, the 30-day average percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent in accordance with LAC 33:IX.5905.A.3. and B.3.

SECTION C. MONITORING AND RECORDS

1. Inspection and Entry
The permittee shall allow the state administrative authority or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by the law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

Enter upon the permittee's premises where a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept for inspection or sampling purposes. Most inspections will be unannounced and should be allowed to begin immediately, but in no case shall begin more than thirty (30) minutes after the time the inspector presents his/her credentials and announces the purpose(s) of the inspection. Delay in excess of thirty (30) minutes shall constitute a violation of this permit. However, additional time can be granted if the inspector or the Administrative Authority determines that the circumstances warrant such action; and

b. Have access to and copy, at reasonable times, any records that the department or its authorized representative determines are necessary for the enforcement of this permit. For records maintained in either a central or private office that is open only during normal office hours and is closed at the time of inspection, the records shall be made available as soon as the office is open, but in no case later than the close of business the next working day;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Louisiana Environmental Quality Act, any substances or parameters at any location.

e. Sample Collection
(1) When the inspector announces that samples will be collected, the permittee will be given an additional thirty (30) minutes to prepare containers in order to collect duplicates. If the permittee cannot obtain and prepare sample containers within this time, he is considered to have waived his right to collect duplicate samples and the sampling will proceed immediately. Further delay on the part of the permittee in allowing initiation of the sampling will constitute a violation of this permit.
(2) At the discretion of the administrative authority, sample collection shall proceed immediately (without the additional 30 minutes described in Section C.1.a. above) and the inspector shall supply the permittee with a duplicate sample.

f. It shall be the responsibility of the permittee to ensure that a facility representative familiar with provisions of its wastewater discharge permit, including any other conditions or limitations, be available either by phone or in person at the facility during all hours of operation. The absence of such personnel on-site who are familiar with the permit shall not be grounds for delaying the initiation of an inspection except in situations as described in Section C.1.b. of these standard conditions. The permittee shall be responsible for providing witnesses/escorts during inspections. Inspectors shall abide by all company safety rules and shall be equipped with standard safety equipment (hard hat, safety shoes, safety glasses) normally required by industrial facilities.

g. Upon written request copies of field notes, drawings, etc., taken by department personnel during an inspection shall be provided to the permittee after the final inspection report has been completed.

2. Representative Sampling
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. All samples shall be taken at the outfall location(s) indicated in the permit. The state administrative authority shall be notified prior to any changes in the outfall location(s). Any changes in the outfall location(s) may be subject to modification, revocation and reissuance in accordance with LAC 33:IX.2903.

3. Retention of Records
Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the state administrative authority at any time.

4. Record Contents
Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The time(s) analyses were begun;
e. The individual(s) who performed the analyses;
f. The analytical techniques or methods used;
g. The results of such analyses; and
h. The results of all quality control procedures.

5. Monitoring Procedures
a. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in this permit.

b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.

c. The permittee or designated laboratory shall have an adequate analytical quality assurance/quality control program to produce defensible data of know precision and accuracy. All quality control measures shall be assessed and evaluated on an on-going basis and quality control acceptance criteria shall be used to determine the validity of the data. All method specific quality control as prescribed in the method shall be followed. If quality control requirements are not included in the method, the permittee or designated laboratory shall follow the quality control requirements as prescribed in the Approved Edition (40 CFR Part 136) Standard Methods for the Examination of Water and Wastes, Sections 1020A and 1020B. General sampling protocol shall follow guidelines established in the

"Handbook for Sampling and Sample Preservation of Water and Wastewater, 1982 "U.S. Environmental Protection Agency. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-83-124503.

6. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:
   a. "A Guide to Methods and Standards for the Measurement of Water Flow, 1975," U.S. Department of Commerce, National Bureau of Standards. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number COM-75-10683.
   b. "Flow Measurement in Open Channels and Closed Conduits, Volumes 1 and 2," U.S. Department of Commerce, National Bureau of Standards. This publication is available from the National Technical Service (NTIS), Springfield, VA, 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-273 535.
   c. "NPDES Compliance Flow Measurement Manual," U.S. Environmental Protection Agency, Office of Water Enforcement. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-82-131178.

7. Prohibition for Tampering: Penalties
   a. LA R.S. 30:2025 provides for punishment of any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit.

   b. LA R.S. 30:2076.2 provides for penalties for any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non compliance.

8. Additional Monitoring by the Permittee
If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 (See LAC 33:IX.4901) or, in the case of sludge use and disposal, approved under 40 CFR Part 136 (See LAC 33:IX.4901) unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the state administrative authority.

9. Averaging of Measurements
Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the state administrative authority in the permit.

10. Laboratory Accreditation
   a. LAC 33:I.Subpart 3, Chapters 45-59 provide requirements for an accreditation program specifically applicable to commercial laboratories, wherever located, that provide chemical analyses, analytical results, or other test data to the department, by contract or by agreement, and the data is:
      (1) Submitted on behalf of any facility, as defined in R.S.30:2004;
      (2) Required as part of any permit application;
      (3) Required by order of the department;
      (4) Required to be included on any monitoring reports submitted to the department;
      (5) Required to be submitted by contractor
      (6) Otherwise required by department regulations.

b. The department laboratory accreditation program, Louisiana Environmental Laboratory Accreditation Program (LELAP) is designed to ensure the accuracy, precision, and reliability of the data generated, as well as the use of department-approved methodologies in generation of that data. Laboratory data generated by commercial environmental laboratories that are not (LELAP) accredited will not be accepted by the department. Retesting of analysis will be required by an accredited commercial laboratory.

Where retesting of effluent is not possible (i.e. data reported on DMRs for prior month's sampling), the data generated will be considered invalid and in violation of the LPDES permit.

c. Regulations on the Louisiana Environmental Laboratory Accreditation Program and a list of labs that have applied for accreditation are available on the department website located under DIVISIONS → LABORATORY SERVICES at the following link:

http://www.deq.louisiana.gov

Questions concerning the program may be directed to (225) 219-9800.

SECTION D. REPORTING REQUIREMENTS

1. Facility Changes
The permittee shall give notice to the state administrative authority as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
   a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under LAC 33:IX.2703.A.1.

   c. For Municipal Permits. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Section 301, or 306 of the CWA if it were directly discharging those pollutants; and any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. Anticipated Noncompliance
The permittee shall give advance notice to the state administrative authority of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers
This permit is not transferable to any person except after notice to the state administrative authority. The state administrative authority may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act or the Louisiana Environmental Quality Act. (See LAC 33:IX.2901; in some cases, modification or revocation and reissuance is mandatory.)

A permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under LAC 33:IX.2903. A.2.b), or a minor modification made (under LAC 33:IX.2905) to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act and the Louisiana Environmental Quality Act.

4. Monitoring Reports
Monitoring results shall be reported at the intervals and in the form specified in Part I or Part II of this permit.

The permittee shall submit properly completed Discharge Monitoring Reports (DMRs) on the form specified in the permit. Preprinted DMRs are provided to majors/92-500's and other designated facilities. Please contact the Permit Compliance Unit concerning preprints. Self-generated DMRs must be pre-approved by the Permit Compliance Unit prior to submittal. Self-generated DMRs are approved on an individual basis. Requests for approval of self-generated DMRs should be submitted to:

Supervisor, Permit Compliance Unit
Office of Environmental Compliance
Post Office Box 4312
Baton Rouge, LA 70821-4312

Copies of blank DMR templates, plus instructions for completing them, and EPA's LPDES Reporting Handbook are available at the department website located at:

http://www.deq.louisiana.gov/portal/Default.aspx?tabid=2276

5. Compliance Schedules
Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

6. Requirements for Notification

a. Emergency Notification
As required by LAC 33.I.3915, in the event of an unauthorized discharge that does cause an emergency condition, the discharger shall notify the hotline (DPS 24-hour Louisiana Emergency Hazardous Materials Hotline) by telephone at (225) 925-6595 (collect calls accepted 24 hours a day) immediately (a reasonable period of time after taking prompt measures to determine the nature, quantity, and potential off-site impact of a release, considering the exigency of the circumstances), but in no case later than one hour after learning of the discharge. (An emergency condition is any condition which could reasonably be expected to endanger the health and safety of the public, cause significant adverse impact to the land, water, or air environment, or cause severe damage to property.) Notification required by this section will be made regardless of the amount of discharge. Prompt Notification Procedures are listed in Section D.6.c. of these standard conditions.

A written report shall be provided within seven calendar days after the notification. The report shall contain the information listed in Section D.6.d. of these standard conditions and any additional information in LAC 33:I.3925.B.

b. Prompt Notification
As required by LAC 33:I.3917, in the event of an unauthorized discharge that exceeds a reportable quantity specified in LAC 33:I.Subchapter E, but does not cause an emergency condition, the discharger shall promptly notify the department within 24 hours after learning of the discharge. Notification should be made to the Office of Environmental Compliance, Surveillance Division Single Point of Contact (SPOC) in accordance with LAC 33:I.3923.

In accordance with LAC 33:I.3923, prompt notification shall be provided within a time frame not to exceed 24 hours and shall be given to the Office of Environmental Compliance, Surveillance Division Single Point of Contact (SPOC) as follows:

(1) by the Online Incident Reporting screens found at http://www3.deq.louisiana.gov/surveillance/irf/forms/ ;or

(2) by e-mail utilizing the Incident Report Form and instructions found at http://www.deq.louisiana.gov/portal/Default.aspx?tabid=279;or

(3) by telephone at (225) 219-3640 during office hours, or (225) 342-1234 after hours and on weekends and holidays.

c. Content of Prompt Notifications. The following guidelines will be utilized as appropriate, based on the conditions and circumstances surrounding any unauthorized discharge, to provide relevant information regarding the nature of the discharge:

(1) the name of the person making the notification and the telephone number where any return calls from response agencies can be placed;

(2) the name and location of the facility or site where the unauthorized discharge is imminent or has occurred, using common landmarks. In the event of an incident involving transport, include the name and address of the transporter and generator;

(3) the date and time the incident began and ended, or the estimated time of continuation if the discharge is continuing;

(4) the extent of any injuries and identification of any known personnel hazards that response agencies may face;

(5) the common or scientific chemical name, the U.S. Department of Transportation hazard classification, and the best estimate of amounts of any and all discharged pollutants;

(6) a brief description of the incident sufficient to allow response agencies to formulate their level and extent of response activity.

d. Written Notification Procedures. Written reports for any unauthorized discharge that requires notification under Section D.6.a. or 6.b., or shall be submitted by the discharger to the Office of Environmental Compliance, Surveillance Division SPOC in accordance with LAC 33:IX.3925 within seven calendar days after the notification required by D.6.a. or 6.b., unless otherwise provided for in a valid permit or other department regulation. Written notification reports shall include, but not be limited to, the following information:

(1) the name, address, telephone number, Agency Interest (AI) number (number assigned by the department) if applicable, and any other applicable identification numbers of the person, company, or other party who is filing the written report, and specific identification that the report is the written follow-up report required by this section;

(2) the time and date of prompt notification, the state official contacted when reporting, the name of person making that notification, and identification of the site or facility, vessel, transport vehicle, or storage area from which the unauthorized discharge occurred;

(3) date(s), time(s), and duration of the unauthorized discharge and, if not corrected, the anticipated time it is expected to continue;

(4) details of the circumstances (unauthorized discharge description and root cause) and events leading to any unauthorized discharge, including incidents of loss of sources of radiation, and if the release point is subject to a permit:

(a) the current permitted limit for the pollutant(s) released;and

(b) the permitted release point/outfall ID.

(5) the common or scientific chemical name of each specific pollutant that was released as the result of an unauthorized discharge, including the CAS number and U.S. Department of Transportation hazard classification, and the best estimate of amounts of any and all released pollutants (total amount of each compound expressed in pounds, including calculations);

(6) a statement of the actual or probable fate or disposition of the pollutant or source of radiation and what off-site impact resulted;

(7) remedial actions taken, or to be taken, to stop unauthorized discharges or to recover pollutants or sources of radiation.

(8) Written notification reports shall be submitted to the Office of Environmental Compliance, Surveillance Division SPOC by mail or fax. The transmittal envelope and report or fax cover page and report should be clearly marked "**UNAUTHORIZED DISCHARGE NOTIFICATION REPORT**."

Please see LAC 33:I.3925.B for additional written notification procedures.

e. Twenty-four Hour Reporting. The permittee shall report any noncompliance which may endanger human health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and; steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The following shall be included as information which must be reported within 24hours:
(1) Any unanticipated bypass which exceeds any effluent limitation in the permit (see LAC 33:IX.2701.M.3.b.);

(2) Any upset which exceeds any effluent limitation in the permit;

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the state administrative authority in Part II of the permit to be reported within 24 hours (LAC 33:IX.2707.G.).

7. Other Noncompliance
The permittee shall report all instances of noncompliance not reported under Section D.4., 5., and 6., at the time monitoring reports are submitted. The reports shall contain the information listed in Section D.6.e.

8. Other Information
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the state administrative authority, it shall promptly submit such facts or information.

9. Discharges of Toxic Substances
In addition to the reporting requirements under Section D.1-8, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Office of Environmental Services, Water Permits Division as soon as they know or have reason to believe:
a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant:
i. listed at LAC 33:IX.7107, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
(1) One hundred micrograms per liter (100 µg/L);
(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4 -dinitro-phenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with LAC33:IX.2501.G.7; or
(4) The level established by the state administrative authority in accordance with LAC 33:IX.2707.F; or

ii. which exceeds the reportable quantity levels for pollutants at LAC 33:I. Subchapter E.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant:
   i. listed at LAC 33:IX.7107, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

      (1) Five hundred micrograms per liter (500 µg/L);
      (2) One milligram per liter (1 mg/L) for antimony;
      (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with LAC 33:IX.2501.G.7; or
      (4) The level established by the state administrative authority in accordance with LAC 33:IX.2707.F; or

   ii. which exceeds the reportable quantity levels for pollutants at LAC 33:I. Subchapter E.

10. Signatory Requirements
All applications, reports, or information submitted to the state administrative authority shall be signed and certified.
   a. All permit applications shall be signed as follows:
      (1) For a corporation - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
         (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or,
         (b) The manager of one or more manufacturing, production, or operating facilities, provided: the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing other comprehensive measures to ensure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and the authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

      NOTE: DEQ does not require specific assignments or delegations of authority to responsible corporate officers identified in Section D.10.a.(1)(a). The agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the state administrative authority to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under Section D.10.a.(1)(b) rather than to specific individuals.

      (2) For a partnership or sole proprietorship - by a general partner or the proprietor, respectively; or
      (3) For a municipality, state, federal, or other public agency - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a federal agency includes:
         (a) The chief executive officer of the agency, or
         (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

   b. All reports required by permits and other information requested by the state administrative authority shall be signed by a person described in Section D.10.a., or by a duly authorized representative of that person. A person is a duly authorized representative only if:
      (1) The authorization is made in writing by a person described in Section D.10.a. of these standard conditions;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (a duly authorized representative may thus be either a named individual or an individual occupying a named position; and,

(3) The written authorization is submitted to the state administrative authority.

c. Changes to authorization. If an authorization under Section D.10.b. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Section D.10.b. must be submitted to the state administrative authority prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing a document under Section D.10. a. or b. above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Availability of Reports

All recorded information (completed permit application forms, fact sheets, draft permits, or any public document) not classified as confidential information under R.S. 30:2030(A) and 30:2074(D) and designated as such in accordance with these regulations (LAC 33:IX.2323 and LAC 33:IX.6503) shall be made available to the public for inspection and copying during normal working hours in accordance with the Public Records Act, R.S. 44:1 et seq.

Claims of confidentiality for the following will be denied:

a. The name and address of any permit applicant or permittee;
b. Permit applications, permits, and effluent data.
c. Information required by LPDES application forms provided by the state administrative authority under LAC 33:IX.2501 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

SECTION E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITION

1. Criminal

a. Negligent Violations

The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who negligently violates any provision of the LPDES, or any order issued by the secretary under the LPDES, or any permit condition or limitation implementing any such provision in a permit issued under the LPDES by the secretary, or any requirement imposed in a pretreatment program approved under the LPDES is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. If a conviction of a person is for a violation committed after a first conviction of such person, he shall be subject to a fine of not more than $50,000 per day of violation, or imprisonment of not more than two years, or both.

b. Knowing Violations

The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly violates any provision of the LPDES, or any permit condition or limitation implementing any such provisions in a permit issued under the LPDES, or any requirement imposed in a pretreatment program approved under

the LPDES is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or imprisonment for not more than 3 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, he shall be subject to a fine of not more than $100,000 per day of violation, or imprisonment of not more than six years, or both.

c. Knowing Endangerment
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly violates any provision of the LPDES, or any order issued by the secretary under the LPDES, or any permit condition or limitation implementing any of such provisions in a permit issued under the LPDES by the secretary, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both. A person which is an organization shall, upon conviction of violating this Paragraph, be subject to a fine of not more than one million dollars. If a conviction of a person is for a violation committed after a first conviction of such person under this Paragraph, the maximum punishment shall be doubled with respect to both fine and imprisonment.

d. False Statements
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the LPDES or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the LPDES, shall, upon conviction, be subject to a fine of not more than $10,000, or imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this Subsection, he shall be subject to a fine of not more than $20,000 per day of violation, or imprisonment of not more than 4 years, or both.

2. Civil Penalties
The Louisiana Revised Statutes LA. R. S. 30:2025 provides that any person found to be in violation of any requirement of this Subtitle may be liable for a civil penalty, to be assessed by the secretary, an assistant secretary, or the court, of not more than the cost to the state of any response action made necessary by such violation which is not voluntarily paid by the violator, and a penalty of not more than $32,500 for each day of violation. However, when any such violation is done intentionally, willfully, or knowingly, or results in a discharge or disposal which causes irreparable or severe damage to the environment or if the substance discharged is one which endangers human life or health, such person may be liable for an additional penalty of not more than one million dollars.

(**PLEASE NOTE**: These penalties are listed in their entirety in Subtitle II of Title 30 of the Louisiana Revised Statutes.)

SECTION F. DEFINITIONS

All definitions contained in Section 502 of the Clean Water Act shall apply to this permit and are incorporated herein by reference. Additional definitions of words or phrases used in this permit are as follows:

1. Clean Water Act (CWA) means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972) Pub.L.92-500, as amended by Pub.L. 95-217, Pub.L. 95-576, Pub.L. 96-483 and Pub.L. 97-117, 33 U.S.C. 1251 et. seq.).

2. Accreditation means the formal recognition by the department of a laboratory's competence wherein specific tests or types of tests can be accurately and successfully performed in compliance with all minimum requirements set forth in the regulations regarding laboratory accreditation.

3. Administrator means the Administrator of the U.S. Environmental Protection Agency, or an authorized representative.

4. Applicable Standards and Limitations means all state, interstate and federal standards and limitations to which a discharge is subject under the Clean Water Act, including, effluent limitations, water quality standards of performance, toxic effluent standards or prohibitions, best management practices, and pretreatment standards under Sections 301, 302, 303, 304, 306, 307, 308 and 403.

5. Applicable water quality standards means all water quality standards to which a discharge is subject under the Clean Water Act.

6. Commercial Laboratory means any laboratory, wherever located, that performs analyses or tests for third parties for a fee or other compensation and provides chemical analyses, analytical results, or other test data to the department. The term commercial laboratory does not include laboratories accredited by the Louisiana Department of Health and Hospitals in accordance with R.S.49:1001 et seq.

7. Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the sampling day. Daily discharge determination of concentration made using a composite sample shall be the concentration of the composite sample.

8. Daily Maximum discharge limitation means the highest allowable "daily discharge".

9. Director means the U.S. Environmental Protection Agency Regional Administrator, or the state administrative authority, or an authorized representative.

10. Domestic septage means either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from grease trap at a restaurant.

11. Domestic sewage means waste and wastewater from humans, or household operations that is discharged to or otherwise enters a treatment works.

12. Environmental Protection Agency or (EPA) means the U.S. Environmental Protection Agency.

13. Grab sample means an individual sample collected over a period of time not exceeding 15 minutes, unless more time is needed to collect an adequate sample, and is representative of the discharge.

14. Industrial user means a nondomestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.

15. LEQA means the Louisiana Environmental Quality Act.

16. Louisiana Pollutant Discharge Elimination System (LPDES) means those portions of the Louisiana Environmental Quality Act and the Louisiana Water Control Law and all regulations promulgated under their authority which are deemed equivalent to the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act in accordance with Section 402 of the Clean Water Act and all applicable federal regulations.

17. Monthly Average, other than for fecal coliform bacteria, discharge limitations are calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes monthly average concentration effluent limitations or conditions, and flow is measured as continuous record or with a totalizer, the monthly average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily discharge concentration, F = daily flow and n = number of daily samples; monthly average discharge =

$$\frac{C_1F_1 + C_2F_2 + \ldots + C_nF_n}{F_1 + F_2 + \ldots + F_n}$$

When the permit establishes monthly average concentration effluent limitations or conditions, and the flow is not measured as a continuous record, then the monthly average concentration means the arithmetic average of all "daily discharge(s)" of concentration determined during the calendar month.

The monthly average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.

18. National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.

19. Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

20. Sewage sludge means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; portable toilet pumpings, type III marine sanitation device pumpings (33 CFR part 159); and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

21. Stormwater Runoff—aqueous surface runoff including any soluble or suspended material mobilized by naturally occurring precipitation events.

22. Surface Water: all lakes, bays, rivers, streams, springs, ponds, impounding reservoirs, wetlands, swamps, marshes, water sources, drainage systems and other surface water, natural or artificial, public or private within the state or under its jurisdiction that are not part of a treatment system allowed by state law, regulation, or permit.

23. Treatment works means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Clean Water Act, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extension, improvement, remodeling, additions, and alterations thereof. (See Part 212 of the Clean Water Act)

24. For fecal coliform bacteria, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.

25. The term MGD shall mean million gallons per day.

26. The term GPD shall mean gallons per day.

27. The term mg/L shall mean milligrams per liter or parts per million (ppm).

28. The term SPC shall mean Spill Prevention and Control. Plan covering the release of pollutants as defined by the Louisiana Administrative Code (LAC 33:IX.9).

29. The term SPCC shall mean Spill Prevention Control and Countermeasures Plan. Plan covering the release of pollutants as defined in 40 CFR Part 112.

30. The term µg/L shall mean micrograms per liter or parts per billion (ppb).

31. The term ng/L shall mean nanograms per liter or parts per trillion (ppt).

32. Visible Sheen: a silvery or metallic sheen, gloss, or increased reflectivity; visual color; or iridescence on the water surface.

33. Wastewater—liquid waste resulting from commercial, municipal, private, or industrial processes. Wastewater includes, but is not limited to, cooling and condensing waters, sanitary sewage, industrial waste, and contaminated rainwater runoff.

34. Waters of the State: for the purposes of the Louisiana Pollutant Discharge Elimination system, all surface waters within the state of Louisiana and, on the coastline of Louisiana and the Gulf of Mexico, all surface waters extending there from three miles into the Gulf of Mexico. For purposes of the Louisiana Pollutant Discharge Elimination System, this includes all surface waters which are subject to the ebb and flow of the tide, lakes, rivers, streams, (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, impoundments of waters within the state of Louisiana otherwise defined as "waters of the United States" in 40 CFR 122.2, and tributaries of all such waters. "Waters of the state" does not include waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act, 33 U.S.C. 1251 et seq.

35. Weekly average, other than for fecal coliform bacteria, is the highest allowable arithmetic mean of the daily discharges over a calendar week, calculated as the sum of all "daily discharge(s)" measured during a calendar week divided by the number of "daily discharge(s)" measured during that week. When the permit establishes weekly average concentration effluent limitations or conditions, and flow is measured as continuous record or with a totalizer, the weekly average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar week where C = daily discharge concentration, F = daily flow and n = number of daily samples; weekly average discharge

$$= \frac{C_1F_1 + C_2F_2 + \ldots + C_nF_n}{F_1 + F_2 + \ldots + F_n}$$

When the permit establishes weekly average concentration effluent limitations or conditions, and the flow is not measured as a continuous record, then the weekly average concentration means the arithmetic average of all "daily discharge(s)" of concentration determined during the calendar week.

The weekly average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.

36. Sanitary Wastewater Term(s):

    a. 3-hour composite sample consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) over the 3-hour period and composited according to flow, or a sample continuously collected in proportion to flow over the 3-hour period.

    b. 6-hour composite sample consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) over the 6-hour period and composited according to flow, or a sample continuously collected in proportion to flow over the 6-hour period.

c. 12-hour composite sample consists of 12 effluent portions collected no closer together than one hour over the 12-hour period and composited according to flow, or a sample continuously collected in proportion to flow over the 12-hour period. The daily sampling intervals shall include the highest flow periods.

d. 24-hour composite sample consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample continuously collected in proportion to flow over the 24-hour period.

STATEMENT OF BASIS

as required by LAC 33:IX.3109 for a draft permit for which a fact sheet under LAC 33:IX.3111 is not prepared, for draft **Louisiana Pollutant Discharge Elimination System Permit No. LA0124605; AI 164731; PER20090001** to discharge to waters of the **State of Louisiana** as per LAC 33:IX.2311.

The **permitting authority** for the Louisiana Pollutant Discharge Elimination System (LPDES) is:

Louisiana Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

I. **THE APPLICANT IS:** Sewerage District No. 1 of Iberia Parish
Spanish Lake Wetland Assimilation Project
2617 Northside Road, Suite 100
New Iberia, Louisiana 70563-0953

II. **PREPARED BY:** Todd Franklin

DATE PREPARED: July 9, 2009

III. **PERMIT ACTION:** issue LPDES permit LA0124605, AI 164731; PER20090001

LPDES application received: May 11, 2009

IV. **FACILITY INFORMATION:**

A. The application is for the discharge of treated sanitary wastewater from a publicly owned treatment works serving the unincorporated areas of Iberia Parish in the vicinity of the Acadiana Regional Airport and the University of Louisiana at Lafayette's New Iberia Research Center.

B. The permit application does not indicate the receipt of industrial wastewater.

C. The facility is located southwest of Acadiana Regional Airport on Tower Drive approximately 0.75 miles northwest of its intersection with LA Highway 3212, Iberia Parish.

Facility Coordinates: Latitude 30° 1′ 44″ North
Longitude 91° 52′ 24″ West

D. The treatment facility consists of a four stage aerated lagoon system consisting of one treatment aeration basin followed by three settling ponds, which are also aerated. Chlorination and dechlorination will be utilized at the facility. Following disinfection, the effluent will be pumped to the wetlands south of Spanish Lake. The design of the discharge into the wetlands involves distribution headers along the southern and western borders of the Spanish Lake Wetlands. Each header will be supplied with valves that release onto concrete splash blocks, spaced at regular intervals to provide uniform distribution of effluent over the wetland.

E. Outfall 001
Discharge Location: Latitude 30° 1′ 44″ North
Longitude 91° 52′ 24″ West

There is only one outfall, Outfall 001, with several distribution points. Samples, excluding the wetland monitoring sampling, shall be taken after the last treatment unit and before entering the distribution system into the wetland area. The distribution points will be employed in any combination and rotation necessary to ensure uniform coverage and to maximize the assimilation potential and the productivity of the wetland. The discharge patterns shall be recorded and included in the Annual Wetland Monitoring Report.

Description: treated sanitary wastewater

Design Capacity: 0.8 MGD

Type of Flow Measurement which the facility is currently using: Flume or V-notch weir with continuous recorder

V. RECEIVING WATERS:

The discharge is into the Spanish Lakes Wetlands; thence into Bayou Tortue; thence into Bayou Teche.

As per LAC 33:IX.1109.J.3, "wetlands approved by the administrative authority for wastewater assimilation projects pursuant to the Water Quality Management Plan, Volume 3, Section 10, Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, are assigned the following designated uses: secondary contact recreation and fish and wildlife propagation."

The discharge from the Spanish Lakes Wetlands flows into Bayou Tortue; thence into Bayou Teche in Subsegment 060401 of the Vermilion-Teche River Basin, defined at LAC 33:IX.1123.Table 3 as *Bayou Teche-from Keystone Locks and Dam to Charenton Canal*. This Subsegment is not listed on the 303(d) list of impaired waterbodies.

The designated uses and degree of support for Subsegment 060401 of the Vermilion-Teche River Basin are as indicated in the table below[1/]:

Degree of Support of Each Use						
Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
Not Supported	Fully Supported	Not Supported	N/A	N/A	N/A	N/A

[1/] The designated uses and degree of support for Subsegment 060401 of the Vermilion-Teche River Basin are as indicated in LAC 33:IX.1123.C.3, Table (3) and the 2006 Water Quality Management Plan, Water Quality Inventory Integrated Report, Appendix A, respectively.

VI. ENDANGERED SPECIES:

The receiving waterbody, Subsegment 060401 of the Vermilion-Teche River Basin, is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U. S. Fish and Wildlife

Service (FWS). This strategy was submitted with a letter dated November 17, 2008, from Rieck (FWS) to Nolan (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat.

VII. HISTORIC SITES:

The discharge will be from a proposed facility. LDEQ has consulted with the State Historic Preservation Officer (SHPO) in a letter dated May 15, 2009, to determine whether construction-related activities could potentially affect sites or properties on or eligible for listing on the National Register of Historic Places. SHPO's response letter, dated June 17, 2009, stated that the facility as proposed will have no potential effects.

VIII. PUBLIC NOTICE:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit modification and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the statement of basis. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

For additional information, contact:

Mr. Todd Franklin
Permits Division
Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

IX. PROPOSED PERMIT LIMITS:

Louisiana Water Quality Integrated Report

Subsegment 060401, Bayou Teche-from Keystone Locks and Dam to Charenton Canal, is not listed on LDEQ's Final 2006 303(d) list as impaired. However, Subsegment 060401 was previously listed as impaired for phosphorus, nitrogen, organic enrichment, dissolved oxygen, pathogen indicators, TSS, turbidity, siltation, and carbofuran, for which the below TMDL's have been developed.

Bayou Teche Watershed TMDL for Dissolved Oxygen Including WLAs for Twenty-two Facilities and Addressing Nutrients

The TMDL addressed the dissolved oxygen and nutrient impairments by assigning a wasteload allocation to all 22 point source discharges located within the Subsegment. In one of the scenarios, the results indicated that limitations for these facilities would not need to be more stringent. This scenario was based on a criterion of 3 mg/l DO during the summer and a 5 mg/l DO during the winter. The second scenario, which was based on a 5 mg/l DO during the entire year, indicated that more stringent limitations would be necessary for two facilities. The Spanish Lakes Wetland Assimilation Project was not considered in the development of this TMDL. However, the Spanish Lakes Wetlands receives the effluent and will utilize the nutrients within the wetland, before any wastewater is released into Subsegment 060401. Therefore, this project is not expected to cause or contribute to issues related to dissolved oxygen and nutrients within Subsegment 060401. Monitoring will be required within the wetland area to verify that the assimilation project is appropriately utilizing the effluent from the wastewater treatment facility.

Total Maximum Daily Load (TMDL) for TSS, Turbidity, and Siltation for the Bayou Teche Watershed

As per the TMDL,

> Point sources do not represent a significant source of TSS as defined in this TMDL. Point sources discharge primarily organic TSS, which does not contribute to habitat impairment resulting from sedimentation. Because the point sources are minor contributors and discharges of organic suspended solids from point sources are already addressed by LDEQ through their permitting of point sources to maintain water quality standards for DO, the wasteload allocations for point source contributions were set to zero. This TMDL only addresses the landform contribution of TSS/sediment and does not address the insignificant point source contributions.

TSS limitations have been placed into the permit according to the current state regulations, guidance, and strategies. Also, solids from the wastewater will be retained within the wetland area, prior to discharge into Subsegment 060401.

Bayou Teche TMDL for Fecal Coliform

As per the TMDL,

> The Louisiana Water Quality Regulations require permitted point source discharges of treated sanitary wastewater to maintain a fecal coliform count of 200 cfu/100 ml in their effluent, i.e., they must meet the standard at end-of-pipe. Therefore, there will be no change in the permit requirements based upon a wasteload allocation resulting from this TMDL.

The above-mentioned fecal coliform limitations have been placed into the permit.

Total Maximum Daily Load (TMDL) for the Pesticide Carbofuran in the Mermentau River and Vermilion-Teche River Basins

According to the TMDL, there is only one known point source discharger within the Vermilion-Teche River Basin; however, it does not discharge any process wastewater where the carbofuran is formulated and packaged. All other dischargers, including this new source into the Spanish Lake

Wetland, do not handle, generate, or process carbofuran; therefore, no wasteload allocation was given to these facilities. Therefore, no permit limitation is necessary to address carbofuran.

The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon the wetland monitoring data obtained or upon additional TMDL's and/or water quality studies. The DEQ also reserves the right to modify or revoke and reissue this permit based upon any changes to established TMDL's for this discharge, or to accommodate for pollutant trading provisions in approved TMDL watersheds as necessary to achieve compliance with water quality standards.

Final Effluent Limits:

Outfall 001

In accordance with LAC 33:IX.1109.J.6 and the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standard, Water Quality Management Plan, Volume 3, the Department may allow the discharge of the equivalent of secondarily treated effluent into wetlands for the purposes of nourishing and enhancing those wetlands. According to LAC 33:IX.5911.A & B, the effluent quality attainable by facilities eligible for treatment equivalent to secondary treatment are 45 mg/l BOD_5 monthly average / 65 mg/l BOD_5 weekly average and 45 mg/l TSS monthly average / 65 mg/l TSS weekly average. However, Alternative State Requirement (ASR) provisions are contained in 40 CFR §133.105(d). The ASR provision allows States the flexibility to set permit limits above the maximum levels of 45 mg/l monthly average and 65 mg/l weekly average for BOD_5 and TSS from lagoons meeting certain requirements. EPA published the approved ASRs in 49 FR 37005 on September 20, 1984. An alternate TSS Limit of 90 mg/l monthly average was approved for the State of Louisiana. According to LAC 33:IX.711.D, with respect to BOD_5, treatment equivalent to secondary treatment for oxidation ponds is defined as 30 mg/l monthly average / 45 mg/l weekly average. Therefore, these limitations will be included in the permit.

Final limits shall become effective on the effective date of the permit and expire on the expiration date of the permit.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
BOD_5	200	30 mg/l	45 mg/l	Limits are based on approved Treatment Equivalent to Secondary Treatment as allowed in the *Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan, Volume 3* for discharges of sanitary wastewater into an approved wetland.
TSS	600	90 mg/l	135 mg/l	

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
Magnesium, Total	Report	Report (mg/l)	Report (mg/l)	In conjunction with the Wetland System Monitoring Requirements of the permit, "Report" for the listed metals has been proposed for this permit based on Best Professional Judgement (BPJ).
Lead, Total	Report	Report (mg/l)	Report (mg/l)	
Cadmium, Total	Report	Report (mg/l)	Report (mg/l)	
Chromium, Total	Report	Report (mg/l)	Report (mg/l)	
Copper, Total	Report	Report (mg/l)	Report (mg/l)	
Zinc, Total	Report	Report (mg/l)	Report (mg/l)	
Iron, Total	Report	Report (mg/l)	Report (mg/l)	
Nickel, Total	Report	Report (mg/l)	Report (mg/l)	
Silver, Total	Report	Report (mg/l)	Report (mg/l)	
Selenium, Total	Report	Report (mg/l)	Report (mg/l)	
Total Nitrogen	Report	Report (mg/l)	Report (mg/l)	Values obtained will be used to calculate long term wetland loading rates.
Total Phosphorus	Report	Report (mg/l)	Report (mg/l)	

Other Effluent Limitations:

1) Fecal Coliform

The discharge from this facility is into a water body (wetland), which has a designated use of Secondary Contact Recreation. However, Primary Contact Recreation limits of 200/100 ml (Monthly Average) and 400/100 ml (Weekly Average) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgment as an added measure for public safety, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) pH

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C, the pH shall not be less than 6.0 standard units nor greater than 9.0 standard units at any time.

3) Solids and Foam

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

4) Wetland System Monitoring

The five (5) year LPDES permit contains technology-based effluent limitations for BOD_5, TSS, and pH reflecting the best controls available. Additional water quality-based effluent limitations and/or conditions are included in the LPDES permit. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

The state has established a narrative water quality criterion, which states that:

"No substances shall be present in the waters of the state or the sediments underlying said waters in quantities that alone or in combination will be toxic to human, plant, or animal life or significantly increase health risks due to exposure to the substances or consumption of contaminated fish or other aquatic life." (*Louisiana Surface Water Quality Standards*, LAC Title 33, Part IX, Chapter 11, Section 1113.B.5.)

However, the State of Louisiana has set the following specific criteria (LAC 33:IX.1113.B.12) for protection of the receiving Natural Wetlands (Spanish Lakes Wetlands):

- **Wetland biological integrity will be guided by above-ground wetland vegetative productivity with consideration given to floral diversity. Due to effluent addition, the discharge area of a wetland shall have no more than a 20 percent reduction in the rate of total above-ground wetland productivity over a five-year period as compared to a reference area.**

EPA document *Biological Criteria: National Program Guidance for Surface Waters*, discusses the Clean Water Act and states that "the general authority for biological criteria comes from Section 101(a) of the Act which establishes as the objective of the Act, the restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters, including natural wetlands. To meet this objective, water quality criteria must include criteria to protect biological integrity. Section 101(a)(2) includes the interim water quality goal for the protection and propagation of fish, shellfish, and wildlife." Biological integrity is functionally defined in this EPA manual as "the condition of the aquatic community inhabiting the unimpaired waterbodies of a specified habitat as measured by community structure and function." The importance and function of wetlands include, but are not limited to the following: erosion and flood control, saltwater intrusion control, water quality enhancement, habitat for threatened and endangered species, wildlife habitat, nutrient material cycling, recreation and aesthetics.

Natural wetland loss is a problem in Louisiana. This problem is caused, in part, by insufficient sedimentation and relative sea level rise each year. The introduction of nutrient rich wastewater to natural wetlands is beneficial in that it stimulates productivity in the wetland. This productivity promotes vertical accretion through increased organic matter deposition and the formation of soil through increased root growth. This vertical accretion helps maintain the wetlands. Additionally, the total suspended solids, provided by the wastewater, also increase the sediment level in the wetland.

Although the introduction of wastewater into natural wetlands renders benefits to the wetland system, changes to the system will occur. Therefore, it is important to address issues, which will indicate the extent of these changes and to determine if the changes are acceptable.

While standard biomonitoring indicates affects on organisms found in free flowing streams and rivers, a biological monitoring schedule broader in scope, and more specific to the wetland ecosystem, than standard biomonitoring, will provide a more direct indication of change in functions of the wetland system as a whole.

The following parameters are proposed to be sampled and monitored for the specified wetland component at three (3) monitoring sites within the Discharge Area and one (1) monitoring site within the Reference Area. The Discharge Area is defined as the area of wetlands directly affected by effluent addition, and is inclusive of the delineated assimilation area. The Reference Area is defined as wetland area that is nearby and similar to the discharge area, but that is not affected by effluent addition.

SPECIES CLASSIFICATION

Within the three Discharge Area sites and within the Reference Area site, three or more 10 x 100 m quadrates should be established. These plots must be oriented perpendicular to the hydrological gradient. All trees within these subplots with a diameter at breast height (dbh) greater than 3.2 cm should be tagged with an identification number.

The relative importance of each major tree species in both the Discharge and Reference Areas will be based on the density (total number), dominance (basal area), and frequency of occurrence in each of the plots using equations 1-4 (Barbour et al. 1987).

Relative density = (individuals of a species)/(total individuals of all species) (1)
Relative dominance = (total basal area of a species)/(total basal area of all species) (2)
Relative frequency = (frequency of species)/(total frequency of all species in area) (3)
Importance Value = Relative density + Relative dominance + Relative Frequency (4)

PERCENTAGE OF WHOLE COVER and GROWTH STUDIES

Productivity of a forested wetland is defined as the sum of stem growth (perennial productivity) and leaf and fruit fall (ephemeral productivity). Above-ground net primary productivity (NPP) should be calculated as the sum of ephemeral and perennial productivity, and presented as live dry weight per square meter per year basis ($g/m^2/yr$).

Perennial productivity should be calculated using diameter at breast height (dbh) measurements of all trees with dbh greater than 3.2 cm within the subplots defined above. Measurements of dbh should be taken during two consecutive winters when trees are dormant, and biomass calculated using allometric equations (Megonigal et al. 1997; Scott et al. 1985). The following steps should be used to calculate perennial productivity:

- Estimate biomass (in kg) from dbh using allometric equations (see Table 1 below).
- Sum biomass per study site and divide by area (in kg/m^2) of the study site. This calculates the biomass per unit area (kg/m^2) for each year and study site.
- Subtract Year 1 biomass (kg/m^2) from Year 2 biomass, and multiply by 1000. This calculates the perennial productivity as $g/m^2/yr$.

Table 1. Regression equations used to convert diameter at breast height (DBH) measurements to overall perennial biomass. All equations are in the form: Biomass = f (DBH), where biomass is in kg, DBH is in cm and f is the parameterized function.

Species	Biomass f(D)	DBH Range	Reference
Fraxinus spp.	Biomass (kg) = ((2.669*((DBHcm*0.394)^1.16332))*0.454	>10 cm	Megonigal et al. '97
Taxodium distichum	Biomass (kg) = 10^(-.97+2.34*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Nyssa aquatica	Biomass (kg) = 10^(-919+2.291*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Acer rubrum	Biomass (kg) = ((2.39959*((DBHcm*0.394)^2)^1.2003))*0.454	10-28 cm	Megonigal et al. '97
Quercus nigra	Biomass (kg) = ((3.15067*((DBHcm*0.394)^2)^1.21955))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg) = ((5.99898*((DBHcm*0.394)^2)^1.08527))*0.45	>28 cm	Megonigal et al. '97
Salix spp.	Biomass (kg) = 10^(-1.5+2.78*LOG10(DBHcm))	n.a.	Scott et al. 1985
Other Species	Biomass (kg) = ((2.54671*((DBHcm*0.394)^2)^1.20138))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg) = ((1.80526*((DBHcm*0.394)^2)^1.27313))*0.45	>28 cm	Megonigal et al. '97

Ephemeral productivity should be measured using 0.25 m^2 leaf litter boxes, with screened bottoms and approximately 10 cm wide sides. Six boxes should be placed randomly in each of the 10 x 100 m quadrates within the Discharge Area and Reference Area. Leaves and other materials that collect in the boxes should be gathered bimonthly, separated into leaves and woody material, dried to a constant weight, and weighed. Ephemeral productivity should be calculated by summing the dried weight of leaves from each box over one year and extrapolating to $g/m^2/yr$.

Net Primary Production: Aboveground net primary production (NPP) will be calculated as the sum of leaf litter and wood protection, and will be given in $g/m^2/yr$.

WATER STAGE

Water stage is a gauged measurement of the water depth, which will assist in determining stress in the wetlands from hydrologic loadings and will determine the existence of a zone of influence resulting from wastewater applications. The zone around the discharge serves to assimilate the wastewater most effectively. This zone grows larger as wastewater continues to be discharged and the assimilative capacity of the immediate area becomes saturated. The water stage at set points within each of the three (3) Discharge Area sites and the Reference Area site shall be measured monthly.

METALS, NUTRIENT I, NUTRIENT II, AND OTHER ANALYSIS

Samples of the flora, sediment, and surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following metals and nutrients: Magnesium, Lead, Cadmium, Chromium, Copper, Zinc, Iron, Nickel, Silver, Selenium, Total Kjeldahl Nitrogen, and Total Phosphorus.

Samples of the sediment and surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following nutrients: Ammonia-Nitrogen, Nitrite Nitrogen, Nitrate Nitrogen, and Phosphate.

Samples of the surface water at each of the three (3) Discharge Area sites and the Reference Area site shall be collected and analyzed for the following parameters: Biochemical Oxygen Demand (BOD_5), Total Suspended Solids, pH, and Dissolved Oxygen.

- **Metals and nutrient data from plant tissue samples** will identify excesses or deficiencies that could become problematic.
- **Sediment analysis for metals and nutrients** will indicate whether or not metals are bound and buried in the sediments, and nutrients assimilated.
- **Corresponding analysis of surface water** must be made to provide a comparison of water quality in the vicinity of the discharge and at increasing distance from it.

Sampling procedures to be used during the wetland monitoring phase.

Water quality analyses must be conducted according to test procedures approved under 40 CFR Part 136.

For soils/sediments, sample preservation, handling, and analysis must meet the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, or most recent revision) or an equivalent substitute as approved by the administrative authority.

ACCRETION RATES

Accretion rates will provide an indication of the how the effluent is contributing sediment and organic matter into the wetland area. Feldspar markers will be laid on the wetland surface in each of the three (3) Discharge Area sites and the Reference Area site, with each plot having three 0.25 m2 subplots where 1 cm thick powdered feldspar clay will be placed (Cahoon and Turner 1989). The subplots will be marked at each corner with PVC poles. Every four years, the thickness of material deposited on top of the feldspar marker at one subplot of each plot will be measured destructively by taking a 20 cm x 20 cm plug using a shovel or trowel, cleanly slicing the core into several sections to reveal the horizon, then measuring the thickness of material above the surface of the horizon at 10 different locations. The rate of vertical accretion will be calculated by dividing the mean thickness of material above the surface of the horizon by the amount of time the horizon had been in place.

Compared to data from the Use Attainability Analysis, the Reference Area site, and the annual wetland monitoring reports, the effects of the discharge on the biological integrity (as defined above) may be accurately assessed.

The permittee shall submit the results of any wetland monitoring testing performed in accordance with the LPDES Permit Number LA0124605, shown in the table below:

PARAMETER	WETLAND COMPONENT		
	FLORA	SEDIMENT	SURFACE WATER
Species Classification	P		
Percentage of Whole Cover (for each species)	P		
Growth Studies	A_1		
Water Stage			M
Metals Analysis: Mg, Pb, Cd, Cr, Cu, Zn, Fe, Ni, Ag, Se	P_1	P_1	P
Nutrient Analysis I: TKN, TP	$P_{1,2}$	$P_{1,2}$	Q
Nutrient Analysis II: NH_3N, NO_2N, NO_3N, PO_4		P_1	Q
Others: BOD_5, TSS, pH, Dissolved Oxygen			P
Accretion Rate		P	

Water quality will be monitored by taking water samples along the path of flow of the effluent in the assimilation site and from one or more control sites.

Sampling in the **DISCHARGE AREA** must be conducted as follows:

Collection of a minimum of three samples per site in each of three sites:

1) Near site location: Latitude 30° 2' 24" North
Longitude 91° 50' 47" West

2) Mid site location: Latitude 30° 2' 55" North
Longitude 91° 50' 52" West

3) Out site location: Latitude 30° 3' 17" North
Longitude 91° 50' 56" West

EXCEPTION: Only one sample per site in each of the three sites for those samples collected quarterly.

Sampling for the **REFERENCE AREA** must be conducted as follows:

Collection of a minimum of three samples in the Reference Area. All three samples will be taken from a site or sites similar to the Discharge Area.

Reference Area location: Latitude 30° 3' 45" North
Longitude 91° 51' 2" West

EXCEPTION: Only one sample per site in the reference area for those samples collected quarterly.

A: **ANNUALLY.** Sample once per year at all three (3) DISCHARGE AREA sites and the REFERENCE AREA site and included in the yearly report.

A_1 – Stem growth and litter fall

M: **MONTHLY.** Samples should be taken at all three (3) DISCHARGE AREA sites and the REFERENCE AREA site each month and included in the yearly report.

P: **PERIODICALLY.** Sampling must be made once during September through November in the fourth year of the permit period for all three (3) DISCHARGE AREA sites and the REFERENCE AREA site (Exception: See footnote P_2 regarding Nutrient I analysis, which is to be sampled in the summer).

P_1- Sample preservation, handling, and analysis must meet the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, or most recent revision) or an equivalent substitute as approved by the administrative authority.

P_2- Sampling to be conducted in summer to reflect peak growth.

Q: **QUARTERLY.** Sampling (one sample collected per site) must be made every three months annually for all three (3) DISCHARGE AREA sites and the REFERENCE AREA site.

If loading rates exceed 15 g/m^2/yr total nitrogen or 4 g/m^2/yr total phosphorus, then either the loading rates must be reduced or the assimilation area must be increased.

Example Calculation for Determining the Nutrient Loading Rates for Wetland Assimilation:

4 g TP/m^2/yr = 35.6 lbs. TP/acre/yr
15 g TN/m^2/yr = 133.8 lbs. TN/acre/yr

Loading Rate for Total Phosphorus:

Discharging to 335 acres, then the yearly loading rate is:
(35.6 lbs. TP/acre/year) x 335 acres = 11,926 lbs. TP/year

The long term average daily loading rate is:
(11,926 lbs. TP/year) / 365 days/year = 32.7 lbs. TP/day

The daily maximum discharge loading rate is:
(32.7 lbs. TP/day) x 3.11 = 102 lbs. TP/day

The maximum 30-day discharge is:
(32.7 lbs. TP/day) x 1.31 = 43 lbs. TP/day

Loading Rate for Total Nitrogen:

Discharging to 335 acres, then the yearly loading rate is:
(133.8 lbs. TN/acre/year) x 335 acres = 44,823 lbs. TN/year

The long term average daily loading rate is:
(44,823 lbs. TN/year) / 365 days/year = 123 lbs. TN/day

The daily maximum discharge loading rate is:
(123 lbs. TN/day) x 3.11 = 383 lbs. TN/day

The maximum 30-day discharge is:
(123 lbs. TN/day) x 1.31 = 161 lbs. TN/day

Suggestions for sampling during the wetland monitoring phase can be found in *The Use of Louisiana Swamp Forests for Application of Treated Municipal Wastewater: Standard Operating Procedures for Monitoring the Effects of Effluent Discharge*. John W. Day, Jr., Joel Lindsey, Jason N. Day, and Robert R. Lane, Comite Resources, Inc. Used with the permission of Dr. John W. Day, Jr., March 14, 2003.

X. PREVIOUS PERMITS:

Because the Spanish Lake Wetland Assimilation Project is a proposed facility, there are no previous permits issued for this facility.

XI. ENFORCEMENT AND SURVEILLANCE ACTIONS:

A) Inspections

Because this is a proposed facility, there have been no inspections performed.

B) Compliance and/or Administrative Orders

No enforcement actions have been administered against this facility.

C) DMR Review

This is a proposed facility; therefore, no DMRs have been submitted for this facility.

XII. ADDITIONAL INFORMATION:

Reopener Clause

The Louisiana Department of Environmental Quality (LDEQ) reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon additional water quality studies and/or TMDLs. The LDEQ also reserves the right to modify or revoke and reissue this permit based upon any changes to established TMDLs for this discharge, or to accommodate for pollutant trading provisions in approved TMDL watersheds as necessary to achieve compliance with water quality standards. Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

In accordance with LAC 33:IX.2903., this permit may be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitations issued or approved under sections 301(b)(2)(c) and (D); 304(b)(2); and 307(a)(2) of the Clean Water Act, if the effluent standard or limitations so issued or approved:

a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

b) Controls any pollutant not limited in the permit; or

c) Requires reassessment due to change in 303(d) status of waterbody; or

d) Incorporates the results of any total maximum daily load allocation, which may be approved for the receiving water body.

Mass Loadings Calculations

Final effluent loadings (i.e. lbs/day) have been established based upon the permit limit concentrations and the design capacity of 0.8 MGD.

Effluent loadings are calculated using the following example:

BOD_5: 8.34 gal/lb x 0.8 MGD x 30 mg/l = 200 lbs/day

Monitoring Requirements

At present, the Monitoring Requirements, Sample Types, and Frequency of Sampling as shown in the permit are standard for facilities of flows between 0.50 MGD and 1.00 MGD.

Effluent Characteristics	Monitoring Requirements	
	Measurement Frequency	Sample Type
Outfalls 001		
Flow	Continuous	Recorder
BOD_5	1/week	3 Hr. Composite
Total Suspended Solids	1/week	3 Hr. Composite

Fecal Coliform Bacteria	1/week	Grab
pH	1/week	Grab
Total Magnesium	1/6 months	3 Hr. Composite
Total Lead	1/6 months	3 Hr. Composite
Total Cadmium	1/6 months	3 Hr. Composite
Total Chromium	1/6 months	3 Hr. Composite
Total Copper	1/6 months	3 Hr. Composite
Total Zinc	1/6 months	3 Hr. Composite
Total Iron	1/6 months	3 Hr. Composite
Total Nickel	1/6 months	3 Hr. Composite
Total Silver	1/6 months	3 Hr. Composite
Total Selenium	1/6 months	3 Hr. Composite
Total Nitrogen	1/quarter	3 Hr. Composite
Total Phosphorus	1/quarter	3 Hr. Composite
Wetland Monitoring	see **Wetland System Monitoring**	

Pretreatment Requirements

Based upon consultation with LDEQ pretreatment personnel, general pretreatment language will be used due to the lack of either an approved or required pretreatment program.

Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. The permittee will accomplish this requirement by completing an Environmental Audit Form which has been attached to the permit. All other requirements of the Municipal Wastewater Pollution Prevention Program are contained in Part II of the permit.

The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	12 Months from Audit Period Beginning Date	3 Months from Audit Period Ending Date

XIII TENTATIVE DETERMINATION:

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in this Statement of Basis.

XIV REFERENCES:

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 8, "Wasteload Allocations / Total Maximum Daily Loads and Effluent Limitations Policy," Louisiana Department of Environmental Quality, 2007.

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 5, "Water Quality Inventory Section 305(b) Report," Louisiana Department of Environmental Quality, 2006.

Louisiana Water Quality Management Plan / Continuous Planning Process, Vol. 3, "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards," Louisiana Department of Environmental Quality, 2008.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 11 - "Louisiana Surface Water Quality Standards," Louisiana Department of Environmental Quality, 2008.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Subpart 2 - "The LPDES Program," Louisiana Department of Environmental Quality, 2008.

Low-Flow on Streams in Louisiana, Louisiana Department of Environmental Quality, March 2000.

Index to Surface Water Data in Louisiana, Water Resources Basic Records Report No. 17, United States Department of the Interior, Geological Survey, 1989.

Iberia Parish Wetland Assimilation Use Attainability Analysis (UAA), John W. Day, Ph.D., Robert R. Lane, Ph.D., Joel Lindsey, Jason Day of Comite Resources, Inc.

LPDES Permit Application to Discharge Wastewater, Sewerage District No. 1 of Iberia Parish, May 11, 2009.

PRETREATMENT REQUIREMENTS

PRETREATMENT EVALUATION AND RECOMMENDATION

FACILIITY NAME: *Sewerage District No. 1 of Iberia Parish (Spanish Lake Wetland Assimilation Project)*

CITY: *New Iberia*

PARISH: *Iberia*

PERMIT #: *LA0124605*

PLANNED DESIGN FLOW: *0.8 MGD*

ESTIMATED OR EXPECTED TREATED WASTEWATER FLOW: *0.8 MGD*

OTHER POTWs IN SYSTEM: *City of New Iberia and Sewerage District No. 1 of Iberia Parish – Tete Bayou WWTP (LA0065251) and City of New Iberia – Hwy. 14 WWTP (LA0120201)*

INDUSTRIES IDENTIFIED VIA CORRESPONDENCE WITH IBERIA PARISH
(Note: Wastewater from these facilities will be routed to the Spanish Lake Wetland Assimilation Project WWTP upon completion of construction):

Industry Name	Type of Industry	Direct or Planned Indirect Discharger
Air Logistics, A Bristow Company	Aircraft repair center and logistics support base for satellite operating bases in the Gulf of Mexico; provides logistical support for international operations	Indirect [1]
Aviation Exteriors Louisiana, Inc.	Exterior painting of large commercial, corporate, and military aircraft	Indirect [2]
Brand T/NOV (National Oilwell Varco)	Manufacture oilfield shaker screens from stainless steel wire	Indirect [1]
Carbo Ceramics Inc.	Manufactures ceramic proppant	Indirect [3]

[1] The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be sanitary wastewater only.

[2] All process water is collected and then evaporated using evaporators which run almost continuously. After the water has been removed from the process water, the resulting concentrate is removed from the boilers and added to the hazardous waste totes. The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be sanitary wastewater only.

[1] All process wastewater is recycled and reused in the process. The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be sanitary wastewater only.

Industry Name	Type of Industry	Direct or Planned Indirect Discharger
Iberia Parish Mosquito Abatement District	Mosquito abatement services	Indirect [4]
InterChem, Inc. LA	Blend and drum chemicals for wholesale customers	Indirect [5]
Pelican Aviation Corp.	Servicing and storing aircraft	Indirect [6]
University of Louisiana – New Iberia Research Center	Primate research center	Indirect [7]

STANDARD LANGUAGE RECOMMENDATION AND JUSTIFICATION:

Sewerage District No. 1 of Iberia Parish is building a new wastewater treatment plant which will discharge into the wetlands south of Spanish Lake in Iberia Parish. It is estimated that construction will be complete by October, 2010. On page 5 of the LPDES application dated May 6, 2009, Iberia Parish indicated that the new plant will service "largely the unincorporated areas of Iberia Parish in the vicinity of Acadiana Regional Airport. The facility will also serve the University of Louisiana at Lafayette's New Iberia Research Center (ULL Primate Center) which discharges approximately 100,000 gpd."

Due to the absence of pretreatment categorical standards for the planned indirect discharges listed above or because the planned discharge consists of sanitary wastewater only, it is recommended that LDEQ Option 1 Pretreatment Language be included in LPDES Permit LA0124605. This language is established for municipalities that do not have either an approved or required Pretreatment program. This recommendation is in accordance with 40 CFR Part 403 regulations, the General Pretreatment Regulations for Existing and New Sources of Pollution contained in LAC Title 33, Part IX, Chapter 61 and the Best Professional Judgement (BPJ) of the reviewer.

[4] The discharge to the Spanish Lake Wetland Assimilation Project WWTP will consist of sanitary wastewater (60 gpd) and vehicle wash water (20 gallons/truck; 8 trucks cleaned but not an everyday activity).

[5] Process wastewater and waste products are hauled offsite. The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be sanitary wastewater only.

[6] The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be sanitary wastewater only.

[7] The discharge to the Spanish Lake Wetland Assimilation Project WWTP will be process and sanitary wastewater; however, pretreatment standards have not been developed for this industry.

PUBLIC NOTICE
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY (LDEQ)
SEWERAGE DISTRICT NO. 1 OF IBERIA PARISH
SPANISH LAKE WETLAND ASSIMILATION PROJECT
DRAFT WATER DISCHARGE PERMIT

The LDEQ, Office of Environmental Services, is accepting written comments on a draft Louisiana Pollutant Discharge Elimination System (LPDES) permit prepared for Sewerage District No. 1 of Iberia Parish, Spanish Lake Wetland Assimilation Project, 2617 Northside Road, Suite 100, New Iberia, LA 70563. The facility is located **on Tower Drive approximatly 0.75 miles northwest of its intersection with LA Highway 3212, Iberia Parish.**

The principal discharge from this proposed source will be made into the Spanish Lake Wetlands; thence into Bayou Tortue; thence into Bayou Teche, waters of the state classified for secondary contact recreation and propagation of fish and wildlife. Under the SIC Code 4952, the applicant proposes to discharge treated sanitary wastewater from a publicly owned treatment works serving the unincorporated areas of Iberia Parish in the vicinity of the Acadiana Regional Airport and the University of Louisiana at Lafayette's New Iberia Research Center.

During the preparation of this permit, it has been determined that the discharge will have no adverse impact on the existing uses of the receiving waterbody. As with any discharge, however, some change in existing water quality may occur.

Written comments, written requests for a public hearing or written requests for notification of the final decision regarding this permit action may be submitted to Ms. Soumaya Ghosn at LDEQ, Public Participation Group, P.O. Box 4313, Baton Rouge, LA 70821-4313. **Written comments and/or written requests must be received by 12:30 p.m., Weekday, Month Day, Year.** Written comments will be considered prior to a final permit decision.

If LDEQ finds a significant degree of public interest, a public hearing will be held. LDEQ will send notification of the final permit decision to the applicant and to each person who has submitted written comments or a written request for notification of the final decision.

The application, draft permit, and statement of basis are available for review at the LDEQ, Public Records Center, Room 127, 602 North 5th Street, Baton Rouge, LA. Viewing hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday (except holidays). **The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the DEQ public website at www.deq.louisiana.gov.**

Inquiries or requests for additional information regarding this permit action should be directed to Mr. Todd Franklin, LDEQ, Water Permits Division, P.O. Box 4313, Baton Rouge, LA 70821-4313, phone (225) 219-3102.

Persons wishing to be included on the LDEQ permit public notice mailing list or for other public participation related questions should contact the Public Participation Group in writing at LDEQ, P.O. Box 4313, Baton Rouge, LA 70821-4313, by email at deqmaillistrequest@la.gov or contact the LDEQ Customer Service Center at (225) 219-LDEQ (219-5337).

Permit public notices including electronic access to the draft permit and statement of basis can be viewed at the LDEQ permits public notice webpage at www.deq.louisiana.gov/apps/pubNotice/default.asp and general

information related to the public participation in permitting activities can be viewed at www.deq.louisiana.gov/portal/tabid/2198/Default.aspx.

Alternatively, individuals may elect to receive the permit public notices via email by subscribing to the LDEQ permits public notice List Server at http://www.doa.louisiana.gov/oes/listservpage/ldeq_pn_listserv.htm

All correspondence should specify AI Number 164731, Permit Number LA0124605, and Activity Number PER20090001.

LOUISIANA WATER POLLUTION CONTROL FEE SYSTEM
RATING WORKSHEET
PERMIT NO: LA0124605; AI 164731; PER20090001

1	a. Company Name:	Sewerage Distict No. 1 of Iberia Parish
	b. Facility Name:	Spanish Lake Wetland Assimilation Project
2.	Local Mailing Address:	2617 Northside Road, Suite 100 New Iberia, Louisiana 70563-0953
3.	Billing Address (If different):	
4.	Facility Location:	southwest of Acadiana Regional Airport on Tower Drive approximately 0.75 miles northwest of its intersection with LA Highway 3212
	a. Parish:	Iberia
5.	Facility Type:	publicly owned treatment works
	a. Treatment Process Used:	four stage aerated lagoon system consisting of one treatment aeration basin followed by three settling ponds, which are also aerated / chlorination and dechlorination will be utilized
6.	Products Produced:	
	a. Raw materials stored or used:	
	b. By-products produced:	
7.	Primary SIC Code:	4952
	a. Other SIC Codes:	
8.	Fac. Manager:	Joseph M. Gonzalez
	a. Telephone:	(337) 369-4413
9.	Owner:	Sewerage District No. 1 of Iberia Parish
	a. Telephone:	(337) 369-4413
10.	Env. Contact:	Joseph M. Gonzalez
	a. Telephone:	(337) 369-4413

11. State Permit No.:	12. NPDES Permit No.
a. Date Issued:	a. Effective Date:
b. New: Modified:	b. Expiration Date:

13. Number and Identification of Outfalls: One, 001

14. Number of Injection Wells:

15. Water Source(s):

16. Receiving Water(s): Spanish Lake Wetlands; thence into Bayou Tortue; thence into Bayou Teche

Is receiving water:

a. Public Water Supply	Yes ( ) No (X)
b. Designated Water Quality Limited	Yes ( ) No (X)
c. In Compliance with Water Quality Standards	Yes ( ) No (X)

17. River Basin: Vermilion-Teche River

18. Basin Segment No. 060401
Federal Tax I. D. No.: 72-6000542
Initials of Rater: jtf

TOTAL RATING POINTS ASSIGNED 16.6

1. FACILITY COMPLEXITY DESIGNATION

Primary SIC 4952

Complexity Designation =

X	I	(0 points)
_____	II	(10 points)
_____	III	(20 points)
_____	IV	(30 points)
_____	V	(40 points)
_____	VI	(50 points)

COMPLEXITY DESIGNATION POINTS 0

2. FLOW VOLUME AND TYPE

A. Wastewater Type I

Is total Daily Average Discharge greater than 60 mgd?

_____Yes, then points = 200

_____No, then

Points = 0.5 X Total Daily Average Discharge (mgd)

Points = 0.5 X _____ =

Total points =

B. Wastewater Type II

Is total Daily Average Discharge greater than 5 mgd?

____Yes, then points= 50

___ No, then

Points = 10 X Total Daily Average Discharge (mgd)

Points = 10 X _____ =

Total points =

C. Wastewater Type III

Is total Daily Average Discharge greater than 25 mgd?

____Yes, then points= 50

__X__ No, then

Points = 2 X Total Daily Average Discharge (mgd)

Points = 2 X 0.8 = 1.6

Total points = 1.6

FLOW VOLUME AND TYPE POINTS 1.6

3. POLLUTANTS

A. BOD_5

Daily Average Load =

8.34 lb/gal x .8 MGD x 30 mg/l = 200 lb/day

_____	≤ 50 lb/day	(0 points)
X	> 50 - 500	(5 points)
_____	> 500 - 1000	(10 points)
_____	> 1000 - 3000	(20 points)
_____	> 3000 - 5000	(30 points)
_____	> 5000 lb/day	(40 points)

COD or

Daily Average Load =

_____	≤ 100 lb/day	(0 points)
_____	> 100 - 500	(5 points)
_____	> 500 - 1000	(10 points)
_____	> 1000 - 5000	(20 points)
_____	> 5000 - 10000	(30 points)
_____	> 10000 lb/day	(40 points)

BOD OR COD DEMAND POINTS 5
(whichever is greater)

B. TSS
Daily Average Load =

8.34 lb/gal x 0.8 MGD x 90 mg/l = 600 lb/day

_____	≤ 100 lb/day	(0 points)
_____	> 100 - 500	(5 points)
X	> 500 - 1000	(10 points)
_____	> 1000 - 5000	(20 points)
_____	> 5000 - 10000	(30 points)
_____	> 10000 lb/day	(40 points)

TSS POINTS 10

C. AMMONIA
Daily Average Load =

_____	≤ 200 lb/day	(0 points)
_____	> 200 - 500	(5 points)
_____	> 500 - 1000	(10 points)
_____	> 1000 - 5000	(20 points)
_____	> 5000 - 10000	(30 points)
_____	> 10,000 lb/day	(40 points)

AMMONIA POINTS N/A

TOTAL POLLUTANT POINTS 15

4. TEMPERATURE (HEAT LOAD)
Heat Load = Average Summer flow (mgd) X °T X 0.00834
where °T = Permit Limit (Max. Temp.) -70E
Heat Load = _____(mgd) X _____ X 0.00834 = _____Billion BTU
Heat Load =

_____	≤ 4 billion BTU	(0 points)
_____	> 4-20 billion BTU	(5 points)
_____	> 20-100 billion BTU	(10 points)
_____	> 100-200 billion BTU	(15 points)
_____	> 200 billion BTU	(20 points)

HEAT LOAD POINTS N/A

5. POTENTIAL PUBLIC HEALTH IMPACTS
Is the receiving water to which the wastewater is discharged or a water body to which it is a tributary used as a drinking water supply source within 50 miles downstream?
X No (0 points)
_____Yes, then . . . Complexity Designation

_____	I, II	(0 points)
_____	III	(5 points)
_____	IV	(10 points)
_____	V	(20 points)
_____	VI	(30 points)

POTENTIAL PUBLIC HEALTH IMPACT POINTS 0

6. MAJOR/MINOR FACILITY DESIGNATION
Has your facility been designated a Major Facility by the administrative authority?
_____Yes, then Points = 25
X No, then

Were effluent limitations assigned to the discharge based on water quality factors in the receiving stream?
X No, then Points = 0
_____Yes, then Points = 5

TOTAL MAJOR/MINOR POINTS 0

TOTAL RATING POINTS ASSIGNED 16.6

Appendix E – Iberia Parish and St. Martin Parish Intergovernmental Agreement

STATE OF LOUISIANA

PARISH OF IBERIA

INTERGOVERNMENTAL AGREEMENT

WHEREAS, the PARISHES OF IBERIA (IBERIA) and ST. MARTIN (ST. MARTIN) are political subdivision of the State of Louisiana as defined by Article 6 § 44(1) of the Louisiana Constitution of 1974; and

WHEREAS, IBERIA PARISH SEWERAGE DISTRICT NO. 1 (DISTRICT) is a political subdivision of the state and domiciled in Iberia Parish responsible for the establishment and maintenance of sewer disposal systems within its boundaries; and

WHEREAS, the PARISH OF IBERIA, as part of its parish-wide drainage DISTRICT is in need of extending L-1A in the westerly direction for a distance of approximately 1500' to the eastern side of Spanish Lake as shown on the aerial photo attached hereto as Exhibit 1; and

WHEREAS, said extension of L-1A will have to traverse the parish line between Iberia and St. Martin Parishes; and

WHEREAS, ST. MARTIN is in the process of maintaining L-1A within its boundaries and has an interest in extending the same approximately 1100' in a westerly direction to the parish line; and

WHEREAS, both parishes have an interest in further extending it an additional 400' to the eastern boundary of Spanish Lake in Iberia Parish; and

WHEREAS, DISTRICT is in the process of installing an aerated lagoon and settling pond for primary and secondary treatment of wastewater to serve a developing area of the parish but not limited to the Acadian Regional Airport and surrounding properties; and

WHEREAS, this project is receiving assistance and funding from the United States Corp of Engineering; and

WHEREAS, the DISTRICT project requires the installation of a force main to carry treated water from the treatment plant to a discharge header to be located in a wetlands area immediately south of Spanish Lake and the contemplated extension of L-1A to Spanish Lake's eastern boundary; and

WHEREAS, the operation of the discharge headers is not only environmentally safe but

productive to the continued replenishment of nutrients necessary for the plant life of the protected wetland; and

WHEREAS, the extension of L-1A is necessary to provide continued drainage of the wetland area and any increase in flow created by the installation of the discharge headers; and

NOW THEREFORE, pursuant to the provisions of Louisiana Constitution art. 6 § 20 and La. R.S. 33:1324(3) the undersigned parties hereby enter into the following intergovernmental agreement:

1.

IBERIA will adopt the appropriate resolution declaring that portion of the extension of ST. MARTIN's L-1A (approximately 400') into Iberia Parish to the eastern boundary of Spanish Lake as a La. R.S. 38:113 channel.

2.

Upon presentation of the resolution referred to in paragraph 1 above, ST. MARTIN will adopt the appropriate resolution declaring that portion of the extension of its channel L-1A (approximately 1100') to the parish line between IBERIA and ST. MARTIN.

3.

Upon the adoption of both resolutions above referred to, IBERIA and ST. MARTIN shall forward said resolutions to the State Department of Public Works for approval.

4.

Upon receipt of approval by the State Department of Public Works, ST. MARTIN shall, at its cost and expense, perform all necessary work to excavate and maintain the necessary extension of L-1A in both parishes as shown on Exhibit 1 to the eastern shore of Spanish Lake.

5.

IBERIA, at its cost and expense, shall be responsible for procuring any necessary working rights of ways and/or the necessary cost of replacing and/or relocating any private works or structures necessitated by the extension of L-1A to the eastern shore of Spanish Lake as shown on Exhibit 1.

6.

All parties shall have a continuing obligation to maintain all aspects of the drainage improvements necessary to ensure the continued drainage of the wetland areas wherein the

discharge headers are to be installed as shown on Exhibit 1.

THUS DONE AND SIGNED before the undersigned witnesses and Notary Public after due reading of the whole on this 28th day of November, 2009, at New Iberia, Iberia Parish, Louisiana, pursuant to Resolution No. 2009-275 of the Iberia Parish Council dated October 14, 2009.

WITNESSES:

PARISH OF IBERIA

BY: Ernest Freyou
ERNEST FREYOU
PRESIDENT

Sally H Ingram
NOTARY PUBLIC #40809

THUS DONE AND SIGNED before the undersigned witnesses and Notary Public after due reading of the whole on this 7th day of December, 2009, at St. Martinville, St. Martin Parish, Louisiana, pursuant to Resolution of the St. Martin Parish Council dated _____.

WITNESSES:

ST. MARTIN PARISH

BY:
GUY CORMIER
PRESIDENT

NOTARY PUBLIC

FABIAN D. TUCKER
Notary Public
Notary ID# 69482
State of Louisiana
My Commission Expires At Death

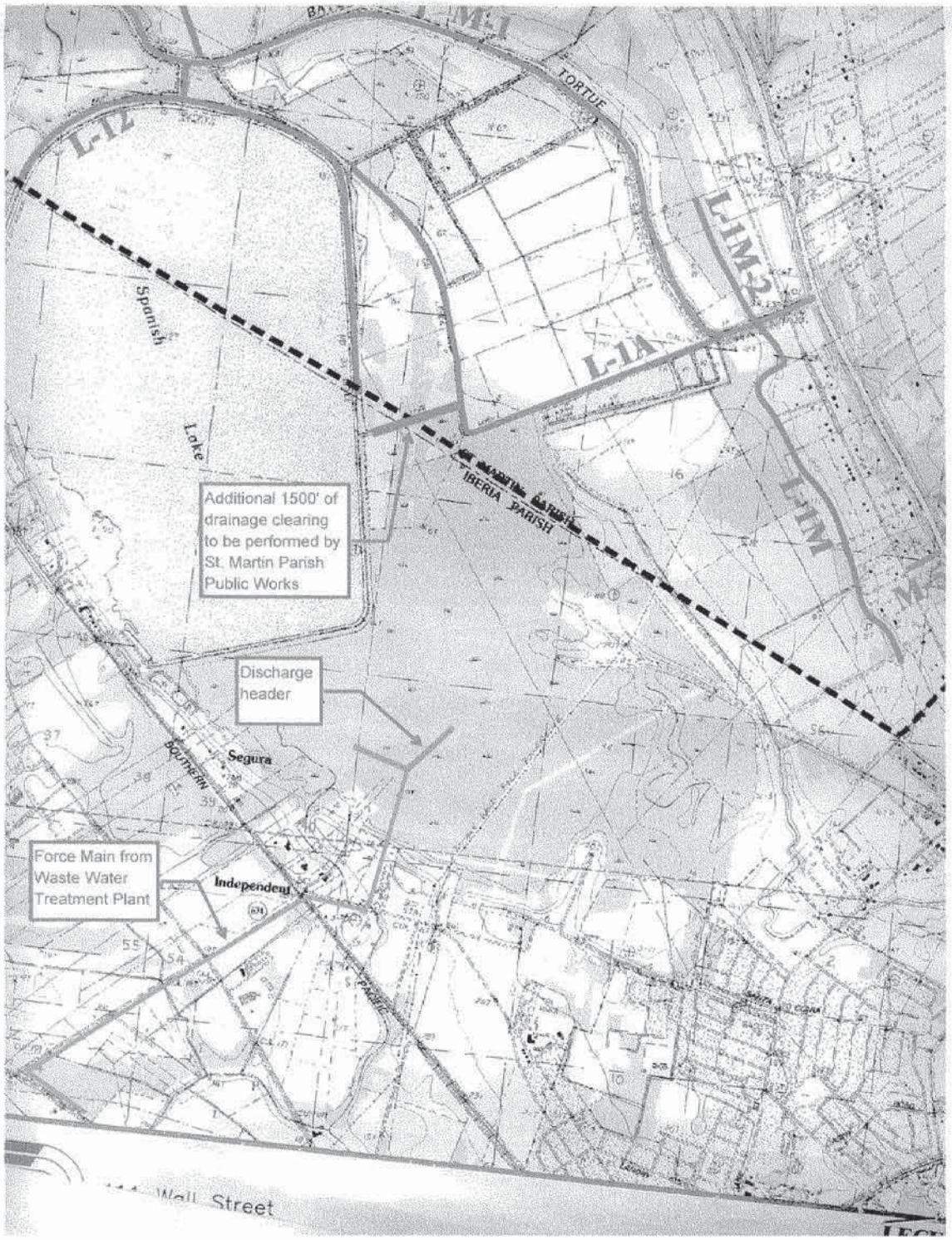
THUS DONE AND SIGNED before the undersigned witnesses and Notary Public after due reading of the whole on this 7th day of December, 2009, at New Iberia, Iberia Parish, Louisiana, pursuant to Resolution of the Iberia Parish Sewer District No. 1 dated November 3, 2009

WITNESSES:

IBERIA PARISH SEWER DISTRICT NO. 1

BY: Joseph M. Gonzalez Sr.
JOSEPH M. GONZALEZ, SR.
EXECUTIVE DIRECTOR

Sally H Ingram
NOTARY PUBLIC #40809


L-12
L-1M-1
TORTUE
L-1M-2
L-1A
L-1M
Spanish
Lake
IBERIA PARISH
Additional 1500' of drainage clearing to be performed by St. Martin Parish Public Works
Discharge header
Segura
SOUTHERN
Force Main from Waste Water Treatment Plant
Independent
PACIFIC
Wall Street

Appendix F – Louisiana Department of Wildlife and Fisheries Letter

BOBBY JINDAL
GOVERNOR

State of Louisiana

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY

JIMMY L. ANTHONY
ASSISTANT SECRETARY

July 30, 2009

Ms. Virginia Brisley, Project Manager
Project Management Branch
United States Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

RE: Spanish Lake Wetland Assimilation Project
Iberia Parish

Dear Ms. Brisley:

The professional staff of the Louisiana Department of Wildlife and Fisheries (LDWF) has participated in two recent teleconferences, conducted on July 2, 2009 and July 23, 2009, in an effort to better understand the proposed Spanish Lake Wetland Assimilation Project and its possible effects on receiving forested wetlands. LDWF staff understand that an Environmental Assessment (EA) will be produced that discusses project need, alternatives, environmental impacts, and mitigation measures. In addition to these items, LDWF has identified the following concerns that warrant thorough evaluation in the EA:

- An alternative site analysis for the treatment of wastewater must be provided. The alternative sites or treatment methods must be practicable alternatives to the proposed Spanish Lake Wetland Assimilation Project. For instance, can the effluent be discharged into adjacent crawfish ponds instead of the state owned wetlands? Can the existing wastewater treatment facility be upgraded, thereby avoiding possible adverse impacts to the proposed receiving wetland?

- The EA must demonstrate that the hydrological gradient of the receiving wetland will assure flow of discharged effluent from the discharge points to the drainage canal at the northeast corner of the lake. The hydrological gradient needs to be sufficient to move the anticipated volume of effluent in a direction and at a flow rate that will prevent prolonged wetland inundation.

- The EA must demonstrate that the receiving wetland can adequately treat and assimilate the proposed discharge volumes without experiencing adverse impacts. The EA shall discuss whether or not the receiving wetland can treat/assimilate discharge volumes of 300,000 gallons per day (gpd) (i.e., current use), 800,000 gpd (i.e., permitted maximum capacity), and 1,500,000 gpd (i.e., future projected permit maximum). Also, the EA shall state what the maximum discharge volume is that can be adequately treated/assimilated by the receiving wetland without adversely affecting the existing forested wetlands.

- The EA must also document current conditions of the receiving wetland. In documenting current conditions, the EA must specifically identify and clearly describe those wetland functions and processes that are now adversely impacted within the receiving wetland. For example, the wetland has been described in the Use Attainability Analysis to be in "poor condition." This assertion must be quantified.

- Construction and maintenance of project infrastructure will result in the direct loss of wetland functions. The loss of wetland functions shall be quantified in the EA. Adequate and appropriate mitigation for such impacts shall be provided by the applicant. If the applicant contends that the assimilation project is "self mitigating", the EA must demonstrate this by quantifying the gain in wetland functions attributable to the project compared to the loss of functions incurred during project construction.

- The EA shall describe historic hydrologic conditions in the receiving wetland, including a characterization of flooding frequency and duration of inundation. For comparison, the EA shall also describe and model the anticipated flooding frequency and duration with the addition of this effluent to the system.

- The EA or permit monitoring protocol shall specifically define what biological or biochemical processes/parameters need to be monitored in order to determine wetland health and insure forested wetland sustainability should the effluent discharge be authorized. Furthermore, the monitoring protocol should identify acceptable limits for each parameter.

- Should LDWF staff determine, by an analysis of monitoring data and on-site conditions, that the receiving wetland is being adversely affected by the effluent discharge, what is the mechanism to initiate and conduct a timely remediation of the impacted wetland? A remediation plan should be developed that clearly describes the implementation process. Also, the applicant must provide a contingency plan that outlines alternative treatment methods should it be determined that the assimilation project is not functioning as anticipated.

Additionally, the applicant will need a land rights agreement from LDWF to construct and operate the project in the Spanish Lake wetlands. Prior to LDWF granting a land rights agreement, each concern identified above must be individually and adequately addressed in the EA or other regulatory documents.

The Louisiana Department of Wildlife and Fisheries seeks to work with you in a cooperative manner on this and future endeavors. Please do not hesitate to contact Kyle Balkum (225-765-2819) of our Habitat Section should you need further assistance.

Sincerely,

Robert J. Barham
Secretary

kb

c: Todd Franklin, LDEQ Water Permits Division

Appendix G – Agency Coordination

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

October 6, 2009

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee:

Please reference Ms. Tammy Gilmore's September 1, 2009, electronic mail requesting our initial review of the U.S. Army Corps of Engineers' (Corps) proposed Iberia Parish Wastewater Treatment and Wetland Assimilation Project, Iberia Parish, Louisiana. That project would be implemented under the Corps' Section 219 Program. The proposed project would involve constructing a new wastewater treatment and disinfection system that would serve northern Iberia Parish and discharge effluent into the Spanish Lake wetlands for tertiary treatment before passing into the Spanish Lake drainage canal, then into Bayou Tortue and thence into Bayou Teche. Based upon information provided by the Comite Resources, Inc.'s Iberia Parish Wetland Assimilation – Use Attainability Analysis (UAA) and the Preliminary Engineering Report conducted by Waldemar S. Nelson and Company, Incorporated, the Corps anticipates that the Spanish Lake Wetlands would benefit from the additional nutrients and freshwater influx that would be provided by the assimilation project. The U.S. Fish and Wildlife Service (Service) has reviewed that information, and provides this Planning-aid Letter in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

PROJECT AND STUDY AREA DESCRIPTION

The goal of the proposed project would be to provide wastewater treatment capacity for current and future residential, commercial, and industrial areas for the unincorporated portions of northern Iberia Parish in the vicinity of the Acadiana Regional Airport. The existing collection system and Pump Station #1 currently discharge wastewater to the City of New Iberia's treatment facility. Due to anticipated future growth, the Parish expects that the existing wastewater treatment system for northern Iberia Parish would exceed the current configuration and design capacity for the City's treatment facility. The proposed treatment facility would consist of a four-stage aerated lagoon system containing one treatment basin and three settling ponds; a chlorination and de-chlorination system; one new pump station (i.e., Pump Station #2); a new force main from Pump Station #2 into the Spanish Lake wetlands; and a distribution system extending from the force main along the southern and western boundaries to evenly distribute the effluent into the Spanish Lake Wetlands. The Corps anticipates that the discharged

effluent would follow the natural gradient through the Spanish Lake Wetlands such that water would flow from the south and west to the north and northeast and eventually drain into the Spanish Lake drainage canal.

The Preliminary Engineering Report discusses two project alternatives:

1. Oxidation Pond with Wetlands Discharge – This alternative would involve routing all sanitary flows from the vicinity of the study service area to an aerated oxidation pond. After treatment the pond effluent would be conveyed to the Spanish Lake Wetlands, both for the provision of nutrient removal and for wetlands restoration.

2. Conveyance to the New Sewage Treatment Plant in New Iberia – This alternative would involve collecting the raw wastewater from the study service area and conveying it to the headworks of treatment plant currently being built by the City of New Iberia. The new facility has a reserved capacity of 2 million gallons per day for the Parish.

The results of the Preliminary Engineering Report indicate that the first alternative listed above would be the most cost-effective for the Parish, and would provide beneficial effects to the Spanish Lake Wetlands.

The Spanish Lake Wetlands are located less than one mile north of the City of New Iberia and west of Bayou Teche, near the Iberia and St. Martin Parishes boundary lines. The wetlands are bounded by Spanish Lake to the north, Louisiana State Highway 182 (LA Hwy 182) and residential areas to the west, crawfish ponds and an abandoned landfill to the east, and residential and agricultural lands to the south. The Spanish Lake Wetlands consist of dry and semi-flooded bottomland hardwood forest, wet bottomland hardwood forest, well-drained bottomland hardwood forest, and permanently flooded swamp. The targeted area for the proposed project would encompass approximately 335 acres of those forest community types.

According to the UAA, the Spanish Lake Wetlands are hydrologically controlled by rainfall, upland runoff, and the impounded nature of the area. Rainfall is the major source of freshwater for the project area. Louisiana Hwy 182, the levees associated with Spanish Lake, urban development, and an abandoned landfill prevent most surrounding upland runoff from reaching the natural wetlands. However, there is some localized runoff from terrace uplands and a portion of the old landfill. Water currently drains from the wetlands to the drainage canal for Spanish Lake, which is located in the northernmost corner of the Spanish Lake Wetlands. Water flows from the southern and western parts of the wetland in a north and easterly direction. Water depths increase from well drained to 0.5-inch in the southwest and 2 to 4 inches in the southeast to over 1.5 feet in the section between the landfill and the southeast corner of Spanish Lake (the central portion of the wetlands). The forested wetlands located north of a small levee connecting Spanish Lake and the crawfish ponds are also well drained.

According to the UAA, the Spanish Lake Wetlands were logged for cypress in the early half of the twentieth century and the current forest structure is all secondary growth. Based upon habitat information in the UAA and the Preliminary Engineering Report, those forested wetlands are in poor condition due to prolonged inundation. The dominant tree species throughout the forest

communities consists of red maple, Chinese tallow, willow, water oak, hackberry, ash, American elm, and black locust. The midstory consists mostly of buttonbush and Chinese privet. There is a small levee traversing in an east-west direction between the lake and the crawfish ponds which is restricting water flow out of the wetlands and causing prolonged inundation in some portions of the project area. The Corps' project description does not indicate that the levee would be removed to reduce flooding and improve water flow through the area with implementation of this project.

FISH AND WILDLIFE RESOURCES OF CONCERN

The forested wetlands within the proposed project area provide valuable habitat for fish and wildlife within Federal trusteeship, including migratory and resident waterfowl, wading birds, songbirds, and interjurisdictional fishes. Those wetlands also provide valuable habitat for small mammals, white-tailed deer, and various amphibians and reptiles. In addition to their habitat values, the wetlands within the proposed project area provide floodwater storage and perform important water quality functions by reducing dissolved nutrient levels and removing suspended sediments.

The Preliminary Engineering Report indicates that the current wastewater treatment system discharges approximately 300,000 gallons per day, of which 100,000 gallons per day consists of discharges from the University of Louisiana at Lafayette (ULL) Primate Center (whose effluent is twice as concentrated as human sources). That report does not, however, indicate that the current system accepts wastewater from industrial users, but does indicate that the Parish anticipates future commercial and industrial growth within the vicinity of the Acadiana Regional Airport. The Service is concerned that such users may contribute potentially harmful pollutants (e.g., heavy metals, petroleum by-products, etc.) to the proposed treatment system that would eventually be transferred into the Spanish Lake Wetlands, which could enter the food chain and adversely affect both flora and fauna of the area. The Corps should include in their project analysis whether the Parish anticipates that commercial and industrial users would contribute heavy metals and other potentially toxic substances to the wastewater discharge and/or whether the proposed treatment facility would have the appropriate primary and secondary treatment systems to remove such substances prior to discharging effluent to the targeted wetlands.

Although we do not object to the proposed project, the Service recommends that the Corps fully analyze whether there is potential for the project to cause further degradation of the current forest conditions for the targeted project area. In order to ensure that fish and wildlife resource values receive equal consideration with project implementation, an alternatives analysis should also be conducted to ensure that other potential methods of wastewater disposal are appropriately explored. One potential alternative feature would be the removal or gapping of the small levee between the lake and the crawfish ponds. Based upon information provided in the UAA, removal of that levee would improve water flow through the targeted wetlands and prevent prolonged inundation which would then allow those wetlands to better assimilate the wastewater effluent. Furthermore, the Corps should determine if future discharges into the Spanish Lake discharge canal could interfere with water management of Spanish Lake. In addition, the Louisiana Department of Wildlife and Fisheries (LDWF) has expressed concerns regarding the

proposed project (attached); those concerns should be adequately addressed during future planning efforts.

According to our records, there are no known occurrences of federally listed threatened or endangered within the proposed project area or its vicinity. No further ESA consultation with the Service would be required for the proposed action, unless there are changes in the scope or location of the proposed project or the project has not been initiated one year from the date of this letter. If the proposed project has not been initiated within one year, follow-up consultation should be accomplished with the Service prior to making expenditures because our threatened and endangered species information is updated annually. If the scope or location of the proposed project is changed, consultation should occur as soon as such changes are made.

The proposed project would be located in an area where colonial nesting wading birds may be present. Colonies may be present that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season. For colonies containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a rookery should be restricted to the non-nesting period, depending on the species present. In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests, and should avoid affecting them during the breeding season (*i.e.*, the time period outside the activity window).

We appreciate the opportunity to provide these comments during the early planning stages of the proposed project, and we look forward to working with the Corps throughout project development. If you or your staff requires further assistance in this matter, please contact Ms. Brigette Firmin (337/291-3108) of this office.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

Attachment

cc: LDWF, Coastal & Nongame Division, Baton Rouge, LA (Attn: Kyle Balkum)
LDWF, New Iberia, LA (Attn: Mike Walker)
LDWF, Natural Heritage Program, Baton Rouge, LA
LDEQ, Baton Rouge, LA

BOBBY JINDAL
GOVERNOR

State of Louisiana

ROBERT J. BARHAM
SECRETARY

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

JIMMY L. ANTHONY
ASSISTANT SECRETARY

July 30, 2009

Ms. Virginia Brisley, Project Manager
Project Management Branch
United States Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

RE: Spanish Lake Wetland Assimilation Project
Iberia Parish

Dear Ms. Brisley:

The professional staff of the Louisiana Department of Wildlife and Fisheries (LDWF) has participated in two recent teleconferences, conducted on July 2, 2009 and July 23, 2009, in an effort to better understand the proposed Spanish Lake Wetland Assimilation Project and its possible effects on receiving forested wetlands. LDWF staff understand that an Environmental Assessment (EA) will be produced that discusses project need, alternatives, environmental impacts, and mitigation measures. In addition to these items, LDWF has identified the following concerns that warrant thorough evaluation in the EA:

- An alternative site analysis for the treatment of wastewater must be provided. The alternative sites or treatment methods must be practicable alternatives to the proposed Spanish Lake Wetland Assimilation Project. For instance, can the effluent be discharged into adjacent crawfish ponds instead of the state owned wetlands? Can the existing wastewater treatment facility be upgraded, thereby avoiding possible adverse impacts to the proposed receiving wetland?

- The EA must demonstrate that the hydrological gradient of the receiving wetland will assure flow of discharged effluent from the discharge points to the drainage canal at the northeast corner of the lake. The hydrological gradient needs to be sufficient to move the anticipated volume of effluent in a direction and at a flow rate that will prevent prolonged wetland inundation.

- The EA must demonstrate that the receiving wetland can adequately treat and assimilate the proposed discharge volumes without experiencing adverse impacts. The EA shall discuss whether or not the receiving wetland can treat/assimilate discharge volumes of 300,000 gallons per day (gpd) (i.e., current use), 800,000 gpd (i.e., permitted maximum capacity), and 1,500,000 gpd (i.e., future projected permit maximum). Also, the EA shall state what the maximum discharge volume is that can be adequately treated/assimilated by the receiving wetland without adversely affecting the existing forested wetlands.

- The EA must also document current conditions of the receiving wetland. In documenting current conditions, the EA must specifically identify and clearly describe those wetland functions and processes that are now adversely impacted within the receiving wetland. For example, the wetland has been described in the Use Attainability Analysis to be in "poor condition." This assertion must be quantified.

- Construction and maintenance of project infrastructure will result in the direct loss of wetland functions. The loss of wetland functions shall be quantified in the EA. Adequate and appropriate mitigation for such impacts shall be provided by the applicant. If the applicant contends that the assimilation project is "self mitigating", the EA must demonstrate this by quantifying the gain in wetland functions attributable to the project compared to the loss of functions incurred during project construction.

- The EA shall describe historic hydrologic conditions in the receiving wetland, including a characterization of flooding frequency and duration of inundation. For comparison, the EA shall also describe and model the anticipated flooding frequency and duration with the addition of this effluent to the system.

- The EA or permit monitoring protocol shall specifically define what biological or biochemical processes/parameters need to be monitored in order to determine wetland health and insure forested wetland sustainability should the effluent discharge be authorized. Furthermore, the monitoring protocol should identify acceptable limits for each parameter.

- Should LDWF staff determine, by an analysis of monitoring data and on-site conditions, that the receiving wetland is being adversely affected by the effluent discharge, what is the mechanism to initiate and conduct a timely remediation of the impacted wetland? A remediation plan should be developed that clearly describes the implementation process. Also, the applicant must provide a contingency plan that outlines alternative treatment methods should it be determined that the assimilation project is not functioning as anticipated.

Additionally, the applicant will need a land rights agreement from LDWF to construct and operate the project in the Spanish Lake wetlands. Prior to LDWF granting a land rights agreement, each concern identified above must be individually and adequately addressed in the EA or other regulatory documents.

The Louisiana Department of Wildlife and Fisheries seeks to work with you in a cooperative manner on this and future endeavors. Please do not hesitate to contact Kyle Balkum (225-765-2819) of our Habitat Section should you need further assistance.

Sincerely,

Robert J. Barham
Secretary

kb

c: Todd Franklin, LDEQ Water Permits Division

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

August 20, 2009

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch

Mr. Scott Hutcheson
State Historic Preservation Officer
Office of Cultural Development
Department of Culture, Recreation and Tourism
P.O. Box 44247
Baton Rouge, Louisiana 70804

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

Scott Hutcheson 9-9-09
Scott Hutcheson Date
State Historic Preservation Officer

Dear Mr. Hutcheson:

The U.S. Army Corps of Engineers, New Orleans District (CEMVN) has initiated modified plans for the location of the Iberia Parish Wastewater Treatment Project, which would provide wastewater treatment for unincorporated areas of northern Iberia Parish in the vicinity of the Acadian Regional Airport. Iberia Parish is located in south central Louisiana west of the Atchafalaya Basin, 106 miles west of New Orleans, and 50 miles south west of Baton Rouge. The project location was modified from your offices previous assessment in May of 2009 due to the Acadian Regional Airport and FAA concerns of habitat development causing possible aviation and safety issues. A field visit to the project area by CEMVN archaeologist Jerica Richardson on June 22, 2009 confirmed that the majority of the area proposed for project work is an extremely developed and disturbed agricultural farm area.

The design of the discharge into the wetlands remains unchanged from your previous assessment and involves constructing distribution headers along the western border of the Spanish Lake Wetlands. Each header will be supplied with orifices, spaced at regular intervals to provide uniform distribution of effluent over the wetland. The location of the oxidation pond and feeding pump station has been moved to avoid drawing wildlife into the vicinity of inbound and outbound aircraft flying into the Acadian Regional Airport. The new project location will be moved 1.5 miles east of the previously proposed location. Details of the project area and plans for the discharge system are shown on enclosures 1 through 4. The targeted wetlands discharge area, Spanish Lake Wetlands, will remain unchanged from your offices previous assessment and concurrence in letters dated December 20, 2004 and May 27, 2009 of no impacts to cultural resources.

The proposed project will provide a nutrient source (treated sanitary wastewater) for restoration of existing wetlands. The Spanish Lake Wetlands are hydrologically controlled by rainfall, upland runoff and the impounded nature of the area. Rainfall is the major source of freshwater. There is limited upland runoff since the Old Spanish Trail Highway (LA Hwy 182) and the levees associated with Spanish Lake, urban development, and an abandoned landfill

AUG 2 4 2009

ALABAMA-COUSHATTA TRIBE OF TEXAS
571 State Park Rd 56 • Livingston, Texas 77351 • (936) 563-1100

June 26, 2009

Jerica Richardson
New Orleans District, Corps of Engineers
Attn: CEMVN-PM-RN
P.O. Box 60267
New Orleans, LA 70160-0267

Dear District Engineer:

On behalf of Chief Oscola Clayton Sylestine and the Alabama-Coushatta Tribe, our appreciation is expressed on your agency's efforts to consult us regarding Iberia Parish Wastewater Treatment Project in Iberia Parish.

Our Tribe maintains ancestral associations within Louisiana despite the absence of written records to completely identify Tribal activities, villages, trails, or grave sites. However, it is our objective to ensure significances of Native American ancestry, especially of the Alabama-Coushatta Tribe, are administered with the utmost attention.

Upon review of the May 27, 2009 information summary submitted to our Tribe, we decline the opportunity to participate in this consultation. The proposed location exists beyond our perimeter of interest for the state of Louisiana. Therefore, no known impacts to religious, cultural, or historical assets of the Alabama-Coushatta Tribe of Texas will occur in conjunction with this proposal.

Should you require additional assistance, please do not hesitate to contact us.

Respectfully submitted,

Bryant J. Celestine
Historic Preservation Officer

Telephone: 936 – 563 – 1181 celestine.bryant@actribe.org Fax: 936 – 563 – 1183

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

HC-61, BOX 21A
CLEWISTON, FL 33440

PHONE: (863) 983-6549
FAX: (863) 902-1117

Jerica Richardson
U.S. Army Corps of Engineers
Planning, Programs, and Project Management Division
Environmental Planning and Compliance Branch
P.O. Box 60267
New Orleans, LA 70160-0267

THPO#: 003577

Wednesday, June 17, 2009

Subject: Assessment of Effects for Iberia Parish Wastewater Treatment Project, Iberia Parish, Louisiana

Dear Ms. Richardson,

The Tribal Historic Preservation Office of the Seminole Tribe of Florida (STOF-THPO) has received your correspondence concerning the aforementioned project. The STOF-THPO concurs with the findings of "no historic properties affected" within the APE for this project. However, the STOF-THPO would like to be informed should any archaeological and/or historic resources be inadvertently discovered during the construction process.

We thank you for the opportunity to review the information that has been sent to date regarding this project. Please reference ***THPO-003577*** for any related issues.

We look forward to working with you in the future.

Sincerely,

FOR

Willard Steele,
Tribal Historic Preservation Officer

Direct routine inquiries to:

Dawn Hutchins,
Compliance Review Supervisor

JLP:dh

Appendix H – Hydrology and Hydraulics

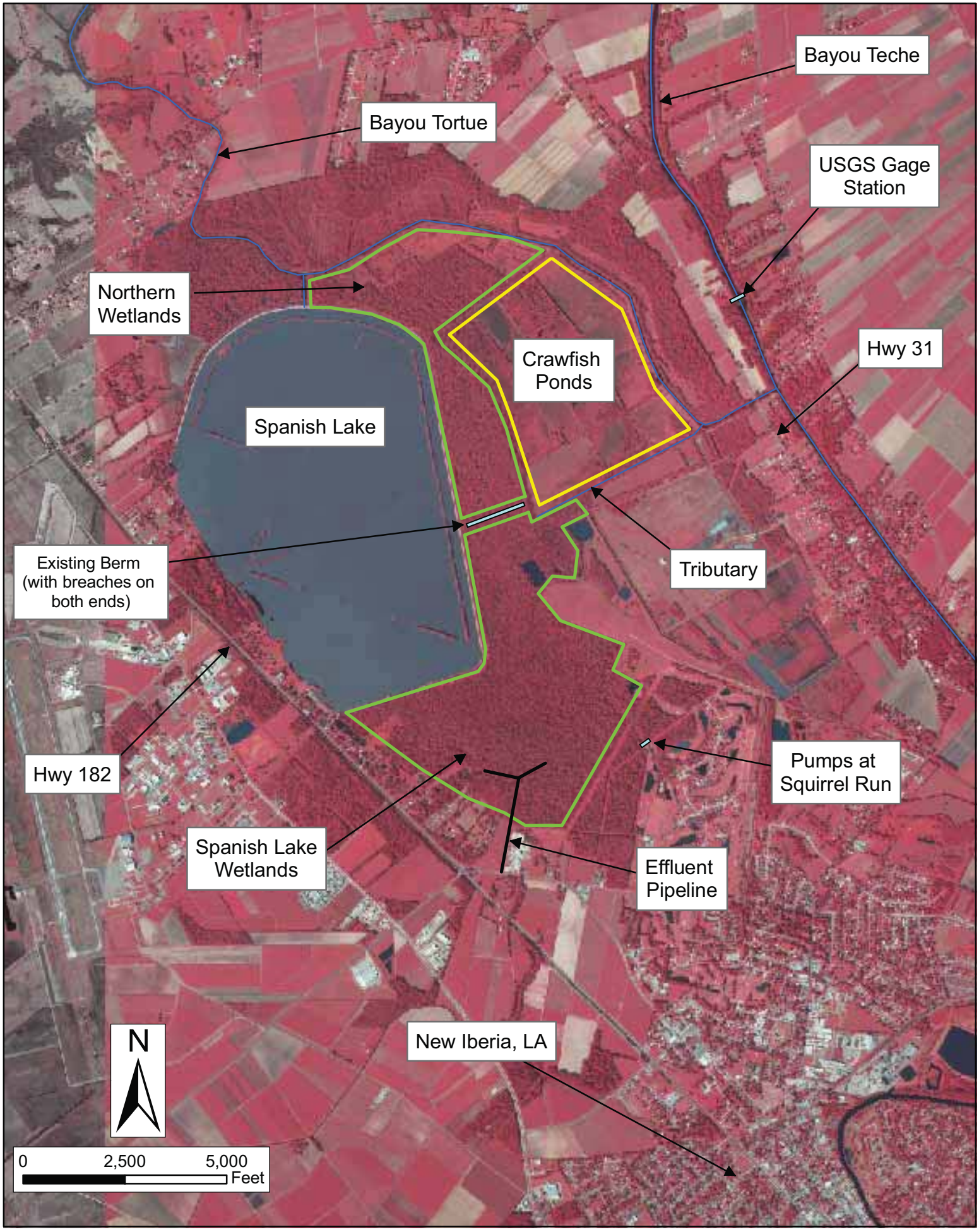


Figure 1. Study Area Overview

Figure 2. Culvert with Flap Gate at Tributary and Bayou Tortue Lower Reach Confluence

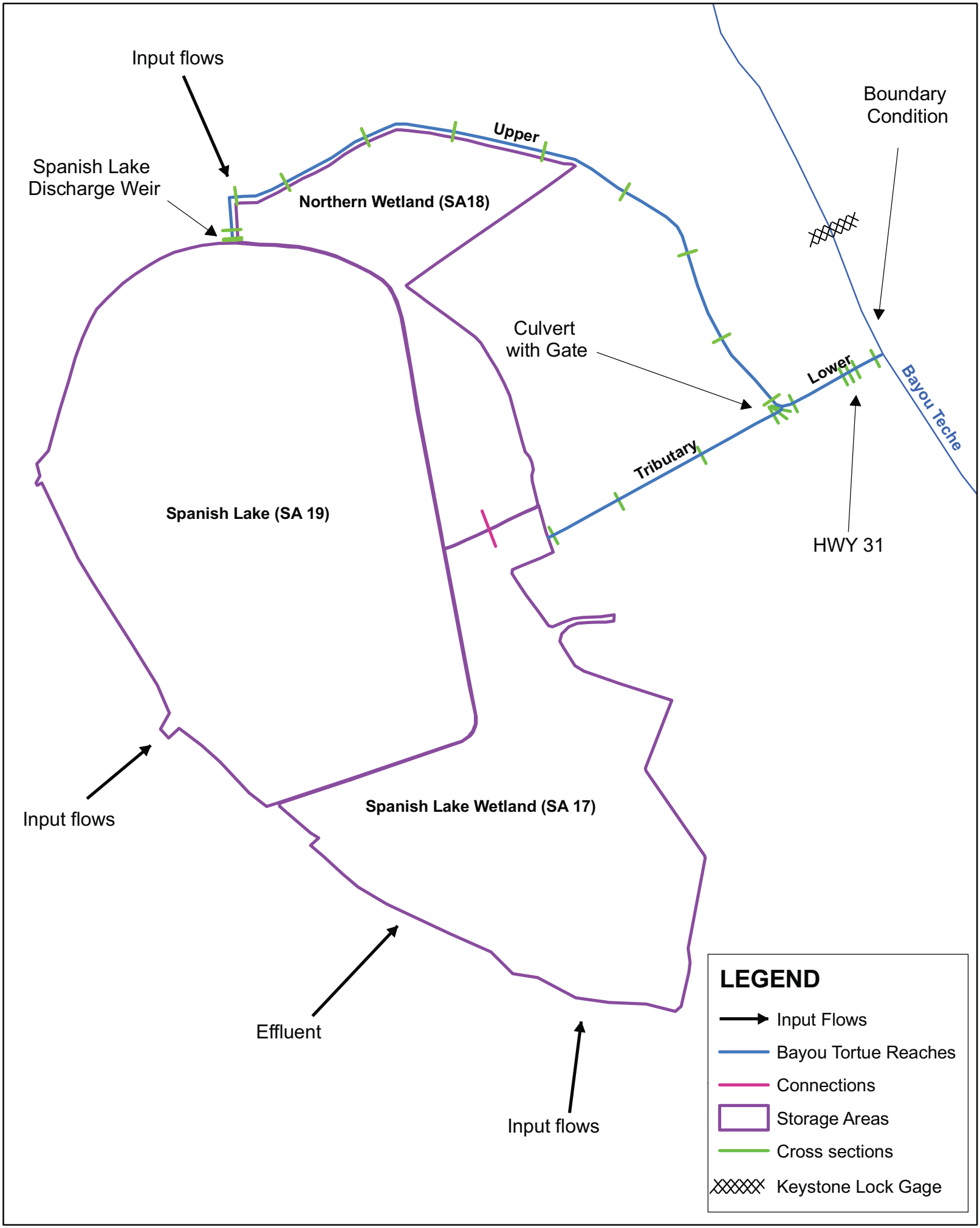


Figure 3. HEC-RAS Model Layout

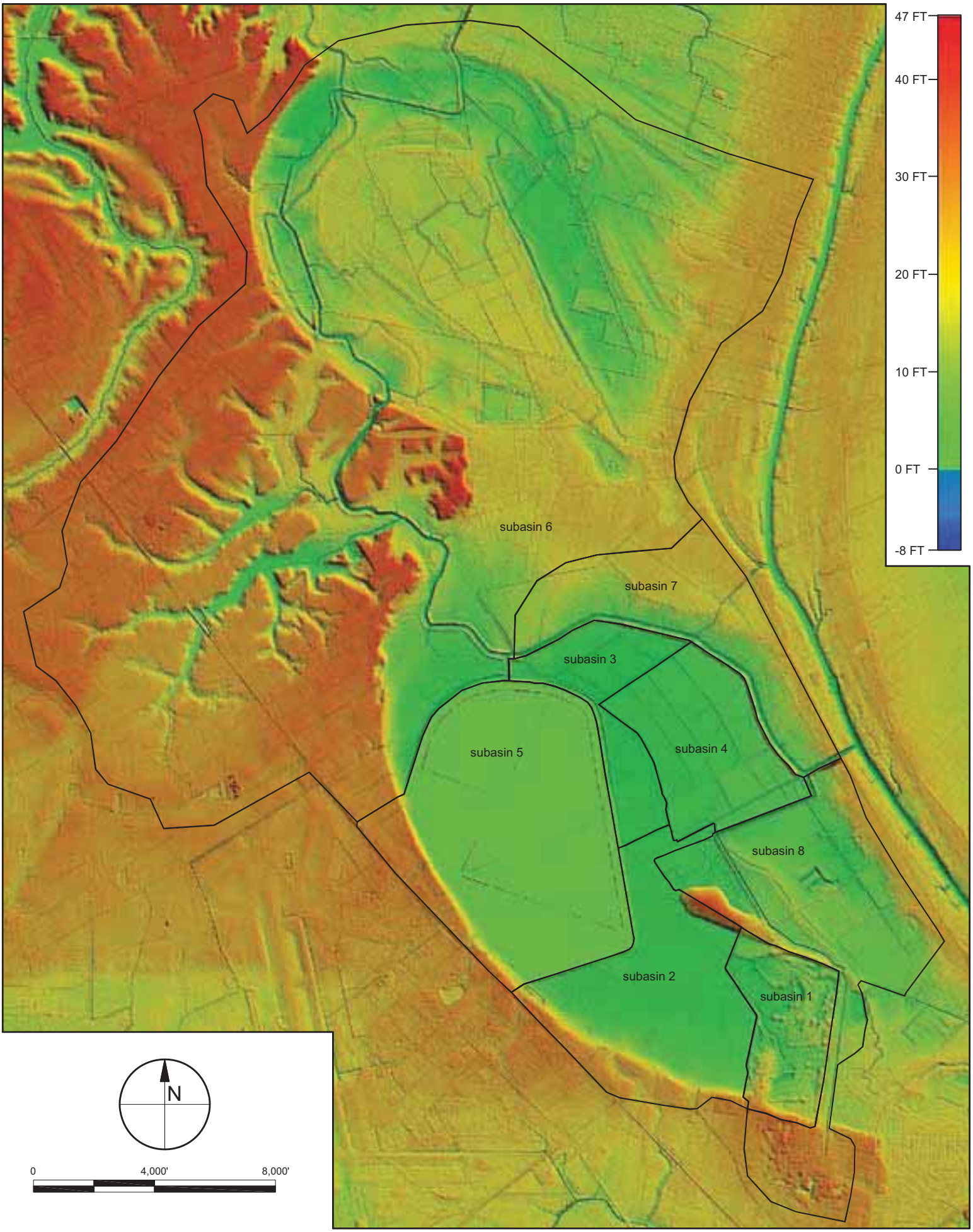


Figure 4. Drainage Sub-basin Boundaries

Figure 5. Inflow Hydrographs for Spanish Lake Wetland

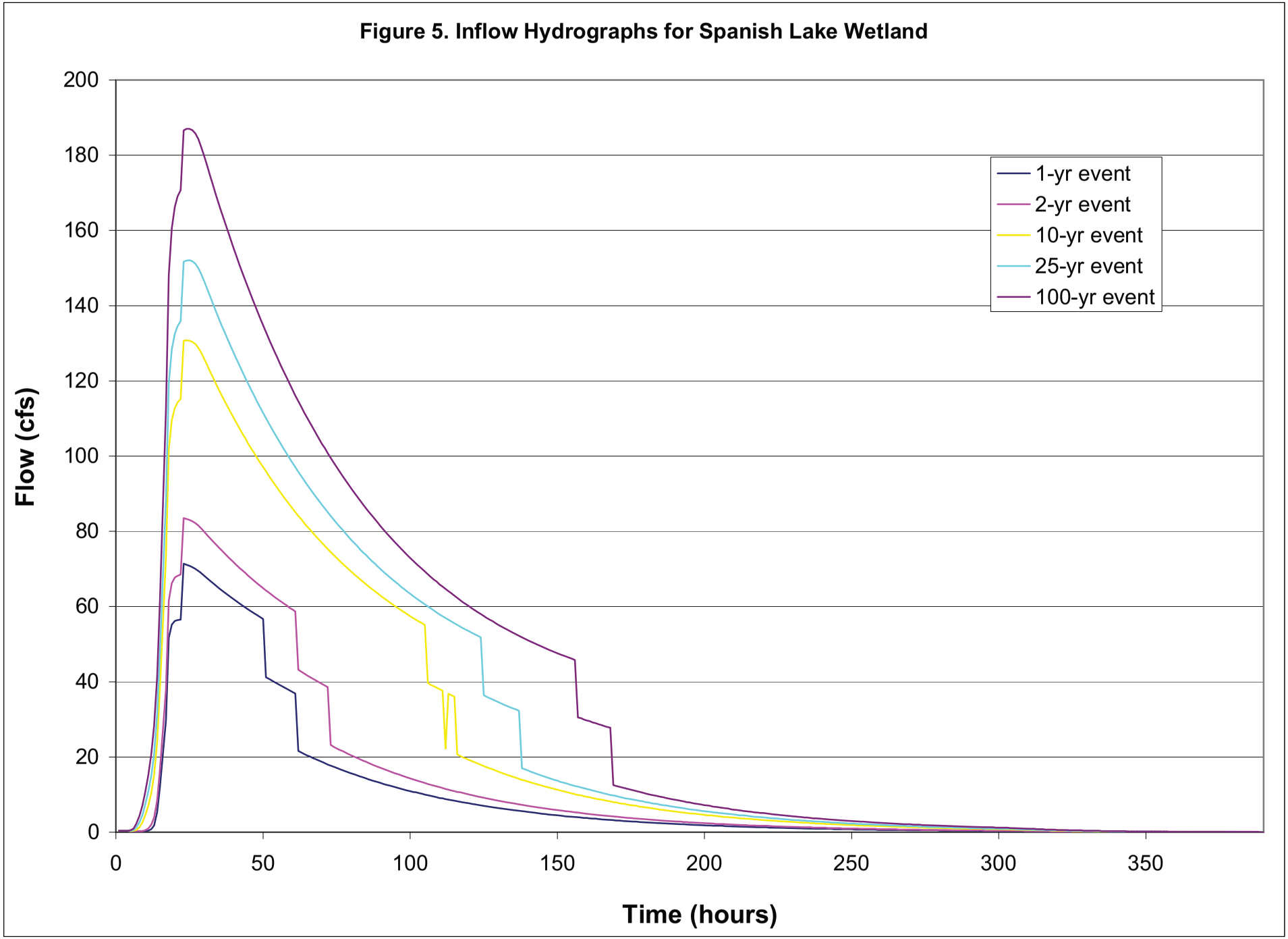


Figure 6. Spanish Lake Wetland Hydroperiod for 1-Year Event with and without Effluent, Dry Season

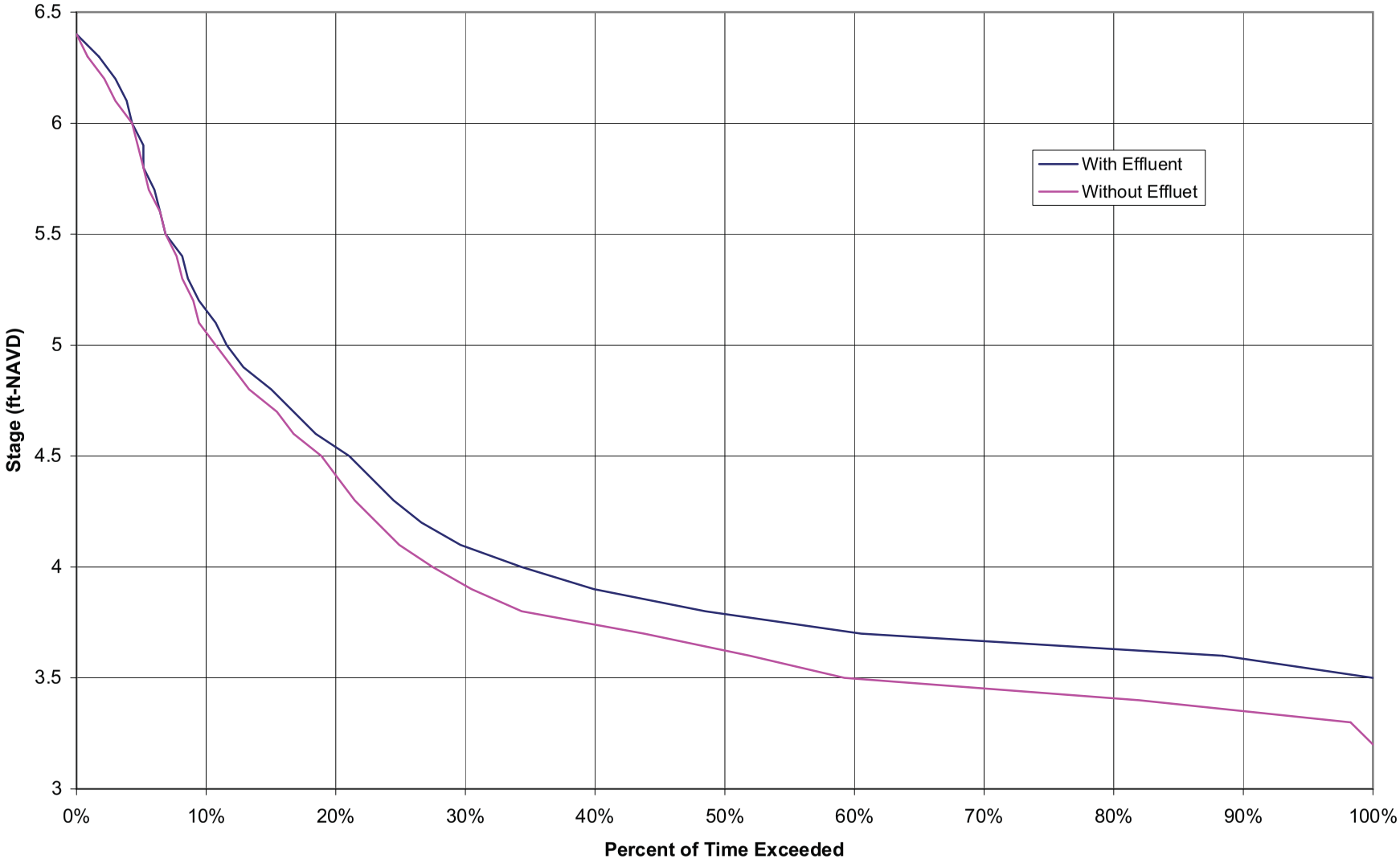


Figure 7. Spanish Lake Wetland Hydroperiod for 1-Year Event with and without Effluent, Wet Season

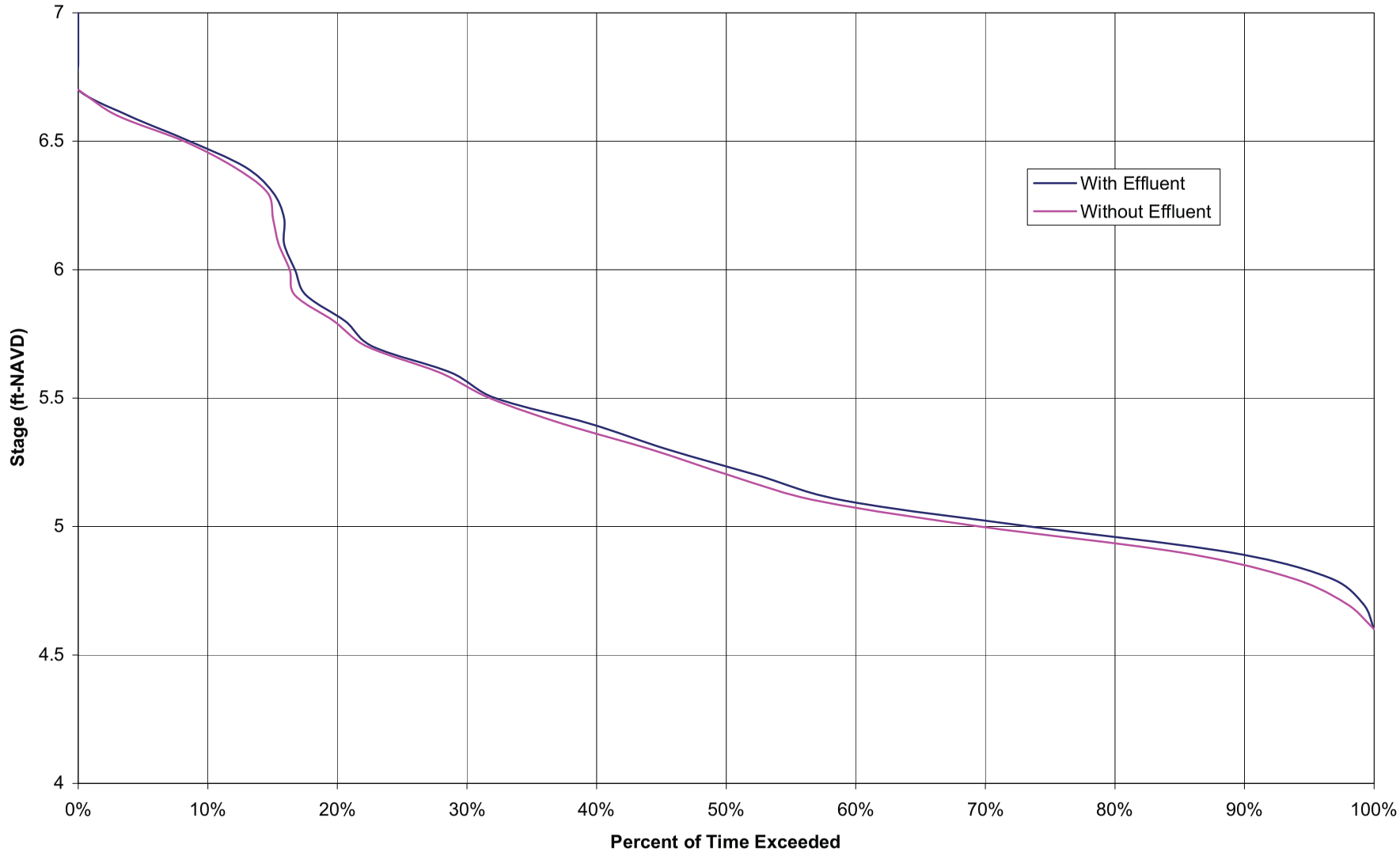


Figure 8. Spanish Lake Wetland Hydroperiod for 25-Year Event with and without Effluent, Dry Season

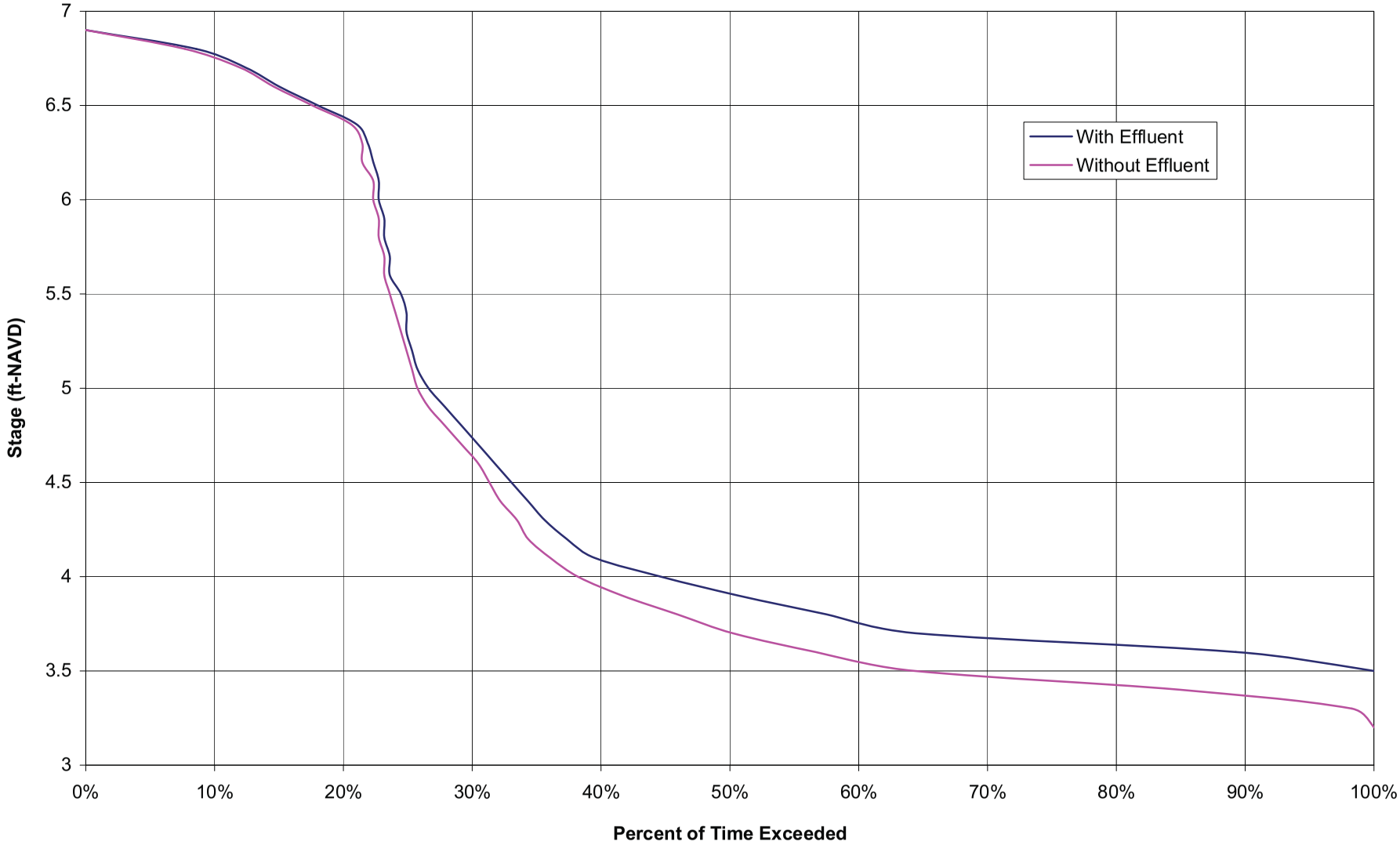


Figure 9. Spanish Lake Wetland Hydroperiod for 25-Year Event with and without Effluent, Wet Season

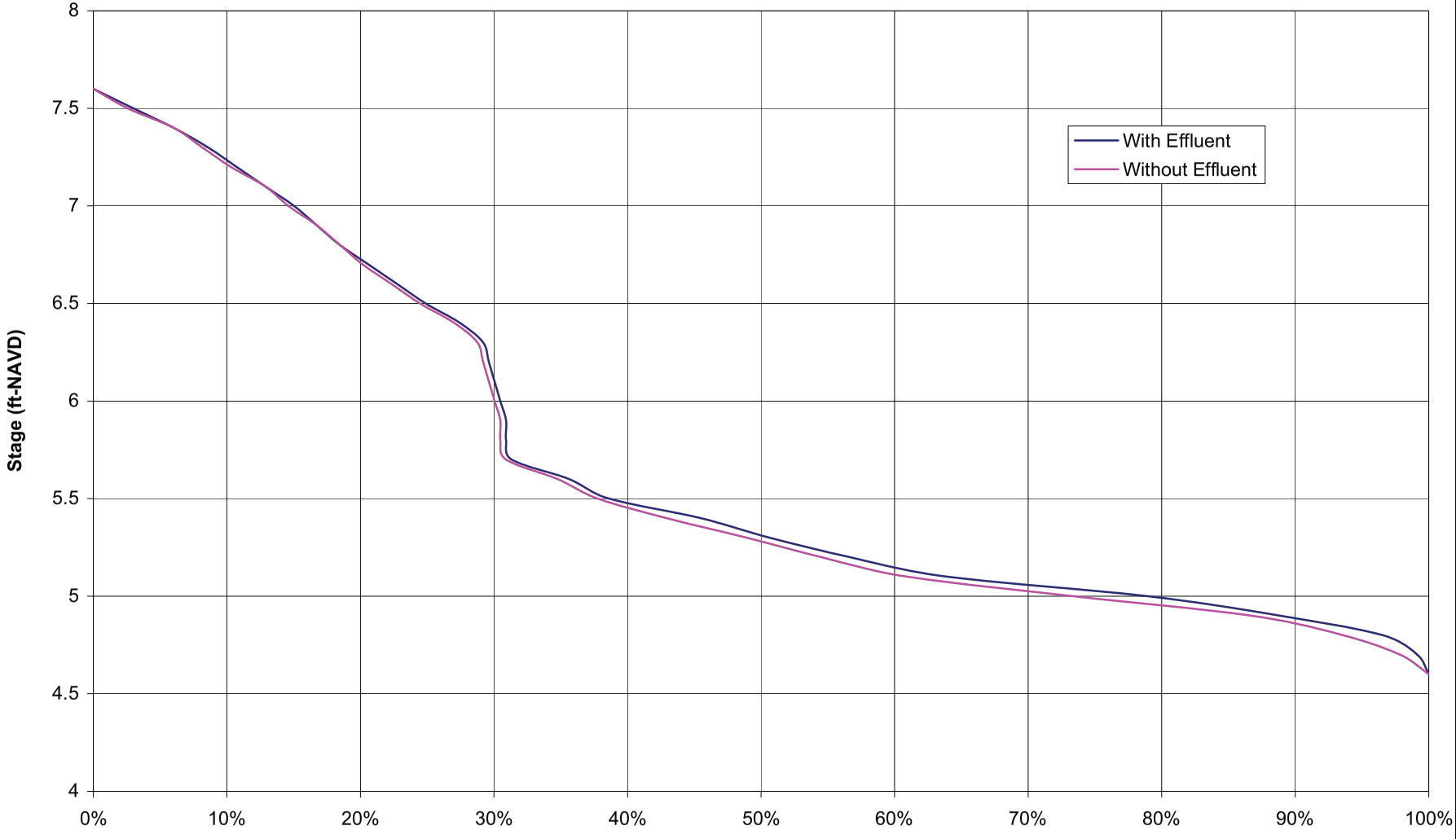


Figure 10. Spanish Lake Wetland Hydroperiod for 100-Year Event with and without Effluent, Dry Season

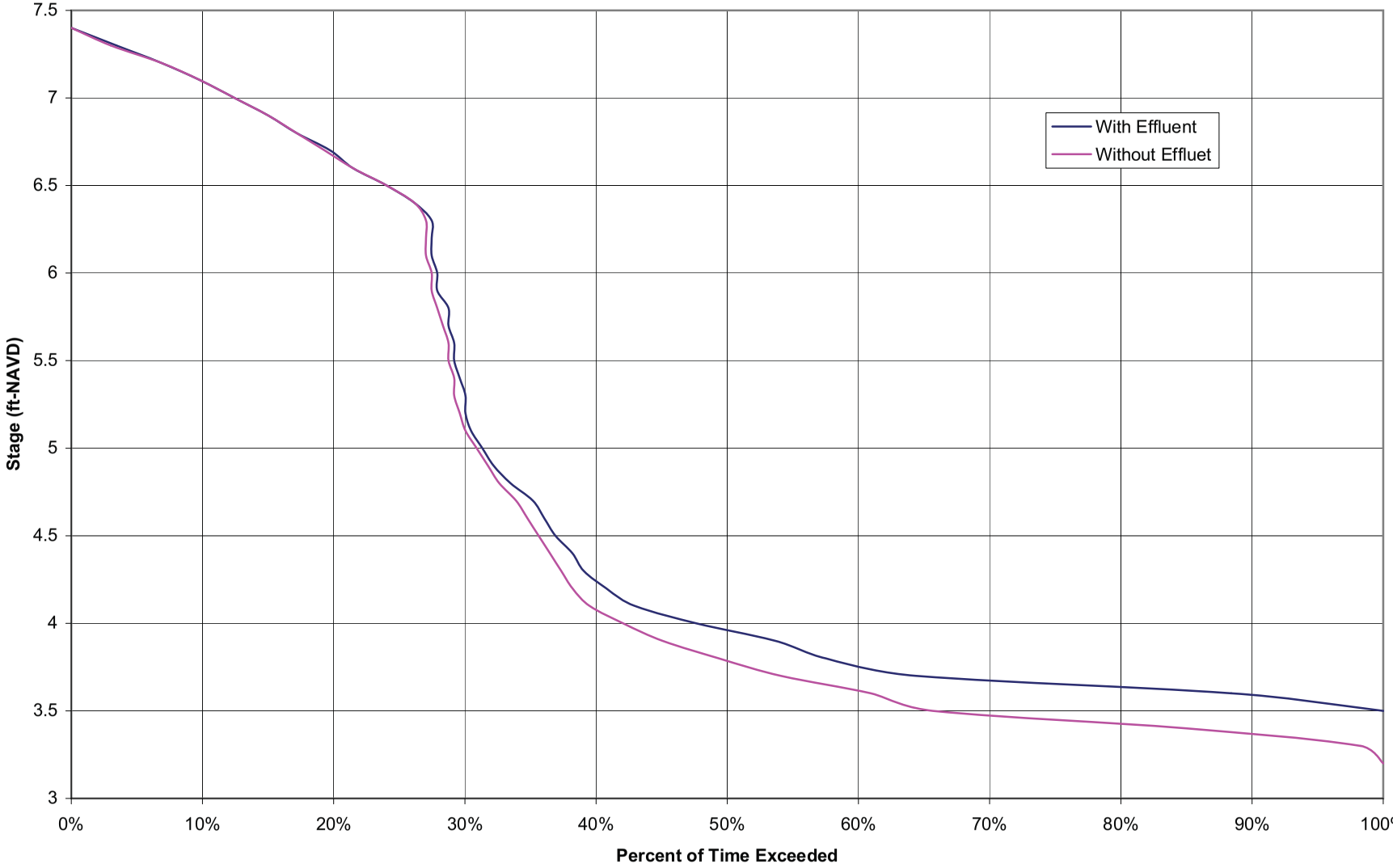


Figure 11. Spanish Lake Wetland Hydroperiod for 100-Year Event with and without Effluent, Wet Season

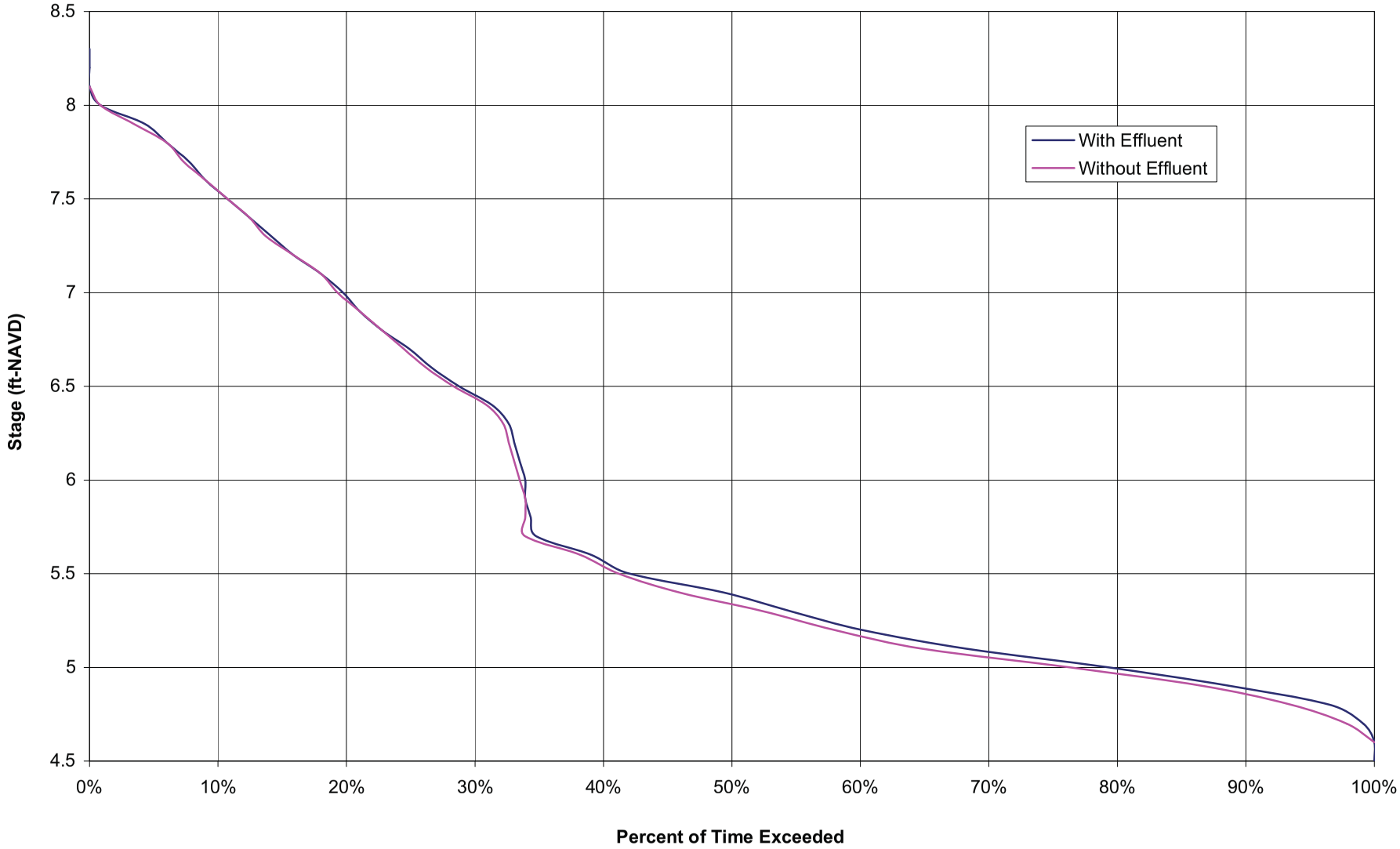


Table 1. Input Parameters for HEC-HMS Model of Spanish Lake Wetland Basins.

SUB BASIN	DA (mi^2)	L (mi)	S (ft/mi)	N	S_o (ft/mi)	D (%)	Ponding (%)	Area (%)	T_c (hr)	R (hr)
1	0.565	1.60	5.0	0.08	5.0	30	0	0	4.69	12.97
2	1.403	1.67	1.7	0.16	1.7	0	0	0	5.38	56.05
3	0.562	1.44	1.8	0.12	1.8	0	0	0	4.25	39.59
4	0.841	1.00	1.0	0.08	2.8	0	100	100	4.93	53.50
5	2.193	1.87	5.0	0.02	5.0	0	0	0	2.15	5.95
6	14.597	6.23	1.0	0.06	7.7	0	50	100	19.70	78.65
7	1.082	0.87	14.8	0.10	14.8	0	30	100	5.50	13.02
8	1.783	1.63	1.4	0.08	15.0	0	75	100	12.94	34.25

Table 2. Peak Stages for Dry Season Scenarios.

Event	SA 17 (Spanish Lake Wetland)		SA 18 (Northern Wetland)		Upper Reach Bayou Tortue (XS 11484)		Tributary to Bayou Tortue (XS 4711)		Lower Reach Bayou Tortue (XS 1802)	
	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent
1-yr	6.31	6.36	5.85	5.86	4.35	4.35	6.31	6.36	4.08	4.08
2-yr	6.39	6.41	6.05	6.05	4.80	4.80	6.39	6.41	4.08	4.08
10-yr	6.67	6.68	6.67	6.68	6.42	6.42	6.67	6.68	4.23	4.23
25-yr	6.89	6.90	6.89	6.90	7.02	7.02	6.89	6.90	4.49	4.49
100-yr	7.31	7.33	7.39	7.39	7.85	7.85	7.31	7.33	4.92	4.92

Table 3. Peak Stages for Wet Season Scenarios.

Event	SA 17 (Spanish Lake Wetland)		SA 18 (Northern Wetland)		Upper Reach Bayou Tortue (XS 11484)		Tributary to Bayou Tortue (XS 4711)		Lower Reach Bayou Tortue (XS 1802)	
	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent	No Effluent	With Effluent
1-yr	6.62	6.62	6.62	6.62	6.58	6.58	6.62	6.63	6.45	6.45
2-yr	6.73	6.74	6.74	6.74	6.73	6.73	6.73	6.74	6.46	6.47
10-yr	7.25	7.25	7.29	7.29	7.49	7.49	7.25	7.25	6.59	6.59
25-yr	7.52	7.53	7.52	7.53	7.86	7.86	7.52	7.53	6.68	6.68
100-yr	8.00	8.00	8.00	8.01	8.45	8.45	8.00	8.01	6.85	6.85

Table 4. Residence Times through SA 17 for Storm Events during Dry and Wet Seasons.

Event	Average Residence Time (hrs)	
	Dry Season	Wet Season
1-yr	14	36
2-yr	19	40
10-yr	29	40
25-yr	29	40
100-yr	31	40

December 9, 2009

Michael McGarry
David Miller & Associates, Inc.
Great Lakes Regional Office
210 Highland Avenue
Hamburg, NY 14075

Re: Final Hydraulic Report, Iberia Parish Wastewater Treatment, Wetland Assimilation Project

Dear Mr. McGarry,

This letter report presents Taylor Engineering's model results and findings for the project referenced above. Our scope of work comprises a general assessment of the effluent discharge hydraulic characteristics through the wetland system, estimates of impacts on dry season, wet season, and flood water levels in the system, and recommendations for potential improvements to the project. We based the findings presented here on limited-detail surveying, reconnaissance, and modeling efforts. We have included all figures and tables at the end of this letter report.

In summary, we found the maximum proposed effluent discharge, 1.5 million gallons per day, may impact water levels in the wetland and, subsequently, flooded surface areas. Model results and calculations indicate the effluent increases water levels particularly during certain dry season scenarios; peak storm water levels in the wetland increase 0.05 feet (ft) during a dry season, 1-year storm event. This water level increase corresponds approximately to a 7-acre increase in flooded area based on the Louisiana State University Atlas LIDAR topographic data (LSU LIDAR). Similarly, during dry periods without rain in late summer (when evapotranspiration rates are high and base flow is low), the effluent can increase ponded water levels in the wetland 0.5 ft, corresponding to a 100-acre increase in ponded area. In other words, during these dry periods, approximately 100 acres of swamp that would have emerged from ponding will remain flooded due to the effluent.

HEC-RAS model simulations of all other storm scenarios (1-year wet season, and 2-, 10-, 25-, and 100-year wet and dry season events) indicate no significant impacts on peak water levels from effluent discharge. Similarly, model results indicate no other significant negative hydraulic impacts downstream of the wetland. Notably, this letter report presents limited-detail HEC-RAS model results for comparative purposes only; we do not recommend using these results to predict actual stages with high accuracy. Nevertheless, the 100-year model stages appear consistent with surveyed high water marks in the project area.

This letter report includes a project background and study area description based on a two-day site visit; details of the model development, execution, and results; and conclusions and recommendations drawn from the site visit and model results.

Background/Study Area

The U.S. Army Corps of Engineers (USACE) New Orleans District and Iberia Parish, the local sponsor, are considering a wetland assimilation project that includes the discharge of up to 1.5 million gallons per day of secondarily treated wastewater to a deteriorated hardwood swamp (Spanish Lake Wetland). The successful project would serve as a cost-effective wastewater treatment alternative as well as a means to improve the health of the wetland.

The wetland, located in south central Louisiana adjacent to Spanish Lake about 3 miles northwest of the City of New Iberia, lies in the Vermillion-Teche basin (Figure 1). The wetland, which serves a small watershed, collects surface water runoff from the south and southwest. It also receives pumped discharge from a residential community, protected by a berm, to the southeast. Isolated from Spanish Lake by a perimeter levee, wetland water generally migrates to the east and north to a berm extending east from the lake levee to a crawfish pond berm. This east-west berm diverts flow to a manmade, poorly maintained ditch that drains to the east into the lower reach of Bayou Tortue through a flap gate (Figure 2). For this report, the manmade ditch will be referred to as "tributary" for clarity and consistency with the HEC-RAS model. Bayou Tortue, the discharge system for Spanish Lake, empties into Bayou Teche. During the reconnaissance, our engineers observed flow from the tributary into Bayou Tortue. This condition suggests the wetland system was draining into the tributary.

The tributary flap gate inhibits backwater from Bayou Teche and Bayou Tortue from entering the wetland system (although extreme high water in Bayou Tortue may overtop the levee and enter the northern wetland). The gate also inhibits discharge from the tributary to Bayou Tortue when water levels in Bayou Teche and Bayou Tortue exceed the gate invert elevation. During storm events when Bayou Teche water levels are high, wetland discharge flows north through the berm (apparently breached in two locations by local landowners) and along the lake levee into the upper reaches of Bayou Tortue (near its connection with the lake). LSU LIDAR indicates the natural sheet flow (without considering the berm and tributary) was likely northerly (between the lake levee and the crawfish pond levee) into Bayou Tortue. Apparently, to enable the natural flow and reduce ponding/flooding in the wetland, local landowners have partially breached the berm near its west and east ends allowing high water to discharge to the north. Given the hydraulic significance of these berm breaches, the HEC-RAS model includes the estimated geometry and invert of the two breaches. A small ditch (Spanish Lake perimeter ditch) parallel with the lake levee further enables northward flow near the berm. The ditch appears poorly defined south of the berm, but becomes more defined and may provide effective conveyance north of the berm.

Not a comprehensive reconnaissance, the site visit comprised only visual observations from the perimeter of the wetland (with a few short excursions into the wetland). Our engineers identified two ditches (the tributary and Spanish Lake perimeter ditch) that could create short-circuiting of flows through and from the system (thus reducing effluent residence time and effluent treatment). However, modifying the project to bypass the northern wetland (that is, the treated effluent discharge point becomes lower Bayou Tortue – through the tributary flap gate – instead of upper Bayou Tortue near the Spanish Lake outlet) would eliminate the short-circuiting issue. The east-west berm would divert the effluent to the tributary, thus eliminating the northern wetland as a treatment mechanism. This modification would result in less effluent treatment time.

Also, ponding (over 1.5 ft deep) observed in the interior of the wetland (Comite Resources, Inc., date unknown) likely contributes to the deterioration of the swamp. A low area (or areas) without a discharge outlet during dry periods likely causes the ponding. In addition, little to no interaction between surface water and groundwater in the wetland (Comite Resources, Inc.) likely further exacerbates ponding.

Applying our understanding of the study area's drainage characteristics, along with available surveys and other available data, we developed and executed hydrologic and hydraulic models as described below.

Hydraulic Model Schematic

This section describes the one-dimensional HEC-RAS 4.0 (USACE, 2008) hydrodynamic model application. HEC-RAS, which can resemble a two-dimensional model, is capable of simulating off-channel storage, overbank storage areas, and a complex network of multiple open channels. In its dynamic mode, the HEC-RAS computational method first applies backwater computations (given initial stream flows) to establish initial water surface elevations. The computational method then applies the time-dependent mass and momentum conservation equations to compute unsteady flows and water surface elevations along river reaches. In addition, the model user must provide the hydraulic conditions at the upstream model boundary in the form of a hydrograph and the downstream boundary condition in the form of hydrograph, rating curve, or a constant energy line slope (normal depth condition). Given the initial water surface elevations and the boundary hydraulic conditions, HEC-RAS employs finite difference approximation to compute the flows and water surface elevations inside the model domain.

To apply the HEC-RAS model to a particular area, the user maps the channel network, overbanks, and wetlands into the model's input format — a series of storage areas and channel cross sections at specified distances along each defined conveyance reach that represents the actual study area conditions. The hydraulic model analyzes two scenarios — existing conditions (without effluent) and proposed conditions (with effluent). Figure 3 illustrates the basic model layout. The blue lines represent channel reaches, and green lines represent the channel cross sections. The model includes three storage areas — SA 17 (Spanish Lake wetland), SA 18 (northern wetland), and SA 19 (Spanish Lake) — and three primary channel reaches. Two reaches — Upper and Lower — represent Bayou Tortue. The manmade ditch that drains SA 17 into the Lower reach of Bayou Tortue through the flap gate is labeled Tributary. In the absence of readily available survey data for Bayou Tortue, Highway 31, and the Spanish Lake outlet weir, we estimated channel depths and side slopes as well as structure dimensions and elevations. LSU LIDAR provided the elevation data for HEC-RAS model cross sections and stage-storage relationships. For the tributary, we superimposed survey data, provided by Iberia Parish, on the LSU LIDAR cross sections for more accurate channel geometry.

The upstream and downstream boundary conditions described below drive water surface elevations within the model.

Boundary Conditions

Hydrologic Analyses/Inflows

We used the HEC-HMS Version 3.4 (USACE, 2009) to conduct hydrologic analyses to determine the upstream rainfall runoff boundary conditions for the HEC-RAS hydraulic model applications (1-, 2-, 10-, 25-, and 100-year rainfall storm events during wet and dry periods). These upstream model boundary conditions include inflows for the Spanish Lake wetland, Spanish Lake, and the Upper reach of Bayou Tortue. Details of the hydrologic model development follow.

LSU LIDAR provided the means to determine the sub-basin drainage areas serving the Spanish Lake wetland system (including Spanish Lake and the Northern Wetland) and Bayou Tortue. Figure 4 illustrates the drainage sub-basin boundaries.

Data from the U.S. Weather Bureau Technical Paper No. 40 (1961) and National Weather Service HYDRO-35 provided the means to develop hypothetical storms (intensity, duration, and frequency). The rainfall hyetograph follows the standard USACE temporal rainfall distribution.

We used the Clark Unit Hydrograph Method within HEC-HMS to produce hydrographs and the Espey Huston Formula (below) to calculate input parameters T_c and R.

$$T_c + R = 130 \frac{\left(\frac{L}{\sqrt{S}}\right)^{0.57} * N^{0.8}}{S_o^{0.11} * 10^I}$$

$$\frac{T_c}{T_c + R} = 0.38 * Log_{10} S_o$$

where: T_c = Clark's time of concentration (in hours)
R = Clark's storage coefficient (in hours)
L = length of the longest watercourse within a subarea (in miles)
S = average slope of longest watercourse in middle 75 percent (in ft/mi)
N = Manning's weighted roughness coefficient along the longest watercourse
S_o = average basin slope of land draining into the longest watercourse (in ft/mi)
I = effective imperviousness ratio (= .0035D)
D = percent urban development

The sub-basin parameters listed in Table 1 are used as input in the Espey Huston Formula to calculate unit hydrograph parameters T_c and R. We used LSU LIDAR to calculate slopes; field observations, Arcement (1989), and Chow (1959) to determine the Manning's N values; and the initial and constant loss rate function to estimate infiltration losses.

Figure 5 shows the runoff hydrographs (sub-basin 2) for the 1-, 2-, 10-, 25-, and 100-year rainfall events (without effluent) flowing into the Spanish Lake wetland. These hydrographs include an estimate of the pumping discharge from the Squirrel Run Golf Club residential community southeast of the wetland.

Tailwater Conditions

In addition to the upstream rainfall runoff boundary conditions, HEC-RAS requires defined downstream boundary conditions – typically water surface elevations. For this study, U.S. Geological Survey (USGS) stage gage data in Bayou Teche provided water surface elevations for use as downstream boundary conditions in HEC-RAS. The USGS Keystone Lock gage (Station 07385702) is located downstream of the lock, 0.4 mile upstream of the tributary's confluence with Bayou Teche. The gage supplied typical wet season and dry season water levels in Bayou Teche. For the boundary conditions, dry season water levels ranged from 3.3 to 4.1 ft, NAVD. Wet season water levels ranged from 4.6 to 6.4 ft, NAVD. Notably, high, wet season water levels in Bayou Teche can significantly affect the discharge from Bayou Tortue and the wetland.

Storm Event Model Results

Peak Stage

Through 20 HEC-RAS model simulations, we predicted water levels throughout the model domain for the 1-, 2-, 10-, 25-, and 100-year rainfall events, with and without effluent discharge, for typical wet and dry seasons. Tables 2 and 3 summarize the peak stages with and without effluent at five locations within the model during dry and wet seasons. The results indicate the effluent has more effect, albeit small, on peak stages during less intense (but more frequent) events during dry seasons when stages and baseflow are lower than wet season conditions. The maximum increase in peak wetland stage (0.05 ft) occurs in the Spanish Lake wetland for the 1-year, dry season event. In the wetland, this stage increase approximately corresponds to a 7-acre increase in flooded wetland area according to stage-area relationships determined from LSU LIDAR. For the 100-year dry season event, the stage increase in the wetland equals only 0.01 ft. Peak stage increases during wet season events are all insignificant.

Hydroperiod

To evaluate wet and dry season storm event hydroperiods, we developed percent exceedance plots from the storm event model results. Figures 6 – 11 depict the percent of time various stages are exceeded during the 1-, 25-, and 100-year storm events for dry and wet seasons. Each figure also shows the effect of the 1.5 million gallons per day of effluent discharge during the storm event. Similar to the effect of the effluent discharge on peak stage, the effect of effluent discharge on hydroperiod is more pronounced during the dry season. The effluent discharge increases the percent of time the wetland experiences its typical stages (5 – 6 ft NAVD) by about 1 – 2 percent (dry and wet seasons). During dry periods, the effluent discharge considerably increases the percent of time the wetland experiences its lower stages. For example, a stage of 4 ft NAVD is exceeded about 7 percent longer with the effluent. However, sensitivity analyses (designed to examine the influence of assumed wetland outlet ground elevations) suggest that the impacts of the effluent during low stages (below 5 ft NAVD) shown in the figures are somewhat conservative (possibly overestimated). With higher outlet ground elevations, impacts of the effluent remain around 1 – 2 percent for lower stages. The sensitivity analyses revealed assumed outlet elevations have very little effect on model results for high/peak stages.

Residence Times

Model results for the 10 storm scenarios provided the means to estimate residence times for flow through the Spanish Lake wetland (Table 4).

Without-Storm Scenarios

We also considered hydraulic effects of the effluent during longer-term periods without significant storm activity. We based this limited analysis on readily available data such as average rainfall and potential evapotranspiration data provided in the Comite Resources report, LSU LIDAR, and our understanding of the wetland's hydrology and hydraulics. This analysis did not include long-term continuous simulation modeling, which would consider evapotranspiration, lateral groundwater movement, and other processes. Such detailed modeling falls beyond the scope of this study.

We considered two scenarios — long-term average conditions and dry periods without rainfall.

According to the Comite Resources report, average annual rainfall exceeds potential evapotranspiration rates. This condition, along with the understanding that little surface water is lost to groundwater recharge in the wetland, suggests that the effluent will typically move through the wetland and discharge to the tributary (and Bayou Tortue) without long periods of stagnation.

However, we also considered the scenario of an extended period without rain during late summer months when potential evapotranspiration rates are high. During a dry period exceeding one month without rain and with little to no base flow entering the wetland (a reasonable condition given the small drainage area), high evapotranspiration can lower water levels 0.5 ft (assuming 7 inches/month evapotranspiration). During the same period, the maximum proposed effluent discharge (1.5 million gallons per day) can increase water levels in the wetland 0.5 ft . Stage-area relationships indicate this 0.5 ft change corresponds to 100 acres in ponded area. In other words, during these dry periods, approximately 100 acres of swamp that would have emerged from ponding will remain flooded due to the effluent discharge. Note we have not performed a statistical analysis on rainfall to estimate the frequency of these dry periods.

Conclusions and Recommendations

The results of the limited detail study described above indicate the proposed Spanish Lake Wetland Assimilation Project will likely provide, on a long-term average basis, a positive discharge that conveys wastewater effluent through the wetland system without significantly increasing peak water levels during storm events. Some significant increases in daily water levels during low flow/dry scenarios can be expected.

While sufficient topographic detail is not available to draw certain conclusions about water stagnation, the effluent could feasibly drain northerly through the wetland to the berm and tributary (to Bayou Tortue), particularly on a long-term average basis. Nevertheless, isolated pockets of ponding may form at times. The introduction of effluent may even reduce stagnant areas; nevertheless, if these pockets become undesirable, terrain modifications such as construction of vegetated flow ways may become necessary. Carefully designed to avoid wetland overdraining, flow ways can help convey water through the system and avoid stagnation. Shallow, vegetated flow ways could provide nutrient uptake and inhibit fast water movement (short-circuiting). However, without more detailed topographic information, we do not recommend flow ways at this time. We highly recommend sufficient monitoring of the project to identify the need for flow ways.

Based on this limited study, we recommend some modifications to the project. These modifications include 1) if flow to the northern wetland is undesirable, plugging the breaches in the east-west berm, and clearing/improving the tributary to Bayou Tortue; or 2) if flow to the northern wetland is desirable, removing the berm, possibly lowering the natural grade somewhat to facilitate water movement to the north (i.e., a small flow way), and constructing a berm between the wetland and the tributary to inhibit short-circuited flow to the tributary.

Modification 1 – No flow to the northern wetland/all flow directed to the tributary.

The berm connecting Spanish Lake to the crawfish ponds currently impedes discharge from the Spanish Lake wetland to the northern wetland. However, breaches in the berm allow high water to enter the northern wetland. Plugging the breaches would prevent northerly water movement during high flows. All

flow would then discharge through the tributary to the lower Bayou Tortue. Field investigations revealed large amounts of debris within the tributary. Supplied survey data from Iberia Parish also indicate

shoaling in the channel near the middle of its length, further restricting channel conveyance. Giving the tributary a uniform channel cross section and slope would improve flow to Bayou Tortue and promote positive drainage through and from the Spanish Lake wetland. Channel and flap gate improvements may also be necessary to ensure the tributary can convey the additional storm flows (redirected from the northern wetland by filling the east-west berm breaches) without causing overtopping of adjacent berms.

Modification 2 – No flow to the tributary/all flow directed to the northern wetland.

Removal of the east-west berm would allow discharge to the northern wetland. Construction of a short flow way to facilitate water movement to the northern wetland (i.e., connect low areas on each side of the berm) may prove necessary. More detailed survey data near the berm would confirm the need for the flow way.

The perimeter ditch than runs parallel to the Spanish Lake berm may require plugging to prevent short-circuiting of effluent flow through the northern wetland. In lieu of filling the ditch completely, discrete plugs (at an undetermined distance apart) should limit short-circuiting, provide a longer residence time, and allow for proper treatment of effluent through the wetland. Ideally, material from the removed berm could supply the fill to plug the ditch.

Construction of a berm or structure at the upstream end of the tributary channel would prevent flow from the wetland to the tributary. Properly designed, the structure could allow intense storm flows to discharge into the tributary and direct daily effluent discharge to the northern wetland. Hydraulic design of such a structure should avoid negative impacts to storm flooding upstream.

All recommendations are conceptual only. Final design will require a more comprehensive site survey, as well as alternative modeling and calculations.

Appendices to this letter report provide supporting documentation. Appendix A provides surveys from Iberia Parish. Appendix B provides HEC-HMS model input and output files. Appendix C provides HEC-RAS model input and output files.

Please call if you have any questions or comments. We greatly appreciate this opportunity to provide our services to you and the USACE New Orleans District.

Sincerely,

Terrence J. Hull, P.E.
President

REFERENCES

Arcement, G.J. and Schneider, V.R. 1989. "Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains". *Water Supply Paper 2339*. U.S. Geological Survey.

Chow, V.T. 1959, Open-channel Hydraulics. McGraw-Hill Book Co., New York, NY.

Comite Resources, Inc. "Iberia Parish Wetland Wastewater Assimilation Preliminary Assessment (Pre-UAA)". Zachary, LA.

Louisiana State University. Atlas: The Louisiana Statewide GIS. http://atlas.lsu.edu/

U.S. Army Corps of Engineers. March 2008. Hydrologic Engineering Centers River Analysis System (HEC- RAS), version 4.0.0. Davis, CA.

U.S. Army Corps of Engineers. August 2009. Hydrologic Engineering Centers Hydrologic Modeling System (HEC- HMS), version 3.4. Davis, CA.

Weather Bureau, U.S. Department of Commerce. May 1961. "Rainfall Frequency Atlas of the United States". Washington D.C.

Appendix I - Use Attainability Analysis

Iberia Parish Wetland Assimilation

Use Attainability Analysis (UAA)

John W. Day, Ph.D., Robert R. Lane, Ph.D., Joel Lindsey, Jason Day
Comite Resources, Inc., 11643 Pride Port Hudson Rd., Zachary, LA 70791
(p) 225-654-8847 (e) lindseyj@bellsouth.net

Executive Summary

A Use Attainability Analysis (UAA) was begun August 2006 to determine the suitability of the Spanish Lake wetland in Iberia Parish Louisiana for the assimilation of municipal effluent. Iberia Parish's wastewater treatment facilities will be the source of the effluent, with a total combined volume of 0.5 million gallons per day (MGD), and expected 1.5 MGD in the foreseeable future. This treated effluent will be discharged into the Spanish Lake wetland, located several miles north of New Iberia, Louisiana. The Spanish Lake wetland is in poor ecological condition due to past human activities, especially logging and impoundment. Changes in hydrology and addition of municipal effluent will help restore this wetland by increasing vegetative productivity, which helps offset regional subsidence by increasing organic matter deposition on the wetland surface. These ecological benefits to the wetland will be in addition to providing the Parish with an economical means to meet more stringent water quality standards in the future.

This study includes water chemistry analysis, hydrology, sediment characterization, vegetation composition, and primary productivity analysis in the Spanish Lake wetland. Four 10 x 100m plots were established, all trees within the plots were tagged, and the diameter measured during the winters of 2007 and 2008. Six leaf litter collection boxes were installed at each plot, and leaf litter was collected periodically during the study. In addition, on-site measurements of pH, temperature, dissolved oxygen, salinity, and conductivity were also recorded at all sites when leaf litter was collected. Water quality samples were taken quarterly and brought to the laboratory for nutrient and sediment analysis.

Nutrient loading rate analysis indicates that the Spanish Lake wetland will assimilate 65-99% of nitrogen and phosphorus discharged from Iberia Parish's treatment facilities. It is also expected that the productivity of the wetland will be enhanced. The overall results of this study indicate that the use of the Spanish Lake wetland for wastewater assimilation will be a long-term solution for treatment of effluent from the Iberia Parish's wastewater treatment facilities.

1.0 INTRODUCTION

Iberia Parish is evaluating the feasibility of discharging secondarily treated municipal effluent into the Spanish Lake wetland for nutrient assimilation prior to discharge to local water bodies. This Use Attainability Analysis (UAA) or (Ecological Base Line Study (EBL)) study was carried out to 1) determine the suitability of the Spanish Lake wetland for effluent assimilation, and 2) evaluate the potential impacts of effluent discharge to this wetland. Environmental data were collected and analyzed for base line data on vegetation dynamics, water and soil chemistry, and hydrology. This data, along with data provided by Iberia Parish and from scientific literature sources, was used in this UAA. This UAA on the feasibility of using the Spanish Lake wetland for tertiary treatment of wastewater from Iberia's wastewater treatment facility benefits from completed UAA's of similar systems at Thibodaux, Breaux Bridge, St. Bernard, Mandeville, Hammond, St. Martinville, Broussard, Amelia, and Luling, Louisiana, as well as the scientific literature in general. Much of the experimental design presented in this document is based on the success of these past studies (Day et al. 1999; 2004).

1.1 Description of area

Iberia Parish is funding an investigation of the feasibility of discharging secondarily treated effluent from the Parish's wastewater treatment facility into the Spanish Lake wetland. Iberia Parish is located in south central Louisiana west of the Atchafalaya Basin, 106 miles west of New Orleans, and 50 miles south west of Baton Rouge (Figure 1).

The Spanish Lake wetland is located approximately three miles northwest of New Iberia (Figure 2), Louisiana, on the western edge of the Mississippi floodplain between the Pleistocene Terrace and the natural levee of Bayou Teche. It consists primarily of forested wetland in poor condition. The area surrounding what is now Spanish Lake was a bottomland that was submerged for most of the year called 'Lake Tasse' on old maps. By virtue of Statehood, Louisiana laid claim to the lake bottom of Lake Tasse. In the early to mid 1900's the original levee was constructed that impounded what is now known as Spanish Lake. During the same period, the region was logged for Cypress and

other commercially valuable species. In early 1990's the lake was drained to construct several break water levees across the lake and to rehabilitate the main levee. A few years later, a new water control structure was constructed at the mouth of the drainage canal for the region, located at the northeast corner of the lake.

Figure 1. Location of the Spanish Lake wetland in south central Louisiana.

The wetland is bordered to the north by Spanish Lake, to the east by crawfish ponds and a municipal landfill, and to the south and west by uplands. There are four main forest communities in the area: dry and semi-flooded bottomland hardwood forest; wet bottomland hardwood forest; well-drained bottomland hardwood forest; and severely degraded waterlogged swamp. The primary vegetation currently consists of Red Maple (*Acer rubrum*), Chinese Tallow (*Sapium sebiferum*), Willow (*Salix nigra*), Water Oak (*Quercus nigra*), and Hackberry (*Celtis occidentalis*).

Figure 2. Location of the Spanish Lake wetland relative to New Iberia, 3 miles to the southeast.

Iberia Parish is considering constructing a pipeline distribution system to discharge secondarily treated effluent into the wetland adjacent to Spanish Lake. Effluent will be distributed evenly along the southern edge of the receiving wetland, and the natural hydrological gradient of the basin will direct flow northward (Figure 3). There is a low levee currently restricting flow out of the wetland that will have to be removed prior to effluent application (Figure 3). Removal of this levee will be advantageous by not only draining effluent water out of the basin, but by also relieving wetland vegetation from chronic inundation which has caused much of the current degraded state. The drainage canal for Spanish Lake and the surrounding region is located at the northeast corner of the lake (Figure 3).

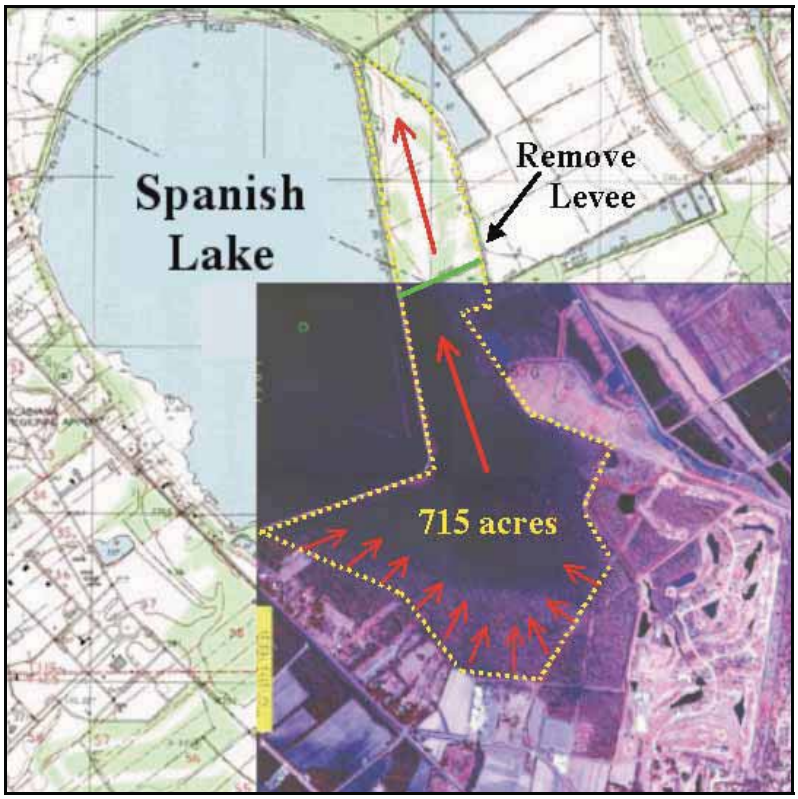


Figure 3. Location of effluent delivery (small red arrows) and flow path (long red arrows) at the Spanish Lake wetland.

1.2 Wetland assimilation of treated domestic wastewater

Wetlands have been used to treat wastewater for centuries, but only in the past several decades has the response to such use been scientifically analyzed in a comprehensive way (Richardson & Davis 1987). The ability of wetlands to perform certain water purification functions has been well established for natural watersheds (Conner et al. 1989; Kadlec and Alvord 1989; Kemp et al. 1985; Khalid et al. 1981 a &b; Knight et al. 1987; Nichols 1983; Richardson & Davis 1987; Richardson & Nichols 1985; U.S. EPA 1987, Kadlec and Knight 1996, Faulkner and Richardson). Studies in the southeastern United States have shown that wetlands chemically, physically, and biologically remove pollutants, sediments and nutrients from water flowing through them (Wharton 1970; Shih and Hallett 1974; Kitchens et al. 1975; Boyt 1976; Nessel 1978; Yarbro 1979; Nessel and Bayley 1984; Yarbro et al. 1982; Tuschall et al. 1981; Kuenzler 1987). Nitrogen, in particular, undergoes numerous chemical transformations in the wetland environment

(Figure 4). Some questions remain as to the ability of wetlands to serve as long-term storage nutrient reservoirs, but there are cypress systems in Florida that continue to remove major amounts of sewage nutrients even after 20-45 years (Boyt et al. 1977; Ewel & Bayley 1978; Lemlich & Ewel 1984; Nessel & Bayley 1984). Recently, Hesse et al. (1998) showed that cypress trees at the Breaux Bridge wastewater treatment wetlands, which have received wastewater effluent for 50 years, had a higher growth rate than nearby trees not receiving effluent.

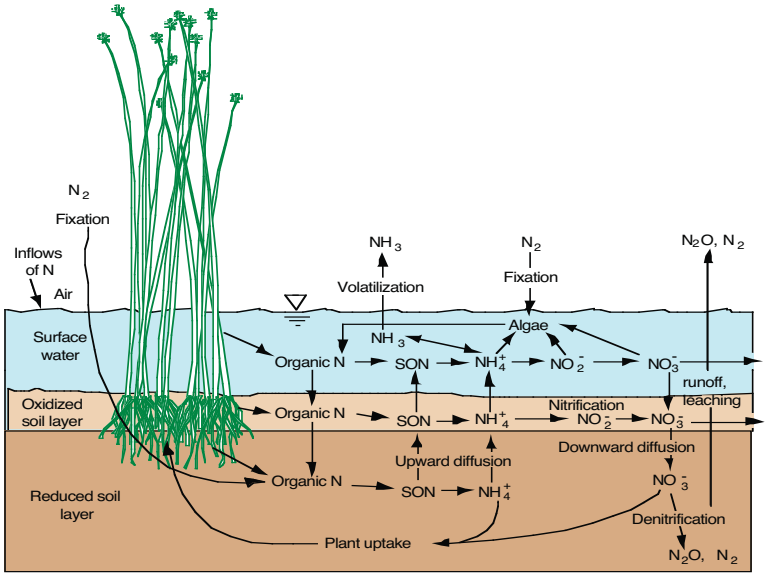


Figure 4. Chemical transformations of nitrogen in wetlands.

From an ecological perspective, interest in wetlands to assimilate effluent is based on a belief that the free energies of the natural system are both capable of and efficient at driving the cycle of production, use, degradation, and reuse (Odum 1978). The basic principle underlying wetland wastewater assimilation is that the rate of application must balance the rate of decay or immobilization. The primary mechanisms by which this balance is achieved are physical settling and filtration, chemical precipitation and adsorption, and biological metabolic processes resulting in eventual burial, storage in vegetation, and denitrification (Patrick 1990; Kadlec & Alvord 1989; Conner et al. 1989). Nitrogen and phosphorus from wastewater can be removed by short-term processes such

as plant uptake, long-term processes such as peat and sediment accumulation, and permanently by denitrification (Hemond and Benoit 1988).

Wetlands with long water residence times are best suited for BOD reduction and bacteria dieback. Many pathogenic microorganisms in sewage effluent cannot survive for long periods outside of their host organisms, and root excretions from some wetland plants can kill pathogenic bacteria (Hemond and Benoit 1988). Protozoa present in shallow waters actively feed on bacteria. The presence of vegetation can also improve the BOD purifying capacity of a wetland by trapping particulate organic matter and providing sites of attachment for decomposing bacteria.

The purpose of the Louisiana Water Control Law and Federal Clean Water Act is to protect or enhance the quality of public water, including wetlands. Three components of the water quality standards adopted by Louisiana and approved by the EPA are: 1) beneficial water uses such as propagation of fish and wildlife, 2) criteria to protect these beneficial uses, and 3) an antidegradation policy which limits the lowering of water quality. In Louisiana, discharging treated effluent into wetlands can allow for the potential enhancement and restoration of the functional attributes associated with wetlands such as groundwater re-charge, flood control, and biological productivity (Kadlec and Knight 1996; Rybczyk et al. 1996; Day et al. 1999, 2004). Specifically, most coastal wetlands have been hydrologically altered, and are isolated from the alluvial systems responsible for their creation (Boesch 1994; Day et al. 2000). This makes these wetlands especially vulnerable to the high rates of relative sea level rise (RSLR: subsidence plus eustatic sea level rise) associated with deltaic systems (Penland 1988) and to predicted increases in eustatic sea level rise (Gornitz 1995; IPCC 2001).

Wetlands have been shown to persist in the face of RSLR when vertical accretion equals or exceeds the rate of subsidence (Baumann et al. 1984; Delaune et al. 1983; Stevenson et al. 1986). In the past, seasonal overbank flooding of the Mississippi River deposited large amounts of sediments into the interdistributary wetlands of the delta plain. Not only did these floods provide an allochthonous source of mineral sediments, which

contributed directly to vertical accretion, but also the nutrients associated with these sediments also promoted vertical accretion through increased autochthonous organic matter production and deposition, and the formation of soil through increased root growth. This sediment and nutrient source has been eliminated since the 1930's with the completion of levees along the entire course of the lower Mississippi, resulting in vertical accretion deficits (RSLR > accretion) throughout the coastal region. Rybczyk et al. (2002) reported that effluent application at Thibodaux, LA, increased accretion rates by a factor of three.

Contributing further to the problem of vertical accretion deficits, many wetlands in the deltaic region have been hydrologically isolated from surrounding marshes, swamps and bayous due to an exponential increase in the construction of canals and spoil banks during the past century (Turner and Cordes 1987). In addition to impeding drainage and, in many cases, physically impounding wetlands, these spoil banks also prevent the overland flow of sediments and nutrients into coastal wetlands, creating essentially ombrotrophic systems from what were naturally eutrophic or mesotrophic.

The total acreage of swamp forest in the Louisiana coastal zone has decreased by 50% from 1956 to 1990 (Barras et al. 1994). Furthermore, it has been predicted that increased rates of eustatic sea level rise and associated increase in salinity could eliminate most of the remaining forested wetlands (Delaune et al. 1987). In the wetland forests of southeastern Louisiana, Conner and Day (1988) estimated vertical accretion deficits ranging from 2.5 to 10.8 mm/yr, which leads directly to increased flooding duration, frequency and intensity. Productivity decreases observed in these wetlands may be attributed to either the direct physio-chemical effects of flooding (i.e. anoxia or toxicity due to the reduced species of S^{2-} and Fe^{2+}), flood related nutrient limitations (i.e. denitrification or the inhibition of mineralization), nutrient limitations due to a reduction in allocthonous nutrient supplies, lack of regeneration, or most likely, a combination of these factors (Mitsch and Gosselink 1986). Although the Spanish Lake wetlands are not threatened by rising sea level, there is a high rate of soil subsidence caused by impoundment.

Recent efforts to restore and enhance wetlands in the subsiding delta region have focused on attempts to decrease vertical accretion deficits by either physically adding sediments to wetlands or by installing sediment trapping mechanisms (i.e. sediment fences), thus increasing elevation and relieving the physio-chemical flooding stress (Boesch et al 1994; Day et al. 1992, 1999, 2004). Breaux and Day (1994) proposed an alternate restoration strategy by hypothesizing that adding nutrient rich secondarily treated wastewater to hydrologically isolated and subsiding wetlands could promote vertical accretion through increased organic matter production and deposition. Their work and other studies have shown that treated wastewater does stimulate productivity and accretion in wetlands (Odum et al. 1975; Mudroch and Copobianco 1979; Bayley et al. 1985; Turner et al. 1976; Knight 1992; Craft and Richardson 1993; Hesse et al. 1998; Rybczyk 1997; Rybczyk et al. 2003).

In areas not directly affected by coastal water levels, hydrological alterations due to human activity have negatively impacted wetlands. This is evident in the forested wetland zone that stretches south from just west of Breaux Bridge to north of New Iberia. These wetlands occur generally just east of the Pleistocene terrace on the western edge of the Mississippi River floodplain and are depressional wetlands located between the terrace and the natural levee ridge of Bayou Teche. These wetlands have been impacted in two basic ways. Many of them are over-drained due to channelization and canal construction, as is the case for wetlands near Broussard and St. Martinville. These wetlands have experienced drying and soil oxidation, sometimes by as much as a meter. As a result, it is common to see exposed roots. By contrast, other wetlands have been impounded, either purposely or by accident. Two examples of this are Lake Martin and Spanish Lake. The wetlands adjacent to Spanish Lake that are the subject of this study are impounded and much of the area is permanently flooded due to the presence of low levees. This impoundment has clearly led to the deterioration of the wetlands. This is evidenced by the presence of dead and dying trees. There is a considerable literature on the impacts of permanent flooding on forested wetlands. These impacts included lowered

productivity, death of trees intolerant to permanent flooding, and lack of recruitment (Conner et al. 1981; DeLaune and Patrick 1987; Myers et al. 1995).

The introduction of treated municipal wastewater into the highly perturbed Spanish Lake wetland is a major step towards its ecological restoration. The nutrient component of wastewater effluent will increase wetland plant productivity (Hesse et al. 1998; Rybczyk 1996), which will help offset regional subsidence by increasing organic matter deposition on the wetland surface. The freshwater component of effluent provides a buffer for saltwater intrusion events, especially during periods of drought, which are predicted to increase in frequency in the future due to global climate change (IPCC 2001). These ecological benefits to wetlands will be in addition to providing Iberia Parish with an economical means to meet more stringent water quality standards in the future.

2.0 PLANNING

2.1 Land use

2.1.1 Existing Land Use

The Spanish Lake wetland is used as habitat for wetland wildlife and for hunting. The Spanish Lake wetland is publicly owned, and is managed by Louisiana Department of Wildlife and Fisheries (LDWF).

2.1.2 Basin Land Use Change

Historically, river spring flood events of Bayou Teche inundated riparian wetlands in the Spanish Lake subsegment (Figure 5), introducing substantial amounts of nutrients and sediments to these wetland communities. Under natural conditions, much of this water moved as sheet-flow through these wetlands, providing ideal conditions for nutrient and sediment retention. As human population and development increased in the region, nutrient concentrations in upland runoff also increased. The impact of these raised nutrient levels on local water quality was increased by the channelization of distributaries and wetlands for flood control, transportation, and oil and gas activities. This channelization often completely drained or bypassed surrounding wetlands, shunting nutrient rich water directly to major distributaries. Thus, as urbanization and agriculture

increased, the amount of upland runoff passing through wetlands decreased. This has led to a number of ecological changes in the Spanish Lake area, including eutrophication of basin waters, reduced wetland productivity, and decreased wetland surface elevation (Day et al. 1982). Urbanization is likely to dominate land-use in the region for the foreseeable future, and habitat and water quality conditions are expected to worsen if no action is taken.

Figure 5. Spanish Lake sub-segment water basin (blue area).

2.1.3 Future Land Use

The population of New Iberia was 73,410 in the year 2000, and has a projected population of 84,960 by 2010. The Spanish Lake wetland has recognized value for flood storage, wildlife habitat, and water quality improvement, making its alteration or development unlikely. There are currently no known plans for development of this area and public ownership ensures that this will not occur.

2.1.4 Wetland Ownership/Availability

The State of Louisiana owns the Spanish Lake wetland, and managed by the Louisiana Department of Wildlife and Fisheries (LDWF).

2.1.5 Accessibility

The Spanish Lake wetland is easily accessible by way of Spanish Lake Rd or West Old Spanish Trail (Hwy 182). It is also accessible by the closed municipal landfill, and several properties on the southern and western edge of the site. Access into the interior of the property is extremely limited. There are no roads that lead into the wooded swamps.

2.1.6 Distance to Wetland

The exact location of Iberia Parish's proposed wastewater treatment facility is yet to be determined.

2.1.7 Current Wastewater Characteristics

Of the 37 estuaries in the Gulf of Mexico area, the Vermilion-Teche Basin is characterized as having one of the highest levels of eutrophic conditions. In the next 3-5 years, it is expected that Louisiana Department of Environmental Quality (LDEQ) will lower the allowable concentrations of nitrogen and phosphorus discharged from the treatment facility, and water quality standards will become more stringent, exemplifying the need for water quality alternatives such as the one described in this report.

2.1.8 Demographic profile of surrounding area (3 miles)

The population of Iberia Parish was 73,410 in 2000, and has a projected population of 84,960 by 2010. The Spanish Lake wetland is partially located in Census Tract 303, Block Group 1. Population figures for this area show 968 households with an average household size of 2.87 and family size of 3.26 (U.S. Census Bureau, Census 2000 Summary File1, Matrices P17, P26, P27, P34, and P35).

2.2 Pollutant Assessment

2.2.1 Wastewater Flow Projections

The ability of wetlands to remove nutrients and other pollutants from overlying water is primarily dependent on concentration and volume, as well as the area of wetlands available to receive the discharge. Nutrient uptake is also influenced by temperature and

the hydrology of the specific wetland site. For example, when flow becomes channelized in a wetland it decreases the physical interface and time of interaction between the effluent and the surrounding landscape, resulting in greatly lowered nutrient removal efficiency for the system.

Nutrient input into a wetland is normally expressed as a loading rate. Loading rates integrate the nutrient concentration and volume of the inflow, and the area of the receiving wetland. Loading rate is generally expressed as the amount of nutrient introduced per unit area of wetland per unit time; normally as g N or P per m^2/yr. Nutrient removal is inversely related to loading rate. Nutrient removal efficiency is the percentage of nutrients removed from the overlying water column and retained within the wetland ecosystem or released into the atmosphere. Richardson and Nichols (1985) reviewed a number of wetland wastewater treatment systems and found a clear relationship between loading rate and nutrient removal efficiency (Figures 6a & b). There are a number of studies from Louisiana where loading rates and nutrient removal efficiencies have been reported. Breaux and Day (1994) provided estimates of loading and removal efficiencies for forested wetlands near Thibodaux and Breaux Bridge where secondarily treated municipal effluent was being discharged. Day et al. (2004) showed that this relationship was generally true for all treatment wetlands in Louisiana. Nutrient uptake has also been reported in coastal wetlands receiving Mississippi River water from the Caernarvon river diversion (Lane et al. 1999; 2004). Mitsch et al. (2001) found similar loading-uptake relationships for wetlands in the upper Mississippi basin. We used the loading and removal rates reported by Richardson and Nichols (1985), which are collaborated by the studies cited above, to estimate water quality improvement associated with different alternatives suggested for the Iberia Parish wastewater treatment facility.

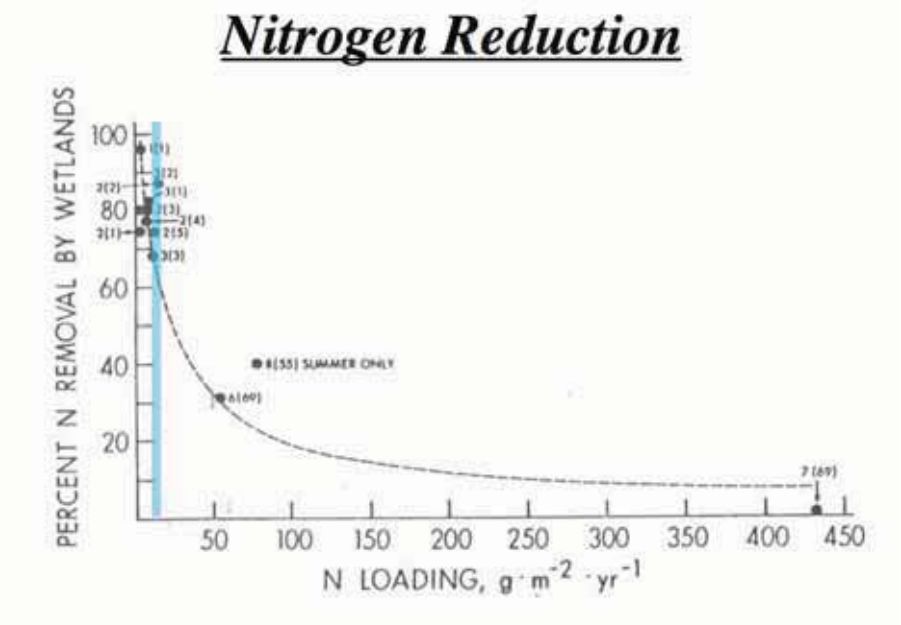


Figure 6a. Nitrogen removal efficiency as a function of loading rate in various wastewater assimilation wetlands (taken from Richardson & Nichols, 1985). Blue line indicates nitrogen loading to the Spanish Lake wetlands from the proposed Iberia Parish wastewater treatment facility with discharge ranging from 1.0-1.5 MGD.

Initially, in order to estimate nutrient removal, the concentrations of total nitrogen (TN) and total phosphorus (TP) and the area of available wetlands are needed. TN and TP values are not available, so average values for secondarily treated wastewater (10 mg/L TN and 3 mg/L TP) were used (Day et al. 2004). These values are somewhat high compared to average Louisiana wastewater concentrations, thus, these uptake estimates are conservative. Total amounts of nitrogen and phosphorus discharge from the treatment facility were calculated using the TN and TP concentrations given above, and the minimum and maximum design flow of the treatment facility (1.0-1.5 million gallons per day (MGD)). Loading rate calculations were based on the wetland area available in the Spanish Lake wetlands (approximately 350 acres). The curves of Richardson and Nichols were used to estimate N and P retention (Figures 6a & b).

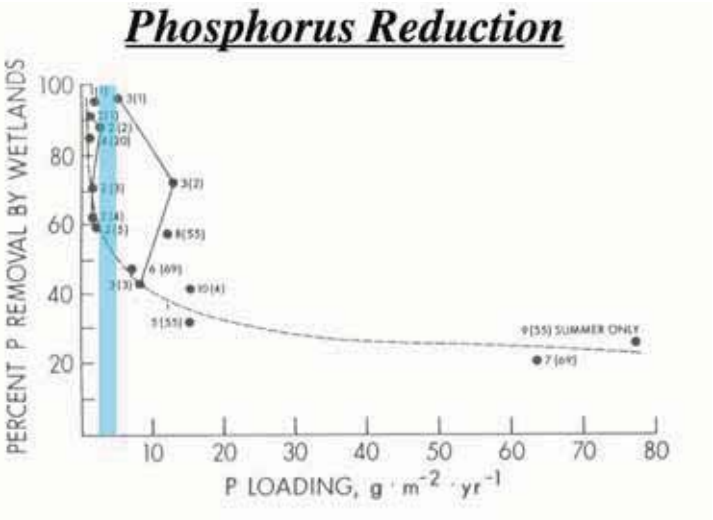


Figure 6b. Phosphorus removal efficiency as a function of loading rate in various wastewater assimilation wetlands (taken from Richardson & Nichols, 1985). Blue line indicates phosphorus loading to the Spanish Lake wetlands from the proposed Iberia Parish wastewater treatment facility with discharge ranging from 1.0-1.5 MGD.

These calculations indicate a nutrient loading rate of 9.8 and 2.9 g/m^2/yr for N and P, respectively, with a discharge of 1.0 MGD, and 14.6 and 4.4 g/m^2/yr for N and P, respectively, with a discharge of 1.5 MGD (Table 1). Based on these loading rate calculations, we predict that nutrient retention will range 60-80% for N and 45-65% for P at 1.0 MGD, and 50-70% for N and 40-60% for P at 1.5 MGD (Table 1; Figures 6a & b). Actual loading is likely to be lower since we used above average concentration values for TN and TP, as well as the maximum design flow, thus actual nutrient retention will likely be much higher.

Table 1. The minimum and maximum design flow of the Iberia Parish wastewater treatment facility (MGD: million gallons per day), estimated nutrient concentration and loading, wetland area available for nutrient assimilation, cumulative annual water height, nutrient loading rate and predicted removal efficiency.

Discharge (MGD)	1.0	1.5
Discharge (m^3/day)	3785	5678
Discharge (m^3/year)	1.38x10^6	2.07x10^6
Nutrient Conc. N/P (mg/L)	10/3	10/3
Nutrient Loading N/P (kg/yr)	13824/4147	20737/6221
Wetland Area (acre)	350	350
Wetland Area (ha)	141.6	141.6
Wetland Area (m^2)	1.42x10^6	1.42x10^6
Loading Rate N/P (g/m^2/yr)	9.8/2.9	14.6/4.4
Predicted Reduction N/P (%)	60-80/45-65	50-70/40-60

2.2.2 Other Point and Nonpoint Pollution Sources

While there is no known point source pollution other than the proposed treated municipal effluent, the Spanish Lake wetland receives storm water runoff from the surrounding landscape, as well as from direct precipitation.

2.3 Cultural Resources

2.3.1 Archaeological Resources

A request was sent to Pam Breaux, State Historic Preservation Officer, Department of Culture, Recreation and Tourism on November 9, 2004. On December 20, 2004, Breaux responded there are no known archaeological sites that would be threatened by this project (see Appendix).

2.3.2 Historical resources

A request was sent to Pam Breaux, State Historic Preservation Officer, Department of Culture, Recreation and Tourism on November 9, 2004. On December 20, 2004, Breaux responded there are no known archaeological sites that would be threatened by this project (see Appendix).

2.3.3 Natural resources estimation/use

The major natural resource values and land use for the Spanish Lake wetland is for habitat and flood storage. Timber species in the area are flood-tolerant (Hook 1984) and might be considered insensitive to sewage loading (Kuenzler 1987). From other studies in the southeastern United States, we can expect that the biomass, productivity and leaf area index of under story plants will increase (Ewel 1984; Nessel and Bayley 1984; Hesse et al. 1998), or not be significantly affected (Straub 1984).

Forested wetlands are known to provide valuable habitat to wildlife mainly because of the abundance of food and cover found in these areas (Harris et al. 1984). Unfortunately, there is a lack of information pertaining to the wetland habitat requirements of most species living in these areas with the exception of nutria, beaver, and some species of waterfowl (Sather and Smith 1984).

Studies in the Atchafalaya Basin indicate that bottomland forests can support from two to five times as many game animals as pine-hardwood areas, and during the winter may contain ten times as many birds per acre as pinelands (Harris et al. 1984). Partial descriptions of wildlife communities have been reported, but thorough characterizations are not available for most wetland areas (Brinson et al. 1981). While we have not yet identified any studies concerning the fauna on these wetland sites, we know that wetlands provide habitat for a wide variety of wildlife (Brinson et al. 1981).

Some animals are completely dependent on wetlands for food, protection, resting areas, reproductive sites, and other life requisites (Sather and Smith 1984). Although some animals spend their entire lifetime in a particular wetland, others are resident for only part of their life cycle or as temporary residents as they travel from one place to another. Wetlands also provide critical habitat for many rare and endangered species of animals. Reasons for the high diversity of animals within a wetland depend on many factors, including the structure and diversity of the vegetation, surrounding land uses, spatial patterns within the wetland, vertical and horizontal zonation, size of the wetland, and water chemistry (Sather and Smith 1984).

Characteristic bird species found in these wetland forests include numerous passerine species, several birds of prey, several upland game birds, and a variety of birds associated with aquatic habitats. The number of mammal species generally ranges from 5-30 with population densities varying greatly from area to area. A typical forested wetland site may include several furbearers, a few small and medium sized mammals, and one or more large mammals. Amphibians and reptiles have generally been neglected in favor of the more economically important animals. However, these latter groups are important in aquatic food chains and are becoming more recognized as valuable indicators of environmental quality (Orser and Shure 1972, Dodd 1978).

2.3.4 Recreation

Hunting and fishing occurs in the forested wetlands surrounding the project area, as well as in the Spanish Lake wetland. Game species found in the area likely include deer, rabbit, squirrel and waterfowl. Mallard and wood duck are the major waterfowl species using the area.

2.3.5 Protected species occurrence

A request was made to the Louisiana National Heritage Program to determine if there are any rare, threatened or endangered species known to occur in the potential treatment areas. Response to the letter indicates that there are no rare, threatened or endangered species known to occur in project area (see Appendix).

2.4 Institutional

2.4.1 Permitting Feasibility

In some cases, the US EPA is willing to permit the use of natural wetlands for assimilation of municipal effluent, and has encouraged the states to approve wetland projects on the basis of the 'anti-degradation rule'. The anti-degradation rule provides for the protection of the existing 'uses' of the wetlands, whether as a wildlife habitat, recreation, groundwater supply, etc. This rule seeks to guard these uses by making sure that the water quality and health of the wetland that supports these uses are not damaged. If the use of a wetland for wastewater management would degrade or prevent any given current use of the wetland, a permit to discharge effluent will likely be denied.

The Louisiana Department of Environmental Quality (LDEQ) has issued nine sanitary wastewater discharge permits for municipal wetland assimilation projects: Thibodaux, Breaux Bridge, Amelia, St Bernard, Broussard, Hammond St. Martinville, Luling and Mandeville. For more information see Chapter 3 River and Stream Water Quality Assessment, 2000 305(b) Part III: Surface Water Assessment, Louisiana Department of Environmental Quality.

2.4.2 Funding sources

Iberia Parish is funding this study.

2.4.3 Existing/Future Wetland Uses

The use of the Spanish Lake wetland is expected to remain largely the same. The habitat of the wetland should be enhanced, and the floodwater storage capacity should be maintained.

3.0 GEOMORPHOLOGY

3.1 Wetland Identification

3.1.1 Wetland Classification

The entire Spanish Lake study site under consideration is designated as wetland, and consists of mostly highly degraded freshwater forest. The area was logged for Cypress and other commercially valuable species during the earlier half of the last century. At present, the wetland is second growth and in very poor condition. On-site and remote sensing surveys of the region indicate four major vegetative communities: a) dry and semi-flooded bottomland hardwood forest; b) wet bottomland hardwood forest; c) severely degraded waterlogged swamp; and d) well-drained bottomland hardwood forest (Figure 7).

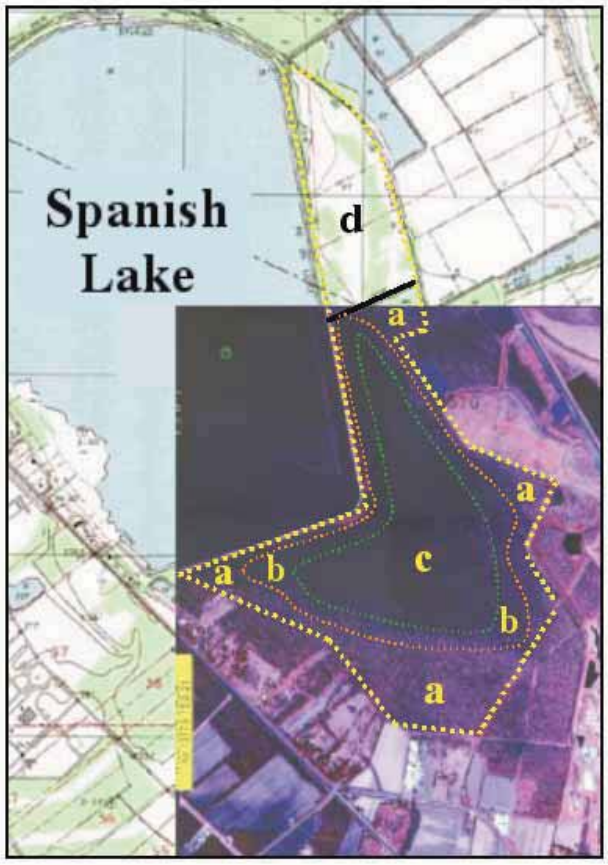


Figure 7. Vegetation communities in the Spanish Lake wetlands a) dry and semi-flooded bottomland hardwood forest; b) wet bottomland hardwood forest; c) severely degraded waterlogged swamp; and d) well-drained bottomland hardwood forest.

The dry and semi-flooded bottomland hardwood forest designated as 'a' in Figure 7 is present along the outer perimeter of the main basin of the Spanish Lake wetlands. This forest type has slightly higher elevation than the interior basin, grading from the surrounding urban landscape to the lower elevation, and subsequently wetter, interior wetlands. Tree species in this region consist of Red Maple (*Acer rubrum*), Hackberry (*Celtis occidentalis*), Chinese Tallow (*Sapium sebiferum*), Ash (*Fraxinus sp.*) and Privit (*Ligustrum sp.*; Figure 8a).

Figure 8a. Dry & semi-flooded bottomland hardwood forest.

The wet bottomland hardwood forest designated as 'b' in Figure 7 is a transitional forest community between the dry and semi-flooded bottomland hardwood forest along the margins and the severely degraded waterlogged swamp located in the interior of the wetland basin. Tree species in this transitional zone include Water Oak (*Quercus nigra*), Red Maple, Tallow, Hackberry and Willow (*Salix nigra*). Some trees in this region have been blown-down and uprooted (Figure 8b).

Figure 8b. Transition zone between healthy bottomland forest and degraded swamp.

The region designated as 'c' in Figure 7 is severely degraded and waterlogged. Water levels in the region are 40 to 60 cm in depth. There are numerous fallen and uprooted trees in the area, with large patches of open canopy with very sparse understory vegetation (Figure 8c). Tree species found in the region are primarily Willow, Tallow and Buttonbush (*Cephalanthus occidentalis*).

Figure 8c. Severely degraded interior swamp.

Figure 8c (cont.). Severely degraded interior swamp.

The region designated as 'd' in Figure 7 consists of well-drained bottomland hardwood forest. There is substantial understory vegetation, except in areas being utilized for cow pasture (Figure 8d). Tree species in this region consist of Red Maple, Ash, American Elm (*Ulmus Americana*), Water Oak, Black Locust (*Robinia pseudoacacia*), Tallow and Willow.

Figure 8d. Well-drained bottomland hardwood forest with cows (left) and without (right).

3.1.2 Wetland Boundaries and Delineation

The Spanish Lake wetland is bordered to the north by Spanish Lake, to the east by crawfish ponds and a municipal landfill, and to the south and west by uplands (Figure 9).

Figure 9. Location of the city of New Iberia, Spanish Lake and the Spanish Lake wetlands.

3.2 Relationship to Watershed

3.2.1 Watershed Morphometry

The Spanish Lake wetland is located in the Vermilion-Teche Basin in south central Louisiana, and consists of the tributaries and distributaries of the Vermillion River and Bayou Teche. The basin is bounded on the north by the Red River basin, on the east by the West Atchafalaya Guide Levee, on the west by the Mermentau basin, and on the south by the Vermillion-Atchafalaya Bays complex. The northern part of the basin consists of wooded and developed uplands on the terrace lands and natural levee ridges of old distributaries. The main crop grown in the basin is sugar cane. The southern portion of the basin has a higher proportion of wetlands including freshwater forested wetlands and nearer the coast there are fresh, brackish and saline marshes. The marshes of the southern part of the basin constitute one of the healthiest and most stable parts of the wetlands along the Louisiana coast.

3.2.2 Wetland Morphometry

The Spanish Lake wetland is located approximately three miles northwest of New Iberia, Louisiana, on the western edge of the Mississippi River Alluvial Plain between the Pleistocene Terrace and the natural levee of Bayou Teche. The wetlands are bordered to the north by Spanish Lake, to the east by crawfish ponds and a municipal landfill, and to the south and west by uplands.

3.3 Soils

3.3.1 Type

Spanish Lake wetland soils are classified as Aligator (At). Soils in this group are wet, and subject to frequent flooding. Excess water limits the use of equipment and potential agriculture use. Soils are poorly drained at low elevations on the alluvial plain and flooding occurs for long periods of time. Natural fertility is high and surface runoff is very slow. Water and air move very slowly through the soil.

3.4 Geology

3.4.1 Subsidence

There is a high relative sea level rise along the Louisiana coast that is caused mostly by regional subsidence. This continuous process, combined with vertical accretion of the wetland surface, means that a significant portion of the material deposited on the surface of the wetland will be buried and permanently lost from the system. This represents a pathway of permanent loss that is not available for non-subsiding wetlands. Penland and Ramsey (1990) estimated a relative sea-level rise of approximately 1.0 cm/yr in the Louisiana delta plain. Therefore, the potential sink for nutrients via burial is large. Since the elevation of the swamp is about 5 feet above sea level, rising sea level should not affect this area for the next several decades.

4.0 HYDROLOGY and METEOROLOGY

The Spanish Lake wetland is hydrologically controlled by rainfall, upland runoff, and the impounded nature of the area. Rainfall is the major source of freshwater. There is limited upland runoff since the Old Spanish Trail Highway (HWY 182) and the levees associated with Spanish Lake, urban development, and the abandoned landfill, block most runoff from the surrounding region. Water drains from the wetlands to the drainage canal for Spanish Lake.

An important characteristic of the Spanish Lake wetlands is that they are mostly impounded. There is a low transverse levee that connects the east levee of Spanish Lake to the crawfish ponds. This levee prevents complete drainage of the area and impounds water. In a transect from the southeast corner of Spanish Lake to the former landfill, water levels ranged from 40 to 60 cm. Water depths in the wetlands in the southeast corner of the site ranged from dry to 5-15 cm. On the western edge of the site adjacent to the terrace, there is a zone of well-drained bottomland hardwood wetland. In the southwestern part of the site, this zone is approximately 500 meter wide. On a west to east transect beginning from the back of the New Century Fabricators company, we encountered 5-10 cm of water about 500 m into the wetland. On a transect south of Spanish Lake, water levels were 5-10 cm near the base of the terrace and increased to 10-

20 cm further to the east. Thus, the better drained zone is wide in the southwest but narrow in the northwest.

Water flow in the site is as follows. There is localized runoff from the terrace uplands and a part of the old landfill. Water flows from the southern and western parts of the wetland in a north and easterly direction. Water depths increase from well drained to a few cm in the south west and 5-10 cm in the southeast to over one half meter in the section between the landfill and the southeast corner of Spanish Lake. Past the levee connecting Spanish Lake and the crawfish ponds, the wetlands are well-drained

4.1 Water Budget

To prepare a water budget, monthly precipitation and mean temperature values were obtained from the National Climate Data Center for the Lafayette Regional Airport meteorological station from 1970- July 2004. Using this data, evapotranspiration (PET) was calculated using Thornwaite's equation. The maximum possible sunshine hours used in the calculation of PET were determined from the Normals value from New Orleans, Louisiana. The components of the water budget are discussed below.

4.1.1 Precipitation

Average annual precipitation (P) for the region is 156.0 cm, as measured from a 20 year average at the Lafayette International Airport.

4.1.2 Evapotranspiration

The calculated annual Potential Evapotranspiration (PET) is 106.6 cm and is relatively constant from year to year. When precipitation is less than PET, many land areas dry out and can no longer supply water at a rate equal to PET demands. These deficit periods usually occur during warm weather months (May through October) when PET rates are high.

4.1.3 Groundwater Interactions

Little is known about groundwater interactions of the site, but in general there is little lateral groundwater movement in the fine-grained sediments of south Louisiana. The low conductivity of clays (10.6 mm/sec, Terzaghi and Peck 1968), coupled with the lack of any significant topographic gradient, indicates that horizontal and vertical groundwater velocities are more likely dominated by surface water pressure (head) and density (salinity) gradients rather than gravity or soil permeability. Moreover, the study area is not in a recharge area for any major underlying aquifer, so little or no loss of surface water to groundwater recharge is expected.

4.1.4 Water Surplus/Deficit

Seasonal and annual variations of rainfall give rise to variability in water surplus/deficit (P-PE). Although rainfall is normally greatest during the warm weather months, high evapotranspiration rates during these months often lead to a net water deficit (Figure 10). Rainfall is generally lower during cold weather months, but net water surpluses are observed due to low evapotranspiration rates (Figure 10). On average, there is an annual surplus of about 53.4 cm in this area. However, this value does not consider pumped inflow or tidal inflow specific to the study area.

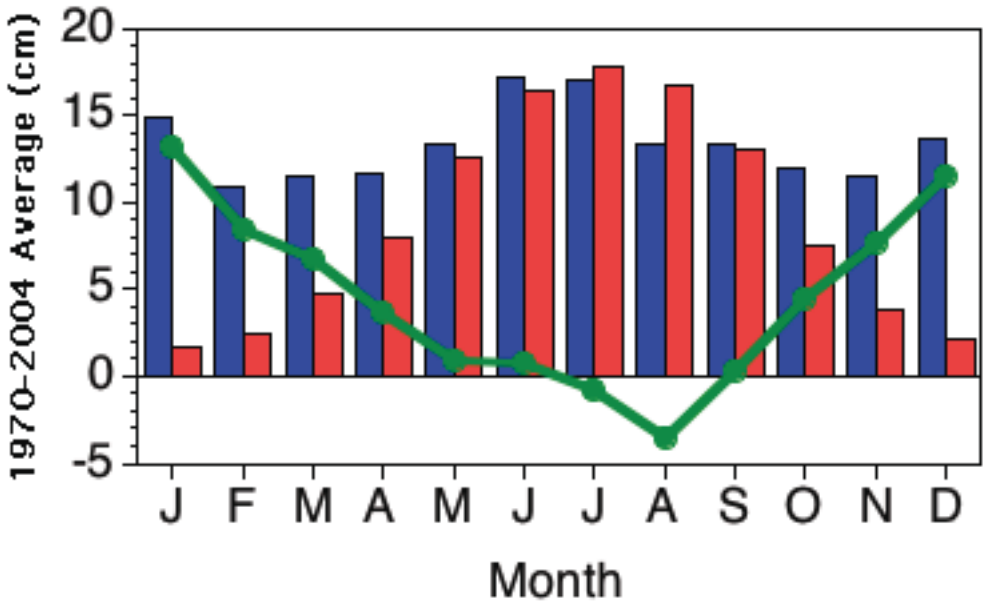


Figure 10. Average rainfall (blue), potential evapotranspiration (red) and net surplus (green).

5.0 METHODS

5.1 Sampling Design

Iberia Parish is proposing to discharge secondarily treated municipal effluent along the southern edge of the Spanish Lake wetland using a wastewater distribution system to disperse effluent evenly and promote overland flow (Figure 3). In order to effectively monitor the effect of this discharge on the floral and faunal components in the receiving wetland, four study locations were identified and delineated. The region surrounding the future location of the wastewater distribution system was designated as the Treatment Site, the region where water exits the study area was designated as the Out Site, and two other sites, designated as Mid-1 and Mid-2, were positioned between the two (Figure 11). Together, the sites described above will be referred to as the Study Sites in this document.

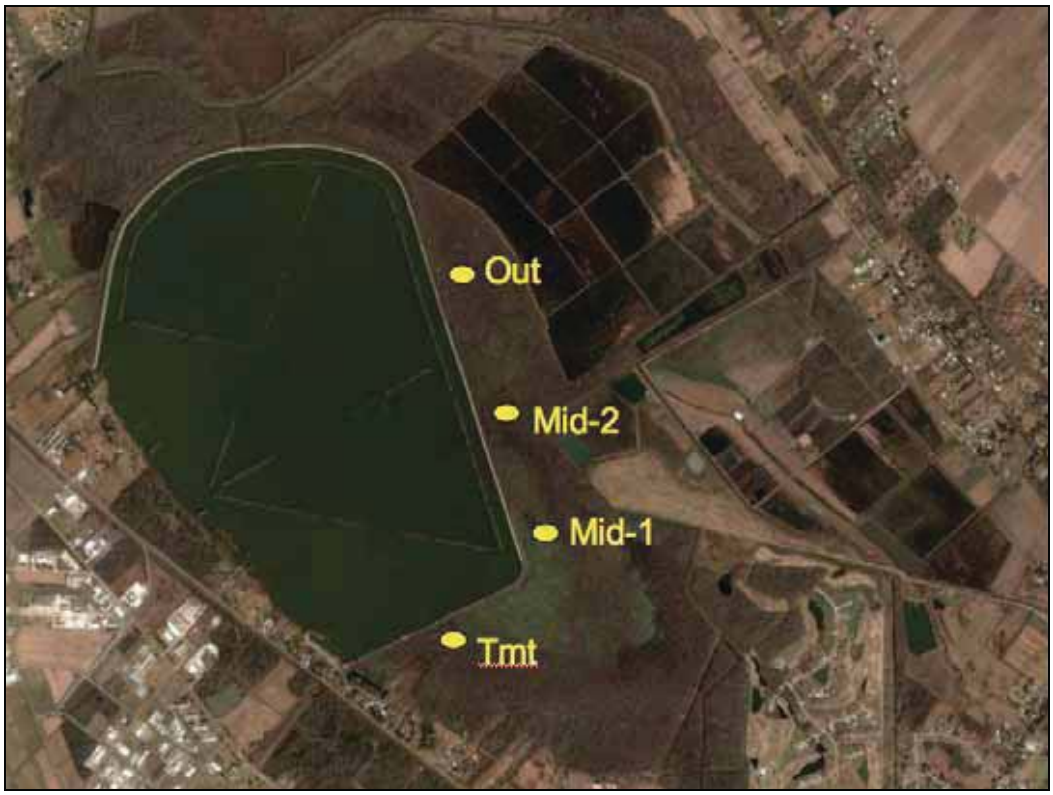


Figure 11. Study sites in the Spanish Lake wetland.

Results of other wetland assimilation sites in Louisiana indicate that benthic community sampling is highly variable and not particularly relevant or useful for wetland monitoring and assessment (Day et al. 1993, 1997, 2004). Therefore, benthos will not be included as part of the sampling design for this UAA. Instead, monitoring of the vegetative community of the Spanish Lake wetland will be used to provide the required technical data for protecting wetland uses as required under the Clean Water Act.

5.2 Water Level

Water level was recorded during site visits using a staff gauge. Water depth was recorded at six locations in each study plot, and averaged.

5.3 Water Quality

Water quality was measured quarterly at all study sites when surface water was present. Dissolved oxygen, water temperature, conductivity and salinity were measured *in situ* using a Yellow Springs Instrument Co. meter. Discrete water samples were taken 5 to 10 cm below the water surface with effort taken not to stir bottom sediments or include any film that may be present on water surface. The samples were immediately stored at 4˚C, on ice, for preservation. The samples were transported to analytical laboratories, and within 24 hours filtered and subsampled. Samples analyzed for nitrate+nitrite were filtered in the laboratory using 0.45 um Whatman GF/F glass fiber filters, and unfiltered samples were subsampled into 125 ml bottles. Both filtered and unfiltered samples were frozen until analysis. The samples were analyzed for nitrate+nitrite (NO_3+NO_2-N), total Kjeldahl nitrogen (TKN), and total phosphorus (TP) by Analytical & Environmental Testing, Inc., Baton Rouge, LA, using EPA methods 353.2, 351.2, and 365.1.

5.3.1 Quality Assurance/Quality Control

Quality Assurance/Quality Control procedures were complied with throughout the project period. A log of all samples received in-house, the type of analysis performed and the QC performed was maintained by document control. The following procedures were followed to insure QA/QC compliance.

5.3.2 Laboratory Blanks

Laboratory, or method blanks consisted of deionized water used for the dilution, glassware cleaning, or any other function utilized in the analytical procedure being performed. The blank was treated exactly as the samples, being of the same volume and carried through the same procedures as the lot of samples analyzed. Laboratory blanks allowed for the detection of interference arising from contaminated glassware, reagents, solvents, or other materials utilized in sample processing and analysis. Blanks were analyzed at a minimum of one per analytical batch in the sample lot.

5.3.3 Field Blanks

Field blanks consisted of laboratory-deionized water placed in a sample container that accompanied sample bottles and the resulting samples through collection, shipment and storage of the samples. As with laboratory blanks, field blanks were carried through the same analytical procedures as the samples analyzed. Field blanks allowed for the detection of contamination arising during sample collection, shipment or storage.

5.3.4 Matrix Spikes/Matrix Spike Duplicates

Matrix spikes and matrix spike duplicates were analyzed at a minimum of 1 in 20 or every two weeks, whichever came first. Matrix spikes and spike duplicates were utilized to the precision of the complete analytical procedure and in some instances were also utilized to assess sample collection procedures. In addition, spike recoveries were examined to determine the effects of the sample matrix on compound recovery during extraction and analysis.

5.3.5 Reference Standards

Reference standards were analyzed as appropriate to assess analyst and laboratory proficiency.

5.3.6 Equations Used to Assess Data Precision, Accuracy and Precision

Precision is defined as the reproducibility of multiple data points that have been generated for a particular method under identical condition. For duplicate samples,

precision is expressed as the relative percent difference (RPD) where: RPD = $(X_1-X_2)/X$ (l00), and X_l and X_2 are the sample and duplicate values, respectively.
Accuracy is a measure of the closeness between an experimentally determined value and the actual value, the latter of which is determined by the analyst using sample spikes, surrogates, or reference standards. Accuracy is expressed in percent recovery, %R = Observed value/Actual Value x 100.

5.4 Vegetation

5.4.1 Tree Productivity

Each study site had a 10 x 100 m quadrate, divided into three 10 x 33.3 m subplots. Two 0.25 m^2 leaf litter boxes, with screened bottoms and approximately 10 cm wide sides, were placed randomly in each subplot (six boxes per site). Leaves and other materials collected in the boxes were gathered periodically starting November 14, 2006. We use the term 'leaf litter' in reference to all non-woody litter including flowers, fruits, and seeds that typically account for < 10% of the non-woody litterfall total (Megonigal and Day 1988). Large stems and sticks were removed from the litter, and the cleaned litter was dried to constant mass at 65˚C and weighed.

The diameter (dbh) of all trees were measured above and below (≈5 cm) an identification tag during the winters of 2007 and 2008. For woody growth, measurements are taken in the winter dormant period. This method allowed measurements to be taken a safe distance from the tag's nail, which often caused a small localized swell. Diameter was measured above the butt swell on large cypress trees. We assumed that the contribution of wood from stems <10 cm dbh and herbs was a relatively small fraction of aboveground net primary production (Phillips 1981; Megonigal et al. 1997). Tree species composition analysis was carried out using equations 1-3 (modified from Barbour et al. 1987). Basal area is defined as the trunk cross-sectional area of a given species in cm^2/m^2.

Relative density = (individuals of a species) / (total individuals of all species) (1)

Relative dominance = (tot. basal area of a sp.) / (tot. basal area of all sp.) (2)

Importance = Relative density + Relative dominance (3)

Stem production was estimated from annual changes in wood biomass calculated using allometric equations based on stem diameter at breast height (dbh, ≈1.3 m) as the independent variable. Aboveground net primary production (NPP) was calculated as the sum of leaf litter and wood protection. Woody litter was not included because we assumed that all wood production was accounted for by the allometric equations that were based on measurements of whole-plant wood biomass. The following steps are used to calculate aboveground net primary production:

- *Calculate biomass (kg) from dbh (cm) for each year measured using allometric equations.*
- *Sum biomass per study site and divide by area (m^2) of study site. This calculates the Biomass per unit area (kg/m^2) for each year and study site.*
- *Subtract Yr1 biomass (kg/m^2) from Yr2 biomass, and multiply by 1000. This calculates Net Primary Productivity (NPP) ($g/m^2/yr$).*

5.5 Soil Characterization

Triplicate bulk density cores were taken from the Treatment and Out study sites using a 10 cm long 2.5 cm diameter 120 cm^3 syringe with the top cut off. This allowed the application of suction as the core was taken, greatly reducing compaction. The sample was sliced into 2 cm sections, dried at 100 degrees Celsius for 24 hours, and weighed. Bulk density was calculated in g/cm^3 units.

6.0 RESULTS

6.1 Water Level

Water levels ranged from dry to 40.3 cm, with the Mid-1 site having the deepest water levels, followed by the Treatment site, except during the January sampling period when the Mid-2 site had deeper water levels than the Treatment site, and water was too high to access the Out site (Table 2).

Table 2. Water levels in the study sites (n.a.: not available).

Date	Tmt	Mid-1	Mid-2	Out
11-14-06	dry	10.8±0.6	dry	dry
1-17-07	21.9±1.2	40.3±1.5	24.0±0.6	n.a.
2-7-07	8.2±1.1	25.7±1.6	n.a	n.a.
3-27-07	1.17±0.6	18.0±1.1	dry	dry
4-18-07	dry	11.3±1.2	dry	dry
7-18-07	4.2±1.0	29.7±4.3	dry	dry
9-12-07	7.8±1.5	33.6±2.5	dry	dry

6.2 Vegetation composition and productivity

Willow (*Salix nigra*) dominated all sites numerically, as well as in relative density, relative dominance, and importance. Red Maple (*Acer rubrum*) and Hackberry (*Celtis occidentalis*) were species of secondary importance (Table 3).

Table 3. Number of individuals (n), basal area, relative density, relative dominance and importance value for tree species in the study sites.

Plot	Species	n	Basal Area (cm^2)	Relative Density	Relative Dominance	Importance Value
Tmt	Hackberry	1	437.4	0.02	0.03	0.05
Tmt	Red Maple	22	2848.7	0.42	0.21	0.62
Tmt	Willow	30	10461.3	0.57	0.76	1.33
Total:		*53*	*13747.5*			
Mid-1	Bushberry	1	107.5	0.05	0.02	0.06
Mid-1	Red Maple	1	77.0	0.05	0.01	0.06
Mid-1	Willow	20	5548.8	0.91	0.97	1.88
Total:		*22*	*5733.3*			
Mid-2	Hackberry	4	780.3	0.07	0.03	0.10
Mid-2	Red Maple	3	346.2	0.05	0.01	0.06
Mid-2	Willow	51	26192.6	0.88	0.96	1.84
Total:		58	27319.1			
Out	Hackberry	10	1319.3	0.14	0.05	0.18
Out	Willow	64	26058.6	0.86	0.95	1.82
Total:		*74*	*27377.9*			

Leaf litter showed a general trend of high production during the fall and decreasing production during winter and spring (Table 4). Ephemeral NPP was highest in Treatment site (440.9±55.0 $g/m^2/yr$), and lower at the rest of the study sites, ranging from 352.1±62.5 to 385.7±63.6 $g/m^2/yr$ (Table 4).

Table 4. Leaf litter data extrapolated to ephemeral net primary production (NPP; s.e.=standard error).

Date	TMT (g/m^2)	Mid-1 (g/m^2)	Mid-2 (g/m^2)	OUT (g/m^2)
11/14/06	emptied	emptied	emptied	emptied
12/13/06	113.3±12.5	74.7±13.7	66.0±14.6	51.3±8.2
1/17/07	7.3±3.5	6.7±1.3	7.3±1.6	n.a.
2/6/07	1.3±0.8	0.7±0.7	1.3±1.3	6.7±1.7
3/27/07	16.0±6.0	14.7±6.3	13.3±5.4	12.0±4.0
4/17/07	26.3±11.8	15.6±3.6	16.7±4.8	16.5±4.8
5/22/07	24.5±7.7	30.1±8.7	24.2±15.6	22.0±8.5
7/18/07	37.3±7.6	56.7±14.7	25.8±9.4	32.0±13.6
9/12/07	81.2±17.8	103.5±18.0	76.4±12.8	104.8±11.2
10/16/07	79.0±13.7	45.3±6.0	69.3±15.2	93.7±18.2
11/15/07	54.6±7.4	37.9±3.5	51.8±7.5	64.8±19.0
Ephemeral NPP ($g/m^2/yr$)	440.9±55.0	385.7±63.6	352.1±62.5	384.5±57.6

Perennial NPP was highest in Mid-1 site (1599.4±n.a. $g/m^2/yr$), followed by Out site (1194.6±334.8 $g/m^2/yr$) and Mid-2 site (1037.2±161.9 $g/m^2/yr$). The Treatment site had the lowest perennial NPP at 686.1±58.8 $g/m^2/yr$. The sum of Perennial and Ephemeral NPP indicates total above ground net primary productivity (NPP). Above ground NPP was highest in the Mid-1 site (1985.1 $g/m^2/yr$), followed by the Out site (1579.1 $g/m^2/yr$), Mid-2 site (1389.3 $g/m^2/yr$), with the Treatment site having the lowest NPP at 1127.0 $g/m^2/yr$ (Table 5).

Table 5. Perennial (dbh), ephemeral (leaves) and total (p+e) net primary productivity (NPP) (s.e.=standard error; n.a.=not available).

Plot	NPP perennial ($g/m^2/yr$)	NPP ephemeral ($g/m^2/yr$)	NPP total ($g/m^2/yr$)
TMT	686.1±58.8	440.9±55.0	1127.0
Mid-1	1599.4±n.a.	385.7±63.6	1985.1
Mid-2	1037.2±161.9	352.1±62.5	1389.3
Out	1194.6±334.8	384.5±57.6	1579.1

6.3 Water chemistry

Nitrate+nitrite (NO_3+NO_2-N or NO_x) concentrations were below detection limits (<0.02 mg/L), with exception of in the Treatment site during the February and June 2007, when concentrations were 0.05 and 0.03 mg/L, respectively (Table 4). Ammonium (NH_x) levels were also below detection limits (<1.0mg/L) at all sites, except at the Mid-1 site during June and September when levels were 1.5 and 1.1 mg/L, respectively, and at the Treatment site in December 2007. Due to lab error, total Kjeldahl nitrogen (TKN) was not measured in January and June 2007. TKN ranged from 1.1 to 3.1 mg/L during September and December. Ortho-phosphate (PO_4) ranged from below detection limit (<0.02 mg/L) to 0.22 mg/L (found at Mid-1 site during June). Total phosphorus (TP) ranged from below detection limit (<0.1 mg/L) to 0.66 mg/L. Total suspended sediments (TSS) ranged from 6.8 to 28.8 mg/L (Table 4).

Table 4. Nutrient concentrations (mg/L) of water in the study sites.

2/7/07	Tmt	Mid-1	Mid-2	Out
NO_x	0.05	<0.02	dry	<0.02
NH_x	<1.0	<1.0	dry	<1.0
TKN	n.a.	n.a.	dry	n.a.
PO_4	<0.02	<0.02	dry	0.16
TP	<0.1	<0.1	dry	0.17
TSS	6.8	28.8	dry	14
6/26/07	Tmt	Mid-1	Mid-2	Out
NO_x	0.03	<0.02	<0.02	dry
NH_x	<1.0	1.5	<1.0	dry
TKN	n.a.	n.a.	n.a.	dry
PO_4	0.15	0.22	0.15	dry
TP	0.52	0.61	0.58	dry
TSS	24.8	8.0	14.4	dry
9/12/07	Tmt	Mid-1	Mid-2	Out
NO_x	<0.02	<0.02	<0.02	dry
NH_x	<1.0	1.1	<1.0	dry
TKN	1.1	3.1	1.4	dry
PO_4	0.19	0.18	0.11	dry
TP	0.31	0.47	0.47	dry
TSS	16.8	9.2	13.3	dry
12/04/07	Tmt	Mid-1	Mid-2	Out
NO_x	<0.02	<0.02	n.a.	<0.02
NH_x	1.1	<1.0	n.a.	<1.0
TKN	2.5	2.0	n.a.	1.4
PO_4	0.13	0.06	n.a.	0.06
TP	0.66	0.34	n.a.	0.28
TSS	26.8	<4.0	n.a.	20.0

Dissolved oxygen levels ranged from 0.01 to 0.85 mg/L (Table 5), conductivity ranged from 77.2 to 418.0 uM, and temperature ranged from 8.1 to 26.1 ˚C. Salinity was never higher than 0.2 ppt, and pH ranged between 5.0 and 7.5 (Table 5).

Table 5. Dissolved oxygen (D.O.), conductivity, temperature, salinity and pH at the study sites.

11-14-06	Tmt	Mid-1	Mid-2	Out
D.O. (mg/L)	dry	0.03	dry	dry
Cond. (uM)	dry	279.8	dry	dry
Temp. (˚C)	dry	17.5	dry	dry
Salinity (ppt)	dry	0.2	dry	dry
pH	dry	5	dry	dry
1-17-07				
D.O. (mg/L)	0.53	0.29	0.70	n.a.
Cond. (uM)	113.5	80.6	77.2	n.a.
Temp. (˚C)	8.1	8.9	8.5	n.a.
Salinity (ppt)	0.1	0.1	0.1	n.a.
pH	5.5	5.5	5.5	n.a.
2-7-07				
D.O. (mg/L)	0.56	0.54	n.a.	n.a.
Cond. (uM)	143.1	85.8	n.a.	n.a.
Temp. (˚C)	15.6	14.5	n.a.	n.a.
Salinity (ppt)	0.1	0.1	n.a.	n.a.
pH	5.5	5.0	n.a.	n.a.
3-27-07				
D.O. (mg/L)	dry	0.32	dry	dry
Cond. (uM)	dry	159.4	dry	dry
Temp. (˚C)	dry	22.7	dry	dry
Salinity (ppt)	dry	0.1	dry	dry
pH	dry	5.5	dry	dry
4-18-07				
D.O. (mg/L)	dry	0.30	0.85	dry
Cond. (uM)	dry	139.0	138.6	dry
Temp. (˚C)	dry	16.5	19.3	dry
Salinity (ppt)	dry	0.1	0.1	dry
pH	dry	5.5	6.0	dry
7-18-07				
D.O. (mg/L)	0.25	0.01	0.25	dry
Cond. (uM)	72.5	118.9	131.5	dry
Temp. (˚C)	25.9	25.7	26.1	dry
Salinity (ppt)	0.0	0.1	0.1	dry
pH	6.0	5.5	6.0	dry
9/12/07				
D.O. (mg/L)	0.20	0.40	0.33	dry
Cond. (uM)	418.0	156.3	131.0	dry
Temp. (˚C)	25.4	25.3	25.8	dry
Salinity (ppt)	0.2	0.1	0.1	dry
pH	7.5	6.9	6.9	dry
12/04/07				
D.O. (mg/L)	0.39	1.60	2.94	1.30
Cond. (uM)	241.0	119.9	112.9	241.2
Temp. (˚C)	13.0	10.9	11.9	13.2
Salinity (ppt)	0.2	0.1	0.1	0.1
pH	7.3	6.8	6.84	7.01

6.4 Characterization of the sediment

Bulk density at the Treatment site was relatively homogeneous, ranging from 0.32 to 0.33 g/cm^3, while bulk density at the Out site was more variable, ranging from 0.27 to 0.64 g/cm^3.

Table 6. Bulk density of soils in the Treatment and Out study sites.

Site/rep	Sample Volume (cm^3)	Dry Weight (g)	Bulk Density (g/cm^3)
Tmt1	95	30.33	0.32
Tmt 2	90	28.50	0.32
Tmt 3	85	27.75	0.33
Out1	90	24.35	0.27
Out2	80	51.54	0.64
Out3	80	41.01	0.51

6.5 Discussion

Nitrate concentrations in the Spanish Lake wetlands were near or below level of detection (0.02 mg/L), and ammonium levels ranged from below detection levels (<1.0 mg/L) to 1.5 mg/L (Table 4). These low concentrations are very similar to other wetlands along the Louisiana coastal zone that are not receiving riverine water, and are indicative of possible inorganic nitrogen deficiency. TKN concentrations, however, were as high as 3.1 mg/L. These high total nitrogen and low inorganic nitrogen concentrations indicate that nitrogen is predominately in organic forms, such as humic substances, tannins, and vegetation, which are not available for assimilation by phytoplankton.

Calculations of nitrogen loading to the Spanish Lake wetlands, and estimates of the efficiency of these wetlands to remove N, indicate that 75-99% of the nitrogen introduced will be removed. Nitrogen is removed from the water column by four major processes: 1) uptake by plants; 2) immobilization by microorganisms into microbial cells during decomposition of plant material low in N; 3) sorption of NH_4 onto the organic matter and the clay cation exchange complex; and 4) most importantly, mineralization-nitrification-denitrification reactions (Lindau et al. 1994). Denitrification has been found to be a

significant pathway for the loss of nitrogen from wetlands (Boynton et al. 1995; Nowicki et al. 1997; Lund et al. 2000; Reilly et al. 2000; Brock 2001).

Rates of denitrification are greater under conditions of fluctuating redox potential (flooding and draining cycles) than where the redox is continuously high or continuously low, and is an important mechanism for the oxidation of ammonia to nitrate and subsequent denitrification (Smith et al. 1983). Frequent changes from anaerobic to aerobic conditions have been shown to cause oxidation of some of the ammonium nitrogen to nitrate during the aerobic phase followed by reduction of the ammonium to nitrogen gas during the anaerobic phase (Patrick and Delaune 1977).

Calculations of phosphorus loading and wetland removal efficiency indicate that 65-95% of phosphorus will be removed. The major mechanism for removal of phosphorus from the water column is plant uptake, microbial assimilation and soil fixation (Patrick 1992). Soluble inorganic phosphate is readily immobilized in soils by adsorption and precipitation reactions with aluminum (Al), Iron (Fe), calcium (Ca), and clay materials (Nichols, 1983). Similar to nitrogen, the fixation of phosphorus is more extensive and less reversible under alternating flooding-draining than under either continuously flooded or continuously moist soil conditions (Patrick 1992). Alternate flooding and drying increases the amount of phosphorus in the ferric phosphate and reluctant-soluble occluded fractions at the expense of the soluble and aluminum phosphate fractions.

Phosphate is usually buffered in wetland systems, with the constituent taken up when concentrations are high and released when they are low (Patrick and Khalid 1974; Patrick 1992). The most important factors in determining phosphorus fixation and release in wetlands soils are the kinds and amounts of clay, the quantities of iron, aluminum, calcium and magnesium compounds, the oxidation-reduction status of the soil as determined by microbial activity under low oxygen conditions, and the soil pH (Patrick 1992).

Litterfall ranged from 352.1±62.5 to 440.9±55.0 g/m^2/yr in the Spanish Lake wetland. This is lower than 642.8 g/m^2/yr measured in a North Carolina coastal plan alluvial forest by Brinson et al. (1980), but comparable to the 328.3 to 417.4 g/m^2/yr measured in the

Lac des Allemands swamp, Louisiana, by Conner and Day (1976). Net primary productivity ranged from 1127.0 g/m^2/yr to 1985.1 g/m^2/yr (Table 6). This is comparable to NPP found at the Lac des Allemands swamp of 886.7 g/m^2/yr for a permanently flooded area and 1779.9 g/m^2/yr for a crawfish farm (Conner and Day 1976).

7.0 CONCLUSIONS

These results provide a baseline of vegetation, sediment, and water data reflecting the current status of the Spanish Lake wetlands. These results indicate that the wetlands are excellent candidates for assimilation of secondarily treated municipal wastewater. The relatively low loading rates and long residence times of wastewater effluent in the wetlands will lead to high assimilation rates of nutrients. It is likely that the added nutrients will lead to increased productivity in the receiving wetlands, as has been observed in other sites, that will help offset regional subsidence and soil oxidation.

In summary, the proposed wetland wastewater assimilation project provides both economic and environmental benefits to the citizens of Iberia Parish. Use of the Spanish Lake wetlands for effluent assimilation will lead to economic savings, improved water quality, and enhanced habitat for fish and wildlife. Citizens will also benefit aesthetically from having a healthy natural ecosystem for recreation purposes. As management of the wetland ecosystem improves its health and functioning, it contributes to the improvement of the larger Vermilion-Teche basin bringing with it such benefits as clean water, enhanced habitat, improved fisheries, and better swimming conditions.

7.1 Uses, criteria and regulatory issues

This report presents data necessary for the discharge of treated wastewater into wetland in the vicinity of New Iberia, Louisiana. The following gives the wetland subsegment designation and description and appropriate criteria and implementation procedures.

The Spanish Lake Wetland
Located 3 miles north of the New Iberia, Louisiana,

Designated Uses - Naturally Dystrophic Waters
B – Secondary Contact Recreation
C - Fish and Wildlife Propagation

The following Criteria are applicable:

- No more than 20% reduction in the total above-ground wetland productivity as measured by litterfall and stem growth data due to effluent addition.

7.1.1 Background and Basis for Criteria Implementation and Assessment

Above ground primary productivity is a key measurement of overall ecosystem health in the wetlands of south Louisiana (Conner 1994; Day et al. 2004). Primary productivity is dependent on a number of factors, including hydrology, nutrient availability and past management practices (Conner 1994; Conner and Day 1976, 1988a and b; Ewel & Odum 1984). Hydrology will not be influenced to a significant degree in the receiving wetland by this project, with exception of the areas immediately surrounding the discharge locations. The underlying ecological model is that the addition of secondarily-treated nutrient rich municipal wastewater to south Louisiana wetlands will promote vertical accretion through increased organic matter production and deposition, counteracting the effects of hydrological isolation and subsidence. Rybczyk et al. (2002) reported that municipal effluent application at Thibodaux, LA, increased soil accretion rates by a factor of three and Hesse et al. (1998) showed that cypress trees at the Breaux Bridge wastewater assimilation wetlands, which have received wastewater effluent for 50 years, had a higher growth rate than nearby trees not receiving effluent.

At each forested study site a 10 x 100 m quadrate was established to measure forest productivity. Productivity of a forested wetland is defined as the sum of stem growth (perennial productivity) and leaf and fruit fall (ephemeral productivity). Perennial productivity was calculated using diameter at breast height (dbh) measurements of all trees with dbh greater than 3.2 cm. Measurements of dbh were taken annually during winter when trees are dormant, and biomass calculated using allometric equations based on dbh. Ephemeral productivity was measured using 0.25 m^2 leaf litter boxes, with screened bottoms and approximately 10 cm wide sides. Six boxes were placed randomly in each study site. Leaves and other materials that collected in the boxes were gathered bimonthly, separated into leaves and woody material, dried to a constant weight, and weighed. Aboveground net primary productivity (NPP) was calculated as the sum of ephemeral and perennial productivity, and presented as live dry weight per square meter basis (g dry wt m^{-2}).

8.0 REFERENCES

Barras, J.A., P.E. Bourgeois, and L.R. Handley. 1994. Land Loss in Coastal Louisiana: 1956-90. National Biological Survey, National Wetlands Research Center. Open File Report 94-01. 4pp. 10 color plates.

Baumann, R.H., J.W. Day, and C. Miller. 1984. Mississippi. deltaic wetland survival; sedimentation versus coastal submergence. Science. 224: 1093-1095.

Blahnik, T. and J. Day. 2000. The effects of varied hydraulic and nutrient loading rates on water quality and hydrologic distributions in a natural forested wetland. Wetlands. 20: 48-61.

Boyt, F.L. 1976. A mixed hardwood swamp as an alternative to tertiary wastewater treatment. M.S. thesis, University of Florida, Gainesville, FL.

Boyt, F.L., S.E. Bayley, and J. Zoltek, JR. 1977. Removal of nutrients from treated municipal wastewater by wetland vegetation. J. Water Pollution Control Federation 49:789-799.

Breaux, A.M. and J.W. Day, Jr. 1994. Policy Considerations for Wetland Wastewater Treatment in the Coastal Zone: A Case Study for Louisiana. Coastal Management. 22:285-307.

Brigham, A. R., W. U. Brigham, and A. Gnilka. 1982. Aquatic insects and oligochaetes of North and South Carolina. Midwest Aquatic Enterprises, Mahomet. Illinois. 837pp.

Brinson, M.M., B.L. Swift, R.C.Plantico, and J.S. Barclay. 1981. Riparian ecosystems: their ecology and status. U.S. Dept. Int. Fish and Wildl. Serv., Biol. Serv. Prog., FWS/OBS-81/17.

Clarke, K. R. and R. M. Warwick. 1994. Changes in marine communities: an approach to statistical analysis and interpretation. Natural Environmental Research Council, UK, 144pp.

Clarke, K. R. and R. H. Green. 1988. Statistical design and analysis of a 'biological effects' study. Mar. Ecol. Prog. Ser. 46:213-226.

Conner, W.H. and J.W. Day, Jr. 1988a. Rising water levels in coastal Louisiana: Implications for two forested wetland areas in Louisiana. Journal of Coastal Research 4(4):589-596.

Conner, W.H. and J.W. Day, Jr. 1988b. The impact of rising water levels on tree growth in Louisiana. Pages 219-224 in Hook, D.D. et al. (eds.), the Ecology and Management of Wetlands, Vol. 2: Management, Use and Value of Wetlands. Croom Helm Ltd Publishers, England.

Conner, W.H.,J.W. Day, Jr, and J.D.Bergeron. 1989. A use attainability analysis of wetlands for receiving treated municipal and small industry wastewater: a feasibility study using baseline data from Thibodaux, LA. Center for Wetland Resources, Louisiana State University, Baton Rouge, LA. 78 p.

Conner, W.H., I. Mihalia, and J. Wolfe. 2002. Tree community structure and changes from 1987-1999 in three Louisiana and three South Carolina forested wetlands. Wetlands. 22(1): 58-70.

Cook, F.A. 1959. Freshwater Fishes in Mississippi. Herman Brothers Co., Jackson, MS.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service Office of Biological Services, Washington, DC. FWS/OBS-79/31. 103 p.

Craft, C.B. and C.J. Richardson. 1993. Peat accretions and phosphorus accumulation along a eutrophication gradient in the northern Everglades. Biogeochemistry 22:133-156.

Day, J.W., A.M. Breaux, I.D. Hesse and J.M. Rybczyk. 1992. Wetland wastewater treatment in the Louisiana coastal zone. Barataria-Terrebone National Estuary Program: Data Inventory Workshop Proceedings: Pages 221-238.

Day, J.W., S. Feagley, I.D. Hesse, J.M. Rybczyk, and X. Zhang. 1993. The use of swamp forests near Thibodaux, Louisiana for application of treated municipal wastewater: monitoring the effects of the discharge. Coastal Ecology Institute, Annual Report submitted to the City of Thibodaux, Louisiana and the Louisiana Dept. of Environmental Quality.

Day, J.W., J.M. Rybczyk, R.I. Pratt, A. Westphal, T. Blahnick, G. Garson, and G.P. Kemp. 1997. A Use Attainability Analysis of long-term wastewater discharge on the Ramos forested wetland at Amelia, LA. Coastal Ecology Institute Report, prepared for St. Mary Parish Water and Sewer Commission #1, City of Amelia, Louisiana.

Day, J., Jr., J. Rybczyk, W. Conner, P. Delgado, S. Feagley, I. Hessse, R. Pratt, A. Westphal, and X. Zhang. 1998. The use of swamp forests near Thibodaux, Louisiana for application of treated municipal wastewater: Monitoring the effects of the discharge 1992-1997. Coastal Ecology Institute, Louisiana State University, Baton Rouge, Louisiana.

Day, J.W., Jr., J.M. Rybczyk, L. Cardoch, W. Conner, P. Delgado-Sanchez, R. Pratt, A. Westphal. 1999. A review of recent studies of the ecological and economical aspects of the application of secondarily treated municipal effluent to wetlands in Southern Louisiana. pp. 155-166. In: L. Rozas, J. Nyman, C. Proffitt, N. Rabalais, and R. Turner (eds.) Recent Research in Coastal Louisiana. Louisiana Sea Grant College Program, Louisiana State University, Baton Rouge.

Day, J., G. Shaffer, L. Britsch, D. Reed, S. Hawes, and D. Cahoon. 2000a. Pattern and process of land loss in the Mississippi delta: A spatial and temporal analysis of wetland habitat change. Estuaries. 23: 425-438

Day, John W., Jae-Young Ko, J. Rybczyk, D. Sabins, R. Bean, G. Berthelot, C. Brantley, A. Breaux, L. Cardoch , W. H. Conner, C. Courville, J.N. Day, A.J. Englande, S. Feagley, E. Hyfield, R. Lane, J. Lindsey, J. Mistich, W. Mitsch, E. Reyes, R. Twilley, A. Yáñez-Arancibia, and X.W. Zhang. 2004. The use of wetlands in the Mississippi Delta for wastewater assimilation: A review. Ocean and Coastal Management 47:671-691.

DeLaune, R.D., R.H. Baumann, and J.G. Gosselink. 1983. Relationships among vertical accretion, coastal submergence, and erosion in a Louisiana Gulf Coast marsh. Journal of Sedimentary Petrology. 53(1):0147-0157.

DeLaune, R.D., C.J. Smith, W.H. Partick, and H. H. Roberts. 1987. Rejuvenated marsh and bay-bottom accretion on rapidly subsiding coastal plain of U.S. gulf coast: a second-order effect of the emerging Atchafalaya delta. Estuarine, Coastal and Shelf Science. 25:381-389.

Delgado-Sanchez, P. 1995. Effects of long-term wastewater discharge in the Cypriere Perdue forested wetland at Breaux Bridge, Louisiana. M.S. thesis, La. State Univ., Baton Rouge, LA.

Dodd, C.K., Jr. 1978. Amphibians and reptiles: the declining species. Water Spectrum 10:24-32.

Douglas, N.H. 1974. Freshwater Fishes of Louisiana. Baton Rouge, LA.: Claitors Publishing Division. 443 p.

Environmental Protection Agency. 1979. Methods for chemical analysis of water and wastes. EPA-600/4-79-020. National Environmental Research Center, Cincinnati, Ohio.

Epler, J. H. 1992. Identification manual for the larval chironomidae (diptera) of Florida. Final Report for DER Contract Number SP251, Florida Department of Environmental Protection, Tallahassee, FL.

Epler, J. H. 1996. Identification manual for the water beetles of Florida. Final Report for DEP Contract Number WM621, Bureau of Water Resource Protection and Florida Department of Environmental Protection, Tallahassee, FL.

Ewel, K.C. and S.E. Bayley. 1978. Cypress strand receiving sewage at Waldo. Pages 750-801 in H.T. Odum and K.C. Ewel, Principal Investigators. Cypress wetlands

for water management, recycling, and conservation. Fourth Annual Report to National Science Foundation.

Ewel, C.E. and H.T. Odum. Cypress Swamps. 1984. University Press of Florida. 472 pages.

Faulkner, S.P. and C.J. Richardson. 1989. Physical and chemical characteristics of freshwater wetland soils. Pages 41-72 in D.A. Hammer, ed., Constructed Wetlands for Wastewater Treatment. Lewis Publishers, Michigan.

Gibson, W. M. and S. K. Gill. 1988. Analysis of tidal variations of Lake Pontchartrain and the Mississippi Sound. NOAA Technical Memorandum NOS OMA 36.

Hartman, R.D. 1984. A study of the relative selectivity of six shallow, estuarine-marsh sampling gears and the distribution of fish and crustaceans in the Sabine National Wildlife Refuge, Louisiana. M. S. thesis, Louisiana State University, Baton Rouge, LA.

Harris, L.D., R. Sullivan, and L. Badger. 1984. Bottomland hardwoods: valuable, vanishing, vulnerable. Florida Cooperative Extension Service, University of Florida, Gainesville, FL.

Hellawell, J. M. 1986. Biological indicators of freshwater pollution and environmental management. Elsevier, London.

Hemond, H.F. and J. Benoit. 1988. Cumulative impacts on water quality functions of wetlands. Environmental Management 12:639-653.

Hesse, I.D, J. Day, and T. Doyle. 1998. Long-term growth enhancement of Baldcypress (Taxodium Distichum) from municipal wastewater application. Environmental Management. 22:119-127.

Hook, D.D. 1984. Waterlogging tolerance of lowland tree species of the south. Southern Journal of Applied Forestry 8:136-149.

Kadlec, R.H. and H. Alvord, Jr. 1989. Mechanisms of water quality improvement in wetland treatment systems. Pages 489-498 in D.W. Fisk, ed., Wetlands: Concerns and Successes. Proceedings sponsored by American Water Resources Association, September 17-22, 1989, Tampa, Florida.

Kadlec, R.H., R.L. Knight. 1996. Treatment Wetlands. Boca Raton. Lewis Publishers.

Kemp, G.P., W.H. Conner, and J.W. Day, Jr. 1985. Effects of flooding on decomposition and nutrient cycling in a Louisiana swamp forest. Wetlands 5:35-51.

Khalid, R.A., R.P. Gambrell, W.H. Patrick, Jr. 1981a. An overview of the utilization of wetlands for wastewater organic carbon removal. Pages 405-423 in Progress in Wetlands Utilization and Management. Proceedings of a Symposium: 9-12 June 1981. Orlando, Florida. Sponsored by: Coordinating Council on the Restoration of the Kissimmee River Valley and Taylor Creek Nubbin Slough Basin.

Khalid, R.A., I.C.R. Holford, M.N. Mixon, and W.H. Patrick. 1981b. Nitrogen and phosphorus reactions in overland flow of wastewater. U.S. Environmental Protection Agency, EPA-600/S2-81-150.

Kitchens, W.F., Jr., J.M. Dean, L.H. Stevenson, and J.H. Cooper. 1975. The Santee Swamp as a nutrient sink. Pages 349-366 in F.G. Howell, J.B. Gentry, and M.H. Smith, eds., Mineral cycling in southeastern ecosystems. Tech. Info. Center, Energy Research and Development Administration, ERDA Symposium Series 36. Available as CONF-740513 from NTIS, Washington, DC.

Knight, R.L, T.W. McKim, H.R. Kohl. 1987. Performance of a natural wetland treatment system for wastewater management. Journal of Water Pollution Control Federation, 59(8):746-754.

Knight, R.L. 1992. Natural land treatment with Carolina bays. Water Environment and Technology 4:13-16.

Kuenzler, E.J. 1987. Impacts of sewage effluent on tree survival, water quality and nutrient removal in coastal plain swamps. Report No. 235 of the Water Resources Research Institute of the University of North Carolina, Chapel Hill, NC. 91 p.

Kushlan, J.A. 1981. Sampling characteristics of enclosure fish traps. Transactions of the American Fisheries Society 110(4):557-562.

Lane, R., J. Day, and B. Thibodeaux. 1999. Water quality analysis of a freshwater diversion at Caernarvon, Louisiana. Estuaries. 2A: 327-336.

Lane, R., J. Day, G. Kemp, and B. Marx. 2002. Seasonal and spatial water quality changes in the outflow plume of the Atchafalaya River, Louisiana, USA. 2001. Estuaries. 25 (1): 30-42.

Lemlich, S.K. and K.C. Ewel. 1984. Effects of wastewater disposal on growth rates of cypress trees. J.Environ.Qual., 13(4):602-604.Lindsay, W.L. and W.A. Norwall. 1978. Development of A DTPA soil test for zinc, iron, manganese, and copper. Soil Sci.Soc.Am.J.42:421-428.

Lenat, D. 1983. Chironomid taxa richness: natural variation and use in pollution assessment. Freshwater Invertebr. Biol. 2:192-198.

Mason, W.T. and P.P. Yevich. 1967. The use of phloxine B and rose bengal stains to facilitate sorting of benthic samples. Transactions of the American Microscopic Society 86:221-223.

Merritt, R. W. and K. W. Cummins. 1996. An introduction to the aquatic insects of North America. 3rd ed. Kendall / Hunt Publishing Co.,Bubuque, Iowa. 862pp.

Mitsch, W., J. Day, J Gilliam, P. Groffman, D. Hey, G. Randall, and N. Wang. 2001. Reducing nitrogen loading to the Gulf of Mexico from the Mississippi River basin: Strategies to counter a persistent problem. BioScience. 51(5):373-388.

Murdroch, J.and J.A. Capobianco. 1979. Effects of Treated Effluent on Natural Marsh. J. of Water Pollution Control Federation 51: 2243-2256.

Nessel, J.K. 1978. Distribution and dynamics of organic matter and phosphorus in a sewage enriched cypress swamp. M.S. thesis, University of Florida, Gainesville, FL.

Nessel, J.K. and S.E. Bayley. 1984. Distribution and dynamics of organic matter and phosphorus in a sewage-enriched cypress swamp. Pages 262-278 in K.C. Ewel and H.T. Odum, eds. Cypress Swamps, University Presses of Florida, Gainesville, FL.

Newbould, P.J. 1967. Methods for estimating the primary productivity of forests. Wilmer Brothers, Ltd., London.

Nichols, D.S. 1983. Capacity of natural wetlands to remove nutrients from wastewater. Journal of Water Pollution Control Federation 55(5): 495-505.

NOAA. 1997. National weather data in electronic form. National Oceanographic and Atmospheric Administration, National Weather Service.

Orser, P.N. and D.J. Shure. 1972. Effects of urbanization on the salamander Desmognathus fuscus. Ecology 53:1148-1154.

Odum, H.T. 1975. Energy quality and carrying capacity of the earth. Tropical Ecology. 16:1-8.

Odum, H.T. 1978. Value of wetlands as domestic ecosystems. Pages 910-930 in H.T. Odum and K.C. Ewel, eds., Cypress Wetlands for Water Management, Recycling, and Conservation. Fourth Annual Report to National Science Foundation and the Rockefeller Foundation.

Patrick, W.H., Jr. 1990. Microbial reactions of nitrogen and phosphorus in wetlands. Pages 52-63 in the Utrecht Plant Ecology News Report, Utrecht, The Netherlands.

Pennak, R. W. 1989. Fresh-water invertebrates of the United States (3rd ed.). J. Wiley and Sons, New York. 628p.

Penland, S., K.E. Ramsey, R.A. McBride, J.T. Mestayer, and K.A. Westphal. 1988. Relative sea level rise and delta plain development in the Terrebonne parish region. Coastal geology technical report, Baton Rouge, La: Louisiana Geological Survey. 121pp.

Pratt, R. 1998. The use of benthic macroinvertebrates for monitoring the discharge of Municipal effluent into a forested wetland at Amelia, Louisiana. MS thesis,Coastal Ecology Institute, Louisiana State University, Baton Rouge, Louisiana.

Rabalais, N., Q. Dortch, D. Justic, M. Kilgen, P. Klerks, P. Templet, and R. Turner. 1995. Status and trends of eutrophication, pathogen contamination, and toxic substances in the Barataria-Terrebonne estuarine system. BTNEP Publ. No. 22. Barataria-Terrebonne National Estuary Program, Thibodaux, LA. 265 pp.

Richardson, C.J. and J.A. Davis. 1987. Natural and artificial ecosystems: ecological opportunities and limitations. Pages 819-854 in K.R. Reddy and W.H. Smith, eds., Aquatic Plants for Water Treatment and Resource Recovery, Magnolia Publishing, Inc, Orlando, FL.

Richardson, C.J. and D.S. Nichols. 1985. Ecological analysis of wastewater management criteria in wetland ecosystems. Pages 351-391 in P.J. Godfrey, E.R. Kaynor, and S. Pelczarski, eds. Ecological considerations in wetlands treatment of municipal wastewaters, Van Nostrand Reinhold Company, NY.

Rybczyk, J.M., J.W. Day, I.D. Hesse and P. Delgado Sanchez. 1996. An overview of forested wetland wastewater treatment projects in the Mississippi River delta region. Proceedings of the Southern Forested Wetlands Ecology and Management Conference. Kathryn Flynn (Ed.) Clemson University, South Carolina. Pages 78-82.

Rybczyk, J., J. Day, and W. Conner. 2002. The impact of wastewater effluent on accretion and decomposition in a subsiding forested wetland. Wetlands. 22(1): 18-32.

SAS Institute Inc. 1987. SAS / STAT guide for personal computers, version 6 edition. SAS Institute Inc., Cary, NC.

Sather, J.H. and R.D. Smith. 1984. An overview of major wetland functions. U.S.Fish.Wildl.Serv. FWS/OBS-84/18.

Shih, S.F. and D.W. Hallett. 1974. Impact of upland marsh on water quality. Internal Report, Department of Resource Planning, Central and Southern Florida Flood Control District, West Palm Beach, FL.

Sklar, F. H. 1983. Water budget, benthological characterization, and simulation of aquatic material flows in a Louisiana freshwater swamp. PhD dissertation, Louisiana State University, Baton Rouge, LA.

Sparks, D.L. (ed). Methods of Soil Analysis, Part 3. Chemical Methods. Soil Science Society of America Book Series Number 5. American Society of Agronomy, Madison, WI.

Stevenson, J.C., L.G. Ward and M.S. Kearney. 1986. Vertical accretion in marshes with varying rates of sea level rise, Pages 241-260. In D. Wolf (ed.) Estuarine variability. Academic Press, New York.

Terzaghi, K. and R.B. Peck, 1968. Soil Mechanics in Engineering Practice, 2nd Ed, John Wiley & Sons, Inc, New York, p.55

Trahan, L., J. J. Bradley, L. Morris, and R. Nolde. 1990. Soil Survey of St. Tammany Parish, Louisiana. USDA, Soil Conservation Service.

Turner, R.E. et al. 1976. Aspects of Land-Treated Waste Application in Louisiana Wetlands. In: Proceedings of the National Symposium on Freshwater Wetlands and Sewage Effluent Disposal. Tilton D.L. editor. Pages 147-167.

Turner, R. and C. Cordes. 1987. Relationship between canal and levee density and coastal land loss in Louisiana. Biological Report 85(14), U.S. Fish and Wildlife Service, Washington.

Tuschall, J.R., P.L. Brezonik, and K.C. Ewel. 1981. Tertiary treatment of wastewater using flow-through wetland systems. Proc. 1981 Annual Conference of the American Society of Civil Engineers, Environmental Division.

U. S. Environmental Protection Agency. 1979. Standard methods for chemical analysis of water and wastewater. Methods Develop. Qual. Assurance Res. Lab. NERC EPA-62516-741003.

U.S. Environmental Protection Agency. 1987. Report on the Use of Wetlands for Municipal Wastewater Treatment and Disposal. Office of Water, Office of Municipal Pollution Control. Submitted to: Senator Quentin N. Burdick, Chairman of Committee on Environmental and Public Works. EPA 430/09-88-005.

Washington, H. G. 1984. Diversity, biotic and similarity indices: a review with special relevance to aquatic ecosystems. Water Res.18:643-694.

Wharton, C.H. 1970. The southern river swamp - a multiple use environment. School of Business Administration, Georgia State University, Atlanta, GA.

Yarbro, L.A. 1979. Phosphorus cycling in the Creeping Swamp floodplain ecosystem and exports from the Creeping Swamp watershed. Ph.D. dissertation, University of North Carolina, Chapel Hill, NC. 231 p.

Yarbro, L.A., E.J. Kuenzler, P.L. Mulholland, and R.P. Sniffen. 1982. The influence of swamp floodplain on exports of nitrogen and phosphorus from North Carolina coastal plain watersheds. Pages 225-241 in P.M. McCaffrey, T. Beemer, and S.E. Gatewood, eds. Proc. of the Symposium, Progress in wetlands utilization and management. Coordinating Council on Restoration of Kissimee River and Taylor Creek-Nubbin Slough Basin.

Zhang, X., S. Feagley, J. Day, W. Conner, I. Hesse, J. Rybczyk, and W, Hudnall. 2000. A water chemistry assessment of wastewater remediation in a natural swamp. 2000. J. of Environmental Quality. 29: 1960-1968.

APPENDIX

MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

ANGÈLE DAVIS
SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

December 20, 2004

Mr. Joel Lindsey
Comite Resources, Inc.
11643 Pride Port Hudson Rd.
Zachary, LA 70791

Re: Proposed Treatment of Secondarily Treated
Municipal Effluent
Spanish Lake Wetlands
Iberia Parish, Louisiana

Dear Mr. Lindsey:

This is in response to your letter dated November 9, 2004, concerning the above-referenced project. There are several known archaeological sites located within a one-mile radius of this proposed development. However, due to the nature of this project, we feel that there will be no effect on these sites. Therefore, we have no objection to its implementation.

If you have any further questions, please do not hesitate to contact Rachel Watson in our Division of Archaeology.

Sincerely,
Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:RW:s

P.O. Box 44247 • Baton Rouge, Louisiana 70804-4247 • Phone (225) 342-8170 • Fax (225) 342-4480 • www.crt.state.la.us

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR

DEPARTMENT OF WILDLIFE AND FISHERIES

DWIGHT LANDRENEAU
SECRETARY

Name	Joel Lindsey
Company	Comite Resources, Inc.
Street Address	11643 Pride Port Hudson Rd.
City, State, Zip	Zachary, LA 70791
Project	Wetland Wastewater Assimilation Project Pre Use Attainability Analysis Land North of New Iberia Adjacent to Spanish Lake, Iberia Parish, LA
Date	December 13, 2004
Invoice Number	04121305

Personnel of the Habitat Section of the Fur and Refuge Division have reviewed the preliminary data for the captioned project. In reviewing our database, no rare, threatened, or endangered species or critical habitats were found within the areas of the captioned project that lie in Louisiana. No state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified sites within Louisiana's boundaries.

The Louisiana Natural Heritage Program has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The Louisiana Natural Heritage Program requires that this office be acknowledged in all reports as the source of all data provided here. If you have any questions or need additional information, please call Louisiana Natural Heritage Program Data Manger Jill Kelly at (225) 765-2643.

Sincerely,

Joshua Cravens for

Gary Lester, Coordinator
Natural Heritage Program

P.O. BOX 98000 • BATON ROUGE, LOUISIANA 70898-9000 • PHONE (225) 765-2800
AN EQUAL OPPORTUNITY EMPLOYER

Appendix J – Iberia Pretreatment Report

Hilda Daigre Curry
Mayor

WASTEWATER DEPARTMENT

800 SUCROSE DRIVE
NEW IBERIA, LA 70560-9629

April 21, 2009

Hilda D. Curry, Mayor
City of New Iberia
457 E. Main Street, Suite 300
New Iberia, La 70560-3700

RE: CNI Sanitary Wastewater Pretreatment Program

Dear Mayor:

During the period of April 2007 through March 2009 the City of New Iberia through its Wastewater Department mailed out 578 specialized User surveys in an attempt to identify pollutants contributed to the Sucrose Drive Treatment Plant and the Tete Bayou Treatment Plant (POTWs) by Industrial Users which Pass Through or Interfere with the operation of either POTW. The purpose of this user survey was to determine the applicability of certain regulations codified at 40CFR403 with respect to the Sucrose Drive & Tete Bayou Treatment Plants.

Of the 578 surveys mailed, 562 were returned completed and 85 follow-up field inspections were conducted by Wastewater Department staff and the City's consultant in this matter, Ms. Ann Wilson. Based on interpretation of the survey data and inquiries of the person(s) directly responsible for gathering the information, neither POTW has been documented as receiving from Industrial Users pollutants which Pass Through or Interfere with the operation of a POTW. Likewise, the attached letter from Ms. Ann Wilson also corroborates these findings. As such, neither POTW is subject to the Development and Implementation requirements presented in 40CFR403.8 at this time.

At present, the Wastewater Department will continue its efforts of creating a Fat, Oil & Grease Ordinance for consideration and adoption by the City Council.

Thank you for your attention in these matters and let me know of any questions.

Sincerely,
City of New Iberia

Vincent S. Palumbo, II, PE
Director - Wastewater Department

xc: Joe Gonzales, Executive Director
George Glaubrecht, President
Marc Duhon, ECO
Iberia Parish Sewerage District No. 1
Domingue Szabo & Associates, Inc.
CNI Wastewater Department

• (337) 369-2368 • Fax (337) 369-2366 •

ANN WILSON
ENVIRONMENTAL CONSULTANT
420 KINGS DRIVE PINEVILLE, LA 71360

Pretreatment
Treatment

NPDES Permitting Wastewater
Water Testing

April 20, 2009

Mr. Vincent Palumbo
City of New Iberia
800 Sucrose Drive
New Iberia, LA 70560

Dear Mr. Palumbo:

Enclosed please find a summary of inspections conducted with the assistance of Mr. Marc Duhon on three occasions in March 2009. It is my conclusion after conducting these inspections to verify findings of the commercial user survey conducted by Ms. Nicole Brigman, there is no significant discharges from commercial users to the City's sanitary sewer system. At this time, no pretreatment program is needed. With the ongoing efforts of Mr. Marc Duhon, the City of New Iberia will be able to continue to update compliance by commercial users to ensure the wastewater treatment plant is able to adequately treat the plant's influent.

If you need further assistance in this project such as developing BMPs, Best Management Practices, for any particular category of user, please let me know. Should you have any questions, please contact me at (318) 542-3150.

Sincerely,

Ann Wilson

Enclosure

cc: Marc Duhon

Carbo Ceramics Inc. - 4810 Industrial Drive – Shane Hebert – Plant Engineer
An inspection was conducted to confirm no process wastewater is discharged to the City's sewer system. All wastewater generated in the process is reused as make up water in the process. No discharge other than sanitary waste from rest rooms are discharged to the City. No permit is needed.

Colors Unlimited Inc./Colors Rytek – 606B South Lewis St. – Ryan Landry – Owner
No inspection was conducted of this facility, but screen printing does not generated wastewater which would pose a threat to the City's wastewater treatment plant.

David Funeral Home – 1101 Trotter St. – Richard David – President
The embalming process was reviewed with personnel from the facility. Chemicals are stored in small quantities and minimal amount of wastewater containing blood products are discharged to the sanitary sewer. No areas of concern were identified during the inspection.

Fletcher Funeral Home – 609 W. Admiral Doyle Dr. – John Butler – Partner
This facility was not inspected, but the procedures are the same as other funeral homes. City personnel may wish to follow up with inspection at later date.

Iberia Parish Mosquito Abatement District – 5217 N. South Taxi Rd. – Herff Jones – Executive Director
This facility was inspected and found to have no process wastewater discharge to the City. The facility may have storm water discharge issues by washing vehicles and discharging without NPDES permit. Chemicals are stored with no secondary containment. However, there is no access to the sanitary sewer. Any spill or release would impact storm drain system.

Lipari Sporting Goods – 958 S. Lewis St. – Kay Lipari – Treasurer
No inspection was conducted of this facility, but screen printing does not generated wastewater which would pose a threat to the City's wastewater treatment plant.

New Iberia Research Center – 4401 W. Admiral Doyle Dr. – Heather Gonsoulin/Johnny Hardcastle
This facility was inspected on two occasions. There were boiler chemicals stored next to floor drains. A request was made during the inspection to provide secondary containment for these chemicals. It was noted during the inspection, the facility is billed for wastewater discharges by water usage. More wastewater is generated than indicated by water usage. This is due to the large volume of storm water discharged to the sanitary sewer by rain water from the cage area located outside. A better billing method would be to install a wastewater discharge meter and bill on the actual amount of wastewater discharged.

The pretreatment pits do very little to treat and remove solids from the wastewater. The inlet and outlet are located at the bottom of a very small pit. These devices should be designed to allow for detention to allow solids to settle out and the discharge to the sanitary sewer be located above the bottom of the pit. The facility should look at covering the cage area to reduce the amount of storm water discharge to the sanitary sewer. Covers could be installed over a period of time to reduce the monetary burden of the project.

Process Printers – 414 W. Admiral Doyle Dr. – Ed Mury – General Manager
All process discharges are contained in 55 gallon drums for off site disposal. No process discharge is placed in the sanitary sewer.

Segura Kwik Kopy Printing – 710 S. Lewis St. – Wayne Lane – Operations Manager
This facility does discharge process wastewater to the City. Marc Duhon has contacted the owner in writing requesting off site disposal of process waste.

Bobby's Alignment Center – 1601 Center St. – Don Miguez – Owner
This facility was inspected and found not to be on City sewer. Marc Duhon is following up on this facility to see if they will be connecting to the City's sewer system. No process discharge was noted during the inspection.

Blue Stream Services – 1013 Hwy 90 East & 1433 Jane St. – Ricky Eskind - Safety Director
This facility was inspected and found to have a pretreatment system to remove oil from the wastewater generated by cleaning equipment. No samples have been taken to verify the system is working properly. The City should request a sample spigot be installed to make taking samples easier. Marc Duhon should follow up to see samples are taken.

Iberia Medical Center – 2315 E. Main St. – Trent Hebert – Plant Manager
This facility has several issues as it relates to discharges to the storm drain system, but not the sanitary sewer. Washing of carts and trash containers and discharging to the storm drain system was observed during the inspection. The facility has no NPDES permit to allow this discharge. Also, the waste grease container should be relocated to minimize spills from entering the bayou.

Discharges from the laboratory were minimal. Some instruments discharge to the sanitary sewer, but the discharge contains small amounts of blood products, cleaners, and buffers. X-ray facility uses digital technology which results in no discharge to the sanitary sewer.

Dauterive Hospital – 600 N. Lewis St. – David Crews – Director of Plant Operations
The discharge from the facility consist discharge from the food service area. Maintenance area discharges consist of boiler blowdown and discharge from the cooling tower. Digital x-ray units result in no discharge to the sanitary sewer. The laboratory discharges small quantities from various instruments. However, this material can be treated by the City's treatment plant.

Daily Iberian, 926 E. Main Street
Facility was inspected and found to have no process wastewater discharge to the sanitary sewer. Printing has no discharge to the sewer. Plate developing has pretreatment, silver recovery system, before discharging to the sanitary sewer system.

Miscellaneous Facilities
Numerous medical facilities such as dentist offices and chiropractic clinics were inspected. Infectious or medical waste was sent off site for disposal. X-ray processors utilize digital technology to eliminate discharges to the sanitary sewer. Marc Duhon will continue to monitor these small users and as time permits will visit additional facilities to verify compliance.

Several food services facilities, ie restaurants were visited. The facilities had grease traps, waste grease containers, strainers on drains, and other best management practices to reduce loading to the City's sanitary sewer. Marc Duhon will continue to monitor facilities to ensure compliance with discharges to the sanitary sewer system.

Appendix K – Public Comments

Will be added after the 30 public comment period has ended