



Conversion of Rural Land to Recreational Sportfishing Use: An Economic Analysis

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CONVERSION OF RURAL LAND TO RECREATIONAL SPORTFISHING USE: AN ECONOMIC ANALYSIS

W. Cumbie, J. Adrian, and D. Fields

INTRODUCTION

Traditional agricultural enterprise markets (such as corn, soybeans, cotton, and peanuts) have been somewhat depressed in recent years (USDA). Today, more rural land is being purchased and operated by nonagriculturally oriented individuals and entities. Additionally, both long-term and new rural land owners have broadened their search for feasible alternative uses for the land resource so as to supplement or increase income (USDA). Many non-traditional enterprises (goats, turfgrass/sod, various horticultural crops, etc.) and production systems (organically grown, free-range animal production, value added systems, etc.) have received attention as viable production alternatives. Also, recreational options such as the issuance of hunting leases and eco-tourism activities have increased. Interest has also been expressed for aquacultural options, including sportfishing.

Sportfishing is a major recreational activity in Alabama and the United States (American Sportfishing Association). In 2001, 212 million people 16 years of age or older lived in the United States, and one in six of these went fishing--a 16 percent participation rate (USDI, a). According to the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation Survey for the United States (issued in October 2002), there were 34.1 million anglers (28.44 million freshwater), who spent 557 million days fishing (467 million freshwater), with expenditures of \$35.6 billion (\$14.7 billion on trips and \$17.0 billion on equipment) (USDI, b). In 2001, Alabama waters were used by 851,000 U.S. resident anglers (86 percent freshwater) for 11.3 million days of fishing (88 percent freshwater) that involved \$735.5 million in total expenditures with roughly an equal split between trip-related and equipment and other-related outlays (USDI, c). These amounts convert to an average of approximately \$870 per angler per year or a per trip outlay of \$32 per day.

Alabama residents comprised three-fourths of the in-state anglers (634,000) and accounted for 83 percent (\$598 million) of the total expenditures made in-state (USDI, c). Black bass were desired by 383,000 in-state anglers with 76 percent of those fishing being Alabama residents. Panfish (bream, bluegill, etc.) and white, striped, and hybrid bass were sought by 215,000 anglers (82 percent Alabama residents) and 145,000 anglers (82 percent Alabama residents), respectively.

While most of this activity involved use of public waters, these statistics illuminate the growing opportunities and potential for planned and managed private recreational waters. Impending retirements of "baby boomers" with the time, income, health, and desire for diverse recreational experiences could enhance demand for day fishing trips and related activities such as family recreation, nature observation, rural aesthetics, and hunting. Provision of a fish production system that guarantees an optimal

recreational experience that includes the opportunity to catch many large, desired fish in an appealing, safe, comfortable environment may be economically viable.

What is required to create and provide an optimal recreational sportfishing experience? And, can such a system be economically viable?.

This paper focuses on two primary objectives: (1) identifying and examining the process of adding recreational water to a rural land tract and of satisfying regulatory requirements and (2) analyzing the economic feasibility of developing a recreational sportfishing lake as an amenity for both an existing multipurpose recreational facility and a stand-alone, start-up 40-acre sportfishing operation.

The first objective will be addressed by describing the process of developing a sportfishing lake and then summarizing and describing requirements specified by the two primary governmental entities involved with the addition of recreational water to a rural land tract: the United States Army Corps of Engineers (USACE) and the Alabama Department of Environmental Management (ADEM). The second objective will be achieved by developing budgets and cash flow statements for two scenarios--both an additional-use sportfishing option for an on-going outdoor recreational facility (Scenario 1) and a start-up sportfishing operation (Scenario 2)--using a 15-year planning horizon and net present value (NPV) methods.

METHODS AND BACKGROUND

Data for the analysis were collected and synthesized from a case study of an on-going recreational facility located in Southeastern Alabama. Over a two-year period, one author was afforded the opportunity to experience all facets of a water development project at the recreational facility (Scenario 1), including site selection, state and federal permitting application requirements, site engineering, construction bidding and acceptance processes, financial performance and budgeting, stocking and management of fish, and marketing and sales plans. Additional data were collected from USACE and ADEM regulatory permitting entities regarding site acceptance and cost of permitting. Selection of the site engineer and resulting consulting costs were derived from actual bids submitted by two separate consulting firms. All construction costs (dam, spillway, pier, drainage, etc.) were also obtained for a bid process that included four separate contracting firms.

The recreational water projects reviewed in detail for this study were specifically designed for sportfishing. The lakes totaled 40 acres in size and ranged from 1 to 24 feet in depth. The lake in Scenario 1 contained five fingers or channels, which are narrowed bodies of water that branch off from the lake's main body of water. There were several sandbars or points that extended from the shorelines toward the main body of the lake. These structures provide fish with preferred spawning areas and habitat for feeding purposes. Most of the tree trunk and root systems that remained from the timber harvest that took place during the construction of the lake were placed in strategic areas throughout the lake. These areas offer fish structures, sanctuaries, and a good feeding habitat. There were also several areas of the lake that contained shallow depths and flooded timber, which provide a beneficial habitat for water fowl. The shorelines and dam were planted with grasses that produce seed and forage that the resident and transient wildlife and waterfowl could utilize for feed, and in turn, also provide great areas for wildlife observation.

The start-up 40-acre lake project (Scenario 2) used borrowed capital and is simply an example to evaluate financial feasibility and demonstrate the design and regulation approval aspects of a recreational water project.

Scenario 1: Costs and Management Practices

The 40-acre sportfishing lake analyzed was constructed and managed as a recreational option for an ongoing multiple purpose recreational facility and for the purpose of generating additional income

for the land owner. The recreational facility provides year-round outdoor sporting activities that generate income primarily through paid hunting trips, shooting sports, timber and hay production. Use was expected to largely be by current members and customers of the facility. The site on which the lake was constructed is currently owned by the facility; therefore, financial assistance for both land purchase and lake construction was not required. The property, previous to lake construction, was used solely for paid hunting trips and a moderately sized hay production operation. With addition of the sportfishing lake, the land owner will position the facility to generate income during the time of year when other aspects of the business are not generating significant cash inflow (April through September).

The planning horizon for the project was 15 years. Capital investments were made in each of the first three years of the project with capital replacements needed in the fifth and tenth years of the project (Table 1). Sales of day fishing memberships were projected to start in April of the fourth year. The initial start-up period was three years in order to obtain larger weights of the sportfish and greater numbers of forage fish before fishing trips were permitted.

Fathead minnows, coppernose bluegill, and shellcrackers were all stocked during October of the second year and were considered forage fish for this particular operation. Fathead minnows were stocked at a rate of 1,000 fish per acre, totaling 40,000 fish. Coppernose bluegill and shellcrackers were stocked at a 9:1 ratio, coppernose bluegill to shellcrackers, at a rate of 1,000 fish per acre totaling 36,000 coppernose bluegill and 4,000 shellcrackers. Threadfin Shad were stocked during March of the third year of the project at a rate of 500 per acre totaling 20,000 fish and were considered forage fish as well. The F-1 Tiger Bass, 2 inches in size, were stocked during June of the third year at a rate of 50 fish per acre totaling 2,000 fish and were considered the target sportfish in this project.

There were two primary motivations for stocking forage fish at earlier times for this project. First, early stocking and a lengthened initial production cycle allowed the forage fish to complete several spawning cycles and increase the population of each specie. Second, this option provided enough time for forage fish to grow, and thus establish a noncompetitive environment for forage with the F-1 Tiger Bass. The F-1 Tiger Bass is a hybrid cross between the northern largemouth bass and the Florida largemouth bass. The northern variety is recognized for highly aggressive feeding habits and behavior, but not for reaching weights significantly over 8 pounds. The Florida largemouth, however, is identified as a less aggressive but larger species, reaching weights in excess of 17 pounds. Motivation for stocking the F-1 Tiger Bass was to grow fish that gain weight quickly and provide fish which exhibit highly aggressive feeding habits (Smith 2005). Fishing will be on a catch and release basis.

Scenario 2: Costs and Management Practices

Most rural land owners would not have an on-going recreational facility. Thus, data from the initial analysis were used to evaluate the feasibility of a 40-acre start-up sportfishing lake, using borrowed capital. The 40-acre sportfishing start-up operation included the same initial and operating costs schedules and management practices as the lake used as an additional use-option for the ongoing outdoor recreational facility, Table 2. Additional costs incurred with this alternative included interest on a \$138,000 loan at 5.75 percent for 15 years plus origination/closing costs, which are amortized, and changes in property tax, labor, and advertising costs resulting from the loss of the synergistic relationship with the ongoing recreational facility. Land was still assumed to be owned and available.

PROJECT DEVELOPMENT: PROCESS AND REGULATION

Goals and objectives of land owners and characteristics of land vary a great deal, just as the specific uses do for new waters (Chappell 2005). Regardless of the personal characteristics of land owners and the planned uses for the waters, there are certain processes and regulations that need to be identified, understood, and followed by all land owners who desire to bring water-related projects to successful completion.

TABLE 1. CAPITAL AND OPERATING COSTS FOR A 40-ACRE SPORTFISHING LAKE THAT IS AN AMENITY TO AN EXISTING RECREATIONAL FACILITY WITH A 15-YEAR PLANNING HORIZON AND USING EQUITY CAPITAL, ALABAMA, 2006

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Capital Costs															
Pond construction	60,000														
Pipe	5,000														
Trash rack	260														
Engineer fee	7,500														
Registration fee	225														
Fertilizer / Plantings		575													
Gravel / Rock		6,500			2,500					2,500					
Fathead minnows			1,600												
Shellcrackers			1,000												
Bluegill			9,000												
Shad			4,000												
Bass			2,000												
Feeder			700												
Boats				15,000											
Dock / Pier				1,500											
Sub - Total	72,985	7,075	18,300	16,500	2,500					2,500					
Operating Costs															
Fish Feed			900	900	900	900	900	900	900	900	900	900	900	900	900
Fertilizer			1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960
Testing/ Monitoring			650	650	650	650	650	650	650	650	650	650	650	650	650
Maintenance	2,000	2,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Insurance			5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Property taxes	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372
Labor			12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Advertising			2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Gross revenue / year	0	0	0	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Net Return / year	-76,357	-10,447	-43,182	7,518	21,518	24,018	24,018	24,018	24,018	21,518	24,018	24,018	24,018	24,018	24,018

TABLE 2. CAPITAL AND OPERATING COSTS FOR A 40-ACRE SPORTFISHING LAKE STARTUP WITH A 15-YEAR PLANNING HORIZON AND USING EQUITY CAPITAL, ALA-BAMA, 2006

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Capital Costs															
Pond construction	60,000														
Pipe	5,000														
Trash rack	260														
Engineer fee	7,500														
Registration fee	225														
Fertilizer / Plantings		575													
Gravel / Rock		6,500			2,500										
Fathead minnows			1,600												
Shellcrackers			1,000												
Bluegill			9,000												
Shad			4,000												
Bass			2,000												
Feeder			700												
Boats			15,000												
Dock / Pier			1,500												
Sub - Total	72,985	7,075	18,300	16,500	2,500					2,500					
Operating Costs															
Fish Feed			900	900	900	900	900	900	900	900	900	900	900	900	900
Fertilizer			1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960	1,960
Testing/ Monitoring			650	650	650	650	650	650	650	650	650	650	650	650	650
Maintenance			5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Insurance			5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Property taxes	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918
Labor	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Advertising			5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Loan Amortization	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Interest on Loan	7,935	7,588	7,220	6,832	6,421	5,986	5,527	5,041	4,527	3,983	3,409	2,801	2,158	1,479	760
Gross revenue / year	0	0	0	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Net Return / year	-107,068	-40,811	-65,178	-14,090	321	3,256	3,715	4,201	4,715	2,759	5,833	6,441	7,084	7,763	8,482

Recreational water planning and development depends upon several factors, including (1) business use and preferences, (2) personal utilization or preferences, (3) site compatibility for such use, and (4) the site approval process.

As noted, a land owner who is planning a site development for recreational water usually has a preconceived idea or vision of the demand for the waters' end use. The initial goals set in transforming the rural land in the on-going recreational facility into a sportfishing lake (Scenario 1) were as follows: (1) Build a lake large enough to sustain a maximum of 90 fishing trips during a 6-month time frame that would generate cash flow during the facility's slower use times of the year; (2) Stock and manage more aggressive and rapidly growing fish which would allow fishing trips to be sold earlier in the life of the project compared to more traditional stocking regimes; (3) Relatively early in the project's life, generate cash flow that would permit relatively quick recoupment of the initial outlays; and (4) Create the opportunity for a memorable recreation experience for clientele.

Once the business and personal goals are set, the next step involves actual site selection or compatibility of the property to complement these goals. Several property attributes affect the ultimate site selection such as topography of the property, streams and other flowing bodies of water, soil characteristics and percolation, and other land characteristics depending on area or region of the state (Environmental Laboratory / USACE). Special attention should always be given to wetland observation when selecting a potential site. Wetlands are areas characterized by growth of wetland vegetation where the soil is saturated during a portion of the growing season or the surface is flooded during some part of most years (Environmental Laboratory / USACE). Wetlands in the state of Alabama generally would include swamps, marshes, bogs, and other similar terrain. The main objective of the land owner is to identify and designate wetlands and consider the impacts they will have on the location and approval process of the projected body of water and vice versa.

The last step, the site approval process through regulatory agencies, requires great amounts of time and detailed preparation. A consulting project engineer, environmental consulting firm, and/or a USACE district engineer can assist in the site planning and approval process. Alabama is served by USACE in the Mobile District, which regulates the majority of the State, and the Nashville District that regulates the extreme northern area of the State. Sources for finding a lake site planner include accredited environmental service companies or engineers, referrals from lake owners in your area, lists of consultants from regulatory agencies, and planners employed for waters/wetlands projects completed or occurring in your area.

The site engineer, recognized as the planner for the remainder of this study, makes assessments of the topography and related impacts to aquatic features, such as wetlands, that the potential recreational water development site will have on the property. Upon the initial assessment of the projected site, determinations are made on the type of permitting needed by the applicable regulatory agencies. (See Appendices 2-9 for specific submission examples.)

In Alabama, the site planning and approval processes typically involve two regulatory agencies: the United States Army Corps of Engineers (USACE) and the Alabama Department of Environmental Management (ADEM). Roles of these agencies are to ensure that construction of impoundments, quality of added water, and potential runoff are achieved in a specified manner which is consistent with established law, environmentally sound, and in the public's interest. The process requires proper permitting of all construction activities and development of environmental impacts for projected sites.

It is very important to take the proper steps in the site approval process before embarking on the actual construction of a site. Failure to successfully identify and complete compatible site locations and proper request for permits could result in project delays, plus severe damages and penalties. Subject to characteristics of a potential site and its dimensions, wetlands/waters delineation could be required. Wetlands delineation simply outlines all wetland areas that are possessed on the applying party's

land. These areas could possibly be utilized in the exchange through mitigation for the approval of the potential water site (ADEM, NPDES). The site planner is able to inform the land holder of these needs so that he/she can take the appropriate actions and steps. Basically, a detailed representation by drawing is developed and provided to the regulatory agencies regarding the wetland location and impacts of the project.

United States Army Corps of Engineers (USACE)

Since 1890, USACE has been regulating activities affecting U.S. waters. Historically, its activities were primarily concerned with navigation of U.S. waterways. However, during the 1960s, the scope of USACE activities broadened through new laws and court decisions to include dumping of trash and sewage in or affecting waterways. In 1972, the Clean Water Act, particularly section 404, passed and broadened the scope of USACE authority, which now considers the full public interest for both the protection and utilization of water resources (USACE, Clean Water Act).

The USACE's focus on public interest is to assure that projects do not harm the general public; that is, the project can not benefit one citizen while at the same time harming others. It is necessary, regardless of the project size or complexity, to follow the correct procedures set in the proposed project's district. Not all projects will require specific permits by USACE. However, the land owner should notify and inquire regarding the proper process to be taken through USACE before starting the building process.

The USACE has many general permits which allow minor activities to be completed without the need for individual processing. There are also several exemptions that are available for very specific activities, though consultation with either a site planner or USACE engineers is still highly recommended. Certain projects can avoid the permitting process partially or completely: the prudent action would be to ensure those omissions apply to your project before beginning construction. The site owner or planner should contact USACE regarding whether or not the potential site is applicable for such exemptions and permits.

Larger, more complex projects typically require a complete process of submission, review, and approval by the USACE before building commences. Since these more complex projects usually require greater amounts of labor, money, and time, adhering to approval guidelines and requirements beforehand can prove beneficial in avoiding hardships throughout the building process.

More information on the steps needed to be taken through USACE in the approval process, the guidelines and influences considered by USACE when permitting projects, and examples of several general forms and applications used by USACE in the approval process can be found in the Appendix. Several of these standard procedures are examined more thoroughly in the following sections.

The pre-application consultation, although optional, can be very beneficial to the planner in expediting the permit process. After determining if a permit is needed, the applicant would need to schedule a meeting date with the local USACE district office. Upon scheduling a meeting, a "Summary of Project" should be sent at least 10 days prior to all agencies that could be in attendance, such as Alabama Game and Fish Department or the Alabama Department of Environmental Management. If applicable, wetland/water delineation for the site should be brought to the meeting. The pre-application meeting is a good opportunity for the applicant to gather information regarding USACE rules and regulations that could affect final project design.

If public notice is needed, the applicant could be asked to notify Federal, state or local agencies, adjacent property owners, and the general public. This contact allows both public and private views to be heard by the USACE. Informing these groups allows for an assessment by USACE on the interest in and impact of the specified project.

Upon receiving information concerning the proposed project, USACE will begin an assessment process. USACE will review the likely benefits of the project compared to the detriments possible from

granting a permit for the said project. There are numerous factors to be considered when evaluating the public interest. Conservation, erosion, economics, aesthetics, flood hazards, wetlands, water quality, recreation, and safety are important issues for consideration when decisions are made for the approval or denial of a construction site. Simply stated, USACE will weigh the need for the proposed project both publicly and privately, consider alternative locations and methods to obtain the project, and evaluate benefits and detriments of the project.

The presence of wetland areas typically requires a wetlands/waters delineation to be completed for USACE. In the state of Alabama, particularly the central and southern regions, wetlands/waters are often found on projected sites. A land owner should identify wetlands that are located on and in proximity of the project and take appropriate measures to ensure that the projected construction site is not detrimental to those specific areas. The site planner will obtain delineation in accordance with the Routine Onsite Methodology described in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.

Having a wetland/waters delineation completed before applying for a permit helps in expediting the approval process. Typically, a planner would take the following steps in a wetland/water delineation process and provision of a wetlands survey. These can vary depending on the proposed permitting site.

- Mark wetland boundaries with labeled flags designated alphabetically and numerically for each wetland site. For example, A-1 on the corner of a wetland boundary and continuing around the perimeter of entire wetland accordingly, A-2, A-3, A-4, until complete. Other wetlands may be designated in similar manner B-1– B-4, C-1–C-6, etc.

- Denote each wetland boundary on the appropriate map.

- Conduct upland and wetland data test for vegetation, soils, and hydrology as per regulatory agency guidelines.

- Give drawings and results to the land owner of each of the areas tested .

- Provide photographs of each area tested in mapped form to the land owner.

A wetland survey prepared by the applying party is also required by USACE for projects in areas that contain wetlands/waters; however, a global positioning system (GPS) could be used in place of a wetland survey. The later method of distinguishing wetlands for USACE is a more economical approach with the general availability of GPS units; however, the user must still have the capability of operating the unit properly.

Drawings of proposed sites and activities are required in addition to wetland delineation and application. There are three types of drawings needed in order for planned activities to be properly depicted for review by USACE. An original (or good copy) of Vicinity, Plan, and Elevation notations are to be submitted by the site planner on 8.5 X 11 inch white paper. These drawings are intended to provide USACE with a clear vision of the projected site and should be in good detail. The Vicinity Map is used to describe the area or vicinity as exact as possible through existing maps or site originals, and should include such items as latitude and longitude, township/range, roads, directions and other items used in locating the site. The Plan View illustrates the proposed activity from a view of above, and should include such items as water marks, location of structures, dimensions, and other items used in describing the site's structural make up and plan of construction. The Elevation View should represent the water elevations, water depths, high water marks, and other items needed in describing the dimensions of the varying elevations of the project site (Environmental Laboratory / USACE). These illustrations can be very detailed and should have the assistance of a professional in development, who may already possess customized versions of each map or view (Appendices 5-7).

Alabama Department of Environmental Management (ADEM)

The second regulatory agency commonly involved in the water development process is the Alabama Department of Environmental Management (ADEM). ADEM enforces any and all regulations and laws affecting the state of Alabama's environment in order to protect the State's environment and citizens. Also, ADEM constantly monitors the State's environmental status and makes recommendations on revisions needed to existing state laws and regulations as environmental status changes.

For the needs of this study, the Permit Coordination and Development Division (PCDD) and the Water Division (WD) will be discussed and the steps required by both divisions during the site selection and construction approval processes for water in Alabama will be included. The PCDD communicates all pertinent application and project standings to the proper divisions involved for each program area. For example, a permit for drainage alteration for an existing water body would first reach PCDD, then would be referred and coordinated to the appropriate division for approval, denial, or monitoring procedures, in this case the WD. The environmental permit is the main tool that ADEM will use to regulate emissions into the air and water, assure the quality of drinking water, and oversee the management of solid and hazardous wastes. The permits sent to ADEM by the site planner will again, first be reviewed by the PCDD and then be directed to the appropriate program areas. When applying for a site approval permit, the destination of acceptance should be understood because failing to do so can cause major time loss in the project's review.

The Water Division (WD) is the other division that will be heavily involved in the permitting process for the proposed recreational water site. The WD constantly evaluates the current and projected status of waters in the state of Alabama. The WD adheres to the Clean Water Act as does the USACE; however, the two agencies work in conjunction under separate sections of the Act. The WD uses section 401 Water Quality Certifications in conjunction with the Section 404 permits used by the Mobile and Nashville Districts of USACE when considering potential site approval.

The main disparity between Sections 404 used by USACE and Section 401 used by ADEM is that the 404 permits address more of the actual construction and design of the proposed water site, while the 401 certifications emphasize the actual water quality of the proposed site. To basically understand how USACE and ADEM work in conjunction with Clean Water Act, remember that USACE approves the actual construction process of the proposed site and ADEM certifies that the quality of water and effects on Alabama waters resulting from that site are acceptable. Section 401 of the Clean Water Act requires that certain activities have a State water quality certification. The WD of ADEM will issue certification, when there is reasonable assurance that the discharges of the proposed water site will not violate the water quality standards under Section 303 of the Clean Water Act and Title 22 of the Code of Alabama 1975 (ADEM).

When evaluating water projects, the ADEM Field Operations Division--Water Quality Program, Chapter 335-6-12 is a great tool to utilize to learn the requirements of water quality standards, definitions, and programs considered by ADEM. The Water Quality Program Chapter's purpose is to establish a comprehensive statewide program for stormwater management pursuant to the requirements of the National Pollutant Discharge Elimination System (ADEM, NPDES). This material can be obtained through ADEM with ease and should be used by prospective site planners.

Application forms required are site and activity/use specific. Consultation should be obtained by the site owner with either the project planner or the Field Operation Division of ADEM before the project commences. Several forms and registrations needed by ADEM for the recreational site are presented in Appendices 7-9. The Field Operation Division will be able to assist site planners with the proper forms for each activity/use. For example, a flooded timber area utilized for hunting would require separate registration and monitoring forms than a 40-acre site used for sportfishing, which would have greater water depths and larger run off potential. If a project site's activities and uses do not accommodate standard best management practices regulated through ADEM, alternative measures regarding

best management practices could be required. Examples of this situation could be improper drainage, discharge, or improper materials used in filtering discharge, such as pipes and rocks.

Again, the primary concern of ADEM with recreational waters regards actual and potential discharge into Alabama waters. Sites are monitored periodically for adherence to regulations and water quality management practices. Like with USACE, ADEM is present to preserve and protect Alabama's waters and citizens.

ECONOMIC ANALYSIS AND FEASIBILITY

Scenario I: Costs and Budget

Costs and returns for the 40-acre sportfishing lake addition to an existing recreational facility are based on the site specific examples identified in this study. Management and budget analysis are based solely for the uses in this project and could vary considerably for other projects. Thus, readers should adjust entries to represent their property and situation.

The investment and operating costs of the project are shown in Table 1. The initial capital costs were assumed to be satisfied through personal equity. The cost of lake construction was \$1,500 per acre, and the engineering fee of \$7,500 included all except one of the registration and permitting fees.

All operating cost remained constant throughout the life of the project and exclude assumptions of future inflation. The sales assumptions were based on other outdoor activities sales and marketing records during the past 23 years at the project site facility. Feed cost were based on a 4-month cycle of two feedings per day and a 2-month cycle of one feeding per day of approximately 7 pounds of feed per feeding, or approximately 3,780 pounds total per year. Fertilizer application was based on recommended practices of liquid based fertilizer. There were seven applications of 200 pound units of fertilizer prescribed from March to October per year. Insurance was liability based, providing \$1,000,000 of coverage per occurrence with two occurrences allowed annually. (Note: Recreational water that is not in a farm setting and is non-income producing can usually be covered by general home owners insurance.) Maintenance cost includes general upkeep and feed and fertilizer application. Labor cost includes overall daily management practices on the site when customers are present, sales and booking, and marketing with the person(s) shared with the existing operation. Property taxes are based on the land's market value (\$1,800 per acre) at a 10 percent assessment rate for a 2,300 acre tract of rural property and a local 51 millage rate. The sportfishing lake represents approximately 6 percent of the facility's outdoor recreation income and is therefore allocated approximately 6 percent of the property taxes for the specified tract of rural land. Advertising costs were assumed to be 6 percent of the facility's total outdoor recreation advertising budget.

Federal income taxes will vary depending on the level of taxable income and the nature of the sportfishing entity's legal business status as a limited liability company, corporation, partnership, or as a sole proprietorship. Sales taxes also fluctuate depending on the county of the state in which the project is located. Thus, all federal and state income taxes were excluded from this analysis but can be simply added to Tables 3 (Scenario 1) or 4 (Scenario 2), for analysis purposes.

Fishing memberships were provided for \$700.00 per day per boat and were held constant throughout the life of the project (See Tables 1 [Scenario 1] and 2 [Scenario 2]). Memberships were assumed to start in the fourth year of the project. Fishing trip sales were expected from existing ad campaigns in outdoor publications, the facility's web site traffic, and individual mailings to the facility's existing customers and members. An existing customer or member was recognized as someone who has personally visited the case study facility, joined as a member in the past, or has specifically requested information regarding outdoor recreation at the facility. The maximum number of fishing trips per season was defined to be 90, which includes two members per trip. A typical booking rate of 85 percent per year, 77 trips, is held constant throughout the life of the project for the base analysis.

TABLE 3. PROJECTION OF THE NET CASH FLOWS FOR A 40-ACRE SPORTFISHING LAKE THAT IS AN AMENITY TO AN EXISTING RECREATIONAL FACILITY, 15-YEAR PLANNING HORIZON, ALABAMA, 2006

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Operating Receipts				53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Terminal Value															
Total Cash Inflow				53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Initial Outlay	-72,985														
Operating Expense	3,372	10,447	43,182	46,382	29,882	29,882	29,882	29,882	29,882	29,882	29,882	29,882	29,882	29,882	29,882
Financial Expense															
Depreciation															
Recurrent Cost				2,500						2,500					
Taxable Income															
Income Taxes															
Total Cash Outflow	-76,357	-10,447	-43,182	46,382	32,382	29,882	29,882	29,882	29,882	32,382	29,882	29,882	29,882	29,882	29,882
Net Cash Flow	-76,357	-10,447	-43,182	7,518	21,518	24,018	24,018	24,018	24,018	24,018	24,018	24,018	24,018	24,018	24,018

TABLE 4. PROJECTION OF THE NET CASH FLOWS FOR A 40-ACRE SPORTFISHING LAKE STARTUP WITH A 15-YEAR PLANNING HORIZON, USING BORROWED CAPITAL FOR CONSTRUCTION AND INITIAL COST PURPOSES, ALABAMA, 2006

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Operating Receipts				53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Terminal Value															
Total Cash Inflow				53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
Initial Outlay	-72,985														
Operating Expense	25,918	32,993	57,728	60,928	44,428	44,428	44,428	44,428	44,428	44,428	44,428	44,428	44,428	44,428	44,428
Financial Expense	8,165	7,818	7,740	7,062	6,651	6,216	5,757	5,271	4,757	4,213	3,639	3,031	2,388	1,709	990
Depreciation															
Recurrent Cost					2,500					2,500					
Taxable Income															
Income Taxes															
Total Cash Outflow	-107,068	-44,811	-65,178	-67,990	-53,579	-54,644	-50,185	-49,699	-49,185	-51,141	-47,067	-47,459	-46,816	-46,137	-45,418
Net Cash Flow	-107,068	-40,811	-65,178	-14,090	321	3,256	3,715	4,201	4,715	2,759	5,833	6,441	7,084	7,763	8,482

By allowing an extended production cycle and providing substantial feeding sources in the way of forage fish, the F – 1 Tiger Bass were expected to increase in size at a rate of 2.2 pounds per year or greater until leveling off in excess of 14.0 pounds. Also, by limiting the amount of fishing pressure on the resource, harvest numbers should increase compared to waters open to the public that can be fished daily by high volumes of people. Expected catch per person per day ranged from 25 to 75 fish, based on similar sportfishing lake harvest records for already established operations with similar management practices in place (Smith, 2005).

Scenario II: Costs and Budget

The 40-acre start-up operation assumes that \$138,000 was borrowed at a 5.75 percent interest, with closing costs being 2.5 percent of the loan, approximately \$3,450. The borrower is responsible for 20 percent of up-front funds and all financial and closing costs (See Tables 2 and 4). Also, labor and advertising costs are no longer shared with the on-going recreational facility. Thus, the labor outlay is increased to \$25,000 and advertising goes to \$5,000 per year. Property taxes are estimated for 100 acres (40 acre lake plus 60 acres for run-off area) at 51 mills and a value of \$1,800 per acre with a 10 percent assessment rate.

The 40-acre sportfishing lake start-up mimics the management practices and cost schedules of the 40-acre sportfishing scenarios added as an amenity to an on-going recreational operation. This scenario required the borrowing of capital to address the initial capital cost and operating cost during the first four years of the project. Closing costs were amortized over the life of the loan. The advertising cost provides ad space in two outdoor publications to be run five times per year, approximately \$3,800, and site brochures and literature, approximately \$1,200 per year. (See Table 2).

Scenario I: Economic Analysis

The 40-acre sportfishing lake addition to an existing outdoor recreational facility was evaluated using Net Present Value (NPV) and Internal Rates of Return (IRR) methods. NPV and IRR methods are effective for evaluating the feasibility of multiyear projects having varied annual inflows and outflows which need to be adjusted or discounted to represent the time value of money; that is, a dollar received today is worth more than a dollar received in the future. If $NPV=0$, the return just equals the defined cost of capital or discount factor. Alternatively, the IRR is the discount rate that will exactly equate the present value of inflows with the present value of outflows. If NPV is positive, the project covers the defined discount factor plus the present value of the indicated amount and the IRR is higher than the discount factor used.

The net present value at a 12 percent discount rate was \$ -14,056 and therefore lacked feasibility at this level (Table 5). However, with a rate of 8 percent, the net present value was \$14,718 and was acceptable to the firm. By accepting the net present value at 8 percent, the manager would be willing to engage in the 40-acre sportfishing addition project. The net present value relays to the manager that the project will not only meet the firm's desired rate of return at 8 percent but will also give the project an additional worth of \$14,718 present value above that defined rate of return. The internal rate of return (IRR) for the 40-acre scenario was 9.8 percent. This rate informs the manager that construction of the project should not take place if the manager believes that the opportunity costs for equity and management time and effort plus potential inflation and risks are greater than 9.8 percent.

A sensitivity analysis of NPV and IRR to percentage of defined use capacity was conducted. At 90 percent (81 visits) of the assumed number of visits (90 visits), the IRR was 12.9 percent and at 95 percent (86 visits) of the assumed number of visits, it was 16.4 percent. Thus, as would be expected, development and maintenance of the clientele base is extremely important to the feasibility of the operation. Note that in this scenario, these rates must be sufficient to cover the opportunity cost of management and capital plus levels of inflation and risk which have not been included in costs estimates.

TABLE 5. CASH INFLOWS, NET PRESENT VALUES (NPV), AND INTERNAL RATES OF RETURN (IRR) FOR A 40-ACRE SPORTFISHING LAKE WITH AND WITHOUT BORROWED CAPITAL IN ALABAMA, 15 YEAR PLANNING HORIZON, 2006

Year	Scenario 1	Scenario 2
	Equity Capital	Borrowed Capital
	Cash Flow ¹	Cash Flow ¹
1	-76,357	-107,068
2	-10,447	-40,811
3	-43,182	-65,178
4	7,518	-14,090
5	21,518	321
6	24,018	3,256
7	24,018	3,715
8	24,018	4,201
9	24,018	4,715
10	21,518	2,759
11	24,018	5,883
12	24,018	6,441
13	24,018	7,084
14	24,018	7,763
15	24,018	8,482
Total	136,730	-178,577
NPV 12%	-14,056	-167,611
NPV 8%	14,718	-172,911
IRR	0.098	—

¹Before income tax

Scenario II: Economic Analysis

The 40-acre sportfishing lake start-up using borrowed capital illustrates a lack of feasibility at 85 percent use capacity and 8 percent and has a NPV of \$-172,911 (See Table 5). Thus, the manager would reject addition of a 40-acre sportfishing lake given defined parameters. Feasibility would not change if use was increased to 100 percent of defined capacity (90 visits); NPV is still \$-95,032 at 8 percent. Even if the owner contributed \$10,000 per year personal value for years 4 to 15 for use by family and friends, the NPV would still be negative at \$-18,988. However, at 6 percent, the NPV is \$951, which represents a 6.1 percent internal rate of return.

In practical terms for feasibility, this means the 40-acre start-up lake generates sufficient returns at 100 percent of defined capacity (including the \$10,000 imputed value for personal use for years 4-15) to cover investment and operating costs (including interest on the loan plus amortized closing costs) and gives a 6.1 percent rate of return. For feasibility,

the owner would decide whether this level was sufficient to cover the opportunity costs of owner equity and management time and effort plus inflation and risks.

DISCUSSION

This paper reviews the process and regulation requirements for transforming rural land into recreational waters and analyzes the economic feasibility of establishing such recreational waters for sportfishing use. The economic analysis evaluated a 40-acre sportfishing lake added as an amenity to an ongoing recreational facility and as a start-up operation. Process and regulation requirements and results discussed are site specific; however, they could be used as guidelines to evaluate other similar construction projects for planning purposes.

Two regulatory agencies—the United States Army Corps of Engineers and the Alabama Department of Environmental Management—are responsible for monitoring, regulating, informing, serving, and, in some cases, punishing those who improperly conduct construction projects of new and existing bodies of water in Alabama. Land owners are responsible for educating themselves on the proper guidelines and procedures set forth by the monitoring agencies. The agencies and land owners working together on proper management of water, best management practices, accurate site planning, excellent water quality controls, and sound construction procedures will ensure successful construction and use of recreational waters by private land owners.

The economic evaluation in this study indicates that addition of recreational sportfishing water to an existing outdoor recreation facility can be beneficial to the firm under certain conditions. By owning the land and using equity capital in the construction of the 40-acre sportfishing scenario, the firm manager would be willing to engage in the addition of sportfishing water to his/her existing operation. With other outdoor recreational activities already in place and generating income, the overhead costs can be shared and minimized for the sportfishing project. That is, the 40-acre scenario only absorbs its respective share of cost of advertising, labor, and property taxes compared to the other income-producing

ing activities the firm has in place. Also, by having an existing customer base, the firm reduces the risk and efforts associated with generating sufficient customer traffic to support the expected sales figures.

Without the synergistic relationships with the ongoing recreational facility, the start-up 40-acre sportfishing operation lacks feasibility. The financial returns could assist the land owner, who does not have other sources of income being generated on his/her land, with maintenance cost associated with the property, property taxes, or in providing supplemental income, but would not be sufficient to cover a defined 8 percent return. The need for borrowed capital has a significant adverse effect on the cash flows of the project.

Establishment of an intensively managed population of sportfish that is desired by the majority of the southeast population, and particularly Alabama residents, is necessary for success. Thus, customer or member participation is expected to meet sales expectations early in the life of the existing outdoor facility. Providing a private setting in which customers or members have the opportunity to harvest above-average catches and weights of fish also encourages customer or member participation more so than traditional forms of freshwater sportfishing. The specific type of sportfish used in this project also affords fisherman the opportunity to experience a more aggressive type of bass than is typically found throughout Alabama.

The analysis in this study can provide both outdoor recreationists and rural land owners with a basic understanding of the process and benefits of constructing recreational waters. Moreover, the analysis in this study demonstrates the economic returns that can be achieved by outdoor recreational facilities through the addition of sportfishing waters.

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APPENDIX 1. STEPS IN THE USACE APPROVAL PROCESS AND GUIDELINES AND INFLUENCES CONSIDERED BY USACE WHEN PERMITTING PROJECTS

The basic application form used by USACE throughout the country is the Engineer Form 4345, Application for a Department of the Army Permit (Appendix 2). The form is easily accessible and can be obtained through downloading from the internet at www.usace.mil or can be acquired through one of the USACE regulatory offices. As previously mentioned, certain activities/uses have already been authorized by nationwide or regional permits, and will need no further approvals. In this situation, USACE would likely inform the planner to commence activities under a Region (RWP) or National (NWP) permit, also referred to as a General Permit. Other activities/uses that are minor or routine in nature, such as inserting new pipes and pumps needed in the irrigation process on an existing farm, may qualify for a Letter of Permission (LOP). A LOP is usually issued for activities that are minimal in impacts and will likely have no public objections. The LOP can be issued quickly since public notification is not required (USACE).

The Individual Permit can be issued in one or two ways. The first, mentioned above, is the Letter of Permission (LOP) and, the second is through a Standard Permit (SP). The SP is a more intensive process of approval and requires more measures to be taken by the owner. A recreational lake of approximately 40 acres in size, on private land in Alabama will be used for an example in the consultant proposal (Appendix 3)

Below are the standard procedures for a SP listed in the order of the review.

I. Pre-application consultation:

- This step is optional, as mentioned previously, but highly is recommended. An applicant can simply contact the USACE engineer in his/her district to schedule a consultation.

II. Applicant/Planner submits ENG Form 4345 to the local regulatory office:

- Local offices can have minute variations for submission.

III. Application received by USACE :

- USACE will assign the project an identification number; the ID number is what the applicant/planner will need to use when checking the status of the application.

IV. Public notice issued:

- This notice is to be issued by USACE within 15 days of receiving all permit information from the applicant, including drawings, fees, and applications.

V. Comment Period:

- The comment period typically takes place within 15 to 30 days after notices of potential site construction have been served, yet it is dependent upon the proposed construction activities.

VI. Proposal review:

- The proposal for planned activities/uses will be reviewed by USACE. This review observes all permit request information and could be delayed if that information is not received in a timely manner.

VII. USACE considers all comments:

- This point of the process is when USACE considers reviews from all relevant “interested” groups such as, adjoining land owners, engineers, or office of public health, for example.

VIII. Other Federal agencies consulted:

- This step is only used if USACE deems it necessary. Example: applicant has been denied previously for a certain construction activity due to Federal or State Law.

IX. District engineer may ask for additional information:

- Depending on the proposed activities, USACE could require wetlands/waters delineation, alternative analysis, mitigations, endangered species impacts, drawings or minimization plans (Appendix 4).

X. Public hearing:

- Public hearings are held to acquire information and give the public the opportunity to present opinions. These meetings are rarely needed, and can usually be resolved informally by the district engineer.

XI. District engineer decision:

- The district engineer will either issue the permit for construction or deny the site and advise the applicant on reasoning.

APPENDIX. 2. APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT <i>(33 CFR 325)</i>	OMB APPROVAL NO. 0710-0003 Expires December 31, 2004
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The public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
--------------------	----------------------	------------------	-------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE <i>(an agent is not required)</i>
6. APPLICANT'S ADDRESS	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business	10. AGENT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE	DATE
NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY	

12. PROJECT NAME OR TITLE *(see instructions)*

13. NAME OF WATERBODY, IF KNOWN <i>(if applicable)</i>	14. PROJECT STREET ADDRESS <i>(if applicable)</i>
15. LOCATION OF PROJECT _____ COUNTY _____ STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN *(see instructions)*

17. DIRECTIONS TO THE SITE

18. Nature of Activity *(Description of project, include all features)*

19. Project Purpose *(Describe the reason or purpose of the project, see instructions)*

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled *(see instructions)*

23. Is Any Portion of the Work Already Complete? Yes _____ No _____ IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

*Would include but is not restricted to zoning, building and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE _____
SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals, or covers up any trick scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

APPENDIX. 3. EXAMPLE CONSULTANT PROPOSAL



630 Colonial Park Drive
Suite 200
Roswell, Georgia 30075
P 770.998.7848 • F 770.998.5000
www.ecologicalsolutions.net

August 29, 2003

Mr. [REDACTED]
[REDACTED]
[REDACTED]
Tuskegee, Alabama 36083

RE: Proposal for Section 404 Waters/Wetland Individual Permit
Construction of Proposed Recreational Ponds
Tuskegee, Alabama
ES Proposal #90999-136

Dear Mr. [REDACTED]:

Ecological Solutions, Inc. is pleased to submit this proposal for Section 404 waters/wetland Individual Permitting for the proposed construction of multiple, eight to twelve-acre recreational ponds within the property boundaries of [REDACTED] in Tuskegee, Alabama. This proposal contains our understanding of the background information, scope of services, fee estimate, and schedule. The scope of services is separated into two phases, consisting of field studies and permitting. The permitting phase will not be initiated until we have discussed with you the wetlands/waters limits and its effect on the project.

Background Information

Based on recent telephone discussions, we understand that [REDACTED] is evaluating numerous potential pond sites to supplement/enhance [REDACTED] full-service hunting, shooting, and recreational resort by providing additional recreational amenities. We understand that up to ten sites are being evaluated and the ponds will encompass approximately eight to twelve acres each.

Due to the nature of pond construction and based on the topographic maps provided, impacts are likely to occur to aquatic features on the property. These aquatic features are considered "waters of the United States." Construction activities within waters of the U.S. are regulated by the U. S. Army Corps of Engineers (USACE) under the Clean Water Act (33 U.S.C. 1344). While certain types of minor activities may be eligible for permitting under the Nationwide Permit (NWP) program, applicable NWP's only allow up to ½ acre of jurisdictional waters/wetlands impacts and 300 linear feet of stream impacts for single and complete projects. Impacts in excess of these thresholds require an Individual Permit (IP). Ecological Solutions recently discussed (in general) pond construction projects with the USACE to determine if an activity-specific regional permit would apply to this project or if the activities would qualify under an agricultural exemption. However, our conversations confirmed that neither of these two alternatives would apply, thereby requiring an Individual Permit for this project.

APPENDIX 4. EXAMPLE CONSULTANT PROPOSAL

Mr. [REDACTED]
August 29, 2003
[REDACTED]



An IP requires a wetlands/waters delineation and may require endangered species and cultural resources surveys, and detailed discussions concerning project purpose/need, alternatives analysis, avoidance/minimization, and compensatory mitigation. Furthermore, a public notice and comment period and coordination with other state and federal agencies is required. Within the Mobile District, the IP process typically requires six to nine months to complete providing favorable review by the agencies. Ecological Solutions' Scope of Services provided below contains the basic elements required to make application to the USACE for an IP.

1.0 SCOPE OF SERVICES

The scope of services provided below is separated into two separate phases. Field Studies and the IP application. Field studies will be conducted and wetlands/waters limits will be provided to the client to discuss potential permitting scenarios and to discuss the most practical and feasible alternatives. The Field Studies phase includes one meeting with White Oak Plantation to discuss these issues. Should [REDACTED] decide to proceed with permitting, Ecological Solutions will immediately initiate the second phase.

1.1 Field Studies (Phase One)**1.1.1 Wetland/Waters Delineation**

Waters of the U.S., including wetlands, are protected under Section 404 of the Clean Water Act, which is administered and enforced by the USACE. Our proposed scope of work for Task 1.1.1 includes delineating the extent, if any, of federal jurisdictional waters/wetlands within the six drainages depicted in the topographic maps provided. The following will be performed to accomplish the wetlands/waters delineation.

A team of biologists will conduct a field visit of the site. Studies to delineate jurisdictional wetlands and waters will be performed in general accordance with the three-parameter Routine Onsite Methodology described in the 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual*. This level of effort is generally required by the USACE to support 404 permitting, if required. Ecological Solutions, Inc. will perform the following:

- Mark wetland boundaries using "wetland boundary" plastic survey flagging. Flags will be labeled with sequential alpha-numeric designation corresponding to wetland area and flag number (example: A - 1). Each wetland boundary will be sketched on the available field map.
- Complete upland and wetland field data points forms for each separate jurisdictional system. Vegetation, soils, and hydrology will be documented on the data forms.
- Complete a sketch identifying jurisdictional systems found on the property and provide to client.
- Take representative photographs of each jurisdictional system.

A wetland survey will be required to locate the wetlands and reference them to known points/locations (i.e., boundary corners). An alternative to a wetland survey, and a method

██████████
August 29, 2003
██████████



generally accepted by the USACE, is the use of a global positioning system unit (GPS) having submeter accuracy for locating wetland flags. This optional task is provided below.

1.1.2 GPS Location of Wetlands/Waters

During field studies, wetland limits will be flagged and located using a Trimble ProXRS or similar model global positioning unit. Several benchmarks or reference points (locations to be provided by ██████████) will also be located to provide for accurate referencing. Collected points will be corrected and a map will be produced showing approximate wetland limits. This map and the data collected will be provided to the client, with the points being available for import into a G.I.S. system or AutoCAD drawing in order to evaluate potential pond sites and select areas that minimize jurisdictional impacts. Please note that the USACE Mobile District accepts GPS location for purposes of verification of the jurisdictional boundaries but wetlands/waters limits must be field located by a licensed surveyor prior to permitting. Our scope of services does not include field location of wetlands/waters limits.

1.2 IP Application (Phase Two)

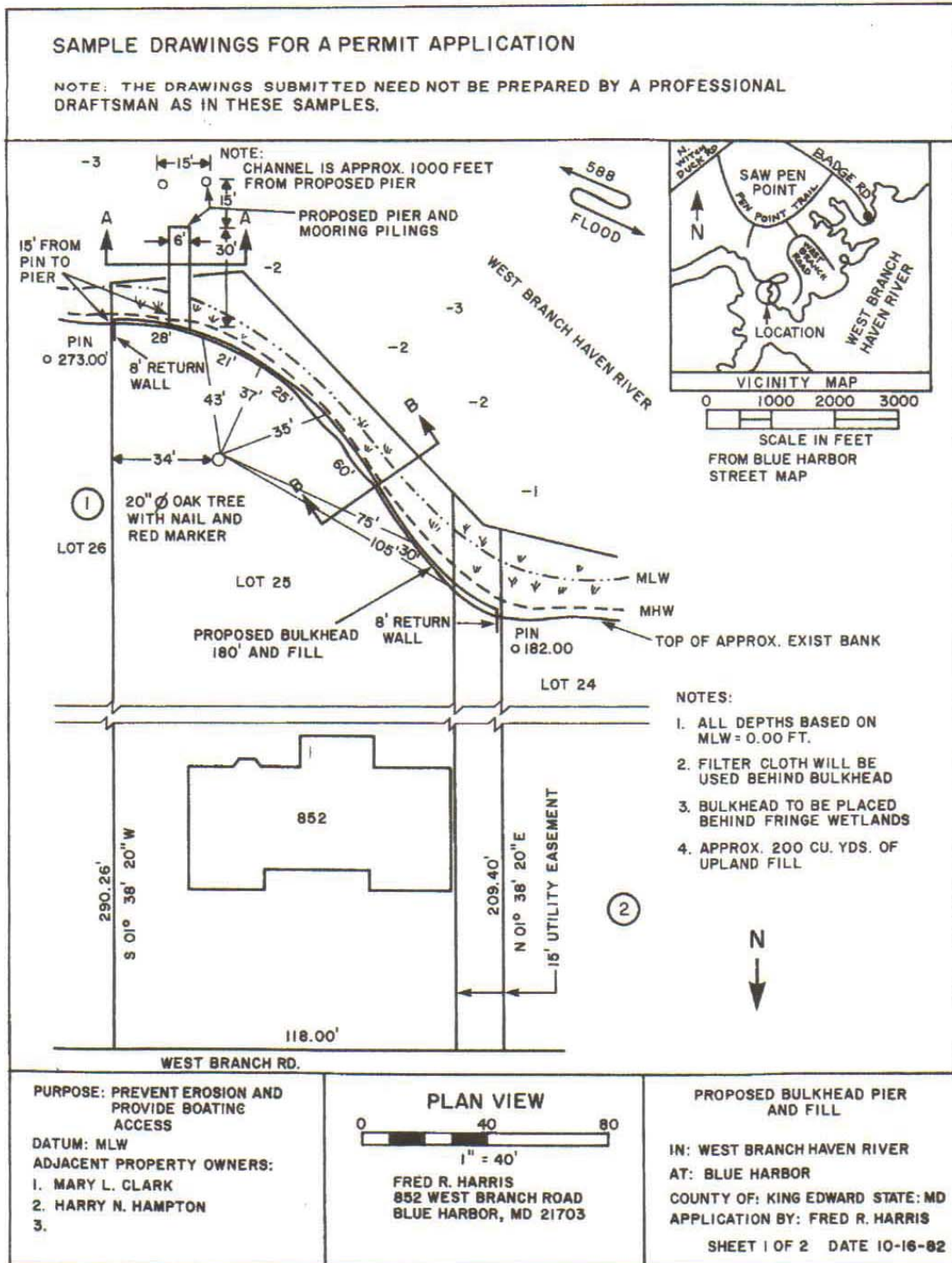
1.2.1 Alternatives Analysis

The IP process requires consideration of purpose and need, and alternatives to avoid and minimize wetland/stream impacts to the extent practicable. For unavoidable impacts, compensatory mitigation will be required. Based on planning, engineering, financial, and other site-specific information provided by your planner(s), and engineers, we will prepare an analysis of project alternatives that demonstrates the necessity to construct the development in the manner proposed. We anticipate this analysis will include drawings and supporting text outlining alternative configurations and the need to build the preferred alternative. We will also include a thorough discussion of your past experience and success with existing ponds and how they contribute to the overall success of ██████████ the demand for additional recreational ponds, and other pertinent information you may already have. We assume that supporting drawings will be provided by ██████████.

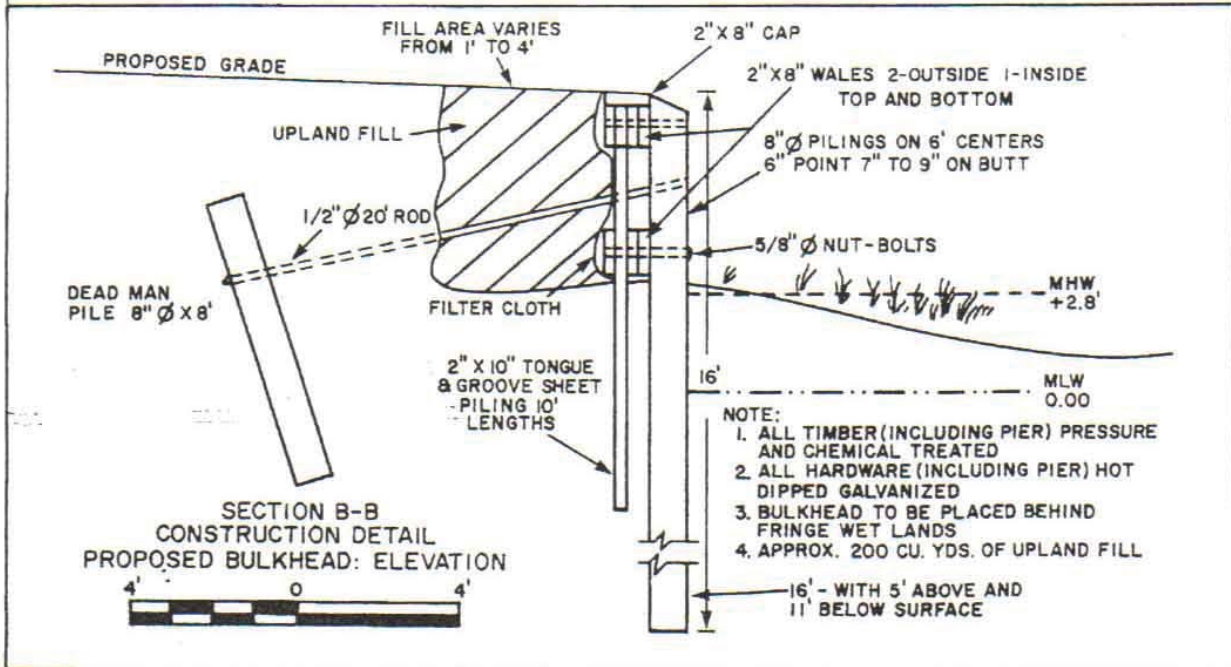
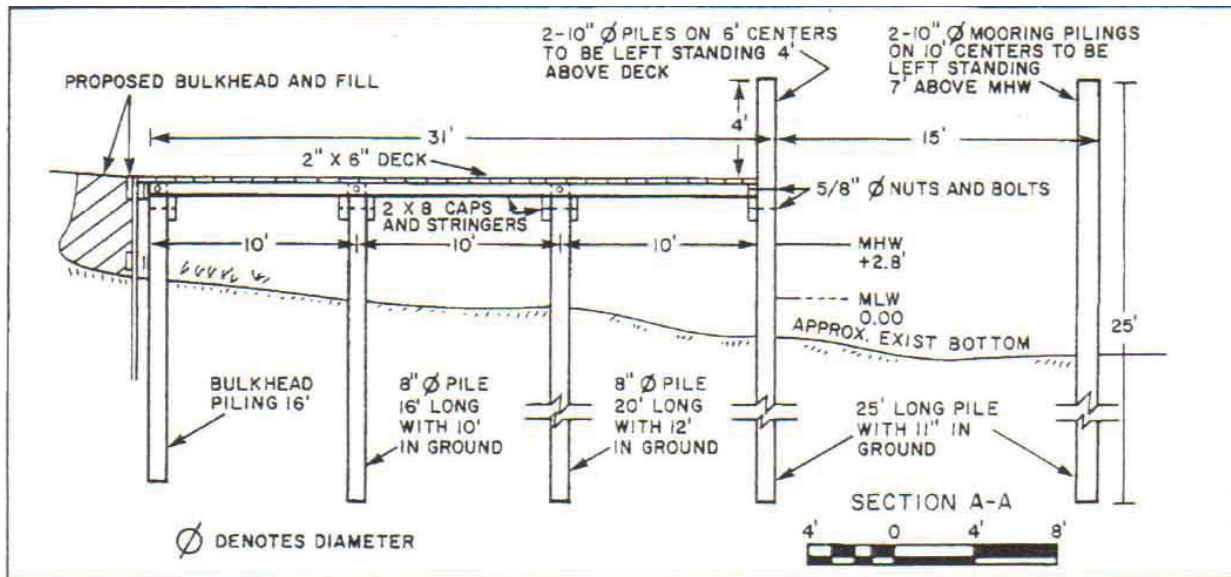
1.2.2 Mitigation Plan

Ecological Solutions will work closely with you to develop a mitigation plan describing activities to offset jurisdictional impacts from pond construction. Considering current land-use of ██████████ we will attempt to develop a plan for on-site mitigation provided that the client makes available other properties that contain potential wetland and stream mitigation sites. Ecological Solutions will assess up to three potential sites on the property and prepare a conceptual mitigation plan based on the site(s) available. This scope includes an assessment of proposed stream and wetland impacts, a mitigation plan description, and conceptual drawings of sufficient detail to complete the permitting process. We anticipate that the mitigation plan will include a discussion of comprehensive erosion control measures, monitoring protocols, and protective measures for waterways. Detailed construction drawings and hydrologic/hydraulic modeling may be required prior to mitigation implementation, but are not included in this scope.

APPENDIX. 5. SAMPLE DRAWINGS FOR A PERMIT APPLICATION

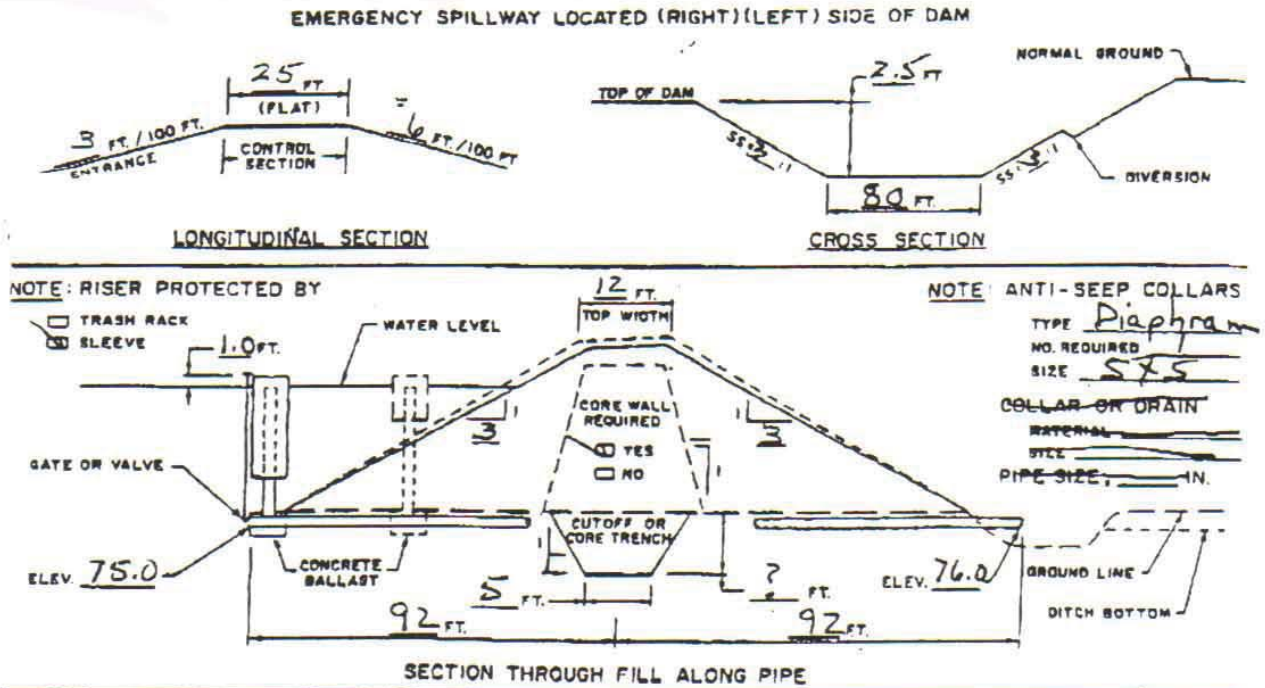


APPENDIX. 6. EXAMPLE SECTION VIEWS



<p>PURPOSE: PREVENT EROSION AND PROVIDE BOATING ACCESS</p> <p>DATUM: MLW</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. MARY L. CLARK 2. HARRY N. HAMPTON 3. 	<p>SECTION VIEWS</p> <p>FRED R. HARRIS 852 WEST BRANCH ROAD BLUE HARBOR, MD 21703</p>	<p>PROPOSED BULKHEAD PIER AND FILL</p> <p>IN: WEST BRANCH HAVEN RIVER AT: BLUE HARBOR COUNTY OF: KING EDWARD STATE: MD APPLICATION BY: FRED R. HARRIS</p> <p>SHEET 2 OF 2 DATE 10-16-82</p>
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APPENDIX 7. EXAMPLE EMERGENCY SPILLWAY LOCATION



NOTE: RISER PROTECTED BY TRASH RACK SLEEVE

NOTE: ANTI-SEEP COLLARS TYPE Diaphram NO. REQUIRED _____ SIZE 5x5

COLLAR OR DRAIN MATERIAL _____ PIPE SIZE _____ IN.

SECTION THROUGH FILL ALONG PIPE

Description of Bench Mark Screw in 24' oak stump 50' west of
End of Dam

TBM Elev. 104.54 Water Level Elev. 100.0 Spillway Elev. 101.0
 Top of Dam Elev. (Constructed) 104.5 (Salted) 103.5
 Surface Area 34 Ac. Max. Fill 26.5 Ft.

POND CAPACITY

Hill: $0.4 \times 34 \text{ Ac.} \times 23 \text{ Ft.} = 312.8 \text{ AF}$

Layers: _____ Ac. x (Max. _____ Ft. Min. _____ Ft.) / 2

Water Use multiple

Rel. No. _____

BILL OF MATERIALS

185	Ft. of 12 in. Smooth	Pipe
24	Ft. of 15 in. Smooth	Pipe
	Ft. of _____ in.	Pipe
1	in. x _____ Ft. Trash Rack	
1	24 in. x 15 Ft. Sleeve	
1	12 in. x 15 in. x 12 in. Tee	
1	8 in. Headgate or 8 in. Valve	
1	Diaphram Anti-Seep Collars 5 Ft. x 5 Ft.	
37.058	Cu. Yds. Embankment Fill	
Unknown	Cu. Yds. Cutoff Excavation	
2	Cu. Yds. Concrete for Ballast	
	(3 Ft. x 3 Ft. x 6 Ft.)	
3	Ac. Clearing	
1	in. x _____ Ft. Treated Post	

VEGETATION PLAN

Salvage and Spread Surface Soil Over the Dam, Spillway and Disturbed Areas, 3 Ac. Total

ITEM	TYPE	RATE	AMOUNT
Lime	<u>Agri</u>	2 Tn./Ac.	6 Tons
Fertl.	<u>15-15-15</u>	750 Lb./Ac.	2250 Lbs.
Seed	<u>Bahia</u>	50 Lb./Ac.	150 Lbs.
		Lb./Ac.	Lbs.
		Lb./Ac.	Lbs.
		Lb./Ac.	Lbs.
mulch	<u>any</u>	Tn./Ac.	3.5 Tons

Prepare Land 6 in. Deep After Lime and Fertilizer Are Spread.

Place Bahia Seed 3/4 in. Deep and _____ Seed _____ in. Deep.

oculate Legume Seed At Rate Specified On oculant Package.

Planting Date June Nov

Warrior stand

Lake 2

37,058 cu Fill

34 ac Lake

APPENDIX. 8. ADEM: EXAMPLE NOTICE OF REGISTRATION

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (ADEM)
FIELD OPERATIONS DIVISION NPDES STORMWATER PROGRAM**

NOTICE OF REGISTRATION (NOR)

THIS FORM IS TO BE USED FOR ADEM ADMINISTRATIVE CODE CHAPTER 335-6-12 - NPDES CONSTRUCTION, NONCOAL/NONMETALLIC MINING AND DRY PROCESSING LESS THAN FIVE ACRES, OTHER LAND DISTURBANCE ACTIVITIES, AND AREAS ASSOCIATED WITH THESE ACTIVITIES

PLEASE READ THE INSTRUCTIONS BEGINNING ON PAGE 3 OF THIS FORM CAREFULLY BEFORE COMPLETING. COMPLETE ALL QUESTIONS. RESPOND WITH "N/A" AS APPROPRIATE. INCOMPLETE OR INCORRECT ANSWERS, OR MISSING SIGNATURES WILL DELAY ACCEPTANCE OF REGISTRATION. IF SPACE IS INSUFFICIENT, CONTINUE ON AN ATTACHED SHEET(S) AS NECESSARY. ATTACH CBMP AND OTHER INFORMATION AS NEEDED. PLEASE TYPE OR PRINT LEGIBLY IN INK.

I. REGISTRANT INFORMATION Registration: Modification: Transfer: Re-Registration: AL _____

Registrant Name <i>DAVE DOE</i>		Facility/Site Name <i>BASS LAKE</i>		# of Years Coverage Requested:	
Responsible Owner/Operator or Official, and Title <i>DAVE DOE</i>			Site Contact and Title <i>JOHN DOE - ENVIRONMENTAL LAKES, INC</i>		
Mailing Address of Registrant <i>123 ELM ST.</i>			Site Street Address or Location Description <i>55 NORTH AVE</i>		
City <i>CITYVILLE</i>	State <i>AL.</i>	Zip <i>33111</i>	City <i>CITYVILLE</i>	State <i>AL</i>	Zip <i>33111</i>
Business Phone Number <i>555-444-3322</i>		Site Phone Number <i>555-555-1112</i>		Fax Number <i>555-555-1133</i>	
Responsible Official (RO) Street/Physical Address <i>SAME</i>			RO Phone Number		Email Address <i>JOHNDOE@XYZ.COM</i>
(If applicable) Registered Agent Name, Address, & Phone Number					

II. LEGAL STRUCTURE OF REGISTRANT

Corporation Individual Single Proprietorship Partnership LLC LLP Government Agency Other

Yes No If not an Individual or Single Proprietorship, registrant is properly registered and in good standing with the Alabama Secretary of State's office. If "No", please explain:

III. ACTIVITY DESCRIPTION & INFORMATION

County(s) *LAKE* Township(s), Range(s), Section(s) *SEC 18 & 19, T 10 NORTH, R 30E*

Directions To Site *7 MILES SOUTH OF CITYVILLE, AL, WEST ON HWY 1*

Yes No Is/will this facility:

(a) an existing site which currently discharges to State waters? (b) discharge to waters of or be located in the Coastal Zone?

(c) a proposed site which will result in a discharge to State waters? (d) be located on Indian/ historically significant lands?

IV. PROPOSED SCHEDULE - Used to determine potential registration duration & applicable fee amount, considering responses to Item VIII.

Anticipated Activity schedule: Commencement date: *6/20/05* Completion date: *8/20/05*

Area of the Registered site: Total site area in acres: *2,400* Total disturbed area in acres: *40*

V. VIOLATION HISTORY

Identify every Notice of Violation (NOV), Administrative Order, Directive, or Litigation filed by ADEM or EPA during the three year (36 months) period preceding the date on which this form is signed issued to the operator, owner, registrant, partner, parent corporation, subsidiary, LLP, or LLC Member. Indicate the date of issuance, briefly describe alleged violations, list actions (if any) to abate alleged violations, and indicate date of final resolution:

VI. MAP SUBMITTAL

VII. PROPOSED ACTIVITY(S) TO BE CONDUCTED

If Non-Coal, Non-Metallic Mining, Recovery, or Construction Material Management Site: Dirt-Chert Sand-Gravel Shale-Clay
 Crushed-Dimension Stone Other _____ Other _____ Other _____
 Primary SIC Code 1896 Brief Description Construction, Noncoal Mining, or Materials Management Activity:
CONSTRUCTION OF LOW LEVEL LAKE WITH ROAD

VIII. RECEIVING WATERS

List name of receiving water(s), latitude & longitude (decimal or deg,min,sec) of location(s) that run-off enters the receiving water, total number of disturbed acres, the total number of drainage acres which will drain through each treatment system or BMP, and the waterbody classification. **If receiving water is designated as ONRW and/or Tier 1 waterbody, attach/submit copy of CBMPP.**

Receiving Water	Latitude	Longitude	Disturbed Acres	Drainage Acres	Waterbody Classification	ONRW Y or N	TIER 1 Y or N
<u>Pretty Stream</u>	<u>N 23°</u>	<u>W 074°</u>	<u>3</u>	<u>100/110</u>	<u>FW</u>	<u>N</u>	<u>N</u>
	<u>20.245"</u>	<u>46.222"</u>					

IX. MODIFICATION & RE-REGISTRATION - CONTINUING EDUCATION & INSPECTION INFORMATION

Yes No Required inspections/monitoring by QCP/QCI have been performed and records retained. **If "No", explain:**

 List name(s) and designation/certification #s of QCPs/QCIs that performed required inspections/monitoring:

X. QUALIFIED CREDENTIALLED PROFESSIONAL (QCP) CERTIFICATION

"I certify under penalty of law that a comprehensive Construction Best Management Practices Plan (CBMPP) for the prevention and minimization of all sources of pollution in stormwater and authorized related process wastewater runoff has been prepared under my supervision for this site/activity, and associated regulated areas/activities, utilizing effective BMPs from the Alabama Handbook For Erosion Control, Sediment Control, And Stormwater Management On Constructions Sites And Urban Areas, Alabama Soil and Water Conservation Committee, as amended (ASWCC). If the CBMPP is properly implemented and maintained by the registrant, discharges of pollutants in stormwater runoff can reasonably be expected to be effectively minimized to the maximum extent practicable according to the requirements of ADEM Administrative Code Chapter 335-6-12. The CBMPP describes the pollution abatement/prevention management and effective structural & nonstructural BMPs that must be fully implemented and regularly maintained as needed at the registered site in accordance with sound sediment and erosion practices to ensure the protection of water quality."

QCP Designation/Description: BASS LAKE - ENVIRONMENTAL LAKE, INC.
 Address 55 NORTH AVE, CITYVILLE, AL. 33111 Registration/Certification _____
 Name and Title (type or print) JOHN DOE - VP Phone Number 555-555-1133
 Signature John Doe Date Signed 5/1/05

XI. OPERATOR - RESPONSIBLE OFFICIAL SIGNATURE

Pursuant to ADEM Administrative Code Rule 335-6-6-.09, this NOR must be signed by a Responsible Official of the registrant who is the operator, owner, the sole proprietor of a sole proprietorship, a general/controllering member or partner, a ranking elected official or other duly authorized representative for a unit of government; or an executive officer of at least the level of vice-president for a corporation, having overall responsibility and decision making for the site/activity. "I certify under penalty of law that this form, the CBMPP, and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the qualified credentialed professional (QCP) and other 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, correct, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment for knowing violations. I certify that this form has not been altered, and if copied or reproduced, is consistent in format and identical in content to the ADEM approved form. I further certify that the proposed discharges described in this registration have been evaluated for the presence of any non-construction and/or coal/mineral mining stormwater, or process wastewaters have been fully identified."

Name (type or print) DAVE DOE Official Title OWNER
 Signature Dave Doe Date Signed 5/1/05

APPENDIX. 9. ADEM: EXAMPLE FOD STORMWATER REGISTRATION TERMINATION REQUEST

ADEM FIELD OPERATIONS DIVISION – NPDES CONSTRUCTION, AND NONCOAL MINING LESS THAN 5 ACRES STORMWATER REGISTRATION TERMINATION REQUEST AND CERTIFICATION

RESPOND WITH "N/A" AS APPROPRIATE. FORMS WITH INCOMPLETE OR INCORRECT ANSWERS, OR MISSING SIGNATURES WILL BE RETURNED AND MAY RESULT IN APPROPRIATE COMPLIANCE ACTION BY THE DEPARTMENT. IF SPACE IS INSUFFICIENT, CONTINUE ON AN ATTACHED SHEET(S) AS NECESSARY. PLEASE TYPE OR PRINT IN INK.

Complete this form, attach additional information as necessary, and send report to the nearest ADEM office.

Item I.

Registrant Name		Facility/Site Name	
NPDES AL	County	Facility Contact and Title	
Facility Latitude & Longitude (decimal or deg,min,sec)		Facility Street Address or Location Description	
Township(s), Range(s), Section(s)		City	State Zip
Phone Number	Fax Number	Email Address	

Item II.

Yes No required inspections/monitoring have been performed and records retained. If "No", explain:

Yes No required inspections/monitoring were performed by a QCI, QCP, or qualified person under the direct supervision of a QCP. If "No", attach required Continuing Education Greenfield Fee, and explain:

Item III.

Yes No All regulated activity authorized by this registration at this facility has been completed, construction/industrial effects removed, solid waste/debris properly disposed, all disturbed areas have been fully reclaimed, suitably stabilized, or perennial vegetative cover established, and stormwater discharges do not represent an adverse impact to water quality.

Yes No Permittee no longer has operational control of the facility or legal responsibility for the site, this registration only provides coverage for a part of a phased project or a part of a larger common plan of development or sale. In order for this termination request to be granted, the Name, Phone Number, and Address of the succeeding responsible operator(s) must be listed:

If "No" attach Inspection Report and BMP Certification [and if conducted, any photographs or monitoring results], and explain:

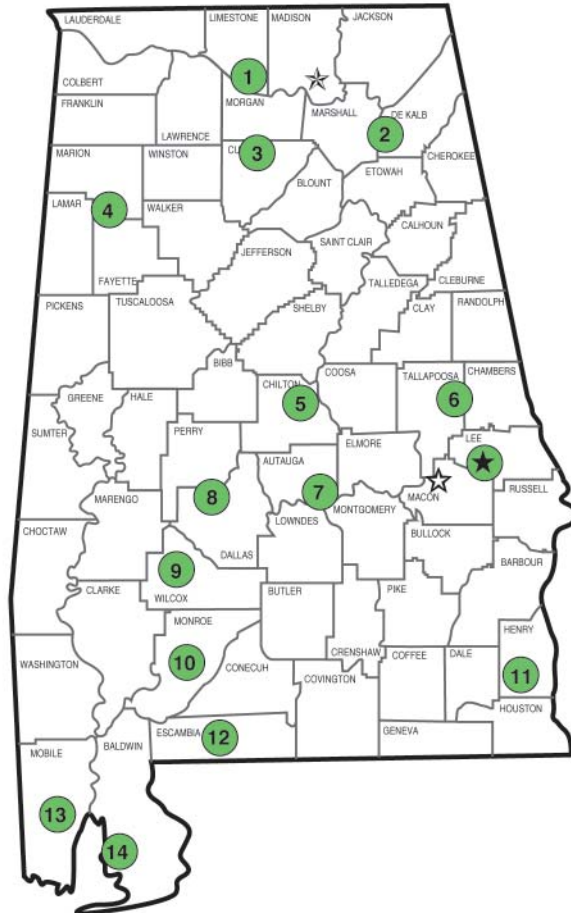
"I understand that discharging pollutants in storm water associated with regulated activity to waters of the State that is not authorized by NPDES registration coverage is a violation of State law. I also understand that the submittal of this request for termination does not release the operator from liability for any violations of this registration, ADEM Administrative Code Chapter 335-6-12, or other ADEM rules until a complete and correct request for termination of the registration is received by the Department. I understand that the registrant, operator, owner, developer, contractors, home builder(s), property owners association, etc., separately or collectively, must retain coverage for subdivision developments or other phased developments until all disturbance activity, including individual home construction, is substantially complete. Coverage for mines or borrow pits must be retained until all disturbance activity is reclaimed or protection of water quality is assured. I understand that should an inspection or complaint reveal significant noncompliance with ADEM rules, an environmental problem related to the discharge of stormwater from the site or that incorrect information has inadvertently been provided, implementation of remedial measures may be required, to include resubmittal of the NOR and subsequent re-registration in order to correct any deficiencies, comply with federal stormwater permitting requirements, and provide for the protection of water quality. 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 fines and imprisonment for knowing violations."

Name & Designation of QCP	Signature	Date
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Name & Title of Registrant Responsible Official	Signature	Date
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Alabama's Agricultural Experiment Station AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the state has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

- ★ Main Agricultural Experiment Station, Auburn.
- ☆ Alabama A&M University.
- ☆ E. V. Smith Research Center, Shorter.

- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Tennessee Valley Research and Extension Center, Belle Mina. 2. Sand Mountain Research and Extension Center, Crossville. 3. North Alabama Horticulture Research Center, Cullman. 4. Upper Coastal Plain Agricultural Research Center, Winfield. 5. Chilton Research and Extension Center, Clanton. 6. Piedmont Substation, Camp Hill. 7. Prattville Agricultural Research Unit, Prattville. | <ul style="list-style-type: none"> 8. Black Belt Research and Extension Center, Marietta. 9. Lower Coastal Plain Substation, Camden. 10. Monroeville Agricultural Research Unit, Monroe. 11. Wiregrass Research and Extension Center, Hearns Creek. 12. Brewton Agricultural Research Unit, Brewton. 13. Ornamental Horticulture Research Center, Springdale. 14. Gulf Coast Research and Extension Center, Fairhope. |
|---|--|