GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT INITIATION

Date: June 18, 1969

Project Title: A Study of Industrial Needs and River Sites in Autauga County, Alabama
Project No.: A-1184
Project Director: Mr. Robert B. Cassell
Sponsor: Alabama State Planning and Industrial Development Board
Effective: July 1, 1969
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Type Agreement: Industrial Development Research Project
Amount: $13,550

Reports: Progress Reports (Letter-type issued at two month intervals)
Final Report

Contact Person: Mr. J. E. Mitchell, Jr., Director
State Planning & Industrial Development Board
State Office Building
Montgomery, Alabama 36104

Assigned to: Industrial Development Division

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Mr. J. E. Mitchell, Jr., Director  
State Planning & Industrial Development Board  
State Office Building  
Montgomery, Alabama 36104

Dear Ed:

I have been reminded that our contract arrangements specify a letter progress report is to be made to you at two-month intervals, so this is intended to meet that requirement.

As you are aware, we have initiated a survey to measure the anticipated potential of the Alabama River both as a water transportation facility and also as a source for large volumes of process water. We are seeking expressions from existing industry as to projected needs in these sectors. We probably have received about three quarters of the replies which we can anticipate from this sort of survey.

As indicated to you earlier last month, we have made progress on some of the background research developing rates of growth in the study area: Autauga, Dallas, Elmore, Lowndes and Montgomery counties. We are compiling reliable data on population, employment, income and manufacturing growth. We plan to compare this area with at least one, and perhaps two, selected areas with a navigable river. We plan to deduce the probable impact of that development in terms of riverfront industrial land needs and use.

Also, we have gathered most of our preliminary map and topographic data covering the main stretch of the Alabama River from Jones Bluff Lock and Dam upstream to Montgomery. We hope to complete this month our field reconnaissance along the river and then to write that section of the report dealing with an analysis of land use.

Our program tentatively calls for a progress report meeting which might be held early next month. Perhaps we can get together at the annual industrial meeting this week in Birmingham and schedule that, as well as review some of the particulars regarding this survey.

Looking forward to seeing you Thursday, With best personal wishes.

Cordially,

Robert B. Cassell, Head  
Community Development Branch

cc: Ross W. Hammond  
Harry L. Baker, Jr.
Mr. J. E. Mitchell, Jr., Director
Alabama Development Office
State Office Building
Montgomery, Alabama 36104

Dear Ed:

This is the second of the letter progress reports called for under our contract to make "A Study of Industrial Needs and River Sites in Autauga County, Alabama."

As I discussed briefly with you last month when you were here in the office, we have made a survey of the anticipated needs by existing industry which might use the Jones Bluff Reservoir either as a transportation mode or as a source of large volumes of process water.

Also, we have completed our field work of site reconnaissance and are writing an analysis of the present land use and the industrial potential of certain areas along the river.

Most of our detailed analysis of the development and growth rates of the study area (Autauga, Dallas, Elmore, Lowndes and Montgomery counties) is completed. We have compiled data on population, income, employment and manufacturing growth.

In seeking comparable areas with which we could measure this economic sector, we finally decided that the most meaningful would be that stretch of the Tennessee River in North Alabama. We are proceeding to develop some meaningful comparisons, particularly to examine the probable impact of economic growth in terms of industrial land and water use.

Also, I have conferred with the Corps of Engineers in Mobile and attempted to explain the approach and intent of this survey. While I had a cordial reception, I did experience the very attitude that you and other interested parties had warned me to expect.

Our program called for a progress report meeting which you indicated earlier might be held in our offices. I await your further advice and recommendation regarding this proposed meeting.

Meantime, we shall be pressing for completion of the first draft of our report. With best personal wishes.

Cordially,

cc: Ross W. Hammond
Harry L. Baker, Jr.

Robert B. Cassell, Head
Community Development Branch
A STUDY OF INDUSTRIAL NEEDS AND RIVER SITES
IN AUTAUGA COUNTY, ALABAMA

Prepared for
Alabama Development Office

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Industrial Development Division
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
January 1970
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Foreword

This survey of the industrial potential of Autauga County, Alabama, was prepared for the Alabama Development Office and for local interests spearheaded by the Prattville Industrial Development Board and the Men of Montgomery. The interest of these groups is obvious, concentrated on fostering the future economic growth of this section of Central Alabama in order to capitalize on the identified assets of the area.

The study was prompted by the enlarged potential which the Alabama River will offer with completion of Jones Bluff Lock and Dam. Impoundment of this reservoir will create new opportunities for the area, as well as new economic and social problems.

One of the problems -- the continuing competition created by conflicting demands of industrial and recreational uses for certain desirable lands along impounded reservoirs -- is examined in this study. It is recognized that any solution must evaluate all considerations, including the economic impact which will result.

As pointed out in this study, Autauga County needs to take steps to preserve for long-range development certain areas which offer great economic potential. Since land is one of nature's irreplaceable resources, it is none too early to take such positive action in order to expand the economic attraction of the area.

Comments and suggestions of the readers are invited.

Ross W. Hammond, Chief
Industrial Development Division
GEORGIA INSTITUTE OF TECHNOLOGY
SUMMARY AND CONCLUSIONS

Benefits from the Reservoir

In order to achieve maximum economic benefit from the impounded reservoir on the Alabama River which will be created by Jones Bluff Lock and Dam, industries which can use barge transportation or which engage in industrial processes requiring large amounts of water must be attracted to Autauga County.

It does not seem likely that much additional use of barge transportation can be anticipated from existing industry. Therefore, plants favoring such mode of transportation need to be induced to locate along the Alabama River. Most of these plants will require immediate access to the river.

Plants which have large water requirements cannot be established any distance from the river. Generally, chemical plants, pulp and paper mills, textile plants, and glass plants are targets for such development. The land needs of such industries are substantial.

In all likelihood, Prattville and Autauga County can experience industrial growth similar to that witnessed in the North Alabama section of the Tennessee River area. The local situation presents a combination of railroad, interstate highway, and navigable river as a basic asset. This combination, when enlarged by easy access to a major metropolitan center, offers a most attractive array of conditions sought by water-oriented industry.

To assure the future economic growth of Autauga County, it is imperative that suitable industrial land areas be further identified (this has been done preliminarily in this report). Such areas should be reserved for designated industrial occupancy.

A continuing conflict can be expected in the allocation of water resources to various uses, particularly between industrial and recreational. Most evidence indicates that the economic benefits which increased industrial activity brings to an area far outweigh those which recreation offers. Also, it is much easier to find alternate sites for recreational use than to develop sites which will meet the high standards and restrictive requirements which industrial purposes impose.
Economic Growth of the Area

The substantial displacement of farm workers resulting from technological changes in agriculture has severely affected total employment in Autauga County and the five-county Alabama River area.

Employment gains here have not been sufficient to keep the area abreast of statewide trends. By contrast, substantial industrial development along the Tennessee River has enabled this area to outpace the Alabama River and state as a whole.

The Alabama River area's share of state manufacturing employment had declined to 5.1% by 1960, contrasted to its 8.9% of total state population in the same year.

Only because of Montgomery County's growth has the area been able to improve its per capita income position with respect to the rest of the state. But this gain has been very slight.

Sites

Of potential riverfront industrial sites examined, four are in Autauga County and two others north of the Alabama River. The Autauga Creek site and the contiguous area to the east offer the greatest potential for industrial growth in Autauga County north of the river.

Of the other sites on the northern bank, two are well removed from the essential basic facilities and, consequently, offer little possibility for industrial use without extensive developmental costs. The other two sites which can be developed are some distance from Prattville and therefore are likely to have very little economic impact on the Prattville area.

Suitable sites located south of the river are of marginal value to the Prattville area. They cannot be reached easily, due to absence of bridges and direct highway connections, making travel time and distance involved too much of a problem for employment of the Autauga County labor pool.

Land areas south of Prattville to the Alabama River are being developed for residential use or remain in agricultural categories. Prattville needs to reserve land for industrial occupancy where major transportation and utility services are concentrated. The completion of Interstate 65 will place a premium on this area for industrial growth.
It is recommended that the Autauga Creek area, with future inclusion of the Prattville Experimental Field, be reserved for industrial use, preferably through county zoning. The character of this area, with installation of the Union Camp pulp mill, has already become industrial.
INTRODUCTION

Purpose of the Study

The final report for this project is intended to accomplish three objectives:

(1) To ascertain the priority need for industrial development in Autauga County, Alabama.

(2) To identify prime industrial sites along the Alabama River with special attention to Autauga County.

(3) To quantify the economic impact of industrial use of the Autauga Creek area.

Background

The Alabama River, which forms the southern boundary of Autauga County, is a major stream in central Alabama. This river, part of the Coosa River system, currently is being developed by the Corps of Engineers with a series of dams for broad uses, including navigation, electric power generation, and recreation. A major phase of this development will provide barge transportation up to Montgomery, the state capital, with completion of Jones Bluff Lock and Dam.

The Jones Bluff Lock and Dam is one in a series on the Alabama-Coosa River system. This dam is 243.6 miles above the mouth of the river and 26 miles west of Montgomery. It is designed to provide a normal upper pool level at elevation 125. The 82-mile long reservoir will have an area of 12,000 acres. (See Map, Figure 1.)

The industrial potential of Autauga County can be enhanced considerably by this development of the Alabama River only if those limited land areas along the river which are suitable for industrial development are reserved for that purpose. Naturally, there will be conflicting and competing demands for the future use of such areas.

Areas Investigated

The area intensively reviewed in this study includes that part of Autauga County, generally three miles north of the river, downstream to Selma. The
primary focus of this analysis was on the potential industrial areas in the vicinity of Prattville, but the study also includes the adjacent counties.

One segment of this assignment was to study the economy of the area (Autauga, Dallas, Elmore, Lowndes, and Montgomery counties) in order to measure the need for industrial growth in jobs and income. Prevalent trends have been examined for these counties, which are referred to as the "five-county Alabama River area." Comparisons were made with a larger area whose industrial growth has resulted from development of a major river system (the "nine-county Tennessee River area") and with the entire state of Alabama.

Potential industrial sites were identified through map study and on-the-ground reconnaissance. Sites which would meet standards for industrial development in terms of navigation use and increased supplies of water for industrial and commercial uses were identified. Described below in the chapter on "Industrial Site Situation" are criteria on which these judgments are based. In the main, these have to do with suitable terrain, the transportation complex within the area, and the utility infrastructure essential for future development.

Because of considerable local interest and earlier controversy about the area, particular attention has been given to the Autauga Creek area. Efforts were made to search the literature for case histories relating to similar water sites, without success, except for the experience along the Tennessee River which is cited. The effect of the present industrial growth trend of the area also is projected.
Principles of Allocation

In the allocation of the use of resources, especially of land and water, decisions are reached that are both political and economic. They may be political in the process by which they are reached, but economic in the concepts employed. Many special interest groups will base their claims to use of public resources on economic considerations. In the reconciliation of these competitive uses, most decisions are made through the evaluation of economic criteria and standards. 1/

A basic concept in economic evaluation is that of determining the optimum use of the resources under consideration. Among the major ingredients in making such decisions is the principle of equalizing marginal values in uses and the principle of marginal cost pricing.

The principle of equalizing marginal values in uses implies that in allocating resources among competing uses the maximum in total value of resources is achieved when all users derive an equal marginal value in use. Thus, when resources cannot be allocated to higher use, the optimum use is reached. However, it is difficult to apply this principle when noncommercial uses are involved, for the problem lies in computing marginal benefits or willingness to pay when uses are not normally allocated through a price system.

The other principle is that resource users should be charged prices equal to the marginal costs of supplying that resource, including values foregone by not applying the resource to some other use. In our economy this occurs in the private sector under conditions of perfect competition.

Recreation Benefits

Outdoor recreation is properly and rightly acknowledged as a suitable use of natural resources. Economically important values are produced through this use of resources. However, difficulties of measuring these values cannot be minimized.

Economic effects or values of outdoor recreation are of two kinds. The first of these are values that go to society in general and may be considered national benefits. The others are local benefits or impacts realized from business generated in the local economy. Each of these has a different bearing on allocation decisions.

The primary benefits, while accruing mainly to recreation users, in some cases extend to the nonusing general public. They are seldom paid for directly by the beneficiaries and the values do not appear in accounts of national income. Parks and related facilities have values apart from sales involved or expenditures made to use them.

On the other hand, the amount of money spent in connection with outdoor recreation and tourism is very large and growing. Considerable weight is given to the economic impact that recreation development brings.

But as a recreation authority points out:

... Because such other forms of recreation development are not evaluated in such explicit terms, inclusion of recreation benefits in water projects can lead to a serious imbalance in recreation development. This will very likely result in an investment bias -- perhaps in terms of location as well as in kinds of recreation provided with relatively more reservoir water-based recreation and relatively less of other types.

We also seem ready to give undue emphasis to recreation use of reservoirs as compared with other bodies of water. While pollution and limited access pose severe restrictions to the recreation use of widely distributed natural bodies of water at the present time, it may well be far more economical to provide outdoor recreation by making opportunities available on rivers, streams, ponds and natural lakes than it is to invest in large reservoirs.2/

Industrial Benefits

In some areas, land may be more profitably used for recreational purposes; in others, industrial usage may have a higher priority. Decisions of how to develop an area or region must be made on the basis of such diverse considerations as social implications, cost-revenue analysis, and general

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attractiveness. Often these considerations are at cross-purposes with each other. On other occasions, they can be accommodated by a general plan of development.

It is a generally accepted planning principle that

Planning for parks, for watersheds, for scenic beauty, for tourism, for conservation, and for amenities cannot be undertaken as a single function. Open space planning, further, must be integrated with all the other land use, economic, social and transportation considerations involved in community, regional, and state planning.\(^3\)

The requirements for industrial land are much more difficult to meet than are the requirements for recreational land. The following criteria for industrial and recreational land uses are derived from recognized authorities.\(^4\)

Recreational acreage sites should be in fringe and outlying areas, topographically variable, with no limitations as to slope and drainage. Flood plains and watersheds, for instance, can be used for recreational purposes. On the other hand, industrial usage requires reasonably level land with usually not more than 5% slope, capable of being graded without too much expense. Site size may range from five acres up, depending on size and economic outlook of the urban area. Direct access to commercial transportation facilities and utilities is a necessity for industrial development, and any site also should be within commuting distance of its labor force. Other considerations include accessibility of major thoroughfare routes and compatibility with surrounding space.

The above comparisons indicate that if a site is desirable for both recreational and industrial purposes, it would be more logical to allocate the land to industrial usage. Plainly, finding a comparable site that will meet recreational requirements would be easier than trying to find an adequate site which would satisfy industrial needs.


Comparison of Industrial and Recreation Benefits

From a purely economic view, several studies have been made demonstrating that industrial uses of water resources are far more productive than competitive recreation purposes.

In a study made of the alternative values of water use in the Southwest, municipal and industrial uses of water represented from 25 to over 100 times the contribution to personal income payment that recreation uses did. This study attempted to measure the relative contribution to a state's economy of various economic uses of water supplies. 5/

This study determined that value added per acre-foot (measured as primary value added plus value added by purchases) by industry contributed between $3,040 and $3,989 as compared to recreation's $212 to $307.

Another study, conducted in Utah, measured direct employment and income per initial allocation of 1,000 gallons of water. It concluded that manufacturing added .072 employees per year with $466 of income added, contrasted to .014 employees and $34 income by recreation. 6/

Limitations of applying solely economic value to various activities in any geographic area are apparent, because criteria of welfare and political process also are important in reaching decisions. However, if industrial growth is to be encouraged, it must at least have equal priority to use of water.

5/ The Value of Water in Alternative Uses, with Special Application to Water Use in the San Juan and Rio Grande Basins of New Mexico, A Study Conducted by a Special Committee under Direction of Nathaniel Wollman, University of New Mexico Press, Albuquerque, New Mexico, 1962.

Encouragement of Industrial Growth


The Alabama-Coosa River is rich in natural resources. Its economy heretofore has been largely agricultural. Considerable industrial expansion is now taking place. Development of the Basin's water resources is essential to meet the present day requirements. . . . The early provision of navigation to Montgomery and the additional power to be generated will be beneficial in the development of the tributary area.

For the Alabama River to be utilized by modern-day industry, two options are open. One of these is to provide navigation facilities which can be utilized by large plants. The second is to make available substantial quantities of water which certain major manufacturing facilities require.

Navigation Use

In order to achieve the anticipated goals cited above, waterborne commerce along the Alabama River must be increased substantially. Industrial facilities which can make use of the river as a means of transportation will have to be attracted to the area. It is quite apparent that only a small part of this development can be expected to result from the industry presently operating in the area.

The breakdown of benefits for the projected development of the Alabama River attributes $3,467,000 to navigation and $4,382,000 to power, out of a total $9,905,000. Thus, the navigation benefits are estimated to constitute some 35% of the total.

The 1960 justification for construction of the Jones Bluff Lock and Dam projected that river traffic on the Alabama River to Montgomery would amount to 2,016,000 tons. Of this amount (Table 1), petroleum products, nonmetallic
Table 1
ANTICIPATED TRAFFIC SAVINGS FROM NAVIGATION ON ALABAMA RIVER SYSTEM TO MONTGOMERY
(in thousands)

<table>
<thead>
<tr>
<th>Commodity Group</th>
<th>Tons</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upbound</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foods and beverages</td>
<td>21</td>
<td>$ 78</td>
</tr>
<tr>
<td>Feeds and grains</td>
<td>49</td>
<td>168</td>
</tr>
<tr>
<td>Wood and paper</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Rubber and rubber products</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Petroleum products</td>
<td>293</td>
<td>710</td>
</tr>
<tr>
<td>Nonmetallic minerals</td>
<td>26</td>
<td>139</td>
</tr>
<tr>
<td>Ores, metals, and manufactures</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Chemicals and fertilizers</td>
<td>172</td>
<td>273</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Upbound</strong></td>
<td>674</td>
<td>$1,399</td>
</tr>
<tr>
<td><strong>Downbound</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foods and beverages</td>
<td>6</td>
<td>$ 29</td>
</tr>
<tr>
<td>Feeds and grains</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Wood and paper</td>
<td>247</td>
<td>305</td>
</tr>
<tr>
<td>Rubber and rubber products</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nonmetallic minerals</td>
<td>1,026</td>
<td>523</td>
</tr>
<tr>
<td>Ores, metals, and manufactures</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Chemicals and fertilizers</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total Downbound</strong></td>
<td>1,342</td>
<td>$ 961</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>2,016</td>
<td>$2,360</td>
</tr>
</tbody>
</table>

minerals (sand, gravel, etc.), and feed and grains would contribute 1,403,000 tons. Thus, slightly more than 600,000 tons could be in products that might be processed for manufacturing, and a substantial amount could be assumed to be wood and fertilizers.

Survey of Existing Industry

A survey made by the Industrial Development Division of Georgia Tech in the fall of 1969 reveals that little use of the river as a transportation mode is anticipated by existing industrial plant operators in the area between Montgomery and Selma.

Questionnaires designed to measure the anticipated economic impact of Jones Bluff Lock and Dam were sent to every firm in the Montgomery-Selma area that might have even a remote interest in the project. Responses were solicited from 66 firms either by mail or by telephone calls. Of these, 73% responded that they would not have any use for the river as a means of shipping. These firms did not expect to make any shipment by water, nor did they consider themselves to be large water users.

It was found that 12% of the firms anticipated tonnages which would be shipped by water. Totals for these were:

Year 1975: 32,730 tons (incoming and outbound)
Year 1985: 26,810 tons (incoming and outbound)

Over 90% of the incoming material was steel, and most of the outbound products were fabricated metals.

Another small group of existing industry, 16% of the total, was cautious about future use of the river. Some companies felt they might be interested in water transportation if analysis proved it would be economically superior to methods presently being used. Others indicated extensive handling facilities would have to be available at dock sites in order to make water transportation feasible. One multi-plant company which had previously used barge shipments at a non-Alabama location indicated company policy had determined the abandonment of that means of shipping.

In this connection, conversations with the Alabama Ports Authority revealed that the installation of dock facilities was not considered a major problem with respect to terrain situations. Rather, the location of such docks will depend ultimately upon the generation of sufficient industrial activity
to justify their installation. It was suggested that Montgomery would be the most likely area for location of such a facility within the foreseeable future.

A few companies had comments about future economic activity along the Alabama River. They foresaw expanded industrial growth in the possible establishment of oil refineries, chemical plants, and pulp and paper mills. At least five of the firms responding were companies that presently employ over 100 persons.

Experience on the Tennessee River

Experience along the Tennessee River supports the general conclusion that the existence of navigable waterways can contribute to the economic growth of the surrounding areas. A recent analysis of the effect of navigation along the Tennessee River indicates that

... manufacturing is concentrated in waterfront counties nationally and in the states adjacent to the inland waterway system. Waterfront counties experienced more rapid economic growth. Residents of waterfront counties have achieved a higher level of income. While evidence has been presented in this report for areas where navigation has been provided, there are implications for underdeveloped regions where navigation could be added to existing resources.

In any regional development plan for stimulating private investment and building basic industry, a channel for water transportation should be seriously considered if natural conditions permit. In a region emerging from overdependence on marginal agriculture and underemployment, basic industry can provide the foundation for developing a full-fledged manufacturing sector.2/

This analysis also points out that the relatively high degree of concentration of certain manufacturing plants in waterfront counties is significant in view of the limited number of waterfront counties. Most of the industry subclassifications on the waterfront have inputs and/or outputs that can move by water. The majority of these also have large water and power requirements.

It was found that the growth of waterfront industry had led to the development of related firms in nonwaterfront locations. Estimates were that the growth of jobs in waterfront manufacturing plants has led to the creation of at least an equal number of jobs in trades and services employment. At least 30,000 jobs were created over the years in trades and services employment.

Combined with manufacturing, the total employment increase resulting from the growth of industry along the Tennessee waterway was estimated to be in excess of 60,000 jobs.

For these reasons alone, as well as others discussed in the "Economic Background" chapter below, the impact of industrial growth in Alabama counties along the Tennessee River has some meaning for this study. Indicators of such growth are compared to similar ones for the counties along the Alabama River which are expected to receive the main impact of the development resulting from the Jones Bluff Lock and Dam impoundment.

Industry Needs and Uses

While it oftentimes is difficult to establish a direct relationship between industrial expansion and river traffic growth, there are other equally important reasons as well for industries to require locations oriented to major rivers. In addition to the obvious need of some operations to take advantage of barge transportation, some industrial firms seek to achieve a lower combination freight cost from non-water transportation services. Even more important, however, is the necessity to obtain access to large quantities of water for manufacturing purposes; in some cases, this may be combined with a need for large flows to provide dilution of plant waste water.

Of major interest to this study are the types of firms which need to locate on the river in order to make use of barge transportation and those industrial operations that must obtain large quantities of process water.

The Tennessee Valley Authority has analyzed major water transportation-using industries. This study listed the percentage of their freight traffic which moved by water in 1963, as shown in Table 2. It is significant that the largest dependence upon water transport was found in the petroleum and coal products industries and in the basic chemicals, plastics, and synthetic rubber and fibers industries. To a much less degree was the primary iron and steel industry category dependent upon river transportation.

Other studies which have analyzed water-oriented industries indicate that for the southeastern area the greatest opportunity for development of new industrial activities would be in synthetics, drugs, paints, agricultural chemicals, cement, grain milling, and pulp and paper production.
## Table 2

### MAJOR WATER TRANSPORTATION- USING INDUSTRIES AND PERCENT OF SHIPMENTS WHICH MOVED BY WATER, 1963

<table>
<thead>
<tr>
<th>Industry</th>
<th>Tons</th>
<th>%</th>
<th>Ton-Miles</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candy, beverages, and tobacco products</td>
<td>44,249</td>
<td>1.9</td>
<td>13,615</td>
<td>2.8</td>
</tr>
<tr>
<td>Paper and allied products</td>
<td>65,551</td>
<td>1.9</td>
<td>26,849</td>
<td>2.4</td>
</tr>
<tr>
<td>Basic chemicals, plastics materials, synthetic rubber and fibers</td>
<td>79,916</td>
<td>12.3</td>
<td>36,397</td>
<td>20.3</td>
</tr>
<tr>
<td>Drugs, paints, and other chemical products</td>
<td>60,318</td>
<td>2.2</td>
<td>23,145</td>
<td>5.4</td>
</tr>
<tr>
<td>Petroleum and coal products</td>
<td>398,066</td>
<td>73.5</td>
<td>274,436</td>
<td>92.8</td>
</tr>
<tr>
<td>Lumber and wood products, except furniture</td>
<td>70,380</td>
<td>2.1</td>
<td>41,500</td>
<td>2.5</td>
</tr>
<tr>
<td>Stone, clay, and glass products</td>
<td>175,597</td>
<td>5.9</td>
<td>27,879</td>
<td>8.1</td>
</tr>
<tr>
<td>Primary iron and steel products</td>
<td>120,521</td>
<td>6.3</td>
<td>34,033</td>
<td>11.2</td>
</tr>
<tr>
<td>Primary nonferrous metal products</td>
<td>18,862</td>
<td>2.9</td>
<td>11,033</td>
<td>1.3</td>
</tr>
<tr>
<td>Industrial machinery, except electrical</td>
<td>5,876</td>
<td>1.1</td>
<td>2,803</td>
<td>0.3</td>
</tr>
<tr>
<td>Other</td>
<td>295,502</td>
<td>0.5</td>
<td>128,218</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,334,838</td>
<td>24.5</td>
<td>619,908</td>
<td>44.0</td>
</tr>
</tbody>
</table>

Several of these industry categories are oriented to regional markets. In most cases, the raw material inputs are generally available either from local sources or no further than the Gulf Coast. Basically, their labor requirements are not of high priority, with a very few significant exceptions. Therefore, the challenge is to define or create market situations attractive for the establishment of these industrial operations.

In addition to these activities, potential barge traffic can be expected to be generated by petroleum storage facilities and grain elevator operations. However, these installations are mainly oriented to local market situations. While not strictly production activities, they do generate some additional employment.

We cannot presume that the existence of navigable water transportation facilities will mean immediate use of that mode of transportation. Rather, potential shippers will have to be conditioned to use of water transportation and preparation made for necessary handling of transfer facilities.

In the Tennessee River study, it was found that the metropolitan areas along the Tennessee have benefited from the waterway, but the most startling development associated with water transportation has been the rise of industrial centers where industries previously were few or nonexistent. In these formerly rural or semirural areas, the impact of water transport appears much more direct and apparent.\(^3\)\(^/\)

This study concludes that waterfront manufacturing activities on the Tennessee River indicate a higher degree of influence in the location of users of raw materials than of suppliers. The suppliers are much less labor intensive than their customers. Therefore, the location influence of waterfront plants on user plants is important in terms of jobs for a given area.

**Major Water-Consuming Industries**

Certainly, water should be viewed as a contributing factor to the economic growth of the state. As such, it has to be weighed with other factors of production and use in the overall assessment of economic activity. Water can

support opportunities for economic expansion, but those opportunities will be converted into the reality of economic growth only if there transpires the expected growth in aggregate final demand for goods and services produced in the state of Alabama.

Manufacturing industry in the United States is a major water user. Within the manufacturing industry category, some 3% of the plants are responsible for 97% of the total water consumption. This small segment of the industry, however, accounts for more than one-third (about 39%) of total manufacturing employment.

In 1963, manufacturing plants throughout the United States used 14-trillion gallons of water. Of this total, 85% was consumed by four major industry groups: primary metals, chemicals and allied products, paper and allied products, and petroleum and coal products, in that order. (See Table 3.)

In the Southeast (Alabama, Florida, Georgia, North Carolina, and South Carolina), the paper and allied products sector constitutes the largest water-using industry, consuming some 522-billion gallons of water in 1963. (See Table 4.) Within this industry sector, paperboard mills accounted for 280-billion gallons, paper mills for 143-billion gallons, and pulp mills for 92-billion gallons.

In the same geographic region, chemicals and allied products industries consumed 217-billion gallons of water, with fertilizer plants being the largest subgroup, accounting for 72-billion gallons. Primary metals was third ranking in the Southeast, using 87-billion gallons annually, almost all (some 95%) of which was accounted for by blast furnaces. Only one other group, food and kindred products, was a significant user of water in the southeastern area, accounting for 42-billion gallons.

As Table 4 shows, Alabama's major water-using industries were, like the region's, in the paper and allied products, chemicals and allied products, and primary metals categories. It is significant that the paper industry had an annual water consumption of 14.9-million gallons per employee and chemicals of 11.7-million per employee. Both of these averages are somewhat higher than corresponding figures for the Southeast.
### Table 3
**ANNUAL WATER USE PER EMPLOYEE, SELECTED INDUSTRIAL GROUPS, UNITED STATES, 1963**

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Total Water Use (in billions of gallons)</th>
<th>Water Consumed Per Employee (in millions of gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Kindred Products</td>
<td>760</td>
<td>1.118</td>
</tr>
<tr>
<td>Meat</td>
<td>105</td>
<td>.654</td>
</tr>
<tr>
<td>Sugar</td>
<td>242</td>
<td>8.442</td>
</tr>
<tr>
<td>Beverages</td>
<td>108</td>
<td>1.128</td>
</tr>
<tr>
<td>Textile Mill Products</td>
<td>148</td>
<td>.419</td>
</tr>
<tr>
<td>Textile finishing (except wool)</td>
<td>59</td>
<td>1.247</td>
</tr>
<tr>
<td>Lumber &amp; Wood Products</td>
<td>151</td>
<td>2.292</td>
</tr>
<tr>
<td>Sawmills &amp; planing mills</td>
<td>114</td>
<td>3.104</td>
</tr>
<tr>
<td>Paper &amp; Allied Products</td>
<td>2,071</td>
<td>8.329</td>
</tr>
<tr>
<td>Pulp mills</td>
<td>279</td>
<td>21.471</td>
</tr>
<tr>
<td>Paper mills</td>
<td>1,138</td>
<td>9.448</td>
</tr>
<tr>
<td>Paperboard mills</td>
<td>577</td>
<td>10.177</td>
</tr>
<tr>
<td>Chemicals &amp; Allied Products</td>
<td>3,889</td>
<td>8.101</td>
</tr>
<tr>
<td>Basic chemicals</td>
<td>3,020</td>
<td>15.202</td>
</tr>
<tr>
<td>Fibers, plastics, &amp; rubber</td>
<td>530</td>
<td>4.081</td>
</tr>
<tr>
<td>Agricultural chemicals</td>
<td>115</td>
<td>9.440</td>
</tr>
<tr>
<td>Petroleum &amp; Coal Products</td>
<td>1,398</td>
<td>11.715</td>
</tr>
<tr>
<td>Petroleum refining</td>
<td>1,388</td>
<td>12.432</td>
</tr>
<tr>
<td>Rubber and Plastics Products</td>
<td>163</td>
<td>.775</td>
</tr>
<tr>
<td>Stone, Clay, and Glass Products</td>
<td>249</td>
<td>1.143</td>
</tr>
<tr>
<td>Cement</td>
<td>114</td>
<td>3.876</td>
</tr>
<tr>
<td>Primary Metals</td>
<td>4,578</td>
<td>5.621</td>
</tr>
<tr>
<td>Blast furnaces &amp; steel mills</td>
<td>3,815</td>
<td>7.917</td>
</tr>
<tr>
<td>Machinery, Except Electrical</td>
<td>157</td>
<td>.296</td>
</tr>
<tr>
<td>Electrical Machinery</td>
<td>105</td>
<td>.131</td>
</tr>
<tr>
<td>Transportation Equipment</td>
<td>247</td>
<td>1.201</td>
</tr>
<tr>
<td>Motor vehicles &amp; equipment</td>
<td>127</td>
<td>.230</td>
</tr>
<tr>
<td>Total</td>
<td>14,045</td>
<td>2.196</td>
</tr>
</tbody>
</table>

Table 4
ANNUAL WATER USE PER EMPLOYEE, SELECTED INDUSTRIAL GROUPS, SOUTHEAST AND ALABAMA, 1963

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Southeast*</th>
<th></th>
<th>Alabama**</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Water Use (Billions of gallons)</td>
<td>Water Consumed Per Employee (Millions of gallons)</td>
<td>Total Water Use (Billions of gallons)</td>
<td>Water Consumed Per Employee (Millions of gallons)</td>
</tr>
<tr>
<td>Food &amp; Kindred Products</td>
<td>42</td>
<td>1.0</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>Textile Mill Products</td>
<td>84</td>
<td>2.0</td>
<td>5</td>
<td>.3</td>
</tr>
<tr>
<td>Paper &amp; Allied Products</td>
<td>522</td>
<td>13.5</td>
<td>104</td>
<td>14.9</td>
</tr>
<tr>
<td>Pulp mills</td>
<td>92</td>
<td>22.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper mills</td>
<td>143</td>
<td>15.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paperboard mills</td>
<td>280</td>
<td>15.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals &amp; Allied Products</td>
<td>217</td>
<td>4.8</td>
<td>70</td>
<td>11.7</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>72</td>
<td>14.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Metals</td>
<td>87</td>
<td>2.5</td>
<td>91</td>
<td>2.6</td>
</tr>
<tr>
<td>Blast furnaces</td>
<td>83</td>
<td>3.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation Equipment</td>
<td>4</td>
<td>.1</td>
<td>1</td>
<td>.1</td>
</tr>
</tbody>
</table>

* The Southeast Water Use Region includes parts of Virginia, North Carolina, Georgia, and Alabama and all of South Carolina and Florida.

** Alabama is listed in two industrial water use regions -- the Tennessee Water Use Region and the Southeast Water Use Region. Thus, total water use by primary metals in Alabama exceeds total water use by that industry in the Southeast.


Water Use by the Chemical Industry

It would be impossible to analyze the factors influencing the location of chemical manufacturing operations without giving major consideration to the importance of water resources. Although the uses of water are numerous, certain basic requirements must be considered.$^4/$

$^4/$ A more detailed discussion can be found in James E. Noblin, Jr., *A Study of Selected Economic Factors Affecting the Location of Chemical Processing Plants*, Mississippi Industrial and Technological Research Commission, Jackson, Mississippi, 1960.
Availability of surface and underground water, with seasonal fluctuations in quality, quantity, and temperature.

Present rate of water consumption and predicted industrial expansion in the area as related to continued availability of supply and effects upon water quality and temperature.

Chemical composition and physical characteristics of the water supply, and quality of supply measured by microscopic and bacteriologic analyses.

Influence of prevailing meteorological conditions on availability of water supply.

Estimated requirements for various needs, i.e., water for processing, cooling, steam generation, sanitary uses, fire protection, as well as future requirements for various services.

Availability of service and relative cost based on a municipal water system, compared with cost of developing a private supply.

Existing and predicted influence of industrial or domestic waste contamination, and the effect of underground contamination on surface and underground waters, resulting from industrial and municipal activities in the area.

In some chemical industries, water constitutes an important raw material -- as a carrier of materials in the process, a source of materials, or entering directly into the manufacture of the finished product. In such cases, the quality, quantity, and temperature of the water become major considerations.

Among other important functions of water in the chemical manufacturing process is its use for cooling purposes. It has been estimated that nine-tenths of all chemical plants use water for condensation, for evaporation, or for cooling. River water, being generally lower in mineral analysis but higher in turbidity and bacterial content than well water, will more likely be used for boiler, washing, and steam purposes.

The chemical industry utilizes considerable amounts of steam, for which a satisfactory water supply, particularly with respect to quality of softness, is highly desirable. Hard water can be very damaging to steam boilers, hot water pipes, pumps and circulating systems, tanks, and other waterjacketed equipment.

Waste disposal is also an important factor in selection of a chemical plant site. Since large amounts of water are required for chemical processing, the problem of disposing of the effluent, often contaminated, has to be solved in a manner meeting the approval of health and water quality control.
authorities. At the same time, this solution cannot impose undue economic burdens on the plant in the form of either capital expenditures or operating costs.

It becomes obvious that future plant site selection by the chemical industry must weigh both the available and potential additional water supply together with the probable increasing competitive demand. And this demand will be generated not only by other industrial users but also by growing municipal domestic and sanitary needs and agricultural and recreational uses.

Land Needs of These Industries

Contrary to some popular misconceptions, certain industries, especially those with complicated production operations and large work forces, require substantial land acreage to accommodate their facilities. Many of these, and in particular a number of chemical manufacturing operations, can be termed "land-intensive" in contrast to certain more simplified manufacturers (garment plants, for example) which can be classified as "labor-intensive." These latter employ large numbers of people in restricted manufacturing space.

Two recent studies of industrial space needs confirm this characteristic. In one case, the investigator 5/ found that chemical plants had a range of 0.26 to 4.0 workers per acre of site, while garment plants had up to 417 workers per acre. In the other 6/, most of the chemical industries surveyed showed two to four employees per acre being typical, although a few plants in this industry grouping were considerably more labor-intensive.

Another revealing space-worker ratio is the average number of square feet of plant space per worker. One of these studies found chemicals plants to range from 680 to 1,340 square feet of plant space per worker compared to the maximum garment plant ratio of 87 square feet per worker. The other study corroborated these findings, concluding that the ratio for most chemical plants falls within a broad range from 500 to 2,000 square feet per employee.


-24-
Potential for Industrial Growth in Prattville-Autauga County

What kind of industrial growth can be expected in the Prattville-Autauga County area as a result of the comprehensive development of the Alabama River?

Once again, we can draw upon the experience along the Tennessee River waterway, which was substantially completed in 1945. This 650-mile river extends from the river's junction with the Ohio River in western Kentucky to Knoxville, Tennessee. Prior to its development, the river drained a valley characterized by agriculture and extractive industries providing raw materials for processing elsewhere. Only Knoxville and Chattanooga could be considered exceptions, both being somewhat industrially oriented. Most of the Alabama towns along the river were generally rural trade centers.

From 1933, when the Tennessee River development began, through 1965, about $1.3-billion was invested in 133 private manufacturing plants and 71 terminals. Of this total, 99% has been invested since completion of the nine-foot navigable channel in 1945. Most of these industries have comparatively large water and power requirements, and are not generally labor-oriented.

While 54% of the industry subclassifications on the waterway have inputs or outputs which can move by water, many of them do not appear to take advantage of the waterway as extensively as they could for barge traffic. In other words, the power-generating and water-using potentials of the river have taken precedence over the water transportation aspects.

Completion of the waterway resulted in the development of six new industrial growth centers where a previous industry base was nonexistent or small. These areas were formerly rural or semirural in character. The six growth centers share two common characteristics: convergence of major rail, highway, and water transportation facilities; and availability of advantageous industrial sites.

The six growth centers and their primary characteristics are the following:

1. **Calvert City, Kentucky.** Several major new industries have formed a chemical manufacturing complex. Most of them have substantial water and power demands, with inputs or outputs adaptable to barge transportation.
2. **New Johnsonville, Tennessee.** This is a nonferrous metals center and a developing chemical center. The industries are large consumers of electric power and water and most have barge-oriented outputs.

3. **Muscle Shoals, Alabama.** This is a metals and chemical producing center. Water-compelled rates are credited for much of this growth. The area also is characterized by off-waterfront plants using outputs of waterfront producers.

4. **Decatur, Alabama.** This is the most diversified of the six centers with 17 industry categories represented in both waterfront plants and associated satellite operations. Many of the industries are large users of water and power; some are also labor-oriented.

5. **Guntersville, Alabama.** This southernmost port on the Tennessee River has developed primarily as a distribution center serving the trade areas to the south and east, with emphasis on major grain processing and merchandising companies. Satellite operations include poultry processing and feed bag manufacture.

6. **Charleston-Calhoun, Tennessee.** The basic industry here (close to Chattanooga) is a large pulp and newsprint mill. Although three river terminals serve the plant (pulpwood and fuel oil input and newsprint output), 80% of the plant's traffic is hauled by two railroads and by trucks. Immediately adjacent to this facility is a satellite chemical producer of chlorine and caustic soda.

Undoubtedly, the Prattville-Autauga County area can duplicate the experience of one or more of these areas -- provided adequate land areas are reserved along the river for industrial occupancy and the necessary utility and land transportation services can be supplied. From an overall objective point of view, the local combination of railroad, interstate highway, and navigable river is a basic factor that must exist. These transportation facilities, combined with easy access to a major metropolitan center, offer the array of factors that large water-oriented industry may seek initially in an intensive location-selection screening process.
Introduction

For purposes of comparison, rates of growth in the study area and another area subject to economic impact from development of a major river system were compiled. Trends in the five-county Alabama River area under study (Autauga, Dallas, Elmore, Lowndes, and Montgomery) are contrasted with a nine-county Tennessee River area in northern Alabama (Colbert, DeKalb, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, and Morgan) and the entire state of Alabama. (See Map, Figure 2.) Although the Tennessee River group is larger in area and population than the Alabama River area, the relative changes are the important considerations.

In measuring various segments of the economic spectrum, different sources had to be examined: Census of Population, Census of Manufactures, Old Age & Survivors Insurance, and estimates by Alabama Department of Industrial Relations. Because of differences in coverage and varying definitions, the data are not precisely comparable. It was felt more important for this study to examine data from the same source over a period of years in order to establish trends in the respective areas.

Generally, both the Alabama River area and the North Alabama area along the Tennessee River were predominantly agricultural regions in 1930, and were hard hit by substantial losses of farm jobs as agriculture became mechanized in succeeding decades. Impoundment of the Tennessee River encouraged the location of numerous industrial plants in North Alabama, enabling this area to increase both its manufacturing jobs and the number of jobs required by many operations supporting these industrial functions. The North Alabama area not only overcame the loss of farm jobs, but also achieved an economic growth greater than the average for the state.

Most of the economic development in the five-county Alabama River area has been concentrated in Montgomery County. The presence of this metropolitan area has contributed greatly to the stability of the region. Compared with the Tennessee River section, however, the area's economic growth has been limited. Autauga County, for example, with some two-thirds of its employment in agriculture in 1940, lost population as jobs became more difficult to find. By 1960, some 30% of its workers travelled outside the county to work. In recent years,
FIGURE 2

ECONOMIC AREAS USED IN COMPARISONS
there has been some improvement in the local situation, but the replacement of lost agricultural jobs is still a major problem.

Population

Population growth in the five-county Alabama River area over the last three decades has been quite modest. Between 1930 and 1960, the absolute increase in population amounted to only 59,940, with an estimated increase of 12,243 between 1960 and 1966. The overall increase, between 1930 and 1966, amounted to 31.3%. (See Table 5.) Comparable increases in the same period were 63.7% for the Tennessee River area and 32.7% for the entire state.

Table 5
POPULATION TRENDS IN ALABAMA RIVER AND TENNESSEE RIVER AREAS AND STATE OF ALABAMA, 1930-1966

<table>
<thead>
<tr>
<th>Population</th>
<th>April 1930</th>
<th>April 1940</th>
<th>April 1950</th>
<th>April 1960</th>
<th>July 1966</th>
<th>Change 1930-66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama River Area</td>
<td>230,617</td>
<td>247,849</td>
<td>263,088</td>
<td>290,557</td>
<td>302,800</td>
<td>72,183</td>
</tr>
<tr>
<td>Tennessee River Area</td>
<td>362,147</td>
<td>385,582</td>
<td>411,597</td>
<td>473,060</td>
<td>592,700</td>
<td>230,553</td>
</tr>
<tr>
<td>Alabama</td>
<td>2,646,248</td>
<td>2,832,961</td>
<td>3,061,743</td>
<td>3,266,740</td>
<td>3,511,000</td>
<td>864,752</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama River Area</td>
</tr>
<tr>
<td>Tennessee River Area</td>
</tr>
<tr>
<td>Alabama</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>As Percent of Alabama</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
</tr>
<tr>
<td>Alabama River Area</td>
</tr>
<tr>
<td>Tennessee River Area</td>
</tr>
</tbody>
</table>

The trend lines for both the nine-county Tennessee River area and the state of Alabama show considerable population growth has taken place since 1950. (See Figure 3.)

In the Alabama River area counties, only Montgomery showed a population in-migration between 1950 and 1960. Since this in-migration, which reflects the population gain over and above the national increase (total births less total deaths), amounted to less than 500 persons, it did little to offset the major outflow from the other counties. The net civilian out-migration from the five-county area in this decade totaled over 27,000 persons. While this out-migration continued, at least up to 1966, the pattern of change varied, with substantial losses experienced by Dallas, Lowndes, and Montgomery counties only partially offset by in-migration into Autauga and Elmore counties. Despite a 4.2% population increase, net out-migration from the five counties

**FIGURE 3**

POPULATION GROWTH: ALABAMA RIVER AND TENNESSEE RIVER AREAS AND STATE OF ALABAMA, 1930-1966

during this period was 15,000 persons. (See Appendix 1.) It should be noted, however, that these census estimates include members of the armed forces; some of the population loss, particularly in Montgomery and Dallas counties, may be due to movements of military.

Comparative figures for the nine-county Tennessee River area show a different pattern, particularly in recent years. (See Table 5 and Figure 3.) Although the area recorded a net migration loss of over 19,000 persons between 1950 and 1960, total population still increased by 14.9%, compared with a 10.4% increase for the Alabama River area. Since 1960 the growth rate has moved upward sharply to 25.3%, with a net in-migration of over 66,000 persons. (See Appendix 1.)

It is important to recognize that while the five-county Alabama River area has maintained its share of the state's population since 1930, the nine-county Tennessee River area has substantially increased its share, primarily because of the economic growth in the area since late in the Fifties. (See Table 5.)

Autauga County. Between 1930 and 1960, Autauga County itself suffered a net loss of nearly 1,000 persons. An increase recorded in the 1930-1940 period was followed by a loss between 1940 and 1950, with a modest gain in the 1950-1960 decade. According to estimates of the Bureau of the Census, however, the county had a more substantial increase between 1960 and 1966. During this period, the population increased by over 4,000 persons from 18,739 in April 1960 to 22,800 in July 1966, a gain of 21.7%. Details are found in Appendix 2.

When the natural increase is taken into consideration, the net population increase of only 553 persons between 1950 and 1960 indicates an out-migration of over 2,600 persons during the decade. Similar calculations for the 1960-1966 period show a reversal of this trend, with an in-migration of some 2,100 persons.

**Agricultural Employment**

A major cause of the out-migration of population has been the heavy loss in agricultural employment. Technological changes have mechanized farming and have boosted productivity while at the same time reducing the need for farm workers. Between 1940 and 1960, the Census recorded a loss of 252,260 agricultural employees in Alabama -- from 354,335 in 1940 to 102,075 in 1960. (See
Table 6 and Figure 4.) Estimates of the Alabama Department of Industrial Relations show that this decrease has continued since 1960. (See Table 7.)

Table 6

CHANGES IN AGRICULTURAL EMPLOYMENT, AUTAUGA COUNTY, ALABAMA RIVER AND TENNESSEE RIVER AREAS, AND STATE OF ALABAMA, 1940-1960 (by place of residence)

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>1950</th>
<th>1960</th>
<th>Change, 1940-1960</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td></td>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Autauga County</td>
<td>4,392</td>
<td>2,397</td>
<td>1,232</td>
<td>-3,160</td>
</tr>
<tr>
<td>Alabama River Area</td>
<td>35,446</td>
<td>21,124</td>
<td>10,155</td>
<td>-25,291</td>
</tr>
<tr>
<td>Tennessee River Area</td>
<td>57,338</td>
<td>52,962</td>
<td>21,690</td>
<td>-35,648</td>
</tr>
<tr>
<td>Alabama</td>
<td>354,335</td>
<td>250,751</td>
<td>102,075</td>
<td>-252-260</td>
</tr>
</tbody>
</table>


FIGURE 4

AGRICULTURAL EMPLOYMENT: ALABAMA RIVER AND TENNESSEE RIVER AREAS AND STATE OF ALABAMA, 1940-1960

Table 7
EMPLOYMENT IN AUTAUGA COUNTY, ALABAMA RIVER AND TENNESSEE RIVER AREAS, AND STATE OF ALABAMA, 1960-1968 (by place of work)

<table>
<thead>
<tr>
<th></th>
<th>March 1960</th>
<th>March 1968</th>
<th>Change, 1960-1968</th>
<th>Percent of State Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Total</td>
<td>4,470</td>
<td>4,800</td>
<td>330</td>
<td>7.4</td>
</tr>
<tr>
<td>Agricultural</td>
<td>970</td>
<td>650</td>
<td>-320</td>
<td>-33.0</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>3,500</td>
<td>4,150</td>
<td>650</td>
<td>18.6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>960</td>
<td>1,280</td>
<td>320</td>
<td>33.3</td>
</tr>
<tr>
<td>Alabama River</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>93,050</td>
<td>105,110</td>
<td>12,060</td>
<td>13.0</td>
</tr>
<tr>
<td>Agricultural</td>
<td>8,010</td>
<td>5,400</td>
<td>-2,610</td>
<td>-32.6</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>85,040</td>
<td>99,710</td>
<td>14,670</td>
<td>17.3</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>12,195</td>
<td>15,940</td>
<td>3,745</td>
<td>30.7</td>
</tr>
<tr>
<td>Tennessee River</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>141,580</td>
<td>196,450</td>
<td>54,870</td>
<td>38.8</td>
</tr>
<tr>
<td>Agricultural</td>
<td>19,380</td>
<td>13,070</td>
<td>-6,310</td>
<td>-32.6</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>122,200</td>
<td>183,380</td>
<td>61,180</td>
<td>50.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>27,990</td>
<td>46,320</td>
<td>18,330</td>
<td>65.5</td>
</tr>
<tr>
<td>Alabama</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,023,700</td>
<td>1,174,400</td>
<td>150,700</td>
<td>14.7</td>
</tr>
<tr>
<td>Agricultural</td>
<td>91,700</td>
<td>61,800</td>
<td>-29,900</td>
<td>-32.6</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>932,000</td>
<td>1,112,600</td>
<td>180,600</td>
<td>19.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>234,400</td>
<td>302,500</td>
<td>68,100</td>
<td>29.1</td>
</tr>
</tbody>
</table>

Source: Estimates of the Alabama Department of Industrial Relations.

In the areas under comparison in this study, substantial losses in agricultural employment were experienced. The five-county Alabama River area had a decline of 71.4% in agricultural employment between 1940 and 1960, while the Tennessee River area showed a loss of 62.2% for the same period. (See Table 6.)

Autauga County experienced the same rate of change in agricultural employment (71.9%) as its general area. Recent estimates indicate that both of the
river areas had lost roughly one-third of their 1960 farm workers by 1968. (See Table 7.)

Nonagricultural Employment

The trend in total employment is, of course, affected considerably by the decline in number of farm workers. When the agricultural data are excluded, the picture of economic development becomes much clearer through comparing nonagricultural employment.

Table 8

EMPLOYMENT IN AUTauga COUNTY, ALABAMA RIVER AND TENNESSEE RIVER AREAS, AND STATE OF ALABAMA, 1940-1960 (by place of residence)

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>1950</th>
<th>1960</th>
<th>Change, 1940-1960</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Autauga County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6,752</td>
<td>5,957</td>
<td>5,818</td>
<td>-934</td>
</tr>
<tr>
<td>Agricultural</td>
<td>4,392</td>
<td>2,397</td>
<td>1,232</td>
<td>-3,160</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>2,360</td>
<td>3,560</td>
<td>4,586</td>
<td>2,226</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>783</td>
<td>1,259</td>
<td>1,425</td>
<td>642</td>
</tr>
<tr>
<td>Alabama River</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88,981</td>
<td>94,119</td>
<td>94,521</td>
<td>5,540</td>
</tr>
<tr>
<td>Agricultural</td>
<td>35,446</td>
<td>21,124</td>
<td>10,155</td>
<td>-25,291</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>53,535</td>
<td>72,995</td>
<td>84,366</td>
<td>30,831</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9,111</td>
<td>12,759</td>
<td>14,451</td>
<td>5,340</td>
</tr>
<tr>
<td>Tennessee River</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>104,945</td>
<td>129,713</td>
<td>151,115</td>
<td>46,170</td>
</tr>
<tr>
<td>Agricultural</td>
<td>57,338</td>
<td>52,962</td>
<td>21,690</td>
<td>-35,648</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>47,607</td>
<td>76,751</td>
<td>129,425</td>
<td>81,818</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>12,800</td>
<td>21,122</td>
<td>44,767</td>
<td>31,967</td>
</tr>
<tr>
<td>Alabama</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>890,848</td>
<td>1,031,680</td>
<td>1,065,897</td>
<td>175,049</td>
</tr>
<tr>
<td>Agricultural</td>
<td>354,335</td>
<td>250,751</td>
<td>102,075</td>
<td>-252,260</td>
</tr>
<tr>
<td>Nonagricultural</td>
<td>536,513</td>
<td>780,929</td>
<td>963,822</td>
<td>427,309</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>155,345</td>
<td>226,065</td>
<td>282,992</td>
<td>127,647</td>
</tr>
</tbody>
</table>

The Alabama River area gained 5.8% in total employment between 1940 and 1950, and only 0.4% between 1950 and 1960. When farm workers are deleted, however, the respective increases become 36.4% and 15.6%. (See Table 8 and Figure 5.) For the state as a whole, nonagricultural employment rose by 45.6% in the 1940-1950 decade and by 23.4% between 1950 and 1960.

The Tennessee River area reaped the benefits of industrial development, showing total employment increases of 23.6% between 1940 and 1950, and 16.5% between 1950 and 1960 -- much higher than those for either the Alabama River area or the state. The difference becomes even more marked when only nonagricultural employment is examined: an increase of 61.2% between 1940 and 1950, and 68.6% in the following decade.

The 1960-1968 estimates show that the Tennessee River area continued to outpace the Alabama River area and the state as a whole, with a 50.1% increase in nonagricultural employment for the period compared with a 17.3% gain for the five-county area and a 19.4% average gain for Alabama. (See Table 7 and Figure 6.)

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1/ Made by the Alabama Department of Industrial Relations.
Manufacturing Employment

Operations which attract money into an area from outside sources will generate subsidiary jobs as employees spend their wages on various goods and services. While government installations or tourist attractions are contributors to this effect, manufacturing establishments are considered the most dynamic in their influence in stimulating the economy of an area.

The manufacturing companies which settled in the nine-county Tennessee River area, with intensive development of that river, have played a major part in the overall expansion of the area. As already indicated, employment in this geographic area showed substantial growth in spite of the heavy decrease in agricultural workers. The five-county Alabama River area made comparatively minor progress, and continues to lose population because of the lack of jobs in the area.

The five-county Alabama River area increased its employment in manufacturing from 9,111 workers in 1940 to 14,451 workers in 1960. (See Table 8 and
Figure 7.) As a share of Alabama's manufacturing employees, however, these figures represented a drop from 5.9% in 1940 to 5.1% in 1960 -- both percentages well below the area's proportion of the state's population (8.7% in 1940 and 8.9% in 1960).

Manufacturing employment in the Tennessee River sector grew from 12,800 in 1940 to 44,767 in 1960. (See Table 8.) While the earlier figures represented only 8.2% of Alabama's manufacturing workers in 1940, by 1960 the area's proportion was 15.8%. Its proportion of the state's population was 13.6% in 1940 and 14.5% in 1960; on this basis of measurement, the nine counties had far less than their share of manufacturing in 1940 but more than their share 20 years later.

Recent data from the Alabama Department of Industrial Relations are by place of work rather than place of residence, so estimates include figures for commuters into (and out of) any area. The definitions used vary also, resulting in lower estimates of manufacturing employment than the figures re-
corded by the censuses of population. The development of the two areas, however, follows the pattern already indicated.

In the five-county Alabama River area, manufacturing employment as a proportion of that of Alabama showed little change between March 1960 and March 1968, rising from 5.2% to 5.3%. (See Table 7 and Figure 8.) Manufacturing employment in Autauga County, while showing a substantial percentage increase, nonetheless has been static so far as its share of the state's total

**FIGURE 8**

**MANUFACTURING EMPLOYMENT: ALABAMA RIVER AND TENNESSEE RIVER AREAS AND STATE OF ALABAMA, 1960-1968**

(by place of work)

![Manufacturing Employment Chart](image)

Source: Estimates of Alabama Department of Industrial Relations.

is concerned, remaining at 0.4%. The Tennessee River area, by contrast, increased its share of manufacturing employment from 11.9% of the state total in March 1960 to 15.3% in March 1968.

While county details from the 1967 Census of Manufactures are not yet in print, the 1963 Census showed the five-county Alabama River area with a preponderance of low-wage industry such as textiles, apparel, furniture, tobacco, and lumber and wood products. Only a few large companies in the metal and machinery classes were in operation. Autauga County had one machinery plant
of over 250 employees; Dallas County had a fabricated metal company in this size category. Montgomery County had a large transportation equipment plant, but this was its only establishment in the metals and machinery class with over 250 employees. The processing of food accounted for over one-third of the manufacturing employees in this metropolitan county.

In all, there were 11 manufacturing companies with over 250 employees each in the five-county area in 1963: two each in food and textiles, and one each in tobacco, furniture, printing and publishing, stone, clay and glass, fabricated metals, machinery, and transportation equipment.

Table 9
MANUFACTURING EMPLOYMENT, ALABAMA RIVER AND TENNESSEE RIVER AREAS, 1954-1963
(by place of work)

<table>
<thead>
<tr>
<th></th>
<th>1954</th>
<th>1958</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama River Counties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autauga</td>
<td>994</td>
<td>1,078</td>
<td>996</td>
</tr>
<tr>
<td>Dallas</td>
<td>2,873</td>
<td>2,811</td>
<td>2,987</td>
</tr>
<tr>
<td>Elmore</td>
<td>843</td>
<td>635</td>
<td>662</td>
</tr>
<tr>
<td>Lowndes</td>
<td>272</td>
<td>283</td>
<td>263</td>
</tr>
<tr>
<td>Montgomery</td>
<td>6,281</td>
<td>6,627</td>
<td>6,952</td>
</tr>
<tr>
<td></td>
<td>11,263</td>
<td>11,434</td>
<td>11,860</td>
</tr>
<tr>
<td>Tennessee River Counties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colbert</td>
<td>5,323</td>
<td>7,033</td>
<td>7,721</td>
</tr>
<tr>
<td>DeKalb</td>
<td>1,746</td>
<td>1,780</td>
<td>2,272</td>
</tr>
<tr>
<td>Jackson</td>
<td>1,388</td>
<td>1,901</td>
<td>2,354</td>
</tr>
<tr>
<td>Lauderdale</td>
<td>1,818</td>
<td>1,803</td>
<td>1,824</td>
</tr>
<tr>
<td>Lawrence</td>
<td>164</td>
<td>299</td>
<td>802</td>
</tr>
<tr>
<td>Limestone</td>
<td>666</td>
<td>621</td>
<td>701</td>
</tr>
<tr>
<td>Madison</td>
<td>4,397</td>
<td>6,160</td>
<td>12,598</td>
</tr>
<tr>
<td>Marshall</td>
<td>1,689</td>
<td>2,505</td>
<td>3,550</td>
</tr>
<tr>
<td>Morgan</td>
<td>4,202</td>
<td>5,300</td>
<td>6,200</td>
</tr>
<tr>
<td></td>
<td>21,302</td>
<td>27,402</td>
<td>38,022</td>
</tr>
</tbody>
</table>

In the Tennessee River area, the manufacturing companies with over 250 employees were much more diversified. Out of a total of 40 such installations, there were six in textiles; five each in primary metals and food; three each in ordnance, apparel, chemicals, fabricated metals, and electrical machinery; two each in machinery, and rubber and plastics; and one each in lumber, leather, stone, clay and glass, and transportation equipment; and one central administrative office.

Table 9, which depicts manufacturing employment for the individual counties between 1954 and 1963, substantiates the limited growth of the Alabama River area, compared with the considerable progress reported in North Alabama. Not all of the nine counties along the Tennessee River showed manufacturing development -- not all counties have sites suitable for large industrial plants. The area as a whole prospered, however, from the availability of manufacturing employment and the wide range of other jobs in trade, construction, transportation, services, etc., that are the corollaries of such development.

The Alabama River counties are by no means an industrial area at the present writing. An analysis of the major employment sectors within this geographic section reveals that both government and trade continue to outstrip manufacturing. (See Figure 9.) Manufacturing presently offers only 15,900 jobs out of a total 99,700 employed in all nonagricultural pursuits, constituting some 15.9% of the total. The situation in Autauga County is somewhat more favorable, with 1,280 manufacturing jobs, 30.8% of a total 4,150 nonagricultural jobs. But if this relationship is to continue in Autauga County and to rise in the other counties along the Alabama River, considerably more job-oriented industry must be attracted to the area.

Income

An examination of the per capita effective buying income figures for 1958 and 1968 in Table 10 emphasizes the relative lack of progress made in the five-county area along the Alabama River as compared with the nine counties of the Tennessee River area. In 1958, only the metropolitan county of Montgomery in the five-county group had a per capita income higher than the average for the state. While all these counties increased per capita income in the 10 years
(part of this gain was due to inflation), only Dallas and Montgomery improved their positions in relation to the Alabama average. Measured in terms of actual dollar increase, Montgomery was the only county which gained more than the state average.

FIGURE 9

EMPLOYMENT BY INDUSTRY GROUP: ALABAMA RIVER, 1960 – 1968
(by place of residence)

Source: Estimates of Alabama Department of Industrial Relations.
Table 10
PER CAPITA EFFECTIVE BUYING INCOME, ALABAMA RIVER
AND TENNESSEE RIVER AREAS AND STATE OF ALABAMA, 1958-1968

<table>
<thead>
<tr>
<th>Area</th>
<th>1958</th>
<th>1968</th>
<th>Change, 1958-68</th>
<th>Proportion of Alabama</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama River Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autauga</td>
<td>$922</td>
<td>$1,467</td>
<td>$545 59.1%</td>
<td>75.7%</td>
</tr>
<tr>
<td>Dallas</td>
<td>1,089</td>
<td>1,880</td>
<td>791 72.6%</td>
<td>89.4</td>
</tr>
<tr>
<td>Elmore</td>
<td>1,059</td>
<td>1,707</td>
<td>648 61.2%</td>
<td>86.9</td>
</tr>
<tr>
<td>Lowndes</td>
<td>839</td>
<td>1,203</td>
<td>364 43.4%</td>
<td>68.9</td>
</tr>
<tr>
<td>Montgomery</td>
<td>1,504</td>
<td>2,548</td>
<td>1,044 69.4%</td>
<td>123.5</td>
</tr>
<tr>
<td>Total Five-County Area</td>
<td>$1,301</td>
<td>$2,189</td>
<td>$888 68.3%</td>
<td>106.8</td>
</tr>
<tr>
<td>Tennessee River Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colbert</td>
<td>$1,251</td>
<td>$2,323</td>
<td>$1,072 85.7%</td>
<td>102.7</td>
</tr>
<tr>
<td>DeKalb</td>
<td>926</td>
<td>1,722</td>
<td>796 86.0%</td>
<td>76.0</td>
</tr>
<tr>
<td>Jackson</td>
<td>895</td>
<td>1,775</td>
<td>880 98.3%</td>
<td>73.5</td>
</tr>
<tr>
<td>Lauderdale</td>
<td>1,260</td>
<td>2,339</td>
<td>1,079 85.6%</td>
<td>103.4</td>
</tr>
<tr>
<td>Lawrence</td>
<td>884</td>
<td>1,364</td>
<td>480 54.3%</td>
<td>72.6</td>
</tr>
<tr>
<td>Limestone</td>
<td>963</td>
<td>1,800</td>
<td>837 86.9%</td>
<td>79.1</td>
</tr>
<tr>
<td>Madison</td>
<td>1,134</td>
<td>2,959</td>
<td>1,825 160.9%</td>
<td>93.1</td>
</tr>
<tr>
<td>Marshall</td>
<td>992</td>
<td>2,199</td>
<td>1,207 121.7%</td>
<td>81.4</td>
</tr>
<tr>
<td>Morgan</td>
<td>1,158</td>
<td>2,398</td>
<td>1,240 107.1%</td>
<td>95.1</td>
</tr>
<tr>
<td>Total Nine-County Area</td>
<td>$1,085</td>
<td>$2,371</td>
<td>$1,286 118.5%</td>
<td>89.1</td>
</tr>
<tr>
<td>Alabama</td>
<td>$1,218</td>
<td>$2,028</td>
<td>$810 66.5%</td>
<td>100.0</td>
</tr>
</tbody>
</table>


In the North Alabama area, two counties (Colbert and Lauderdale) ranked above the state average in 1958. By 1968 three other counties -- Madison, Marshall, and Morgan -- also had achieved a per capita income level above that of Alabama. In addition, all the counties with the exception of Lawrence made substantial gains relative to the state average. The biggest change was in
Madison County, and the smallest gainer (DeKalb County) improved its position by nearly nine percentage points.

The five-county Alabama River area as a unit maintained its per capita income above the average for the state between 1958 and 1968 (see Figure 10), and improved its position from 106.8% to 107.9% of the Alabama figures. This was due chiefly to the dominant influence of Montgomery County, a high-income county with some 58% of the area's population.

FIGURE 10

PER CAPITA EFFECTIVE BUYING INCOME: AUTAUGA COUNTY, ALABAMA RIVER AND TENNESSEE RIVER AREAS, AND STATE OF ALABAMA, 1958 AND 1968

Source: Based on Table 10.
INDUSTRIAL SITE SITUATION

Introduction

One of the purposes of this survey is to identify land sites along the Alabama River which meet standards for industrial development in terms of navigation and water use, transportation complex of the area, and utility infrastructure. In this manner, those sites appearing to have industrial potential will be called to the attention of the appropriate Autauga County authorities.

The area examined embraces the north bank of the Alabama River between the eastern border of Autauga County and Selma, from the river to a point approximately three miles north of the river, as well as a more cursory examination of identified sites along the river's south bank. Primary focus of the survey was on the industrial potential of areas in the vicinity of Prattville. The field survey was carried out in the fall of 1969, following a review of pertinent topographic maps and other data covering the study area.1/

Among basic criteria used by modern industry to locate new plant facilities is the availability of good industrial sites. As previously indicated, the larger facilities require proportionately large acreages with extensive utility services and choice of several transportation modes. As a consequence, a broad range of industrial plant sites should be sought by any community or area that is seriously engaged in industrial development as a process of creating new jobs.

Each industrial site offers different advantages, depending on its topography and its relationship to highways, rail, river transportation, and to utilities. Availability of water transportation to abutting land areas is limited by depth and flow of the river and flood levels, as well as topography. An area which can offer a full range of sites, including river locations suitable for water transport, has a decided development advantage over many, and perhaps most, areas of the U. S.

1/ Prior consultations were held with interested and knowledgeable individuals in Autauga County, the Montgomery Area Chamber of Commerce, and the Alabama Development Office. Representatives of the Montgomery Area Chamber of Commerce and the Autauga County Agent assisted in the field survey.
General Site Criteria

An industrial site is more than just a land parcel. Several criteria must be met, in a proper relationship, to make an industrial site.  

**Topography.** Any tract of land to be of interest as a potential industrial site must be topographically suitable. Preferably, it should have a slope of 5% to 10%. This does not necessarily mean that the land surface must always be flat or nearly flat, because certain industries and some situations will permit use of quite rugged terrain. Some relatively rugged sites may be improved and adapted to industrial use through grading. The topographic factor in site selection also includes underlying geologic conditions, since these affect not only the topography of an area but also its drainage and load-bearing capacity.

**Utilities.** Any industry must have water to some degree, along with sewers or some other facility for handling the waste water. Generally, even minimum industrial areas will require more water and sewerage services than will residential and commercial areas, but the demands for these services differ with the types of manufacturing operations. It is essential, therefore, that water and sewerage or some other forms of waste disposal either be available in the site area or so located that they can be economically extended to the site area. Also, the service lines must be of sufficient sizes to meet the needs of the industries using the utilities.

Industry also needs some power source to operate its equipment, to heat and air-condition its plant, and to provide light. Electricity and natural gas are the two basic sources of power and of heating used by modern industry; of these two, electricity is a must. While all industry will not require natural gas, the attractiveness of a site may be reduced if this fuel is not readily available.

**Transportation.** Industry must have access to transportation. All potential sites should have frontage at some point on the community's major thoroughfare system or a major highway, and at the minimum, easy access to the system. Some industries will require rail and water transportation; the site that

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2/ The following discussion of site criteria and river sites is based upon George I. Whitlatch and Winfred G. Dodson, *Industrial Sites, Their Selection and Development*, Industrial Development Division, Engineering Experiment Station, Georgia Institute of Technology, 1968, pp. 8-10 and 33-34.
combines good access to both rail and water transportation in addition to highway access has an increased potential.

Ownership. An area of vacant land may appear to have a favorable relationship to transportation and utilities, but this is no assurance of its availability. Often tracts of relatively small acreage may involve a number of ownerships, and the greater the multiplicity of ownerships, the greater the difficulty of acquisition. Some lands cannot be acquired in fee simple because of existing leases or mineral rights, power or gas line easements, or similar encumbrances or conflicts. Further, estate entailments involving minor heirs may make acquisition of the land very difficult, if not impossible. Existence of family or private cemeteries often complicates the assembly of a complete land tract, so the potential user is blocked. Even where land is in a single ownership, the owner may not wish to sell.

River Site Criteria

A specialized site situation is the "river" or "water" site where a manufacturing operation requires location along a river or other stream in order to obtain processing water in substantial volume and/or to obtain the advantage of water shipping. Ordinarily, the demand for this kind of site is by industries in the chemical field or other "wet industries," such as pulp and paper mills, and the need is for substantial acreages. Both size and topography of the site are of major importance since, in many cases, the problem of waste disposal can be solved more easily by using shallow basins for storage as equalization tanks and oxidation lagoons. Alternatively, reservoirs which provide a substantial amount of impoundment can be used for storage, with release controlled in proportion to the ability of the stream to handle the wastes.

Because of increased pollution controls, both at the state and federal levels, the wet industries will have to provide more effective methods of waste treatment and disposal. As suggested above, this often will necessitate site acreages of substantially greater magnitude than this type of industry formerly required.

One engineering firm specializing in these wet industries bases its search for a pulp and paper mill site on the basic requirement of 400 acres for the plant site and 4,000 acres for lagoon areas. One of the nation's leading chemical firms has established 500 acres as the minimum size for any of its river
sites, although a range of 70 to 404 acres for chemical plants was cited in one study. The median, however, was about 250 acres.

Obviously, the selection of a river site is a specialized task involving a complex of factors, chief among which are the following: sufficient acreage for both plant and any needed waste disposal facilities, a topographic situation that affords the actual plant site safety from flooding (although lagoons or other disposal areas may be in flood plain areas with proper gravity flow and flood protection), and proximity to transportation routes, usually both railroad and highway, and fuel and power supplies. In certain situations, flood plain areas can be used as plant sites if flood protection is offered by levees, flood walls, or similar protective measures.

Few, if any, communities can afford to keep sizable river sites under control, even by long-term option, but it is desirable that any community development group maintain specific and comprehensive information on all potential river sites in its area. Gone is the day of the "dream" river site when such a site was not considered unless it had access to a water supply which could be used without treatment of any type as well as indications that waste disposal could be easily provided. Today, good river sites under any condition are difficult to find, and those that can be satisfactorily developed within existing pollution controls deserve protection and reservation for future industrial use.

In certain situations, industrial plants may have to be sited at some distance from their water source. For example, a river with a wide flood plain may necessitate location of the plant on a terrace or other upland area above flood level. Usually, any land 40 feet or more above the normal level of a stream can be considered safe from flood. However, to obtain such protection, it may be necessary to go a half mile or more back from the stream channel. If the projected operation requires the pumpage of large volumes of water from the river, these factors of distance and height become major economic considerations because they affect pumping costs.

These costs tend to increase in proportion to the distance between river and plant site, as well as the height of the site above normal river level. As

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the distance increases, frictional resistance increases in the line, and the higher the elevation of the site, the greater is the hydrostatic head that must be overcome. Either of these factors increases pumping costs, with the maximum costs resulting when the water service line is excessively long and the site is at high elevations along a river bluff. Under conditions where the water line is at a level between river and plant, the maximum distance for economical pumping of several million gallons of water daily is usually a mile or less. This distance limit, obviously, decreases with increased elevation of the line to the plant site.

The Alabama River Area Site Situation

During the three-day field survey, site areas were inspected along the north and south banks of the Alabama River in Montgomery, Lowndes, Dallas, and Autauga counties. Twelve river site areas were surveyed. (See Map, Figure 11.) Four areas were in Autauga County, two were north of the river in Dallas County, and six areas were south of the river and outside Autauga County.

Prior to field inspection, topographic maps were reviewed to determine likely site areas. In subsequent consultations with individuals familiar with the local situation, some areas were dropped from consideration based on information on flooding or planned developments by the Corps of Engineers. Areas which appeared to have some potential but later were deleted include the Days Bend area, site of Jones Bluff Lock and Dam; the eastern half of the Tyson site area, location of the proposed Cypress Creek Park; and the northeast section of the Antioch site area, location of the proposed Gunter Hill Park.

While each site area differed from the others in some respects, generally each area examined was in agricultural use, with some scattered residential development. Flood elevations generally ranged from 140 to 160 feet mean sea level (MSL) over the study area. Pool level along the Alabama River in this area following completion of Jones Bluff Lock and Dam is projected to be 125 feet. For purposes of this study, 165 feet MSL is considered to be the minimum flood-free elevation with the dam in place, considering the above-mentioned 40-foot elevation above normal river level as safe for construction.

Water for domestic supply generally may be obtained from wells ranging from 200 to over 1,200 feet in depth. Water for processing purposes can be obtained from the river and treated waste water returned to the river.
FIGURE 11

MAP OF INDUSTRIAL SITES AND PROPOSED RECREATION AREAS ALONG THE ALABAMA RIVER

INDUSTRIAL SITES

1. AUTAUGA CREEK
2. PRATTVILLE
3. WADSWORTH
4. DUTCH BEND
5. BURNSVILLE
6. BELCHER
7. MINTER
8. BEERS
9. BYSON
10. SCOTT
11. BURKVILLE
12. ANTIOCH

PROPOSED RECREATION AREAS

A. AUTAUGA CREEK
B. HURRMAN BAR
C. GUNTER HILL PARK
D. TALLAWESEE CREEK
E. SWIFT CREEK
F. CYPRESS CREEK PARK
G. GORDON BEND
H. JONES BLUFF PARK
Autauga Creek Site. Of the six site areas examined along the north side of the river, only one, the Autauga Creek site area, appears to be suitable for dock facilities and river navigation use, although other areas studied might provide suitable sites for industries requiring river water for processing and disposal of treated sewage. In some cases, flooding may keep development too far from the river to permit the economic piping of water from river to plant.

The Autauga Creek site area (identified as Site 1 on Map, Figure 11), however, has an elevation of approximately 240 feet MSL at the river, permitting industrial use of this area even during flood. Maximum reported flood elevation along this part of the river is 161 feet, recorded at Montgomery in 1961. A review of Corps of Engineers Flood Frequency Profiles reveals this flood level to be equivalent to a 50-year storm frequency and probably close to the highest flood level one can expect. Flood level for a 100-year storm frequency in the vicinity of Autauga Creek (western boundary of the property) when Jones Bluff Lock and Dam is completed will be approximately 159 feet.

At or above the 240-foot contour level, the Autauga Creek site area contains approximately 400 acres of level land in the form of a broad plateau ranging in elevation from 240 feet to 260 feet. This plateau extends from Autauga Creek on the west to a ridge on the east side which also borders the Prattville site area. Both land area and topography would permit industrial use. On-site inspection of the Autauga Creek site area did not show any rock outcroppings to indicate grading difficulties due to underlying rock near the surface.

Other factors contributing to the Autauga Creek site area's feasibility are its nearness to rail service, to paved highway, to utilities, to urban development and its land area size and topography. Development of the Union Camp plant west of the Autauga Creek site area has given an industrial character to the area. A rail lead track has been extended to this plant, and an additional rail lead could be developed to serve the Autauga Creek area from the Union Camp rail. A paved highway, County Road No. 4, surfaced to approximately

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a 30-foot width, is located at the property's north end. This road intersects with U. S. 31-82, a four-lane, divided facility connecting Prattville with Montgomery, about 1½ miles east of the Autauga Creek site area.

In terms of utility development, this area has electric power from Alabama Power Company and natural gas from Alabama Gas Corporation. Groundwater is reportedly available in the area at approximately 200 feet. The river would be available as a water source for processing and for disposing of treated effluent. City water and sewer services reportedly do not extend this far south.

Prattville, about 1½ miles north of the Autauga Creek area, provides both a nearby source of labor and living and shopping areas. Downtown Montgomery is about 30 minutes away by car.

Other site areas studied along the river's north bank include: the Prattville site area between the Autauga Creek site and the Gulf, Mobile and Ohio Railroad; the Wadsworth site area, between Rocky Branch and Noland Creek and from Alabama Highway 14 south to the river; the Dutch Bend site area from Hayward Creek east to Swift Creek and from Alabama 14 south to the river; the Burnsville Site area, generally extending from Alabama 14 on the west and north to Mulberry Creek on the east and south, to a line extending from the Hammermill plant site west to Alabama 14; and the Belcher Site area south of the Hammermill plant site, a long narrow strip along the river bounded on the west by an improved rural road and a section line and on the south by a section line. These sites are discussed briefly below, with a more detailed analysis provided as Appendix 3.

**Prattville Site.** Some 10 years ago, this tract (identified as Site 2 on Map, Figure 11) was considered a potential industrial site, but it has remained in agricultural use. Southeast of Prattville and along the Alabama River, it is bounded on the east by the Gulf, Mobile and Ohio Railroad, and on the west by the Autauga Creek site. About 400 acres in the northwest corner are above the 165-foot contour and could be utilized for a manufacturing operation.

**Wadsworth Site.** This area (identified as Site 3 on Map, Figure 11) is dominated by an elongated plateau running generally northeast-southwest, ranging in elevation from 300 feet at its north end to 200 feet further south. This site area does not lend itself to construction, except north of Wadsworth Ponds. The river is reported to have flooded the area south of the ponds in 1961,
Putting safe construction area at about 3½ miles from the river, too far to permit pumping of water from the river.

Development of rail service to the area would be difficult, if not impossible. The nearest rail line is about six miles north at Pate, and a rail lead would require crossing a swamp and hilly terrain. Site development also would entail additional highway development. Immediately beyond the southwest corner of the Wadsworth site area, in the vicinity of Mount Ramoth Church, lies an area which might have dock development potential. Here a bluff at an elevation of about 180 feet comes to within 500 feet of the river. However, this area is proposed for development by the Corps of Engineers as the Huffman Bar area for recreational purposes.

**Dutch Bend Site.** Like the Wadsworth area, this area (identified as Site 4 on Map, Figure 11) is too far removed from both rail and river to be easily developed. Rail service would require building more than eight miles of track over hilly terrain. The minimum safe elevation for building, 165 feet, is about three-quarters of a mile from the river. Site development also would entail considerable road improvements since the area is now served primarily by a network of unpaved roads.

**Burnsville Site.** This area (identified as Site 5 on Map, Figure 11) now has rail through its southern section because of the Hammermill plant development south of Gardiner Island. The area's road improvements also stem from Hammermill's location, with a 30-foot-wide paved facility serving the plant site. Remaining available land north of Hammermill which would be above flooding is about 1,000 feet from the river. The possibility of using Big Mulberry Creek for dock facilities and for access to the river also appears a remote possibility because flood-free land areas adjacent to the creek range from one-fourth of a mile to one mile away. However, this site area appears to have some potential for water-using industry. Its location, a considerable distance from Prattville and outside Autauga County, means that the employment impact on Autauga County will be somewhat limited.

**Belcher Site.** Development of this site area (identified as Site 6 on Map, Figure 11) would have a limited impact on the Prattville area because of its distance. The minimum elevation for construction (about 165 feet) lies entirely in the area's north end, where some 300 acres could be utilized. It is
assumed that nearby utilities at Hammermill could be extended to this area along with rail facilities. Site development probably would require consider-
able grading and road-building.

Site Areas South of the River. The six site areas south of the Alabama River are of marginal value to the Prattville area and its industrial develop-
ment program because of the travel time and distance involved. Although the river may facilitate the movement of goods by barge, its location and the lack of an access bridge across the Alabama River between Montgomery and Selma impedes travel by Prattville workers to plants on these sites, with the possi-
ble exception of the Antioch site. However, a part of the Antioch area is being taken by the Corps of Engineers to create Gunter Hill Park. Creation of this park may reduce or eliminate the Antioch area's industrial use potential by creating an incompatible land use situation. Site areas south of the Ala-
bama River appear to be generally suitable for the use of industry requiring docks and river transport.

The Antioch site (identified as Site 12 on Map, Figure 11) has a high bluff overlooking a river bend; however, this section of Antioch is reported to re-
quire extensive grading and could be very expensive to develop. It does offer nearby paved highway access and rail within 1½ miles, as well as natural gas and electric power.

The Burkville (or Manack) site area (identified as Site 10 on Map, Figure 11) has rail along its south side. Road access is over a 30-foot-wide, graded gravel road along the area's south side. The best potential area here for a plant site probably would be on the tract's east side, north of Manack.

The Scott site area (identified as Site 11 on Map, Figure 11), in the vicinity of Dutch Island, appears to have in its south central section an area of approximately 650 acres with good potential, if utilities, highway, and rail can be developed. Elevations vary some 60 feet over the tract from 260 to 200. This area would be above flood level and has river frontage which would be above flood level. However, rail is approximately two miles south of the area, and the existing gravel road access would have to be improved. Although there is electric power, natural gas is not presently available.

The Tyson site area (identified as Site 9 on Map, Figure 11), near White Hall, is to be acquired by the Corps of Engineers for development as Cypress.
Creek Park. This area's future potential as an industrial site is doubtful since it appears park development will take all river frontage lying above flood level. Moreover, both park and industrial development in the usable part of the Tyson area would create an incompatible land-use situation.

The Beers site area (identified as Site 8 on Map, Figure 11), near Benton, has undergone partial development west of Old Town Creek as a location for a Dan River Mills textile plant. The Beers area has the best rail and highway access situation on the south side of the river -- to U. S. 80, a four-lane, divided facility, with the Western Railway of Alabama line crossing through the area. However, flood-free land (above an elevation of 165 feet) lies from three-quarters of a mile to 1½ miles from the river. Within this contour there is an area containing about 600 acres.

The Minter site area (identified as Site 7 on Map, Figure 11), north of Beers, has rail immediately to the south. Flood-free land, as in the case of Beers, is some distance from the river. The area is dominated by a plateau at the 200-foot level in its southwest corner, containing approximately 400 acres. Development within Minter would require road improvements. Natural gas would have to be extended from the Dan River Mills plant.

In general, all site areas south of the river, except those removed from possible industrial use by public use area designation, have some industrial site potential where elevations exceed flood levels. Due to the location of these flood-free areas in relation to the river, usable land for a plant location is frequently too far from the river to make possible the use of river-front dock facilities and, in some cases, too far to economically pump river water to a plant.
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It was deemed essential to examine existing land development trends from Prattville south to the river in order to project future land development within this area. As employed here, "land use" refers to the manner in which land in a particular section is being put to use presently or how, if present trends continue, it may likely be used in the future.

**Land Development Determinants**

Land development results from several causes or determinants. A particular use of a particular land parcel results because several factors have worked together to cause individuals to decide to use the land in that manner. The amount of land in use in a community at a given time generally reflects its population size. For instance, a town of 10,000 population will require more land in residential, commercial, industrial, and other land use to meet its needs than would a community of 5,000 people.

**Existing Land Use.** The type of development already in an area greatly influences the development of adjacent areas. Existing residential use can attract more housing development nearby. At the same time, existing residences may encourage nearby commercial development if there are enough people to provide a market.

**Utilities.** Availability of water, sewer, natural gas, electric power, and telephone services encourages and assists land development. While gas, power, and telephone services are almost universally obtainable, water and sewer services are not so common, even within some developed communities. Not only the presence of water and sewer services, but also their degree of availability influences land use. An area with large water and sewer lines possibly can serve and attract industrial development, while areas served by smaller lines, or possibly without service, are more limited as to the types of land use they can support. However, the development potential of an area for industrial use may be so great that it justifies extending large-size water and sewer lines into the area.

**Transportation.** Transportation facilities have a similar impact on land use. Availability of the proper highway, rail, air, and water transportation facilities can give an area one type of use potential while their absence can
give it another. Areas with good access to major highway, rail, and water transport have an industrial use potential because industry needs some or all of these facilities. Such a location would not necessarily be the best place to locate a residential subdivision, however. Retail development usually occurs along major thoroughfares, main streets, and at some major street intersections, where a sizable market is reasonably nearby. The absence of major thoroughfares virtually eliminates commercial development but provides the type of environment needed for residential development.

**Topography.** The degree of slope over a particular tract will limit its use. Steep hillsides or mountainous areas can be used for recreation sites and sometimes for residential subdivisions but have little potential for other land uses. Land that is low-lying and subject to periodic flooding may be usable only for agriculture and/or recreation purposes. Industrial uses of land are much more restrictive as to topography, with a strong preference for moderate terrain with good drainage.

**Desires of Local Citizens.** The collective desires of the local citizenry, sometimes local pride, also will determine what develops where. This factor also probably has more to do with the quality of development than any other because a town's appearance usually reflects what its citizens want it to look like. Local desires have impact on development either through providing for adequate control or the absence of control. Controlled development requires community approval and support of land-use planning, zoning, subdivision regulation, and their intended use as determinants in guiding land development. Uncontrolled development means community approval and support of haphazard or the "let it happen anywhere" type of development. In this situation, the lack of control helps to determine land use by creating a path of least resistance and by keeping local government out of the land-use decision-making process.

**Economics.** The cost per acre of land and its return on investment for a particular use compared to its cost and return for other uses determines in part how land is used. When individuals see a profitable business opportunity at a particular location, they will likely take advantage of it.

**Ownership.** Whether a particular land parcel is to be used for residential, commercial, or industrial use -- all other things being equal -- also is determined by its owner. For one or many reasons, the owner may prefer or
may not prefer to put his land to a particular use. Multiple ownerships or unsettled estates sometimes have their impact on land use by making it impossible to place acreages on the market.

Several or all of these determinants interact to bring land into, or to keep it out of, active use.

Existing Land Use

Existing development is an important indicator of future land-use trends. Although the area between Prattville and the river is of major concern, land utilization along major thoroughfares and within areas from central Prattville south to the city limits also were studied to determine land-use growth trends as they will probably continue along the growth corridors.

A one-day land-use field survey was conducted in the Prattville area, generally from Fourth Street (U. S. 82) and Martin Boulevard south to the Alabama River and from County Road No. 75 west to the Fourth Street Bypass (U. S. 82) intersection. Appropriate information was recorded on a 1966 map of Prattville, including general data on structural conditions and appearance. Prattville's major growth thrust appears to be to the south and to the east.

The study area's transportation network is basically good. U. S. 82 Bypass, a four-lane facility, serves the area and intersects with highways serving Selma (Alabama 14), Montgomery (U. S. 82-31), Tuscaloosa (U. S. 82), and Birmingham (U. S. 31). By 1971 the local highway situation will be improved even further with completion of the Interstate 65 link. From the north, it will pass about four miles east of Prattville, continuing through Montgomery and interchanging with I-85. Through U. S. 82-31 and Alabama 14, the area will have access to this interstate facility and to the major cities it serves.

A proposed interstate-type highway linking Meridian, Mississippi, with Macon, Georgia, and passing through Autauga County probably will follow much of the existing Alabama 14 alignment. Although the status of this highway is somewhat uncertain, it may be built within 10 years. Its construction through the county would further enhance the development potential in the Prattville area, with an east-west interstate-type facility linked with other parts of the interstate system.
The study area has rail service from the Gulf, Mobile and Ohio Railroad line between St. Louis, Missouri, and Montgomery. This line passes through Prattville, turning south and crossing under the U. S. 82 Bypass near Dosterville. In the vicinity of this crossing, two rail spurs have been developed to serve new industry -- one serving the Union Camp plant south of Prattville and the second the Stegall-Sylvest Company plant at McQueen. Both of these rail leads open up development opportunities by increasing the feasibility of rail service to other potential site areas.

East of Prattville, land use is generally agricultural with some scattered residential development. Agricultural use continues westward into the city limits along County Road No. 2 (Martin Boulevard) to Pine Creek and south along the creek to U. S. 31 and 82. Most of this area is zoned R-2 Residential, except for a strip along U. S. 31-82 containing a mixture of business (B-1) and light industrial (M-1) zoning.

Land development along U. S. 31-82 from Martin Boulevard southeastward toward Montgomery is a mixture of residential and commercial interspersed with vacant land in the vicinity of Pine Creek and south of Doster Street to the city limits. From Prattville's limits southward, the mixing of commercial and residential becomes more intense and signs of structural deterioration become more evident (for example, a junkyard or public dump located near the U. S. 82 Bypass intersection). Although some vacant land exists between this strip development and its counterpart across the Alabama River in Montgomery County, apparently commercial development along U. S. 31-82 will merge within a few years into a solid strip between Montgomery and Prattville. Such development in time will reduce the traffic-carrying capacity of U. S. 31-82, and if the present quality of development continues along the roadside, its appearance will considerably mar one of Prattville's major highway entrances. Areas of mixed land use indicate a transition from one primary use to another. If deterioration is unchecked, such areas can rapidly become slums.

Land use along U. S. 82 Bypass is primarily vacant or agricultural with some scattered residential development. Southwest of the bypass, the country club golf course is the only land use outside the residential, vacant, or agricultural categories. The clubhouse and course are visually pleasing additions to the landscape in this section of town.
Land use along Alabama 14 (Washington Street), County Road No. 35, and Gin Shop Hill Road is mostly residential, with vacant or agriculturally used land becoming dominant at Prattville's city limits.

There appears to be a trend toward strip commercial development along U. S. 82 on Prattville's west side. As in the case of development east of town, a deteriorated appearance and slumlike development can result if care is not taken in controlling and guiding land development in this area.

Some deteriorated areas were noted in and near Prattville along Gin Shop Hill Road, County Road 35 and Alabama 14. These areas have been identified in the public mind as places where refuse can be dumped because local government has permitted this use. Such areas grow into a bigger problem if no action is taken to regulate trash disposal and clean up these areas.

Prattville has some residential development which is an attractive asset to the community, notably new subdivisions at the intersection of Alabama 14 and U. S. 82 Bypass; north along Alabama 14 in the vicinity of Mill Pond Road; and on the east side of town in the vicinity of Martin Boulevard (County Road No. 2).

Land Development outside Prattville

Immediately south of Prattville's limits are scattered residential developments and considerable vacant or agricultural land. South of Alabama 14 and County Road No. 4, residential development becomes extremely scattered and agriculture becomes the dominant use, except for the large Union Camp plant site south of town. Land south of Prattville generally is level to rolling, falling from a high elevation of about 300 feet MSL to about 100 feet at the Alabama River, except for a high bluff just east of Autauga Creek overlooking the river at an elevation of 200 feet. At this point, a large triangularly shaped plateau area at the 200-foot level -- bounded generally by Autauga Creek, County Road No. 4, and a ridge line -- reaches the river. Although this 200-foot plateau continues westward from Autauga Creek, at no other point in the Prattville area does it approach the river.

Below the 200-foot elevation, land reportedly is usable for construction to a minimum elevation ranging from 160 to 140 feet. Reported flood levels along the Alabama River in the Prattville area reached 163 feet in 1886. The U. S. Army Corps of Engineers' graph "Alabama River Natural Profile and with Jones Bluff Dam in Place" shows a water level of about 159 feet at Autauga
Creek for a 100-year frequency flood, while a 25-year storm has a level of about 155 feet. It would appear that the 165-foot level would be the lowest safe elevation for building, and below this level it would not be feasible to erect permanent structures of any appreciable value. Land use below 165 feet generally should be limited to such open-space uses as agriculture, parks, and play fields because of the flood problem. The county should consider controlling future development within this flood plain through a county-wide zoning ordinance which would provide for the proper types of land use in flood areas while restricting incompatible types of development.

Summary

Existing land use south from Prattville to the river generally lacks a focus. Urban-type development tends to be scattered and strung-out along the U. S. 82 Bypass, Alabama 14, County Road No. 4, and intersecting roads radiating southward from the city limits. Vacant land and somewhat scattered development are evident within the city limits, indicating there is room for additional growth in Prattville. However, the bypass route, County Road No. 4, Alabama 14, and existing rail lines provide the area with a good transportation network and, therefore, a good development potential. This potential has been enhanced by location of the Union Camp facility, which spurred improved rail and utility service in the area.

General Trends and Anticipated Development

Several factors will have their impact on Prattville's future land development. Along with existing trends, these include present zoning, topography, flooding, and proposed development by the U. S. Army Corps of Engineers. All will play a role in determining the future land-use pattern. (See Map, Figure 12.)

Residential and Agricultural. If present development trends continue, much of the land south of Prattville will most likely be either residential or agricultural. Residential development will probably locate and fill in vacant areas adjacent to the rather scattered residential development south of U. S. 82 Bypass, between the bypass and County Road No. 4. Residential use in this area probably will extend from Gin Shop Hill Road on the west to Autauga Creek on the east. The golf course and country club located on the bypass west of
FIGURE 12

PROPOSED GENERAL LAND USE IN AREA SOUTH OF PRATTVILLE

PRATTVILLE

GULF, MOBILE & OHIO RAILROAD

U.S. 82

BYPASS

UNION CAMP

ALABAMA RIVER

PROPOSED GENERAL LAND USE IN AREA SOUTH OF PRATTVILLE

INDUSTRIAL

RESIDENTIAL

SWAMP

COUNTRY CLUB
Gin Shop Hill Road possibly will attract a high quality of residential development. For the most part, land southwest of Prattville should go into residential use. The adjacent in-city area is zoned R-1 Residential, and within this area some good-quality residential development exists.

Topographically, the area contains flat to rolling land with a hill at about the 400-foot elevation in the vicinity of the U. S. 82 Bypass intersection with U. S. 82 on the west side of Prattville. West of the bypass-Alabama 14 intersection, however, are several swampy areas which do not appear to be suitable for building. Otherwise, the area appears to be suitable for residential use, since homes are more adaptable to a broader topographic range, from flat to hilly. At present, the southwest area lacks potential for industrial use since it is without rail service and appears to have utility services geared to residential use. Some limited commercial development probably will occur at selected spots to serve the convenience shopping needs of area residents.

Agricultural development probably will continue as the single largest land use in the area. The effect of Jones Bluff Dam will be to create a pool level of about 125 feet, based on a one-year flood frequency.\(^1\) This level will reach 143 feet on a two-year flood frequency and 156 feet on a 25-year frequency. Roughly below the 165-foot contour then, the land is subject to periodic flooding, and should not be used for constructing permanent facilities. Future experience with water inundation will offer guidance on levels to be expected, and building restrictions can be adjusted accordingly. Map study and ground reconnaissance indicate the existence of large swampy areas that cannot be utilized efficiently for industrial activities.

Commercial. Some limited commercial development probably will occur at selected locations in the study area to serve the convenience shopping needs of residents. Exact locations are not projected in this report because they depend on the development pattern of other land uses, especially the future distribution of population and the future thoroughfare network. Some commercial development may occur outside Prattville along the U. S. 82 Bypass, and perhaps in the vicinity of Papermill Road and County Road No. 4. Most of the

\(^{1/}\) U. S. Corps of Engineers, "Alabama River Natural Profile and with Jones Bluff Dam in Place."
bypass frontage inside Prattville is presently zoned residential. Commercial
development along U. S. 31 and 82 can be expected to continue southeast toward
Montgomery. Similar commercial growth is noted along U. S. 82 west of Pratt-
ville. In both cases, steps should be taken to discourage strip commercial
development and rather encourage future commercial growth clustering in shopping
centers at key points.

**Industrial.** East of Autauga Creek, between County Road No. 4 and the
U. S. 82 Bypass, is land with a good industrial potential. The land is flat
to rolling, has rail service, and has good highway access from the bypass on
the north and County Road No. 4 on the south. Rail line extensions south to
Union Camp and to Stegall-Sylvest Company also make possible the development
of industrial sites from County Road No. 4 south to approximately the 165-foot
contour elevation.

Industrial use requires water and sewer lines of fairly sizable diameter
as well as ample quantities of electric power and natural gas. While these
services are not present in the area to a sufficient degree to serve industry
at this time, the area meets enough of the basic industrial site requirements
to merit industrial use. Nearest water service in the area is at the inter-
section of Alabama 14 and U. S. 82 Bypass. Union Camp provides its own water
requirements from an intake station at Autauga Creek and the Alabama River.
Natural gas is available in the area. If necessary, additional utility exten-
sions could be carried out later as needed to develop the area.

Prattville will need to reserve land for future industrial sites. Since
land in the southeast quadrant appears to meet industrial use qualifications,
with suitable land not readily available throughout the Prattville area, its
future development should be guided toward industrial use. Although the Pratt-
ville Experimental Field is located in this section, at some future date it
may prove desirable to relocate this facility to another part of Autauga
County. Anticipating this eventuality, it is recommended that this area also
be reserved for industrial use.

**Other Developments.** Schools and other facilities of a public nature must
be located in the area as needed to serve growth. No attempt is made here to
pinpoint such locations. Development of such facilities will depend on the
number of people locating in the area and their distribution pattern. Addi-
tional recreation and recreation-related developments are anticipated along
the river because of proposed Corps of Engineers development in conjunction with the Jones Bluff Lock and Dam project. From Jones Bluff east to Montgomery, approximately nine recreation site areas currently are planned by the Corps of Engineers. Three of these areas, Autauga Creek, Cooters Pond, and Montgomery, are relatively close to Prattville. The reservoir created by Jones Bluff Dam no doubt will generate additional pleasure boat use leading to recreation-related land uses such as marinas and other commercial developments.

Guiding Future Growth. Prattville and Autauga County together should take certain steps to insure that future development conforms to a logical land-use pattern, geared to the needs of anticipated population growth. Both city and county should undertake a coordinated land-use plan to guide future development. Growth will not be confined to Prattville alone, so that provision should be made in such a plan to coordinate development between county and city.

Along with plan development goes plan implementation, requiring, among other things, zoning and subdivision regulation. Zoning guides the type of land development in various areas of the city or county along lines set up by the land-use plan. Subdivision regulations guide the quality of subdivision development by setting standards and by requiring certain improvements. Special consideration should be given in developing flood plain zoning to guide development below the 165-foot elevation.

Prattville has an existing land-use plan, prepared several years ago. This plan should be updated in light of current developments cited in this report. At the same time, a county development plan should be undertaken and its elements coordinated with those in the city plan. The most desirable situation would be to combine city and county zoning into one unified ordinance based on a county-wide land-use plan. Combined city-county subdivision regulations also would be desirable. Anticipated general land-use patterns which could guide such zoning are shown in Figure 12.
APPENDICES
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Appendix 1

NET MIGRATION ESTIMATES, 1960-1966

<table>
<thead>
<tr>
<th>Alabama River Area</th>
<th>Tennessee River Area</th>
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<td>+ 500</td>
</tr>
<tr>
<td>Dallas</td>
<td>DeKalb</td>
</tr>
<tr>
<td>- 5,900</td>
<td>- 500</td>
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<tr>
<td>Lowndes</td>
<td>Jackson</td>
</tr>
<tr>
<td>- 2,700</td>
<td>- 1,700</td>
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<tr>
<td>Elmore</td>
<td>Lauderdale</td>
</tr>
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<td>+ 800</td>
<td>- 400</td>
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<tr>
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<td>Lawrence</td>
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<td>Limestone</td>
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<td>Marshall</td>
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<td>Morgan</td>
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Appendix 2

POPULATION TRENDS, FIVE-COUNTY ALABAMA RIVER AREA, 1930-1966

<table>
<thead>
<tr>
<th>County</th>
<th>April 1930</th>
<th>April 1940</th>
<th>April 1950</th>
<th>April 1960</th>
<th>July 1966</th>
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<tr>
<td>Autauga</td>
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<td>20,977</td>
<td>18,186</td>
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<td>Dallas</td>
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<td>55,245</td>
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<td>Elmore</td>
<td>34,280</td>
<td>34,546</td>
<td>31,649</td>
<td>30,524</td>
<td>34,000</td>
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<td>Lowndes</td>
<td>22,878</td>
<td>22,661</td>
<td>18,018</td>
<td>15,417</td>
<td>14,700</td>
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<td>Montgomery</td>
<td>98,671</td>
<td>114,420</td>
<td>138,965</td>
<td>169,210</td>
<td>174,200</td>
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<tr>
<td>Five-County Area</td>
<td>230,617</td>
<td>247,849</td>
<td>263,088</td>
<td>290,557</td>
<td>302,800</td>
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</table>

Appendix 3
DETAILED SITE AREA DESCRIPTIONS

The following descriptions provide additional detail on each site area examined. Descriptions of the Belcher, Minter, Beers, Tyson, Scott, Burkville, and Antioch site areas are based upon "The Problems of River Site Development: Examples from the Coosa-Alabama River System."¹/

Autauga Creek Site

This site area (identified as Site 1 on Map, Figure 11) of approximately 400 acres is a broad V-shaped plateau formed at the 240-foot elevation line by a ridge paralleling Autauga Creek on the west and one running northeast from the Alabama River to County Road No. 4 near McQueen. The area is bounded on the north by County Road No. 4, paved to a 30-foot width. The site is located 1½ miles south of the Prattville city limits. The Prattville site lies immediately to the southeast. Elevations range for the most part from a high of 250 feet in the north along the road to 240 feet at the river and along its east and west sides; a small knoll on the west side rises to about 280 feet. The area is drained by several small creeks running north to south across the area and by Autauga Creek on the west.

Rail service could be obtained from a lead track of the Gulf, Mobile and Ohio Railroad into the Union Camp plant site parallel to the western edge of the site. Electric power is available from the Alabama Power Company and natural gas from the Alabama Gas Corporation. Groundwater is reported available at about 200 feet. The river also would be available as a source of processing water.

The most feasible portion of this area for river site development is in the western two-thirds of the tract. Here, between Autauga Creek and another creek and County Road No. 4 to the north, are some 300 acres. The Autauga Creek site reportedly remained above the water level during the 1961 flood. The area is now in agricultural use.

Prattville Site

Although this 1,350-acre tract (identified as Site 2 on Map, Figure 11) was considered some 10 years ago, its value as farmland has precluded other uses. Located southeast of Prattville on the north side of the Alabama River, it is bounded on the east by the Gulf, Mobile and Ohio Railroad, on the north by Reese Ferry Road, on the west by the Autauga Creek site, and on the south by the river. Elevation ranges from 132 feet to 272 feet. About 400 acres in the northwest corner are above 165 feet. This high plateau falls away rapidly from southwest to northeast to a low, level plain at 140 to 150 feet.

The Gulf, Mobile and Ohio Railroad runs along the edge of the site. U. S. 31 runs parallel to the railroad a quarter-mile east and Alabama 14 runs along the north boundary. Both Alabama Power Company and Alabama Gas Corporation have service lines running between Prattville and Montgomery. Groundwater is available at 200 feet.

Wadsworth Site

This area (identified as Site 3 on Map, Figure 11) contains approximately 5¾ square miles; it extends from Alabama Highway 14 south to the Alabama River and is bounded on the west by Rocky Branch and on the east by Noland Creek. The area is dominated by an elongated plateau running generally northeast to southwest, ranging in elevation from 300 feet at the northern end to 200 feet further south. The remainder of the area lies below 200 feet, sloping to the river. Except for an area north of Wadsworth Ponds, this site area does not lend itself to construction. The area south of the ponds to the river is reported to have flooded in 1961.

Immediately beyond the southwest corner of the Wadsworth site area, in the vicinity of Mount Ramoth Church, is an area which might have dock potential. Here a bluff at about 180 feet comes to within 500 feet of the river. However, this area is to be developed by the Corps of Engineers as the Huffman Bar area for recreational purposes. Land area above the 200-foot elevation, including the Mount Ramoth Church area west of the Wadsworth site, contains approximately 1,400 acres. This area is presently in agricultural use.

Nearest rail line is the Gulf, Mobile and Ohio, located about six miles north at Pate. Developing a rail lead would require crossing a swamp and hilly terrain, with six miles of track. The area is presently served by Alabama
Highway 14 and a road paved to a 30-foot width south from Highway 14 to Wadsworth Ponds.

Electric power is available from the Alabama Power Company. A natural gas line extends to the Union Camp plant site just east of this site area, and could be extended. Groundwater is available at 400 to 500 feet.

Dutch Bend Site

This area (identified as Site 4 on Map, Figure 11) is south of Autaugaville between Alabama Highway 14 on the north and the river. Its east and west boundaries are Yellowwater Creek and Howard Creek, respectively. This area contains about 1,300 acres in a large plateau, with elevations up to 280 feet.

The area is served by a network of unpaved county roads extending southward from Alabama 14. Rail would have to be extended from the Gulf, Mobile and Ohio, eight miles north, over hilly terrain. Groundwater probably is available at 400 to 500 feet. The river could be used as a source of processing water and for treated sewage disposal.

Electric power would be available from the Alabama Power Company or the Electric Membership Cooperative. Natural gas is not available at present. The area is in agricultural use, with some scattered residential development.

Burnsville Site

This area (identified as Site 5 on Map, Figure 11) consists of a strip of land approximately 1 ½ miles wide extending from Alabama 14 on the west to Mulberry Creek (the Autauga County line) and the Alabama River on the east; it is located in Dallas County about one mile south of Burnsville. A plateau at an elevation of about 240 feet contains about 900 acres over the area's western half. A drainage area runs through the area’s eastern half, and the plateau drops sharply to a flat area at 100-foot elevation extending through the northeast corner of the area to Mulberry Creek. Terrain differential over the site ranges about 60 feet. The Hammermill Paper plant is located in the area's southeast corner.

Highway access is along a network of county roads intersecting with Alabama 14 on the west and north. Some highway improvements have been made to serve Hammermill. A lead track of the Southern Railway has been extended to
the plant. Groundwater probably is available at depths that prevail for other site areas. River water would be available for processing water, and treated effluent could be discharged into the river.

Electric power and natural gas are available from Alabama Power Company and Southern Natural Gas Company. Like neighboring areas, the potential site is used for agriculture except for the Hammermill plant.

**Belcher Site**

Located in Dallas County on the west side of the Alabama River, this area (identified as Site 6 on Map, Figure 11) is adjacent to the Hammermill Paper Company plant. Total acreage amounts to some 1,800, in a long, narrow strip along the river. Topography varies from 209 feet in the north portion to swampy lows of 100 feet in the south. The site is bounded on the north by Hammermill, on the east by the river, on the west by an improved rural road and a section line, and on the south by a section line. Drainage from the northern third goes to two small creeks.

Transportation access to the Belcher Site was improved when the Hammermill plant was constructed. The access road to Hammermill extends from Alabama Highway 14 across the upper portion of the site, connecting with the improved road running along the western boundary. A Southern Railway spur from Burnsville into the Hammermill property would provide rail service.

Hammermill has electricity and natural gas on its property, making these easily available to this site. Water can be obtained from the Alabama River for industrial purposes and groundwater is available at between 200 and 700 feet in this area. Treated sewage can be returned to the Alabama River.

**Minter Site**

Located in Dallas County, 11 miles southeast of Selma, this 6,400-acre area (identified as Site 7 on Map, Figure 11) is bounded on the east by the Alabama River, on the north by a section line across the neck of Durant Bend, on the west by the river and property and section lines, and on the south partially by the Western Railway of Alabama and by Camp Creek, which is also the northern boundary of the Beers site.

Elevation ranges from 100 to 213 feet. The Atlantic Coast Line (now Seaboard Coast Line) Railroad in its brochure declared 140 feet a safe minimum
elevation for construction and estimated that 3,400 acres would be above this
level. Most of this acreage comprises two large plateaus in the central and
western portions with level land at about 200 feet.

The Western Railway of Alabama main line runs along the south boundary
from the southwest corner for about a mile, providing good rail access. The
site is two miles north of U. S. Highway 80. A two-lane paved road runs
north from U. S. 80 to the Western Railway one-quarter mile west of the south-
west corner of the site. This road continues as an improved dirt road north
to within one-half mile of the river, following the river through the high
plateau in the center of the site. Improvement of this road would give good
access to the site area.

Electric power is available within the site from Alabama Power Company
lines serving the Dan River plant at Benton. Natural gas is available near
Craig Air Force Base, about five miles west of the site area. Groundwater is
available at 450 to 1,200 feet, while the Alabama River along two sides would
provide an industrial water source and means for treated waste disposal.

Beers Site

This site (identified as Site 8 on Map, Figure 11), directly south of the
Minter site, is about 11 miles southeast of Selma and directly northwest of
Benton. It is bounded on the north by Camp Creek, on the east by the Alabama
River, on the south by Dan River Mills and U. S. 80, and on the west by a sec-

tion line. About half the total 4,000 acres is in Dallas County, and half in
Lowndes County. Elevation ranges from 100 to 260 feet. Minimum safe eleva-
tion for construction is estimated as 160 feet, with approximately 230 acres
in this range. Most of the high ground lies in the western and southwest area.

The Western Railway of Alabama bisects the site from northwest to south-
east. U. S. Highway 80 runs along the south boundary. Access roads would have
to be constructed. The utilities situation is similar to that for the Minter
site.

Tyson Site

Located in Lowndes County, 24 miles west of Montgomery, this site (iden-
tified as Site 9 on Map, Figure 11) contains some 3,700 acres. The Alabama
River is the northern boundary, with Cypress Creek on the east, the Western
Railway of Alabama on the south, and property lines on the west. Elevation ranges from 100 to 260 feet. About 1,900 acres are above the estimated minimum construction level of 165 feet. Most of the high area lies in the central and eastern portions. Two small creeks divide the northern area along the river into three sections.

The Western Railway on the south would provide rail service to the area. A paved two-lane highway parallels the rail line from White Hall at the western corner along the entire south line, continuing east as the Old Selma Road. There are no access roads.

Electricity would come from Alabama Power Company, 19 miles east. Natural gas is available from Alabama Gas Corporation at about the same distance. Pioneer Electric Cooperative also serves the area, and a Southern Natural Gas pipeline runs 12 miles north of the river. Groundwater can be found at 450 feet, and the river would be available for industrial water and treated sewage disposal.

Scott Site

This site area (identified as Site 10 on Map, Figure 11) has 6,400 acres and includes an entire bend in the Alabama River, bounded on the east, north, and west by water. The site is 17 miles west of Montgomery. The southern boundary is a property line along a section line 1½ miles north of the Western Railway of Alabama. This might be extended a half-mile to the Old Selma Road. Range of elevation is from 100 to 226 feet, with some 3,000 acres lying above the 165-foot contour. Large areas of high rolling land lie in the south-central portion of the site area.

The Western Railway runs parallel to the south boundary at a distance of 1½ miles, and the Old Selma Road parallels the south boundary about a half-mile away, connected by a county road with U.S. 80, 5½ miles south.

Electric power is available from Alabama Power Company lines at Montgomery. Natural gas can be developed from Alabama Gas Corporation, 15 miles east, or Southern Natural Gas, eight miles north. Groundwater can be found at 450 feet.

Burkville Site

Approximately 1,100 acres are included in this site area (identified as Site 11 on Map, Figure 11). The site, located 10 miles west of Montgomery, is
bounded on the north by the Alabama River, on the east by Pintlalla Creek (the Montgomery-Lowndes County line), on the south by the Western Railway of Alabama, and on the west by a property line. Elevation ranges from 100 to 208 feet. About 700 acres lie above the 165-foot contour, mostly in the center section of the area.

The Western Railway of Alabama runs along the southern boundary of the site. Lowndes County Road 54, a paved two-lane road, runs parallel to the Western track about two-thirds of the width of the site, and then heads northeast, east, and to Pintlalla Creek. A dirt road bisects the property from County Road 54 north to the river. Another county paved road one-quarter mile west connects with U. S. 80, eight miles south.

Electric power can be obtained from Alabama Power Company's line, 7\(\frac{1}{2}\) miles east. Groundwater can be developed at 450 feet. Natural gas will come from an Alabama Gas Corporation line, seven miles east.

**Antioch Site**

Extensive grading, as well as recent residential encroachments, have reduced the attractiveness of this 2,200-acre area (identified as Site 12 on Map, Figure 11) for industrial use. Located in Montgomery County, seven miles west of Montgomery, the site is bounded on the north and west by the Alabama River, on the south by County Road 54 (Old Selma Road), and on the east by property lines. The terrain ranges in elevation from 100 to 300 feet. About 1,000 acres lie above the 165-foot contour. Reliable estimates have been made that extensive grading for a large plant site would cost at least $1-million.

The site has no rail service, but the Western Railway of Alabama has a spur from its main line (1\(\frac{1}{2}\) miles south) to within a few yards of the Old Selma Road. Gulf, Mobile and Ohio Railroad has a spur from its main line five miles east to a gravel pit one mile east of the site. County Road 54, resurfaced and widened several years ago to the southeast corner of the site, offers a good two-lane highway connector east. A paved road from County Road 54 to U. S. 80, five miles south, enhances the surface transportation.

Alabama Power Company has transmission lines to the edge of the property and Alabama Gas Corporation has a 10-inch main within one-half mile. Groundwater is available at 200 feet.
Government Publications


Hearings Before a Subcommittee of the Committee on Appropriations, House of Representatives. 91st Congress, 1st Session, Pt. 1, 1969.


Books


Wollman, Nathaniel. The Value of Water in Alternative Uses, with Special Application to Water Use in the San Juan and Rio Grande Basins of New Mexico. Special Committee under Direction of Nathaniel Wollman, University of New Mexico Press, Albuquerque, New Mexico, 1962.

Articles


