THE ECONOMIC AND ENVIRONMENTAL STRUCTURE OF ALABAMA'S COASTAL REGION, PART II: ENVIRONMENTAL STRUCTURE

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STRUCTURE OF ALABAMA'S COASTAL REGION

PART II: ENVIRONMENTAL STRUCTURE

(ABSTRACT)

The information presented is an extension of an input-output model describing the economic structure of the two coastal counties in Alabama. This extension comprises a description of environmental considerations in the production of goods and services, and includes 34 water quality factors, 6 air quality factors, 11 solid waste factors, 3 water use factors, 10 fuel use factors, 4 land use factors, and 8 occupation factors. A detailed explanation of methodology is given, as well as an accounting of the amount of pollution produced or resource consumed by each of the 31 producing sectors used to characterize the coastal economy. The direct and indirect effects of these environmental factors are quantified in this model. An example of the use of economic-environmental input-output analysis in evaluating alternative regional investment strategies is given.

The results of this study should be useful to regional planners concerned with the quantification of trade-offs between economic growth and environmental quality. Applications to resource allocation and manpwoer planning are also suggested.

PREFACE

The work upon which this report was based was financed in part by funds provided by Mississippi-Alabama Sea Grant. The theoretical and computational developments were undertaken by researchers in the Department of Agricultural Economics and Rural Sociology at Auburn University. Any errors of fact, logic, or judgment in the report are the responsibility of the authors.

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The computer program, ECON-ECOL, used for this study was obtained from the Department of Agricultural Economics and Rural Sociology, Texas Agricultural Experiment Station, Texas A & M University, College Station, Texas. The program was written by Don Book and J. E. Blaylock [5].

This study would have been greatly prolonged without the contribution of numerous helpful librarians at several libraries. We are most grateful for their cheerful and ready assistance.

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CONTENTS

INTRODUCTION

Input-output models have been used extensively for the evaluation of economic interactions and for economic planning since their conception by Wassily Leontief in the late 1920's [20]. The model and resultant economic analyses presented in Part I of this report are typical applications of the technique.

Only recently has the concept been extended to include flows of environmental goods such as pollution and the use of natural resources. Cumberland [9] is credited with the first attempt at constructing an input-output model of environmental-economic interactions. This model was improved and extended by Daly [10] and Isard [18]. Other approaches have been proposed by Leontief [21] and Victor [50] with some of the more practical applications to coastal regions presented by Hite and Laurent [15], Roberts [31], and Loehman and McElroy [23].

The information presented in this report is an extension of the economic model given in Part I [27]. The purpose of the analysis was to identify and quantify the environmental factors in the economic system of the Alabama Coastal Region. This would permit an analysis of the interrelationships between the economic sectors and environmental variables. Obviously some industries produce more pollution than others, just as some industries produce more output than others. Furthermore, some industries, which themselves are not strongly linked to environmental factors, may rely heavily on other industries that are. These relationships form a

complex set of interactions which is best described by input-output analysis.

Most types of economic activity require inputs of natural resources, such as land and water. Also, most require some capacity to eliminate waste. For this report, natural resources were broadly defined as inputs of physical units of matter, usually indirectly involved in the production of a finished economic product or commodity. Because of the difficulties of assigning monetary values to certain inputs such as parking space or cooling water, these were treated in physical units like acres and gallons.

The capacity to eliminate waste was broadly interpreted as the production of pollution. Pollution was in turn defined as material for which there was no productive use.

OBJECTIVES

The specific objectives of this study were:

1. To estimate the annual production of water, air and solid wastes and the consumption of resources by each sector in the Alabama Coastal economy;
2. To relate these figures to the production of goods and services; and
3. To calculate the impact that changes in output would have on the production of pollution and the consumption of resources.

The results of this study should be of interest to regional planners in estimating the trade-offs between economic growth and environmental quality.

DATA COLLECTION AND ASSIMILATION

A major portion of the time required for completing this research was devoted to compiling and standardizing data to illustrate the environmental influence that all economic sectors have upon the Alabama Coastal Region. The following section gives a detailed explanation of the procedures used to collect data and prepare it for the environmental analysis. Data were grouped into the following categories: Detailed Employment, Water Quality, Air Quality, Solid Waste, Water Use, Fuel Use, Land Use, and Occupations.

Detailed Employment

Since all estimates of environmental parameters were converted either directly or indirectly from a "per employee" basis, it was necessary to have accurate employment data to avoid errors of aggregation. The most detailed source of employment data was the Alabama Directory of Mining and Manufacturing [17]. This directory lists each mining or manufacturing establishment by Standard Industrial Classification (SIC) code as well as giving a range of employment. The employment figure used in this study was the midpoint of the range.

A custom print-out of the Directory obtained from the Alabama Development Office listed establishments grouped by "product SIC code" for the combined counties of Mobile and Baldwin. The SIC code of the primary product was used as the basis for assigning each establishment to a particular sector. Many sectors defined in the input-output model at the 2-digit SIC code level were thus represented by detailed employment data at the 4-digit SIC code level. Hence, whenever possible, factors

stated in terms of units per employee per day were matched with employment at the most detailed level common to both. When the calculations were completed at the detailed level, the sum of the "sub-sectors" was used to represent the sector.

Additional employment data were obtained from County Business Patterns [45] and from the Unemployment Compensation Agency in Mobile. These data were used in the same manner as outlined above. Approximately 220 sub-sectors were used in estimating environmental parameters for the 31 sectors in the model.

Water Quality

Table 1 shows the sources used for each sector. Data taken from the Alabama Water Improvement Commission (AWIC) files were collected from individual firms. This was also the case with the data from the Mobile 208 study [37]. Data from these two sources were given in pounds per day. To convert these to yearly estimates, the number of days of operation per year was estimated for each sector.

According to AWIC personnel, monitoring reports were filed on all firms with significant discharges made directly to stream segments. Therefore, any firm in the region for which there was no file either had no significant or measurable discharge, or discharged into a municipal, semi-public, or private treatment facility. Accordingly, the discharge of municipal treatment facilities was then distributed to all sectors on the basis of employment: the assumption being that the waste was primarily "sanitary waste" from restrooms, sinks, showers, etc. Waste loads from semi-public and private facilities were distributed to the sectors which were the primary users of the facility.

TABLE 1

SOURCES OF WATER QUALITY DATA BY SECTOR FOR BALDWIN-MOBILE COUNTY ENVIRONMENTAL INPUT-OUTPUT MODEL

	Economic Sector	Source of Data: 1975 - 1978 AWIC Industrial Files	1977 208 Industrial Waste Loads [40]	1977 208 Municipal STP Waste Loads [38]	1977 208 Semi-Public and Private STP waste Loads [39]	Other	Assumed Number of Days of Annual Operation
1.	Fishery Products			X			250
2.	Fresh or Frozen Packaged Fish	X		X		[37]	250
3.	Livestock					[24, 25]	---
4.	Crops					[24, 25]	---
5.	Greenhouse and Nursery Products					[33, 34]	---
6.	Forestry Products					[14]	---
7.	Agricultural Services						---
8.	Petroleum & Natural Gas			X			350
9.	Sand & Gravel Mining			X			300
10.	Construction			X	X		300
11.	Food & Kindred Products	X	X	X			300
12.	Apparel & Textiles			X			300
13.	Lumber & Wood Products	X	X	X			300
14.	Paper & Allied Products	X	X	X			350
15.	Printing & Publishing			X			250
16.	Chemicals, Plastics, Drugs, Paints	X	X	X			350
17.	Petroleum Refining	X	X	X			350
18.	Stone, Clay & Glass		X	X			300
19.	Fabricated Metals	X		X			250
20.	Transportation Equipment	X		X			300
21.	Other Manufacturing	X	X	X			300
22.	Water Transportation			X			300
23.	Other Transportation	X	X	X			300
24.	Communications		X	X			350
25.	Wholesale and Retail Trade	X	X	X	X		300
26.	Finance, Insurance and Real Estate			X			250
27.	Hotel, Personal, and Repair Services			X	X		300
28.	Medical, Educ., & Non-Profit Serv.			X	X		250
29.	Other Services			X	X		250
30.	State and Local Government			X	X		250
31.	Households			X	X		365

Soil erosion (in the form of Total Suspended Solids) from pasture land, crop land, and forest land was the only source of water pollution from Livestock, Crops, and Forestry Products deemed measurable and significant in the region. Total acres of pasture or crop land were multiplied by a soil erosion factor provided by the Soil Conservation Service [24, 25] to estimate total suspended solids generated by the Livestock and Crops sectors. Soil erosion from commercial forest land was estimated from a study by Hewlett [14] which determined that one ton of soil per acre erodes during the first year following a logging operation. Subsequent erosion is considered negligible. From Tyler [41], it was estimated that approximately 3.3% of the 1,225,000 acres of commercial forest land in the region is cut each year, giving 40,425 tons of total suspended solids. Information on other agricultural sectors was insufficient for estimation of water quality parameters.

Row 9 ("Nitrogen (via STP)") represents the waste loads of nitrogen discharged from municipal sewage treatment plants which were charged to each sector on the basis of employment. This differs from "Total Kjeldahl Nitrogen" (row 8) in that the nitrogen accounted for in row 8 is directly discharged by that sector whereas that in row 9 is indirectly discharged through the sewage treatment plant.

Waste loads from non-point sources, while significant in certain stream segments, were omitted from this study. It is difficult to account for waste loads which, by definition, do not come from an identifiable source.

Air Pollution

Most man-made air pollution emissions result from the combustion of fossil fuels in both internal and external combustion processes [35]. Compilation of Air Emissions Factors (AP-42) by the Environmental Protection Agency [7] presents factors for estimating emissions for a variety of fuels and combustion processes including non-combustion sources. Table 2 shows the sources of information used to determine air emissions by sector.

Sulfur content of coal (1.4%), sulfur content of fuel oil (including distillate at 0.7% and residual at 1.2%), and ash content of coal (7%) which are typically used in the region (and which are required for permitted emission) were obtained from the Alabama Air Pollution Control Commission (AAPCC) [12]. Total fuel consumed by category in each sector was multiplied by the appropriate emission factor from AP-42 to calculate total tons of emission for each pollution parameter under consideration. Particulate emissions from coal combustion were reduced by 90% to account for pollution control equipment [12]. In some cases sector point-source emissions, as estimated by AAPCC, exceeded values calculated from fuel use coefficients (e.g. Sectors 17, 18, and 21). In these cases the AAPCC values were used.

Forestry Products emissions from prescribed burns were estimated from emission factors given in AP-42, fuel loading rates per acre from Cooper [8] and acres of prescribed burns per year from Tyler [41]. Particulate emissions from agricultural tillage (i.e. Sector 4) were estimated by applying the emission factor equation from AP-42 (part B, p. 11.2.2-1). This equation required estimation of the soil texture predominant in the

TABLE 2

SOURCES OF AIR POLLUTION DATA BY SECTOR FOR BALDWIN-MOBILE COUNTY ENVIRONMENTAL INPUT-OUTPUT MODEL

	Economic Sector	Source of Data: Compilation of Air Emission Factors [7]	Alabama Air Pollution Control Commission [12]	Motor Vehicle Facts and Figures [26]	Other
1.	Fishery Products	X			
2.	Fresh or Frozen Packaged Fish	X			
3.	Livestock	X			
4.	Crops	X			[47]
5.	Greenhouse and Nursery Products	X			
6.	Forestry Products	X			[8, 41]
7.	Agricultural Services	X			
8.	Petroleum & Natural Gas	X			
9.	Sand & Gravel Mining	X			
10.	Construction	X			
11.	Food & Kindred Products	X			
12.	Apparel & Textiles	X			
13.	Lumber & Wood Products	X			
14.	Paper & Allied Products	X			
15.	Printing & Publishing	X			
16.	Chemicals, Plastics, Drugs, Paints	X			
17.	Petroleum Refining	X	X		
18.	Stone, Clay & Glass	X	X		
19.	Fabricated Metals	X			
20.	Transportation Equipment	X			
21.	Other Manufacturing	X	X		
22.	Water Transportation	X			
23.	Other Transportation	X		X	
24.	Communications & Utilities	X			
25.	Wholesale and Retail Trade	X			
26.	Finance, Insurance and Real Estate	X			
27.	Hotel, Personal, and Repair Services	X			
28.	Medical, Educ., & Non-profit Serv.	X			
29.	Other Services	X			
30.	State and Local Government	X			
31.	Households	X		X	

agricultural area of the region [47], the average number of tills per acre [22], and the total acres of crops in the region [1].

Emissions from motor gas and distillate for Other Transportation were assumed to originate from internal combustion engines. Aircraft emissions were estimated from landing and takeoff cycles per year by aircraft category. These data were obtained from the Mobile Airport Tower.

Motor gas emissions from Households were estimated by using AP-42 [7] and by determining the total miles driven in the region. This determination was made from the average number of miles per gallon per passenger vehicle reported in Motor Vehicle Facts and Figures [26] and the number of private passenger vehicles registered in the region from the Alabama County Data Book [2].

Solid Waste

Table 3 shows the sources of data used in estimating solid waste categories. Data were not available for some sectors. The Livestock and Crops sectors were exempted from solid waste production by defining "solid waste" as waste destined for landfills. Solid wastes produced by these two sectors were assumed to be disposed of on-site. This was also the case with the Greenhouse sector and the Forestry sector. Much solid waste from forestry is burned, and this was accounted for under Air Quality. The majority of estimation factors came from Niessen [29,30] and Salvato [32]. These were expressed in tons per employee per year (TEY). The number of persons employed by each sector in 1972 was used to convert TEY to tons per year. In some cases, pounds per employee per day were given in place of TEY. For these, the number of days of operation per

TABLE 3

SOURCES OF SOLID WASTE DATA BY SECTOR FOR BALDWIN-MOBILE COUNTY ENVIRONMENTAL INPUT-OUTPUT MODEL

	Economic Sector	Source of Data: Handbook of Solid Waste Management [29]	Environmental Engineering [32]	Estimation of Solid Waste [30]	Other
1.	Fishery Products				
2.	Fresh or Frozen Packaged Fish				[13]
3.	Livestock				
4.	Crops				
5.	Greenhouse and Nursery Products				[33]
6.	Forestry Products				[28]
7.	Agricultural Services				
8.	Petroleum and Natural Gas				
9.	Sand and Gravel Mining				
10.	Construction			X	
11.	Food and Kindred Products	X		X	
12.	Apparel and Textiles	X		X	
13.	Lumber and Wood Products	X		X	
14.	Paper and Allied Products	X		X	
15.	Printing and Publishing	X		X	
16.	Chemicals, plastics, Drugs, Paints	X		X	
17.	Petroleum Refining	X	X	X	
18.	Stone, Clay and Glass	X		X	
19.	Fabricated Metals	X		X	
20.	Transportation Equipment	X		X	
21.	Other Manufacturing	X		X	
22.	Water Transportation	X		X	
23.	Other Transportation	X		X	
24.	Communications and Utilities	X		X	
25.	Wholesale and Retail Trade	X		X	
26.	Finance, Insurance and Real Estate	X		X	
27.	Hotel, Personal, and Repair Services	X		X	
28.	Medical, Educ., & Non-Profit Services	X	X	X	[42]
29.	Other Services	X		X	
30.	State and Local Government	X		X	
31.	Households	X			[2]

year for each sector was taken from Table 1 for use in converting the data to tons per year.

Specific waste categories (paper, wood, etc.) were estimated from Niessen [29] except for processing waste from Fresh or Frozen Packaged Fish which was assumed to be all Food Waste. Items in the "Miscellaneous Waste" category include such waste products as inorganic ash, stones, and dust [29]. For some of the industries listed by Niessen [29], the percentage of components did not add up to 100%, so for these sectors the sum of rows 42 through 51 in Table 7 are not equal to row 41.

Water Use

Water use estimates came from the same sources as shown in Water Quality Methodology (Table 1). Flow data were usually given as "process water", "sanitary water" or "cooling water". For the contribution to each sector from sewage treatment plants, flow data from the Mobile 208 Study [38] were summed for all sewage treatment facilities to equal 27.48 million gallons per day (MGD). These treatment facilities served an estimated population of 226,000. From this, the number of gallons required per person per day was calculated. It was assumed that employees at work accounted for one third of a day. Water use by sector was thus caluclated in the following way: (number of employees) X (1/3 day) X (number of working days per year) X (million gallons per employee per day). Households were charged with the remainder of water use not accounted for by other sectors.

Process water and sanitary water were combined into one environmental parameter, Process Water, since both require treatment. Cooling

water was assumed to be "non-contact".

Total Water Use was calculated simply by adding together Process Water and Cooling Water requirements.

Fuel Consumption

Fuel consumption was taken from the sources given in Table 4. The Census of Manufacturers data [44, 46] were listed by 4-digit SIC code, and the Department of Energy (DOE) [48] data were given by both 2-digit SIC code and by sector aggregates of 2-digit SIC codes. National consumption was computed on a per employee basis and multiplied by regional employment to arrive at regional consumption.

Sectors 3 and 4 were reported by the Federal Energy Administration [11] as consumption per head of livestock or per acre of crop by state. Multiplying by the number of head or acres in the region yielded regional consumption for those sectors.

Sector 24 was reported by DOE exclusive of consumption of electrical generation. The Alabama Air Pollution Control Commission provided consumption data for the two electrical generating facilities in the region [12].

Household consumption of gasoline was calculated from average passenger vehicle miles per gallon listed by Motor Vehicle Facts and Figures [26] multiplied by the number of registered private vehicles in the region reported in the Alabama County Data Book [2]. Primary data were unavailable for Greenhouse and Nursery Products so consumption was established by multiplying the estimated cost of heating a square foot of greenhouse by the total area of greenhouses in the region [6] and

TABLE 4

SOURCES OF ENERGY AND FUEL CONSUMPTION DATA BY SECTOR AND BY TYPE OF FUEL
FOR BALDWIN-MOBILE COUNTY ENVIRONMENTAL INPUT-OUTPUT MODEL

		Type of Energy or Fuel									
	Economic Sector	Electricity	Distillate	Residual	Coal	Coke	Natural Gas	Gasoline	LPG	Jet Fuel	Aviation Fuel
1.	Fishery Products		[48]					[48]			
2.	Fresh or Frozen Packaged Fish		[44]	[44]	[44]		[44]				
3.	Livestock		[11]					[11]	[11]		
4.	Crops		[11]				[11]	[11]	[11]		
5.	Greenhouse and Nursery Products								[34]		
6.	Forestry Products	[44]	[44]	[44]	[44]		[44]				
7.	Agricultural Services										
8.	Petroleum and Natural Gas	[48]	[48]		[48]		[48]	[48]			
9.	Sand and Gravel Mining	[48]	[48]		[48]		[48]	[48]			
10.	Construction	[48]	[48]					[48]			
11.	Food and Kindred Products	[44]	[44]	[44]	[44]		[44]				
12.	Apparel and Textiles	[44]	[44]	[44]	[44]		[44]				
13.	Lumber and Wood Products	[44]	[44]	[44]	[44]		[44]				
14.	Paper and Allied Products	[44]	[44]	[44]	[44]	[44]	[44]				
15.	Printing and Publishing	[44]	[44]	[44]	[44]		[44]				
16.	Chemicals, Plastics, Drugs, Paints	[44]	[44]	[44]	[44]	[44]	[44]				
17.	Petroleum Refining	[44]	[44]	[44]	[44]		[44]				
18.	Stone, Clay and Glass	[44]	[44]	[44]	[44]		[44]				
19.	Fabricated Metals	[44]	[44]	[44]	[44]		[44]				
20.	Transportation Equipment	[44]	[44]	[44]	[44]		[44]				
21.	Other Manufacturing	[44]	[44]	[44]	[44]	[44]	[44]				
22.	Water Transportation		[48]	[48]				[48]			
23.	Other Transportation		[48]	[48]			[44]	[48]		[48]	[48]
24.	Communications and Utilities	[48]	[12, 48]	[48]	[12]		[12, 48]				
25.	Wholesale and Retail Trade	[48]	[48]	[48]			[48]				
26.	Finance, Insurance and Real Estate	[48]	[48]	[48]			[48]				
27.	Hotel, Personal, and Repair Services	[48]	[48]	[48]			[48]				
28.	Medical, Educ., & Non-Profit Services	[48]	[48]	[48]			[48]				
29.	Other Services	[48	[48]	[48]			[48]				
30.	State and Local Government	[48]	[48]	[48]			[48]		[48]		
31.	Households	[48]	[48]				[48]	[2, 26]	[48]		

dividing by the price of LP gas in the region. Fuel consumption data were unavailable for Forestry Products, however consumption was estimated to be 10% of the sum of SIC 08 plus SIC 2411 [19].

Land Use

Land use factors were calculated for most sectors using Ide [16]. Exceptions were Livestock, Crops, Greenhouse and Nursery Products, Forestry Products, and Households. Ide listed land use data in square feet per employee for 2-, 3-, and 4-digit SIC codes. Employment information at the 4-digit level (see Detailed Employment Methodology) was used wherever possible, and the resulting square footage calculated was summed for the sector. For example, employment data and square footage per employee were available at the 4-digit level for Petroleum Refining establishments having SIC codes 2911, 2951, and 2952. These two components were multiplied together for each of the three 4-digit codes and summed to give the total square footage used by SIC sector 29 (Petroleum Refining) in 1972.

Occasionally, factors for building site were not given although floor space factors were. In these cases, floor space and building site were taken to be the same (i.e. a single-floored building). When parking space factors were not given for a certain industry, they were either assumed to be the same as related industries, or an overall average estimate of 200 square feet of parking space per employee was used.

Livestock land use was estimated from acreage of pasture given by the Soil Conservation Service [24,25]. Crop acreage was given by Alabama Agricultural Statistics [1]. Greenhouse land use data was estimated from

information given by Dr. Ray Self of the Ornamental Horticulture Substation, Mobile [33]. Forestry land use came from the Alabama Cooperative Extension Service [49]. Household land use came from a study by the South Alabama Regional Planning Commission [36]. Data were not available to satisfactorily estimate floor space, building site, and parking space for Households.

Occupation

Table 5 lists the two sources of occupational data used in this study. The SIC codes covered by each source are also listed in this table. Table 6 lists the equivalent terms used by each source.

The Occupational Employment Statistics (OES) reports [3] provided estimated employment and percent of total employment by occupational category for selected industries in the State of Alabama. The reports spanned the years 1975 to 1979 and included the first seven categories listed in the regional study, i. e. "Managers" through "Sales Workers". In general, estimates of regional occupation by sector were made by multiplying total regional employment in an industry by "percent of total employment" for each occupation category from the OES reports. Industries within a sector were then summed together to give sectoral totals. Thus, the sum of the eight occupation categories is equal to the total employment for that sector, with some rounding error.

For several industries not covered in the OES reports, data on occupation were estimated from the U. S. Bureau of the Census publication "Occupation by Industry" [43]. An additional category, Farm Workers, was estimated from this source. Calculations were similar to those used for the OES reports.

TABLE 5

SOURCES AND SIC CODES USED FOR OCCUPATION DATA BY SECTOR FOR BALDWIN-MOBILE COUNTY ENVIRONMENTAL INPUT-OUTPUT MODEL

Economic Sector	Source of Data: Alabama Occupational Employment SIC Codes	Source of Data: U. S. Bureau of the Census (1972) SIC Codes
1. Fishery Products		09
2. Fresh or Frozen Packaged Fish		203
3. Livestock		011-013, 0192
4. Crops		011-013, 0192
5. Greenhouse and Nursery Products		011-013, 0192
6. Forestry Products		08
7. Agricultural Services		07
8. Petroleum and Natural Gas	13	
9. Sand and Gravel Mining	10, 14	
10. Construction	15 - 17	
11. Food and Kindred Products	201 - 209	
12. Apparel And Textiles	23	
13. Lumber and Wood Products	24	
14. Paper and Allied Products	261 - 266	
15. Printing and Publishing	27	
16. Chemicals, Plastics, Drugs, Paints	281-287, 289	
17. Petroleum Refining		29
18. Stone, Clay and Glass	324 - 329	
19. Fabricated Metals	34	
20. Transportation Equipment	37	
21. Other Manufacturing	22, 25, 35, 36, 38, 39, 301, 303, 306, 332, 336	
22. Water Transportation	44	
23. Other Transportation	40, 41, 47	42, 45, 46, 481
24. Communications and Utilities	49, 483	
25. Wholesale and Retail Trade	50, 52-58, 531,554	59
26. Finance, Insurance and Real Estate	60 - 67	
27. Hotel, Personal, and Repair Services	70, 72, 76	
28. Medical, Educ., & Non-Profit Services	80 (excl. 806), 86	82, 806
29. Other Services	73, 75, 78, 79, 81, 89	
30. State and Local Government	92, 93	
31. Households		

TABLE 6

ROW NAMES AND EQUIVALENT OCCUPATIONAL TERMS BY SOURCE

Row Name	OES Reports [3]	Census [43]
Managers	"Managers and Officers"	"Managers and Administrators, except Farm"
Professionals	"Professionals"	"Professional, Technical, and Kindred Workers", excluding "Computer Specialists", "Health Technologists and Technicians", "Engineering and Science Technicians", and "Technicians, except Health, and Engineering and Science"
Technicians	"Technicians"	"Computer Specialists", "Health Technologists and Technicians", "Engineering and and Science Technicians", and "Technicians, except Health, and Engineering and Science"
Service Workers	"Service Workers"	"Service Workers, except Private Household "
Production Workers	"Maintenance and Production"	"Craftsmen and Kindred Workers ", "Operatives, except Transport", "Transport Equipment Operatives", and "Laborers, except Farm"
Clerical Workers	"Clerical Workers"	"Clerical and Kindred Workers "
Sales Workers	"Sales Workers"	"Sales Workers"
Farm Workers		"Farmers and Farm Managers", and "Farm Laborers and Farm Foremen"

RESULTS

Environmental Factors

Data given in Table 7 show the quantity of pollutant produced, or resource consumed, by each of the 31 sectors in the Alabama Coastal economy during 1972. Pollutants are designated by a negative sign and include the first three broad categories of Water Quality (34 factors), Air Quality (6 factors), and Solid Waste (11 factors). The remaining factors comprise the four resource use categories of Water Use (3 factors), Fuel Use (10 factors), Land Use (4 factors) and Occupation (8 factors). Most of the empty cells represent lack of data rather than lack of production of pollution or consumption of resources. The last column in Table 7 gives the total for the row. All units are in short tons (2,000 lbs. per ton) per year except as indicated.

It is noteworthy that a single sector often contributes the bulk of the activity in a certain environmental factor. This demonstrates that certain critical environmental factors of production can be characteristic of certain industries.

Environmental Factors per Thousand Dollars of Output

The data in Table 8 were derived by dividing each environmental factor in a given column by the total dollar output for 1972 produced by the sector named at the top of the column (the relevant tables describing the economic structure of the region are given in Part I of this study).

TABLE 7

POLLUTANTS PRODUCED OR RESOURCES CONSUMED BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	FISHERY PROD	PKGD FISH	LIVESTOCK	CROPS	GREEN-HOUSE	FORESTRY	AG SERVICES	PETRO-LEUM
1.TOTAL SUSPENDED SOLIDS	-1.560	-420.430	-760000.000	-2867400.000	0.000	-40425.000	0.000	-0.184
2.TOTAL DISSOLVED SOLIDS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.BOD-5	-1.560	-217.570	0.000	0.000	0.000	0.000	0.000	0.000
4.AMMONIA	0.000	-0.066	0.000	0.000	0.000	0.000	0.000	-0.184
5.NITRATE	0.000	-0.010	0.000	0.000	0.000	0.000	0.000	0.000
6.NITRITE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7.ORGANIC NITROGEN	0.000	-0.340	0.000	0.000	0.000	0.000	0.000	0.000
8.TOTAL KJELDAHL NITROGEN	0.000	-0.410	0.000	0.000	0.000	0.000	0.000	0.000
9.NITROGEN (VIA STP)	-1.560	-3.320	0.000	0.000	0.000	0.000	0.000	0.000
10.TOTAL NITROGEN (SUM 8+9)	-1.560	-0.830	0.000	0.000	0.000	0.000	0.000	-0.184
11.TOTAL PHOSPHORUS	-0.520	-2.790	0.000	0.000	0.000	0.000	0.000	-0.184
12.ORGANIC CARBON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.041
13.SULFATE	0.000	-0.060	0.000	0.000	0.000	0.000	0.000	0.000
14.SULFIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15.SULFITE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16.CYANIDE	0.000	-2.690	0.000	0.000	0.000	0.000	0.000	0.000
17.OIL AND GREASE	0.000	-0.370	0.000	0.000	0.000	0.000	0.000	0.000
18.PHENOLS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19.ALUMINUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20.CADMIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21.CALCIUM	0.000	-0.010	0.000	0.000	0.000	0.000	0.000	0.000
22.CHROMIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23.COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24.CYANIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25.FLUORIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26.IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27.LEAD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28.MAGNESIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29.MANGANESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30.MERCURY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31.NICKEL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
32.POTASSIUM	0.000	-0.050	0.000	0.000	0.000	0.000	0.000	0.000
33.SODIUM	0.000	-0.140	0.000	0.000	0.000	0.000	0.000	0.000
34.ZINC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35.PARTICULATES	0.000	-37.800	-4.870	-49.440	-2.940	-2213.390	0.000	-4.230
36.SULFUR OXIDES	-238.250	-182.950	-9.440	-90.440	-0.020	-4.640	0.000	-12.450
37.NITROGEN OXIDES	-3032.540	-69.550	-48.140	-921.470	-14.340	-529.170	0.000	-45.220
38.CARBON MONOXIDE	-1193.750	-84.070	-503.120	-3848.540	-3.120	-14227.280	0.000	-104.120
39.HYDROCARBONS	-96.380	-7.010	-23.490	-218.810	-1.150	-3125.190	0.000	-7.630
40.ALDEHYDES	0.000	-0.470	-1.730	-23.350	0.000	0.000	0.000	-0.750
41.TOTAL SOLID WASTE	0.000	-2084.000	0.000	0.000	0.000	0.000	0.000	0.000
42.PAPER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
43.WOOD WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44.LEATHER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45.RUBBER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46.PLASTIC WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
47.METAL WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
48.GLASS WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49.TEXTILE WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50.FOOD WASTE	0.000	-2084.000	0.000	0.000	0.000	0.000	0.000	0.000
51.MISCELLANEOUS WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
52.PROCESS WATER (MGAL)	15.250	10.250	0.000	0.000	0.000	0.000	0.000	0.000
53.COOLING WATER (MGAL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.750
54.TOTAL WATER (52+53)(MGAL)	15.250	10.250	0.000	0.000	0.000	0.000	0.000	0.000
55.ELECTRICITY (THOU KWH)	0.000	11366.745	0.000	0.000	0.000	297.753	0.000	1.750
56.NATURAL GAS (MILL CU FT)	0.000	256.027	0.000	5.990	0.000	2.415	0.000	0.000
57.LP GAS (BBL)	0.000	0.000	1911.310	7409.330	78181.810	0.000	0.000	285.989
58.DISTILLATE (BBL)	-19284.490	-9810.000	3549.430	9269.910	0.000	3089.000	0.000	0.000
59.RESIDUAL (BBL)	0.000	-4400.000	0.000	0.000	0.000	49.000	0.000	4359.000
60.MOTOR GAS (BBL)	-1993.500	0.000	7216.000	9670.920	0.000	0.000	0.000	0.000
61.AVIATION GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1168.000
62.JET FUEL (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
63.COAL	0.000	5788.000	0.000	0.000	0.000	0.000	0.000	0.000
64.COKE AND BREEZE	0.000	0.000	0.000	0.000	0.000	3.780	0.000	352.800
65.LAND (ACRES)	906.048	34.780	76000.000	318000.000	1462.000	122500.000	108.505	0.000
66.FLOOR SPACE (ACRES)	0.758	17.470	136.149	10.500	4.250	0.000	14.126	4.397
67.PARKING (ACRES)	0.000	3.472	2.847	49.102	144.370	0.000	13.227	0.448
68.BUILDING SITE (ACRES)	2.758	17.492	13.189	29.102	144.372	0.000	28.465	0.000
69.MANAGERS (PERSONS)	149.100	50.300	0.300	0.900	0.300	2.800	12.100	3.440
70.PROFESSIONALS (PERSONS)	69.600	33.200	1.400	5.200	1.400	29.100	29.300	4.340
71.TECHNICIANS (PERSONS)	7.400	3.300	0.400	1.200	0.400	2.700	4.600	1.740
72.SERVICE WORKERS (PER)	20.700	10.300	1.400	5.700	1.400	1.400	3.000	0.000
73.PRODUCTION WORKERS (PER)	1210.400	710.300	10.900	32.700	10.900	17.100	114.200	109.400
74.CLERICAL WORKERS (PER)	29.400	14.300	0.400	12.000	4.000	6.700	10.300	6.340
75.SALES WORKERS (PERSONS)	15.200	12.100	1.300	3.800	1.300	0.400	3.300	0.440
76.FARM WORKERS (PERSONS)	0.000	0.000	479.000	1438.000	479.000	0.000	23.500	0.000

TABLE 7 - Continued

POLLUTANTS PRODUCED OR RESOURCES CONSUMED BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	SAND & GRAVEL	CONSTRUC-TION	FOOD & KINDRED	APPAREL	LUMBER & WOOD	PAPER & ALLIED	PRINTING	CHEMICALS
1.TOTAL SUSPENDED SOLIDS	-0.060	-9.030	-7.290	-2.250	-87.860	-11250.000	-0.936	-981.800
2.TOTAL DISSOLVED SOLIDS	0.000	0.000	-1.100	0.000	-935.480	-112213.000	0.000	-200244.000
3.BOD-5	-0.060	-9.060	-4.860	-2.250	-89.210	-6204.000	-0.936	-659.800
4.AMMONIA	0.000	-0.005	-0.190	0.000	-0.210	-37.770	0.000	-59.940
5.NITRATE	0.000	-0.024	-0.002	0.000	-0.017	-7.630	0.000	-16.100
6.NITRITE	0.000	0.000	0.000	0.000	-0.002	-0.928	0.000	-0.700
7.ORGANIC NITROGEN	0.000	0.000	0.000	0.000	-0.040	-855.280	0.000	-44.800
8.TOTAL KJELDAHL NITROGEN	0.000	0.000	-0.192	0.000	-1.360	-926.200	0.000	-122.200
9.NITROGEN (VIA STP)	-0.060	-8.990	-2.340	-2.250	-2.620	-11.030	-0.936	-4.000
10.TOTAL NITROGEN (SUM 8+9)	-0.060	-8.990	-2.532	-2.250	-3.980	-937.230	-0.936	-126.200
11.TOTAL PHOSPHORUS	-0.020	-1.030	-0.798	-0.744	-1.390	-89.530	-0.310	-34.300
12.ORGANIC CARBON	0.000	0.000	0.000	0.000	-67.290	-12.780	0.000	-355.100
13.SULFATE	0.000	0.000	0.000	0.000	-25.690	-10.420	0.000	-3957.000
14.SULFIDE	0.000	0.000	0.000	0.000	-0.012	-0.403	0.000	-0.004
15.SULFITE	0.000	0.000	0.000	0.000	0.000	-0.438	0.000	-0.360
16.CHLORIDE	0.000	0.000	-0.081	0.000	-931.490	-3.150	0.000	-22015.000
17.OIL AND GREASE	0.000	0.000	-2.360	0.000	-1.320	-3.170	0.000	-51.800
18.PHENOLS	0.000	0.000	0.000	0.000	-0.058	-54.860	0.000	-0.249
19.ALUMINUM	0.000	0.000	0.000	0.000	-0.030	0.000	0.000	-106.500
20.CADMIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.003
21.CALCIUM	0.000	0.000	0.000	0.000	-0.261	0.000	0.000	-0.005
22.CHROMIUM	0.000	0.000	0.000	0.000	-3.170	-38.500	0.000	-4.380
23.COPPER	0.000	0.000	0.000	0.000	-10.860	-0.002	0.000	-0.001
24.CYANIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.187
25.FLOURIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.691
26.IRON	0.000	0.000	0.000	0.000	-0.005	-0.005	0.000	-2.788
27.LEAD	0.000	0.000	0.000	0.000	-0.001	-0.003	0.000	-0.004
28.MAGNESIUM	0.000	0.000	0.000	0.000	-0.003	0.000	0.000	-4.790
29.MANGANESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30.MERCURY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.061
31.NICKEL	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	-0.408
32.POTASSIUM	0.000	0.000	0.000	0.000	-0.398	0.000	0.000	-467.000
33.SODIUM	0.000	0.000	0.000	0.000	-0.764	-0.403	0.000	-2673.000
34.ZINC	0.000	0.000	0.000	0.000	-0.011	-19.270	0.000	-46.730
35.PARTICULATES	-2.330	-115.620	-905.910	-0.860	-32.480	-1445.670	-6.550	-1097.120
36.SULFUR OXIDES	-4.650	-79.880	-318.630	-20.840	-135.580	-6342.940	-41.980	-5193.280
37.NITROGEN OXIDES	-24.300	-1223.550	-143.790	-2.920	-183.250	-3631.730	-28.230	-2309.090
38.CARBON MONOXIDE	-36.900	-14516.600	-17.890	-0.320	-23.610	-371.560	-2.240	-213.970
39.HYDROCARBONS	-2.930	-621.470	-5.030	-0.180	-11.120	-125.180	-1.480	-83.860
40.ALDEHYDES	-0.280	-43.080	-0.970	-0.040	-2.080	-27.150	-0.830	-8.130
41.TOTAL SOLID WASTE	0.000	-4234.000	-11415.000	-598.000	-109325.000	-15100.000	-441.000	-10999.000
42.PAPER WASTE	0.000	0.000	-5970.000	-312.000	-18257.000	-8501.300	-374.410	-6049.650
43.WOOD WASTE	0.000	0.000	-879.000	0.000	-78277.000	-1706.300	-24.250	-494.960
44.LEATHER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45.RUBBER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46.PLASTIC WASTE	0.000	0.000	-102.700	0.000	0.000	0.000	0.000	-1022.910
47.METAL WASTE	0.000	0.000	-936.000	0.000	0.000	-1419.400	0.000	-791.930
48.GLASS WASTE	0.000	0.000	-559.300	0.000	0.000	0.000	0.000	-241.980
49.TEXTILE WASTE	0.000	0.000	0.000	-283.730	0.000	0.000	0.000	0.000
50.FOOD WASTE	0.000	0.000	-1906.300	-7.500	0.000	0.000	0.000	0.000
51.MISCELLANEOUS WASTE	0.000	0.000	-1050.100	0.000	-8527.000	-2114.000	0.000	-2166.800
52.PROCESS WATER (MGAL)	0.000	88.200	100.800	21.900	267.720	26593.000	9.000	5117.000
53.COOLING WATER (MGAL)	0.000	0.000	0.000	0.000	255.600	32648.000	0.000	554.400
54.TOTAL WATER (52+53) (MGAL)	0.000	88.200	100.800	21.900	523.320	59241.000	9.000	5671.400
55.ELECTRICITY (THOU KWH)	3313.500	8596.800	49858.915	5373.348	60961.122	650174.249	9759.221	1196303.413
56.NATURAL GAS (MILL CU FT)	106.679	0.000	460.347	15.344	443.794	7394.555	53.034	10941.121
57.LP GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
58.DISTILLATE (BBL)	1626.240	81248.000	16401.960	892.720	46908.460	281713.880	19743.880	135946.630
59.RESIDUAL (BBL)	0.000	0.000	8256.790	139.000	5401.400	729353.390	110.720	95308.000
60.MOTOR GAS (BBL)	413.600	20865.000	0.000	0.000	0.000	0.000	0.000	0.000
61.AVIATION GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
62.JET FUEL (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
63.COAL	131.600	0.000	16850.940	93.430	1343.850	212678.650	11.400	169745.550
64.COKE AND BREEZE	0.000	0.000	0.000	0.000	0.000	18.690	0.000	533.580
65.LAND (ACRES)	203.961	262.958	145.365	43.399	279.021	373.312	135.972	435.482
66.FLOOR SPACE (ACRES)	0.361	91.158	26.120	11.085	25.303	74.590	7.338	108.712
67.PARKING (ACRES)	0.396	20.343	32.181	26.462	21.456	34.581	5.591	19.032
68.BUILDING SITE (ACRES)	0.041	14.803	27.471	9.165	19.947	74.456	6.486	51.674
69.MANAGERS (PERSONS)	5.130	677.520	139.990	23.400	96.600	218.800	69.300	161.400
70.PROFESSIONALS (PERSONS)	1.300	308.160	18.990	9.000	21.000	283.800	105.300	183.400
71.TECHNICIANS (PERSONS)	0.220	140.400	0.700	1.100	0.300	60.000	1.800	172.800
72.SERVICE WORKERS (PER)	0.430	72.720	70.160	27.000	44.100	104.200	27.900	47.000
73.PRODUCTION WORKERS (PER)	37.190	3489.230	1411.080	1036.900	1808.100	6294.600	454.000	1937.800
74.CLERICAL WORKERS (PER)	2.810	475.200	168.440	47.200	105.000	548.500	187.200	219.600
75.SALES WORKERS (PERSONS)	0.860	36.720	67.100	5.400	18.900	40.300	54.500	28.000
76.FARM WORKERS (PERSONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

TABLE 7 - Continued

POLLUTANTS PRODUCED OR RESOURCES CONSUMED BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANTS OR RESOURCE	PETROL REF	STN, CLY & GLS	FAB METALS	TRANSP EQP	OTHER MFG	WATER TRANSP	OTHER TRANSP	COMM & UTIL
1.TOTAL SUSPENDED SOLIDS	-50.230	-1264.000	-1.670	-6.290	-47.560	-3.490	-5.820	-5.170
2.TOTAL DISSOLVED SOLIDS	-1114.000	-2225.000	0.000	-50.220	0.000	0.000	0.000	0.000
3.BOD-5	-50.400	-2.210	-0.880	-3.900	-2.560	-3.490	-5.370	-5.780
4.AMMONIA	-2.100	-0.476	0.000	-0.149	-0.008	0.000	0.000	-0.003
5.NITRATE	-16.280	0.000	0.000	-0.062	0.000	0.000	0.000	-0.315
6.NITRITE	-0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7.ORGANIC NITROGEN	-1.770	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8.TOTAL KJELDAHL NITROGEN	-4.410	-2.760	0.000	-0.203	0.000	0.000	0.000	0.000
9.NITROGEN (VIA STP)	-0.690	-0.750	-0.676	-3.420	-2.480	-3.490	-4.340	-4.590
10.TOTAL NITROGEN (SUM 8+9)	-5.100	-3.510	-0.676	-3.623	-2.480	-3.490	-4.340	-4.590
11.TOTAL PHOSPHORUS	-15.280	-0.248	-0.224	-1.230	-1.420	-1.160	-1.440	-2.200
12.ORGANIC CARBON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13.SULFATE	-4.970	0.000	0.000	0.000	-0.026	0.000	0.000	0.000
14.SULFIDE	-0.516	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15.SULFITE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16.CHLORIDE	-14.000	-4765.000	0.000	0.000	0.000	0.000	0.000	0.000
17.OIL AND GREASE	-8.400	0.000	0.000	0.000	-6.730	0.000	-0.615	0.000
18.PHENOLS	-0.075	0.000	0.000	0.000	-0.890	0.000	-0.001	0.000
19.ALUMINUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20.CADMIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21.CALCIUM	0.000	-176.100	0.000	0.000	0.000	0.000	0.000	0.000
22.CHROMIUM	-2.570	-0.053	-0.021	-0.708	-0.902	0.000	-0.007	0.000
23.COPPER	-0.012	0.000	-0.002	0.000	-0.054	0.000	-0.003	0.000
24.CYANIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25.FLOURIDE	0.000	-3.210	-0.002	0.000	0.000	0.000	-0.043	0.000
26.IRON	-0.095	0.000	-0.007	0.000	-0.143	0.000	0.000	0.000
27.LEAD	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28.MAGNESIUM	0.000	-258.900	0.000	0.000	0.000	0.000	0.000	0.000
29.MANGANESE	0.000	0.000	0.000	0.000	-8.850	0.000	0.000	0.000
30.MERCURY	-0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31.NICKEL	0.000	0.000	-0.034	0.000	0.000	0.000	0.000	0.000
32.POTASSIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
33.SODIUM	0.000	-114.300	0.000	0.000	0.000	0.000	0.000	0.000
34.ZINC	-0.247	0.000	-0.003	-0.572	-0.001	0.000	0.000	0.000
35.PARTICULATES	-65.000	-585.000	-5.940	-20.540	-138.000	-342.550	-51.050	-2521.890
36.SULFUR OXIDES	-369.000	-2750.000	-31.030	-141.810	-490.310	-3145.680	-322.600	-49184.560
37.NITROGEN OXIDES	-256.640	-686.950	-28.700	-59.400	-166.320	-1168.250	-395.130	-5976469.000
38.CARBON MONOXIDE	-23.320	-73.420	-3.670	-5.620	-21.660	-2610.440	-2089.080	-145883.440
39.HYDROCARBONS	-6.620	-28.540	-1.730	-3.300	-10.790	-196.040	-201.840	-8917.890
40.ALDEHYDES	0.000	-3.410	-0.290	-0.860	-0.490	0.000	-2.070	-10.040
41.TOTAL SOLID WASTE	-7015.000	-1440.300	-1105.000	-3565.000	-7629.000	-5899.000	-7084.000	-3015.000
42.PAPER WASTE	-5057.000	-486.700	-492.800	-1814.600	-3184.240	-3442.000	-4278.000	-1821.000
43.WOOD WASTE	-477.000	-62.000	-113.800	-335.000	-927.290	0.000	0.000	0.000
44.LEATHER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45.RUBBER WASTE	0.000	0.000	0.000	-50.000	-7.410	0.000	0.000	0.000
46.PLASTIC WASTE	-1073.300	0.000	0.000	-74.900	-358.750	-536.000	-646.000	-283.000
47.METAL WASTE	-368.700	-116.600	-256.400	0.000	-707.940	-809.000	-751.000	-320.000
48.GLASS WASTE	0.000	-184.300	0.000	0.000	-109.000	-644.000	-800.000	-348.000
49.TEXTILE WASTE	0.000	0.000	0.000	0.000	-8.100	0.000	0.000	0.000
50.FOOD WASTE	0.000	0.000	0.000	0.000	-1.350	-405.000	-503.000	-214.000
51.MISCELLANEOUS WASTE	-70.150	-576.000	-134.400	-695.200	-1561.100	-68.000	-85.000	-36.000
52.PROCESS WATER (MGAL)	152.200	7.200	25.750	40.500	224.500	33.900	58.500	51.100
53.COOLING WATER (MGAL)	584.500	248.400	0.000	239.400	0.390	0.000	0.000	350569.000
54.TOTAL WATER (52+53,MGAL)	776.700	255.600	25.750	279.900	224.890	33.900	58.500	350620.100
55.ELECTRICITY (THOU KWH)	47332.724	108117.904	30519.833	37035.830	1141355.296	0.000	0.000	37368.797
56.NATURAL GAS (MILL CU FT)	2206.279	2568.473	261.204	160.320	328.748	0.000	566.432	17018398.620
57.LP GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
58.DISTILLATE (BBL)	17721.790	40523.890	5992.170	10086.660	7442.900	147560.000	247920.000	2923990.000
59.RESIDUAL (BBL)	28824.160	56337.180	2128.720	21085.730	6636.910	557370.000	79640.000	133376.000
60.MOTOR GAS (BBL)	0.000	0.000	0.000	0.000	0.000	97810.000	2001950.000	0.000
61.AVIATION GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	82120.000	0.000
62.JET FUEL (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	203910.000	0.000
63.COAL	658.660	77858.830	380.250	1403.450	17181.070	0.000	0.000	2748500.000
64.COKE AND BREEZE	0.000	0.000	0.000	0.000	312.960	0.000	0.000	0.000
65.LAND (ACRES)	306.744	257.937	113.038	168.164	475.137	149.085	673.864	445.427
66.FLOOR SPACE (ACRES)	12.034	10.788	11.270	12.442	27.337	10.258	41.349	14.893
67.PARKING (ACRES)	14.158	9.201	8.970	10.590	17.647	8.780	23.837	7.314
68.BUILDING SITE (ACRES)	10.662	7.875	18.356	27.915	35.370	10.258	39.437	10.794
69.MANAGERS (PERSONS)	30.300	39.600	28.000	65.000	93.100	456.400	207.300	233.600
70.PROFESSIONALS (PERSONS)	69.700	7.800	15.600	68.600	54.000	60.800	71.800	366.400
71.TECHNICIANS (PERSONS)	30.200	3.600	16.300	30.200	45.000	0.000	20.400	98.400
72.SERVICE WORKERS (PER)	11.600	5.400	11.100	54.800	36.900	81.200	71.300	48.300
73.PRODUCTION WORKERS (PER)	238.400	489.000	516.000	2273.100	1572.700	1693.000	2518.000	1197.100
74.CLERICAL WORKERS (PER)	84.300	42.600	52.000	202.900	159.500	284.200	359.000	1112.600
75.SALES WORKERS (PERSONS)	9.500	12.000	10.400	27.400	22.800	20.400	32.200	71.600
76.FARM WORKERS (PERSONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

TABLE 7 - Continued

POLLUTANTS PRODUCED OR RESOURCES CONSUMED BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANTS OR RESOURCE	TRADE	FIN, INS, & RE	HOTELS	MED, ED SERV	OTHER SERV	ST & LOC GOVT	HOUSEHOLDS	FEDERAL GOVT
1.TOTAL SUSPENDED SOLIDS	-72.100	-5.360	-6.920	-19.970	-5.930	-15.850	-877.280	-2998679.742
2.TOTAL DISSOLVED SOLIDS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-316402.800
3.BOD-5	-37.900	-5.360	-6.590	-25.710	-5.960	-15.860	-877.830	-8239.132
4.AMMONIA	-0.203	0.000	-0.350	-0.224	-0.003	-0.001	-0.300	-102.010
5.NITRATE	-1.080	0.000	-1.800	-10.310	-0.029	-0.006	-2.230	-55.899
6.NITRITE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.635
7.ORGANIC NITROGEN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-901.930
8.TOTAL KJELDAHL NITROGEN	0.000	0.000	0.000	-4.330	-0.026	0.000	0.000	-1041.991
9.NITROGEN (VIA STP)	-33.070	-5.360	-4.120	-9.040	-5.850	-15.830	-873.260	-1009.258
10.TOTAL NITROGEN (SUM 8+9)	-33.070	-5.360	-4.120	-13.370	-5.876	-15.830	-873.260	-2071.249
11.TOTAL PHOSPHORUS	-12.670	-1.770	-5.280	-8.820	-1.960	-5.260	-294.010	-484.465
12.ORGANIC CARBON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-435.170
13.SULFATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-3997.684
14.SULFIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.935
15.SULFITE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.806
16.CHLORIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-27231.411
17.OIL AND GREASE	-0.861	0.000	0.000	0.000	0.000	0.000	0.000	-77.626
18.PHENOLS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-56.133
19.ALUMINUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-104.530
20.CADMIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.003
21.CALCIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-174.376
22.CHROMIUM	-0.006	0.000	0.000	0.000	0.000	0.000	0.000	-50.317
23.COPPER	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-10.934
24.CYANIDE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.187
25.FLOURIDE	-0.063	0.000	0.000	0.000	0.000	0.000	0.000	-4.029
26.IRON	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-3.043
27.LEAD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.009
28.MAGNESIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-263.693
29.MANGANESE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-8.650
30.MERCURY	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.092
31.NICKEL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.443
32.POTASSIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-468.248
33.SODIUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-2788.307
34.ZINC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-36.874
35.PARTICULATES	-73.520	-8.910	-1.900	-614.810	-4.460	-299.940	-1484.680	-11778.940
36.SULFUR OXIDES	-561.330	-31.850	-13.210	-4501.040	-30.810	-2405.610	-462.210	-79093.460
37.NITROGEN OXIDES	-238.310	-22.840	-7.520	-1964.630	-18.240	-823.400	-11467.910	-4004420.300
38.CARBON MONOXIDE	-21.560	-2.620	-0.790	-153.640	-1.990	-55.460	-192272.630	-382138.720
39.HYDROCARBONS	-12.880	-7.900	-0.460	-103.690	-1.030	-44.320	-26148.350	-40373.010
40.ALDEHYDES	-3.130	-0.200	-0.200	-47.720	-0.190	-15.400	-2.180	-195.440
41.TOTAL SOLID WASTE	-34143.000	-7789.000	-3702.000	-27174.000	-4383.000	-16462.000	-190074.000	-674420.000
42.PAPER WASTE	-20622.000	-4705.000	-2236.000	-16413.000	-2647.000	-9943.000	-81722.000	-198329.300
43.WOOD WASTE	0.000	0.000	0.000	0.000	0.000	0.000	-9653.000	-88949.400
44.LEATHER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	-644.000	-644.000
45.RUBBER WASTE	0.000	0.000	0.000	0.000	0.000	0.000	-2100.000	-2157.410
46.PLASTIC WASTE	-3209.000	-732.000	-348.000	-2554.000	-412.000	-1547.000	-2584.000	-15503.540
47.METAL WASTE	-3619.000	-826.000	-392.000	-2880.000	-465.000	-1745.000	-15989.000	-32127.970
48.GLASS WASTE	-3858.000	-880.000	-418.000	-3071.000	-495.000	-1860.000	-16312.000	-29773.580
49.TEXTILE WASTE	0.000	0.000	0.000	0.000	0.000	0.000	-4845.000	-5054.800
50.FOOD WASTE	-2424.000	-553.000	-263.000	-1929.000	-311.000	-1169.000	-31655.000	-43410.150
51.MISCELLANEOUS WASTE	-410.000	-93.000	-44.000	-326.000	-53.000	-198.000	-28568.000	-44794.150
52.PROCESS WATER (MGAL)	345.090	52.250	76.200	206.500	57.500	154.500	8544.650	42295.410
53.COOLING WATER (MGAL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	385090.490
54.TOTAL WATER (52+53,MGAL)	345.090	52.250	76.200	206.500	57.500	154.500	8544.650	427385.900
55.ELECTRICITY (THOU KWH)	487460.416	64800.991	40336.614	49322172.874	51750.227	3650574.375	50635.200	57092089.147
56.NATURAL GAS (MILL CU FT)	947.379	182.259	113.450	1349.119	126.548	29195.886	218.268	17076607.640
57.LP GAS (BBL)	0.000	0.000	0.000	0.000	0.000	9287.260	57156.000	153505.710
58.DISTILLATE (BBL)	4898.600	270.930	138.960	784572.900	178.280	45827.260	51786.000	5376943.480
59.RESIDUAL (BBL)	139327.600	837.140	521.100	703182.800	668.450	279835.500	0.000	2852789.590
60.MOTOR GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	4201120.000	6491853.180
61.AVIATION GAS (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	82120.000
62.JET FUEL (BBL)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	203910.000
63.COAL	0.000	0.000	0.000	3039.460	0.000	0.000	0.000	3250013.540
64.COKE AND BREEZE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	865.230
65.LAND (ACRES)	1210.935	141.858	62.744	231.178	2929.659	288.044	44802.000	1476320.500
66.FLOOR SPACE (ACRES)	324.497	24.910	39.245	86.392	73.152	117.079	0.000	1169.744
67.PARKING (ACRES)	392.385	39.915	38.483	33.184	65.440	118.730	0.000	1142.684
68.BUILDING SITE (ACRES)	364.549	24.910	43.735	106.305	71.614	117.079	0.000	1335.843
69.MANAGERS (PERSONS)	3045.800	1016.500	281.000	451.100	494.500	1404.100	0.000	9480.180
70.PROFESSIONALS (PERSONS)	576.600	274.400	84.200	3057.600	812.700	1751.500	0.000	8323.770
71.TECHNICIANS (PERSONS)	49.600	17.800	23.900	667.400	303.900	347.500	0.000	2089.260
72.SERVICE WORKERS (PER)	4473.900	341.900	1391.200	2668.600	1282.300	3660.600	0.000	14720.110
73.PRODUCTION WORKERS (PER)	7461.600	334.200	1012.800	337.400	1204.500	5434.900	0.000	47787.290
74.CLERICAL WORKERS (PER)	5355.100	2465.300	453.600	1461.500	1352.800	2562.000	0.000	18130.210
75.SALES WORKERS (PERSONS)	5537.400	659.900	54.300	13.400	174.300	64.400	0.000	7063.840
76.FARM WORKERS (PERSONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2421.200

TABLE 8

ENVIRONMENTAL FACTORS PER THOUSAND DOLLARS OF OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	FISHERY PROD	PKGD FISH	LIVESTOCK	CROPS	GREEN-HOUSE	FORESTRY	AG SERVICES	PETROLEUM	SAND & GRAVEL
1.TSS	-0.000088	-0.004083	-4.776269	-125.735584	0.000000	-0.357453	0.000000	-0.000007	-0.000006
2.TDS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
3.BOD-5	-0.000088	-0.007444	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000007	-0.000006
4.AMMONIA	0.000000	-0.000002	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5.NITRATE	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
6.NITRITE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
7.ORGANIC N	0.000000	-0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
8.TKN	0.000000	-0.000010	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
9.N (VIA STP)	-0.000068	-0.000269	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000007	-0.000006
10.TOT NITROGEN	-0.000088	-0.000274	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000007	-0.000006
11.TOTAL PHOS	-0.000029	-0.000090	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000002	-0.000002
12.ORGANIC C	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
13.SULFATE	0.000000	-0.000003	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
14.SULFIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
15.SULFITE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
16.CHLORIDE	0.000000	-0.000067	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
17.OIL & GREASE	0.000000	-0.000012	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
18.PHENOLS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
19.ALUMINUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
20.CADMIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
21.CALCIUM	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
22.CHROMIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
23.COPPER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
24.CYANIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25.FLOURIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
26.IRON	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
27.LEAD	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
28.MAGNESIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
29.MANGANESE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
30.MERCURY	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
31.NICKEL	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
32.POTASSIUM	0.000000	-0.000002	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
33.SODIUM	0.000000	-0.000005	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
34.ZINC	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
35.PARTICULATES	0.000000	-0.001224	-0.000293	-0.003922	-0.000426	-0.457534	0.000000	-0.000240	-0.000222
36.SULFUR OXIDE	-0.013439	-0.005923	-0.000343	-0.002055	-0.000003	-0.001373	0.000000	-0.000479	-0.000442
37.NITROGEN OX	-0.171059	-0.002899	-0.003029	-0.027251	-0.002601	-0.108573	0.000000	-0.002508	-0.002311
38.CARBON MONOX	-0.367337	-0.000197	-0.031619	-0.162109	-0.000449	-3.768303	0.000000	-0.004005	-0.003699
39.HYDROCARBONS	-0.025896	-0.000065	-0.001476	-0.009498	-0.000166	-0.046101	0.000000	-0.000301	-0.000279
40.ALDEHYDES	0.000000	-0.000015	-0.000121	-0.001324	0.000000	0.000000	0.000000	-0.000029	-0.000027
41.SOLID WASTE	0.000000	-0.066984	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
42.PAPER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
43.WOOD	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
44.LEATHER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
45.RUBBER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
46.PLASTIC	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
47.METAL	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
48.GLASS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
49.TEXTILE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
50.FOOD	0.000000	-0.066984	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
51.MISC.	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
52.PROCESS WATR	0.000860	0.000332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000067	0.000057
53.COOLING WATR	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
54.TOTAL WATER	0.000860	0.000332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000067	0.000057
55.ELECTRICITY	0.000000	0.358286	0.000000	0.000000	0.000000	0.041557	0.000000	0.341654	0.315091
56.NATURAL GAS	0.000000	0.006289	0.000000	0.000263	0.000000	0.000499	0.000000	0.011086	0.010144
57.LP GAS	0.000000	0.000000	0.088695	0.327530	11.258901	0.000000	0.000000	0.000000	0.000000
58.DISTILLATE	23.142427	0.317599	0.223066	2.749152	0.000000	0.638619	0.000000	0.167677	0.154441
59.RESIDUAL	0.000000	0.142450	0.000000	0.000000	0.000000	0.010130	0.000000	0.000000	0.000000
60.MOTOR GAS	2.383803	0.000000	0.453661	2.265758	0.000000	0.000000	0.000000	0.042646	0.039331
61.AVIATION GAS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
62.JET FUEL	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
63.COAL	0.000000	0.187128	0.000000	0.000000	0.000000	0.000777	0.000000	0.013569	0.012514
64.COKE&BREEZE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
65.LAND	0.051223	0.001771	4.776269	13.970620	0.210541	253.256151	0.035810	0.000169	0.019395
66.FLOOR SPACE	0.000494	0.000566	0.000829	0.000460	0.000612	0.000000	0.004462	0.000019	0.000034
67.PARKING	0.000000	0.000129	0.000164	0.001145	0.021323	0.000000	0.004365	0.000000	0.000038
68.BUILDING	0.000494	0.000581	0.000429	0.001145	0.021324	0.000000	0.009394	0.000000	0.000004
69.MANAGERIAL	0.008185	0.001823	0.000019	0.000039	0.000043	0.000538	0.003993	0.000134	0.000494
70.PROFESSIONAL	0.003700	0.001078	0.000101	0.000219	0.000236	0.006014	0.009571	0.000148	0.000124
71.TECHNICAL	0.000417	0.000431	0.000025	0.000053	0.000058	0.000558	0.001518	0.000067	0.000021
72.SERVICE	0.001517	0.001505	0.000119	0.000259	0.000274	0.000289	0.000990	0.000000	0.000041
73.PRODUCTION	0.068276	0.023828	0.000685	0.001434	0.001570	0.003535	0.037690	0.004215	0.003537
74.CLERICAL	0.001658	0.003221	0.000251	0.000526	0.000576	0.001385	0.005380	0.000268	0.000247
75.SALES	0.000857	0.000489	0.000082	0.000167	0.000183	0.000083	0.001089	0.000033	0.000082
76.FARM	0.000000	0.000000	0.030141	0.063078	0.069067	0.000000	0.007756	0.000000	0.000000

TABLE 8 - Continued

ENVIRONMENTAL FACTORS PER THOUSAND DOLLARS OF OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANTS OR RESOURCE	CONSTRUC-TION	FOOD & KINDRED	APPAREL	LUMBER & WOOD	PAPER & ALLIED	PRINTING	CHEMICALS	PETROL REF	STN, CLY & GLS
1.TSS	-0.000030	-0.000145	-0.000049	-0.001494	-0.031568	-0.000048	-0.004129	-0.001160	-0.040383
2.TDS	0.000000	-0.000029	0.000000	-0.015910	-0.314874	0.000000	-0.842153	-0.025727	-0.071086
3.BOD-5	-0.000030	-0.000125	-0.000049	-0.001517	-0.017409	-0.000048	-0.002775	-0.001166	-0.000071
4.AMMONIA	-0.000000	-0.000005	0.000000	-0.000004	-0.000106	0.000000	-0.000252	-0.000048	-0.000015
5.NITRATE	-0.000000	-0.000000	0.000000	-0.000000	-0.000021	0.000000	-0.000003	-0.000000	0.000000
6.NITRITE	0.000000	0.000000	0.000000	-0.000000	-0.000003	0.000000	-0.000188	-0.000041	0.000000
7.ORGANIC N	0.000000	0.000000	0.000000	-0.000001	-0.002400	0.000000	-0.000514	-0.000102	-0.000088
8.TKN	0.000000	-0.000005	0.000000	-0.000023	-0.002599	0.000000	-0.000514	-0.000102	-0.000088
9.N (VIA STP)	-0.000030	-0.000063	-0.000049	-0.000045	-0.000031	-0.000048	-0.000017	-0.000016	-0.000024
10.TOT NITROGEN	-0.000030	-0.000068	-0.000049	-0.000068	-0.002630	-0.000048	-0.000531	-0.000118	-0.000112
11.TOTAL PHOS	-0.000010	-0.000021	-0.000016	-0.000024	-0.000251	-0.000016	-0.000144	-0.000353	-0.000068
12.ORGANIC C	0.000000	0.000000	0.000000	-0.001144	-0.000030	0.000000	-0.001493	0.000000	0.000000
13.SULFATE	0.000000	0.000000	0.000000	-0.000437	-0.000028	0.000000	-0.016440	-0.000115	0.000000
14.SULFIDE	0.000000	0.000000	0.000000	-0.000000	-0.000001	0.000000	-0.000000	-0.000012	0.000000
15.SULFITE	0.000000	0.000000	0.000000	0.000000	-0.000001	0.000000	-0.000002	0.000000	0.000000
16.CHLORIDE	0.000000	-0.000002	0.000000	-0.007338	-0.000009	0.000000	-0.092578	-0.000323	-0.152236
17.OIL & GREASE	0.000000	-0.000063	0.000000	-0.000022	-0.000009	0.000000	-0.000218	-0.000194	0.000000
18.PHENOLS	0.000000	0.000000	0.000000	-0.000001	-0.000154	0.000000	-0.000001	-0.000002	0.000000
19.ALUMINUM	0.000000	0.000000	0.000000	-0.000001	0.000000	0.000000	-0.000439	0.000000	0.000000
20.CADMIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.000000	0.000000
21.CALCIUM	0.000000	0.000000	0.000000	-0.000004	0.000000	0.000000	-0.000000	0.000000	-0.005626
22.CHROMIUM	0.000000	0.000000	0.000000	-0.000054	-0.000108	0.000000	-0.000018	-0.000059	-0.000002
23.COPPER	0.000000	0.000000	0.000000	-0.000185	-0.000000	0.000000	-0.000000	-0.000000	0.000000
24.CYANIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000001	0.000000	0.000000
25.FLOURIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000003	0.000000	-0.000103
26.IRON	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	-0.000012	-0.000002	0.000000
27.LEAD	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.000000
28.MAGNESIUM	0.000000	0.000000	0.000000	-0.000000	0.000000	0.000000	-0.000020	0.000000	-0.008272
29.MANGANESE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
30.MERCURY	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.000000	0.000000
31.NICKEL	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000002	0.000000	0.000000
32.POTASSIUM	0.000000	0.000000	0.000000	-0.000007	0.000000	0.000000	-0.001967	0.000000	0.000000
33.SODIUM	0.000000	0.000000	0.000000	-0.000013	-0.000001	0.000000	-0.011241	0.000000	-0.003662
34.ZINC	0.000000	0.000000	0.000000	-0.000000	-0.000054	0.000000	-0.000071	-0.000004	0.000000
35.PARTICULATES	-0.000380	-0.013523	-0.000019	-0.000552	-0.004057	-0.000338	-0.004614	-0.001501	-0.018490
36.SULFUR OXIDE	-0.000249	-0.008517	-0.000450	-0.002646	-0.023411	-0.002164	-0.021839	-0.008522	-0.087859
37.NITROGEN OX	-0.004020	-0.003843	-0.000063	-0.003116	-0.010191	-0.001455	-0.009710	-0.005927	-0.031532
38.CARBON MONOX	-0.047691	-0.000478	-0.000007	-0.000402	-0.001043	-0.000116	-0.000900	-0.000539	-0.002344
39.HYDROCARBONS	-0.002042	-0.000241	-0.000004	-0.000189	-0.000351	-0.000076	-0.000353	-0.000153	-0.000912
40.ALDEHYDES	-0.000142	-0.000026	-0.000001	-0.000035	-0.000076	-0.000043	-0.000034	0.000000	-0.000169
41.SOLID WASTE	-0.013910	-0.305116	-0.012045	-1.859269	-0.042371	-0.022732	-0.046253	-0.162009	-0.046066
42.PAPER	0.000000	-0.159574	-0.006735	-0.310493	-0.023855	-0.019299	-0.025439	-0.116808	-0.015550
43.WOOD	0.000000	-0.023495	0.000000	-1.331241	-0.004788	-0.001250	-0.002081	-0.011916	-0.001981
44.LEATHER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
45.RUBBER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
46.PLASTIC	0.000000	-0.002745	0.000000	0.000000	0.000000	0.000000	-0.004302	-0.024788	0.000000
47.METAL	0.000000	-0.025019	0.000000	0.000000	-0.003983	0.000000	-0.003330	-0.007129	-0.003725
48.GLASS	0.000000	-0.014950	0.000000	0.000000	0.000000	0.000000	-0.001018	0.000000	-0.005888
49.TEXTILE	0.000000	0.000000	-0.004397	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
50.FOOD	0.000000	-0.350954	-0.000162	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
51.MISC.	0.000000	-0.028069	0.000000	-0.145017	-0.005932	0.000000	-0.009112	-0.001620	-0.018403
52.PROCESS WATR	0.000290	0.002694	0.000473	0.004553	0.074621	0.000464	0.021516	0.004439	0.000230
53.COOLING WATR	0.000000	0.000000	0.000000	0.004347	0.091612	0.000000	0.002331	0.013499	0.007936
54.TOTAL WATER	0.000290	0.002694	0.000473	0.008900	0.166233	0.000464	0.023849	0.017938	0.008166
55.ELECTRICITY	0.028243	1.332698	0.115987	1.036754	1.824415	0.503053	5.022302	1.093135	3.454246
56.NATURAL GAS	0.000000	0.012838	0.000331	0.007548	0.020749	0.002734	0.046010	0.050953	0.082060
57.LP GAS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
58.DISTILLATE	0.267056	0.491873	0.019270	0.797763	0.790501	1.017726	0.571685	0.489279	1.550286
59.RESIDUAL	0.000000	0.220699	0.003000	0.091861	2.046595	0.005707	0.400791	0.665685	1.799910
60.MOTOR GAS	0.685498	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
61.AVIATION GAS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
62.JET FUEL	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
63.COAL	0.000000	0.290039	0.002028	0.022855	0.596785	0.000548	0.713816	0.015216	2.487477
64.COKE&BREEZE	0.000000	0.000000	0.000000	0.000000	0.000052	0.000000	0.002244	0.000000	0.000000
65.LAND	0.000864	0.005223	0.000937	0.004745	0.001048	0.007009	0.001831	0.007084	0.008241
66.FLOOR SPACE	0.000135	0.000698	0.000239	0.000430	0.000209	0.000378	0.000457	0.000292	0.000345
67.PARKING	0.000067	0.000860	0.000571	0.000365	0.000097	0.000288	0.000080	0.000327	0.000294
68.BUILDING	0.000049	0.000745	0.000198	0.000339	0.000209	0.000334	0.000217	0.000246	0.000252
69.MANAGERIAL	0.002226	0.003742	0.000505	0.001643	0.000614	0.003572	0.000679	0.000700	0.001265
70.PROFESSIONAL	0.001012	0.000496	0.000194	0.000357	0.000656	0.005428	0.000771	0.001610	0.000249
71.TECHNICAL	0.000461	0.000019	0.000024	0.000107	0.000168	0.000093	0.000727	0.000697	0.000115
72.SERVICE	0.000239	0.001875	0.000583	0.000750	0.000461	0.001438	0.000198	0.000268	0.000173
73.PRODUCTION	0.018034	0.037717	0.035334	0.030750	0.017634	0.023402	0.008149	0.005506	0.015423
74.CLERICAL	0.001561	0.004502	0.002098	0.001786	0.001539	0.009449	0.000923	0.001947	0.001361
75.SALES	0.000121	0.001794	0.000117	0.000321	0.000113	0.002809	0.000118	0.000219	0.000383
76.FARM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE 8 - Continued

ENVIRONMENTAL FACTORS PER THOUSAND DOLLARS OF OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANTS OR RESOURCE	FAB METALS	TRANSP EQP	OTHER MFG	WATER TRANSP	OTHER TRANSP	COMM & UTIL	TRADE	FIN, INS, & RE	HOTELS
1.TSS	-0.000152	-0.000073	-0.000336	-0.000029	-0.000055	-0.000033	-0.000172	-0.000015	-0.000147
2.TDS	0.000000	-0.000585	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
3.BOD-5	-0.000080	-0.000045	-0.000018	-0.000029	-0.000051	-0.000037	-0.000090	-0.000015	-0.000140
4.AMMONIA	0.000000	-0.000002	-0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	-0.000007
5.NITRATE	0.000000	-0.000001	0.000000	0.000000	0.000000	-0.000002	-0.000003	0.000000	-0.000038
6.NITRITE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
7.ORGANIC N	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
8.TKN	0.000000	-0.000002	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
9.N (VIA STP)	-0.000061	-0.000040	-0.000018	-0.000029	-0.000041	-0.000030	-0.000079	-0.000015	-0.000088
10.TOT NITROGEN	-0.000061	-0.000042	-0.000018	-0.000029	-0.000041	-0.000030	-0.000079	-0.000015	-0.000088
11.TOTAL PHOS	-0.000020	-0.000014	-0.000010	-0.000010	-0.000014	-0.000014	-0.000030	-0.000005	-0.000112
12.ORGANIC C	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
13.SULFATE	0.000000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
14.SULFIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
15.SULFITE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
16.CHLORIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
17.OIL & GREASE	0.000000	0.000000	-0.000062	0.000000	-0.000006	0.000000	-0.000002	0.000000	0.000000
18.PHENOLS	0.000000	0.000000	-0.000006	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000
19.ALUMINUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
20.CADMIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
21.CALCIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
22.CHROMIUM	-0.000002	-0.000038	-0.000006	0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000
23.COPPER	-0.000000	0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000
24.CYANIDE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25.FLUORIDE	-0.000000	0.000000	0.000000	0.000000	-0.000001	0.000000	-0.000000	0.000000	0.000000
26.IRON	-0.000001	0.000000	-0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
27.LEAD	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
28.MAGNESIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
29.MANGANESE	0.000000	0.000000	-0.000063	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
30.MERCURY	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
31.NICKEL	-0.000003	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
32.POTASSIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
33.SODIUM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
34.ZINC	-0.000000	-0.000007	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
35.PARTICULATES	-0.000540	-0.000239	-0.000975	-0.002892	-0.000480	-0.016302	-0.000175	-0.000025	-0.000040
36.SULFUR OXIDE	-0.002821	-0.001651	-0.003465	-0.026559	-0.003035	-0.317933	-0.001337	-0.000106	-0.000281
37.NITROGEN OX	-0.002609	-0.000692	-0.001175	-0.009864	-0.003717	-38.622045	-0.000568	-0.000064	-0.000160
38.CARBON MONOX	-0.000334	-0.000065	-0.000154	-0.022040	-0.019653	-0.943003	-0.000951	-0.000007	-0.000015
39.HYDROCARBONS	-0.000157	-0.000038	-0.000076	-0.001655	-0.001899	-0.057646	-0.000031	-0.000022	-0.000010
40.ALDEHYDES	-0.000026	-0.000010	-0.000003	0.000000	-0.000019	-0.000065	-0.000007	-0.000001	-0.000004
41.SOLID WASTE	-0.100455	-0.041502	-0.053915	-0.048116	-0.066643	-0.019489	-0.081344	-0.021774	-0.078749
42.PAPER	-0.044800	-0.021125	-0.022303	-0.029061	-0.040245	-0.011771	-0.049131	-0.013153	-0.047564
43.WOOD	-0.010345	-0.003900	-0.006553	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
44.LEATHER	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
45.RUBBER	0.000000	-0.000582	-0.000052	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
46.PLASTIC	0.000000	-0.000872	-0.002535	-0.004526	-0.006265	-0.001829	-0.007645	-0.002046	-0.007403
47.METAL	-0.023309	0.000000	-0.005003	-0.005100	-0.007065	-0.002069	-0.008622	-0.002309	-0.008339
48.GLASS	0.000000	0.000000	-0.000770	-0.005437	-0.007526	-0.002204	-0.009191	-0.002460	-0.008892
49.TEXTILE	0.000000	0.000000	-0.000057	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
50.FOOD	0.000000	0.000000	-0.000010	-0.003419	-0.004732	-0.001383	-0.005775	-0.001546	-0.005595
51.MISC.	-0.012255	-0.008093	-0.011174	-0.000574	-0.000800	-0.000233	-0.000977	-0.000260	-0.000936
52.PROCESS WATR	0.002341	0.000471	0.001587	0.000286	0.000550	0.000330	0.000822	0.000146	0.001621
53.COOLING WATR	0.000000	0.002787	0.000003	0.000000	0.000000	2.266107	0.000000	0.000000	0.000000
54.TOTAL WATER	0.002341	0.003258	0.001589	0.000286	0.000550	2.266437	0.000822	0.000146	0.001621
55.ELECTRICITY	2.376530	0.664445	8.066115	0.000000	0.000000	0.241555	1.161344	0.181149	0.858043
56.NATURAL GAS	0.023746	0.001886	0.002323	0.000000	0.005329	110.008326	0.002257	0.000509	0.002413
57.LP GAS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
58.DISTILLATE	0.541106	0.117190	0.052600	1.245873	2.332311	18.900912	0.011194	0.000757	0.002956
59.RESIDUAL	0.193520	0.245468	0.046904	4.705967	0.749214	0.862153	0.331939	0.002340	0.011065
60.MOTOR GAS	0.000000	0.000000	0.000000	0.825826	18.833374	0.000000	0.000000	0.000000	0.000000
61.AVIATION GAS	0.000000	0.000000	0.000000	0.000000	0.772545	0.000000	0.000000	0.000000	0.000000
62.JET FUEL	0.000000	0.000000	0.000000	0.000000	1.918286	0.000000	0.000000	0.000000	0.000000
63.COAL	0.034568	0.016338	0.121421	0.000000	0.000000	17.766530	0.000000	0.000000	0.000000
64.COKE&BREEZE	0.000000	0.000000	0.002212	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
65.LAND	0.010276	0.001958	0.003358	0.001259	0.006339	0.002879	0.002885	0.000397	0.001335
66.FLOOR SPACE	0.001025	0.000149	0.000193	0.000087	0.000389	0.000096	0.000773	0.000078	0.000835
67.PARKING	0.000815	0.000123	0.000125	0.000074	0.000224	0.000048	0.000935	0.000112	0.000817
68.BUILDING	0.001669	0.000325	0.000250	0.000087	0.000371	0.000070	0.000869	0.000070	0.000930
69.MANAGERIAL	0.002600	0.000990	0.000658	0.003853	0.001950	0.001510	0.007256	0.002842	0.005977
70.PROFESSIONAL	0.001418	0.000799	0.000382	0.000513	0.000675	0.002381	0.001374	0.000767	0.001791
71.TECHNICAL	0.001462	0.000352	0.000318	0.000000	0.000192	0.000638	0.000118	0.000050	0.000588
72.SERVICE	0.001009	0.000638	0.000261	0.000686	0.000671	0.000441	0.010659	0.000956	0.002594
73.PRODUCTION	0.046904	0.026462	0.011114	0.016017	0.023688	0.007738	0.017727	0.000934	0.021544
74.CLERICAL	0.004727	0.002362	0.001127	0.002400	0.005259	0.007192	0.012758	0.006892	0.009449
75.SALES	0.000945	0.000319	0.000161	0.000172	0.000303	0.000463	0.013193	0.001957	0.001155
76.FARM	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE 3 - Continued

ENVIRONMENTAL FACTORS PER THOUSAND DOLLARS OF OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANTS OR RESOURCE	MED, ED SERV	OTHER SERV	ST & LOC GOVT
1.TSS	-0.000155	-0.000040	-0.000059
2.TDS	0.000000	0.000000	0.000000
3.BOD-5	-0.000199	-0.000040	-0.000059
4.AMMONIA	-0.000002	-0.000000	-0.000000
5.NITRATE	-0.000080	-0.000000	-0.000000
6.NITRITE	0.000000	0.000000	0.000000
7.ORGANIC N	0.000000	0.000000	0.000000
8.TKN	-0.000034	-0.000000	0.000000
9.N (VIA STP)	-0.000070	-0.000039	-0.000059
10.TOT NITROGEN	-0.000103	-0.000040	-0.000059
11.TOTAL PHOS	-0.000068	-0.000013	-0.000020
12.ORGANIC C	0.000000	0.000000	0.000000
13.SULFATE	0.000000	0.000000	0.000000
14.SULFIDE	0.000000	0.000000	0.000000
15.SULFITE	0.000000	0.000000	0.000000
16.CHLORIDE	0.000000	0.000000	0.000000
17.OIL & GREASE	0.000000	0.000000	0.000000
18.PHENOLS	0.000000	0.000000	0.000000
19.ALUMINUM	0.000000	0.000000	0.000000
20.CADMIUM	0.000000	0.000000	0.000000
21.CALCIUM	0.000000	0.000000	0.000000
22.CHROMIUM	0.000000	0.000000	0.000000
23.COPPER	0.000000	0.000000	0.000000
24.CYANIDE	0.000000	0.000000	0.000000
25.FLOURIDE	0.000000	0.000000	0.000000
26.IRON	0.000000	0.000000	0.000000
27.LEAD	0.000000	0.000000	0.000000
28.MAGNESIUM	0.000000	0.000000	0.000000
29.MANGANESE	0.000000	0.000000	0.000000
30.MERCURY	0.000000	0.000000	0.000000
31.NICKEL	0.000000	0.000000	0.000000
32.POTASSIUM	0.000000	0.000000	0.000000
33.SODIUM	0.000000	0.000000	0.000000
34.ZINC	0.000000	0.000000	0.000000
35.PARTICULATES	-0.004758	-0.000030	-0.001122
36.SULFUR OXIDE	-0.034831	-0.000208	-0.009002
37.NITROGEN OX	-0.015203	-0.000123	-0.003081
38.CARBON MONOX	-0.001189	-0.000013	-0.000208
39.HYDROCARBONS	-0.000802	-0.000007	-0.000155
40.ALDEHYDES	-0.000364	-0.000001	-0.000058
41.SOLID WASTE	-0.210284	-0.029570	-0.061599
42.PAPER	-0.127011	-0.017858	-0.037206
43.WOOD	0.000000	0.000000	0.000000
44.LEATHER	0.000000	0.000000	0.000000
45.RUBBER	0.000000	0.000000	0.000000
46.PLASTIC	-0.019764	-0.002780	-0.005789
47.METAL	-0.022287	-0.003137	-0.006530
48.GLASS	-0.023765	-0.003340	-0.006960
49.TEXTILE	0.000000	0.000000	0.000000
50.FOOD	-0.014927	-0.002098	-0.004374
51.MISC.	-0.002523	-0.000358	-0.000741
52.PROCESS WATR	0.001598	0.000388	0.000578
53.COOLING WATR	0.000000	0.000000	0.000000
54.TOTAL WATER	0.001598	0.000388	0.000578
55.ELECTRICITY	381.676710	0.349133	13.660131
56.NATURAL GAS	0.010440	0.000854	0.109248
57.LP GAS	0.000000	0.000000	0.034752
58.DISTILLATE	6.071371	0.001203	0.171482
59.RESIDUAL	5.441538	0.004510	1.047120
60.MOTOR GAS	0.000000	0.000000	0.000000
61.AVIATION GAS	0.000000	0.000000	0.000000
62.JET FUEL	0.000000	0.000000	0.000000
63.COAL	0.023520	0.000000	0.000000
64.COKE&BREEZE	0.000000	0.000000	0.000000
65.LAND	0.001789	0.019762	0.001070
66.FLOOR SPACE	0.000669	0.000494	0.000438
67.PARKING	0.000257	0.000441	0.000444
68.BUILDING	0.000823	0.000483	0.000438
69.MANAGERIAL	0.003491	0.003336	0.005254
70.PROFESSIONAL	0.023661	0.005483	0.006954
71.TECHNICAL	0.005319	0.002050	0.001300
72.SERVICE	0.020806	0.008651	0.013698
73.PRODUCTION	0.002611	0.004126	0.020337
74.CLERICAL	0.011310	0.009127	0.009587
75.SALES	0.000104	0.001176	0.000241
76.FARM	0.000000	0.000000	0.000000

Since one assumption of input-output analysis is that factors of production are linearly related, Table 8 allows us to describe the economic-environmental relationships within a broader range than just the year 1972. This time range is generally accepted to be between five and ten years depending on the rate of change in technology and the diversification of the product mix in the economy. Thus, given the dollar amount of output in any one year, it is possible to convert this to the number of units per year of any given environmental factor. For example, 3.768 tons of carbon monoxide are produced for every thousand dollars of output by the Forestry Products sector. If this sector produced 5% more output in 1980 than in 1972, then it would have produced [(.05)(4,837) + (4,837)](3.768) = 19,137.107 tons of carbon monoxide in 1980.

Environmental Interdependence

Table 9 represents the total effect on each environmental factor of a change in sales to final demand by each sector. This is in contrast to Table 8 which represents only the direct change from an increase in output. Thus, from Table 9, for every thousand dollars of output sold by Fishery Products outside of the economy (i.e. to Federal Government or Exports), 0.019342 million gallons of process water are consumed in the region. Notice that this is much more than the 0.000860 gallons per thousand dollars consumed directly by the Fishery Products sector. The difference is accounted for by the sectors that are related directly or indirectly to Fishery Products for their own inputs and outputs.

The requirement that Table 9 be applied to changes in "sales to final demand" rather than simply a change in output is related to the

TABLE 9

TOTAL EFFECT PER THOUSAND DOLLAR CHANGE IN OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	FISHERY PROD	PKGD FISH	LIVESTOCK	CROPS	GREEN-HOUSE	FORESTRY	AG SERVICES	PETROLEUM	SAND & GRAVEL
1.TSS	-2.939143	-4.652872	-55.697338	-135.881730	-3.826839	-30.156346	-31.049581	-1.440435	-1.475392
2.TDS	-0.087260	-0.108170	-0.127053	-0.187887	-0.096714	-0.094827	-0.113700	-0.054189	-0.079159
3.BOD-5	-0.002462	-0.010558	-0.002527	-0.002618	-0.002203	-0.002388	-0.002977	-0.001354	-0.001794
4.AMMONIA	-0.000033	-0.000040	-0.000043	-0.000061	-0.000032	-0.000032	-0.000038	-0.000018	-0.000027
5.NITRATE	-0.000071	-0.000054	-0.000049	-0.000059	-0.000039	-0.000044	-0.000038	-0.000022	-0.000036
6.NITRITE	-0.000000	-0.000001	-0.000000	-0.000001	-0.000000	-0.000000	-0.000001	-0.000000	-0.000000
7.ORGANIC N	-0.000098	-0.000253	-0.000119	-0.000129	-0.000093	-0.000100	-0.000208	-0.000054	-0.000095
8.TKN	-0.000147	-0.000321	-0.000182	-0.000214	-0.000141	-0.000148	-0.000266	-0.000081	-0.000137
9.N (VIA STP)	-0.001429	-0.001606	-0.001322	-0.001239	-0.001267	-0.001390	-0.001198	-0.000811	-0.000894
10.TOT NITROGEN	-0.001577	-0.001928	-0.001503	-0.001453	-0.001408	-0.001538	-0.001464	-0.000892	-0.001031
11.TOTAL PHOS	-0.000557	-0.000615	-0.000505	-0.000492	-0.000473	-0.000519	-0.000461	-0.000300	-0.000345
12.ORGANIC C	-0.000164	-0.000173	-0.000236	-0.000345	-0.000182	-0.000179	-0.000193	-0.000104	-0.000137
13.SULFATE	-0.001450	-0.001486	-0.002223	-0.003434	-0.001685	-0.001624	-0.001728	-0.000932	-0.001277
14.SULFIDE	-0.000002	-0.000001	-0.000001	-0.000001	-0.000001	-0.000001	-0.000001	-0.000000	-0.000001
15.SULFITE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
16.CHLORIDE	-0.011236	-0.011526	-0.015961	-0.022281	-0.012304	-0.012161	-0.012261	-0.007728	-0.014329
17.OIL & GREASE	-0.000056	-0.000062	-0.000059	-0.000068	-0.000038	-0.000041	-0.000040	-0.000022	-0.000033
18.PHENOLS	-0.000006	-0.000016	-0.000007	-0.000006	-0.000005	-0.000006	-0.000013	-0.000003	-0.000006
19.ALUMINUM	-0.000038	-0.000038	-0.000058	-0.000090	-0.000044	-0.000042	-0.000065	-0.000024	-0.000033
20.CADMIUM	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
21.CALCIUM	-0.000113	-0.000113	-0.000128	-0.000113	-0.000104	-0.000111	-0.000093	-0.000091	-0.000264
22.CHROMIUM	-0.000017	-0.000020	-0.000012	-0.000015	-0.000010	-0.000011	-0.000015	-0.000006	-0.000010
23.COPPER	-0.000006	-0.000006	-0.000006	-0.000006	-0.000005	-0.000006	-0.000006	-0.000003	-0.000004
24.CYANIDE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
25.FLOURIDE	-0.000002	-0.000002	-0.000003	-0.000003	-0.000002	-0.000002	-0.000002	-0.000002	-0.000005
26.IRON	-0.000061	-0.000061	-0.000002	-0.000003	-0.000001	-0.000001	-0.000001	-0.000001	-0.000001
27.LEAD	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
28.MAGNESIUM	-0.000168	-0.000168	-0.000190	-0.000170	-0.000155	-0.000165	-0.000139	-0.000135	-0.000390
29.MANGANESE	-0.000007	-0.000006	-0.000005	-0.000004	-0.000005	-0.000005	-0.000004	-0.000003	-0.000004
30.MERCURY	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
31.NICKEL	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
32.POTASSIUM	-0.000168	-0.000174	-0.000260	-0.000403	-0.000197	-0.000190	-0.000202	-0.000109	-0.000149
33.SODIUM	-0.001033	-0.001062	-0.001570	-0.002376	-0.001194	-0.001156	-0.001213	-0.000681	-0.001024
34.ZINC	-0.000010	-0.000012	-0.000012	-0.000017	-0.000009	-0.000009	-0.000012	-0.000005	-0.000007
35.PARTICULATES	-0.009152	-0.011329	-0.013340	-0.013263	-0.006630	-0.479374	-0.009019	-0.005509	-0.007084
36.SULFUR OXIDE	-0.082129	-0.079991	-0.071818	-0.089460	-0.061446	-0.066943	-0.056153	-0.041067	-0.056312
37.NITROGEN OX	-6.590863	-6.253142	-6.367768	-6.147883	-5.729959	-5.936908	-5.013162	-3.828401	-5.183749
38.CARBON MONOX	-0.521811	-0.473195	-0.546948	-0.599578	-0.425731	-4.349904	-0.429524	-0.278277	-0.328137
39.HYDROCARBONS	-0.074856	-0.059347	-0.053586	-0.055935	-0.046262	-0.714919	-0.045646	-0.029846	-0.034251
40.ALDEHYDES	-0.000168	-0.000149	-0.000707	-0.001252	-0.000169	-0.000325	-0.000382	-0.000128	-0.000137
41.SOLID WASTE	-0.493644	-0.565601	-0.524651	-0.459983	-0.438959	-0.486264	-0.431268	-0.280080	-0.312048
42.PAPER	-0.222993	-0.222562	-0.237185	-0.204586	-0.195038	-0.216738	-0.188052	-0.123358	-0.138948
43.WOOD	-0.053278	-0.058407	-0.057480	-0.054352	-0.045965	-0.050667	-0.053504	-0.030836	-0.033319
44.LEATHER	-0.000903	-0.000869	-0.000882	-0.000833	-0.000861	-0.000944	-0.000816	-0.000546	-0.000603
45.RUBBER	-0.003055	-0.002886	-0.002883	-0.002721	-0.002811	-0.003085	-0.002664	-0.001784	-0.001970
46.PLASTIC	-0.017782	-0.016435	-0.017250	-0.016527	-0.016484	-0.016466	-0.013581	-0.009216	-0.010697
47.METAL	-0.037293	-0.037757	-0.040681	-0.034699	-0.036233	-0.038187	-0.032551	-0.021674	-0.024104
48.GLASS	-0.035955	-0.035940	-0.038634	-0.036077	-0.033916	-0.037497	-0.031843	-0.021537	-0.023701
49.TEXTILE	-0.007090	-0.006768	-0.006816	-0.006438	-0.006644	-0.007289	-0.006305	-0.004215	-0.004678
50.FOOD	-0.054705	-0.123710	-0.061311	-0.050331	-0.051175	-0.056363	-0.048922	-0.032338	-0.035534
51.MISC.	-0.051494	-0.051717	-0.053508	-0.047504	-0.046690	-0.051368	-0.045969	-0.029762	-0.033565
52.PROCESS WATR	0.019342	0.023493	0.019691	0.020017	0.017431	0.018900	0.020399	0.010831	0.013361
53.COOLING WATR	0.380848	0.371369	0.376233	0.362746	0.338483	0.344270	0.300676	0.225480	0.307325
54.TOTAL WATER	0.400190	0.394862	0.395924	0.382764	0.355914	0.363170	0.321074	0.236711	0.320686
55.ELECTRICITY	56.396687	53.938956	59.981650	53.833582	53.571668	58.357810	49.761164	33.765328	36.796063
56.NATURAL GAS	18.265376	17.565827	18.682680	17.414208	16.290833	16.554643	14.237339	10.891955	14.750284
57.LP GAS	0.132887	0.134298	0.365810	0.541708	12.247928	0.983032	0.277977	0.078423	0.084808
58.DISTILLATE	27.843345	15.466572	6.164860	7.473858	4.269258	5.713040	4.482384	2.949418	3.756016
59.RESIDUAL	1.690202	1.932718	1.812285	1.649408	1.521357	2.021144	1.482610	0.940839	1.153615
60.MOTOR GAS	9.737201	9.162239	9.357492	9.665323	7.146567	9.322644	7.349072	4.535545	5.054002
61.AVIATION GAS	0.045297	0.042678	0.075071	0.058924	0.046818	0.097144	0.048118	0.028183	0.034491
62.JET FUEL	0.112475	0.205295	0.186408	0.146312	0.116251	0.241215	0.119481	0.069981	0.085644
63.COAL	3.111362	3.238919	3.154655	3.045904	2.782972	2.831349	2.480599	1.871650	2.596059
64.COKE&BREEZE	0.000442	0.000403	0.000460	0.000617	0.000387	0.000401	0.000385	0.000231	0.000304
65.LAND	1.090860	1.364510	11.883173	15.969515	1.422963	263.347609	4.370010	0.582537	0.633218
66.FLOOR SPACE	0.001544	0.001890	0.002484	0.001793	0.001667	0.001396	0.005718	0.000595	0.000696
67.PARKING	0.001083	0.001253	0.002031	0.002586	0.023951	0.002921	0.005707	0.000588	0.000780
68.BUILDING	0.001684	0.002045	0.003054	0.002442	0.024101	0.003313	0.010897	0.000635	0.000720
69.MANAGERIAL	0.017431	0.014715	0.010383	0.009408	0.008442	0.009906	0.011636	0.005663	0.006303
70.PROFESSIONAL	0.012130	0.010786	0.009592	0.009153	0.008212	0.015099	0.016759	0.005075	0.005516
71.TECHNICAL	0.002474	0.002571	0.002266	0.002235	0.001972	0.002674	0.003236	0.001237	0.001356
72.SERVICE	0.016665	0.016916	0.017053	0.015410	0.014780	0.019574	0.013839	0.008753	0.009596
73.PRODUCTION	0.109249	0.096367	0.096117	0.089086	0.084429	0.093254	0.069198	0.049533	0.026728
74.CLERICAL	0.020291	0.022250	0.020612	0.019279	0.017369	0.019739	0.020731	0.011453	0.012086
75.SALES	0.008219	0.008296	0.008075	0.007431	0.006942	0.007107	0.007257	0.004368	0.004757
76.FARM	0.002133	0.003312	0.061280	0.070261	0.077764	0.017708	0.025449	0.001053	0.001084

TABLE 9 - Continued

TOTAL EFFECT PER THOUSAND DOLLAR CHANGE IN OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	CONSTRUC-TION	FOOD & KINDRED	APPAREL	LUMBER & WOOD	PAPER & ALLIED	PRINTING	CHEMICALS	PETROL REF	STN, CLY & GLS
1.TSS	-1.734465	-37.361299	-2.119683	-3.958078	-1.799157	-1.504243	-2.540880	-1.525791	-1.869820
2.TDS	-0.075124	-0.130648	-0.132627	-0.093914	-0.519192	-0.153513	-1.185701	-0.110266	-0.180018
3.BOD-5	-0.001883	-0.002950	-0.002696	-0.003635	-0.024353	-0.005562	-0.006106	-0.002886	-0.002750
4.AMMONIA	-0.000025	-0.000049	-0.000043	-0.000029	-0.000173	-0.000051	-0.000360	-0.000078	-0.000051
5.NITRATE	-0.000034	-0.000046	-0.000038	-0.000028	-0.000058	-0.000032	-0.000135	-0.000426	-0.000036
6.NITRITE	-0.000000	-0.000001	-0.000001	-0.000000	-0.000004	-0.000001	-0.000004	-0.000000	-0.000000
7.ORGANIC N	-0.000062	-0.000165	-0.000151	-0.000087	-0.003201	-0.000613	-0.000422	-0.000128	-0.000186
8.TKN	-0.000124	-0.000236	-0.000213	-0.000153	-0.003511	-0.000697	-0.000895	-0.000233	-0.000331
9.N (VIA STP)	-0.000980	-0.001357	-0.001303	-0.000856	-0.000779	-0.000895	-0.000986	-0.000852	-0.001119
10.TOT NITROGEN	-0.001104	-0.001593	-0.001516	-0.001009	-0.004290	-0.001592	-0.001881	-0.001084	-0.001450
11.TOTAL PHOS	-0.000371	-0.000519	-0.000493	-0.000335	-0.000617	-0.000390	-0.000574	-0.000491	-0.000430
12.ORGANIC C	-0.000211	-0.000232	-0.000236	-0.001660	-0.000358	-0.000180	-0.002091	-0.000152	-0.000181
13.SULFATE	-0.001225	-0.002155	-0.002268	-0.001800	-0.002042	-0.001473	-0.022960	-0.001556	-0.001598
14.SULFIDE	-0.000001	-0.000001	-0.000000	-0.000001	-0.000002	-0.000001	-0.000001	-0.000013	-0.000001
15.SULFITE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000002	-0.000000	-0.000002	-0.000000	-0.000000
16.CHLORIDE	-0.015972	-0.017667	-0.015274	-0.019398	-0.013676	-0.010127	-0.130975	-0.010911	-0.174215
17.OIL & GREASE	-0.000033	-0.000123	-0.000051	-0.000058	-0.000052	-0.000032	-0.000324	-0.000236	-0.000037
18.PHENOLS	-0.000005	-0.000010	-0.000009	-0.000006	-0.000204	-0.000039	-0.000012	-0.000007	-0.000011
19.ALUMINUM	-0.000031	-0.000056	-0.000059	-0.000032	-0.000052	-0.000038	-0.000606	-0.000038	-0.000042
20.CADMIUM	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
21.CALCIUM	-0.000323	-0.000205	-0.000094	-0.000108	-0.000072	-0.000067	-0.000116	-0.000093	-0.000105
22.CHROMIUM	-0.000013	-0.000014	-0.000013	-0.000080	-0.000154	-0.000032	-0.000039	-0.000071	-0.000016
23.COPPER	-0.000017	-0.000006	-0.000005	-0.000250	-0.000022	-0.000007	-0.000005	-0.000004	-0.000006
24.CYANIDE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000001	-0.000000	-0.000000
25.FLOURIDE	-0.000006	-0.000004	-0.000002	-0.000002	-0.000002	-0.000002	-0.000006	-0.000002	-0.000112
26.IRON	-0.000001	-0.000002	-0.000002	-0.000001	-0.000002	-0.000001	-0.000016	-0.000003	-0.000001
27.LEAD	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
28.MAGNESIUM	-0.000476	-0.000303	-0.000140	-0.000151	-0.000108	-0.000100	-0.000198	-0.000138	-0.000977
29.MANGANESE	-0.000004	-0.000005	-0.000011	-0.000003	-0.000003	-0.000003	-0.000004	-0.000003	-0.000004
30.MERCURY	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
31.NICKEL	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000002	-0.000000	-0.000000
32.POTASSIUM	-0.000140	-0.000252	-0.000266	-0.000151	-0.000231	-0.000171	-0.002712	-0.000168	-0.000187
33.SODIUM	-0.001006	-0.001573	-0.001581	-0.000896	-0.001386	-0.001022	-0.015571	-0.001020	-0.001018
34.ZINC	-0.000007	-0.000013	-0.000013	-0.000007	-0.000060	-0.000020	-0.000101	-0.000014	-0.000011
35.PARTICULATES	-0.009579	-0.026578	-0.008256	-0.050491	-0.014404	-0.007635	-0.013795	-0.007738	-0.027994
36.SULFUR OXIDE	-0.049920	-0.081140	-0.062543	-0.047270	-0.077879	-0.055471	-0.088398	-0.058517	-0.159178
37.NITROGEN OX	-4.273346	-4.447245	-5.758174	-4.017806	-4.519060	-4.651003	-5.749381	-4.685612	-4.375648
38.CARBON MONOX	-0.361010	-0.495527	-0.417269	-0.642128	-0.303445	-0.304515	-0.359805	-0.304174	-0.404022
39.HYDROCARBONS	-0.039574	-0.050807	-0.045370	-0.092213	-0.033644	-0.032544	-0.038008	-0.031970	-0.043198
40.ALDEHYDES	-0.000259	-0.000497	-0.000144	-0.000160	-0.000199	-0.000164	-0.000172	-0.000119	-0.000249
41.SOLID WASTE	-0.481352	-0.831059	-0.449399	-2.769827	-0.512123	-0.358327	-0.420932	-0.469029	-0.444974
42.PAPER	-0.172119	-0.396099	-0.199643	-0.591511	-0.182657	-0.161487	-0.193762	-0.255391	-0.188121
43.WOOD	-0.129140	-0.083828	-0.047976	-1.810863	-0.170589	-0.056271	-0.046043	-0.044956	-0.053748
44.LEATHER	-0.000640	-0.000865	-0.000844	-0.000538	-0.000494	-0.000566	-0.000649	-0.000562	-0.000743
45.RUBBER	-0.002092	-0.002827	-0.002769	-0.001759	-0.001615	-0.001851	-0.002123	-0.001836	-0.002428
46.PLASTIC	-0.011604	-0.018972	-0.014164	-0.009783	-0.009468	-0.009899	-0.018190	-0.036379	-0.082658
47.METAL	-0.026465	-0.065580	-0.033660	-0.022078	-0.025976	-0.023724	-0.031631	-0.030507	-0.033565
48.GLASS	-0.025823	-0.052744	-0.032788	-0.021707	-0.020258	-0.022518	-0.027604	-0.022665	-0.035357
49.TEXTILE	-0.004944	-0.006692	-0.012001	-0.004162	-0.003824	-0.004379	-0.005018	-0.004337	-0.005742
50.FOOD	-0.038124	-0.112760	-0.049913	-0.032198	-0.030044	-0.033727	-0.039706	-0.033663	-0.043689
51.MISC.	-0.046154	-0.082501	-0.047539	-0.223694	-0.050506	-0.034890	-0.049046	-0.032925	-0.061582
52.PROCESS WATR	0.014057	0.023569	0.020218	0.018086	0.103410	0.029565	0.044798	0.017236	0.018676
53.COOLING WATR	0.253544	0.382863	0.342262	0.243332	0.386113	0.295305	0.346117	0.291242	0.386476
54.TOTAL WATER	0.267602	0.406411	0.362480	0.261417	0.489523	0.324870	0.390913	0.308477	0.405352
55.ELECTRICITY	39.078886	56.003963	51.641613	34.626840	33.071362	35.939707	46.329225	35.783000	48.125033
56.NATURAL GAS	12.138599	18.319941	16.373284	11.395947	12.944369	13.226017	16.379496	13.366600	14.126013
57.LP GAS	0.110338	0.257843	0.118040	0.305100	0.088546	0.082838	0.095878	0.080898	0.104725
58.DISTILLATE	3.597660	6.135319	4.241516	4.144083	4.320786	4.545433	4.793455	3.876800	4.129191
59.RESIDUAL	1.219179	1.945378	1.452534	1.252333	3.658954	1.474022	1.829082	1.847132	3.322778
60.MOTOR GAS	6.394186	8.392539	7.013491	5.093126	5.011092	4.990962	5.916041	5.415135	7.024885
61.AVIATION GAS	0.052710	0.068703	0.048172	0.033640	0.064582	0.043975	0.057608	0.060189	0.077196
62.JET FUEL	0.130884	0.170595	0.119613	0.133684	0.160363	0.109192	0.142547	0.149453	0.191683
63.COAL	2.185755	3.536815	2.841954	1.599189	2.990252	2.387035	3.730357	2.301283	5.736787
64.COKE&BREEZE	0.000309	0.000459	0.000692	0.000271	0.000441	0.000322	0.000235	0.000301	0.000369
65.LAND	1.452702	5.899941	0.884063	25.217246	2.446674	0.912420	1.029936	0.634723	0.913446
66.FLOOR SPACE	0.000944	0.002262	0.001207	0.001245	0.000944	0.001103	0.001395	0.000964	0.001172
67.PARKING	0.000914	0.002519	0.001468	0.001571	0.000801	0.000981	0.000906	0.000984	0.001109
68.BUILDING	0.000976	0.002716	0.001243	0.001625	0.001011	0.001117	0.001161	0.000961	0.001144
69.MANAGERIAL	0.008901	0.013533	0.006425	0.007791	0.006214	0.009451	0.007644	0.006491	0.008320
70.PROFESSIONAL	0.006846	0.009067	0.002360	0.006045	0.005624	0.011181	0.007280	0.007036	0.006650
71.TECHNICAL	0.001905	0.002097	0.001795	0.001409	0.001411	0.001430	0.002530	0.002062	0.001698
72.SERVICE	0.011179	0.017469	0.013778	0.010155	0.009201	0.011089	0.011441	0.009593	0.011596
73.PRODUCTION	0.046468	0.082352	0.075155	0.063464	0.047784	0.051343	0.038367	0.030890	0.045548
74.CLERICAL	0.014825	0.023770	0.018284	0.013542	0.012837	0.022308	0.015098	0.014108	0.015643
75.SALES	0.005941	0.009576	0.006799	0.004971	0.004504	0.007720	0.005608	0.004802	0.006134
76.FARM	0.001356	0.025946	0.001562	0.003410	0.001277	0.001101	0.001771	0.001112	0.001344

TABLE 9 - Continued

TOTAL EFFECT PER THOUSAND DOLLAR CHANGE IN OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	FAB METALS	TRANSP EQP	OTHER MFG	WATER TRANSP	OTHER TRANSP	COMM & UTIL	TRADE	FIN, INS, & RE	HOTELS
1.TSS	-2.111267	-2.059110	-2.053543	-1.145553	-2.379128	-1.612765	-2.421764	-2.342697	-2.175822
2.TDS	-0.095173	-0.079351	-0.135365	-0.040618	-0.066222	-0.056756	-0.086349	-0.049584	-0.099266
3.BOD-5	-0.002529	-0.002229	-0.002356	-0.001205	-0.001992	-0.001721	-0.002590	-0.001314	-0.002518
4.AMMONIA	-0.000032	-0.000029	-0.000043	-0.000014	-0.000025	-0.000020	-0.000030	-0.000017	-0.000041
5.NITRATE	-0.000036	-0.000035	-0.000036	-0.000023	-0.000052	-0.000032	-0.000042	-0.000022	-0.000079
6.NITRITE	-0.000000	-0.000000	-0.000001	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
7.ORGANIC N	-0.000129	-0.000092	-0.000129	-0.000050	-0.000081	-0.000067	-0.000119	-0.000060	-0.000110
8.TKN	-0.000177	-0.000136	-0.000192	-0.000071	-0.000119	-0.000097	-0.000165	-0.000086	-0.000159
9.N (VIA STP)	-0.001328	-0.001314	-0.001102	-0.000717	-0.001148	-0.001050	-0.001483	-0.000726	-0.001404
10.TOT NITROGEN	-0.001505	-0.001450	-0.001294	-0.000789	-0.001267	-0.001147	-0.001628	-0.000812	-0.001564
11.TOTAL PHOS	-0.000494	-0.000485	-0.000426	-0.000267	-0.000443	-0.000392	-0.000545	-0.000272	-0.000608
12.ORGANIC C	-0.000178	-0.000164	-0.000256	-0.000077	-0.000126	-0.000111	-0.000163	-0.000098	-0.000183
13.SULFATE	-0.001557	-0.001314	-0.002378	-0.000672	-0.001082	-0.000948	-0.001401	-0.000823	-0.001690
14.SULFIDE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000001	-0.000000	-0.000001	-0.000000	-0.000001
15.SULFITE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
16.CHLORIDE	-0.012108	-0.011296	-0.016388	-0.005400	-0.008830	-0.007739	-0.011210	-0.006604	-0.012553
17.OIL & GREASE	-0.000041	-0.000035	-0.000110	-0.000019	-0.000045	-0.000025	-0.000037	-0.000020	-0.000039
18.PHENOLS	-0.000008	-0.000006	-0.000014	-0.000003	-0.000005	-0.000004	-0.000007	-0.000004	-0.000006
19.ALUMINUM	-0.000041	-0.000034	-0.000062	-0.000017	-0.000028	-0.000025	-0.000036	-0.000021	-0.000044
20.CADMIUM	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
21.CALCIUM	-0.000122	-0.000141	-0.000111	-0.000059	-0.000100	-0.000087	-0.000121	-0.000079	-0.000112
22.CHROMIUM	-0.000014	-0.000021	-0.000018	-0.000006	-0.000012	-0.000007	-0.000011	-0.000006	-0.000011
23.COPPER	-0.000006	-0.000008	-0.000007	-0.000003	-0.000005	-0.000004	-0.000006	-0.000004	-0.000005
24.CYANIDE	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
25.FLOURIDE	-0.000003	-0.000003	-0.000003	-0.000001	-0.000003	-0.000002	-0.000003	-0.000002	-0.000002
26.IRON	-0.000002	-0.000001	-0.000003	-0.000001	-0.000001	-0.000001	-0.000001	-0.000001	-0.000001
27.LEAD	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
28.MAGNESIUM	-0.000181	-0.000208	-0.000165	-0.000088	-0.000149	-0.000130	-0.000179	-0.000117	-0.000167
29.MANGANESE	-0.000010	-0.000007	-0.000010	-0.000003	-0.000004	-0.000003	-0.000005	-0.000003	-0.000005
30.MERCURY	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
31.NICKEL	-0.000003	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000	-0.000000
32.POTASSIUM	-0.000182	-0.000153	-0.000279	-0.000078	-0.000125	-0.000110	-0.000163	-0.000096	-0.000198
33.SODIUM	-0.001118	-0.000964	-0.001664	-0.000486	-0.000781	-0.000687	-0.001012	-0.000599	-0.001202
34.ZINC	-0.000010	-0.000016	-0.000013	-0.000004	-0.000007	-0.000005	-0.000009	-0.000005	-0.000009
35.PARTICULATES	-0.008867	-0.008727	-0.008947	-0.007677	-0.008830	-0.026927	-0.009499	-0.005302	-0.008572
36.SULFUR OXIDE	-0.064797	-0.062060	-0.060839	-0.064310	-0.063298	-0.409814	-0.075206	-0.041265	-0.068892
37.NITROGEN OX	-5.825860	-5.597862	-5.314314	-3.242063	-5.816595	-46.659223	-7.017381	-3.856109	-6.555876
38.CARBON MONOX	-0.426076	-0.421310	-0.376469	-0.257002	-0.411097	-1.411844	-0.480651	-0.257119	-0.452749
39.HYDROCARBONS	-0.046580	-0.046316	-0.040810	-0.026920	-0.043426	-0.102473	-0.051381	-0.026970	-0.048603
40.ALDEHYDES	-0.000169	-0.000157	-0.000138	-0.000083	-0.000161	-0.000200	-0.000185	-0.000117	-0.000156
41.SOLID WASTE	-0.548996	-0.514272	-0.458177	-0.294740	-0.466181	-0.373760	-0.569441	-0.289544	-0.531218
42.PAPER	-0.239286	-0.223441	-0.194322	-0.139929	-0.219142	-0.168048	-0.264756	-0.130222	-0.248361
43.WOOD	-0.065583	-0.069995	-0.046545	-0.025520	-0.044014	-0.038928	-0.054331	-0.034154	-0.047278
44.LEATHER	-0.000864	-0.000859	-0.000738	-0.000463	-0.000749	-0.000691	-0.000937	-0.000474	-0.000896
45.RUBBER	-0.002839	-0.003581	-0.002470	-0.001526	-0.002437	-0.002257	-0.003061	-0.001549	-0.002927
46.PLASTIC	-0.014003	-0.015117	-0.015025	-0.013340	-0.020559	-0.013576	-0.023900	-0.011282	-0.022416
47.METAL	-0.037396	-0.033957	-0.034445	-0.024386	-0.037583	-0.029454	-0.046356	-0.022475	-0.043644
48.GLASS	-0.033145	-0.033229	-0.029443	-0.024580	-0.037395	-0.029464	-0.046675	-0.022496	-0.043836
49.TEXTILE	-0.006680	-0.006702	-0.005773	-0.003548	-0.005790	-0.005336	-0.007235	-0.003658	-0.006962
50.FOOD	-0.050526	-0.050440	-0.043443	-0.031457	-0.049624	-0.042330	-0.061869	-0.030571	-0.058404
51.MISC.	-0.061185	-0.059775	-0.054559	-0.025942	-0.041991	-0.037611	-0.052173	-0.027146	-0.049440
52.PROCESS WATR	0.020889	0.017725	0.019038	0.009523	0.015599	0.013738	0.019999	0.010105	0.020114
53.COOLING WATR	0.345574	0.334656	0.315504	0.191097	0.344005	2.845107	0.415167	0.228010	0.387756
54.TOTAL WATER	0.366464	0.352381	0.334542	0.200620	0.359604	2.858845	0.435166	0.238115	0.407870
55.ELECTRICITY	54.547770	52.853777	52.575470	28.698495	45.710253	43.230674	62.156701	34.074881	55.539435
56.NATURAL GAS	16.579735	15.916967	15.110147	9.190022	16.539941	138.010551	19.973267	10.979918	18.044085
57.LP GAS	0.120448	0.122573	0.107972	0.066432	0.108502	0.099734	0.141053	0.082490	0.130211
58.DISTILLATE	4.815998	4.317667	3.961666	3.349298	6.581940	24.864974	5.036953	2.822152	4.455062
59.RESIDUAL	1.638862	1.765003	1.346727	0.188422	2.119223	2.179665	2.104840	1.019445	1.514093
60.MOTOR GAS	7.279132	7.272554	6.396496	5.448334	25.818290	5.770194	7.680443	4.112437	7.263716
61.AVIATION GAS	0.054169	0.054944	0.052647	0.053183	0.844780	0.039453	0.048244	0.030848	0.044015
62.JET FUEL	0.134506	0.136430	0.130728	0.132057	2.097652	0.097965	0.119793	0.076598	0.109291
63.COAL	2.883741	2.750235	2.757771	1.558231	2.793541	22.393681	3.379956	1.863070	3.172642
64.COKE&BREEZE	0.000571	0.000434	0.002789	0.000183	0.000284	0.000250	0.000360	0.000201	0.000417
65.LAND	0.965391	1.107100	1.132772	0.473627	0.844741	0.711246	1.015934	0.750125	0.885808
66.FLOOR SPACE	0.001924	0.001099	0.001015	0.000665	0.001246	0.000832	0.001817	0.000693	0.001785
67.PARKING	0.001715	0.001085	0.000935	0.000594	0.001095	0.000785	0.001995	0.000751	0.001788
68.BUILDING	0.002676	0.001446	0.001153	0.000660	0.001316	0.000874	0.002022	0.000767	0.001987
69.MANAGERIAL	0.010323	0.009171	0.007468	0.006921	0.009535	0.008298	0.010840	0.008090	0.014461
70.PROFESSIONAL	0.008524	0.008369	0.006619	0.004820	0.007577	0.009027	0.010748	0.006370	0.009566
71.TECHNICAL	0.003234	0.002254	0.001886	0.001025	0.001883	0.002246	0.002350	0.001388	0.002400
72.SERVICE	0.013928	0.014243	0.011569	0.008423	0.013125	0.011997	0.027628	0.010937	0.044458
73.PRODUCTION	0.079012	0.067417	0.039568	0.036863	0.054452	0.034800	0.055132	0.023618	0.054051
74.CLERICAL	0.020306	0.018919	0.014892	0.011924	0.020544	0.021294	0.031994	0.018572	0.026840
75.SALES	0.007448	0.006916	0.005930	0.003737	0.006486	0.005542	0.020236	0.005976	0.008033
76.FARM	0.001544	0.001519	0.001494	0.000844	0.001670	0.001202	0.001802	0.001626	0.001631

TABLE 9 - Continued

TOTAL EFFECT PER THOUSAND DOLLAR CHANGE IN OUTPUT
BY ECONOMIC SECTOR, ALABAMA COASTAL REGION, 1972

POLLUTANT OR RESOURCE	MED. ED SERV	OTHER SERV	ST & LOC GOVT	HOUSEHOLDS
1.TSS	-2.753719	-2.405044	-2.254813	-2.596050
2.TDS	-0.099356	-0.079577	-0.111009	-0.080070
3.BOD-5	-0.002682	-0.002429	-0.002e23	-0.002634
4.AMMONIA	-0.000035	-0.000027	-0.000037	-0.000027
5.NITRATE	-0.000121	-0.000036	-0.000044	-0.000040
6.NITRITE	-0.000000	-0.000000	-0.000000	-0.000000
7.ORGANIC N	-0.000103	-0.000119	-0.000127	-0.000091
8.TAN	-0.000187	-0.000161	-0.000184	-0.000133
9.N (VIA STP)	-0.001534	-0.001347	-0.001367	-0.001735
10.TOT NITROGEN	-0.001720	-0.001508	-0.001551	-0.001868
11.TOTAL PHOS	-0.000610	-0.000498	-0.000514	-0.000629
12.ORGANIC C	-0.000187	-0.000145	-0.000222	-0.000155
13.SULFATE	-0.001712	-0.001267	-0.001869	-0.001353
14.SULFIDE	-0.000000	-0.000000	-0.000001	-0.000000
15.SULFITE	-0.000000	-0.000000	-0.000000	-0.000000
16.CHLORIDE	-0.012605	-0.010216	-0.015394	-0.010684
17.OIL & GREASE	-0.000039	-0.000032	-0.000042	-0.000034
18.PHENOLS	-0.000006	-0.000007	-0.000007	-0.000005
19.ALUMINUM	-0.000049	-0.000033	-0.000049	-0.000035
20.CADMIUM	-0.000000	-0.000000	-0.000000	-0.000000
21.CALCIUM	-0.000109	-0.000113	-0.000177	-0.000112
22.CHROMIUM	-0.000010	-0.000010	-0.000013	-0.000009
23.COPPER	-0.000005	-0.000005	-0.000009	-0.000006
24.CYANIDE	-0.000000	-0.000000	-0.000000	-0.000000
25.FLOURIDE	-0.000002	-0.000002	-0.000004	-0.000002
26.IRON	-0.000001	-0.000001	-0.000001	-0.000001
27.LEAD	-0.000000	-0.000000	-0.000000	-0.000000
28.MAGNESIUM	-0.000163	-0.000167	-0.000262	-0.000166
29.MANGANESE	-0.000005	-0.000005	-0.000005	-0.000006
30.MERCURY	-0.000000	-0.000000	-0.000000	-0.000000
31.NICKEL	-0.000000	-0.000000	-0.000000	-0.000000
32.POTASSIUM	-0.000200	-0.000148	-0.000218	-0.000158
33.SODIUM	-0.001215	-0.000918	-0.001399	-0.000975
34.ZINC	-0.000009	-0.000008	-0.000011	-0.000008
35.PARTICULATES	-0.014322	-0.010920	-0.011280	-0.009355
36.SULFUR OXIDE	-0.112290	-0.079781	-0.086926	-0.066515
37.NITROGEN OX	-1.587907	-0.003437	-7.441200	-0.252e03
38.CARBON MONOX	-0.512691	-0.465416	-0.490761	-0.539108
39.HYDROCARBONS	-0.055382	-0.050398	-0.051251	-0.060732
40.ALDEHYDES	-0.000542	-0.000158	-0.000268	-0.000174
41.SOLID WASTE	-0.705638	-0.475524	-0.557658	-0.557374
42.PAPER	-0.346667	-0.215036	-0.2454d8	-0.246019
43.WOOD	-0.050138	-0.040255	-0.074713	-0.053083
44.LEATHER	-0.001002	-0.000808	-0.000883	-0.001201
45.RUBBER	-0.003270	-0.002913	-0.002828	-0.003918
46.PLASTIC	-0.315e59	-0.317235	-0.321062	-0.014955
47.METAL	-0.041383	-0.037868	-0.042018	-0.043971
48.GLASS	-0.042230	-0.037773	-0.041993	-0.043873
49.TEXTILE	-0.007733	-0.006457	-0.006d20	-0.009262
50.FOOD	-0.074078	-0.054321	-0.057063	-0.068878
51.MISC.	-0.056261	-0.04e266	-0.052119	-0.062466
52.PROCESS WATR	0.021359	0.016618	0.019764	0.021698
53.COOLING WATR	0.44e959	0.473141	0.446182	0.368907
54.TOTAL WATER	0.466317	0.491756	0.459946	0.39de06
55.ELECTRICITY	444.971431	53.866473	91.278222	67.946713
56.NATURAL GAS	21.544407	22.767133	21.256425	17.761788
57.LP GAS	0.139718	0.125949	0.179698	0.100253
58.DISTILLATE	11.407137	5.402411	5.667186	4.761165
59.RESIDUAL	7.101465	1.525d6c	2.786353	1.661d30
60.MOTOR GAS	7.990625	7.207d34	7.665227	9.282132
61.AVIATION GAS	0.043818	0.043d8c	0.055ed1	0.042349
62.JET FUEL	0.108804	0.104d7d	0.138259	0.105146
63.COAL	3.664879	3.823446	3.619110	3.015671
64.COKE&BREEZE	0.000409	0.000343	0.000431	0.000380
65.LAND	0.995641	0.913900	1.28e259	1.003112
66.FLOOR SPACE	0.001657	0.001443	0.001441	0.001003
67.PARKING	0.001239	0.001406	0.001439	0.001033
68.BUILDING	0.001918	0.001537	0.001550	0.001129
69.MANAGERIAL	0.012240	0.011851	0.014123	0.00d470
70.PROFESSIONAL	0.032127	0.013646	0.015247	0.00e509
71.TECHNICAL	0.007350	0.005964	0.007477	0.002016
72.SERVICE	0.035836	0.022532	0.027913	0.015454
73.PRODUCTION	0.336449	0.241767	0.258558	0.234028
74.CLERICAL	0.029214	0.020793	0.026903	0.017985
75.SALES	0.007333	0.008191	0.007015	0.007780
76.FARM	0.002004	0.001722	0.001760	0.001930

TABLE 10

EFFECT OF PET FOOD PLANT ON REGIONAL INCOME, EMPLOYMENT, AND SELECTED ENVIRONMENTAL FACTORS: EXAMPLE

	CHANGE IN FINAL DEMAND	FIRST YEAR IMPACT ON REGION OF SELECTED FACTORS								
		INCOME	EMPLOYMENT	BOD-5	PARTICULATES	SOLID WASTE	PROCESS WATER	ELECTRICITY	LAND	TECHNICIANS
	DOLLARS	DOLLARS	PERSONS	TONS	TONS	TONS	M GAL	THOU KWH	ACRES	PERSONS
FISHERY PRODUCTS	1698371	2506561	321	4.18	15.54	838.39	32.85	95782.50	1852.60	4.20
CONSTRUCTION	609758	637040	58	1.15	5.84	293.51	8.57	23827.44	1190.68	1.16
FOOD & KINDRED	1345184	1900452	246	3.97	35.75	1117.93	31.70	75335.63	7936.51	2.82
PAPER & ALLIED	634238	511042	55	15.45	9.14	324.81	69.39	20975.11	1551.77	.89
FAB METALS	13625	19203	2	.03	.12	7.48	.28	743.21	13.43	.04
OTHER MFG	77170	92933	6	.18	.69	35.36	1.47	4057.25	87.42	.15
COMM & UTIL	124968	140934	14	.22	3.12	46.71	1.72	5402.45	88.88	.28
FIN, INS, & RE	130223	100625	11	.17	.69	37.71	1.32	4437.33	97.68	.18
ST & LOC GOVT	220046	31786	3	.58	2.48	122.7]	4.35	17884.95	283.48	.77
TOTAL	4655593	5940576	716	25.93	73.37	2824.61	151.65	248445.87	13102.45	10.49

TABLE 11

EFFECT OF RESORT COMPLEX ON REGIONAL INCOME, EMPLOYMENT, AND SELECTED ENVIRONMENTAL FACTORS: EXAMPLE

	CHANGE IN FINAL DEMAND	FIRST YEAR IMPACT ON REGION OF SELECTED FACTORS								
	DOLLARS	INCOME DOLLARS	EMPLOYMENT PERSONS	BOD-5 TONS	PARTICULATES TONS	SOLID WASTE TONS	PROCESS WATER M CAL	ELECTRICITY THOU KWH	LAND ACRES	TECHNICIANS PERSONS
SAND & GRAVEL	220817	217005	15	.40	1.56	68.91	2.95	8125.20	139.83	.30
CONSTRUCTION	5111148	5339827	500	9.62	48.96	2460.26	71.85	199727.75	9980.55	9.74
FOOD & KINDRED	178545	252247	33	.53	4.75	148.38	4.21	9999.23	1053.40	.37
OTHER TRANSP	30873	37743	4	.06	.25	14.39	.48	1411.21	26.70	.06
CONN & UTIL	1364434	1538759	130	2.35	34.01	509.97	18.74	58985.52	970.45	3.06
OTHER SERV	44625	64821	7	.11	.40	21.22	.83	2404.71	40.78	.18
ST & LOC GOVT	57242	82529	8	.15	.65	31.92	1.13	4652.53	73.74	.20
TOTAL	7007684	7532931	697	13.22	90.58	3255.05	100.19	285306.15	12285.45	13.91

fact that while a single sector has certain direct requirements regardless of whether it sells to local sectors or outside of the region, indirect effects from changes in output can only occur for the whole region if something leaves or enters the economy. The economic structure of the region is like a locked box--the only way to change the contents inside is to open the box and take something out or put something in.

USE OF THE ENVIRONMENTAL MODEL

Tables 10, 11, and 12 are patterned after the example in Part I of the use of the input-output model in impact analysis. The analysis is extended in Part II to include seven resource factors selected from the environmental model.

Given the changes in sales to final demand by the sectors involved in each alternative investment (pet food plant vs. resort complex) it is possible to add the resulting environmental effects to the economic impact analysis. This is especially useful in balancing the apparent positive economic effects with negative environmental considerations. One pitfall that many uninitiated users of I/O analysis fall into is that economic growth almost always can be shown to lead to economic benefits. Single-case economic impact analysis can be used to show positive gains in output, income, and employment to suit the user's purpose. Multiple-case economic impact analysis is simply the choosing of the best alternative from a selection of good ones. However, the combination of environmental and economic analysis helps reveal the positive/negative tradeoffs not apparent in either one by itself.

Tables 10 and 11 were constructed using the information on sales to final demand by sector from Part I of this study and the environmental

TABLE 12

COMPARISON OF IMPACT OF PET FOOD PLANT AND RESORT COMPLEX ON REGION: EXAMPLE EXTENDED TO INCLUDE SELECTED ENVIRONMENT FACTORS

COMPARISON FACTOR	PET FOOD PLANT	RESORT COMPLEX
Total Cost	$4,655,593.00	$7,007,684.00
$ Income/$ Cost	1.28	1.07
Employment/$mil Cost	153.79	99.46
Tons BOD-5/$mil Cost	5.57	1.89
Tons Particulates/$mil Cost	15.76	12.93
Tons Solid Waste/$Mil Cost	606.71	464.50
MGal Process Water/$mil Cost	32.57	14.30
Thou KWH Electricity/$mil Cost	53,365.03	40,713.33
Acres Land/$Mil Cost	2,814.35	1,753.14
Technicians Required/$Mil Cost	2.25	1.98

interdependence matrix (Table 9) from Part II. The value found at the intersection of the economic sector (column) and environmental factors (row) was multiplied by the sales to final demand estimated to be made by that sector for that project. Thus, BOD-5 for Fishery Products is calculated as follows:

$1,698,371 X .002462 = 4181.389 tons per year

It can be seen from Table 12 that while the pet food plant gives higher economic returns in terms of income and employment, it also generates higher waste loads and resource uses in all seven environmental categories. The regional planner is thus faced with the decision of how to weigh economic benefits and environmental costs to arrive at the best solution for the region. Many ways to assign dollar values to environmental parameters are available in the literature. It was the primary purpose of this study, however, to establish the quantities of various polluting factors that will be generated.

Other uses of economic-environmental input-output studies have been suggested by Blaylock and Jones [4], Loehman and McElroy [23], and Roberts [31]. Blaylock and Jones used their study of the lower Rio Grande region of Texas to examine the impact of various alternatives for economic growth. They projected the environmental repercussions which would accompany an increase in output equivalent to that which would be necessary to achieve: (1) regional self-sufficiency in certain candidate sectors, (2) regional export potential in other sectors, and (3) the attraction of new industries.

Loehman and McElroy [23] used their model of Lee County, Florida to examine the impact of industrial growth and expansion on economic

accounts (exports, total output, imports, and gross regional product), social accounts (employment and income), and environmental accounts (12 pollution and 7 resource factors). They also examined the effects of new residents and suggested applications for their study in community development planning.

Roberts [31] used coefficients from his input-output model of Clatsop County, Oregon in a linear programming application to optimize the industry mix in the region. His approach was to maximize the contribution to gross regional product from several major sectors in the economy subject to realistic industrial growth rate constraints as well as constraints on the amount of pollution that could be tolerated in the region.

The studies cited above are by no means exhaustive of the applications for economic-environmental input-output models, but rather are examples of the wide range of uses to which these models can be adapted in regional planning.

SUMMARY

The extension of the economic input-output model of coastal Alabama to include environmental factors was designed to increase the capabilities of planners in assessing the effects of various strategies for growth and development in the region.

An effort was made to include every major category of pollution and to provide reliable estimates of pollution production rates. Fuel use estimates were a logical extension of the search for air pollution parameters since the two are so functionally related. Water use factors

were available from the same sources as water quality factors.

Specific solid waste categories such as paper and glass may ultimately be more useful in evaluating these "wastes" as potential resources through recycling. Land use factors represented the most detailed estimates of these data available without conducting an exhaustive regional survey. Finally, the inclusion of occupation categories is a unique application of this information to input-output modelling and should be of considerable interest to labor analysts in assessing regional manpower needs. There is no reason that the application could not be extended to include several hundred occupational categories if the detailed occupation-by-sector data were available.

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