

PROPOSAL FOR
PRELIMINARY FEASIBILITY STUDY
FOR
SAMPIT RIVER
CHANNEL DEVELOPMENT

JANUARY 1975

Proposal For

PRELIMINARY FEASIBILITY STUDY

For

SAMPIT RIVER

CHANNEL DEVELOPMENT

January 1975

Henningson, Durham & Richardson

HENNINGSON, DURHAM & RICHARDSON

ARCHITECTURE
ENGINEERING
PLANNING

P. O. BOX 11257
CHARLOTTE, N. C. 28209
704/364-1800

January 6, 1975

Honorable O. M. Higgins, Mayor
City Hall
Georgetown, South Carolina

Re: Proposal for Preliminary
Feasibility Study, Sampit
River Channel Development

Dear Mayor Higgins:

Transmitted herewith is our proposal to prepare a preliminary feasibility study for development of a channel in the Sampit River for ocean-going vessels. The proposed study will address the following major problems:

1. The maximum feasible size of channel that can be developed in the Sampit River.
2. The vertical and horizontal clearances that should be established for the channel.
3. The type of bridge which would be most suitable for the Sampit River crossing.
4. The environmental implications of developing a channel in the Sampit River.
5. The economic benefits to be derived by the City, County and State if the Sampit River channel is developed and the industrial development along the Sampit River realized.

To provide the best possible study results, we have engaged as a special consultant to us Mr. Joseph M. Caldwell, former Chief of Engineering Division, U. S. Corps of Engineers. Mr. Caldwell is a recognized expert in waterways and harbors, and he has firsthand knowledge of Winyah Bay, as well.

For economic studies we have engaged a team of economics professors from the University of South Carolina, Bureau of Business and Economic Research. These economists have prepared numerous economic analyses for various agencies in South Carolina, including the study, "Impact of the

Honorable O. M. Higgins, Mayor
January 6, 1975
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State Ports Authority Upon the Economy of South Carolina."

We will engage a recognized authority on the lowland estuarine and wetland ecology to assist in evaluating the environmental impact of proposed Sampit River channel improvements.

Local surveyors will, if available, be used to obtain the hydrographic data needed for this study. Some of the data, however, may already be available from the City, State, or the Corps of Engineers. We will search for any available data before ordering new surveys, thus hopefully reducing the costs for surveys.

The proposed fees for the study are:

1. Complete study including costs for special consultants: \$68,000
2. Hydrographic and soils surveys (assuming all survey data as specified in the proposal will have to be obtained by field surveys): \$9,000

We propose to complete the study in six (6) months and provide you with fifty (50) copies of the report.

I will be most happy to discuss any aspect of this proposal in more detail with you at your convenience.

Sincerely,

HENNINGSON, DURHAM & RICHARDSON OF NORTH CAROLINA


Charles L. Baker
Vice President

CLB/jel

68,000
9,000
77,000

CITY OF GEORGETOWN
SOUTH CAROLINA

Proposal for
Preliminary Feasibility Study
for
Sampit River Channel Development

BY

Henningson, Durham and Richardson

January 1975

PRELIMINARY FEASIBILITY STUDY
FOR
SAMPIT RIVER CHANNEL DEVELOPMENT

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Preliminary Feasibility Study for
Sampit River Channel Development

Introduction

Purpose of Study The proposed study is intended to answer some basic questions concerning the potentials for developing the Sampit River channel for ocean-going vessels, the justification and feasibility for constructing a movable or a high clearance bridge over the proposed channel, and the environmental constraints for such development. Some of the questions which this study would address are:

1. What is the maximum feasible channel which can be developed in the Sampit River?
2. What vertical and horizontal clearances would such a channel require?
3. What is the most suitable bridge for such a channel crossing?
4. What types and maximum sizes of ships could use the developed channel?
5. What type of industry would be most suitable for such an area?
6. What are the environmental constraints for development?
7. What role would State and Federal agencies have in the development of the channel bridge, and the potential industrial complex?
8. How would the development be financed?
9. What will be the economic benefits to the community and the State?

With the above questions answered, even on a preliminary basis, the

City of Georgetown and the County will be in a better position to promote the water-oriented industrial development in the area.

Intended Use of the Study The study will be addressed primarily to the City of Georgetown and the County for their guidance in promoting and coordinating the development of the Sampit River channel and the industrial development in the area. However, the following agencies will also be very much concerned about the study findings and recommendations:

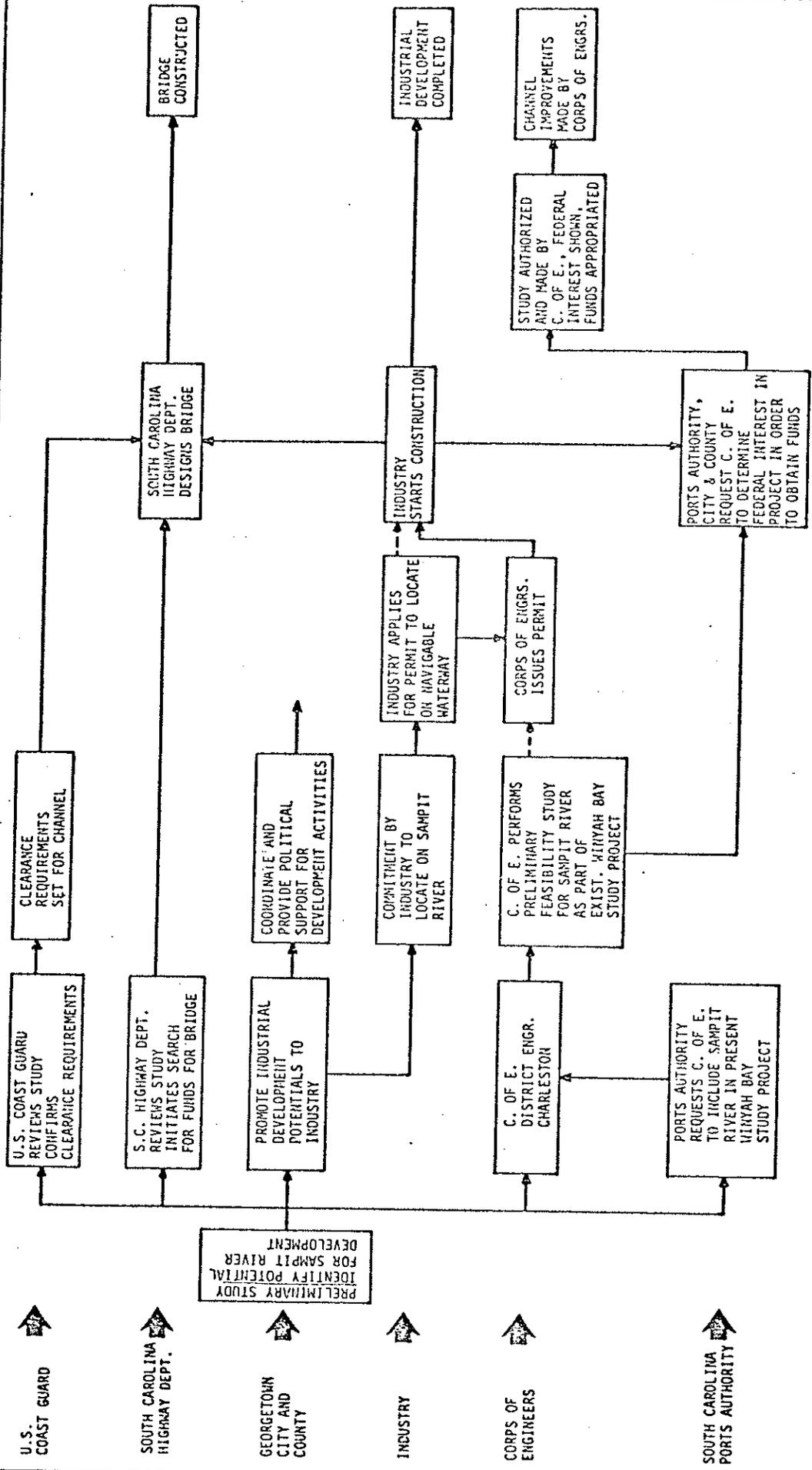
1. U.S. Coast Guard
2. South Carolina Highway Department
3. U.S. Army, Corps of Engineers
4. South Carolina Ports Authority

It is expected that the preliminary findings of this study will be sufficiently definitive and the recommendations sufficiently justifiable to permit the above agencies to support the development of the project.

A chart showing the use and relationship of the proposed study with a series of activities and events which hopefully it will generate is attached. The "Activity Flow Chart - Sampit River Navigation Channel and Industrial Development" shows how this study relates to the subsequent actions by other State and Federal agencies in support of the project.



JAN. 1978



ACTIVITY FLOW CHART
SAMPIT RIVER NAVIGATION CHANNEL AND INDUSTRIAL DEVELOPMENT

U.S. COAST GUARD

SOUTH CAROLINA HIGHWAY DEPT.

GEORGETOWN CITY AND COUNTY

INDUSTRY

CORPS OF ENGINEERS

SOUTH CAROLINA PORTS AUTHORITY

Scope of Work

A. Industrial Development Potentials

The study will assemble from available city and county sources data concerning the advantages of the industrially zoned area south of the Sampit River. The assets of the area will be reviewed with the intent of identifying the types of industries which would find it most advantageous to locate there. The following items will be reviewed and summarized:

1. The current industry in the area
2. Available land for industrial development and its suitability for industrial construction
3. Labor characteristics in the area
4. Available utilities, gas, and water
5. Ground and air transportation serving the area

B. Sampit River Physical Study

The Sampit River is a tidal river about 1200 feet in width at its mouth where it enters Winyah Bay. It extends westerly about ten miles to become a small creek in a swampy area. It is, however, still some 500 to 600 feet wide and 24 feet deep at the mouth of the Pennyroyal Creek, some 4 miles upstram from Winyah Bay. It is this lower 4 miles of the Sampit (Winyah Bay to Pennyroyal Creek) that is being considered for channel development.

The lower one mile (downstream of the Highway 17-701 bridge) is artificially widened and dredged to a depth of 27 feet as a turning basin for the Georgetown Port development. This lower one mile is subjected

to heavy shoaling which necessitates almost yearly dredging to maintain the necessary channel depths; the shoaling in this lower one mile is apparently in the order of several hundred thousand cubic yards per year.

1. Hydrographic Data. In order to assess the feasibility and probable costs of improving the lower four miles of the Sampit for navigation, certain hydrographic surveys and data are needed, as indicated below:

- (a) Hydrographic survey. This survey should cover the Sampit River from Winyah Bay to Spring Gully, a channel length of some nine miles. In the reach between Pennyroyal Creek and the 17-701 bridge (about 3 miles), cross-sections should be taken at about 500-foot intervals so that accurate computations of required initial dredging could be computed. Cross-sections could be extended to 1000-foot intervals for the reach between Pennyroyal Creek and Spring Gully. Proper tidal stage data should be taken during the surveys so that the soundings can be referred to the local hydrographic chart datum, probably mean low water.
- (b) Tidal data. Tidal data should be taken over a full tidal cycle (25 hours) to show times and heights of high tides and low tides during the tidal cycle. Tidal data should be collected at at least five points: in the Sampit River portion of Georgetown Harbor, about 2 miles upstream from the Highway 17-701 bridge, about 4 or 5 miles upstream from the bridge, about 7 to 8 miles upstream from the bridge, and at the small bridge crossing (near Sampit) some 9 miles upstream from the Highway 17-701 bridge.
- (c) Salinity data. Concurrently with the measurement of the

tidal heights, salinity data should be taken at the tidal observation points to define the high-tide, mid-tide and low-tide salinity conditions at the observations points. On each sampling occasion, salinity samples should be taken at the surface, at mid-depth, and near the bottom.

- (d) Tidal velocities. Concurrently with the measurements of salinity, the tidal velocities (direction and magnitude) at the surface should be measured.
- (e) Wash borings and probings. There have been reports of rock or hard-pan underlying the mud bottom of the Sampit. It is necessary to know the top elevations of this material if it exists. Thus a number of probings or wash borings are needed to define these elevations, if the hard material exists. Probings or wash borings should be made at 1000-foot intervals along the centerline of the Sampit from Winyah Bay to Pennyroyal Creek or as far upstream as there is any intention of enlarging the Sampit Channel. The probings (or wash borings) should carry down to at least the 45-foot MLW elevation or to the top of the hard material if shallower than 45 feet MLW. At each fourth centerline probing location over the first four miles of the Sampit, probings should also be taken near each bank in addition to the centerline boring.

Accuracy of data. The data indicated in the above items (a) through (e) does not need to be of extreme accuracy. For instance, if it is assumed that the positions of the banks of the Sampit are accurately shown on the Georgetown South (5150 IV SE) and the Kilcock Bay (5150 IV SW) 1:24,000

quadrangle sheets of the USGS, then the hydrographic survey could utilize these sheets to provide the channel bank alignments and locations in displaying the hydrographic survey and other data indicated in items (a) through (e). The salinity data is needed to indicate the extent to which sea water is presently penetrating into the Sampit River. If there is presently no sea water penetration into the Sampit, then this set of salinity samples need not be taken. If, however, the Winyah Bay ship channel is deepened to, say, 35 feet from its present depth of 27 feet, then sea water intrusion into the Sampit River may become a reality, whether this is presently the case or not. The salinity samples need only be analyzed with enough accuracy to indicate differences in specific gravity of 0.0025.

Data collection guidelines. The tidal, current, and salinity data identified as items (b), (c), and (d) in the preceding paragraph should be taken at times of low fresh water into Winyah Bay and the Sampit and in the absence of strong winds over the area.

2. Channel Development Potentials. From the hydrographic survey data obtained under Item 1 above, an analysis will be made for a navigation channel development. This study would include the following items:
 - (a) An estimate of channel widths, depths, allowable curvatures, and permissible current velocities for various types of vessels which might use the channel.
 - (b) A presentation of alternative channel dimensions which seem to warrant consideration for adoption. At least three al-

ternatives would be presented.

- (c) An estimate of the initial dredging quantities (both unconsolidated material and rock) required for the alternatives of (b), above.
- (d) An estimate of the annual shoaling rate of the alternatives of (b), above.
- (e) An estimate of the initial cost and maintenance for the various alternatives of (b), above.

C. Environmental Impact Review

The intent of the environmental impact review is to provide the City of Georgetown and other interested parties with a realistic overview and appraisal of the current status of the Sampit River ecosystem from a physical and regulatory perspective. It will point out the probable environmental consequences of river channelization and development of heavy industry upstream of the U.S. Highway 17 Bridge, and will give the reader a clear sense of the types of problems to expect based on the record of similar ventures elsewhere.

The presentation of information will be specific but not academic; it will be operational rather than theoretical, and will be useful to the reader in making future decisions. It will be based on site visitations and reconnaissance, evaluation of published data, interviews with local, state, and Federal agency representatives as well as responsible environmental organizations, and it will discuss in detail the laws and their requirements that govern environmental protection and coastal zone management.

No one part of an ecosystem operates independently of any other. Consequently, development of tidal marshlands will require exceptionally vigorous attention to the stresses that will be generated in the related marine

and shoreland environment. Stringent regulations at the Federal level, including the Coastal Zone Management Act of 1972 and the Flood Disaster Protection Act of 1973, attest to the importance of maintaining proper regard for the natural balance and productivity of the estuarine area. Numerous states such as Florida, North Carolina and California have also enacted protective legislation.

Two themes underlie these legislative actions. The first is known as "areas of environmental concern," which recognizes that certain areas, because of their attributes, require special treatment. Within these areas, human activities must be controlled, though not necessarily prohibited. The second concept designates land areas into three broad categories - "preservation, conservation and development" - and allows or disallows certain types of activities based on a set of established suitability criteria. These themes, which are mutually compatible, will be the frame of reference for our environmental review.

Products of our investigation of the potential impacts attendant upon alteration of the local environment will, in effect, comprise the sub-elements of a section of the final report. The scope of our effort will include the following tasks:

1. Preparation of an overview of current environmental quality in the Sampit River ecosystem and, more generally, in the reach of the City of Georgetown. This information will be descriptive rather than technical and will be based on available information and a physical review of the area, but will not attempt to provide exhaustive taxonomic commentary or any data requiring sampling or rigorous scientific analysis other than that generated during the hydrologic surveys described elsewhere in this proposal.

Among the items to be reviewed are air and water quality,

soils, aquatic and terrestrial flora and fauna, breeding and sustenance areas for wildlife, current land uses and industrial activities and other ecological relationships. To aid the uninformed reader, a description of the dynamic interactions and dependencies in a tidal marshland will be provided.

2. As an extension of the generalized overview in (1), a recognized expert in estuarine ecology with firsthand experience in wetlands analysis in the southeastern United States will conduct an onsite investigation and provide an interpretive report of his findings, as well as a detailed outline for further technical research program should the need for such an activity occur in the process of seeking required government approvals.
3. A discussion of potential environmental problems will be presented, based on the findings of work tasks (1) and (2). Those impacts related to channelization, including the effects of dredging and spoils disposal and changes in salinity and water temperature, will be segregated insofar as possible from those one would expect to occur under various intensities, types and locations of industrial development. Where appropriate, comments on the extent, duration and severity of impacts will be included, as will suggestions for mitigation.
4. Preparation of a comprehensive summary of applicable Federal and state laws and guidelines, and discussion of their implications with specific reference to this project.
5. Preparation of a discussion of the politics of opposition, a summary of what may occur in terms of public dissent at the local, state and regional level. This section will focus on a few pertinent examples of the controversies, compromises and court

actions that have taken place recently in other areas where municipal interests in industrial growth have collided with environmental activism in the pursuit of wetlands preservation. The orientation will be toward providing a perspective that may encourage avoidance of repetitive mistakes and costly procedural delays.

6. Preparation of a technical bibliography to serve as a reference for further investigation or review.

In summary, the facts developed in work tasks described above will provide a useful and comprehensive base of information for the local decision-maker, and will serve as a worthwhile first step in evaluating the issues involved in large-scale expansion of Georgetown's industrial and economic infrastructure.

D. Georgetown Port Development

A review will be made of the present operations of the Port of Georgetown, the plans for its expansion and improvements, and how the proposed Sampit River channel development would relate to the main port activities. The following subjects would be covered:

1. Present Port Operations. With the cooperation of the South Carolina Ports Authority, the existing industrial shippers in Georgetown, and the members of the Georgetown Pilots' Association, a survey will be made of the present operations of the port. This survey will include:
 - (a) Type of ships and sizes using the port
 - (b) The cargo handling systems used
 - (c) Available wharves, docks, and repair facilities
2. Physical Description of Waterways and Navigation Channels. This

section of the report would include a description of the physical characteristics of the present waterways and navigation channels in the Winyah Bay complex. The report would emphasize those features which have a bearing on the proposed Sampit River Port Development concept. As the movement of vessel traffic into the Sampit would be primarily via the Winyah Bay Ship Channel and secondarily via the Atlantic Intracoastal Waterway, it is important that the present conditions, difficulties (including maintenance), and operational history of these channels be recognized and the hydraulics of the various rivers entering Winyah Bay be considered.

3. Work by Corps of Engineers. This report will describe the actions and responsibilities of the U.S. Army Corps of Engineers in the waterways of the study area. As is well known, the Corps of Engineers - under its Civil Works Program - has the responsibility for the Federal interests in navigation and flood control in the Winyah Bay areas. The active navigation projects include the Winyah Bay Ship channel from the Atlantic to Georgetown and the Atlantic Intracoastal Waterway. The Ship Channel Project includes about one mile of channel and turning basin in Sampit from Winyah Bay to the Highway 17-701 Bridge.

As the present and possible future actions of the Corps of Engineers in the watercourses of the Winyah Bay area are of great importance to any planned development of the Sampit, this report will discuss their present activities and their possible future activities as they may bear on the Sampit River Port Development concept. Of particular significance in this respect is the ongoing Corps of Engineers' study for possible deepening of the

Winyah Bay Ship Channel, which includes a hydraulic model now in operation at the Corps' Waterways Experiment Station at Vicksburg, Mississippi.

The report will also discuss the possibility and advisability of having the Sampit River Port Development concept tested on the Corps' hydraulic model at Vicksburg.

4. Sampit River Channel Development in Relation to Port of Georgetown. After review of the present operations of the Georgetown Port, the prospects for deepening the main channels to the port in Winyah Bay, and hydrographic surveys and studies of the Sampit River, a recommendation will be made concerning the size of channel which could be developed in the Sampit River. This portion of the study will consider the size of ships which could operate in the Sampit Channel, the cargo handling systems which should be considered, and the operation of the ships through the Winyah Bay, the Port of Georgetown and the Sampit River Channel. Ship turning basins, anchorage, and navigation will be discussed. Estimates of types and sizes of ships which would use the Sampit River Channel will be discussed. The required width, depth, and vertical clearance of the Sampit River channel will be recommended.

E. U.S. 17 Bridge Over Sampit River

Based on the studies in the earlier sections of this report, a determination will be made concerning the required width and vertical clearance of the Sampit River Channel. An estimate of the number of ships of various sizes which would use the channel will also be known. With this information, the type of bridge which would be most suitable for this crossing will be studied. Preliminary studies including sketches of several types of bridges

will include consideration of:

- (a) Existing soils and foundations
- (b) Aesthetics and suitability of design
- (c) Operation and maintenance of the bridge
- (d) Construction costs

From these studies a most suitable type of bridge for this crossing will be recommended.

F. Economic Impact of Industrial Development

Under Section A of this study three hypothetical types of industries which would find it most advantageous to locate along the Sampit River will be identified. In this section the selected industries will be further analyzed as to their economic impact on the area and the State. The following items will be studied in detail.

1. For the three hypothetical types of industries estimates will be made concerning the type and volume of cargo which they would generate in order to determine the type, size and number of ships which would be required to serve them.
2. The economic impact of industrial development will be estimated for Georgetown City and County as well as the State of South Carolina. Direct benefits such as industry related employment and tax revenues from property and state income taxes will be estimated. Indirect benefits from industry generated economic growth will be estimated in terms of additional jobs and tax revenues. The economic burdens on the community such as increased demand for public services due to the industrial development will also be reviewed. The total economic benefit will be assessed.

3. Knowing the economic benefits of potential industrial development and the costs for channel improvement in Winyah Bay and the Sampit River, a benefit-cost analysis of the proposed public improvements will be made. The benefit-cost ratios for the construction of a bascule or other type of high vertical clearance bridge will also be checked.

It is expected that this economic analysis will show in hard numbers the benefits which would accrue to the community and the State of South Carolina if industrial development was encouraged along the Sampit River by developing it for navigation for ocean-going vessels.

Study Staff

We propose to assign senior engineers and environmentalists from the HDR staff to perform the various technical aspects of the study. For certain very specialized areas of the study such as coastal engineering, estuarine ecology and economics, we propose to enlist the advice of experts (consultants) who are knowledgeable of the lowland problems of South Carolina and in particular the Winyah Bay and Georgetown County region. The proposed staff and their responsibilities are listed below. See attached resumes for details.

HDR Staff

Officer-in-Charge -

Charles L. Baker P.E.

Study Director -

Algis A. Lukas P.E.

Waterfront Engineering -

Leroy E. Baker P.E.

Transportation and Traffic Engineering -

Bruce A. Menne P.E.

Kenneth W. Rutland P.E.

Clemens A. Meyer, Ph.D. P.E.

Bridges -

Virgil G. Meedel P.E.

Shiv Batra

Environmental Studies -

Robert Judd

Richard Lee, Ph.D.

Richard S. Lee

Aquatic Biologist

EDUCATION:

Harvard University, Cambridge, A.B., Biology;
University of Alaska, College, Alaska, Fresh-Water
Fisheries; University of California, Santa Barbara,
Master of Arts, Ichthyology; Ph.D. candidate,
Ichthyology.



Experience

1973 to Present

Henningson, Durham & Richardson. Ecological and Safety Sciences Department. Aquatic Biologist with responsibility for that phase of environmental impact statements for projects including: Recreational and Marina Development, Ventura, California, Port District; Patuxent, Maryland, Air Research Center Master Plan, and Navajo County, Arizona, Water Resources and Disposal Study.

1972 to 1973

Multran American Corporation, Santa Barbara California. Consultant, Aquatic Biologist and Limnologist.

1968 to 1973

University of California, Santa Barbara. Instructor, Extension Service.

National Marine Fisheries Service, NOAA. Biological Technician, Survey Team Leader.

1969 to 1970

Santa Barbara Underseas Foundation. Chief On-Board Instructor, Floating Marine Lab.

1969 to 1970

Santa Barbara Museum of Natural History, Santa Barbara, California. Aquatic Biologist and Ichthyologist. Research, public relations and curatorial duties.

1965 to 1967

Catalina Island School for Boys, Avalon, California. Chairman, Advisory Board of Ocean Science Center Proposal (funded by Educational Facilities Lab); Chairman, Department of Science; Instructor, Biology, English, General Science.

1963 to 1965

Midland School, Los Olivos, California. Instructor, Biology and English.

1961 to 1962

University of Alaska, College, Alaska. Department of Wildlife Management: Teaching Assistant in Zoology; Field research in Fresh-Water Fisheries.

1961 to 1962

Tundra Summer Camping Program, Fairbanks, Alaska. Director.

1960 to 1961

Punahou School, Honolulu, Hawaii. Instructor, General Science.

Guest Scientist (Research and Landing Morphology of Benthic Fishes) on the Cruise #7303-G from LaPaz, Mexico to Puerto Limon, Costa Rica; and Guest Scientist (Parasites and Morphology of Benthic Fishes), Legs 3 & 4 SOULCETON Cruise from Valparaiso, Chile to Isla Pere. Both cruises were sponsored by Scripps Institute of Oceanography.

Served from 1972 to 1973 as Vice President, Board of Directors, Rancho La Vina Corporation, Lompoc, California. From 1968 to 1972, served Santa Barbara Underseas Foundation in the following capacities: Member, Board of Directors; President, Board of Directors; Director of Educational and Technical Services.

Publications:

"The Birds of Moku Manu." Paradise of the Pacific Magazine, 1961 (with William Knowlton); "Alaska," in A.J. McClane (ed.), McClane's Standard Encyclopedia of Fishing, Holt, Rhinehart & Winston, 1965; "Yukon Territory," *ibid.*; "Prionotus Xenisma Jordan and Bollman, a Sea Robin New to California," California Fish and Game, 54 (4): 278-280, 1968; "The Filetail Catshark, *Parmaturus xanirus*, in mid-water in the Santa Barbara Basin off California," *ibid.*, 55 (1): 88-90, 1969; "Floating Marine Laboratory Study Cruise Student Manual," Santa Barbara Underseas Foundation, Cont. no. 1: 1-44, 1969; "Additional Bathymetric and Locality Data for Some Opisthobranchs and an Octopus from Santa Barbara County," *The Veliger*, 12 (2): 220-221, 1969 (with P. Brophy); "Five Fishes of Unusal Interest," Museum Talk (Santa Barbara Museum of Natural History), XLIV (e): 37-42, 1970; "A key to the freshwater fishes of California," in M. Love and R. Bray (eds.), Keys to the Fishes of California with Information on their Biology and Fishery, Laboratory syllabus, Zoology 161, University of California, Santa Barbara, pp. 179-209, 1972; "A Key to the Cyclopterid fishes of California," *ibid.*, pp. 92-95; "An annotated checklist of the fishes of the Santa Barbara region," in J. Bennett (ed.), *The Natural History of Goleta Point* (in press, 1973); "Gulpers, Snatchers, and Anglers," Museum Talk (Santa Barbara Museum of Natural History), XLVII (1): 9-11, 1973.

Consultants

Waterways and Harbors - Joseph M. Caldwell

Mr. Caldwell was Chief of Engineering Division, Directorate of Civil Works, Office of Chief of Army Engineers (retired June 1973). He is currently a private consultant specializing in hydraulics, coastal engineering, waterways and harbors. Mr. Caldwell is thoroughly familiar with Winyah Bay since he built the first hydraulic model of the bay for testing at the Vicksburg U.S. Waterways Station. He also was chief engineer of the Vicksburg, Mississippi, experiment station.

Economics - Randolph C. Martin, Ph.D.

Ronald P. Wilder, Ph.D.

Both Martin and Wilder are economics professors at the University of South Carolina, College of Business Administration, Bureau of Business and Economic Research. Both are familiar with the economic base of the region. Dr. Wilder, furthermore, was the co-author of the study, "Impact of the State Ports Authority Upon the Economy of South Carolina," which was performed under a grant from the South Carolina State Ports Authority.

Estuarine/Wetlands Ecologist - To be selected

A recognized expert in estuarine ecology will be selected who has firsthand experience in wetlands analysis in the southeastern United States.

Charles L. Baker, P.E.

*Vice President,
Henningson, Durham & Richardson of North Carolina*



Education:

Bachelor of Science in Civil Engineering, The Citadel, Civil Engineer—Sanitary Option, North Carolina State College.

Registration:

Professional Engineer—North Carolina, South Carolina and Virginia.

Experience

1967 to Present

Vice President in charge of Henningson, Durham & Richardson, Inc. of North Carolina which employs 25 engineers, architects, designers, draftsmen, clerical and field personnel. This office provides engineering and architectural services to municipalities, counties, special districts, federal agencies and private clients in the Atlantic and Gulf states.

1962 to 1967

Henningson, Durham & Richardson, Inc. of North Carolina. Sanitary Section Head. Responsible for the preparation of reports, design of water distribution systems, water treatment plants, sewerage systems, sewage treatment plants, industrial waste facilities, feasibility studies for all types of sanitary facilities and all other sanitary engineering projects.

1956 to 1962

W. K. Dickson and Company, Inc., Consulting Engineers, Charlotte, N. C. Vice President and Project Engineer. Reports, design and project development of water works, sewage works, and civil engineering for various municipalities and private clients in North and South Carolinas.

1954 to 1956

U. S. Geological Survey, North Carolina District, Raleigh, N. C. Made stream-flow measurements and made reconnaissance trips and conducted special field surveys as in the determination of flood discharges and low flows. Computed daily stream-flow values from discharge measurements. Worked on drainage basin correlation studies.

1953 to 1954

W. K. Dickson and Company, Inc., Consulting Engineers, Charlotte, N. C. Instrumentman and draftsman on water, sewer and general civil engineering projects. Design of small steel and concrete structures.

Memberships:

National Society of Professional Engineers (NSPE); American Society of Civil Engineers (ASCE); American Water Works Assoc. (AWWA); Water Pollution Control Federation (WPCF); American Public Works Association (APWA).

Algis A. Lukas, P.E.

Civil Engineer

Education:

Bachelor of Science in Civil Engineering, University of Pennsylvania; Master of Science in Civil Engineering, Catholic University of America.

Professional Registrations:

Professional Engineer — Illinois, Connecticut, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia.



1969 to Present

Experience

1964 to 1966

Henningson, Durham & Richardson, Washington, D.C. Manager of Transportation and Traffic Engineering Projects. Responsible for design and coordination of traffic engineering and transportation projects. Projects include urban expressways, highways, urban street networks, traffic studies, parking, public transportation and transportation planning. Projects include:

Management of a \$35,000,000 rail rapid transit design project for Washington, D.C. METRO system. The project, Section D-8, included an underground subway station and approximately one mile of tunnels. Manager for design of \$18,000,000 TOPICS project for Virginia Beach, Va.; Cumberland, Maryland Urban Renewal; traffic signalization program for Anne Arundel Co., design of 9 miles of primary highway in West Virginia; street layout for 200 unit housing project; urban renewal Sioux City, Iowa; transportation and traffic plan for San Pedro Sula, Honduras; traffic and parking study for Columbus Hospital, Milwaukee; airport access study, Omaha, Nebraska, chairman traffic operations design committee for Papago Freeway, Phoenix, Arizona; I-80 and 84th Street interchange study Omaha, Nebraska.

1966 to 1969

H.W. Lochner, Co. Supervising Liaison Engineer. Responsible for coordination of highway design projects performed by various consultants for Connecticut Highway Department. Responsibilities included coordination of surveys, geometric highway design, traffic studies, bridge design, hydraulics, soils investigations and other related activities for eight major projects ranging in construction costs from \$3,500,000 to \$13,000,000.

DeLeuw, Cather & Company, Project Manager and Project Engineer. Project engineer on the preparation of plans for 50 miles of primary highway for British Guiana; preparation of preliminary plans and final drawings on the urban section of I-74 through Moline, Illinois, including intersection design and signalization for urban streets; preliminary study to utilize existing railroads for rail rapid transit service in Louisville, Kentucky; final design of two rural interchanges on U.S. Highway 12 in Wisconsin; urban transportation studies for Dallas, Texas and Minneapolis-St. Paul, Minnesota; rail rapid transit studies for Washington, D.C., Boston and Chicago; final alignment and profile design for a subway in Philadelphia.

1962 to 1964

DeLeuw, Cather & Company, Highway and Traffic Designer Engineer. Design engineer on Harlem Interchange of Southwest Expressway in Chicago; design and preparation of construction drawings for a portion of I-70 in Indiana; preliminary alignment and profile studies for improvements of the Congress Street Expressway and North Avenue Interchange in Chicago; preliminary alignment, profile, and drainage studies of U.S. 12 including several interchanges, grade separations, and frontage roads; preliminary studies of New Jersey Turnpike widening at the Elizabeth Interchange; final plans of Lawndale Interchange in Chicago.

1958 to 1962

U.S. Air Force, Bolling Air Force Base. First Lieutenant and Project Engineer. Responsible for various design and construction projects including street designs and improvements, parking lots, building construction and remodeling, marinas, and other waterfront improvements.

(CONTINUED)

1957 to 1958

Philadelphia Electric Company. Engineer-in-Training. Participated in a management training program designed to familiarize prospective managers with power plant planning, design, construction, operation and maintenance.

1956 to 1957

Bell Telephone Company, Technical Assistant. Worked with senior engineers in the design and supervision of projects under construction.

Professional Societies:

American Society of Civil Engineers; Institute of Traffic Engineers; Highway Research Board. Institute for Rapid Transit.

Leroy E. Baker, P.E.

Civil Engineer



Education:

Master of Science in Civil Engineering, majoring in hydraulics and structures, University of Illinois. Bachelor of Science in Civil Engineering, University of Nebraska.

Registration:

Professional Engineer—Illinois, Nebraska.

Experience

1969 to Present

Henningson, Durham & Richardson. Project Engineer specializing in water resources and related projects. Assignments have included major responsibility on North Central Montana Water Conservancy District Study, hydrodynamic and earthquake design of piers for Interstate bridges on Clark Fork River in Montana, and Mississippi River crossing studies in Iowa. Project Engineer for civil design of Malmstrom Safeguard Perimeter Acquisition Radar Site, Ralston Viaduct project in Nebraska, and Omaha West Dodge urban freeway design. Varied experience in design of storm sewers, drainage and irrigation facilities, bridges, highways and airports.

1965 to 1969

Harza Engineering Company, Consulting Engineers, Chicago, Illinois. Hydraulic and structural engineer working on special problems associated with the design and construction of large hydro-electric projects throughout the world. Assignments included analysis of slopes and foundations conditions; finite element analysis of two and three dimensional structures; development of a computer program to perform dead load, grout load and temperature analysis

of double curvature thin arch dams; design of an extensive subsurface drainage system around Mangla Spillway, Pakistan; Design of Karun Arch Dam, Iran; review of design criteria for Tarbela Dam, Pakistan; evaluation and computer processing of instrumentation data from Mossyrock Arch Dam; cavitation and scour studies for Mangla Spillway, West Pakistan.

1962 to 1964

Henningson, Durham & Richardson. Bridge design, construction inspection and surveying for municipal paving and storm sewers.

1960 to 1962

U.S. Geological Survey, Nebraska District, Lincoln, Nebraska. Made stream-flow and various other hydrologic measurements on streams throughout Eastern Nebraska. Constructed gaging stations and cableways at new recording stations.

Memberships:

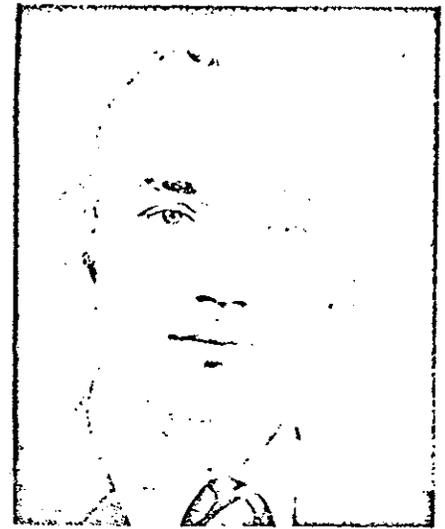
American Water Resources Association; American Society of Civil Engineers; National Society of Professional Engineers; Professional Engineers of Nebraska; Sigma Xi.

Publications:

"Application of Elasto-Plastic Analysis in Mechanics by Finite Element Method," L. E. Baker, et al; Proceedings of the Eleventh Symposium on Rock Mechanics, University of California at Berkeley in 1969.

Bruce A. Menne, P.E.

Civil Engineer



EDUCATION:

Bachelor of Science in Civil Engineering, The Citadel.

REGISTRATION:

Professional Engineer — Missouri.

Experience

1973 to Present

Henningson, Durham & Richardson, Transportation Engineer. Project Manager responsible for administration and supervision of a final design TOPICS Contract for an urban expressway in Virginia Beach, Virginia. The contract is comprised of surveys; traffic operations and design; and roadway, bridge and lighting design.

1972 to 1973

Howard, Needles, Tammen & Bergendoff, Alexandria, Virginia. Project Engineer and Senior Designer. Project engineer responsible for engineering, cost estimating and report writing for an environmental impact statement and engineering report of a controversial proposed Northern Virginia Interstate Highway. Concurrent responsibilities included coordination between the disciplines of structural, highway, environmental, economic, urban planning and journalist team members. Project engineer for toll road construction plan revision in State of Virginia. Engineering and supervision for design of construction plans for a Washington, D.C. METRO station parking lot. Assisted in planning of the widening of the Capital Beltway in Northern Virginia. Assisted in the resurfacing design of the principal runway at Washington National Airport.

1965 to 1972

Howard, Needles, Tammen & Bergendoff, Kansas City, Missouri. Highway Planning Engineer and Highway Design Engineer. Performed report writing, corridor location and feasibility studies, origin and destination surveys and traffic analyses for a proposed toll road in South Central Louisiana. Served as member of design team for a route location study in a suburban area of Chicago, Illinois. Elements of the study included engineering, socio-economic consideration and the preservation of parklands. Performed engineering, cost estimating and report writing for location and feasibility studies for seventeen toll bridges across rivers bordering Iowa. Assisted in location studies of interstate highways in the Kansas City area. Responsible for the performance of horizontal and vertical control surveying for aerial photographic mapping of a highway corridor in Kansas City, Missouri. Later assisted in the preliminary layout plans for that highway. As a design engineer, assisted in final construction plans for a rural interstate highway and an urban expressway. Duties included calculating horizontal and vertical alignment, grading, earthwork, open channel drainage design, quantities, and cost estimating.

MEMBERSHIP:

American Society of Civil Engineers.

Kenneth W. Rutland

Civil Engineer



Education:

Bachelor of Science in Civil Engineering; University of South Carolina; Working on Master of Science in Transportation Engineering, George Washington University.

Registration:

Engineer-in-Training: South Carolina 1969.

Experience

1972 to Present

Henningson, Durham & Richardson. Washington, D.C. Traffic Engineer. Responsible for designing the relocation of streets and highways affected by the construction of a section of the Washington Metropolitan Area Transit Authority's Subway System, developing maintenance of traffic and detour plans and coordinating with all concerned agencies on approval of the design concept. Responsible for coordination and preparation of the traffic and transportation section of the implementation study and report CBD Urban Renewal Program, Cumberland, Maryland.

1971 to 1972

U.S. Army, Corps of Engineers, Ft. Belvoir, Virginia. First Lieutenant. Executive Officer and Platoon Leader, Engineer Company. Supervised construction of portable floating bridges. Responsible for the maintenance and accountability for over \$500,000 in equipment and tools used in the construction of these bridges.

1970 to 1971

U.S. Army, Corps of Engineers, Ft. Belvoir, Virginia. Second Lieutenant. Instructor at the United States

Army Engineer School, Construction Engineering Division, Heavy Construction Branch, Pavement and Materials Section, Concrete Sub-section. Instructed officers and enlisted students in concrete construction from design of mix to placement, finishing, curing and inspection. Conducted laboratory classes involving concrete mix design and tests on concrete.

1969 to 1970

South Carolina State Highway Department, Columbia, S. C. Assistant Traffic Engineer. Responsible for various traffic operations projects involving channelization, signalization and signing. Involved in signal design for a major intersection in City of Columbia utilizing an eight-phase quad left-turn controller.

1965 to 1969

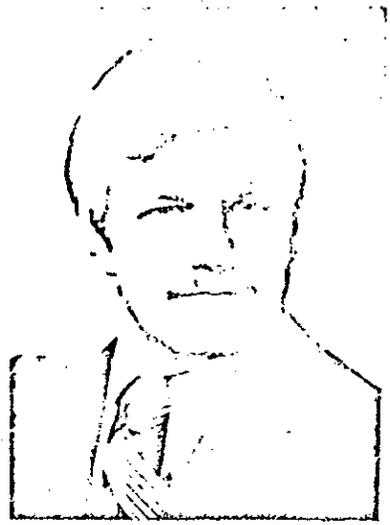
Daniel Construction Company, Greenville, South Carolina. Summer employment while attending college. Chief of surveying team on construction of a plant for the General Tire and Rubber Company, Charlotte, N.C. Member of surveying team on a construction project in North Augusta, S. C.

Membership:

American Society of Civil Engineers; Institute of Traffic Engineers. Associate Member; Washington Section Institute of Traffic Engineers. Member.

Clemens A. Meyer, P.E.

Transportation Engineer



EDUCATION:

Bachelor of Science in Architecture, Iowa State University; Master of Science in Civil Engineering, University of South Carolina, Ph.D in Civil Engineering, North Carolina State University

REGISTRATION:

Professional Engineer, South Carolina

Experience

1974 to Present

Henningson, Durham & Richardson, Senior Traffic Engineer. Traffic signal systems design for Anne Arundel County, Maryland; Signal Systems and Traffic Operations Analysis of the Virginia Beach Boulevard — a 7.5 mile primary urban arterials, TOPICS project.

1971 to 1973

North Carolina State University, Research Associate in the Highway Research Program. Active in research project related to photographic analysis of signalized intersection utilizing various types of pulse and presence traffic detectors. Responsibility included project planning, data collection and analysis. Completed requirements for Doctor of Philosophy degree in Transportation Engineering at North Carolina State University. Dissertation topic was based on developing computer model to analyze signalized intersection studied in research project.

1970 to 1971

University of South Carolina College of Engineering. Instructor. Assisted in data analysis of transit utilization study conducted under UMTA grant by Traffic and Transportation Center at the University. Obtained Master of Science degree in Transportation Engineering; thesis concerned with development of intra-campus transit system for University.

1969 to 1970

Nebraska State Department of Roads, Junior Engineer. Project responsibility included design of roadway service areas, maintenance building site planning and design.

1966 to 1968

U.S. Army, Corps of Engineers, Lieutenant. Assistant to the Post Engineer, Fort Jackson, S.C.. Responsibility in areas of long and short range facility planning and design. Presently serving as Captain in North Carolina Army National Guard as Construction Officer of Engineer Brigade.

MEMBERSHIPS:

Institute of Traffic Engineers
Highway Research Board
American Society of Military Engineers
Chi Epsilon Engineering Society

Virgil G. Meedel, P.E.

Assistant Vice President



Education:

Bachelor of Science in Civil Engineering, University of Nebraska; Master of Science in Structures, University of Nebraska.

Registration:

Professional Engineer — Nebraska, Montana, Iowa.

Experience

1972 to Present

Henningson, Durham & Richardson. Assistant Manager, Transportation Department. Project Coordinator for design of section of Washington, D.C., Metropolitan Transit Authority's rapid transit system. Coordinator and liaison between disciplines on the design and preparation of plans on an accelerated schedule for approximately 4,000 feet of twin-earth tunnels, transit station and support facilities.

1971 to 1972

Henningson, Durham & Richardson. Project Manager for Papago Freeway, Phoenix, Arizona. Successful competitive conceptual design for elevated structure. Preparation of conceptual, preliminary and final plans for one mile of 12-lane elevated freeway. Traffic analysis and design of structures, drainage, signing, signals, roads, roadway delineation, communications and lighting.

1965 to 1971

Henningson, Durham & Richardson. Project Engineer. Responsible for major interstate and primary highways, bridges, viaducts, and heavy civil structures. Project Engineer on Cozad Overpass over Highway 30 and railroad, Cozad, Nebraska.

Project Engineer on 46th Street Bridge over Floyd River, Sioux City, Nebraska. Project Engineer for J.F. Kennedy Expressway, F to L Street, Omaha, Nebraska. Determination of preliminary and final alignment; design and preparation of preliminary and final structural, roadway and drainage plans; preparation of plans for site clearance and right-of-way; and preparation of plats. Design engineer for Peterson Interchange, Colorado Springs, Colorado.

Project Engineer for L Street Viaduct over Stockyards and Railroad Yards, Omaha, Nebraska. Roadway, structural, and drainage design; preparation of final structural, sewer and roadway plans. Preparation of site clearance plans, right-of-way plans, and plats. Project Engineer for Lexington Viaduct over Highway 30 and Railroad, Lexington, Nebraska.

Project Engineer for 84th Street Underpass, Douglas County, Nebraska. Studies and preliminary designs and plans for underpass on 84th Street under Union Pacific Railroad embankment.

Project Engineer for 27th & L Street Interchange, Omaha, Nebraska.

Project Engineer for I-90 Bridges. Deerlodge, Montana.

Project Engineer for Hamilton Boulevard Bridges, Sioux City, Iowa.

Project Engineer for I-90 Bridges, Superior, Montana. Preliminary and final plans for 470-foot steel girder structure over Clark Fork River. Conceptual design with aesthetic considerations and preparations of preliminary plans for two crossings of Clark Fork with 1200-foot twin steel box structures. Preliminary plans for concrete slab underpasses.

1964 to 1965

Kirkham, Michael & Associates. Project Engineer on 28th & Dodge Street Interchange and North Expressway, Omaha, Nebraska. Determination of final vertical and horizontal alignment for all major movements and ramps. Preparation of preliminary plans for 14 structures. Drainage studies and storm sewer relocation. Determination of right-of-way requirements, preparation of plat and site clearance plans.

(CONTINUED)

1961 to 1964

Kirkham, Michael & Associates. Design Engineer.
Jewel Road relocation, Sarpy County, Nebraska.

Project Engineer on 11th Street Bridge and Viaduct, Sioux Falls, South Dakota, over Big Sioux River and Railroad Yards. Determination of vertical and horizontal alignment; structural and roadway design and preparation of final bridge and roadway plans; and right-of-way plans and plats.

Design Engineer on 60th Street Chicago and Northwestern Bridge, Douglas County, Nebraska. Structural and roadway design, and preparation of plans for structure and roadway.

Design Engineer on 8 overpasses on Oklahoma I-40. Structural design and preparation of plans.

Memberships:

National Society of Professional Engineers;
American Society of Civil Engineers; Professional Engineers of Nebraska; Highway Research Board; Sigma Tau.

Honors:

Hamilton Award for Proficiency in Engineering.
Outstanding Service Award, 1971. President, Nebraska Section, American Society of Civil Engineers, 1973.

1960 to 1961

Kirkham, Michael & Associates. Field Engineer, 72nd and Center Street Interchange and Overpass, Omaha, Nebraska.

Design Engineer. Farnam Street and Harney Street Overpasses, Omaha, Nebraska. Structural and roadway design and preparation of final plans for concrete box girder bridges.

1958 to 1960

Behlen Manufacturing Company. Design Engineer. Research and development of light gage structural steel members and design of foundations and steel frames for buildings.

Lajpat R. Batra, P.E.

Civil-Structural Engineer



EDUCATION:

Master of Science in Civil Engineering, 1970, Major in Structures, University of Nebraska, Bachelor of Science in Civil Engineering, 1969, University of Nebraska, Diploma in Civil Engineering, 1959-1962,

REGISTRATION:

Professional Engineer-Nebraska

Experience

1972 to Present

Henningson, Durham & Richardson. Design Engineer. Washington Metropolitan Area Transit Authority, Subway System, Modeling of heavy underground structures on elastic foundation with ICES/STRU DL. Design of station vault, passageway, dome reliefs, fresh air vents, service rooms, elevators and tunneling etc., coordination of specifications.

Design Engineer, Papago Expressway System, design of columns, post-tension box girders, column foundations etc. of a part of one mile section, high profile, twelve-lane divided expressway, Phoenix, Arizona.

Design Engineer, bridge over Dodge Street at 120th Street intersection, conceptual study of Railroad Bridge on 84th Street, water intake structure in Texarkana and miscellaneous type of work for water treatment facilities in Iowa.

1970 to 1972

Nebraska State Department of Roads, Lincoln, Nebraska. Design Engineer, Bridge Design Division, designed numerous types of bridges such as multiple span-plate girders, prestressed girders, deck steel and concrete slab bridges over Platte River and interstate in Nebraska.

MEMBERSHIPS:

American Society of Civil Engineers, Professional Engineers of Nebraska, Sigma Tau, Chi Epsilon.

1969

Nebraska Prestressed Concrete Company, Lincoln, Nebraska. Design Assistant-Designed new plant additions for future expansion such as mono rail to carry ready mixed concrete, building additions, etc.

1969

University of Nebraska, Lincoln, Nebraska. Graduate Assistant. Involved in civil engineering research series and became co-author of "The Performance of Precast Continuous Reinforced Concrete Beams with Welded Reinforced Assemblies" by G.C. Ernst, A.R. Riveland and L. Batra, a technical report of a Research Project sponsored by the University.

1967 to 1969

Lincoln Steel Corporation, Lincoln, Nebraska — Design Assistant. Assisted in designing building connections, crane trusses and structural drafting.

1963 to 1966

Municipal Corporation, Delhi, India — Supervisor. Supervised municipal construction projects relating to asphaltic roads, utilities, buildings, parks and recreation facilities, etc.

Impact Specialist

Education:

Bachelor of Arts in Economics, Georgetown University, 1964; Master of Arts in Economics, Georgetown University, 1970.

General:

Mr. Judd has had extensive experience in project management and evaluation in the fields of environmental quality and conservation. He has either been responsible for or participated in project planning, scheduling, control and development of detailed proposals and study designs. He has supervised and directed professional staffs in the areas of economics, urban and regional planning, systems analysis and public participation. He has also identified, negotiated, organized and directed technical subconsultants and specialized study teams. Much of his work effort has been specifically directed at the preparation of environmental impact statements for large-scale public works projects.

Experience:

1974 to Present

Henningson, Durham & Richardson. Environmental Studies Specialist and Project Manager currently involved with environmental impact studies, site planning and management projects.

*Baltimore, Maryland. Air quality maintenance plan update.

*False Cape State Park, Virginia. Studies, proposals and plans.

*Upper Mississippi River. Impact statement of dredging activities.

1972 to 1974

Howard, Needles, Tammen and Bergendoff, Alexandria, Virginia. Manager of the Department of Environmental Quality and Conservation where his duties included the preparation of environmental impact statements for public works projects, development and management of projects consistent with procedural and technical requirements of local, state and Federal agencies concerning air quality, noise pollution, water resources, socio-economic analysis, urban and regional planning, and primary and secondary impact assessment. Projects included:

*Successful completion of the controversial I-66 Transportation Alternates Study in northern Virginia.

*Site expansion and master plan for airport development at Burlington, Vermont and Bangor, Maine.

*Alsea and Siletz Bays, Oregon. Management plan and wetlands review.

*Casey Canal Expressway, Georgia. Studies, proposals, and plans.

1971 to 1972

Interim manager and advisor to family related manufacturing/retail business in process of expanding operations.

1970 to 1971

The Allagash Group, Bath, Maine. Associate Director and member of a three-man interdisciplinary team which initiated, incorporated and operated an applied research organization to develop policy oriented information on the management of growth. Projects included preparation of a citizen's guide to land use and the co-production of a conference and film, 'Maine-Land', with Maine's educational television network. Also, initiated or participated in the design of a study to determine the carrying capacity of Baxter State Park, a benefit/cost analysis of tourist impact on Maine's resource and employment base, a study design relating lakeshore land use to changes in water quality, and legislation leading to establishment of Maine's Land Use Regulation Commission.

BIOGRAPHICAL SKETCH
JOSEPH MORTON CALDWELL

BIRTHPLACE: Yazoo City, Mississippi

FAMILY STATUS: Married (Moselle Smith of Vicksburg, Miss.) Two children
(daughter, Courtney) (son, Jeffrey)

EDUCATION: Yazoo City Public Schools, Graduated High School (with Honors), May 1928. Graduated Mississippi State College 1932 with B.S. in Electrical Engineering.

PROFESSIONAL CAREER: Began work at Waterways Experiment Station, Vicksburg, Mississippi, in June 1933 as an Engineering Assistant. Was promoted several times and in 1940 was placed in charge of all hydraulic model testing at the Waterways Experiment Station. Remained in charge until commissioned in Army and ordered to other duties.

In 1945, on discharge from Army, accepted employment in the Research Division of Beach Erosion Board, Washington, D.C. Was Chief of Research Division from 1951 until November 1963, when Beach Erosion Board was converted to Coastal Engineering Research Center. Was Technical Director of Coastal Engineering Research Center from December 1963 to January 1970.

From January 1971-June 1973 served as Chief, Engineering Division, Directorate of Civil Works, Office, Chief of Engineers, Department of the Army, Washington, D.C., 20314. This directorate is the headquarters office for planning engineering design and construction, and operation of all Civil Works projects of the Corps of Engineers.

From July 1973 to present. Retired from Civil Service career with Army Corps of Engineers on June 30, 1973, to become a consulting engineer in private practice. Have recently worked on projects in Florida, the Philippines and Algeria.

MILITARY CAREER: Commissioned as 1st Lieutenant, Corps of Engineers, U.S. Army, in August 1942. Served in Army for four years. Promoted to Captain and then Major. Honorably discharged June 1946. Assigned principally to Military Intelligence duties on staff of the Army Chief of Engineers, final military assignment being Chief of Strategic Intelligence Branch, OCE. Graduated from U.S. Army Command and General Staff School, Fort Leavenworth, Kansas, 1944.

AWARDS: Meritorious Civilian Service Award by Department of Army (1952) for work in design of emergency hurricane protection. Southeast Asia Civilian Service Award (March 1957) of U.S. Naval Facilities Engineering Command for on-site support of Navy effort in South Vietnam in 1955. Meritorious Civilian Service Award (1973) for supervision of engineering and design of Civil Works program of Corps of Engineers, Feb. 1971-June 1973.

Notes:

PROFESSIONAL EXPERIENCE (see Instruction 7)

From: July 1973 to present

To most recent date of employment:

EMPLOYER (Name and Address) AND TYPE OF BUSINESS: Consulting Engineer

2732 N. Kensington Street
Arlington, Virginia, 22207, USA.

TITLE OF POST AND NATURE OF DUTIES:

Self-employed consulting engineer specializing in hydraulics, coastal engineering, waterways and harbors. In this capacity have been employed recently on projects in British Columbia, Florida, Algeria (two projects), the Philippines, and Saudi Arabia. Duties range from advising clients on soundness of proposed engineering activities and designs to personally developing concepts for flood control, harbor layouts, and salinity barrier designs.

NUMBER AND KIND OF EMPLOYEES SUPERVISED: No employees supervised.

From: February 1971 To: June 1973 (retired from Civil Service)

EMPLOYER (Name and Address) AND TYPE OF BUSINESS: Director of Civil Works
Office, Chief of Army Engineers
Washington, D.C. 20314

TITLE OF POST AND NATURE OF DUTIES: Chief of Engineering Division, Directorate of Civil Works, Office of Chief of Army Engineers. In this position I had direct responsibility for the engineering design of all Civil Works (public works) projects of the Corps of Engineers totalling in excess of \$1 billion annually. Projects dealt with large scale flood control, navigation improvements, harbor development, beach erosion control, and coastal storm protection. This is the largest water use and water control program in the United States. (Civil Service grade, GS-17.)

Supervised personal staff of 70 high-grade professional engineers and scientists; these were in turn backed up by some 2000 or more.

NUMBER AND KIND OF EMPLOYEES SUPERVISED: engineers, in field offices.

From: Dec 1963 To: Jan 1971

EMPLOYER (Name and Address) AND TYPE OF BUSINESS: Coastal Engineering Research Center (formerly Beach Erosion Board)
Kingman Bldg., Fort Belvoir, VA, 22016 (formerly in Washington, D.C.)

TITLE OF POST AND NATURE OF DUTIES: Technical Director of the Coastal Engineering Research Center. Duties involved overall responsibility for the technical direction and technical adequacy of the coastal engineering research program of the Center. This program encompassed all phases of coastal engineering from the open coast to the head of tidewater in the estuaries. The program of research increased from \$400,000 in 1963 to in excess of \$3,000,000 after 1969. In addition, my duties required responsible review of the engineering aspects of coastal projects constructed by the Corps of Engineers; this program in the early 1970's involved the expenditure of over \$200,000,000 annually. Duties involved also the giving, on request, of consulting advice on coastal projects in the United States and overseas. (Grade GS-16 from Aug. 1964)

NUMBER AND KIND OF EMPLOYEES SUPERVISED: About 50 of which about 30 were professionals.

PROFESSIONAL EXPERIENCE (Continued)

From: April 1945 to Nov 1963

To: Nov 1963

EMPLOYER (Name and Address) AND TYPE OF BUSINESS: (Engineering office and research laboratory)
Beach Erosion Board, Little Falls Road, N.W.
Washington, D.C.

TITLE OF POST AND NATURE OF DUTIES: Started in 1946 as Chief of the Laboratory Section of the Research Division; successively promoted to Chief of the Research Branch (1948) and then to Chief of the Research Division (1953). Duties involved conduct of research program in Coastal Engineering (waves, storm surges, tides, shore erosion, breakwater design, etc.). This work was done as part of the Civil Works (public works) mission of the U.S. Army Corps of Engineers. Duties also involved consulting on field problems. (Final grade GS-13)

NUMBER AND KIND OF EMPLOYEES SUPERVISED: 25 employees including 15 professionals

From: August 1942

To: April 1946

EMPLOYER (Name and Address) AND TYPE OF BUSINESS: Officer in Army of the United States.

Principally assigned to staff of Chief of Engineers, U.S. Army. Started as 1st Lieutenant; honorably discharged as Major.

TITLE OF POST AND NATURE OF DUTIES: Chiefly assigned as Engineer Intelligence Officer.

Duties involved preparation of reports on engineer equipment of foreign armies and preparation of reports on terrain, roads, railroads, landing beaches, power plants, and ports in enemy-held territories.

Up to 30 employees directly with another 300 working under contract. About
NUMBER AND KIND OF EMPLOYEES SUPERVISED: 1/3 were professional engineers, scientists, etc.

From: October 1940

To: January 1943

EMPLOYER (Name and Address) AND TYPE OF BUSINESS:

U.S. Waterways Experiment Station
Vicksburg, Mississippi

TITLE OF POST AND NATURE OF DUTIES: Was Chief of the Hydraulic Division of the Experiment

Station. All hydraulic model and experimental work was under my direction.

Average work-load of the Division was about 20 hydraulic models at all times.

Included in responsibilities was active supervision of an instrument development facility for developing various kinds of hydraulic model instruments

and for field measurements of pressures and strains in earth dams and in concrete slabs. (Grade P-4, then 1st Lieut., Army of the United States.)

NUMBER AND KIND OF EMPLOYEES SUPERVISED: 150 including about 30 professionals.

From: June 1933

To: October 1940

EMPLOYER (Name and Address) AND TYPE OF BUSINESS:

U.S. Waterways Experiment Station
Vicksburg, Mississippi

TITLE OF POST AND NATURE OF DUTIES: Started as model assistant in the conduct of hydraulic model studies. In 1935 was made Project Engineer in charge of a model study; in 1937 was made a Branch Chief in charge of several models, and also directed the work of the instrumentation laboratory of the Experiment Station. Models involved dealt with tidal estuaries, harbors, navigation channels, flood control, high dams, locks, and various types of hydraulic structures.

NUMBER AND KIND OF EMPLOYEES SUPERVISED: (Final) 30 including about 10 professionals.

OTHER AWARDS RECEIVED

Outstanding Performance Rating: 1960, 1968 and 1970
Southeast Asia Civilian Service Award of the Naval Facilities
Engineering Command: 1967
Meritorious Civilian Service Award: 1962
" " " " 1973

PARTIAL LISTING OF PUBLISHED WORKS

- "Supersonic Sounding Instruments and Methods" Transactions ASCE, Volume 117, (1952)
- "Tidal Currents at Inlets in the United States" ASCE Proceedings Separate No. 716 (June 1955)
- "Experimental Study of Wave Overtopping on Shore Structures" (with Saville) Proceedings 1953 Conference Inter. Assoc. Hydraulic Research, Sept. 1953
- "Sedimentation in Harbors" Chapter 16 from Trask's Applied Sedimentation. John Wiley and Sons, 1950
- "An Ocean Wave Measuring Instrument," Beach Erosion Board Technical Memorandum No. 6, October 1948
- "Reflection of Solitary Waves," Beach Erosion Board Technical Memorandum No. 11, November 1949
- "Wave Action and Sand Movement Near Anaheim Bay, California," Beach Erosion Board Technical Memorandum No. 68., February 1956
- "Accuracy of Hydrographic Surveying in the Surf Zone" (with Saville), Beach Erosion Board Technical Memorandum No. 32, March 1953
- "By-Passing Sand at South Lake Worth Inlet, Florida" Proceedings of 1st Conference on Coastal Engineering. Council on Wave Research, The Engineering Foundation, 1951
- "The Design of Wave Channels," Proceedings 1st Conference on Ships and Waves. Council on Wave Research, The Engineering Foundation, 1955.
- "The Step-Resistance Wave Gage" Proceedings 1st Conference on Coastal Engineering Instruments, Council on Wave Research, The Engineering Foundation, 1956

"Shore Erosion by Storm Waves," Beach Erosion Board Miscellaneous Paper No. 1-59
(April 1959)

"Development of and Tests of a Radio-Active Sediment Density Probe," Beach
Erosion Board Technical Memorandum No. 121, October 1960

"Coast Protection," Article in Encyclopaedia Britannica, 1960 Edition

"The Beach Erosion Boards Wave Spectrum Analyzer and Its Purpose," (with
Williams) Proceedings of National Academy of Sciences Conference on Ocean
Wave Spectra, May 1961

"Coastal Processes and Beach Erosion," Journal of The Boston Society of
Civil Engineers Vol 53, No. 2, April, 1966

"Plans For Shore Protection Paso Caballos Nicaragua," ASCE, June 1966

"Guidance For Future Work on The Southeast Coast of The Province of
Buenos Aires," Report to the Ministry of Public Works Province of Buenos
Aires, August 1970

"Methods of Protection Cables U. S. Naval Facility, High Point, Bermuda,"
Coastal Engineering Research Center, April 1967

"Pressure in Draft Tubes at Little Falls Pumping Station," Beach Erosion
Board, U.S. Army Corps of Engineers, February 1962

"Use of Ship Hull For Breakwater And Jetty Construction, Coastal Engineering
Research Center, Jan. - Feb. 1966

ELECTED
OFFICIAL MEMBERSHIP

Member, National Academy of Engineering
Member, U.S. Committee on Large Dams

PROFESSIONAL MEMBERSHIP

Member, American Society of Civil Engineers
Member, American Geophysical Union
Member, Marine Technology Society
Member, Washington Academy of Science
Member, International Association for Hydraulic Research, Delft, Holland
Registered Professional Engineer, Washington, D.C.

RESUME

Randolph C. Martin
113 Linchouse Reach Road
Columbia, South Carolina 29210
Phone: (803) 772-1567

PERSONAL DATA

Born January 12, 1944, in The Dalles, Oregon. Married with no children.

EDUCATION

Ph.D. (Economics), Washington University, St. Louis, 1971;
M.A. (Economics), Washington University, St. Louis, 1968; and
B.S. (Economics), Lewis and Clark College, Portland, Oregon, 1966.

AREAS OF SPECIALIZATION

Urban and Regional Economics
Public Finance

PROFESSIONAL POSITIONS

Instructor, Washington University, 1969

Research Assistant, Institute for Urban and Regional Studies,
Washington University, 1966-69

Research Associate, Bureau of Urban and Regional Affairs, University
of South Carolina, 1970-72

Assistant Professor, University of South Carolina, 1970 to September 1973

Associate Professor, University of South Carolina, September 1973 to
present

HONORS AND MEMBERSHIPS

Alpha Kappa Psi, Business and Economics Honorary
Omicron Delta Epsilon, Economics Honorary
American Economic Association
Regional Science Association
Committee on Urban Economics Fellowship (1966-67)
Economic Development Administration Fellowship (1969-70)

PUBLICATIONS .

"Spatial Distributions of Population: Cities and Suburbs," Journal of Regional Science, Vol. 13, No. 2, August 1973.

"City-Suburb Variations In Housing Consumption and Production Patterns," The Review of Regional Studies, Vol. 4, No. 1, Spring 1974.

"Population Changes for South Carolina Economic Areas: 1950-1970," Business and Economic Review, March-April, 1971.

"Urban-Rural Population and Size of Place Analysis for South Carolina: 1900-1970," Urban and Regional Review, March, 1971.

"Urban Renewal: The Columbia Case," Urban and Regional Review, June, 1971.

"Urban Qualities," with G. E. Breger, Urban and Regional Review, December, 1971.

"Housing Trends for South Carolina, Census Regions and the Nation," Urban and Regional Review, Spring, 1972.

Review of H. V. Hodson, The Diseconomics of Growth in Arete, Vol. 2, Fall, 1972, Number 2.

CONSULTING AND OTHER PROFESSIONAL ACTIVITY

Served in a consulting capacity on projects for the South Carolina Governor's Advisory Committee on Housing and the Governor's Advisory Committee on Human Relations.

Presented "Spatial Distribution of Population: Cities and Suburbs" at the Annual North American Meetings of The Regional Science Association in Ann Arbor, Michigan, November, 1971:

Presented "City-Suburb Variations in Housing Consumption and Production Patterns" at the Annual Meeting of the Southern Regional Science Association, Washington, D.C., April 1974.

Research Report: "Prediction of Input Price Inflation and Its Impact on Hospital Costs," part of the Proposal for a Prospective/Incentive Reimbursement Project for South Carolina Hospitals; College of Business Administration, University of South Carolina.

Program Chairman for The Economics Session of The 1973 Annual Meeting of The South Carolina Academy of Science, Rock Hill, South Carolina, March, 1973.

VITA

NAME: Ronald P. Wilder

ADDRESS: 707 Trafalgar Drive
Columbia, South Carolina 29210

TELEPHONE: Home (803) 772-6209
Office (803) 777-2647

DATE AND PLACE OF BIRTH: January 15, 1941
Freeport, Texas

MARITAL STATUS: Married; two children

EDUCATION: B.A., Rice University, 1963 (Economics)
M.A., Rice University, 1964 (Economics)
Ph.D., Vanderbilt University, 1969 (Economics)

PRESENT POSITION:

Assistant Professor of Economics, College of Business
Administration, University of South Carolina, Columbia,
South Carolina (since 1970)

PREVIOUS EXPERIENCE

Summer Intern, U.S. Department of State, 1965.
Teaching Assistant, Vanderbilt U., 1965-1968.
Commissioned Officer, U.S. Army, two years
active duty, 1968-1970, primary duty: cost analysis
Instructor (part-time), Northern Virginia Center,
University of Virginia, 1969.

AREAS OF TEACHING AND RESEARCH INTEREST:

Industrial Organization
Antitrust Policy
Economics of Regulated Industries
Managerial Economics
Engineering Economics
Economics of Education

PUBLICATIONS:

Articles:

"Utility Regulation in South Carolina," Business and Economic Review, (University of South Carolina, March, 1972).

"Promotion and Advertising by Public Utilities: Information, Persuasion and Regulation," Business and Economic Review, (University of South Carolina), November, 1972.

"Public Utility Advertising: Some Observations," Land Economics, November, 1973.

"Advertising and Inter Industry Competition: Testing a Galbraithian Hypothesis," Journal of Industrial Economics, March, 1974.

"Determinants of Research and Development Activity by Electric Utilities," (with S. Stansell), Bell Journal of Economics and Management Science, Autumn, 1974.

"The Electronic Data Processing Industry: Market Structure and Policy Issues," The Antitrust Bulletin, forthcoming.

"Cost and Benefits of MBA Programs: A Case Study," (with B. F. Kiker), American Association of Collegiate Schools of Business Bulletin, forthcoming.

Research Reports:

Economic Benefits and Environmental Issues Related to Channel Improvements on the Savannah River. (Member of Study Team.) Prepared for Savannah River Basin Development Commission by members of the faculties of the University of Georgia and the University of South Carolina, 1973.

Costs and Benefits of MBA Programs at the University of South Carolina. (Contributor.) Prepared for the Alfred P. Sloan Foundation by Center for Studies in Human Capital, College of Business Administration, University of South Carolina, 1973.

Impact of the State Ports Authority upon the Economy of South Carolina. (with D. Pender.) Bureau of Business and Economic Research, University of South Carolina, 1974.

PAPERS PRESENTED:

"Distributed Lags and Advertising: An Empirical Study," (with S. Stansell). Annual meetings of the Southern Economic Association, Washington, D.C., November 10, 1972.

"Trends in Vertical Integration Among Large Manufacturing Firms," (with I. Tucker), Atlantic Economic Conference, Richmond, Va., September 29, 1973. Abstracted in Atlantic Economic Journal, November, 1973.

"Changes in Labor Productivity, Prices, and Factor Shares in U.S. Manufacturing 1958-69," (with C.G. Williams). Annual meetings of the Southwestern Economics Association, Dallas, Texas, March 29, 1974.

"Public Utility Research and Development," (with S. Stansell). Public Utilities Conference at Graduate School of Management, UCLA, Los Angeles, August, 1974.

"Inter-industry Differences in the Effects of Wage and Price Controls," (with C.G. Williams). Annual Meetings of the Southern Economic Association, Atlanta, November, 1974.

RESEARCH IN PROGRESS:

"The Effects of Government Regulation: Some Additional Evidence," submitted to journal March, 1973, revised January, 1974.

"Advertising and Distributed Lags" (with S. Stansell), submitted to journal, summer 1974.

"Vertical Integration, Firm Size and Firm Growth," (with I. Tucker).

"Estimating the Income Elasticity of Residential Demand for Electricity from Consumer Panel Data," (with J. Willenborg), submitted to journal April, 1974.

TEACHING DATA:

Courses Taught:

Undergraduate:

Principles of Economics
Managerial Economics
Government and Business
Engineering Economics

Graduate:

Industrial Economics
The State and Economic Life
The Firm and its Environment

PRELIMINARY FEASIBILITY STUDY
FOR
SAMPIT RIVER CHANNEL DEVELOPMENT

PROPOSED STUDY FEE

January 1975

Preliminary Feasibility Study for
Sampit River Channel Development

Manhour Estimates

Item of Study	Project Manager	Sr. Professional	Jr. Professional	Draftsman	Typist
A. Industrial Development Potentials	40	80	40	120	20
B. Sampit River Physical Study	40				40
1. Hydrographic Survey		40	80	80	
2. Channel Development Potentials		160*		120	
C. Environmental Impact Review	40				40
1. Sampit River Channel Development		100*			
2. Industrial Development		200			
		160			
D. Georgetown Port Development	40				40
1. Present Port Operations		40	20	40	
2. Physical Description of Waterways and Navigation		40*	20	40	
3. Work by Corps of Engineers		80*	20	40	
4. Sampit River Channel Development in Relationship to Georgetown Port		40	20	40	
E. U.S. 17 Bridge Over Sampit River	40				20
1. Clearance Requirements		16	8		
2. Study of Types of Bridges		80	120	80	
3. Recommendations		80	40	40	
F. Economic Impact	40				40
1. Economic Impact of Industrial Development		80	40		
2. Economic Comparison of Alternative Transportation Modes		80	40		
3. Benefits and Costs of Channel Development		80	40		
	240	1356	488	600	200

hours estimated for consultants

Study Fee Proposal

Direct Labor

	Hours	Rate/hour	Total
Project Manager	240	\$14.00	\$ 3,360
Sr. Professional	1356	10.00	13,560
Jr. Professional	488	7.50	3,660
Draftsman	600	5.00	3,000
Typist	200	4.00	<u>800</u>
			\$24,380

Overhead

Overhead at 115% x Direct Labor \$28,037

Direct Costs

Travel

D.C. to Georgetown - 10 x \$200 =	\$2,000
Charlotte to Georgetown - 4 x \$100 =	400
Per Diem - 45 days x \$30/day =	1,350
Miscellaneous Printing	1,000
Report Printing	<u>2,000</u>

Total Direct Costs 6,750

Subtotal \$59,167

Profit @ 15% 8,875

Total Study Cost (not including surveys) \$68,042

Say \$68,000

Field Surveys
Estimated Costs

Item 1. Hydro survey. A hydrographic survey of the Sampit River from Winyah Bay upstream for about nine miles to the vicinity of Spring Gulley. (Probable cost in order of \$3,000, but may be already available from Corps of Engineers.)

Item 2. Tidal data. The heights and times of high and low water at five stations along the Sampit at about two mile intervals starting at the Sampit Turning Basin upstream to about the head of tidal influence. (Probable cost in order of \$1,800.)

Item 3. Salinity data. Salinity samples to be taken at time of tidal data collection of Item 2. A total of about 120 samples would be taken, assuming salt water was detected at all stations. (Probable cost including analysis about \$1,200.)

Item 4. Tidal velocities. Tidal velocities taken at the surface during the time the salinity samples are being taken. (No cost as made with salinity survey crews and equipment.)

Item 5. Probings or wash borings. A total of about 30 probings or wash borings to determine the presence (and elevation) of any hardpan or rock which might underlie the bottom of Sampit Creek. (Probable cost in order of \$3,000.)

Total Estimated Cost

\$9,000

Memorandum

To: Mayor Higgins, Georgetown, S.C.From: A.A. LukasSubject: Sampit River DevelopmentDate: December 27, 1974Potentials

On December 10 and 11, I visited the Corps of Engineers (Charleston, S.C. office) the South Carolina Ports Authority, and the South Carolina Department of Highways to discuss in detail the extent of involvement, commitments, interest and responsibilities which each of the above agencies have in the potential development of Sampit River (west of the U.S. 17 bridge) for navigation by deep-draft oceangoing vessels. The significant comments from these meetings are as follows:

Corps of Engineers

Meeting with Edwin W. Meredith, 12-10-74

1. The Corps of Engineers is regulated concerning their participation in navigable channel improvements only to those projects where an actual commitment from potential users is made. Preferably the potential users (private industrial developments or public port facilities) should be in existence before the Corps will recommend Federal cost participation in the channel improvements. Furthermore the Corps requires that there be more than one user of the improvement before Federal funds can be committed. These regulations are detailed in Corps of Engineers Policies Publication EP 1165-2-1 (28 Dec. 72) paragraph 11-11, copy of which is attached with this Memo.

2. If there are industries located on a channel for which improvement with Federal funds is requested, there must be a study made to show that the benefits which will be derived from the proposed navigation improvement are greater than the costs of building and maintaining the navigable waterway by the Corps. Alternative transportation costs by rail, truck or other modes must be compared against the costs of the channel improvement.

3. Sampit River is currently recognized as a navigable river for small ships and barges. The present U.S. 17 bridge over the Sampit River has a vertical clearance of 34 feet and two 100 feet horizontal clearance waterways. In order to determine if this limited clearance is to be increased, a study should be made to determine the following:

- (a) The maximum size ship which could use the existing Sampit River waterway if the highway bridge was not in place.
- (b) The maximum potential channel which could be developed by dredging and straightening out some of the sharp bends in the river.

In order to perform the above study a preliminary hydrographic survey of the river needs to be made.

Memorandum

To: _____

From: _____

Subject: Sampit River Development

Date: _____

Potentials

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4. An Activity Flow Chart was developed to show the interrelationship of activities, events, and actions which need to be made by the various governmental agencies in order that the improvements to the Sampit River navigation channel be realized. See attached "Activity Flow Chart." The following agencies will be involved and need to be coordinated during this process:

- (a) Georgetown City and County (Sponsoring Agency)
- (b) South Carolina Ports Authority
- (c) Corps of Engineers
- (d) U.S. Coast Guard
- (e) South Carolina Highway Department

It is to be noted that the initiative to begin this long series of activities must be taken by the City and/or Georgetown County. A preliminary feasibility study must be made to demonstrate to all other State and Federal agencies that the development of Sampit River for navigation by ocean-going ships is feasible and economically justifiable. Once this is done, the other agencies can undertake detailed planning for their contribution to the development of the project.

South Carolina State Ports Authority

Meeting with W. Don Welch, Executive Director, 12-10-74

1. The Activity Flow Chart was reviewed with Mr. Welch and he agreed that the sequence of events which has taken place is basically correct as outlined in the chart. Mr. Welch agreed that once a preliminary feasibility study is made, the Ports Authority will be in a position to request the Corps of Engineers to perform more detailed studies of the Sampit River.

2. One of the major problems facing further development and maintenance of Georgetown harbor is lack and difficulty of finding suitable disposal sites for dredged spoil materials.

3. Mr. Welch confirmed that, in general, the Corps of Engineers requires that three or more beneficial users be served before they will expand Federal funds for channel improvements.

4. There is a possibility that the Ports Authority may issue revenue bonds in order to help finance certain port improvements if it can be shown that such improvements will result in a profitable return on the investment.

HENNINGSON, DURHAM & RICHARDSON, INC.

Memorandum

To: _____

From: _____

Subject: Sampit River Development

Date: _____

Potentials

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South Carolina Highway Department

Meeting with James R. Graves, Chief Bridge Engineer, 12-11-74

1. The Highway Department will hold the plans to build a second U.S. 17 bridge over Sampit River in abeyance for some period of time (1-2 years) as a result of a resolution passed by the City of Georgetown requesting that construction of a second fixed span bridge be postponed. If a resolution of the problem concerning a greater vertical clearance for the Sampit River channel is not reached and funds for a more costly bridge not obtained, then the Highway Department will have to proceed with its current plans to build a second bridge with 34 feet of clearance.

2. The Highway Department has not yet received a permit from the Coast Guard to build the second bridge. The delay in receiving the permit which was requested on April 18, 1973 appears to be due to a need for clarification of minor details of design. The request for permit was addressed to:

Commander (oan)
Seventh Coast Guard District
Room 1018, Federal Building
51 S.W. 1st Avenue
Miami, Florida 33130

3. The Highway Department does not have funds for a high level or bascule bridge. The Truman-Hobs Act funds are apparently not applicable in this situation since the intent of the Act is for removal of obstructions to navigation. Further investigation concerning these funds may be advisable. The administrator of these funds for the Seventh Coast Guard District is C. G. Blich, Jr., in Miami, Florida.

4. Mr. Graves concurred that a preliminary engineering and economic study be made of the Sampit River channel development potentials in order to justify the increased vertical clearances and the great additional costs for a bascule or a high level fixed span bridge.

are unpredictable and may be offset if carriers correspondingly increases rates on commodities not suited to water movement or in areas not subject to competition by water transport. In considering benefits of navigation projects, the actual traffic which would develop on a waterway may be less than that originally estimated as prospective if competing carriers reduce rates to discourage use of the waterway. This possibility is recognized by the Corps of Engineers but, in practice, it has been found impracticable in most cases to forecast the extent of competitive rate cutting and the amount by which estimated prospective commerce will be affected thereby.

11-11: Navigation Project for General Versus Special Interest Beneficiary. Section 2 of the River and Harbor Act of 5 June 1920 provides that the Chief of Engineers in recommending navigation improvements shall make a determination of the general versus the special interest in an improvement, and recommend an appropriate sharing of costs between Federal and non-Federal interests. The existence of only one present or prospective user at a proposed navigation improvement has generally been considered to be evidence that special or local benefits are involved within the intent of the 1920 Act. Basic policy provides for Federal establishment or expansion of navigation waterways for general public use, and to provide relatively broad public benefits. Users and others are relied upon to construct their related facilities such as access channels from the main channel to wharveside. Under this policy the Federal participation in waterway undertakings varies from zero to 100 percent depending upon the nature of the services rendered and the incidence of benefits and the significance of the proposed works compared to the total project.

a. Exclusive Use of Beneficiary. The Corps will not recommend any Federal cost participation, establishment, or expansion of a Federal project where the improvement would be capable of only serving a single user. This situation exists when restrictive conditions of any sort permit the private user the exclusive enjoyment of the project improvement. An example of such exclusive benefits would be where one commercial entity controls all the land giving access to the improvement.

b. Predominant Use. The Corps will withhold recommending Federal participation in a significant increment or major increase in length and/or depth improvement where one predominant beneficiary would be served at the outset unless it can be firmly established that the improvement is to be used beneficially by other shippers within a reasonable short period of time (say 5 years). A significant increment is defined as one involving major increases in project length and/or depth and costs of at least 50 percent of the total project costs. Depending on the circumstances, the predominant beneficiary is required to participate in costs of project construction and maintenance. The potential for other prospective shippers is controlled by factors such

as availability, ownership, and suitability of adjacent land for development and location by other industries or users; availability of land transport and other essential service features; the area's economic potential; and determination that no restrictive conditions exist that would prohibit future use of the proposed improvement by others.

(1) Cost Sharing Policy. Local interest shall contribute 50 percent of the construction costs of the general navigation facilities, exclusive of aids to navigation, in addition to meeting other requirements of local cooperation normal for any commercial navigation project.

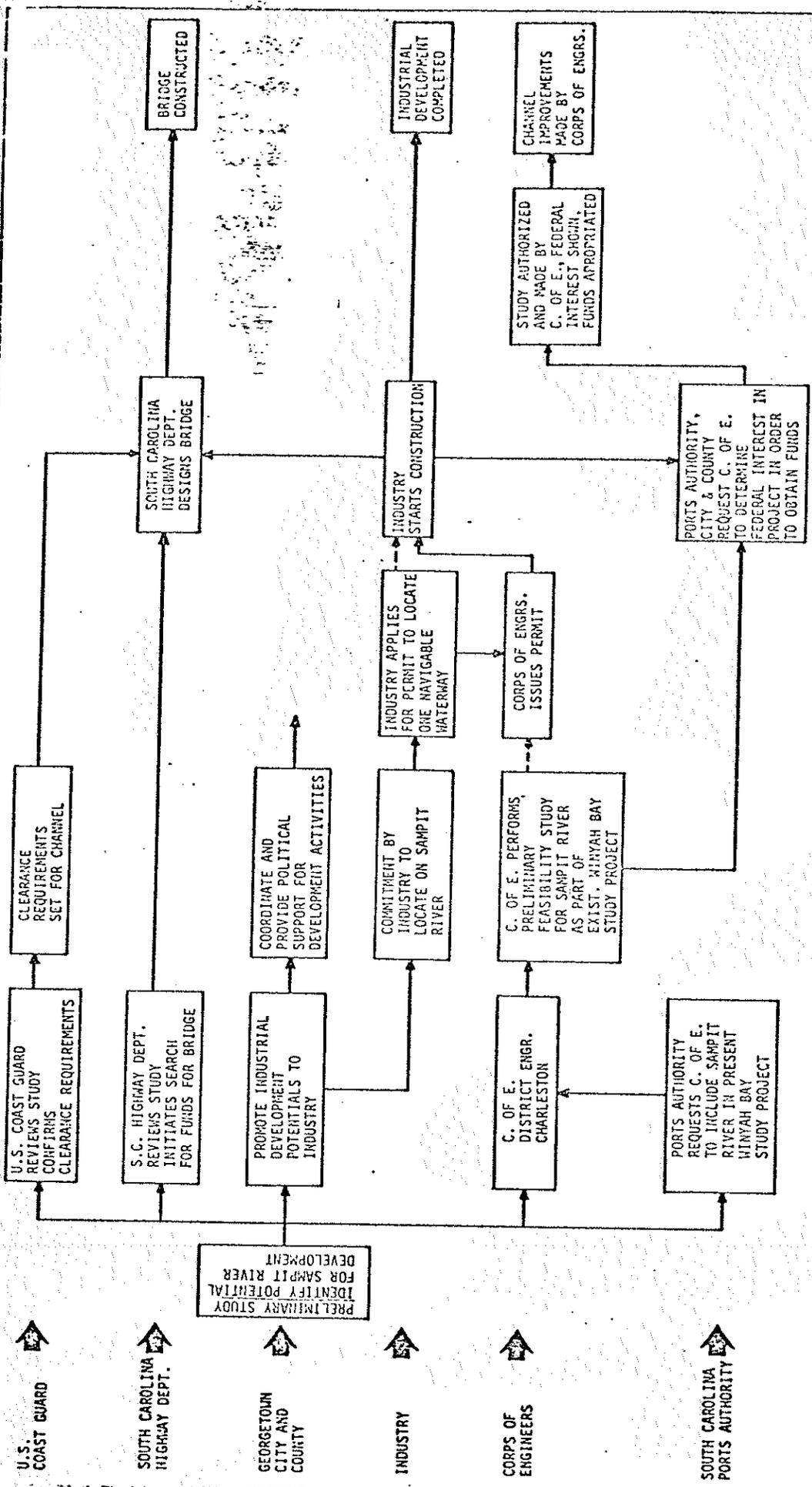
(2) Single Carrier. The determination of exclusive or predominant user lies in the identity of the shipper or receiver, rather than in the mode of transportation (i.e., common and captive carriers). Thus, if one or more common carriers served only one shipper or receiver a single-user situation would prevail. However, this would not apply if a single carrier served several shippers or receivers.

c. Progressive Development. The general policy of Federal interest and cost sharing principles apply where several users would be served at the outset or if additional users could be served immediately after project completion. This policy also encompasses the principles of progressive development to include: the situation where the improvement is the last increment of project construction reaching the last additional user; nominal extension of navigation where Federal interest has already been established; and provision of justified service to additional users which reasonably might have been incorporated in the existing project had the need been foreseen at the time of its formulation.

11-12. Collection and Release of Waterborne Commerce Information.

a. Collection. Waterborne commerce statistics is one of the fields involved in the Federal Shipping Statistic Program. Under the terms of the Federal Reports Act of 1942 and the Budget and Accounting Procedures Act of 1950, the Office of Statistical Policy of the Office of Management and Budget sponsors the program. The Corps of Engineers collects and compiles data on the domestic waterborne commerce; the Bureau of Customs collects and the Bureau of Census compiles the data on foreign waterborne commerce. The Bureau of the Census supplies the foreign traffic information required by the Corps of Engineers.

b. Release of data. The data collected from the vessel operators will be held in strict confidence with the understanding that it will not be disclosed and will be used only in the compilation of port or waterway statistics. Dissemination of the data is by publication in the annual publication titled, "Waterborne Commerce of the United States." The public and other Federal agencies may be furnished unpublished information summarized to the level of published information.



ACTIVITY FLOW CHART
SAMPIT RIVER NAVIGATION CHANNEL AND INDUSTRIAL DEVELOPMENT



JAN. 1975

- U.S. COAST GUARD
- SOUTH CAROLINA HIGHWAY DEPT.
- GEORGETOWN CITY AND COUNTY
- INDUSTRY
- CORPS OF ENGINEERS
- SOUTH CAROLINA PORTS AUTHORITY