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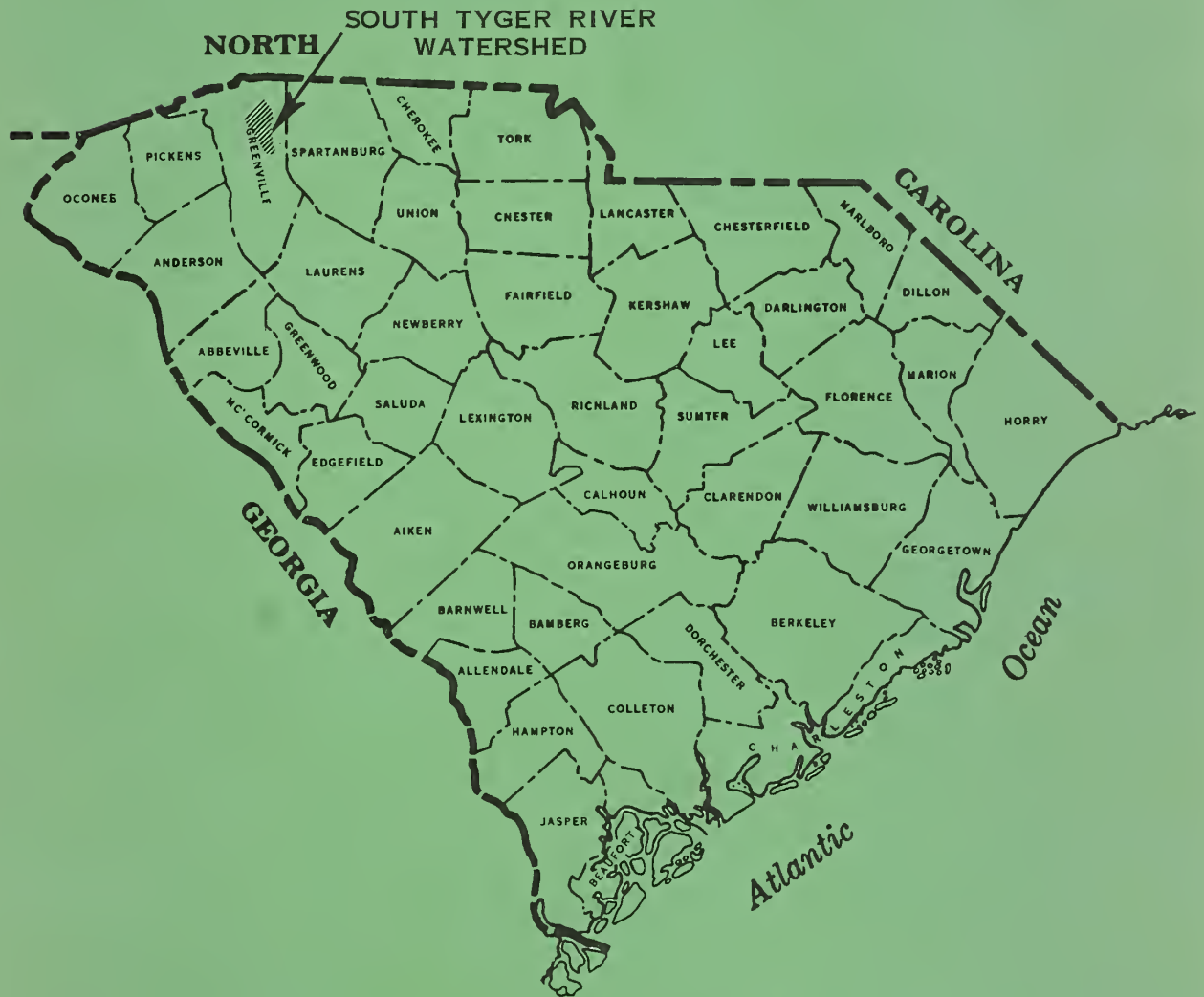
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# ENVIRONMENTAL IMPACT STATEMENT

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## SOUTH TYGER RIVER WATERSHED Greenville County, South Carolina



U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
AND  
FOREST SERVICE

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SOUTH TYGER RIVER WATERSHED PROJECT  
Greenville County, South Carolina

FINAL ENVIRONMENTAL IMPACT STATEMENT

George E. Huey, State Conservationist  
Soil Conservation Service

Sponsoring Local Organizations

South Tyger River Watershed Conservation District  
Box 10328, Federal Station  
Greenville, South Carolina 29603

Greenville County Soil and Water Conservation District  
Route 4  
Piedmont, South Carolina 29673

Commission of Public Works, City of Greer  
Greer, South Carolina 29651

December 1975

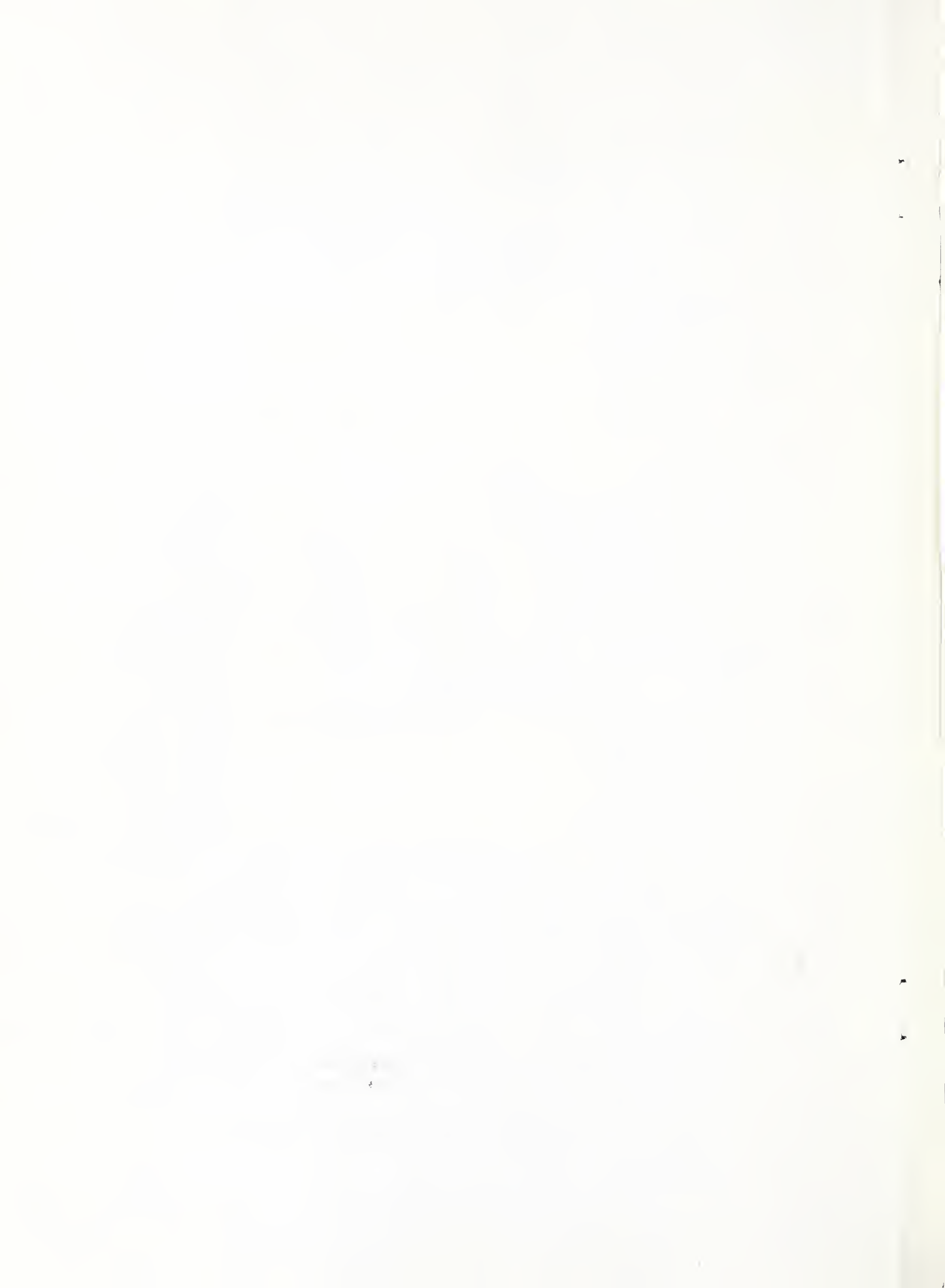
Prepared by

UNITED STATES DEPARTMENT OF AGRICULTURE  
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USDA SOIL CONSERVATION SERVICE  
ENVIRONMENTAL IMPACT STATEMENT

South Tyger River Watershed Project  
Greenville County  
South Carolina

Prepared in Accordance with  
Sec. 102(2)(C) of P.L. 91-190

Summary Sheet

- I Final
- II Soil Conservation Service
- III Administrative
- IV Description of Project Purpose and Action  
A revised project for watershed protection, flood prevention, municipal and industrial water storage, and recreation in Greenville County, South Carolina to be implemented under authority of the Watershed Protection and Flood Prevention Act (PL 566, 83d Congress, 68 Stat. 666), as amended.
- V Summary of Environmental Impacts  
The project work remaining to be done will reduce flooding, erosion, and sediment damages; provide municipal and industrial water supply for the city of Greer; provide increased recreational opportunities for residents and visitors in the area; and provide increased economic opportunities for improving per capita income. The structural measures will inundate 853 acres, temporarily flood 1,030 acres, and utilize a total area of 1,936 acres requiring 719 acres to be cleared of trees. The ambient air quality and water quality will be degraded for a short period during construction.
- VI List of Alternatives Considered  
A. Accelerated land treatment  
B. Land treatment, flood proofing, land use compatible with present flooding, and municipal and industrial water from other sources  
C. No project
- VII Comments have been received from the following agencies:  
S.C. Water Resources Commission (for the Governor)  
S.C. Division of Administration (State Clearinghouse)  
S.C. Appalachian Council of Governments  
U.S. Department of the Army  
U.S. Department of Health, Education, and Welfare  
U.S. Department of Commerce  
U.S. Department of the Interior  
Environmental Protection Agency  
Office of Equal Opportunity - USDA
- VIII Draft Statement Transmitted to CEQ on September 9, 1975





USDA SOIL CONSERVATION SERVICE  
FINAL ENVIRONMENTAL IMPACT STATEMENT 1/  
for  
South Tyger River Watershed  
Greenville County, South Carolina

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

South Tyger River Watershed Conservation District  
Greenville County Soil and Water Conservation District  
Commission of Public Works, City of Greer

PURPOSES AND GOALS

The purposes of the watershed project are to improve the economic conditions of the community, to protect and enhance environmental values, conserve the soil resource base, and improve living conditions for the residents of the community.

Goals for installing land treatment include a reduction of erosion on cropland to within tolerable limits for sustained production, reduced erosion and increased production on pastureland, improved hydrologic conditions and greater production on forest lands, a 75 percent reduction in soil loss from critically eroding areas, and an 80 percent reduction of off-site sediment damage. Goals for reducing floodwater damages include protection of flood plain land suitable for economic production of crops and pasture, a reduction of damage to roads, bridges, and other fixed improvements. Other goals include protection and improvement of fish and wildlife habitat, providing additional recreational opportunities and providing a dependable water supply to meet the projected needs in the year 2028.

1/ All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigations by the Soil Conservation Service and U.S. Forest Service, of the U.S. Department of Agriculture.

PLANNED PROJECT

Land Treatment Measures

The objectives of the South Tyger River Watershed are firmly tied to an intensive land treatment program which will reduce erosion and the rate of runoff. These measures are basic and must be properly installed and maintained if the project is to function as planned. The land treatment is based upon the findings obtained from standard soil surveys.

Conservation treatment systems will be installed on 1,200 acres of cropland scattered throughout the watershed during the project installation period reducing soil loss to within tolerable limits. At least two systems of treatment will be used. These systems are as follows:

System 1: A combination of terraces, grassed waterways, field borders, land leveling, stripcropping, contour farming, and conservation cropping systems.

System 2: A combination of grassed waterways, field borders, land leveling, contour farming, conservation cropping systems, and no-till planting.

All of the practices in System 1 and System 2 can be used together and with excellent results for conservation farming, but the land's capabilities will govern what practices should be employed and in what combination.

Other areas will receive partial treatment. About 150 acres of critically eroding cropland will receive special treatment during the installation period by the establishment of permanent grasses.

On pastureland, the major treatment system will include smoothing the land and pulling down and smoothing old terraces by special equipment, removal of undesirable forage and weeds by mechanical cutting and applying selected herbicides, planting improved grasses and legumes, and a balanced fertilization and liming program based on soil tests and treatment needs. Landowners using herbicides will be urged to follow the recommendations of the Clemson University Extension Service, a cooperating agency with the U.S. Department of Agriculture, and the regulations of the South Carolina Pesticide Control Act. Cross fencing will be installed where deemed necessary. During the installation period, an estimated 1,500 acres of pastureland will be adequately treated and additional areas will receive partial treatment.

On forest land, conservation practices will be installed that will improve hydrologic conditions. By manipulating stand compositions that create favorable conditions for the maximum production and

protection of litter and humus, a protective cover and an absorbent forest floor will develop.

Measures that create these favorable conditions include tree planting, timber stand improvement, thinnings, and protection of the forest floor from livestock grazing and wild fires.

To provide for proper installation and maintenance of these measures, forest management plans will be prepared and included as a part of conservation plans.

Forest measures to be installed during the installation period include 1,000 acres of hydrologic stand improvement and the stabilization of 200 acres of critically eroding forest land.

Special treatment, such as sloping roadbanks, mulching, and establishing grasses will be provided to stabilize 50 acres of critically eroding county roads.

Technical assistance furnished by the Soil Conservation Service and the South Carolina State Commission of Forestry, through its cooperative program, will play a major role in the application of land treatment measures. Most of the land treatment measures will be applied on private land by the landowner or operator through voluntary agreement with the soil and water conservation district. These measures are for reducing erosion, runoff, and sediment movement. After the original work plan was approved, the accelerated land treatment program began and about 80 percent of the planned measures have been applied. Areas remaining to be treated include 200 acres of cropland, 300 acres of pastureland, 300 acres of forest land, and 80 acres of critically eroding areas.

### Structural Measures

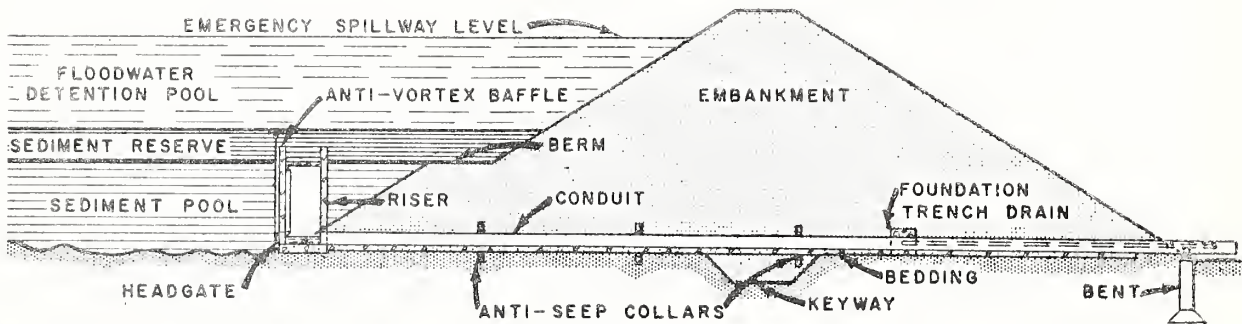
Three floodwater retarding structures (Sites 2, 4, and 5) and the channel work on Peck and Meadow Creeks have been installed. Structural measures yet to be installed include two floodwater retarding structures (Sites 3D and 6A), one multiple purpose structure (Lake Robinson), and basic recreation facilities. Installation costs of all structural measures are estimated to be \$6,302,600. Annual costs for remaining structural measures are shown in Appendix A. The locations of structural measures are shown on the Project Map (Appendix B).

The combined drainage area above all structures is 34,929 acres and is 91.5 percent of the watershed. The drainage areas above structures are:

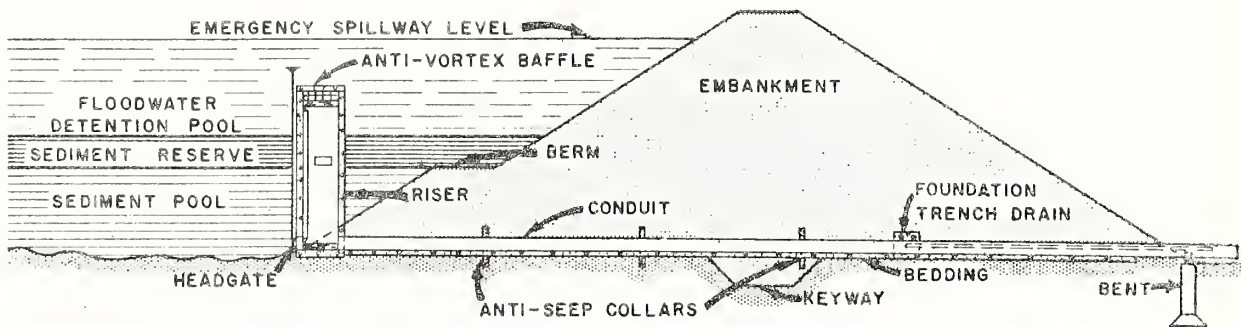
Structure 2	-	1,792 acres
Structure 3D	-	4,922 acres
Structure 4	-	1,767 acres
Structure 5	-	1,798 acres
Structure 6A	-	3,411 acres
Lake Robinson	-	31,518 acres

Structures 2, 4, and 5 provide 1,506 acre feet of floodwater detention and 294 acre feet for sediment accumulation.

Structures 3D and 6A will provide 2,530 acre feet of floodwater detention and 640 acre feet for sediment accumulation. The structures are designed for an effective life of 100 years. These structures consist of earthfill embankments and reinforced concrete principal spillways located on yielding foundations. Structure 2 is 29 feet high and 424 feet long; Structure 4 is 28 feet high and 665 feet long; and Structure 5 is 43 feet high and 628 feet long. Structure 3D will be about 43 feet high and approximately 570 feet long. Structure 6A will be about 31 feet high and approximately 640 feet long.



TYPICAL SECTION OF FLOODWATER RETARDING STRUCTURE, WITH SINGLE STAGE RISER



TYPICAL SECTION OF FLOODWATER RETARDING STRUCTURE, WITH TWO STAGE RISER

Principal spillways consist of reinforced concrete risers on the upstream side of the structures with reinforced concrete pipes, fitted with anti-seep collars, placed through the embankments. Structure 3D has a single stage riser, and Structures 2, 4, 5, and 6A have two-stage risers. The crest of the principal spillway of Structure 3D and

the crest of the low stage inlet of Structure 6A will be set at the 50 year sediment accumulation elevation. The crest of the low stage of the principal spillway riser for Structure 5 was constructed at the 50 year sediment accumulation elevation and for Structures 2 and 4 was constructed at the 100 year sediment accumulation elevation. The principal spillways outlet into deep excavated plunge basins at the end of the principal spillway pipes. Water flowing through the principal spillway plunges down into the pool dissipating much of its erosive energy.

The emergency spillways will be constructed in earth and vegetated. The crest elevations for the spillways of Sites 3D and 6A will be set at the 50 year frequency level and will have a two percent chance of operation in any year. The percent chance of operation of the emergency spillways for Structures 4 and 5 is four percent and for Structure 2 is two percent.

The Lake Robinson structure will include storage for 855 acre feet of sediment, 734 acre feet of recreation water, and 12,811 acre feet for municipal and industrial water. The minimum surface area of the recreation pool will be 250 acres. The surface area of the water supply pool will be 800 acres.

Reservoir operation studies of Lake Robinson using rainfall and runoff records for the years 1952 through 1956 were made to determine the yield. The drought of 1954 is one of the most critical on record for this area. The only other drought of this magnitude on record occurred in 1925.

The following table shows demand and minimum surface areas during a drought comparable to the one in 1954 for Lake Robinson:

<u>Demand</u> (mgd)	<u>Minimum Surface Area</u> (Acres)
5	787
10	760
15	715
20	653
25	570
30	468
35	295

Even during a drought, the pool fluctuation will be minor until the demand exceeds ten million gallons per day (mgd) which would occur in the fall or winter months. During normal years, the 32 mgd demand would reduce the surface from 800 acres to 595 acres. Enwright Associates, the engineering firm employed by the Commission of Public Works, City of Greer, projected the need for 8.7 mgd by 1980, 10.5 mgd by 1987, and 14.5 mgd by the year 2000. The need for 32 mgd

is not expected to occur until 2028.

Maximum elevations of pools are as follows: sediment pool - 860.0, recreation pool - 863.5, M&I pool - 889.0, and top of dam - 914.0.

The structure will consist of an earthfill embankment 77 feet high with a 90 foot concrete ogee spillway. The spillway crest will be set at the maximum surface elevation of the water supply pool. The spillway will outlet into a Saint Anthony Falls (SAF) type, energy dissipating basin. This basin creates a hydraulic jump (a turbulent, rapid rise in the water surface) which dissipates much of the water's erosive energy within the reinforced concrete structure. The concrete ogee spillway and SAF basin will be located on a non-yielding rock foundation. The upstream face of the earth embankment portion of the structure and the entrance channel to the ogee spillway will be riprapped over the area subject to wave action. A chimney drain for the non-concrete portion of the dam will be installed to reduce the potential for damage in the event of an earthquake.

A reinforced concrete riser will be constructed upstream from the ogee spillway and will be connected to the ogee spillway by a reinforced concrete pipe. A culvert opening will be voided through the ogee spillway section to allow the discharge flowing through the riser system to outlet on the downstream side of the ogee spillway. A headgate will be installed at the bottom of the riser to allow the reservoir level to be lowered for maintenance of the structure. Two gates will be installed on the riser to release M&I water downstream to Lake Cunningham where the Commission of Public Works, City of Greer has its municipal water treatment facilities.

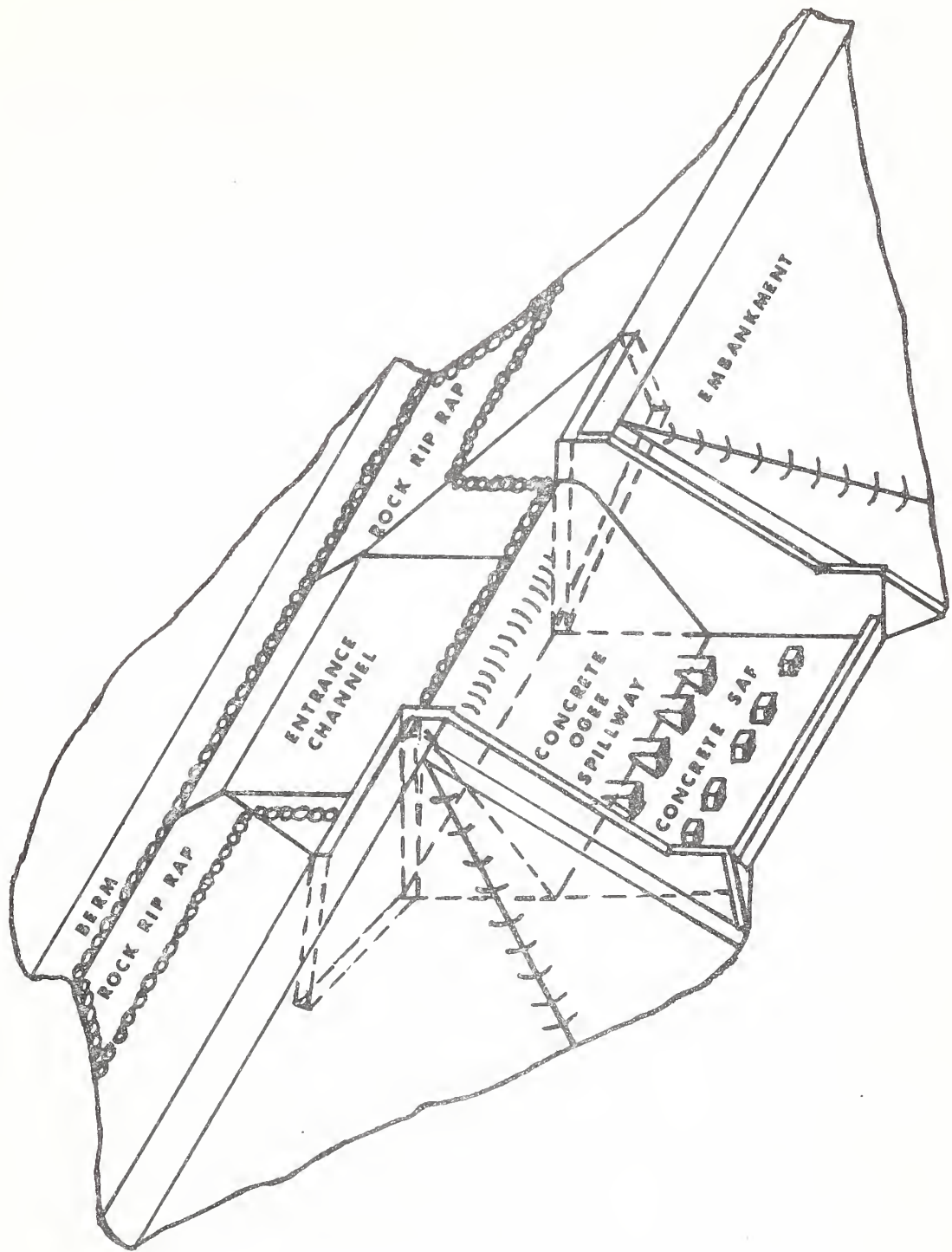
A dike approximately 820 feet long and 27 feet high will be constructed across a low saddle adjacent to the hill forming the right abutment. Its upstream face subject to wave action will be riprapped.

The channel banks below the SAF outlet will be riprapped for a distance of about 400 feet to prevent channel bank erosion. The ogee spillway and SAF outlet will be fenced to control access.

Material for all embankments will be obtained from areas near the structures or from excavated emergency spillways. Most of the borrow needed will be obtained from areas below the top of dam elevation.

The sediment pools of the structures will initially be filled with water but will gradually be replaced with sediment during the 100 year life of the reservoirs. The sediment pools of Sites 3D and 6A and the normal pool of Lake Robinson plus a strip 15 feet horizontally from the water's edge will be cleared of woody vegetation. The construction areas for structure embankments, emergency spillways, and borrow areas will be cleared and grubbed. A strip covered by the top 10 feet of M&I water in Lake Robinson will be grubbed to improve initial water quality. The total area to be cleared is 931 acres, consisting of 719 acres of forest and 212 acres of openland.

Vegetation suitable to the soils, site conditions, and intended uses will be established on the embankments, exposed borrow areas, and earth spillways. Plant species and the method of establishment



LAKE ROBINSON  
MULTIPLE PURPOSE STRUCTURE

will be specified in a vegetation plan prepared for each structure. Varieties of vegetation favorable to wildlife will be established in the borrow areas above the normal pools. The cleared strip along the edge of the pools will revegetate naturally.

Easements will be obtained to the top of dam elevation at Sites 3D and 6A and will include 313 acres. The installation of Lake Robinson will require land rights to be obtained on 1,623 acres. Fee title will be obtained on 1,146 acres and flowage easements will be obtained on 477 acres. (See Public Recreation Development Map.) The land to be purchased includes 800 acres for the normal pool and the remainder for the recreation development area, the construction area, and the recreation access strip around the normal pool.

The recreation area planned in conjunction with Lake Robinson will be located adjacent to the right abutment of the structure and will be accessible by paved road from State Highways 92 and 101. Recreation facilities and full public access will be provided. The recreation development will be in accord with the statewide plan. Facilities are shown on the Public Recreation Development Area Map and are listed in Table 2B.

Recreation facilities will include paved access roads, parking areas for cars and boat trailers, boat ramps, picnic tables, cast iron grills, underground waste receptacle units, picnic shelters, foot trails, and comfort stations. Plans for the recreation facilities are preliminary and may vary slightly in final design.

Paved roads and the car-boat parking areas in the recreation area will consist of one and one-half inches of asphaltic surface over a four inch crushed stone base. The width of the paved road surface will be 22 feet. The parking area for picnickers will be surfaced with four inches of crushed stone. All roads and parking areas will generally follow the contour. Grasses and/or legumes will be established on all cuts and fills. Drainage will be provided by collection ditches and culverts, where necessary.

The boat launching ramps will be constructed of reinforced concrete logs.

Picnic tables will be constructed with reinforced concrete uprights with wooden seats and table tops. Wooden picnic shelters will be approximately 20' x 40' with a concrete floor.

Two four unit (2+2) flush type comfort stations will be located in the recreation area. Septic tanks with disposal fields will be used to treat wastes. All sanitary facilities will be approved by appropriate federal, state, and local health authorities prior to installation.

To provide water for the comfort stations and hydrants, a connection will be made to the existing water distribution system of Blue Ridge Rural Water Company. Hydrants will be located adjacent to parking areas and boat launching ramps.

Foot trails will be constructed five feet wide and will be graded to provide a good hiking surface.



Electrical distribution lines will be installed to provide power to comfort stations and lighting for parking areas.

Signs for identification and directions and gates to control access will be installed. The area will be landscaped as appropriate.

The facilities will be designed and constructed to assure accessibility and usability by the physically handicapped in accordance with Public Law 90-480.

All planned structural measures will meet the requirements of local and state health laws. None of the single purpose floodwater retarding structures will be available to the public for any recreation activities. Unless adequate sanitary facilities are provided, the sponsors will discourage the use of these structures for public recreation. All of the structures have a potential for public use.

Land areas to be committed to structural measures, are summarized as follows:

	<u>Forest land</u>	<u>Openland</u>	<u>Total</u>
	-----(acres)-----		
<u>Site 3D</u>			
Sediment Pool	9	4	13
Maximum Reservoir Area <u>1/</u>	30	160	190
Construction Area	6	0	6
<u>Site 6A</u>			
Sediment Pool	37	3	40
Maximum Reservoir Area <u>1/</u>	95	17	112
Construction Area	5	0	5
<u>Lake John A. Robinson</u>			
Sediment Pool	140	25	165
Recreation Pool <u>2/</u>	205	45	250
M&I Pool <u>2/</u>	617	183	800
Maximum Reservoir Area <u>1/</u>	1,206	375	1,581
Construction Area	15	10	25
Purchase Area <u>3/</u>	864	282	1,146
Recreation Development Area <u>4/</u>	13	12	25
<u>Total Area Committed for</u>			
<u>Remaining Work</u>	1,366	570	1,936

1/ Pool area at top of dam elevation.

2/ Pool areas are cumulative.

3/ Includes recreation development area, normal pool, structure, borrow areas and the recreation access strip around the normal pool.

4/ Eight acres are within the maximum reservoir area.

During construction, the following actions will be taken to control erosion and pollution:

- a. Sprinkling will be used to keep dust in construction areas within acceptable limits.
- b. Sanitary facilities will be provided in accordance with the requirements of the South Carolina Department of Health and Environmental Control.
- c. Precautions will be taken at equipment and repair areas to prevent contaminants from reaching streams and ground water, to comply with Public Law 92-500 and South Carolina Pollution Control Act.
- d. All operations will be conducted to minimize stream turbidity at and below the structures. Requirements established by the South Carolina Department of Health and Environmental Control will be adhered to during construction. The following erosion and sediment control measures will be applied as needed to the area of land which will be exposed:
  - (1) the contract will include earthmoving equipment time to construct diversions, waterways, and terraces as needed to retard the rate of runoff and control runoff from the construction site;
  - (2) debris basins will be used to minimize sediment leaving the construction site where needed;
  - (3) clearing and grubbing of construction sites and borrow areas will occur in stages as construction progresses;
  - (4) temporary vegetation and/or mulching will be used to protect the soils; segments of work will be completed and protected as rapidly as is consistent with construction schedules; and
  - (5) conduits or bridges will be installed where construction activities cross flowing streams.
- e. Prior to construction, areas will be designated for the disposal of waste material. All debris will be disposed of in accordance with regulations of the South Carolina

Department of Health and Environmental Control. The landowners of the area to be cleared will be given the opportunity to salvage trees prior to the beginning of construction.

- f. Vector control will be mutually agreed upon by the Soil Conservation Service, the local sponsors, and the South Carolina Department of Health and Environmental Control.

Included in changes to fixed improvements needed to install the project are road and bridge relocations on three county roads within the reservoir of Structure 3D, two paved and one unpaved. Three buildings and one well are within the minimum easement area of Site 6A. The buildings will be moved or demolished and the well will be protected from contamination. State Highway 140, located at the upper end of Site 6A, lies below the elevation of the emergency spillway crest and will be raised.

Several changes to fixed improvements are needed at Lake Robinson. Mays Bridge and the western end of Mays Bridge Road are located where the structure and the dike will be constructed and will be removed. A new bridge and road will be constructed downstream from the structure to maintain the road connection between State Highways 92 and 101.

Fews Bridge on State Highway 113 and Tyger Bridge on State Highway 114, crossing Lake Robinson, will be raised to allow boats 11 feet of clearance above the normal pool elevation. The abandoned bridge near Fews Bridge will be removed.

Pennington Road, crossing a tributary of the reservoir at a point approximately 0.7 miles north of Mays Bridge, will be raised about eight feet to elevation 902.0. A county road crossing Wildcat Creek, one-quarter mile northeast of Tyger Bridge, will be raised about four feet to elevation 902.0.

When Fews Bridge is raised, a telephone cable and water line attached to the bridge will be raised. Approximately one mile of power lines located in the reservoir will be removed. These lines are located along the western end of Mays Bridge Road and along other roads which serve buildings to be demolished.

Three farm ponds are located within the reservoir area, but only one will be inundated by the normal pool. This pond is located about one-quarter mile north of West Road. Ponders and Fews Lakes have approximate top of dam elevations of 905.0 and 897.0, respectively.

Two dwellings and 11 storage buildings and/or barns have first floor elevations below elevation 899.1, the maximum elevation of the reservoir during the emergency spillway design storm. These buildings will be demolished or removed from the reservoir area. Five dwellings and six storage buildings and/or barns have first floor elevations between 899.1 and 914.0, the top of dam elevation. The first floor

of the dwellings are all above elevation 909.0. The top of dam elevation is based on the structure's spillway conveying safely the runoff from the probable maximum eight hour storm. Since the probability of the reservoir filling above elevation 900.0 is so small, the sponsors plan to obtain flooding easements on the dwellings, barns and storage buildings, and other fixed improvements in this area instead of moving or demolishing them. The sponsors are aware that they are responsible for damages caused by floodwater inundating property within the reservoir created by the dam and will obtain the necessary land rights to protect themselves.

The project will comply with the Historic and Archeological Data Preservation Act, Public Law 93-291, and the Historic Properties Preservation Program, Public Law 89-665 (Section 106). It will also comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894).

#### Operation and Maintenance

Each portion of the watershed works of improvement enters the operation and maintenance phase when it is completed. Structural measures are considered complete when they are accepted from the contractor. Vegetative measures are considered complete as soon as adequate cover has been obtained or two growing seasons have elapsed. Sponsors are not expected to bear the entire cost of repairing damage caused by lack of planned vegetative cover if damages occur before vegetative measures are completed. If damages occur during this period, the Service and the sponsors will enter into a joint agreement to repair the damage.

Land treatment measures, including critical area plantings, will be maintained by the respective landowners in cooperation with the Greenville County Soil and Water Conservation District. The cost will be borne by the landowner. The Service and the South Carolina State Commission of Forestry will provide technical assistance for maintenance.

The responsibility for maintenance of all structural measures installed in the watershed, except Lake Robinson and the recreation development, will be assumed by the South Tyger River Watershed Conservation District. The District will use funds from a tax levy on real property in the watershed to maintain the structural measures. The estimated annual operation and maintenance cost of these structures is \$3,000.

The Commission of Public Works, City of Greer, will operate and maintain Lake Robinson. Annual operation and maintenance cost for this structural measure, estimated to be \$1,100, will be financed with funds from their operating budget.

Operation and maintenance of structures will include, but is not limited to, mowing, fertilizing, and controlling the vegetation, repair of any damage to the principal spillways, emergency spillways, the ogee

spillway, plunge basins, riprapped outlet, channels, and embankments; operation of gates on the riser of the Lake Robinson structure to release M&I water; and removal of any floating logs and debris which may affect the operation of the structures.

The Commission of Public Works, City of Greer, will be responsible for the operation and maintenance of the recreation development associated with Lake Robinson. The annual operation and maintenance cost is estimated to be \$14,700 and will be financed with funds from their operating budget. A full-time employee will be hired to operate and maintain the recreation facilities. During peak use periods, additional help will be procured. The recreation areas will require repair and replacement of facilities, mowing of grassed areas, and custodial, policing, sanitation, safety, and other operational services. No admission or use charges are contemplated.

The M&I pool of Lake Robinson ranges from elevation 863.5 to 889.0. The maximum surface area of the M&I pool and recreation pool are 800 acres and 250 acres, respectively. Based on reservoir operation studies, considering seepage and evaporation, Lake Robinson will provide the needed water and will retain a near maximum water surface area except during periods of low rainfall. Public recreation will normally occur on the surface of the M&I pool. The water level should not be lowered below elevation 863.5. If it is found that there is a continuing need for the use of the recreation storage for municipal or industrial purposes, the Commission of Public Works, City of Greer, will reimburse the federal government for all PL-566 funds used for public recreation associated with the reservoir.

Lake Robinson will be stocked with game fish and managed according to recommendations by the South Carolina Wildlife and Marine Resources Department.

Specific operation and maintenance agreements between the Service and the sponsors will be executed for each structural measure prior to signing a land rights, relocation, or project agreement. The O&M agreement will contain, in addition to specific sponsor responsibilities for nonstructural and structural project measures, specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance. O&M agreements will contain a reference to the South Carolina Watershed Operations and Maintenance Handbook, prepared by the Soil Conservation Service.

The South Carolina Department of Health and Environmental Control has designated several points within and immediately below the watershed as water quality stations. They will continue to monitor water quality at these stations and the operation and maintenance of the recreation development to insure conformance with applicable state laws.

During periods of low stream flow, water will be released through gates installed on principal spillway risers for reservoir management. Released rates will at least equal inflow to the reservoir to provide for downstream use. The South Tyger River Watershed Conservation

District will be responsible for releasing water as needed from all floodwater retarding structures. The Commission of Public Works, City of Greer, will release water as needed from Lake Robinson.

The Soil Conservation Service and the sponsors will make a joint inspection annually, or after severe flooding, for three years following installation of each structural measure. Inspections after the third year will be made annually by the sponsors with a copy of their report submitted to the Service representative.

The sponsors will maintain a record of operations and maintenance activities and inspections in their files. These reports will be made available to the Service upon request.

Project Costs

Cost estimates to complete remaining works of improvement are as follows:

	PL-566	Other	Total
	(dollars)		
Land Treatment	30,500	89,200	119,700
Structural Measures			
Construction	1,070,700	2,346,300	3,417,000
Engineering	114,600	121,400	236,000
Administration	208,700	55,400	264,100
Land Rights	380,800	1,513,900	1,894,700
Relocation Payments	18,200	11,800	30,000
Total Structural Measures	1,793,000	4,048,800	5,841,800
TOTAL	1,823,500	4,138,000	5,961,500

ENVIRONMENTAL SETTING

Physical Resources

The South Tyger River Watershed consists of 38,147 acres in the lower Blue Ridge-upper Piedmont region of South Carolina. The entire watershed lies within Greenville County. South Tyger River Watershed is bordered on the east by Middle Tyger River, on the northwest by North Saluda River and on the southwest by Enoree River. The watershed's 12 mile length extends from four miles north of the Tigerville community to Lake Cunningham. Tigerville community, the home of North Greenville Junior College, is located in the north central portion of the area. Greenville, a city of 61,436<sup>1/</sup>, is 11 miles southwest and Greer, a city of 10,642<sup>2/</sup>, lies five miles south of the watershed boundary. The population of the watershed is about 10,000. Approximately one-half is classed as rural. The other residents hold off-farm jobs but engage in part-time farming.

South Tyger River is a tributary of Tyger River within the Santee River Basin. It is in the South Atlantic-Gulf Region and the Santee-Edisto subregion as designated by the U.S. Water Resources Council<sup>3/</sup>. The northern one-third of the watershed lies in the East and Central General Farming and Forest Region. Small, general farms are characteristic of much of this region, but there are large dairy and livestock farms on some areas of the more favorable soils. Relief in this part of the watershed ranges from gently rolling to steep hills. The southern two-thirds of the area lies in the South Atlantic and Gulf Slope Cash Crop, Forest, and Livestock Region. This is the traditional cotton region and consists of gently sloping to rolling southern Piedmont. Rainfall averages 49 inches annually and is seasonally well distributed. The mean annual temperature is 61 degrees Fahrenheit, with monthly means varying from 45 degrees in January to 79 degrees in July. The average length of the growing season is 219 days<sup>4/</sup>. Land form elevations above mean sea level range from 83 to 2,300 feet.

Soils with sandy loam surface layers are dominant throughout the watershed. Soils with clayey subsoils are most common in the southern

<sup>1/</sup> County and City Data Book 1972, U.S. Department of Commerce, Bureau of the Census.

<sup>2/</sup> Ibid.

<sup>3/</sup> Water Resources Regions and Subregions for the National Assessment of Water and Related Land Resources, July 1970, Water Resources Council, Washington, D.C.

<sup>4/</sup> Atlas of River Basins of the United States, prepared by U.S. Department of Agriculture, Soil Conservation Service, June 1963.

two-thirds of the watershed. Soils with loamy subsoils occur in the mountains, foothills, and flood plains. Most soils in the Piedmont are gently sloping or sloping and most soils in the Blue Ridge are moderately steep to very steep. Erosion is a severe problem on approximately 400 acres. The flood plain soils are subject to flooding and most have free water at one to two feet below the surface about 60 days per year. With proper water management, these soils are well suited to intensive agricultural use. The principal soil series and their important characteristics are<sup>1/</sup>:

<u>Soil Series</u>	<u>Slope Range</u> (percent)	<u>Permeability</u>	<u>Depth</u>	<u>Watershed Area</u> (percent)
Piedmont soils-				
clayey subsoils				
Cecil	2-15	Moderate	Deep	27
Pacolet	10-40	Moderate	Mod. Deep	10
Hiwassee	2-25	Moderate	Deep	7
Appling	2-10	Moderate	Deep	3
Blue Ridge soils-				
loamy subsoils				
Brevard	6-25	Moderate	Deep	8
Evard	15-70	Moderate	Mod. Deep	6
Edneyville	6-70	Moderate	Mod. Deep	11
Ashe	25-90	Mod. Rapid	Shallow	3
Saluda	15-80	Moderate	Shallow	4
Flood plain soils-				
loamy subsoils				
Cartecay	Nearly level	Mod. Rapid	Deep	5
Toccoa	Nearly level	Mod. Rapid	Deep	3
Soils with an areal extent of less than three percent of the watershed area				13

<sup>1/</sup> Soil Survey Greenville County, South Carolina, USDA, Soil Conservation Service, 1975.



Classification of watershed soils by capability class and sub-class is shown below<sup>1/</sup>:

<u>Capability Class and Subclass</u>	<u>Percentage of Watershed Area</u>	<u>Number of Acres</u>
IIe	15	5,700
IIIe	20	7,600
IVe	15	5,700
VIe	22	8,427
VIIe	20	7,600
IIIw	8	3,120

The land capability classification system is the grouping of soils to show, in a general way, their suitability for use of cropland, pastureland, and wildlife. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The letter "e" indicates that erosion is the primary hazard and "w" designates a wetness hazard. Capability Classes II and III include those soils suitable for annual or periodic cultivation of row crops. Capability Class IV includes those soils on which cultivation should be undertaken only occasionally or under very careful management. Capability Classes VI and VII include those soils considered unsuitable for cultivation of row crops, but are suitable for pasture, forest or wildlife use. With very careful management, some areas of Classes VI and VII are suitable for use as apple orchards.

Geologic features in this area consist of the Inner Piedmont Belt as described by Overstreet and Bell. The core of the Inner Piedmont Belt, which underlies the watershed, consists of migmatites, schists, and gneisses. Many granite bodies are present; pegmatite is abundant. The schists range from gray to black and are fine to coarse grained. They contain thin layers of gneiss, quartzite, and marble. Garnet and sillimanite are common inclusions. There are many veins of gneissic pegmatite dispersed throughout the above materials. The geologic ages<sup>2/</sup> of these materials range from Upper Precambrian to Mississippian<sup>2/</sup>.

There is one mining operation in the watershed at present. A sand-gravel-asphalt operation is located on Beaverdam Creek near

<sup>1/</sup> Ibid.

<sup>2/</sup> Overstreet, W. C., and Bell, H. III, The Crystalline Rocks of South Carolina, Geological Survey Bulletin 1183, 1965.

State Highway 253. Potential crushed stone locations occur approximately three miles north of Tigerville and two to three miles south of Tigerville on Beaverdam Creek<sup>1/</sup>. Gold was mined on Wildcat Creek near the east-central boundary of the watershed but apparently was exhausted during "the fifties" (1850)<sup>2/</sup>. Mica and other clay minerals have been produced near the Tigerville community, but all operations have ceased. Large crystals of zircon have been found in place at the old vermiculite mines or in creek bottoms of the vicinity<sup>3/</sup>. Other mineral values have not been assessed at this time.

The source for ground water is highly weathered and fractured zones in the granite gneiss. These weathered zones or aquifers have developed along faults and fractures in the bedrock. Areas along the base of the hillsides or within the valleys are potentially the best locations for ground water exploration. The average depth of drilled wells is 134 feet and the average yield is 11 gallons per minute. Most of the water obtained from granite gneiss is slightly acidic. In 16 samples, the pH ranged from 6.0 to 7.4. The water is generally soft. A hardness of 60 milligrams per liter (mg/l) is rare. The iron content ranged from 0.0 to 7.0 mg/l. When ground water is used for public consumption, it must meet state standards. (See Appendix D.) Dug wells of the area usually range from 10 to 50 feet, but some are as deep as 100 feet. These wells usually yield a large amount of water for several minutes because they are reservoirs, but once the water is removed the soil and rock yield only about one to five gallons per minute<sup>4/</sup>. Many of the rural residents have joined the Blue Ridge Rural Water Company. Persons having commercial water in their household now use their well water for livestock and irrigation.

South Tyger River heads as Noe Creek in Greenville County, approximately four miles north of Tigerville. It flows southeastward for a distance of 12 miles where it enters Lake Cunningham at the watershed outlet. Its major tributaries are Burban Fork Creek, McKinney Creek, Barton Creek, Meadow Creek, Mush Creek, Peck Creek, Wildcat Creek, and Beaverdam Creek. All of these streams are perennial. Field and map surveys indicate there are approximately 70 miles of perennial streams in the watershed. Each perennial stream is supported

<sup>1/</sup> South Carolina State Development Board, Geology Division, personal contact 1974.

<sup>2/</sup> Sloan, Earl, Catalogue of the Mineral Localities of South Carolina, pg. 32, 1908. (Reprint South Carolina State Development Board, 1958.)

<sup>3/</sup> Gem Stone Resources of South Carolina, C. K. McCauley, Bulletin No. 30, Division of Geology, State Development Board, Columbia, South Carolina, 1964.

<sup>4/</sup> Ground Water Resources of Greenville County, South Carolina, N. C. Koch, Bulletin No. 38, South Carolina State Development Board, 1968.

by 50 to 150 miles of intermittent stream. A field survey of selected streams indicates that a drainage area of 25 to 200 acres, with one to five miles of ephemeral drainageways, is needed to originate an intermittent stream.

South Tyger River is classified by the South Carolina Department of Health and Environmental Control as a Class "B" stream<sup>1/</sup>. This classification is assigned to a stream after a public hearing as being the stream quality desired. The actual stream quality may be better or worse than the classification assigned. The current state policy is to improve all stream quality. After a classification is selected, then it becomes law that nothing may be done to lower the water quality below the assigned value. A Class "B" stream has the standard of being suitable for municipal and recreational purposes, excluding swimming. (See Appendix E.) For raw surface water quality at selected points on South Tyger River, see Appendix F.

There are an estimated 50 farm ponds within the watershed. The average size of these ponds is four to five acres. These ponds usually hold water throughout the year, providing water for livestock, recreation and limited irrigation. There are three flood prevention lakes within the watershed. These lakes and their sites numbers as shown on the Project Map are:

<u>Site Number</u>	<u>Permanent Water</u> (acres)	<u>Floodwater</u> (acres)
2	12	64
4	14	67
5	15	63

Lake Cunningham, a 175 acre reservoir and the water supply for the city of Greer, is located at the outlet of the watershed. Dysart Lake, located in the headwaters of Meadow Fork Creek, has a surface area of about 10 acres.

<sup>1/</sup> Stream Classifications for the State of South Carolina, South Carolina Department of Health and Environmental Control, 1972.

Economic Data

There are about 350 farms and several hundred small tracts used primarily as rural homesites in the watershed. The primary employment is nonfarm industrial jobs. The average farm contains 80 acres and is valued at \$70,000, including buildings and improvements. Flood plain holdings range in size from one to 140 acres. Upland values range from \$400 to \$1,800 per acre. Flood plain land values range from \$400 to \$1,000 per acre.

The agricultural pattern consists of general farming practices rather than specialized enterprises. The typical farm is producing row crops, pastures, cattle and forest products. The cultivated land is primarily used for the production of small grains, corn, soybeans, and vegetable crops. The average upland yield per acre for corn is 55 bushels and soybeans is 25 bushels. Yields in the flood plain for corn range from 80 bushels in years without flood damage to almost nothing following flooding. Annual grazing yields per acre average about three animal unit months on upland and five animal unit months on flood plain land.

Thirty-four percent of the farms are considered as commercial. A further breakdown of commercial farms shows that within this group there is a high percentage of farms that fall in Economic Class VI, or that have total sales of less than \$2,500. About 78 percent of all farms have sales of less than \$2,500 per year. Economic classes of farms as listed in the Census of Agriculture, 1969, are as follows:

<u>Class of Farm</u>	<u>Value of Farm Products Sold</u>	<u>Number in Watershed</u>
I	\$40,000 and over	11
II	\$20,000 to \$39,999	9
III	\$10,000 to \$19,999	11
IV	\$ 5,000 to \$ 9,999	13
V	\$ 2,500 to \$ 4,999	34
VI	\$ 50 to \$ 2,499	42
Non-commercial	\$ 50 to \$ 2,499	230

The land use in the watershed is as follows:

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	4,460	12
Pasture & Idle	6,910	18
Forest land	24,800	65
Miscellaneous	1,977	5
Total	<u>38,147</u>	<u>100</u>

Forest land in the watershed encompasses approximately 24,800 acres, or 65 percent of the watershed. Of this, 23,580 acres are in upland types and 1,220 acres are in bottom land types.

Upland forest types are 6,060 acres in loblolly-shortleaf pine; 3,980 acres in oak-pine; and 13,540 in oak-hickory<sup>1/</sup>. Major species consist of loblolly, shortleaf and Virginia pine, various oaks, mainly southern red, scarlet, black and white oaks, hickory, red maple, and sweetgums.

About 2,000 acres of the loblolly-shortleaf pine stands are in plantations; the remaining 4,000 acres in natural stands. Very few of the plantations and none of the natural stands are 100 percent pine. Although classified as pine stands, they can contain up to 25 percent hardwoods.

Bottom land types contain a variety of species including red maple, yellow poplar, red gum, black gum, water oak, cottonwood, sycamore, and river birch. Understory species are willow, willow oak, dogwood, maple, ironwood, and box elder.

Stand size classes are 33 percent sawtimber, 41 percent poletimber, and 26 percent seedling-sapling<sup>2/</sup>.

Acreage of commercial forest land by site classes are<sup>3/</sup>:

<u>Site Class</u>	<u>Present Acreage</u>	<u>Percent</u>
1	0	0
2	1,587	6
3	5,232	21
4	13,912	56
5	4,069	17

Site class is a classification of forest land in terms of inherent capacity to grow crops of wood<sup>4/</sup>. Soils were used as an indicator of potential productivity to estimate site index, volumes of wood per acre, and acreages of each site class.

Site class 1 is capable of producing 165 or more cubic feet per acre annually; site class 2, between 120 and 165; site class 3, between 85 and 120; site class 4, between 50 and 85; and site class 5, less than 50 cubic feet annually<sup>5/</sup>.

<sup>1/</sup> Basic data derived from USDA-Forest Service "Resource Bulletin SE-9 for Piedmont of South Carolina", 1967, and adjusted based on field observations.

<sup>2/</sup> Ibid.

<sup>3/</sup> Ibid.

<sup>4/</sup> Ibid.

<sup>5/</sup> Ibid.

Acceptable growing stock groups are:

greater than 70 percent (fully stocked)	-	4,068 acres
50 to 70 percent (medium stocked)	-	14,451 acres
less than 50 percent (poorly stocked)	-	6,281 acres

The following table illustrates the present growing volume of growing stock in the watershed, the average annual growth, and the average annual removals<sup>1/</sup>.

	<u>Growing Stock</u>	<u>Annual Growth</u>	<u>Annual Removals</u>
	----- (million cubic feet) -----		
Pine	5.61	0.46	0.25
Other Softwoods	0.05	0.00	0.00
Soft Hardwoods	5.22	0.30	0.14
Hard Hardwoods	<u>11.24</u>	<u>0.41</u>	<u>0.18</u>
Total	<u>22.12</u>	<u>1.17</u>	<u>0.57</u>

With less than half of the annual growth being removed, the volume of growing stock will continue to increase. Markets for sawtimber are available within the county for both pine and hardwood. However, pulpwood must be transported some 75 miles to Canton, North Carolina or 225 miles to Charleston, South Carolina and, therefore, stumpage price is low.

Since pulpwood stumpage value is low, the incentive for the small landowner to practice forest management is lacking. Little harvesting, other than land clearing, thinnings, stand establishment or cultural practices, has been accomplished in recent years.

Except for land used for public schools, North Greenville Junior College, highways, municipal buildings and post offices, all of the land is in private ownership.

#### Plant and Animal Resources

Generally, the game fish populations are limited to the 50 farm ponds and three floodwater retarding structures. Moderate fishing pressure exists along South Tyger River for about two miles above Lake Cunningham, but because of infertility of stream water and turbidity,

<sup>1/</sup> Ibid.

fishing pressure in the remainder of the watershed is extremely light. The streams in the watershed have been classified by fishery biologists of the South Carolina Wildlife and Marine Resources Department as bullhead-sucker streams. Brown bullheads and redhorse suckers are the dominant species in the streams. Other species include yellowfin, warpaint, and popeye shiners, white madtom, and flat catfish, redbreast, bluegill, redear and pumpkinseed sunfishes, warmouth, black and white crappies, largemouth bass, several species of darters, gizzard shad, carp and bluehead chub.

Two of the three floodwater retarding structures which have been constructed were stocked with bream and bass. Fishing began in the summer of 1971 at one site and in 1972, at the other. Residents report good fishing in both reservoirs. One structure has only recently been completed.

The areas cleared for the two miles of channel work completed have a dense cover of shrubby growth which attracts songbirds such as thrushes, cardinals, towhees, catbirds, hooded warblers and others.

The forested areas of the flood plain are Type 1 wetlands, characterized by mature bottom land trees. The dense overstory has reduced herbaceous vegetation underneath. No swamp or marshy areas which would attract waterfowl exist in the watershed.

The principal wildlife species in the watershed are squirrel, rabbit, quail and doves, however, any species common to this area of the Piedmont could occur. No rare or endangered species are known to exist in the watershed.

#### Recreational Resources

Hartwell Reservoir, developed by the U.S. Army Corps of Engineers, is about 35 miles west of the watershed and Table Rock State Park is about 25 miles west. Paris Mountain State Park and Pleasant Ridge State Park are about five miles and 12 miles from the proposed recreation development, respectively. The three state parks have a combined total of 184 family camp sites. Each park has swimming facilities, picnic tables and nature trails. Pleasant Ridge State Park has one vacation cottage and Table Rock State Park has 12 cottages. One recreation area has been developed on Hartwell Reservoir in South Carolina. This development is near the dam, about 50 miles southwest of the watershed. A 1,000 acre state is under development on the Keowee-Toxaway Lakes, about 35 miles west of the watershed.

All of the recreational developments in the area experience high seasonal usage. Recent census data indicates a population of 400,000 people within a 25 mile radius of the proposed development. Based on the existing and projected needs, the South Carolina Department of Parks, Recreation and Tourism has designated this area as needing

a new state park<sup>1/</sup>. The proposed development will help satisfy the needs.

#### Archeological, Historical, and Unique Scenic Resources

There are no historic sites in South Tyger River Watershed that are listed in the National Register of Historic Places. Several historic homes, as identified by the South Carolina Department of Archives and History, are located in the upland areas near the watershed boundary. These have the potential to be included in the National Register.

A field reconnaissance was made within the watershed by the Institute of Archeology and Anthropology, University of South Carolina. No significant archeological values were identified. A detailed report has been prepared by the Institute.

#### Soil, Water, and Plant Management Status

Changes in land use in the South Tyger River Watershed during the past 20 years have included a reduction in row crops, an increase in pastures and an increase in the number of homes. Cotton has disappeared. Soybeans, feed grains, and the number of beef cows have increased. Several hundred homes have been built, mostly on small tracts subdivided from farms along the roads. The watershed is about halfway between Greenville and Spartanburg and trends indicate that there will be an increasing number of families moving into the area.

Tenant-operated farm operations have about disappeared. The current trend is for larger operations with equipment and labor to cash-rent several farms for more efficient operations. There are still numerous marginal farm operations. Cattle farming where fields are planted to permanent grasses has decreased erosion rates considerably, but uncertain markets and small size operations provide small profits.

Technical assistance, educational programs, and loans are available to farmers and other landowners through state and federal agencies. The South Carolina State Commission of Forestry, in cooperation with the U.S. Forest Service, is providing forest management assistance, forest fire protection and suppression, distribution of planting stock and forest pest control assistance. Loans are available to eligible landowners through the Farmers Home Administration to help finance soil and water conservation practices. The Cooperative Extension Service of

<sup>1/</sup> SCORP-70, South Carolina Department of Parks, Recreation and Tourism, Columbia, South Carolina, 1970.



Clemson University, through the county agricultural extension agents, is assisting with information and educational programs. The Vocational Agricultural Programs in the public schools educate youth and adult groups in conservation and land management. The Agricultural Stabilization and Conservation Service administers the Rural Environmental Conservation Program which provides cost sharing assistance to qualified landowners for erosion and sediment control practices and forest management.

The Greenville County Soil and Water Conservation District has active programs that encourage planning and application of conservation measures. Other activities of the district include cooperative seed purchase, operation of equipment, and educational programs. The district is a sponsor of the Rabon Creek Watershed project. The Soil Conservation Service assists the soil and water conservation district. About 225 landowners are cooperators with the district and 200 of these have soil and water conservation plans covering more than 70 percent of the watershed. Approximately 80 percent of the planned land treatment practices have been applied and more than half of the land is adequately protected from erosion. Soil surveys have been completed for the watershed.

#### Projects of Other Agencies

There are no known projects which will adversely affect the works of improvement included in this plan. The structural and land treatment measures will reduce the amount of sediment now entering Lake Cunningham.

### WATER AND RELATED LAND RESOURCE PROBLEMS

#### Land and Water Management

Most of the crops and pasture in the watershed are on land Classes IIe, IIIe, and IVe. These soils are subject to erosion if not properly managed. Low farm incomes have resulted in poorly maintained water disposal systems and improper land use on many farms. Landowners have not committed enough resources to conservation of their soil. Financial cost-sharing, as well as accelerated technical assistance is needed to encourage land use adjustments and apply needed measures.

The hydrologic condition of the forest land is 31 percent very poor, 20 percent poor, 38 percent fair, and 11 percent good. The relatively poor condition throughout the watershed is due to overcutting of the forests, overgrazing in the forest and past cultivation of lands that have recently returned to forests. This poor condition prohibits the soil from receiving large amounts of rainfall through infiltration, thus causing overland flow during heavy rainfall, erosion within the forests, additional sediment in the streams, and additional flooding of the bottom lands.

There were about 200 acres of severely eroding forest lands when the work plan was first prepared in 1966. All of this has now been planted to trees, to other vegetation, or has reverted to trees through natural regeneration.

Although major streams overflow their banks occasionally and deposit sediment along the bottom land forests, very little damage is caused to the existing forest stands from the flooding or from sediment deposits.

However, due to the occasional flooding and the normally wet soil conditions, landowners are reluctant to do any forest management in these fertile bottom lands. Individual trees are harvested, but stands are normally left alone. Over the years, this lack of management has left these stands with mostly noncommercial species, or commercial species of very poor quality.

#### Floodwater Damage

Damage from floodwater is a major problem in the watershed. Existing channels are not adequate to contain the runoff from frequent storms.

An analysis of storm events from 1934 through 1970 indicates that flooding can be expected to occur on an average of about 2.5 times per year. Floods large enough to inundate 50 percent of the flood plain can be expected about 1.5 times per year. The most intense rainfall during this period occurred on October 6, 1949, when 4.97 inches of rain fell in three hours. Other major storms during the period occurred on August 12, 1940, when 6.33 inches fell in 12 hours and on July 4, 1968, when 5.21 inches fell. Records indicate that about 55 percent of floods in this area occur during the months of March through October.

As a result of flooding, much of the fertile flood plain has been abandoned. Crops have been moved to hill lands to avoid flooding, but, as a result, erosion has been increased. Costs of production are higher and yields are lower on the uplands. In some cases, soils are not being used within their capabilities. Owners cannot manage their farmland to the best advantage under these conditions.

There are 3,120 acres of flood plain land within the watershed, of which 1,150 are in pasture, corn, and truck crops. All corn and truck crops are now being grown in the upper reaches where the threat of flooding is not as great. Most of the downstream flood plain is now in pasture and forest and is subject to frequent inundation. The flood plain has previously been used for the production of row crops and pasture; however, present flooding makes it uneconomical to improve and manage these areas for maximum production.

Floodwater damage to roads and bridges is a serious problem at 15 locations. Farm fences are frequently damaged by direct water pressure against posts and by the impact of flooding debris.

The total average annual floodwater damage prior to project

installation was \$23,200.

### Erosion Damage

Erosion rates on cultivated land are considerably above the tolerable four tons per acre annual soil loss. The soils on steeper slopes are susceptible to development of critically eroding areas. Soil losses on pastureland, forest land, industrial sites, and urban developments are generally within acceptable limits. Average annual erosion rates are: cultivated land - 31 tons/acre; forest land - 1 ton/acre; pastureland - 0.7 ton/acre; and urban-industrial land - 0.7 ton/acre.

Erosion damage caused by scouring on the flood plains is present in all reaches. Soil productivity on these areas is reduced 20 to 50 percent. Annual monetary damages are \$600 over 230 acres.

At the time of work plan development, approximately 400 acres were serious sediment sources in the watershed. Fifty acres of these were associated with road cuts and fills. These critically eroding areas are scattered throughout the watershed. Remaining to be stabilized are 20 acres associated with road cuts and fills and 60 acres on farms.

### Sediment Damage

Overbank sediment deposition is moderate to severe in all reaches. Deposits of sterile sand occur throughout the flood plain. Depth of deposition ranges from a few inches in areas infrequently flooded to several feet near the stream channels. The channel capacities are reduced due to a moderate to heavy sand bedload. The stream water quality is reduced due to suspended sediment concentrations. Average annual suspended sediment concentrations at selected watershed locations are:

<u>Location</u>	<u>Suspended Sediment Concentration</u>
South Tyger River at entrance to Lake Cunningham	194 mg/1
Noe Creek, one-half mile east of Tigerville	199 mg/1
Meadow Fork Creek, two miles west of Tigerville	184 mg/1
Beaverdam Creek, three miles northwest of Lake Cunningham	410 mg/1

Sediment accumulation has reduced the productive capacity on 1,340 acres. Yields have been lowered 20 to 90 percent. The monetary damages average \$5,500 annually.

Without the project, accumulation of sediment in Lake Cunningham is reducing the reservoir storage 22 acre feet annually. This results in an annual value reduction of \$19,700 because of the high values associated with existing properties surrounding the lake and the investment in the pumping station.

#### Municipal and Industrial Water Problems

The Commission of Public Works, City of Greer, and the Blue Ridge Rural Water Company presently obtain their water from Lake Cunningham. Sediment accumulations have reduced the storage capacity of the reservoir. Because of this reduction of capacity and increased population and industrial growth, this reservoir will not supply the needs. Ground water aquifers in this area normally will not supply large quantities of water. Yields from most wells range from three to 25 gallons per minute.

The Greer area is experiencing rapid industrial growth. The rate of growth is expected to continue for the foreseeable future. The continued industrial growth and the accompanying urban development in the approximately 150 square mile service area of the two water distributing agencies will create a greater need for an expanded water supply. Enwright Associates, has determined the projected needs to be eight million gallons per day by 1980 to serve an anticipated population of 57,000 and 32 million gallons per day by 2028 to serve an estimated population of 208,000.

#### Recreation Problems

The Statewide Comprehensive Outdoor Recreation Plan identified a need for an additional recreation development in the watershed area. The estimated population within a 25 mile radius of the watershed is 400,000.

Hartwell Reservoir and Keowee-Toxaway (under development), Table Rock, Pleasant Ridge and Paris Mountain State Parks are within 50 miles of the watershed. Lake Cunningham is just below the watershed, but has no public facilities. Smaller lakes and parks are nearby, but the developments in the area currently have heavy usage and will not be able to satisfy the demands of the projected population of 510,000 in 1990, and 640,000 in 2020.

### Economic and Social Problems

About 74 percent of the commercial farms are low producing units with annual sales of less than \$10,000. Farm incomes are lower, on the average, than nonfarm incomes. Underemployment of farmers due to small land holdings adds to the low income problem. Nonfarm employment is primarily in textile industries where wages are historically lower than other sections of the economy. According to U.S. Bureau of the Census data for 1970, 12 percent of all families and 32 percent of all black families in the area had incomes below poverty level. Lower incomes throughout the region result in a lower tax base which affects the amount of revenue available for education and other social programs.

### ENVIRONMENTAL IMPACT

The installation of project measures will reduce floodwater damages by an average of 88 percent. The level of protection provided will be adequate for truck crops near the floodwater retarding structures and for pastures in the downstream reaches. Sediment yield to Lake Cunningham will be further reduced from 17 to two acre feet per year. This will greatly increase the life of Lake Cunningham for M&I water storage and residential lots. Damages by sediment deposition on flood plain land will be reduced by about 87 percent.

Present land use in the benefited area is as follows: 225 acres of pasture and 726 acres of trees and brush. After the project is installed, land use is expected to be 412 acres of pasture, 113 acres of crops, and 426 acres of forest. Structural measures will benefit 85 family farms, most of which are low-income producing units. The project will encourage these farmers to make land use adjustments that will improve family income. Upland erosion on cultivated land will be reduced 30 percent (9 tons per acre) by the installation of land treatment practices and changes in land use. Erosion of flood plains will be reduced by the construction of the floodwater retarding structures.

Water stored in Lake Robinson will serve a population of 200,000 people within the next 50 years. An estimated sustained yield of 32 million gallons per day, will be used by residences, businesses, and industries in the service area of the Commission of Public Works, City of Greer, and the Blue Ridge Rural Water Company. Additional jobs will be created by expanding industrial and commercial development.

Forest wildlife habitat will be changed to crops or pasture type habitat by clearing of 300 acres. Construction of the reservoirs and recreation facilities will require clearing of 719 acres of forest wildlife habitat and permanently inundate 853 acres. In addition, 1,030 acres will be designated as flood pools and will be periodically inundated as floodwater is temporarily stored. About 6.3 miles of

stream fishery will be lost.

The reservoirs will create waterfowl habitat. The edges of the lakes will provide about 23.5 miles of shoreline habitat favorable for herons, egrets, and shorebirds which are now absent or limited in numbers. These species can be expected to migrate through or, even reside, in the watershed. Wood duck populations will increase with the creation of rearing and brooding habitat. As sediment accumulates in the reservoirs, more marsh habitat will be created.

The project will create 853 acres of lake fishery. The 800 acre multiple purpose lake will have the potential to produce high yields of game fish such as bream and bass.

Planting of wildlife food and cover crops in power line rights-of-way, field borders, and open areas in woods will improve wildlife habitat, especially for birds and other small animals. Stabilization of critically eroding areas will improve wildlife habitat.

Water stored in Lake Robinson for recreation and the recreation facilities will increase the opportunities for recreational use. The activities will include fishing, picnicking, boating, sight-seeing, hiking, and similar activities. Facilities will have a design capacity of 375 visitors. The average annual use of the recreational facilities is estimated to be 53,000 visitor days. The value of a visitor day is estimated to be \$2.00.

Water temperature will be increased because of the increased water surface exposure. This will result in a maximum temperature increase of five degrees Fahrenheit downstream. Evaporation losses will also be greater.

A review of the proposed project with the South Carolina Department of Archives and History, Historic Preservation Section, revealed that no historic place would be affected.

The Institute of Archeology and Anthropology, University of South Carolina has made a field survey of all construction sites and areas to be permanently flooded. No archeological sites were located in these areas. A detailed report has been prepared by the Institute of Archeology and Anthropology. Should any artifact or other scientific value be uncovered during construction, the Institute of Archeology and Anthropology and the National Park Service will be notified.

The proposed construction will not affect any unique scientific landscape features, nor will it change the existing responsibility of any federal agency under Executive Order 11593 with respect to archeological and historic resources.

Employment opportunities will be increased as a result of the project. Unemployed and underemployed persons will have more opportunities to find jobs or to be more fully employed. Some underemployed farmers will be better able to utilize flood plain land for more efficient farming operations. An ample supply of municipal and industrial water will encourage present industries and businesses to expand their operations and will encourage other industries to locate

in the community. The planned project will create six permanent skilled jobs, 45 permanent semi-skilled jobs, 21 skilled jobs for one year and 148 semi-skilled jobs for one year. The regional income benefit from the project is \$355,200. It is estimated that this income will be distributed as follows:

<u>Income Class</u>	<u>Percentage of Adjusted Gross Income in Class</u>	<u>Percentage Benefits in Class</u>
Less than \$4,000	16	20
\$4,000-\$10,000	43	43
More than \$10,000	41	37

Local costs of \$159,300 will be distributed as follows:

<u>Income Class</u>	<u>Percentage of Adjusted Gross Income in Class</u>	<u>Percentage Contribution in Class</u>
Less than \$4,000	16	10
\$4,000-\$10,000	43	40
More than \$10,000	41	50

According to U.S. Bureau of the Census data for 1970, 12 percent of all families, and 32 percent of all black families in the area had incomes below poverty level. As the tables above show, installation of the planned project will redistribute income from the higher to the lower income class.

Local secondary benefits in the form of increased business from transporting additional supplies and products and other business activity will accrue to residents of the community.

The proposed recreation area will provide an opportunity for supportive enterprises to develop. Job opportunities and other economic benefits will result from commercial growth on private land surrounding the area.

The increases in population, industries, business activities, and travel in the area will increase the burden of waste disposal and other adverse effects associated with a greater number of people and increased travel. Increased road maintenance may be required due to increased traffic on the areas roads.

The increased traffic resulting from the recreational use of Lake Robinson will have little effect on noise levels around the reservoir. Peak use during the summer will be approximately 750 persons

per day and will increase traffic by about 250 cars per day. The area where Lake Robinson will be constructed is considered rural and any increase in traffic should have little impact on residents of the area. An investigation of the area around Lake Robinson revealed no rest homes, hospitals, or other noise-sensitive sites are located near the site of the reservoir.

Expanded business, new homes, and enhanced land values will tend to improve the tax base, thereby providing more funds for education and other social functions in the community.

Two families will be relocated and will incur the inconvenience of moving as a result of land acquisition.

The land treatment measures for forest land will improve the hydrologic condition of the forest soils, thus improving the soil's ability to absorb rainfall. As more water is absorbed by the soil, less will flow overland, erosion will be reduced, sediment in the streams will be reduced, and flooding will be less often and less severe.

The proposed Lake Robinson will inundate 582 acres of bottom land forest types, which is about half of bottom land hardwoods in the watershed. The soils within this area of forest land, the potential productivity class and potential cubic foot volume of growth per acre per year, and acreage is as follows:

<u>Soil Type</u>	<u>Potential Productivity</u>		<u>Acreage</u>
	<u>Class</u>	<u>Cu.Ft. Vol./Ac./Yr.</u>	
Cartecay-Chewacla	Very high	130 cu.ft.	455
Cartecay-Toccoa	High	110 cu.ft.	112
Wehadkee	Very high	140 cu.ft.	15

The potential annual growth on this area is about 76,200 cubic feet. This volume could be achieved with either pine or hardwood by applying sound management practices, by reducing sediment deposits and by eliminating flooding. Present annual growth of commercial species within this same area is approximately 18,500 cubic feet.

There are 617 acres of forest that will be inundated, and 31 acres of forest will be lost due to the construction of the dam, spillways, borrow areas, etc.

Upon completion of the lake, construction of home sites around the lake, fishing facilities, recreation facilities and related transportation facilities will reduce forest acreage even more.

Approximately 648 acres of wildlife habitat will be lost to certain wildlife species associated with wet bottom lands, such as beaver, muskrat, etc. Present populations of these species are low.

Overall, wildlife habitat will be affected very little since about 75 percent of the forests in the watershed are classed as oak-hickory



or oak-pine types.

A total of 1,936 acres of land will be committed to the structural measures which includes the recreation development. This land will be restricted to specific use as follows:

	<u>Forest Land</u>	<u>Open Land</u>	<u>Water Area</u>	<u>Total</u>
Without Project	1,370	536	30	1,936
With Project	693*	390*	853	1,936

\*or uses compatible with infrequent inundation and recreation

Of the 1,936 acres, there are 1,146 committed to recreation. There are 1,030 acres subject to infrequent inundation by storage of floodwaters of which 22 percent is flood plain presently subject to inundation. Only 422 of the 1,030 acres will be inundated by a flood having a recurrence interval of once in 100 years. The remaining 608 acres will be inundated less frequently.

The agricultural and wildlife values will be reduced or lost because of the changed and restricted use of the area. Installation of the structures will inundate 6.3 miles of stream channel.

#### Favorable Environmental Effects

- a. Reduce erosion on cultivated land by 30 percent and roadsides by 52 percent. Erosion on pastureland and forest land will be reduced slightly
- b. Reduce floodwater and associated damages by 88 percent
- c. Reduce sediment entering Lake Cunningham by 88 percent
- d. Annual suspended sediment concentrations will be reduced from 194 to 31 mg/l at the watershed outlet
- e. Provide municipal and industrial water storage for the city of Greer
- f. Provide additional water based recreational opportunities
- g. Create 853 acres of lake fishery resource
- h. Increase waterfowl habitat and provide 23.5 miles of shoreline habitat

Adverse Environmental Effects

- a. Modify and restrict land use on 1,936 acres as follows:

	<u>Forest Land</u>	<u>Open Land</u>	<u>Water Area</u>	<u>Total</u>
Without Project	1,370	536	30	1,936
With Project	693*	390*	853	1,936

\*or uses compatible with infrequent inundation and recreation

- b. Inundate 6.3 miles of perennial stream
- c. Increase traffic and road maintenance
- d. During construction degrade ambient air quality, stream water quality, and increase noise pollution
- e. A slight increase of on-site erosion and sediment entering the streams during construction
- f. Require relocation of at least two dwellings
- g. Convert 300 acres of forest wildlife habitat to crop or pasture type habitat

ALTERNATIVES

The following alternatives were considered:

1. Accelerated land treatment. This alternative consists of those practices and measures described previously under the heading of "Planned Project - Land Treatment." Impacts from this alternative would be similar to those described for the land treatment portion of the proposed plan. Flood damages would be reduced approximately three percent. Adverse impacts resulting from the irreversible and irretrievable commitment of land to structural measures would be eliminated. Needs for additional municipal and industrial water supply and for increased water based public recreation opportunities would not be satisfied. Cost of this alternative is estimated to be \$300,000.

2. Land treatment, flood proofing, land use compatible with present flooding, and municipal and industrial water from other sources. This alternate would necessitate land use restrictions to minimize damages. There are no existing authorities to implement land use regulations in the watershed. The only reasonable use of the flood plain which would be compatible with existing flooding is forest land and some pasture. These uses would not be compatible with existing farm units or the economic needs of the area. The only fixed improvements involved are roads and bridges. Flood proofing would involve enlarging the bridge openings, raising or relocating roads, and/or riprapping. The engineering firm employed by the Commission of Public Works, City of Greer, considered six alternative sources of water outside the watershed and found them to be either impractical or unavailable. The cost of obtaining water from either of the sources considered far exceeded the proposed Lake Robinson cost. The cost of this alternative, not including water supply is estimated to be \$600,000 and would provide eight percent of the benefits from the planned project. Recreation needs would not be satisfied.
3. No project. With no project, the area will experience a serious shortage of municipal and industrial water, recreation needs will not be satisfied, sediment accumulation in Lake Cunningham will continue, and floodwater damages will remain.

#### SHORT-TERM VS. LONG-TERM USE OF RESOURCES

The proposed project's direct short term uses of the environment will consist of the use of material and human resources necessary to construct the improvements, the immediate effects on the land used and economy in the project area, and the effects of the construction on the ecology of the area. The initial impact will result from conversion of the needed land to structures planned. This will affect the properties involved by reducing the land area now used by the property owners for the present uses. Completion of the proposed project is compatible with projected uses of land. The planned conservation treatment will permit the continued use of the land by this and future generations.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

There are 1,936 acres of land committed to the project. Installation of the project will also require the commitment of labor, materials, and energy for construction.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

General

An application for federal assistance through Public Law 566 was submitted by the sponsors of the South Tyger River Watershed on March 13, 1964. This application was processed, planning authorization granted, and a work plan was developed. This plan was approved for installation by the Agricultural Committees of Congress on February 23, 1967.

The structural measures included in the plan consist of five single purpose floodwater retarding structures, one multiple purpose structure for flood prevention and municipal water supply, and 15.03 miles of channel work. Three floodwater retarding structures and about two miles of channel work have been installed.

The sponsors have requested that the multiple purpose structure and remaining channel work be deleted. The Blue Ridge Rural Water Company will provide water for the town of Tigerville.

Lake Robinson, a multiple purpose structure for flood prevention, municipal and industrial water supply, and recreational water storage has been added to the plan. The Commission of Public Works, City of Greer, has been added as a sponsor.

The plan now includes five single purpose floodwater retarding structures, one multiple purpose structure, and two miles of channel work as structural measures to supplement the land treatment measures.

The planning of this project has been coordinated with interested agencies. The consulting engineering firm hired by the Commission of Public Works, City of Greer, has developed information as to the need, quality and quantity of water, and various alternatives involved to assist with the planning.

Discussion and disposition of each comment on draft environmental impact statement

The following agencies were asked to comment on the draft environmental impact statement:

- S.C. Water Resources Commission (for the Governor) - responded
- S.C. Division of Administration (State Clearinghouse)
- Wildlife and Marine Resources Department - responded
- Highway Department - responded
- Department of Archives and History - responded
- Institute of Archeology and Anthropology - responded
- Department of Health and Environmental Control - did not respond
- Land Resources Conservation Commission - did not respond
- Department of Parks, Recreation and Tourism - did not respond
- Commission of Forestry - responded
- Department of Agriculture - did not respond
- S.C. Appalachian Council of Governments - responded
- U.S. Department of the Army - responded
- U.S. Department of Health, Education and Welfare - responded
- U.S. Department of Commerce - responded
- U.S. Department of the Interior - responded
- U.S. Department of Transportation - did not respond
- Environmental Protection Agency - responded
- Appalachian Regional Commission - did not respond
- Federal Power Commission - did not respond
- Office of Equal Opportunity - USDA - responded

Each issue, problem or objection is listed and a response given on the following pages. The original letters of comment appear in Appendix C.

South Carolina Water Resources Commission

Comment 1: "As requested, the staff of the Water Resources Commission has reviewed the Draft Revised Watershed Plan and Environmental Impact Statement for the South Tyger River Watershed Project in Greenville County. The design modifications to include a multiple-use reservoir makes this project a valued asset to the Greenville and Spartanburg area. Water demands in this area are expected to rapidly surpass the supply capacity of the available systems and any project offsetting this concern is beneficial. The b/c of 1.5/1 appears to be acceptable for projects of this type. The development attracted by this M&I project is probably a little understated."

Response: Noted

Comment 2: "I question however the values given to recreation benefits on the proposed Lake Robinson which does not allow for swimming facilities. It appears to me that 53,000 recreation days may be inflated for an impoundment of this size. However the M&I benefits probably offset this benefit."

Response: Reports written by the Greenville County Planning Commission and the South Carolina Department of Parks, Recreation and Tourism clearly indicate a need for water based recreation in this area. The number of recreation days projected is based on the need for recreation in the area and the anticipated use of facilities planned for the recreation development. The visitor day benefits were based on studies made of similar type Soil Conservation Service assisted projects and conform to recommendations by the Water Resources Council.

South Carolina Division of Administration

This agency serves as a clearinghouse for state agencies. In this capacity, they received the following responses:

South Carolina Wildlife and Marine Resources Department

Comment 1: "From a freshwater fisheries viewpoint, the proposed project will probably be beneficial in that the silt load within the streams should be reduced. At the present time no significant fishery exists in the project area."

Response: Noted

Comment 2: "During January-February of this year, we released 41 deer in the upper portion of the watershed, upstream from any of the proposed construction or channelization. Presently the project will not effect these deer but it could eliminate additional habitat thereby restricting the overall population expansion."

Response: The "Environmental Impact" section acknowledges that bottom land forest types will be removed by the construction of the project. This will represent a loss of deer habitat. However, deer will benefit from the improved pastures established as a result of the project.

South Carolina Highway Department

Comment: "It appears that this watershed project will affect several bridges. Any changes in roadway alignment or bridges should be coordinated with the SCHD."

Response: The State Highway Engineer and the District Engineer have assisted in the planning of the project and are aware of the needed modifications to roads and bridges. The final plans for the project will be coordinated with the Department.

South Carolina Department of Archives and History

Comment: "We have previously consulted with Wilber Campbell of the Soil Conservation Service, and at this time, we know of no historic sites which would be affected by this project. Please check with Ms. Georgianna Graham, of the Appalachian Regional Council of Governments in Greenville to see whether she is aware of sites on which we have no information."

Response: The Appalachian Regional Council of Governments was contacted and they confirmed that no historical sites will be affected by the project.

Institute of Archeology and Anthropology, University of South Carolina

Comment: "The Institute of Archeology and Anthropology, University of South Carolina, has made an archeological survey of this project area and has found that no archeological resources appear to be endangered by this project as outlined in this A-95 statement."

Response: Noted

South Carolina State Commission of Forestry

Comment: "These plans are well written and we concur with the draft of each."

Response: Noted

South Carolina Appalachian Council of Governments

Comment: "In reviewing the draft environmental impact statement for the South Tyger River Watershed Project, it was basically found to be consistent with this agency's plans and policies. However, one of our major concerns which was not adequately addressed in the impact statement, relates to the effect this project may have on water quality in the area. Specifically, what will be the short term and long term effects on water quality in the Greenville area. Moreover, will this project create industrial and residential development that keeps pace with projected wastewater needs as contained in the Greenville Metro 201 Facilities Plan. Most importantly, one should determine if the Greenville Metro Area 201 Facilities Plan will be affected by the



South Tyger River Watershed Project. If the project will effect the Greenville Plan, then coordination between the watershed project and the Greenville 201 Plan is necessary."

Response: Enwright Associates is the Lead Engineer for the development of the 201 Plan noted in the Appalachian Council of Government's letter. The planning area was increased by Enwright Associates from that originally designated by the South Carolina Department of Health and Environmental Control and the Environmental Protection Agency for the explicit purpose of including the Lake Robinson area and to address the many points noted by the Appalachian Council of Governments.

The water quality, as prescribed by the South Carolina Water Quality Standards System, will not be adversely affected by this project. The 201 planning period extends through 1995. Population and waste flows have been projected through 1995 and waste treatment location and needs addressed such that appropriate standards are maintained.

Treatment facilities are to be designed such that water quality standards are maintained during seven day duration, 10 year frequency flow (7Q10) conditions. Enwright Associates has determined, via water quality models, that the minimum treatment requirements as established by federal regulations will maintain standards at 7Q10 conditions. Furthermore, if the Lake Robinson project is constructed, a minimum water release which is greater than the 7Q10 flow for the South Tyger River in the project area has been projected. In general, therefore, it can be concluded that long term downstream water quality may actually be improved during low flow periods with the project over that which would be expected without the project if the area develops as projected. On a short term basis, the same reasoning can be applied with the possible exceptions of the construction period. It is anticipated that during construction there will be an increase in sediment transport by the South Tyger River. While established water quality standards are not expected to be violated during this period, increased turbidity from runoff and siltation could occur. Actions to control erosion and pollution during construction are listed under "Planned Project".

By including the project in the planning area, its influence on the area's growth trends has been considered. Waste transport and treatment facilities are planned for phased construction based upon need through the 1995 planning period. High density development around the proposed project has not been projected. Population and industrial growth have been projected in the Greer area but under certain ceiling constraints imposed by the Environmental Protection Agency.

U.S. Department of the Army

Comment: "We have reviewed the work plan and foresee no conflict with any project or current proposal of this Department. The draft environmental impact statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned."

Response: Noted

U.S. Department of Health, Education and Welfare

Comment 1: "Page 2, line 25 indicates that selected herbicides will be used to remove undesirable forage and weeds. Which herbicides are to be used? What precautions will be taken to minimize the contamination of the aquatic environment resulting from herbicide application and fertilizer run-off? Are these chemicals to be used in areas where animals are grazing? If so, what measures will be taken to prevent exposure of the animals to these agents?"

Response: The environmental impact statement has been modified and addresses the use of herbicides.

Comment 2: "Page 15, line 8: Do any of the farms in this region border any waterfront or prospective waterfront areas? If so, what precautions will be taken to avoid the runoff of agricultural wastes in this watershed, i.e., a grass buffer zone between farm and water?"

Response: Farms do border the South Tyger River and will border the Lake Robinson development; however, a recreation access border around the lake will provide a buffer area between farming operations and the lake. Farmers are normally unable to plant row crops adjacent to the waters edge of the single purpose floodwater

retarding structures and natural grass buffer zones develop.

Comment 3: "Page 29, line 12 indicates that forest wildlife habitat will be changed to crops or pasture-type habitat, and will be permanently inundated. We consider this to be an adverse environmental impact and suggest inclusion as such on page 32 of the subject document."

Response: The sentence indicates that there will be 300 acres of forest wildlife habitat changed to crops or pasture type habitat because of the flood protection provided by the project. This has been added under "Adverse Environmental Effects".

Comment 4: "Will it be necessary to remove any of the sediment which accumulates behind the floodwater retarding structure? If so, the disposal of this material should be discussed in this document."

Response: Removal of sediment accumulating in the reservoir is not planned.

U.S. Department of Commerce

Comment 1: "Bench marks, triangulation stations, and traverse stations have been established by the National Geodetic Survey in the vicinity of the proposed project. Construction required for the project could result in destruction or damage to some of these monuments."

Response: No bench marks, triangulation stations, or traverse stations will be affected by the proposed structural measures.

Comment 2: "Since flood prevention is a major goal of the project, the climate description would be enhanced by information on flood-producing weather systems. The frequency, intensity, and type of storm which produces flooding should be indicated, as well as the time of year such storms occur. Record rainfall amounts, in addition to normal amounts, should be included. If possible, specific rainfall occurrences should be related to flooding events."

Response: The "Floodwater Damage" section under "Water and Related Land Resources Problems" has been expanded to include this information.

U.S. Department of the Interior

Comment: "Thank you for the letter of September 9, 1975, requesting our views and comments on the work plan and draft environmental statement for South Tyger River Watershed, Greenville County, South Carolina. Our review indicates that the proposal is adequate as it relates to minerals, and fish and wildlife resources. However, we find that the outdoor recreation interests have not been properly considered.

Page 31, paragraph 3 of the draft environmental statement mentions that upon completion of the lake, construction of homes sites and other facilities will reduce forest acreage. Without land use zoning regulations or some type of land use control, development of home sites and facilities around the lake could also adversely effect the aesthetics of the shoreline and the quality of the recreation experience. In addition, there is no discussion of public access to the lake and shoreline. These impacts should be addressed in the final environmental statement."

Response: The recreation features and the public access provided at the Lake Robinson reservoir are discussed on Page 8 of the environmental impact statement. Additional discussion on Pages 11 and 12 indicates that the sponsors plan to restrict the construction of permanent buildings below the top of dam elevation. This elevation is 25 feet vertically above and averages 250 feet horizontally from the edge of the normal pool. Houses will generally be located in wooded areas outside the recreation access strip and flood pool area and will be screened from the view of the recreating visitor. It is anticipated that the development around the reservoir will not significantly detract from the recreational experience.

Environmental Protection Agency

Comment 1: "A description of the benefits of a natural free-flowing stream subject to purification effect of natural stream biota as compared with the poorer assimilative capacity of the reservoir environment should be given "

Response: The project will result in 6.3 miles of free-flowing streams being replaced by impoundments. During the summer months, the water of a free-flowing stream has a higher dissolved oxygen content than the water of an impoundment, and therefore has good capability for the degradation of organic wastes. However, there are few sources of organic wastes in the watershed so BOD is nominal.

An impoundment on a small stream will have a greater assimilation capacity than the stream segment it replaces. This is through the dilution factor of the large volume of water, anaerobic digestion in the deep water during summer stratification, and the phytoplankton of surface waters.

Comment 2: "No attempt has been made to quantify the noise impact in particular as a result of increased traffic resulting from recreational use. The final environmental statement should quantify the impact from activities other than construction and should identify the type and number of noise-sensitive sites affected. Also, abatement should be addressed as necessary."

Response: The environmental impact statement has been expanded to include information concerning the noise impact induced by the project.

Office of Equal Opportunity - USDA

Comment: "Our review reveals that no comments, either positive or negative, have been included concerning the impact of the proposed South Tyger River Watershed Work Plan on minorities residing in the target area. This appears to be an omission since the 1970 Census data show that minorities comprise 17.1 percent of the population in Greenville County."

Response: The environmental impact statement has been expanded to include discussions of the impact of the proposed project on minorities residing in the target area.

APPROVED: L. W. Domeier, Acting DATE: 12/23/75  
G. E. Huey, State Conservationist  
SOUTH CAROLINA

LIST OF APPENDICES

APPENDIX A - Comparison of Benefits and Costs for Remaining Structural Measures

APPENDIX B - Project Map

APPENDIX C - Letters of Comment Received on the Draft Environmental Impact Statement

APPENDIX D - South Carolina Drinking Water Standards

APPENDIX E - Quality Standards for Class "B" Waters

APPENDIX F - Surface Water Quality in South Tyger River Watershed

APPENDIX G - Public Recreation Development Area Map

APPENDIX H - Recreation Area Map





APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR REMAINING STRUCTURAL MEASURES

South Tyger River Watershed, South Carolina

(Dollars)  
AVERAGE ANNUAL BENEFITS 1/

Evaluation Unit	Damage Reduction	More Intensive Land Use	Municipal and Industrial Water			Secondary Redevelopment	Total	Average Annual Cost	Benefit Cost Ratio
			Recreation Development	Recreation Development	Secondary Redevelopment				
Structural Measures 2/	44,800	12,700	145,500	106,000	18,500	27,500	355,000	231,300 3/	1.6 to 1
Project Administration								10,400	
<b>GRAND TOTAL</b>	<b>44,800 4/</b>	<b>12,700</b>	<b>145,500</b>	<b>106,000</b>	<b>18,500</b>	<b>27,500</b>	<b>355,000</b>	<b>241,700</b>	<b>1.5 to 1</b>

1/ Price base: Current normalized for crop and pasture benefits; 1974 for all other.

2/ Includes three floodwater retarding structures and the channel work which have already been completed.

3/ Costs were amortized as follows: Lake Robinson - 3 1/4 percent interest rate for 100 years; all others 3 1/8 percent interest rate for 100 years.

4/ In addition, land treatment measures will provide damage reduction benefits of \$1,960 annually.

June 1975



U.S. DEPARTMENT OF AGRICULTURE  
1,570,000SOIL CONSERVATION SERVICE  
COLUMBIA, SOUTH CAROLINA

LOCATION MAP

770,000

770,000

740,000

740,000

740,000

740,000

710,000

710,000

PROJECT MAP  
SOUTH TYGER RIVER WATERSHED  
WITHIN  
GREENVILLE COUNTY  
SOUTH CAROLINA

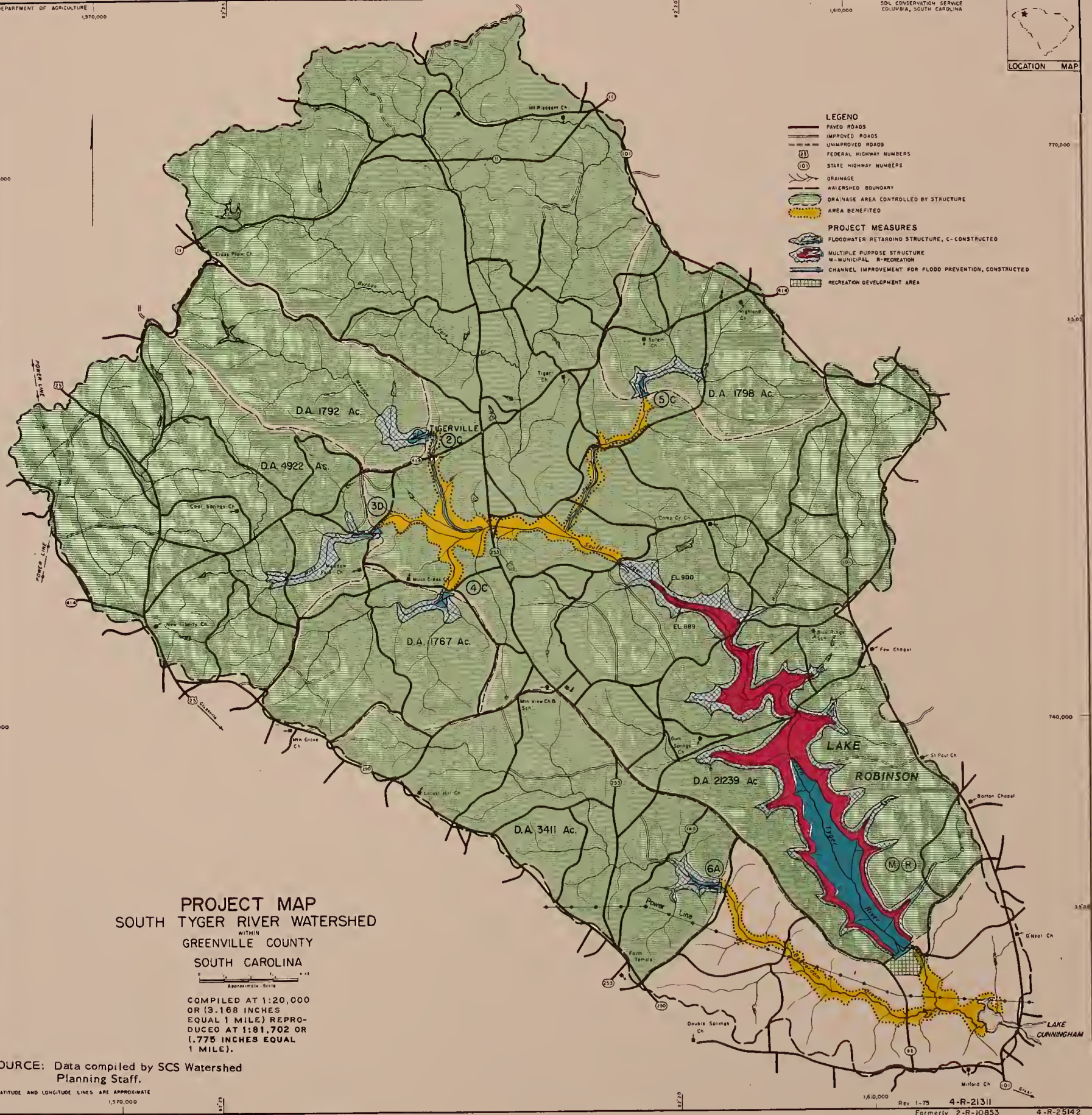
Approximate Scale  
0 1 2 Miles

COMPILED AT 1:20,000  
OR (3.168 INCHES  
EQUAL 1 MILE) REPRO-  
DUCED AT 1:81,702 OR  
(1.775 INCHES EQUAL  
1 MILE).

SOURCE: Data compiled by SCS Watershed  
Planning Staff.

LATITUDE AND LONGITUDE LINES ARE APPROXIMATE  
1,570,000

- LEGENO**
- PAVED ROADS
  - IMPROVED ROADS
  - UNIMPROVED ROADS
  - FEDERAL HIGHWAY NUMBERS
  - STATE HIGHWAY NUMBERS
  - DRAINAGE
  - WATERSHED BOUNDARY
  - DRAINAGE AREA CONTROLLED BY STRUCTURE
  - AREA BENEFITED
- PROJECT MEASURES**
- FLOODWATER RETARDING STRUCTURE, C-CONSTRUCTED
  - MULTIPLE PURPOSE STRUCTURE  
M-MUNICIPAL R-RECREATION
  - CHANNEL IMPROVEMENT FOR FLOOD PREVENTION, CONSTRUCTED
  - RECREATION DEVELOPMENT AREA



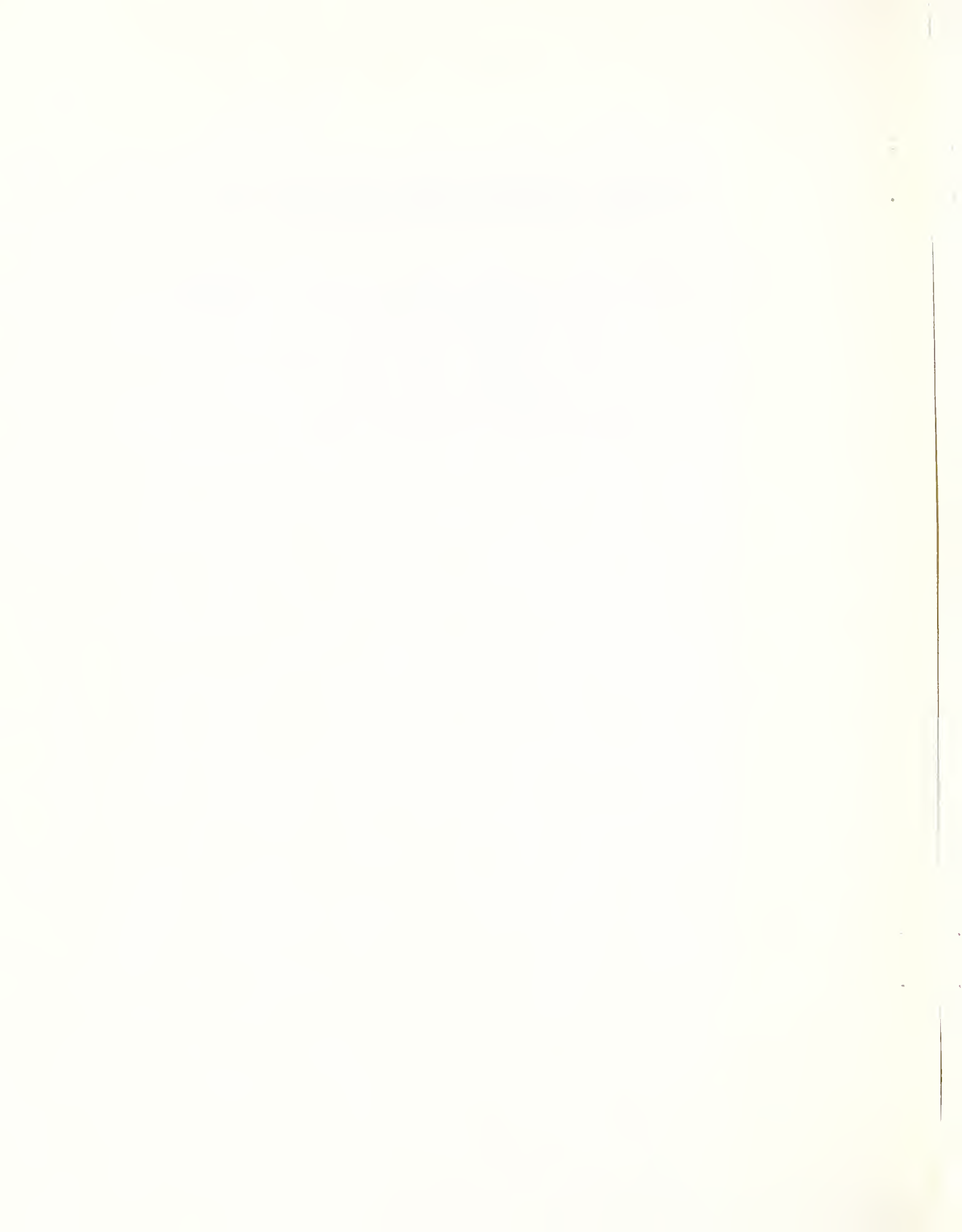
1,610,000 Rev 1-75 4-R-21311

Formerly 2-R-10853 4-R-25142



APPENDIX C - LETTERS OF COMMENT RECEIVED ON THE  
DRAFT ENVIRONMENTAL IMPACT STATEMENT

South Carolina Water Resources Commission (for the Governor)  
South Carolina Division of Administration (State Clearinghouse)  
South Carolina Appalachian Council of Governments  
U.S. Department of the Army  
U.S. Department of Health, Education and Welfare  
U.S. Department of Commerce  
U.S. Department of the Interior  
Environmental Protection Agency  
Office of Equal Opportunity - USDA



State of South Carolina  
Water Resources Commission

Clair P. Guess, Jr.  
Executive Director

November 17, 1975

Mr. George E. Huey  
State Conservationist  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Mr. Huey:

As requested, the staff of the Water Resources Commission has reviewed the Draft Revised Watershed Plan and Environmental Impact Statement for the South Tyger River Watershed Project in Greenville County. The design modifications to include a multiple-use reservoir makes this project a valued asset to the Greenville and Spartanburg area. Water demands in this area are expected to rapidly surpass the supply capacity of the available systems and any project offsetting this concern is beneficial. The b/c of 1.5/1 appears to be acceptable for projects of this type. The development attracted by this M&I project is probably a little understated.

I question however the values given to recreation benefits on the proposed Lake Robinson which does not allow for swimming facilities. It appears to me that 53,000 recreation days may be inflated for an impoundment of this size. However the M&I benefits probably offset this benefit.

Sincerely,

Christopher L. Brooks  
Planner/Economist

CLB/jat





# State of South Carolina

## Office of the Governor

JAMES B. EDWARDS  
GOVERNOR

November 19, 1975

DIVISION OF ADMINISTRATION  
Edgar A. Brown Building  
Columbia, South Carolina 29201

Mr. G. E. Huey  
State Conservationist  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Re: South Tyger River Watershed

Dear Mr. Huey:

The State Clearinghouse has completed its review of the draft environmental impact statement and the revised plan for the South Tyger River Watershed. Enclosed are the comments that I received from the Highway Department, the State Archeologist, and the Wildlife and Marine Resources Department, the Department of Archives & History. The State Clearinghouse has no additional comments to make.

Thank you for your cooperation.

Sincerely,



Elmer C. Whitten, Jr.  
State Clearinghouse

ECWjr/cs  
Enclosures



THE  
: :  
: :  
: :  
: :  
CO

# South Carolina Project Notification & Review System

## PROJECT NOTIFICATION REFERRAL

Department of Wildlife and Marine Resources  
P. O. Box 167  
Columbia, SC 29202

RECEIVED

OCT 17 1975

S. C. DEPARTMENT OF WILDLIFE AND MARINE RESOURCES

STATE APPLICATION IDENTIFIER

Clearinghouse Use Only

CONTROL NUMBER

DIST.	NO.	FY
01	2002	6

SUSPENSE DATE  
10/20

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This circular requires the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946. Please return this form prior to the above suspense date to:

State Clearinghouse  
Division of Administration  
1205 Pendleton Street  
Columbia, South Carolina 29201

Signature

Name Elmer C. Whitten, Jr.

### RESULTS OF AGENCY REVIEW

- PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

SEE ATTACHED LETTER DATED OCTOBER 28, 1975 TO DR. GEORGE E. HUEY, STATE CONSERVATIONIST, SOIL CONSERVATION SERVICE.

OCT 31 1975  
DIVISION OF ADMINISTRATION

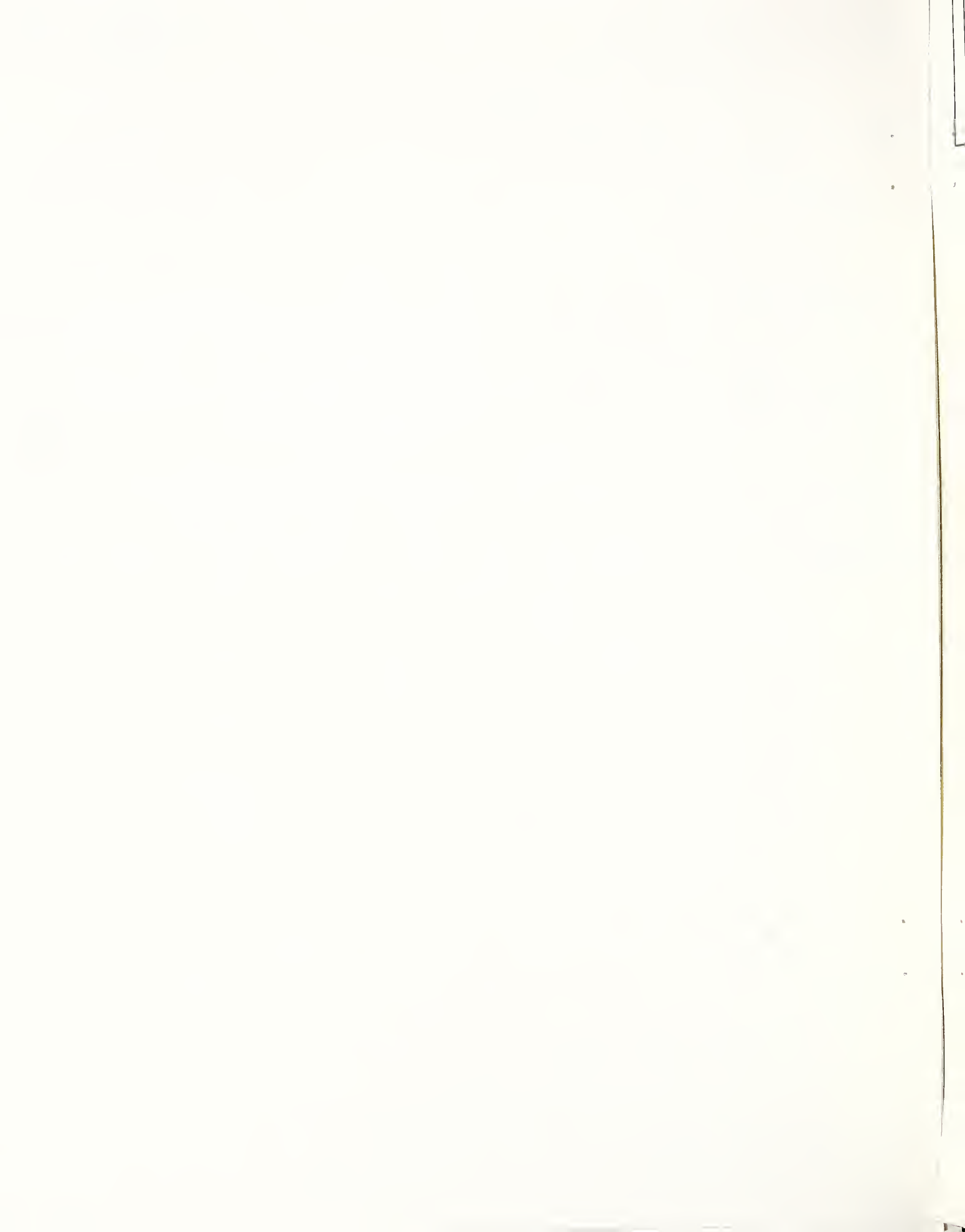
FOR THE REVIEWING AGENCY

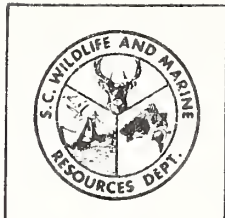
OCT 29, 1975

TITLE:

ENCLOSURE

FORM 536





*South Carolina  
Wildlife & Marine  
Resources Department*

James A. Timmerman, Jr., Ph.D.  
Executive Director  
Jefferson C. Fuller, Jr.  
Director of  
Game and Freshwater Fisheries

October 28, 1975

Dr. George E. Huey, State Conservationist  
Soil Conservation Service  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Dr. Huey:

Reference is made to the draft statement for the Revised Watershed Work Plan for the South Tyger River Watershed. We submit the following comments for your consideration.

From a freshwater fisheries viewpoint, the proposed project will probably be beneficial in that the silt load within the streams should be reduced. At the present time no significant fishery exists in the project area.

During January-February of this year, we released 41 deer in the upper portion of the watershed, upstream from any of the proposed construction or channelization. Presently the project will not effect these deer but it could eliminate additional habitat thereby restricting the overall population expansion.

Yours truly,

  
James A. Timmerman  
Executive Director

JAT/mb

cc: Jeff Fuller  
Joe Logan  
Brock Conrad  
Sam Stokes  
Randy Geddings

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South Carolina  
Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: Mr. Charles Moorefield  
SCHD

*Handwritten notes:*  
10/20/75  
S. 10/20/75  
10/20/75

STATE APPLICATION IDENTIFIER		
Clearinghouse Use Only		
CONTROL NUMBER		
DIST.	NO.	FY
01	2002	6
SUSPENSE DATE		
10/20		

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946. Please return this form prior to the above suspense date to:

State Clearinghouse  
Division of Administration  
1205 Pendleton Street  
Columbia, South Carolina 29201

Signature: *Elmer C. Whitten, Jr.*  
Name: Elmer C. Whitten, Jr.

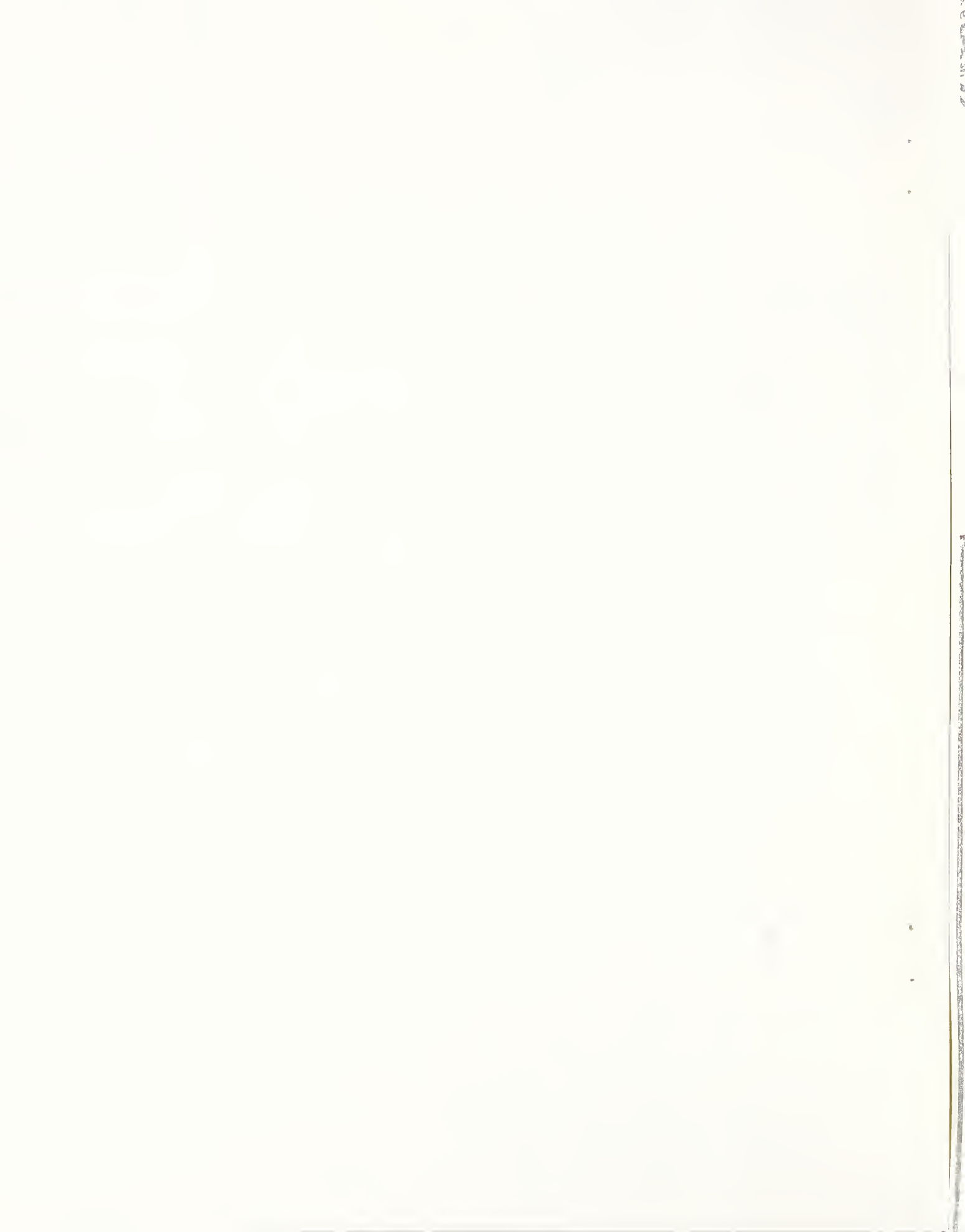
RESULTS OF AGENCY REVIEW

- PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

*It appears that this watershed project will effect several bridges, any changes in roadway alignment or bridges should be coordinated with the SCHD.*

(Use separate continuation sheet if necessary)

FOR THE REVIEWING AGENCY:  
SIGNATURE: *W. E. ...* DATE: October 3, 1975  
TITLE: Program ... PHONE: 758-2966







South Carolina  
Project Notification & Review System

PROJECT NOTIFICATION REFERRAL

TO: Dr. Charles Lee  
Dept of Archives & History  
P. O. Box 11669  
Columbia, SC 29211

RECEIVED  
SEP 16 1975  
S. C. DEPARTMENT OF  
ARCHIVES & HISTORY

STATE APPLICATION IDENTIFIER  
Clearinghouse Use Only  
CONTROL NUMBER  
DIST. NO. FY  
01 2002 6  
SUSPENSE DATE  
10/20

The attached project notification is being referred to your agency in accordance with Office of Management and Budget Circular A-95. This System coordinates the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the State Clearinghouse. Any questions may be directed to this office by phone at 758-2946. Please return this form prior to the above suspense date to:

State Clearinghouse  
Division of Administration  
1205 Pendleton Street  
Columbia, South Carolina 29201

Signature Elmer C. Whitten, Jr.  
Name Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

- PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

OCT 27 1975  
DIVISION OF  
ADMINISTRATION

We have previously consulted with Wilbur Campbell of the Soil Conservation Service, and at this time, we know of no historic sites which would be affected by this project. Please check with Ms. Georgianna Graham, of the Appalachian Regional Council of Government in Greenville to see whether she is aware of sites on which we have no information.

Under contract with the Department of Archives and History, the Regional Councils of Government have agreed to identify and evaluate affected historic properties, to assess the effects of proposed projects, and to work with project applicants to make certain that historic properties are taken into account. The Institute of Archeology and Anthropology is also under contract with Archives and History to do similar survey work. For determination of archeological value in this project, we suggest you contact Dr. Robert L. Stephenson, Director of the Institute.

(Use separate continuation sheets if necessary)

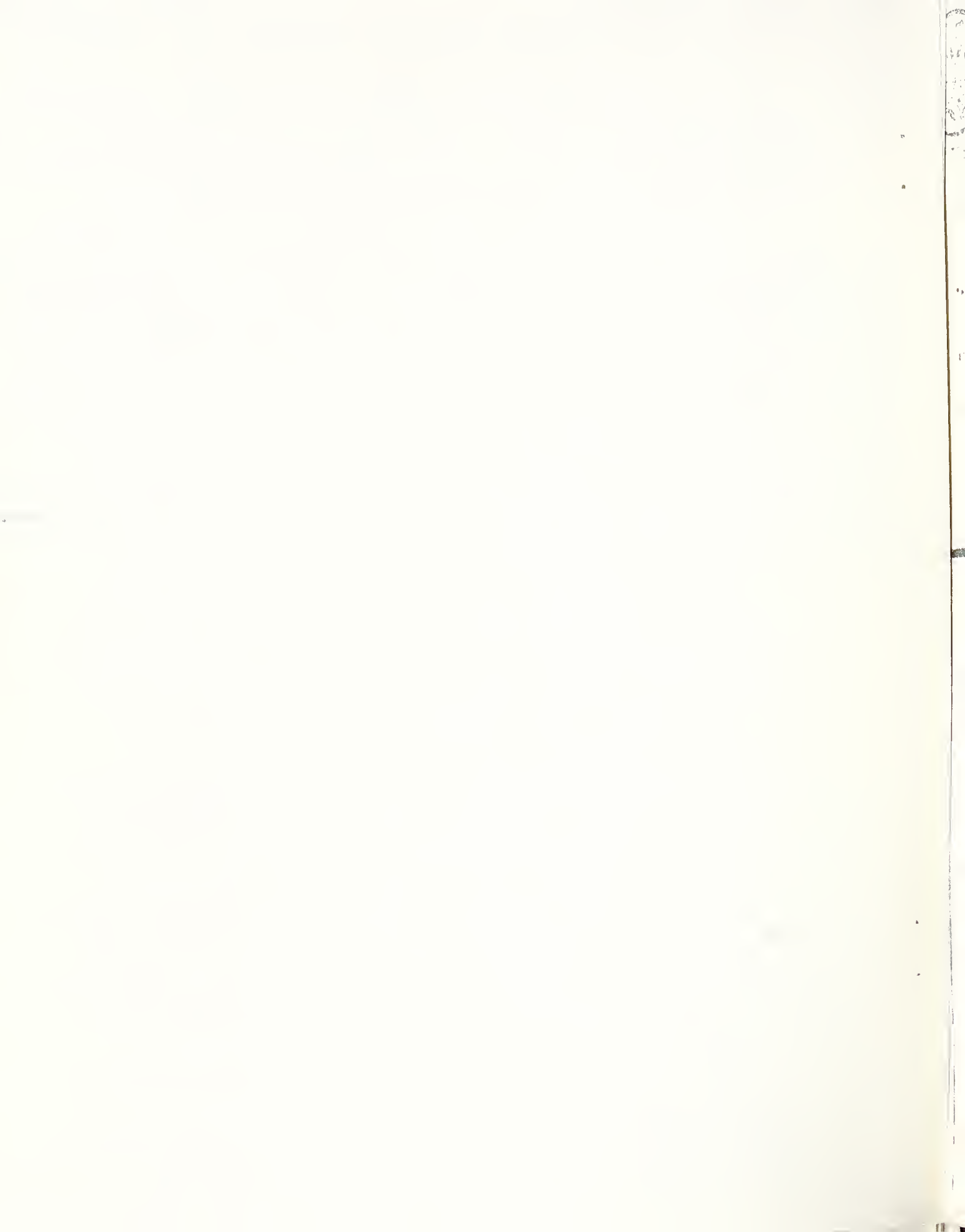
FOR THE REVIEWING AGENCY:

SIGNATURE: William L. A. [unclear]

DATE: 10/15/75

TITLE Coordinator, Historic

PHONE: 758-5816





South Carolina  
Project Notification & Review System

(5)

PROJECT NOTIFICATION REFERRAL

RECEIVED SEP 16 1975

STATE APPLICATION IDENTIFIER		
Clearinghouse Use Only		
CONTROL NUMBER		
DIST.	NO.	FY
01	2002	0
SUSPENSE DATE		
10/20		

The attached project notification is being referred to your agency in accordance with the Office of Management and Budget Circular A-95. This circular requires the review of proposed Federal or federally assisted development programs and projects. Please provide comments below, relating the proposed project to the plans, policies, and programs of your agency. All comments will be reviewed and compiled by the clearinghouse. Any questions may be directed to this office by phone at 758-2946. Return this form prior to the above suspense date to:

*Elmer C. Whitten, Jr.*

Director of Administration  
1000 Lexington Street  
Columbia, South Carolina 29201

Signature \_\_\_\_\_  
Name Elmer C. Whitten, Jr.

RESULTS OF AGENCY REVIEW

- PROJECT CONSISTENT WITH AGENCY PLANS AND POLICIES
- AGENCY REQUESTS CONFERENCE TO DISCUSS COMMENTS
- AGENCY COMMENTS ON CONTEMPLATED APPLICATION AS FOLLOWS:

The Institute of Archeology and Anthropology, University of South Carolina, has made an archeological survey of this project area and has found that no archeological resources appear to be endangered by this project as outlined in this A-95 statement.

The South Carolina Department of Archives and History should be consulted as to the potential locations of historic buildings in the project area.

(Use separate continuation sheets if necessary)

FOR THE REVIEWING AGENCY:  
SIGNATURE: \_\_\_\_\_ DATE: September 25, 1975

TITLE: Director of Administration PHONE: 777-8170



*ms*

# South Carolina State Commission of Forestry

JOHN R. TILLER STATE FORESTER

P. O. BOX 21707 COLUMBIA, S. C. 29221

October 17, 1975

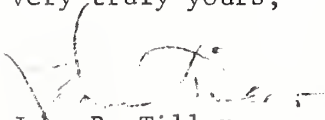
Mr. George E. Huey  
State Conservationist  
USDA-Soil Conservation Service  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear George:

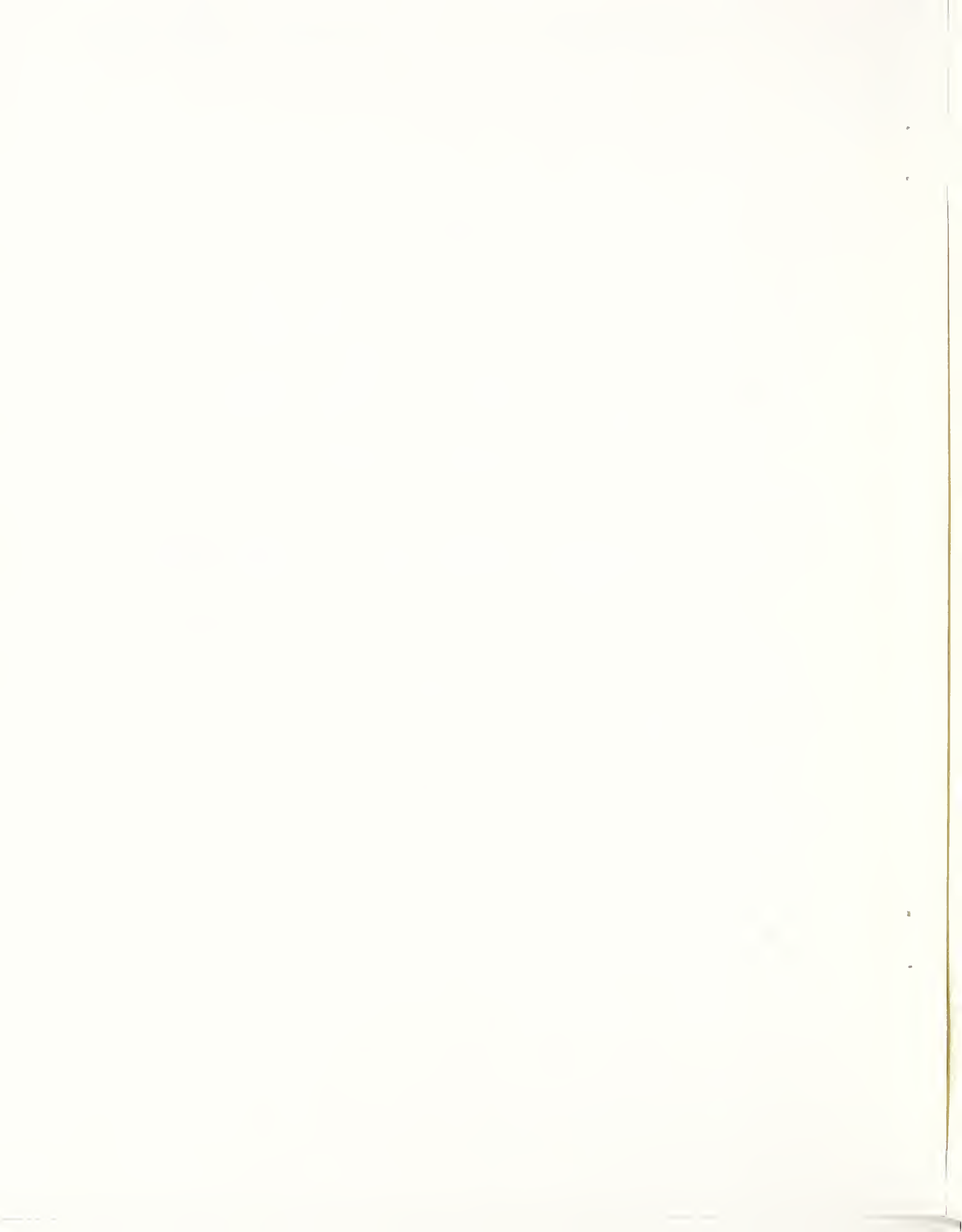
We have reviewed the draft "Revised Watershed Work Plan" and "Environmental Impact Statement" for the South Tyger River Watershed in Greenville County, South Carolina.

These plans are well written and we concur with the draft of each.

Very truly yours,

  
John R. Tiller  
State Forester

JRT:yr



November 13, 1975

Mr. George E. Huey, State Conservationist  
United States Department of Agriculture  
Soil Conservation Service  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Mr. Huey:

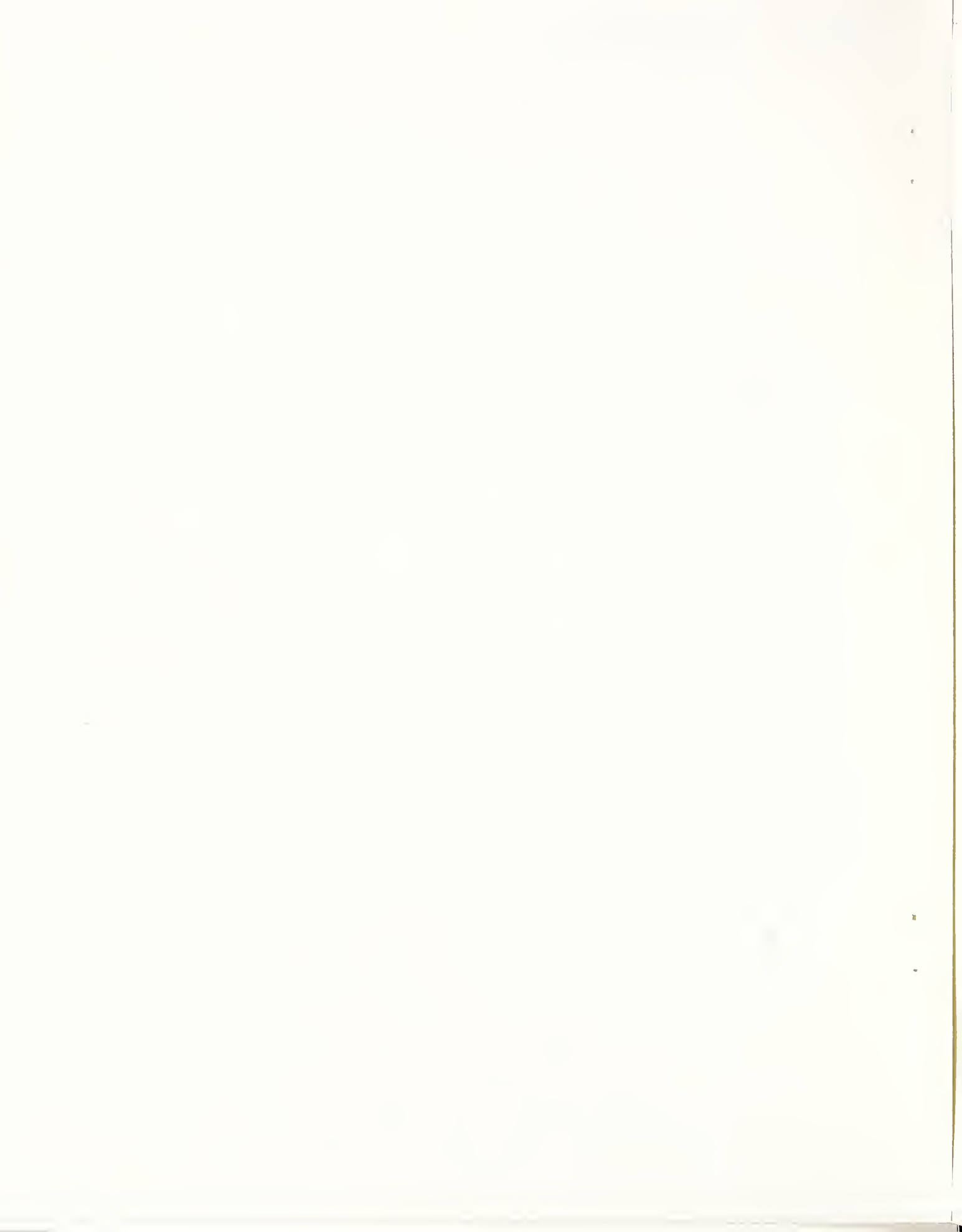
In reviewing the draft environmental impact statement for the South Tyger River Watershed Project, it was basically found to be consistent with this agency's plans and policies. However, one of our major concerns which was not adequately addressed in the impact statement, relates to the effect this project may have on water quality in the area. Specifically, what will be the short term and long term effects on water quality in the Greenville area. Moreover, will this project create industrial and residential development that keeps pace with projected wastewater needs as contained in the Greenville Metro 201 Facilities Plan. Most importantly, one should determine if the Greenville Metro Area 201 Facilities Plan will be affected by the South Tyger River Watershed Project. If the project will effect the Greenville 201 Plan, then coordination between the watershed project and the Greenville 201 Plan is necessary.

If there are any questions regarding any of these comments, please do not hesitate to call.

Sincerely,

John H. Shipp, III  
Environmental Planner

JHS/kc







DEPARTMENT OF THE ARMY  
 OFFICE OF THE ASSISTANT SECRETARY  
 WASHINGTON, D.C. 20310

18 NOV 1975  
 WA

Honorable Robert W. Long  
 Assistant Secretary of Agriculture  
 Washington, D. C. 20250

Control No.  
 06-21  
 Referred to: SCS  
 Date: \_\_\_\_\_  
 B NOV 13 1975

Dear Mr. Long:

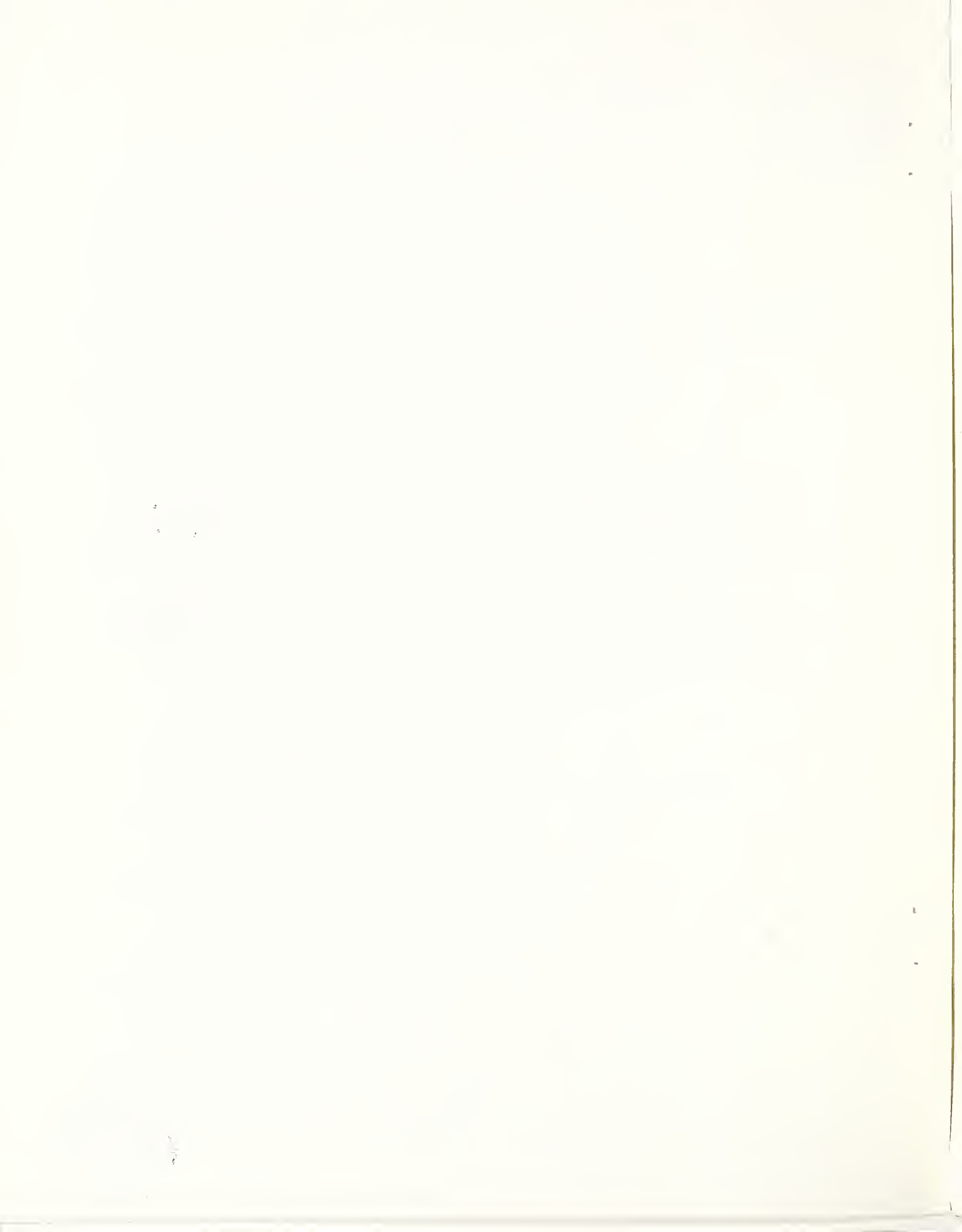
In compliance with the provisions of Section 5 of the Public Law 566, 83d Congress, the State Conservationist of South Carolina by letter of 9 September 1975 requested the views of the Chief of Engineers on the work plan and draft environmental statement for the South Tyger River Watershed.

We have reviewed the work plan and foresee no conflict with any project or current proposal of this Department. The draft environmental impact statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

Charles R. Ford  
 Deputy Assistant Secretary of the Army  
 (Civil Works)







DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20201

NOV 13 1975

Mr. G.E. Huey  
State Conservationist  
Soil Conservation Service  
U.S. Department of Agriculture  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Mr. Huey:

We have reviewed the draft Environmental Impact Statement concerning the South Tyger River Watershed, South Carolina. On the basis of our review, we offer the following comments:

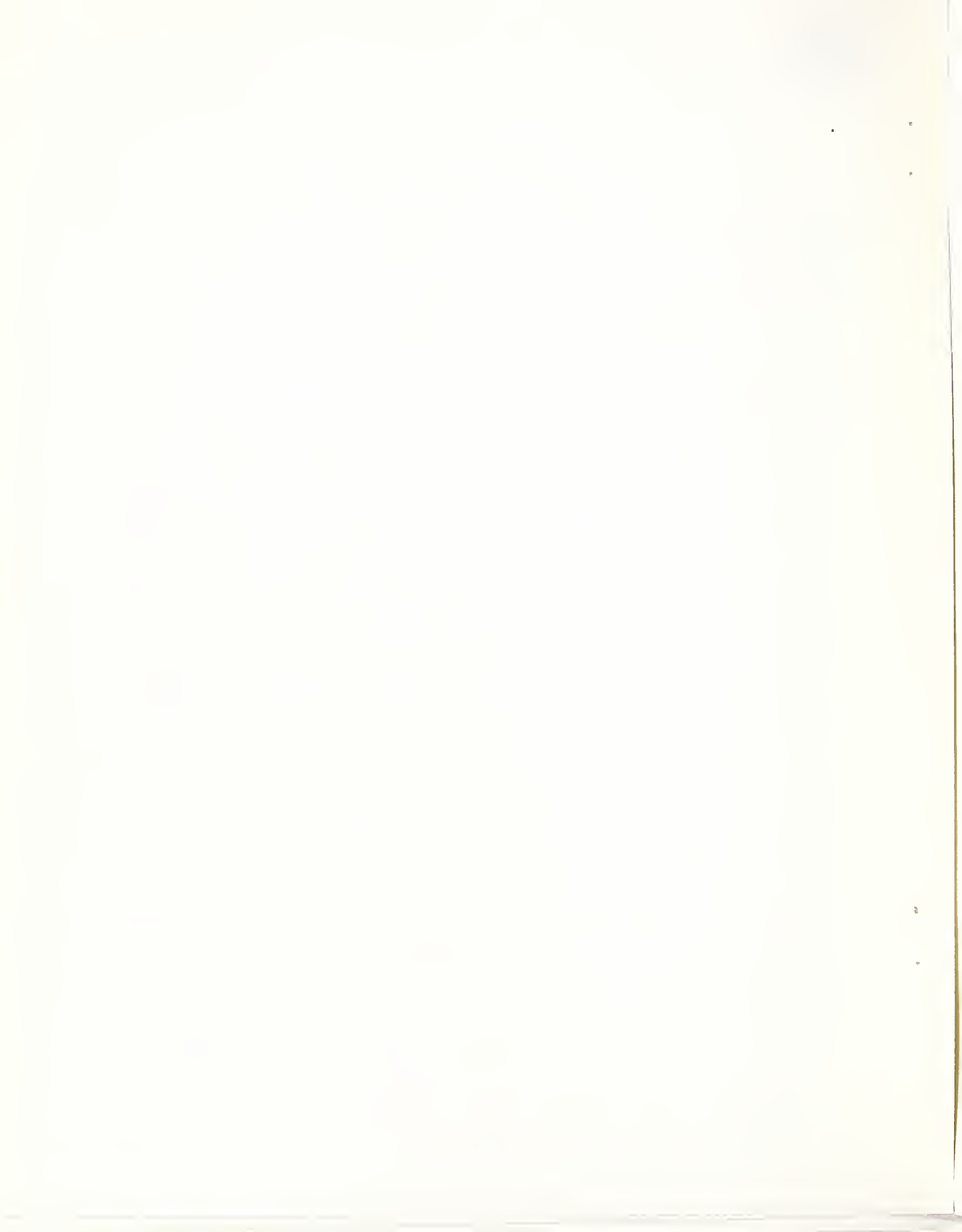
- 1 - Page 2, line 25 indicates that selected herbicides will be used to remove undesirable forage and weeds. Which herbicides are to be used? What precautions will be taken to minimize the contamination of the aquatic environment resulting from herbicide application and fertilizer run-off? Are these chemicals to be used in areas where animals are grazing? If so, what measures will be taken to prevent exposure of the animals to these agents?
- 2 - Page 15, line 8: Do any of the farms in this region border any waterfront or prospective waterfront areas? If so, what precautions will be taken to avoid the run-off of agricultural wastes in this watershed, i.e., a grass buffer zone between farm and water?
- 3 - Page 29, line 12 indicates that forest wildlife habitat will be changed to crops or pasture-type habitat, and will be permanently inundated. We consider this to be an adverse environmental impact and suggest inclusion as such on page 32 of the subject document.
- 4 - Will it be necessary to remove any of the sediment which accumulates behind the floodwater retarding structure? If so, the disposal of this material should be discussed in this document.

Sincerely,

Charles Custard

Director

Office of Environmental Affairs





UNITED STATES DEPARTMENT OF COMMERCE  
The Assistant Secretary for Science and Technology  
Washington, D.C. 20230

November 4, 1975

Mr. G. E. Huey  
State Conservationist  
Department of Agriculture  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Mr. Huey:

Reference your draft environmental impact statement entitled "South Tyger River Watershed, Greenville, South Carolina." In order to expedite transmittal of the enclosed comments from the National Oceanic and Atmospheric Administration, we are sending them to you in the form in which they were received in this office.

Thank you for giving us an opportunity to provide these comments which we hope will be of assistance to you. We would appreciate receiving four (4) copies of the final statement.

Sincerely,

A handwritten signature in cursive script that reads "Sidney R. Galler".

Sidney R. Galler  
Deputy Assistant Secretary  
for Environmental Affairs

Enclosures







U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
ENVIRONMENTAL DATA SERVICE  
Washington, D.C. 20235

October 6, 1975

Dx6/DLEC

TO: William Aron  
Director, Office of Ecology and Environmental Conservation, EE

FROM: *Lewis A. Pitt*  
Lewis A. Pitt  
Special Projects

SUBJECT: EDS Review of DEIS 7509.26 (South Tyger River Watershed, S.C.)

The EDS has reviewed the subject DEIS and offers the following comments:

Since flood prevention is a major goal of the project, the climate description would be enhanced by information on flood-producing weather systems. The frequency, intensity, and type of storm which produces flooding should be indicated, as well as the time of year such storms occur. Record rainfall amounts, in addition to normal amounts, should be included. If possible, specific rainfall occurrences should be related to flooding events.

Climatological data are available from the National Climatic Center, Asheville, N.C. 28801.







U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Rockville, Md 20852

Date: October 16, 1975

Reply to  
Attn of:

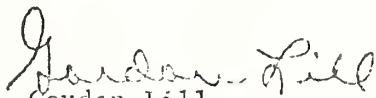
Subject: Comments on DEIS 7509.26 - South Tiger River Watershed, S. C.

To: Director, Office of Ecology and  
Environmental Conservation, NOAA

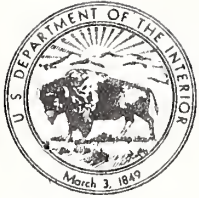
The National Geodetic Survey does not have any comments on subject draft environmental impact statement, other than the possible impact on monuments of the National Geodetic Control Networks.

Bench marks, triangulation stations, and traverse stations have been established by the National Geodetic Survey in the vicinity of the proposed project. Construction required for the project could result in destruction or damage to some of these monuments.

The National Geodetic Survey requires sufficient advance notification of impending disturbance or destruction of monuments so that plans can be made for their relocation. The National Geodetic Survey recommends that provision be made in the project funding to cover costs of monument relocation.

  
Gordon Lill  
Deputy Director  
National Ocean Survey





# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

In Reply Refer  
to: ER-75/891

NOV 21 1975

Dear Mr. Huey:

Thank you for the letter of September 9, 1975, requesting our views and comments on the work plan and draft environmental statement for South Tyger River Watershed, Greenville County, South Carolina. Our review indicates that the proposal is adequate as it relates to minerals, and fish and wildlife resources. However, we find that the outdoor recreation interests have not been properly considered.

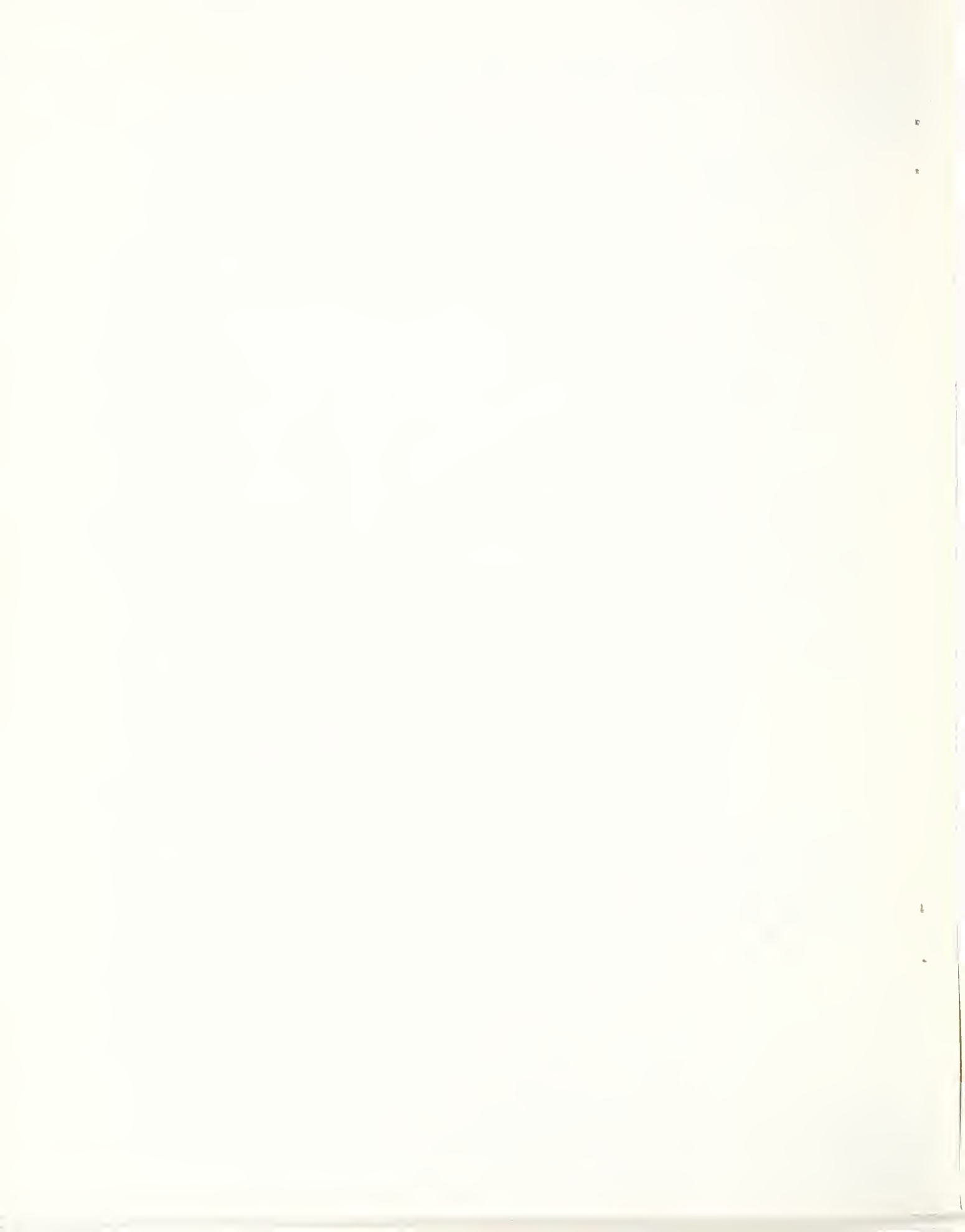
Page 31, paragraph 3 of the draft environmental statement mentions that upon completion of the lake, construction of home sites and other facilities will reduce forest acreage. Without land use zoning regulations or some type of land use control, development of home sites and facilities around the lake could also adversely effect the aesthetics of the shoreline and the quality of the recreation experience. In addition, there is no discussion of public access to the lake and shoreline. These impacts should be addressed in the final environmental statement.

Sincerely yours,

Deputy Assistant Secretary of the Interior

G. H. Huey  
State Conservationist  
Soil Conservation Service  
240 Stoneridge Drive  
Columbia, South Carolina 29210







UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.  
ATLANTA, GEORGIA 30309

November 10, 1975

Mr. G. E. Huey  
State Conservationist  
U. S. Department of Agriculture  
Soil Conservation Service  
240 Stoneridge Drive  
Columbia, South Carolina 29210

Dear Mr. Huey:

We have reviewed the Draft Environmental Impact Statement for South Tyger River Watershed Project in Greenville County, South Carolina, and our comments are as follows:

A description of the benefits of a natural free-flowing stream subject to purification effect of natural stream biota as compared with the poorer assimilative capacity of the reservoir environment should be given.

No attempt has been made to quantify the noise impact in particular as a result of increased traffic resulting from recreational use. The final environmental statement should quantify the impact from activities other than construction and should identify the type and number of noise-sensitive sites affected. Also, abatement should be addressed as necessary.

In view of the foregoing, we have classified LO- (lack of objection) to the impact of the action and 2 (insufficient information) to the Impact Statement.

We would appreciate receiving five copies of the final environmental impact statement when it is available, and if we can be of further assistance in any way, please let us know.

Sincerely,

A handwritten signature in cursive script, appearing to read "David R. Hopkins".

David R. Hopkins  
Chief, EIS Branch

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UNITED STATES DEPARTMENT OF AGRICULTURE  
OFFICE OF EQUAL OPPORTUNITY  
WASHINGTON, D.C. 20250

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SEP 24 1975

IN REPLY  
REFER TO: 8140 Supplement 7

SUBJECT: Revised Watershed Work Plan and  
Draft Environmental Statement,  
South Tyger River Watershed,  
Greenville County, South Carolina

→ TO: G. E. Huey  
State Conservationist

→ THROUGH: Verne M. Bathurst, Deputy Administrator  
for Management, SCS

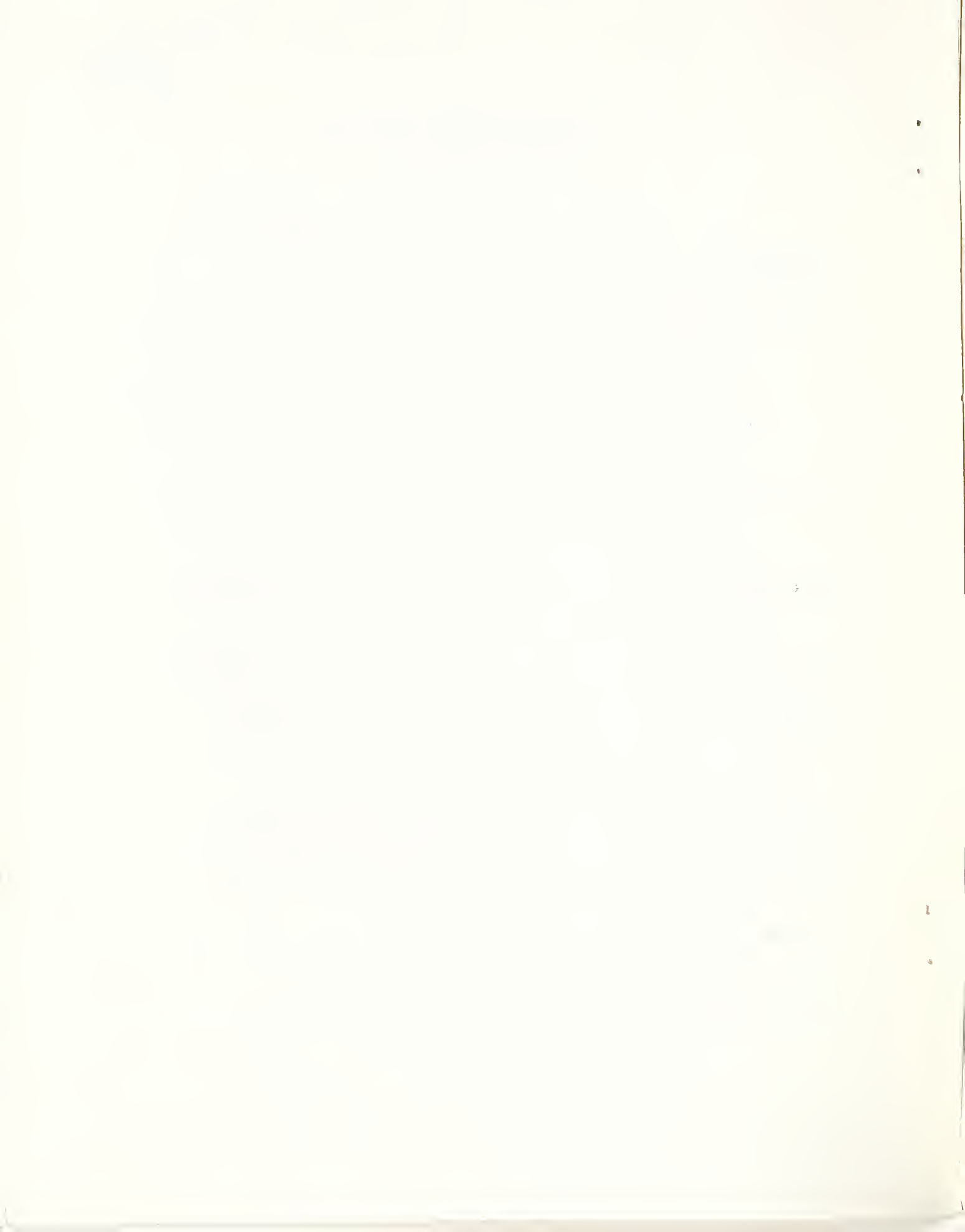
The Environmental Impact Statement (EIS) and Revised Watershed Work Plan were reviewed by this office to assess the civil rights impact for socio-economic effects on minority groups.

Our review reveals that no comments, either positive or negative, have been included concerning the impact of the proposed South Tyger River Watershed Work Plan on minorities residing in the target area. This appears to be an omission since the 1970 Census data show that minorities comprise 17.1 percent of the population in Greenville County.

In the final draft, we recommend that you include a socio-economic impact assessment of the proposed South Tyger River Watershed Work Plan on minorities in Greenville County in accordance with existing Soil Conservation Service published guidelines in the Federal Register, Vol. 39, No. 107 - Monday, June 3, 1974.

*Miles S. Washington, Jr.*

MILES S. WASHINGTON, JR.  
Acting Director





APPENDIX D - SOUTH CAROLINA DRINKING WATER STANDARDS 1/

The South Carolina Department of Health and Environmental Control collects samples of water from the distribution systems of public water supplies in South Carolina, and conducts chemical analyses in accordance with the Law, Rules and Regulations for Waterworks Systems in the State of South Carolina. These analyses are designed to determine if the finished water meets standards for chemical quality as set forth in the 1962 U.S. Public Health Service Drinking Water Standards. These analyses are also used to evaluate treatment processes where such processes are employed.

<u>Characteristic or Chemical Substance</u>	<u>Limit</u>
Total Solids	Should not exceed 500 mg/1
Turbidity	Should not exceed 5 t.u.
Color	Should not exceed 15 units
Alkalinity	Should not exceed 500 mg/1
Calcium	Related to hardness
Magnesium	Related to hardness
Hardness	Should not exceed 100 mg/1
Sodium	No standard. Provided as information for medical doctors when requested
Iron	Should not exceed 0.3 mg/1
Chloride	Should not exceed 250 mg/1
pH	Acceptable range from 6.5 to 8.5
Manganese	Should not exceed 0.05 mg/1
Copper	Should not exceed 1.0 mg/1
Zinc	Should not exceed 5.0 mg/1
Potassium	No standard. Provided as information for medical doctors when requested
Mercury	Should not exceed 0.5 ppb
Chromium	Should not exceed 0.05 mg/1
Cadmium	Should not exceed 0.01 mg/1
Lead	Should not exceed 0.05 mg/1

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1/ Law, Rules and Regulations for Waterworks Systems in the State of South Carolina, South Carolina State Board of Health, November 1970.



APPENDIX E - QUALITY STANDARDS FOR CLASS 'B' WATERS 1/

Class 'B' waters are suitable for domestic supply after complete treatment in accordance with requirements of the South Carolina Department of Health and Environmental Control. They are also suitable for propagation of fish, industrial and agricultural uses and other uses requiring water of lesser quality.

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Items	Specifications
1. Fecal coliform	Not to exceed a geometric mean of 1000/100 ml based on five consecutive samples during any 30 day period; nor to exceed 2000/100 ml in more than 20 percent of the samples examined during such period (not applicable during or following periods of rainfall).
2. pH	Range between 6.0 and 8.5, except that swamp waters may range from pH 5.0 to pH 8.5.
3. Dissolved oxygen	Daily average not less than 5 mg/l, with a low of 4 mg/l, except that swamp waters may have an average of 4 mg/l.
4. Phenolic compounds	Not greater than 1 microgram per liter unless caused by natural conditions.

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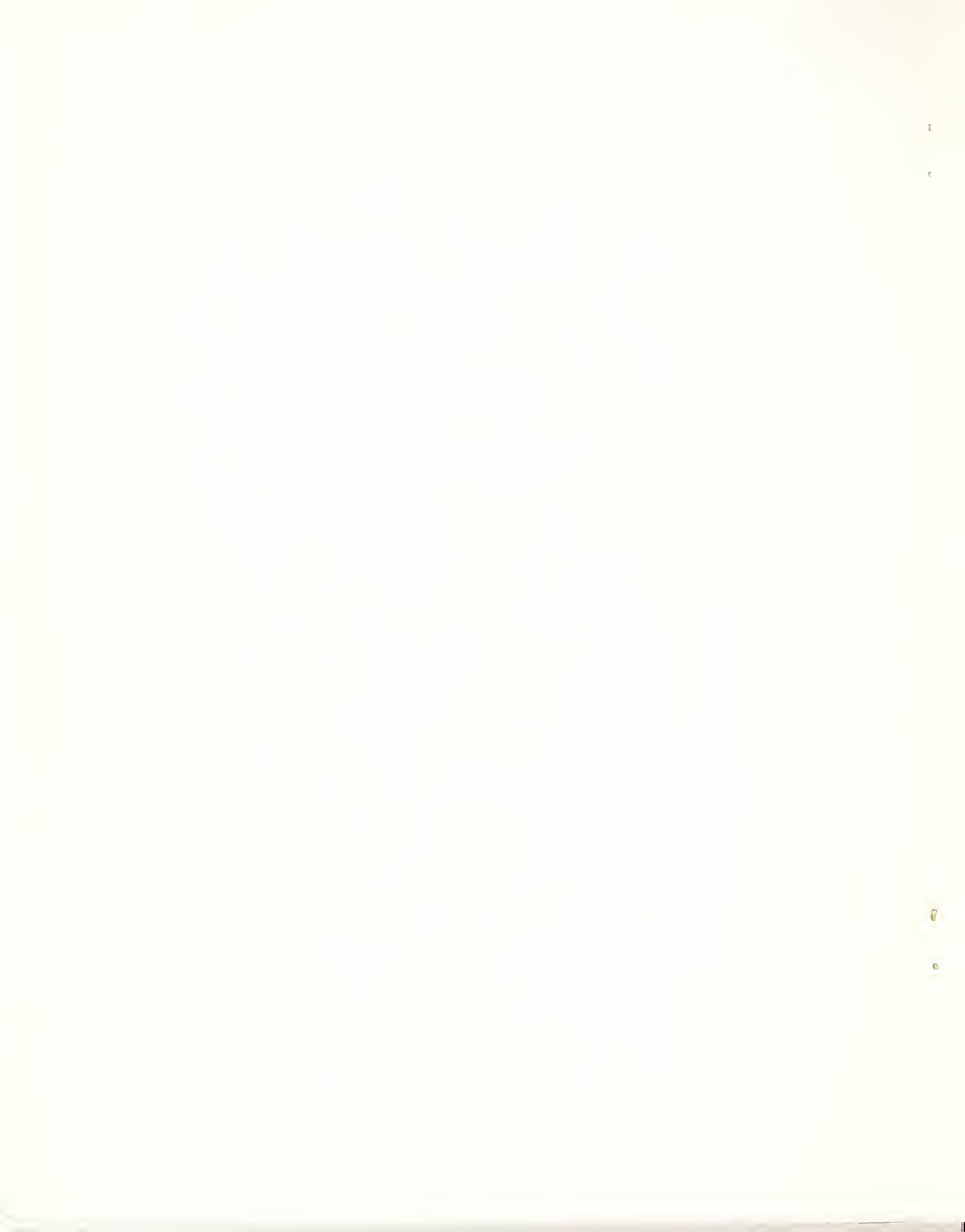
1/ Water Classification Standards System for the State of South Carolina, South Carolina Pollution Control Authority, 1972.

June 1975



APPENDIX F - SURFACE WATER QUALITY IN SOUTH TYGER RIVER WATERSHED 1/

Station Number and Location	Date of Sample	Water Temperature (centigrade)	pH	Dissolved Oxygen (MG/L)	Fecal Coliform (No./100ML)	Biochemical
						Oxygen Demand 5 Day (MG/L)
B-317 South Tyger River at South Carolina Highway 253, below Tigerville	7/25/74	-	6.2	-	725	2.4
	8/23/74	-	6.5	-	500	1.7
B-305 Mays Bridge Road off South Carolina Highway 92, northwest of Greer	7/17/72	18.0	6.8	8.0	180	0.2
	5/30/73	16.0	6.1	10.4	390	1.6
	7/24/73	20.0	7.1	8.8	-	-
	10/ 5/73	18.0	7.3	9.5	2,100	1.4
	5/28/74	18.0	-	8.5	575	1.3
	6/24/74	19.0	-	8.8	-	-
7/26/74	21.0	-	8.0	-	-	
B-304 Beaverdam Creek at South Carolina Highway 92, five miles northwest of Greer	7/17/72	18.0	-	7.8	70	0.4
	5/30/73	16.0	7.1	10.5	150	1.5
	7/24/73	21.0	7.3	8.3	-	-
	10/ 5/73	18.5	7.25	8.9	775	1.3
	5/28/74	18.0	-	9.0	1,600	1.3
	6/24/74	20.0	-	8.6	-	-
7/26/74	20.0	-	8.5	-	-	



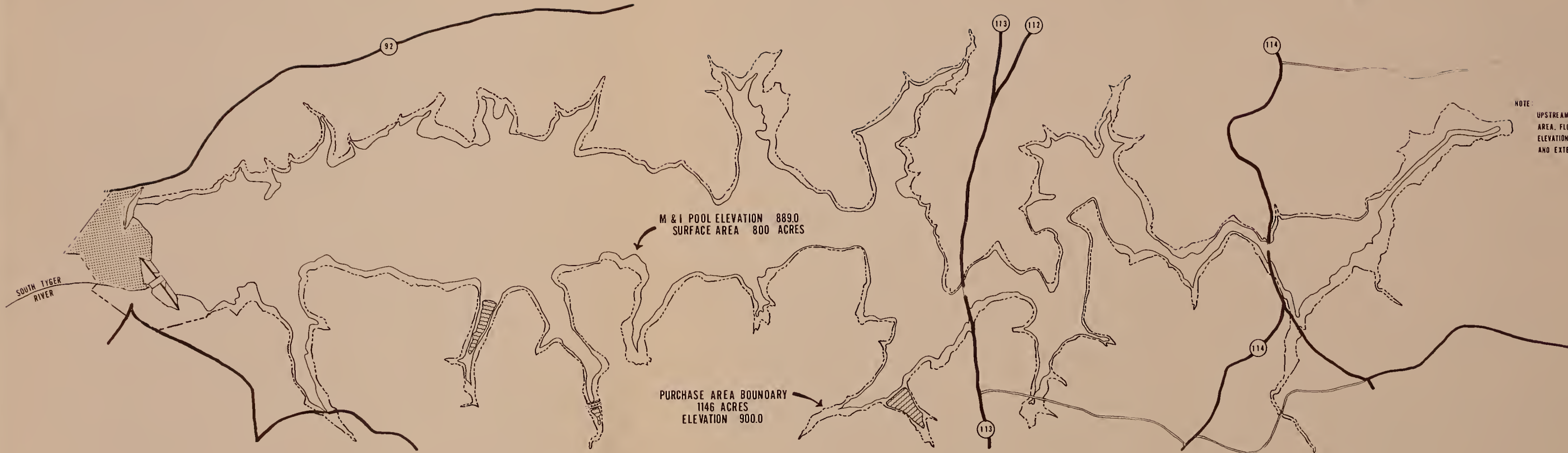
APPENDIX F - SURFACE WATER QUALITY IN SOUTH TYGER RIVER WATERSHED 1/

Station Number and Location	Date of Sample	Water Temperature (centigrade)	pH	Dissolved Oxygen (MG/L)	Fecal Coliform (No./100ML)	Biochemical
						Oxygen Demand 5 Day (MG/L)
B-149	6/12/62	23.5	6.9	9.2	-	1.3
South Tyger River	6/13/62	24.0	6.8	8.9	-	1.6
below Greer Reservoir	10/ 8/62	21.5	7.0	8.8	-	1.4
at bridge on South	5/28/63	18.0	6.9	9.6	-	-
Carolina Highway 14	5/29/63	19.5	6.8	8.9	-	-
	6/ 5/63	23.5	6.9	8.5	-	1.3
	9/26/68	23.0	7.8	8.4	-	1.4
	9/27/68	21.0	6.9	8.8	-	1.3
	7/ 8/71	23.0	6.5	8.3	-	2.4
	8/10/71	21.0	5.8	8.4	-	1.7
	7/17/72	21.0	6.7	7.2	-	0.1
	5/30/73	19.0	6.9	11.9	660	2.5
	7/ 9/73	25.0	7.1	9.5	30	0.7
	10/ 5/73	20.0	6.9	9.3	369	2.2
	6/24/74	19.0	-	9.0	-	-
	7/26/74	24.0	-	8.4	-	-

1/ Computer Data, Surface Water Quality Samples, South Carolina Department of Health and Environmental Control, 1974.



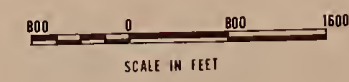




M & I POOL ELEVATION 889.0  
SURFACE AREA 800 ACRES

PURCHASE AREA BOUNDARY  
1146 ACRES  
ELEVATION 900.0

- LEGEND**
- PAVED ROAD
  - IMPROVED ROAD
  - (92) STATE HIGHWAY NUMBER
  - - - PURCHASE AREA BOUNDARY
  - TOP OF M & I POOL
  - ▨ POND
  - ⋯ RECREATION AREA



**PUBLIC RECREATION DEVELOPMENT AREA  
SOUTH TYGER RIVER WATERSHED**

LAKE ROBINSON  
GREENVILLE COUNTY, SOUTH CAROLINA  
U S DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
COLUMBIA, SOUTH COLUMBIA



LAKE ROBINSON SITE  
SOUTH TYGER RIVER  
RECREATION AREA  
WITH BASIC FACILITIES

LEGEND

- PAVED ROAD
- FOOT TRAIL
- PARKING AREA
- PICNIC TABLE
- PICNIC SHELTER
- COMFORT STATION
- BOAT RAMP
- PURCHASE BOUNDARY

